ARANGE Deliverable D1.3

Current and historical forest management in the case study areas

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Abstract:

The main objective of T1.3 is to gather data on current and historical forest management and harvesting and logging technologies within each case study area (CSA). Data were gathered through several questionnaires. In each case study area current (business-as-usual - BAU) forest management concepts were described as a silvicultural system covering the entire life cycle of a representative stand type (RST), including the related harvesting and logging technologies. The level of detail has been chosen in a way that the information can be used to implement BAU management in forest simulation models (Task 2.4). For harvesting approaches a survey was also done at representative landscape level in each of the CSA. In total BAU silvicultural systems for 197 RSTs are available in this Deliverable. Quantitative data on historical forest management was available from five CSAs. These data will be used in Task 2.3 to analyze historic relationships between stand conditions, management and ecosystem service indicators.

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1 Introduction

1.1 General

Mountain forests provide multiple ecosystem services, such as protection against landslides, avalanches, rockfall, erosion, etc. To fulfill this multifunctionality, but also to achieve the sustainability of forest management, appropriate forest management concepts need to be developed and applied. Traditional silvicultural systems (e.g. clear cutting system, uniform shelterwood system, etc.) were developed with a clear focus on sustainable timber production, but they paid less attention to younger developmental stages with high demands on silvicultural measures (Mathews, 1999). However, in the more recent past systems which provide continuous forest cover through extended regeneration periods and ongoing continous regeneration processes have gained much attention since they are supposed to better fulfill the demands for multiple ecosystem services (Gamborg and Larsen, 2003).

The main mission of Task T1.3 in WP1 is to gather data on current and historical forest management concepts within each case study area (CSA). Since forest management needs to be operationally implemented to become effective the investigation of related harvesting and logging technologies was also included into the task. There were three main objectives of T1.3:

a) to get an overview on current forest management concepts applied in the case study areas;
b) to get an overview on currently used harvesting and logging technologies in the case study areas;
c) to gather available historical data on stand structure and composition in relation to (historical) forest management practices.

In order to meet these objectives the deliverable D1.3 is divided into three main chapters, each dealing with one of these aims: 1) Current forest management, 2) Harvesting technologies, and 3) Historical forest management.

From the project point of view the main deliverables of T1.3 will be 1) the operational description of current forest management concepts in CSAs and 2) the digital database on current forest management in the CSAs. Both will represent the basis for implementation of forest management in forest simulation models in WP2. This report, however, summarizes the data assembled in the database where detailed descriptions of gathered data are given in Annexes 2 and 3.

1.2 Terms and abbreviations

Table 1.1: Some terms and abbreviations used in the deliverable D1.3

Term/Abbreviation	Description / definition
BAU	business-as-usual = current
CSA	Case Study Area
CSR	Case Study Responsible person
DBH	diameter at breast height
Developmental phase:	
Regeneration	seedling and sapling phase; 0-130 cm in height
Thicket phase	sapling phase; >130 cm in height, <10 cm in dbh
Early pole phase	dominant stand diameter of 10-20 cm in DBH
Older pole phase	dominant stand diameter of 20-30 cm in DBH
Mature phase	dominant stand diameter of 30-50 cm in DBH
Overmature phase	
FM	forest management
RDC	relative dbh class
Regeneration system	a cutting procedure by which new stands are created
RST	representative stand

1.3 List of tree species

Table 1.2: List of tree species' names used in the deliverable

English name	**Scientific name**
silver fir	*Abies alba*
sycamore maple	*Acer pseudoplatanus*
downy birch	*Betula pubescens*
European ash, common ash	*Fraxinus excelsior*
European beech	*Fagus sylvatica*
European larch	*Larix decidua*
Norway spruce	*Picea abies*
lodgepole pine	*Pinus contorta*
Scots pine	*Pinus sylvestris*
holm oak	*Quercus ilex*
Pyrenean oak	*Quercus pyrenaica*
other conifers	
other broadleaves	
all species in RST	

2 Current forest management

Current forest management, often also referred to as business-as-usual forest management (hereafter BAU FM), represent the normal course of silvicultural measures over the entire life cycle (i.e. rotation) of a stand. In the ARANGE project the BAU FM was defined as the currently practiced silvicultural regime in a specific representative stand type (RST). In a particular RST there could be more than one BAU FM system.

2.1 Methodology

2.1.1 Questionnaire

Data on BAU FM practices in CSAs were gathered through a web-questionnaire which was completed by the CSR for each CSA. The web-questionnaire is based on the textual operational description of BAU FM (Annex 1), which was developed with contributions of all partners in T1.3. The web-questionnaire is oriented towards gathering the most important data on FM systems, particularly silvicultural operations, and harvesting technologies in the RSTs. The web-questionnaire was divided into three main parts (Figure 2.1 – worksheets with labels in the uppermost row):

1. input of the identification data;
2. input of data on BAU FM in a particular RST;
3. viewing of the data on BAU FM in RSTs (with a possibility of data edit).

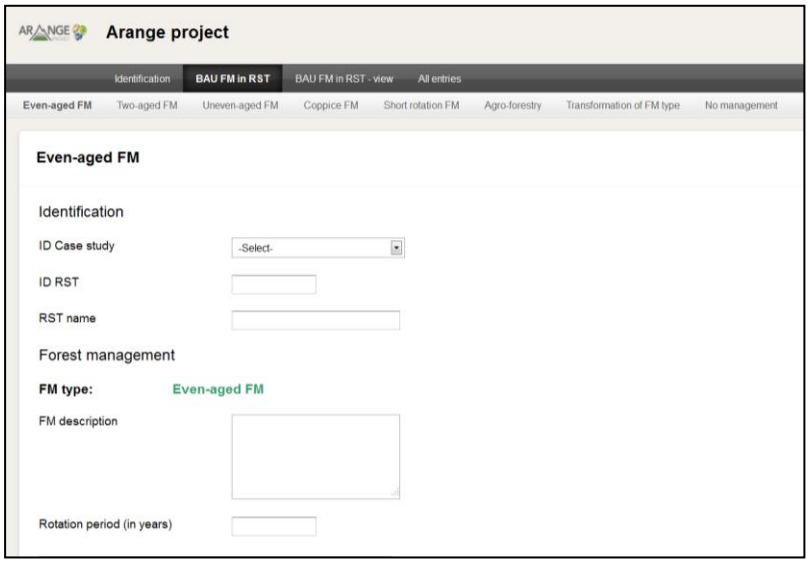


Figure 2.1: Web-questionnaire – a part of the data-entry page for even-aged BAU FM is shown.

In the first step of data entry, the »identification« worksheet had to be chosen and the personal data of the responsible person for data entry had to be given.

Next »BAU FM in RST« worksheet had to be selected and at the same time the worksheet of the correct FM system (second uppermost row in Figure 2.1) was to be selected and opened. Afterwards, the data on BAU FM practice in a particular RST can be entered. Sets of questions slightly differed between the FM types, but the core part of questions was the same for all FM systems.

2.1.2 FM systems for characterization of BAU FM

Eight FM systems were used to characterize the BAU FM in RSTs. The definitions used in this Deliverable are adopted after Mathews (1999) and Nyland (2002).

Even-aged FM system

Regeneration in even-aged FM system is usually accomplished over a relatively short time period, the canopy is removed in one or a few regeneration fellings. Such concept produces even-aged stands, which mean that canopy trees are about the same height and that diameters are distributed in a “bell-shaped” distribution. Even-aged stands are usually >1 ha in size. A rotation period of even-aged forest should not be shorter than 50 years. If shorter, Short rotation FM system should be identified.

Two-aged FM system

Two-aged FM creates two-storied high forests composed of an upper and a lower storey of trees. Usually, two or more tree species are involved, the upper storey is usually made of light-demanding tree-species under which shade-tolerant species can grow in the understorey.

Uneven-aged FM system

Uneven-aged FM system is characterized by silvicultural practices that create stands in which trees of all ages and sizes are present at a relatively small area. Trees in a stand are either intimately mixed or mixed in small groups. The canopy is continuously present throughout the stand; regeneration and recruitment into upper canopy strata need to be continuous.

Coppice FM system

The coppice FM system involves reproduction of trees by vegetative reproduction (i.e. suckers, sprouts). The rotation period is determined by the tree species and the size of material required. The method of annual coupes by area (i.e. clear cuts) is most usually practiced, and thinnings may be practiced as well. Coppice with standards (i.e. Mittelwald) is included in this FM system as well.

Short rotation FM system

Short rotation FM system implies a clear cut system with planting of seedlings . Thinnings may also be applied. This FM system includes tree plantation FM for bioenergy or timber production or for any other purpose with a rotation period of 50 years or shorter.

Agro-forestry

Agro-forestry is a FM system if growing trees is combined with agricultural crops and/or the grazing of lifestock. Different systems of agro-forestry may be distinguished: agro-silvicultural, silvo-pastoral, and agro-silvo-pastural systems.

Transformation FM

Transformation/conversion from FM system X to FM system Y should be identified if RST is in the phase of active transition from one FM system to another one. As X the FM system from which RST is converted from should be identified, while Y refers to FM system to which RST is supposed to be converted. For example, pure even-aged stands may be converted to uneven-aged stands, or coppice stands to even-aged high forests, etc.

No management

Applicable if no FM has been applied in a RST. Several reasons for that could be identified: environmental protection (conservation) as forest reserves, forest areas of pronounced protective ecosystem services (slopes, erosion, etc.), inaccessibility, etc.

2.1.3 Regeneration systems

FM system is closely related to the system used in order to regenerate forest stands, i.e. the regeneration system. Regeneration system was defined as a cutting procedure by which new stands are created. Some regeneration systems are inherently related to specific FM systems (e.g. clear cutting system and even-aged FM, creating even-aged stands), but some regeneration systems may be freely compatible to different FM system and stand types (e.g. group system may create even-aged or uneven-aged stands, depending mainly on the area of its application and the length of regeneration period; similarly is valid also for shelterwood strip system). Within the T1.3, nine different regeneration systems have been defined.

Clear cutting system

Successive areas (coupes) are clear felled, some pre-existing poles or groups of saplings may be left if they are large enough to form self-contained crops. Afterwards, coupes are (usually artificially) regenerated. Created new stands are of even-aged structure.

Uniform shelterwood system

It is a system of successive regeneration fellings on a large area and usually implies a uniform opening of the canopy, creating new even-aged stands. When the stand approaches the age at which it will be harvested and regenerated, the harvest is made in several steps. First step is the seeding cut, which removes a certain portion of trees evenly across a stand to open stand canopy and provide sufficient light to ensure germination and survival of seedlings. The seeding cut is followed by one or several secondary fellings to provide more light for the established regeneration layer. The last cut is the final felling of the residual stand, when the regeneration is already well established. To qualify as a shelterwood system at least two cuts are required.

Group system

It is a system of successive regeneration fellings in gaps. First, natural gaps with groups of advance regeneration in a stand are identified and usually the gap around each group is widened. If there are no natural gaps and groups of advance regeneration new canopy openings are initiated over the regeneration area. If regeneration becomes established the canopy shelter is removed and the gap may be enlarged. Several such secondary fellings enlarging the gaps may be implemented. The final felling removes the last remaining seed bearers in the residual stand separating the various groups of regeneration. This regeneration system includes also irregular shelterwood (i.e. "Femel system") and other similar systems. Group systems can be used to create even-aged and uneven-aged stands, depending on the length of regeneration period, the number of successive gap enlargements, and the size of created gaps.

Shelterwood strip system

Shelterwood strip system is a system of successive regeneration fellings which are made in strips of different widths. Regeneration begins with a seeding cut carried out along one edge in form of a strip. When regeneration on a strip is established, a secondary felling or the final cut is made over it and another seeding felling is carried out on the next strip. The process is continuously repeated until the intended forest area is regenerated. With this system even-aged or uneven-aged stands can be created, depending on the size of created strips.

Seed tree system and High forest with reserves system

Both are systems in which selected trees or tree groups are not harvested, but are left standing to provide a seed source for natural regeneration and/or to produce large-sized high quality timber. The majority of the old stand is usually clear felled.

Single tree selection system

In single tree selection systems scattered individual trees of multiple age classes are selected to be harvested over the whole stand area. This regeneration system produces small canopy openings, which are especially conducive to the establishment and growth of shade-tolerant tree species. Harvest trees are selected by diameter (i.e. harvest) and structure regulation (i.e. tending). Created stands are always of uneven-aged structure.

Group selection system (=patch cut)

In group selection system small groups of trees are selected to be harvested over the whole area. This regeneration system produces canopy openings of sizes up to 0.1 ha (i.e. circular gaps approximately one tree height wide), in more extreme versions up to 1 ha (i.e. circular gaps approximately 2-3 tree heights wide). Created stands are of uneven-aged structure.

Coppice system

At this point, a simple coppice system is understood under this term. It is a silvicultural system in which a (fixed) area of old crop (i.e. an annual coupe) is annually clear felled. The entire area of coppice is divided into annual coupes in numbers equal to the number of years in the rotation period. A result of simple coppice systems are even-aged coppice stands. If other coppice systems are used in a RST, it should be mentioned in the description of the regeneration felling.

Other (regeneration systems)

Need to be defined case by case.

2.2 ARANGE BAU FM database

Based on the input data in the web-questionnaire, one of the results of T1.3 are the databases which include all gathered information on BAU FM in RSTs in all CSAs. There are four main databases for each identified FM system in the CSAs: even-aged FM, uneven-aged FM, coppice FM, and no FM. Each database is in Microsoft Excel® format (Figure 2.2) and compiles more than 250 columns (=parameters/ information); an exception is the database for no FM, which compiles only 8 columns. The databases will be available for internal use on the ARANGE web platform.

	A	B	C	D	E	F	G	H	I	J
1	ID Case study	ID RST	RST name	FM_ID	BAU FM_r	FM description	Rotation	TD_Sp1	TD_1	TD_Sp2
2	Shiroka laka	4	Mixed forests on Cambisols	10	1	Mixed forests on Cambisol	120	0	0	0
3	Shiroka laka	6	Mixed coniferous forests on Cambisols	10	1	Mixed coniferous forests or	120	0	0	0
4	Shiroka laka	7	Mountainous spruce forests on permesotrophic soils	10	1	The mountainous spruce fo	120	0	0	0
5	Shiroka laka	8	Mountainous spruce forests on submesotrophic soils	10	1	The mountainous spruce fo	120	0	0	0
6	Shiroka laka	5	Scots pine dominated forests on Cambisols	10	1	Scots pine dominated fores	120	0	0	0
7	Shiroka laka	3	Black pine dominated forests on Rendzina	10	1	Black pine dominated fores	120	0	0	0
8	Shiroka laka	1	Beech forests	10	1	Beech forests grow on mes	120	0	0	0
9	Dinaric Mountair	11	even-aged mixed fir-beech-spruce stands on flat sites around 900 m asl	10	1	FM concept is small-scale	140	Abies alba	80	Picea abie
10	Dinaric Mountair	8	even-aged mixed fir dominated stands on S exposed sites around 900 m asl	10	1	FM concept is small-scale	140	Abies alba	80	Picea abie
11	Dinaric Mountair	7	even-aged mixed conifers dominated stands on N exposed sites around 900 m asl	10	1	FM concept is small-scale	140	Abies alba	80	Picea abie
12	Dinaric Mountair	6	even-aged mixed fir dominated stands on flat sites around 900 m asl	10	1	FM concept is small-scale	140	Abies alba	80	Picea abie
13	Dinaric Mountair	5	even-aged mixed fi-beech stands	10	1	FM concept is small-scale	140	Abies alba	80	Picea abie
14	Dinaric Mountair	4	even-aged mixed fir dominated stands	10	1	FM concept is small-scale	140	Abies alba	80	Picea abie
15	Dinaric Mountair	10	even-aged pure spruce stands	10	1	Stands were mainly artificia	130	Abies alba	70	Picea abie
16	Dinaric Mountair	9	even-aged pure spruce stands	10	1	Stands were mainly artificia	130	Abies alba	70	Picea abie
17	Dinaric Mountair	2	even-aged altimontane beech stands	10	1	FM is practiced as the irreg	135	Abies alba	50	Picea abie
18	Dinaric Mountair	1	even-aged mixed beech dominated stands	10	1	Practice of irregular shelter	135	Abies alba	70	Picea abie
19	Kozie chrbty	17	1635	10	1	0	100	0	0	0
20	Kozie chrbty	16	1612	10	1	0	160	0	0	0
21	Kozie chrbty	15	1543 b	10	1	0	120	0	0	0
22	Kozie chrbty	14	1526 b	10	1	0	100	0	0	0
23	Kozie chrbty	13	1496 II	10	1	0	110	0	0	0
24	Kozie chrbty	12	1496 I	10	1	0	110	0	0	0
25	Kozie chrbty	11	1404	10	1	0	110	0	0	0
26	Kozie chrbty	10	1343 II	10	1	0	110	0	0	0
27	Kozie chrbty	9	1343 I	10	1	0	100	0	0	0
28	Kozie chrbty	8	1283 b	10	1	0	160	0	0	0
29	Kozie chrbty	7	1090	10	1	0	110	0	0	0
30	Kozie chrbty	6	1080	10	1	0	110	0	0	0
31	Kozie chrbty	5	1060	10	1	0	100	0	0	0
32	Kozie chrbty	4	1003	10	1	0	160	0	0	0
33	Kozie chrbty	3	310	10	1	0	150	0	0	0
34	Kozie chrbty	2	140 II	10	1	0	110	0	0	0
35	Kozie chrbty	1	140 I	10	1	0	110	0	0	0
36	Montes Valsain	12	evenaged mature P.sylvestris, coppice Q. pyrenaica	10	1	P.sylvestris (70%)Q. pyren	120	Pinus sylv	0	0
37	Montes Valsain	6	evenaged P.sylvestris, coppice Q.pyrenaica	10	1	70% P.sylvestris, 30% Q.p	120	Pinus sylv	0	0
38	Montes Valsain	5	mature evenaged Psylvestris, coppice Q.pyrenaica	10	1	30% P.sylvestris, 70% Q.p	120	Pinus sylv	0	0
39	Montes Valsain	13	pure even-aged P. sylvestris, ST=6	10	1	Site Type=6, Site Index=23	120	Pinus sylv	60	0
40	Montes Valsain	14	pure even-aged P.sylvestris, ST=7	10	1	site type=7, site index=17	120	Pinus sylv	0	0
41	Montes Valsain	11	even-aged pure P.sylvestris, ST=5	10	1	Site Type=5, Site Index=26	120	Pinus sylv	0	0

Figure 2.2: A screen shot of the even-aged FM database.

Parameters, described in the databases, are structured into seven groups: identification information, general information on BAU FM, and five groups of silvicultural operations – regeneration operations, weeding, tending, thinning, and regeneration felling operations. Within these groups 100 different parameters are gathered (Table 2.1).

(1) Identification information

This group comprised data for identification of CSA, RST, and BAU FM.

(2) General information on BAU FM

As general information on BAU FM, data on rotation period and target diameter per tree species are gathered.

(3) Regeneration operations

This group comprised data on regeneration period, regeneration type, and on a particular regeneration operation – time reference, species mixture, data on labour and costs.

(4) Weeding operations

Information on weeding operations are gathered regarding time reference of each operation, technology used, and data on labour and related costs.

(5) Tending operations

Data are structured similarly as for weeding operations, only the data on proportion of removed individuals was additionally gathered.

(6) Thinning operations

Thinning operations are described with data on thinning type, time reference for a particular operation, tree species involved, removals (1. proportion in total stand basal area or volume and 2. diameter structure of removals in relative dbh classes), harvesting and extraction technology, and data on costs and productivity (for the report see Chapter 3).

(7) Regeneration felling/Selection felling operations

The data were structured as done for thinning operations; the only difference was that thinning type was exchanged with the information on regeneration system.

Table 2.1: Information and parameters in the ARANGE BAU FM databases

DATA STRATUM	COLUMN TITLE	DESCRIPTION
Identification information	ID Case study	Case study name
	ID RST	RST number
	RST name	RST name/title
	FM_ID	ID of FM (see Operational description of the questionnaire)
	BAU FM_no	Serial number of FM practice in a particular RST
	ID RST×FM	A unique numerical number ID composed as "ID RST_FM ID_BAU FM_no"
	FM description	Description of FM practice
General information	Rotation period	Rotation period in years
	Species1	Species 1 for which target DBH (TDBH1) is given
	TDBH1	Target DBH for species 1
	Species2	Species 2 for which target DBH is given
	TDBH2	Target DBH for species 2
	Species3	Species 3 for which target DBH is given
	TDBH3	Target DBH for species 3
	Species4	Species 4 for which target DBH is given
	TDBH4	Target DBH for species 4
	Species5	Species 5 for which target DBH is given
	TDBH5	Target DBH for species 5
Regeneration operations (all data were gathered for 3 regeneration operations and 5 tree species per operation)	Regeneration period	Regeneration period in years
	Regeneration type	Regeneration type (natural, artificial- planting, artificial - seeding, mixed, etc.)
	R_Age	Age of a stand when particular operation was done
	R_Phas	Developmental phase when particular operation was done
	R_Htop	Top height of a stand when particular operation was done
	R_Spec	Tree species
	R_Orig	Origin of a species
	R_Prop	Proportion in regeneration of a species
	R_Rgdn	Regeneration density in seedlings/ha for a species

	R_Sedn	Seed density in kg/ha for a species (if seeding was done)
	R_SpAr	Spatial arrangement of a species
	R_Lab	Labour in h/ha done for regeneration operation (and species)
	R_Cost11	Cost in €/ha for regeneration operation (and species)
	Regeneration description	Description of regeneration operations
Weeding operations (all data were gathered for 4 weeding operations)	W_Age	Age of a stand when particular operation was done
	W_Dphas	Developmental phase when particular operation was done
	W_Htop	Top height of a stand when particular operation was done
	W_Lab	Labour in h/ha done for a particular operation
	W_Cost	Costs in €/ha for a particular operation
	W_Techn	Technology used for a particular operation
	Weeding description	Description of weeding operations
Tending operations (all data were gathered for 4 tending operations)	TD_Age	Age of a stand when particular operation was done
	TD_Dpha	Developmental phase when particular operation was done
	TD_Htop	Top height of a stand when particular operation was done
	TD_DBHd	Dominant DBH of a stand when particular operation was done
	TD_DBHm	Mean DBH of a stand when particular operation was done
	TD_Remo	Removals - proportion of removed regeneration (in % of total number of regeneration)
	TD_Tech	Technology used for a particular operation
	TD_Lab	Labour in h/ha done for a particular operation
	TD_Cost	Costs in €/ha for a particular operation
	Tending description	Description of tending operations
Thinning operations (all data were gathered for 5 thinning operations and 5 tree species per operation)	Thinning type	Identification of thinning type (from above, from below, combination, none)
	TH_Age	Age of a stand when particular operation was done
	TH_DPh	Developmental phase when particular operation was done
	TH_Htp	Top height of a stand when particular operation was done
	TH_Dd	Dominant DBH of a stand when particular operation was done
	TH_Dm	Mean DBH of a stand when particular operation was done
	TH_sp	Tree species

	TH_Vol	Removals - removed volume of a species
	TH_%Rm	Removals - proportion of removed stand volume (or BA) of a species in total stand volume (or BA)
	TH_D1R	Removals in relative DBH class 1 - proportion of removed trees per relative DBH class in regard to all removed trees (in %)
	TH_D2R	Removals in relative DBH class 2
	TH_D3R	Removals in relative DBH class 3
	TH_D4R	Removals in relative DBH class 4
	TH_D5R	Removals in relative DBH class 5
	TH_Har	Harvesting method of particular species in particular operation
	TH_Fel	Felling method of particular species in particular operation
	TH_Del	Delimbing method of particular species in particular operation
	TH_Buc	Bucking method of particular species in particular operation
	TH_Ext	Extraction method of particular species in particular operation
	TH_ExD	Extraction distance in particular operation
	TH_CoH	Harvest costs in €/m^3 of timber in a particular operation
	TH_CoE	Extraction costs in €/m^3 of timber in a particular operation
	TH_PrH	Harvest productivity in m^3/PSH_{15} (PSH_{15} = productive working hours excluding breaks)
	TH_PrE	Extraction productivity of extraction in m^3/PSH_{15}
	Thinning description	Description of thinning operations
Regeneration felling operations (all data were gathered for 4 regeneration felling operations and 5 tree species per operation)	Regeneration system	Identification of regeneration system
	RF_Hin	Selection harvest time interval in years – ONLY FOR UNEVEN-AGED BAU FM PRACTICE!
	RF_Age	Age of a stand when particular operation was done
	RF_DPh	Developmental phase when particular operation was done
	RF_Htp	Top height of a stand when particular operation was done
	RF_Dd	Dominant DBH of a stand when particular operation was done
	RF_Dm	Mean DBH of a stand when particular operation was done
	RF_sp	Tree species
	RF_Vol	Removals - removed volume of a species

	RF_%Rm	Removals - proportion of removed stand volume (or BA) of a species in total stand volume (or BA)
	RF_D1R	Removals in relative DBH class 1 - proportion of removed trees per relative DBH class in regard to all removed trees (in %)
	RF_D2R	Removals in relative DBH class 2
	RF_D3R	Removals in relative DBH class 3
	RF_D4R	Removals in relative DBH class 4
	RF_D5R	Removals in relative DBH class 5
	RF_Har	Harvesting method of particular species in particular operation
	RF_Fel	Felling method of particular species in particular operation
	RF_Del	Delimbing method of particular species in particular operation
	RF_Buc	Bucking method of particular species in particular operation
	RF_Ext	Extraction method of particular species in particular operation
	RF_ExD	Extraction distance in particular operation
	RF_CoH	Harvest costs in €/m^3 of timber in a particular operation
	RF_CoE	Extraction costs in €/m^3 of timber in a particular operation
	RF_PrH	Harvest productivity in m^3/PSH_{15} (PSH_{15} = productive working hours excluding breaks)
	RF_PrE	Extraction productivity of extraction in m^3/PSH_{15}
	Regeneration felling description	Description of regeneration felling operations

2.3 Reports across case study areas

In the CSAs 4 different types of BAU FM could be found: even-aged, coppice, uneven-aged, and no FM, which are very unevenly distributed between CSAs (Figure 2.3). Even-aged BAU FM can be found in the CSA 1 (Montes Valsain, Spain), CSA 4 (Sneznik, Slovenia), CSA 6 (Kozie chrbty, Slovakia), and CSA 7 (Shiroka laka, Bulgaria). Coppice BAU FM is applied only in CSA 1, while uneven-aged BAU FM is practiced in the CSA 3 (Montafon, Austria) and CSA 4. No FM is applied in several RSTs in the Spanish, Slovenian and Bulgarian CSAs.

Since more than one BAU FM can be identified in a RST, the total number of different BAU FM can be higher than the number of RSTs in a particular CSA.

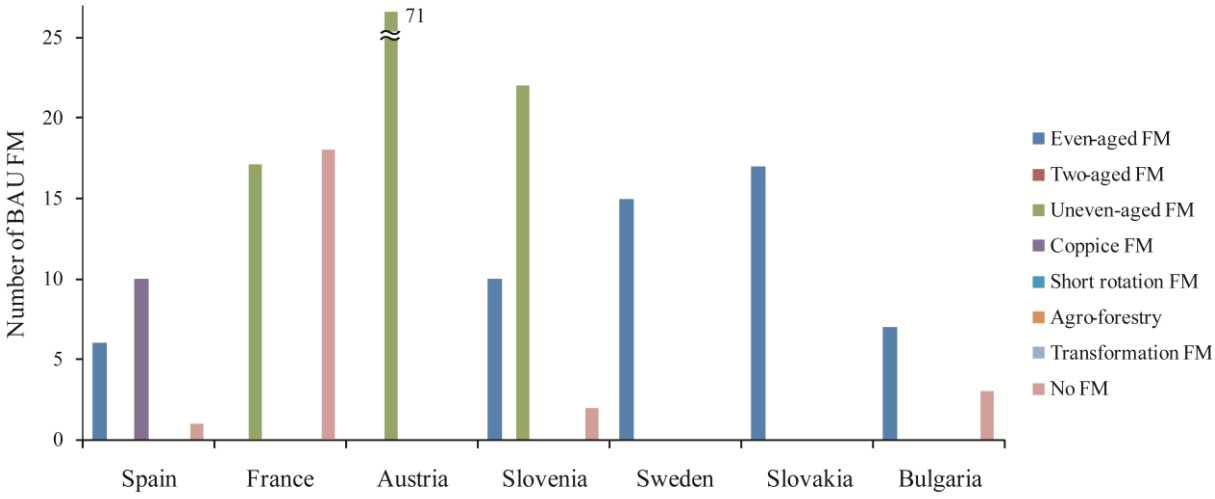


Figure 2.3: Number of identified BAU FM in the ARANGE case study areas

2.3.1 Even-aged forest management

In the vast majority of RSTs where even-aged FM is practiced, stands are regenerated using natural regeneration only. The exception is CSA 6 in Slovakia where stands are regenerated with a combination of natural and artificial (planted) regeneration.

Weeding operations are more an exception as a rule, while tending operations are common in CSA 1 (Spain), CSA 4 (Slovenia), and CSA 7 (Bulgaria).

Thinning type differs between CSAs. A combination of thinning types is applied in CSA 1 (thinning from below and random thinning) and CSA 7 (thinning from below and from above), thinning from above is practiced in CSA 4, while in CSA 6 thinning operations are done as sanitary fellings. Normally, 3-4 thinning operations are applied in the RSTs subjected to even-aged FM. Thinning intensities range from 17-28 % of total stand volume in early pole stage stands, 9-28 % in older pole stage stands, and 10-28 % in mature stands.

The regeneration system applied in the CSAs is mainly a group system; in CSA 4 and CSA 7 it is an irregular shelterwood system, which in ARANGE is identified as a group regeneration system. Regeneration periods range from 20 to 30 years, while in the CSA 6 it may be as long as 40 years. In the CSA 4 and CSA 7 regeneration of stands is normally done in three regeneration fellings, while in the CSA 1 usually four regeneration fellings are executed. Felling intensities of consecutive regeneration fellings are 30-50 % of total stand volume, while it is 100 % in the final felling.

2.3.2 Two-aged forest management

Two-aged FM is not applied in any of the RSTs.

2.3.3 Uneven-aged forest management

Uneven-aged FM is currently practiced in CSA 2 (France), CSA 3 (Austria) and CSA 4 (Slovenia), but significant differences can be distinguished between these CSAs.

In Vercors (CSA2) single-tree selection, rarely group selection system is applied. Firstly, 50-80 % of trees above a predefined diameter limit is chosen to be harvested. A gap to the total removals of 15-20 % of stand basal area is then completed with trees with a diameter inferior to a diameter limit, considering also their quality. The return period is 10 years.

In Montafon (CSA3) uneven-aged FM is performed as a modified group selection system, in which selection cuts are executed as slit cuts of variable size along the sky-line track which are spanned diagonally across the slope. On a (slit) cut area all trees are harvested. No weeding, tending or thinning operations are performed. The (theoretical) return period per skyline track is about 200 years.

In Sneznik (CSA4) uneven-aged FM is applied as a combination of a small-scale irregular shelterwood system and a group selection system. The application of regeneration system depends on site and stand characteristics: group selection system is normally applied on sites with more extreme site conditions and in stands with a higher share of conifers, especially silver fir, otherwise an irregular shelterwood system is practiced. If irregular shelterwood system is applied, stands are treated similarly as described for even-aged FM, only the created canopy gaps are smaller, including the removal of individual stems only (“free style silviculture” sensu Mlinsek (1968) and Boncina (2011)). In stands subjected to group selection system, a harvest interval is approximately 10 years and average harvest intensity 15 % of total stand volume.

2.3.4 Coppice forest management

Coppice FM is currently applied only in the Spanish CSA 1 Montes Valsain in pure Pyrenean oak stands and in its mixed stands with Scots pine or holm oak. The only practiced coppice form is simple or even-aged coppice with a rotation period of 70 years. Stands are regenerated naturally by making new growth from stumps or roots. At stand age of 20 years a tending operation is applied, while thinning operations start at age 30 years and are consecutively executed at stand age 40 and 60 years in the majority of RSTs; in some RSTs thinning is done also at age 50. Thinning intensities range between 11 (8) % and 23 (28) % of total stand volume. Final clear cutting is executed at stand age of 70 years.

2.3.5 Short rotation forest management

Short rotation FM is not applied in any of the CSAs.

2.3.6 Agro-forestry

Agro-forestry is not applied in any of the CSAs.

2.3.7 Transformation forest management

Transformation FM is not applied in any of the CSAs.

2.3.8 No forest management

The absence of FM was identified in the CSA 1 (Spain), CSA 4 (Slovenia), and CSA 7 (Bulgaria). Main causes for no active management in a RST are nature conservation (2 RSTs in CSA 4) and emphasized protective roles (2 RSTs in CSA 7), but also inaccessibility (1 RST in CSA 7) and abandonment of pasture (1 RST in CSA 1) were designated as causes for the absence of FM.

2.4 Reports per case study areas

Detailed reports for each RST in each CSA can be found in Annex 2. Here just a brief summary per CSA is given.

2.4.1 CSA1 – Montes Valsain, Iberian Mountains, Spain

In the Spanish CSA 1 Montes Valsaín, three different FM systems are found (Table 2.2); all of them are implemented using ground skidding.

Table 2.2: Number and share of different BAU FM systems in the CSA1

	BAU FM							
	Even-aged	Two-aged	Uneven-aged	Coppice	Short rotation	Agro-forestry	Transform-ation FM	No FM
Number	6			10				1
Share (%)	35			59				6

Coppice FM is the most commonly practiced in the Spanish CSA. It is the only FM system in 7 RSTs: six of them are pure Pyrenean oak RSTs and one is a mixed Pyrenean oak-holm oak RST. Even-aged FM is applied in three pure Scots pine RSTs, while in three RSTs even-aged and coppice FM systems are applied in parallel (even-aged FM in Scots pine and coppice FM in Pyrenean oak). No management is applied in the pure holm oak RST.

2.4.1.1 Regeneration operations

When stands are regenerated, only natural regeneration of Scots pine, Pyrenean oak and holm oak are used. Scots pine is regenerated from seed, while Pyrenean oak and holm oak are regenerated vegetative by sprouts (coppice).

2.4.1.2 Weeding and tending operations

No weeding operation or other early release treatments are conducted in the RSTs.

In RSTs the only tending operation is done in the thicket stage stands at approximate age of 20 years. In RSTs with even-aged FM (Scots pine stands), the tending intensity ranges between 38-69 %, meaning that 38-69 % of individuals are removed from the stand. In RSTs with coppice FM, this interval is even broader: 27-76 % of individuals are removed in the tending operation. Trees to be removed are selected randomly in a stand.

2.4.1.3 Thinning operations

Thinning is practiced as a combination of thinning from below and random thinning. In RSTs with even-aged FM three thinning operations are performed, while in RSTs with coppice FM between three and four operations are carried out.

In RSTs with even-aged FM, the first thinning operation is carried out at age of 40 years when stands are in the developmental phase of older (some still early) pole phase. The thinning intensity ranges from 17-26 % of total stand volume (Figure 2.4). The consecutive thinning operations are performed every 20 years at ages 60 and 80 years, respectively. The intensities of

the second operation vary between 9 and 14 % of total stand volume, while intensities of the third operation range 21-38 % of total stand volume.

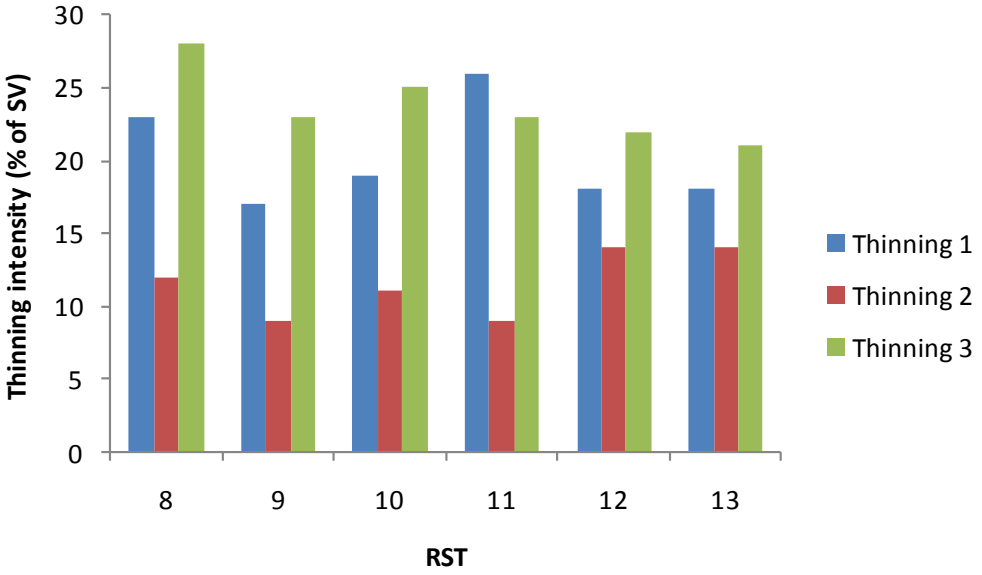


Figure 2.4: Thinning intensities (in % of stand volume) in RSTs subjected to even-aged FM in the CSA 1

In RSTs with coppice FM, the first thinning operation is performed at age 30 years and is done with intensities of 11-16 % of total stand volume (in majority of 16 %; Figure 2.5). The second thinning is done at age 40 years with intensities of 19-24 % of total stand volume. The third thinning is done at ages of 50 (RSTs 8, 10, 12) or 60 years with 12-23 % of total stand volume being removed. The fourth thinning operation is performed only in RSTs 8, 10 and 12 and is carried out at age 60 years with intensities of 21-28 % of total stand volume.

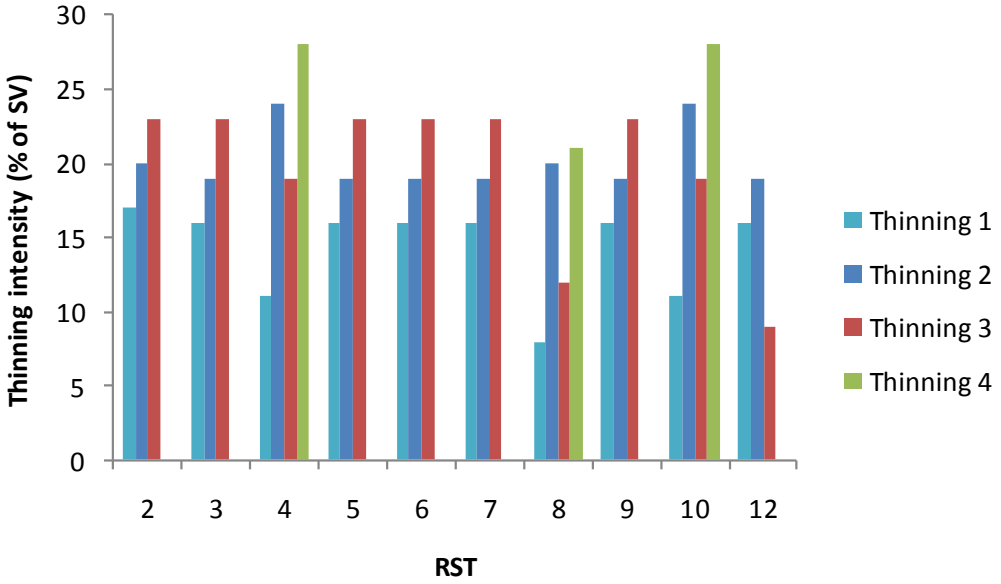


Figure 2.5: Thinning intensities (in % of stand volume) in RSTs subjected to coppice FM in the CSA 1

2.4.1.4 Regeneration felling operations

In RSTs where even-aged FM is practiced, the regeneration system used is a group system. Rejuvenation of stands is normally done in four successive regeneration fellings, an exception is RST 5 with three successive regeneration fellings (Figure 2.6).

The first felling is performed at age of 100 years when mean stand diameter reaches 45-55 cm in DBH. The felling intensity ranges from 43-53 % of total stand volume. The second regeneration felling is applied at stand age of 110 years with an intensity of 31-39 % of total stand volume, while the third regeneration felling is normally done at age 115 years with harvest intensities of 23-33 % of total stand volume (in RST 5 this felling is absent). Final fellings are accomplished at age 120 years.

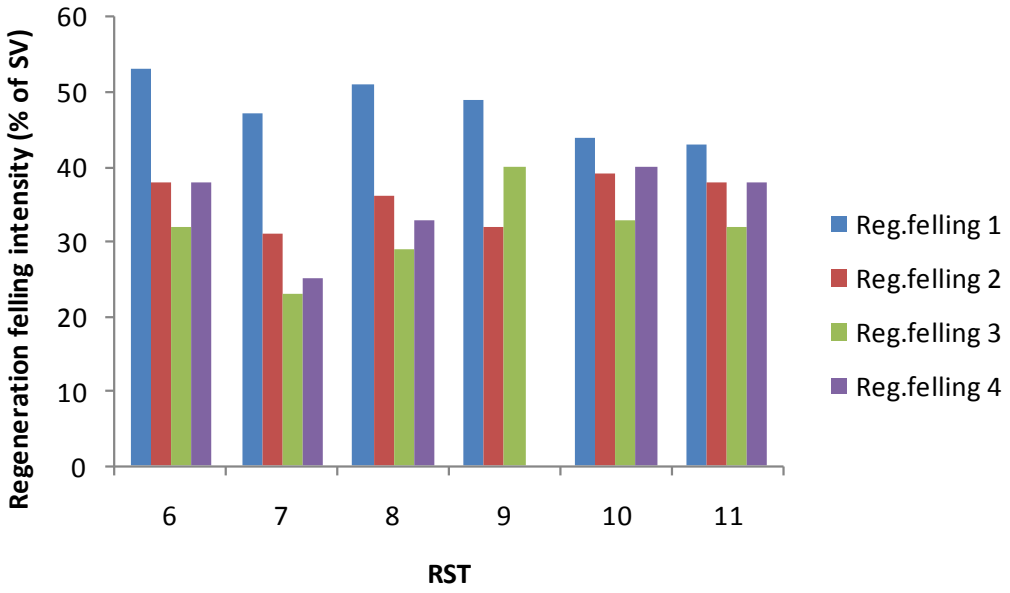


Figure 2.6: Regeneration felling intensities (in % of stand volume) in RSTs subjected to even-aged FM in the CSA 1

In RSTs with coppice FM, a clear cutting system is applied. In all such RSTs a clear cut is done at age 70 years.

2.4.1.5 No FM

RST 1 represents pure holm oak stands on former pastures, in which no forest management is performed. Pastures were abandoned in the recent past and no FM has been applied since then.

2.4.2 CSA 2 – Vercors, Western Alps, France

In the French CSA all managed stands are subjected to uneven-aged BAU management (Table 2.3), while in all RSTs also no FM is applied in some parts.

Table 2.3: Number and share of different BAU FM in the CSA2

	BAU FM							
	Even-aged	Two-aged	Uneven-aged	Coppice	Short rotation	Agro-forestry	Transform-ation FM	No FM
Number			17					18
Share (%)			94					100

2.4.2.1 Regeneration operations

In the Vercors CSA stands are regenerated naturally. Regeneration is a mixture of Silver fir, Norway spruce, European beech, sycamore maple and other broadleaves in a mixture of different proportions.

2.4.2.2 Weeding and tending operations

In the thicket stage within uneven-aged stands one tending operation is performed, removing 10 % of all saplings.

2.4.2.3 Thinning operations

Thinning is performed simultaneously with selection cutting. With thinning operations trees of high quality are promoted, regardless the species. However, in public forests Norway spruce is favored if and where possible.

2.4.2.4 Regeneration felling operations

Single-tree selection cuttings are applied in all RSTs. The selection harvest is done every 10 years. A certain proportion of trees above a predefined diameter limit (50-80% of all these trees) are harvested. In total 15-20 % of total stand basal area is to be removed in one operation. If not enough trees above a predefined diameter limit is harvested, then trees below this limit are cut, considering also their quality. Reducing local tree density is also an objective. The removals per tree species are proportional to their proportion in stand basal area, only Norway spruce is sometimes favored in public forests. Broadleaves are usually preserved if rare.

2.4.3 CSA 3 – Montafon, Eastern Alps, Austria

As indicated in the Chapter 2.2 (Figure 2.3), all RSTs in the Montafon CSA are subjected to uneven-aged BAU management (Table 2.4), although a handful of RSTs feature even-aged structure due to historic management.

Table 2.4: Number and share of different BAU FM in the CSA3

	BAU FM							
	Even-aged	Two-aged	Uneven-aged	Coppice	Short rotation	Agro-forestry	Transform-ation FM	No FM
Number			70					
Share (%)			100					

2.4.3.1 Regeneration operations

Forests in the Montafon CSA are regenerated by natural regeneration only. Regeneration is a mixture of Norway spruce as the dominant species and other coniferous (Silver fir, European larch, Swiss stone pine) and broadleaved species (European beech, sycamore maple, common ash, rowan).

2.4.3.2 Weeding and tending operations

No weeding, tending or protection operations are applied in the RSTs.

2.4.3.3 Thinning operations

No thinning operation is practiced in the RSTs.

2.4.3.4 Regeneration felling operations

The regeneration system in the RSTs of the Montafon CSA is a modified group selection system. The (theoretical) harvesting interval is 200-250 years (time until the same part of the RST is harvested again). The vast majority of the RSTs are located on steep slopes which require sky-line based logging techniques. The selection cuts are flexible in size and executed as slit and small patch cuts along the sky-line track which are spanned diagonally across the slope. The slit cuts are 5-40 m wide and up to 80 m long. The exception to that is RST 8.1 (RST 8 in Silbertal landscape) in which group selection cuts are performed in less steep terrain using tractor and winch for logging. There the average diameter of the group cuts is 40 m, whereas all other management parameters are the same like in steep terrain.

2.4.4 CSA 4 – Sneznik, Dinaric Mountains, Slovenia

In the Slovenian CSA4 Sneznik, even-aged, uneven-aged and no FM were identified as BAU FM types in the RSTs (Table 2.5). All RSTs feature terrain allowing skidder based logging techniques. In RSTs in which even-aged FM is practiced, rotation periods are 130-140 years. In two RSTs no FM has been implemented for several decades due to nature conservation reasons.

Table 2.5: Number and share of different BAU FM in the CSA4

	BAU FM							
	Even-aged	Two-aged	Uneven-aged	Coppice	Short rotation	Agro-forestry	Transform-ation FM	No FM
Number	10		22					2
Share (%)	29		65					6

2.4.4.1 Regeneration operations

Only natural regeneration is used when stands are rejuvenated. Regeneration is composed of many tree species: three main species European beech, Silver fir and Norway spruce predominate, sycamore is frequent, while other broadleaved species (wych elm, small-leaved linden, rowan, etc.) are present individually or in small patches.

2.4.4.2 Weeding and tending operations

No weeding operation is conducted in the RSTs.

In RSTs with even-aged FM and in RSTs with uneven-aged FM with small-scale irregular shelterwood regeneration system three tending operations are usually done. The first tending operation is conducted in the regeneration developmental stage at a stand height of 1.3 m. In general, 10 % of all seedlings and saplings are removed in this operation. The second operation is conducted at an approximate stand height of 3.5 m and usually 40 % of individuals are removed. The third tending operation is performed when a dominant stand diameter reaches 7.5 cm in DBH. In general 35 % of young trees are removed from the stand. In all tending operations silver fir, sycamore, wych elm and other minority broadleaved species are promoted. Broadleaves are even more explicitly promoted in Norway spruce dominated RSTs 9 and 10.

2.4.4.3 Thinning operations

Thinning is practiced in all RSTs with even-aged FM and in RSTs with uneven-aged FM with small-scale irregular shelterwood regeneration system. Thinning from above (i.e. crown thinning) is practiced and usually four thinning operations are conducted in a RST (Figure 2.7); the exceptions are RSTs 2 (pure altimontane European beech stands), 9 and 10 (both Norway spruce dominated stands) with only two thinning operations.

Thinning operation 1 is carried out in the early pole stage stands at dominant stand diameter of approximately 15 cm in DBH. The thinning intensity is normally 22 % of total stand volume, only in the RSTs 9 and 10 the intensities are 28 % of total stand volume due to mechanized harvesting done by harvesters and forwarders.

Thinning operation 2 is performed in the older pole phase stands at dominant stand diameter of approximately 30 cm in DBH. The intensity of thinning is usually around 15 % of total stand volume; in the RSTs 9 and 10 the intensity is once again 28 % of total stand volume.

Thinning operations 3 and 4 are carried out in the mature phase stands at dominant stand diameter of 40 and 55 cm in DBH, respectively. The intensity is in both operations 10 % of total stand volume.

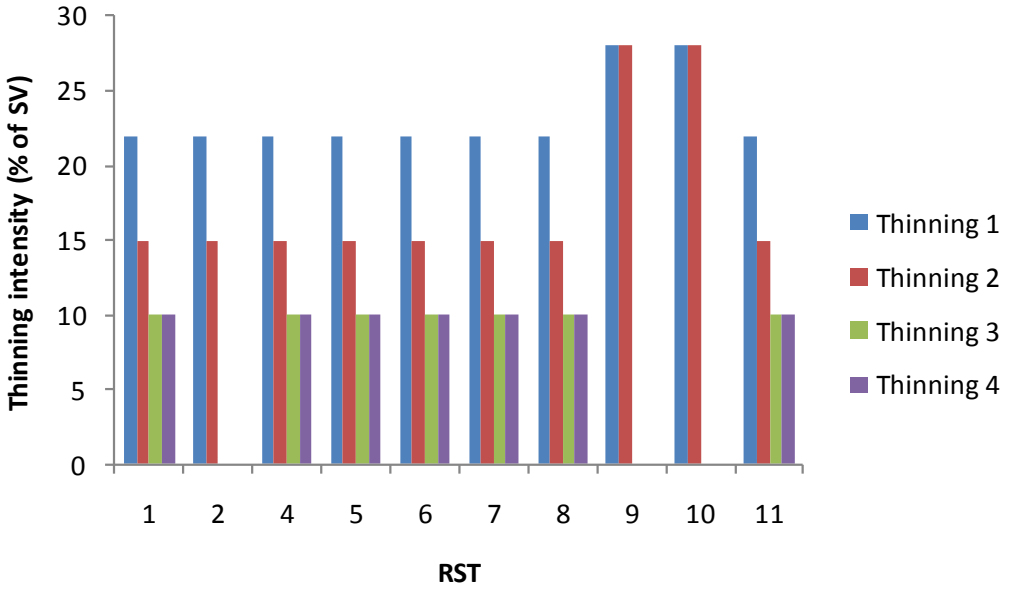


Figure 2.7: Thinning intensities (in % of stand volume) in RSTs subjected to even-aged FM in the CSA 4

2.4.4.4 Regeneration felling operations

The regeneration system used in RSTs with even-aged FM is the irregular shelterwood system, which was in project identified as a group system, meaning a system of successive regeneration fellings with regeneration period of 20-30 years. Regeneration of a stand begins at points called "limits of transport", which provide spatial order to the system (however, need not be regularly spaced). Several regeneration areas are usually made in a stand under regeneration process; their number depends on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration

felling. Initial regeneration areas (operation 1) are usually 0.2-0.5 ha large (size of 1-2(3) tree heights in diameter) and are enlarged afterwards in 2 steps (operations) up to the size of 0.5-1 ha. Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the last regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in a sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 2-3(5) ha large stand.

In the majority of even-aged RSTs, rejuvenation of stands is made in three successive regeneration fellings, only in RSTs 9 and 10 it is made in two steps (Figure 2.8). Generally, the first felling is performed at dominant stand diameter of 65 cm in DBH. Exceptions are RST 2 with the dominant stand diameter of 45 cm in DBH and RSTs 9 and 10 with the dominant stand diameter of 55 cm in DBH. The felling intensity is in general 33 % of total stand volume, while it is 35 % in RST 2 and 40 % in RSTs 9 and 10.

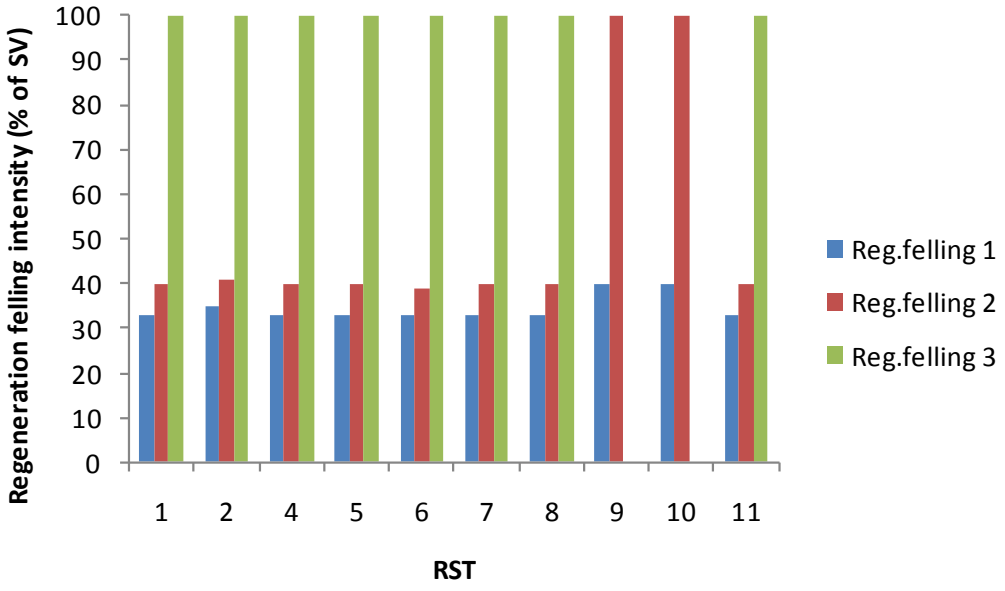


Figure 2.8: Regeneration felling intensities (in % of stand volume) in RSTs subjected to even-aged FM in the CSA4

The second felling is carried out at dominant stand diameter of 75 cm in DBH. Exceptions are RST 2 with the dominant stand diameter of 55 cm in DBH and RSTs 9 and 10 with the dominant stand diameter of 70 cm in DBH. In general, the felling intensity is 40 % of total stand volume. In RSTs 9 and 10 the second regeneration felling is the last one, therefore the entire stand is cut (felling intensity is 100 % of total stand volume).

The third regeneration felling is usually the last regeneration felling, therefore its intensity is 100 % of total volume of the remaining stand. Generally it is performed at dominant stand diameter of 80 cm in DBH.

In uneven-aged RSTs, a combination of small-scale irregular shelterwood system and group selection system is used to regenerate forest stands; on sites with more extreme site conditions (steep slope, rocky terrain, etc.) and in stands (or part of stands) with higher proportion of conifers, group selection (in some smaller parts also single-stem selection) system is normally applied, while in other (parts of) stands irregular shelterwood system is practiced.

1) If irregular shelterwood system is used, practically all above described information and parameters are the same, only the size of initial regeneration areas is smaller 0.1-0.3 ha large (size of 1-2 tree heights in diameter) and they are enlarged up to only 0.5-0.75 ha. At the end of the regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 1-2 ha large stand.

2) If group selection system is applied, the intensity of selection felling is normally 15 % of total stand volume and selection harvests are carried out approximately every 10 years. Usually, however, a combination with single-tree selection system is practiced, at which single-tree selection is mainly applied in steep terrain with a high rockiness, but is scattered present all over managed stands. In a stand, small groups of trees on areas of 0.05-0.2 ha or individual trees are felled. Several small canopy gaps are made over the stand and are irregularly spaced. The groups of trees are felled considering the advanced regeneration established under the canopy, dbh of trees, health status of trees, and tree species.

2.4.4.5 No FM practice

There are two RSTs in which no FM practice has been performed for decades. These areas are protected due to nature conservation reasons and inaccessibility due to steep and very rocky terrain.

2.4.5 CSA 5 – Vilhelmina, Scandinavian Mountains, Sweden

All 15 RSTs in the CSA5 are managed with an even-aged FM system (Table 2.6). The rotation periods in these RSTs are defined to 90-110 years. Terrain features allows logging techniques with harvesters and forwards in the entire CSA.

Table 2.6: Number and share of different BAU FM in the CSA5

	BAU FM							
	Even-aged	Two-aged	Uneven-aged	Coppice	Short rotation	Agro-forestry	Transform-ation FM	No FM
Number	15							
Share (%)	100							

2.4.5.1 Regeneration operations

A combination of artificial and natural regeneration is used to regenerate forest stands. Norway spruce and Scots pine are usually planted, but lodgepole pine is planted in 3 RSTs as well. However, Norway spruce and Scots pine, but even more so downy birch regenerate in these RSTs naturally as well, therefore a mixture of artificial and natural regeneration is used.

2.4.5.2 Weeding and tending operations

No weeding operation is performed during the stand's life cycle, while one tending operation is applied in the thicket stage at top stand height of 3 m. In the operation 55-65 % of individuals in the regeneration are removed.

2.4.5.3 Thinning operations

A combination of thinning from above and from below is applied in all RSTs. Thinning operation is applied once in a rotation period at top stand height of 13 m. The thinning intensity is 35 % of stand volume.

2.4.5.4 Regeneration felling operations

The regeneration system used is clear cutting. 90 % of total stand volume are removed in one regeneration felling, while the remaining 10 % are left in the stands due to nature conservation purposes.

2.4.6 CSA 6 – Kozie chrbty, Western Carpathians, Slovakia

In CSA6 Kozie chrbty in Slovakia, all RSTs are managed with the even-aged FM system (Table 2.7). The rotation periods in these RSTs are between 100 and 160 years. All RSTs feature terrain allowing tractor or skidder based logging techniques.

Table 2.7: Number and share of different BAU FM in the CSA6 (the number of RSTs considering also stand age class is given in brackets)

	BAU FM							
	Even-aged	Two-aged	Uneven-aged	Coppice	Short rotation	Agro-forestry	Transform-ation FM	No FM
Number	25 (45)							
Share (%)	100							

2.4.6.1 Regeneration operations

Not much quantitative data is available for the regeneration operations, but some scarce data are given in the reports. In general, a combination of natural and artificial regeneration is mainly used when stands are regenerated. Natural regeneration is a mixture of conifers (Norway spruce) and broadleaves, while artificial regeneration is made of planted Norway spruce, but also European larch, European beech and European ash are planted.

2.4.6.2 Weeding and tending operations

Weeding operation is performed in the majority of RSTs at stand age 2 years; it is not applied only in RSTs 9.1, 9.2, and 15.0. Contemporarily, protection of young trees against ungulate browsing is realized.

Tending operations are practiced in all RSTs. Tending is performed at stand age of 15, 20 or 30 years (in thicket stage of 5-6 m top height). Normally, 50 % of saplings are removed.

2.4.6.3 Thinning operations

Thinning is practiced as a moderate thinning from below. 2-4 thinning operations are performed in a RST (Figure 2.9).

The first thinning operation is carried out at approximate stand age of 25-40 years, in some RSTs at age of 55 years. The variability of thinning intensities is great, ranging 10-36 % of total stand volume. Next 2-3 thinning operations follow in approximate 10-15-year periods with thinning intensities varying between 11 and 22 % of total stand volume. In some RSTs thinning intensity of individual operations is lower than 10 % of total stand volume, even so low as 3 %. At the time of the last thinning, the stand age vary between 65 and 90 years.

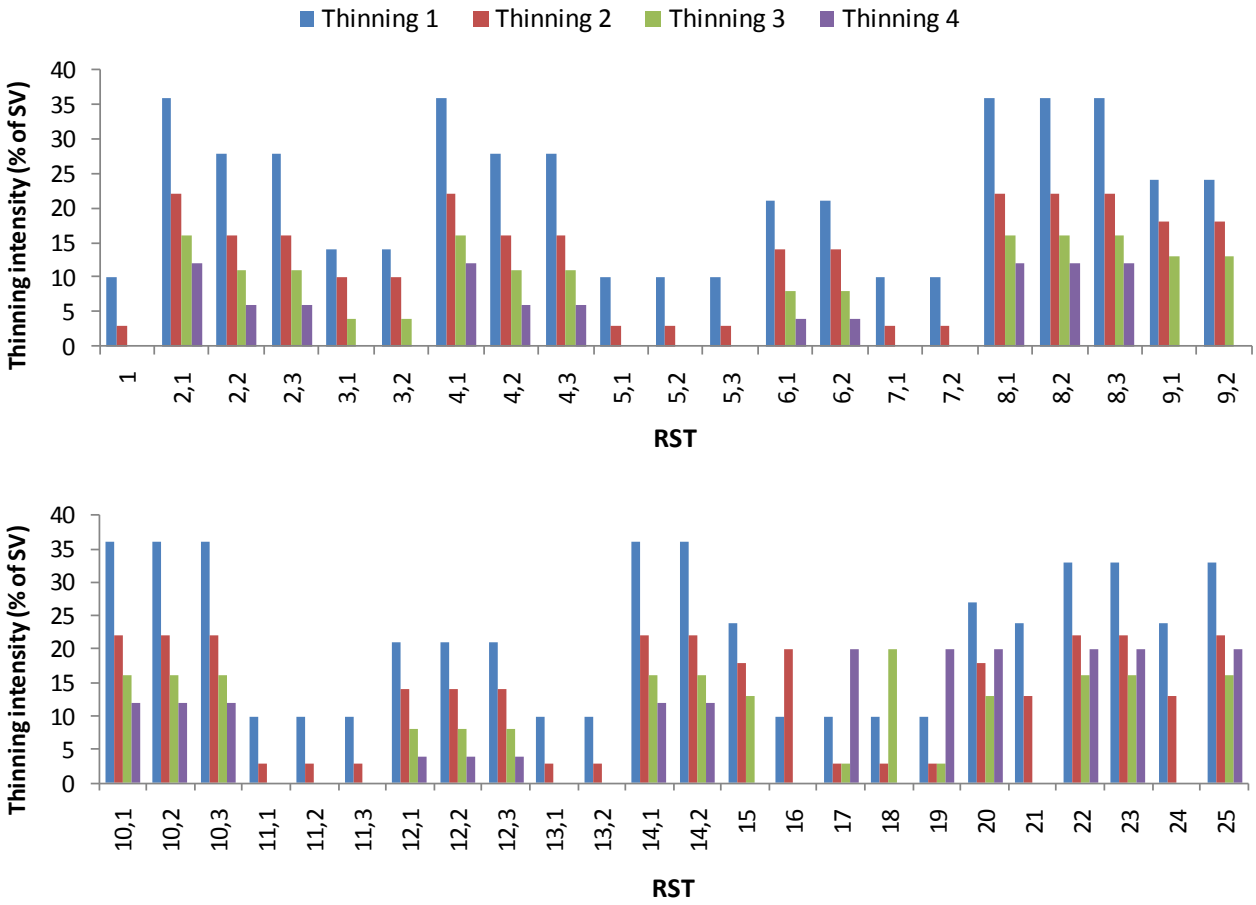


Figure 2.9: Thinning intensities (in % of stand volume) in RSTs in the CSA6

2.4.6.4 Regeneration felling operations

Regeneration system used in the entire CSA is the uniform shelterwood system. In the RSTs regeneration of stands is made in 3 or 4 successive regeneration fellings. If it is done in 3 fellings, the first felling is performed at age 70-95 years, in some RSTs at age 120 years. The felling intensity is 33 % of total stand volume. The second regeneration felling follows in approximate 10-year period with the felling intensity of 50 % of total stand volume. The last felling is follows in the following 5 or 10 years and all remaining trees are harvested. If regeneration is done in 4 fellings, the first felling is done at age 75-95 years with the felling intensity of 16 % of total stand volume. The second, third, and fourth fellings are performed in 10-years periods with the felling intensities of 40 %, 66 %, and 100 % of total stand volume, respectively. The exceptions are RSTs 21.0 and 24.0, in which the regeneration of stands starts at age 115 years, and the following fellings are performed at ages of 130, 140, and 150 years.

2.4.7 CSA 7 – Shiroka laka, Rhodope Mountains, Bulgaria

In the Bulgarian CSA Shiroka laka, even-aged and no FM BAU FM systems were identified (Table 2.8). In RSTs with even-aged FM, 120 years long rotation period is practiced. Several logging techniques are practiced in the CSA: animal skidding in RSTs 1, 3, 4, and 5, skidder in RST 6, and sky-line logging in RSTs 7 and 8.

Table 2.8: Number and share of different BAU FM in the CSA7

	BAU FM							
	Even-aged	Two-aged	Uneven-aged	Coppice	Short rotation	Agro-forestry	Transform-ation FM	No FM
Number	7							3
Share (%)	70							30

2.4.7.1 Regeneration operations

When rejuvenating stands, only natural regeneration is used. Regeneration is composed of up to four tree species, but mainly of 2-3 species. European beech and Norway spruce are the main species in the regeneration layer, while Black pine and Scots pine are also present in some RSTs. Due to a prolonged regeneration period (up to 30 years), young stands are composed of individuals of different ages and consequently of small patches of different developmental stages, respectively: from seedlings to individuals in the early pole stage.

2.4.7.2 Weeding and tending operations

No weeding operation or other early release treatments are conducted in the RSTs.

In RSTs with even-aged FM, one tending operation is done approximately 20 years after the final harvest. At this age young trees already reach the early pole stage and 20 % of them are removed in order to release individuals of best stem and crown quality.

2.4.7.3 Thinning operations

Thinning is practiced as a combination of thinning from above (i.e. crown thinning) and thinning from below. Usually three thinning operations are performed in a RST (Figure 2.10).

The first thinning operation in a RST is carried out at approximately 30 years after the final harvest. The thinning intensity varies between 20 and 25% of total stand volume. Next two thinning operations follow in approximate 20 year periods. The thinning intensities vary between 20 and 30% of total stand volume. At the time of the last thinning, the age of trees in a stand vary between 70 and 100 years. If trees in the smallest relative DBH class are still left in a stand, they are all removed.

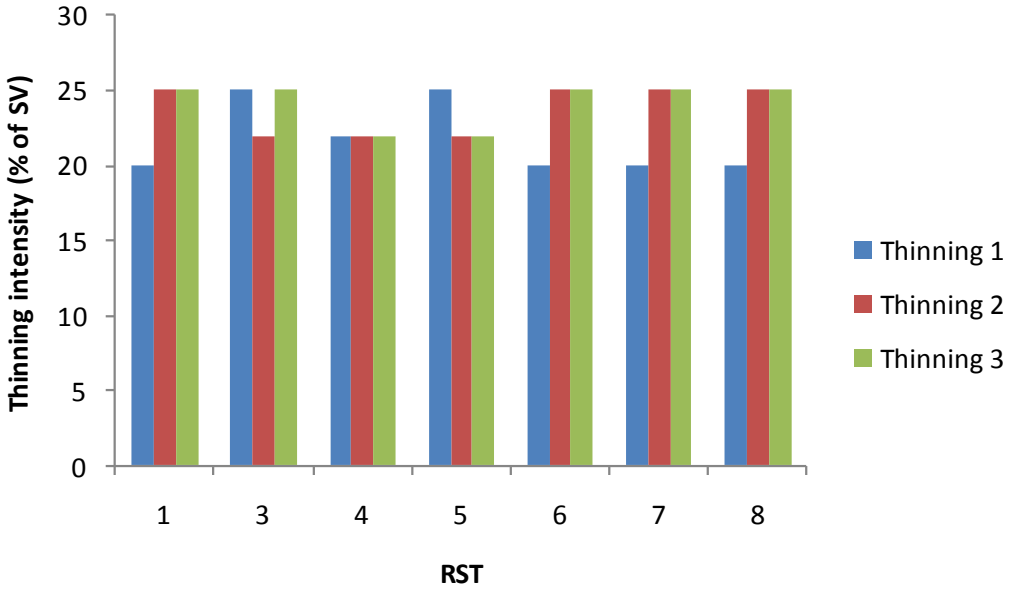


Figure 2.10: Thinning intensities (in % of stand volume) in RSTs subjected to even-aged FM in the CSA7

2.4.7.4 Regeneration felling operations

Regeneration system used in RSTs practicing even-aged FM is an irregular shelterwood system (in the ARANGE project identified as a group system). In all even-aged RSTs, rejuvenation of stands is made in three successive regeneration fellings (Figure 2.11).

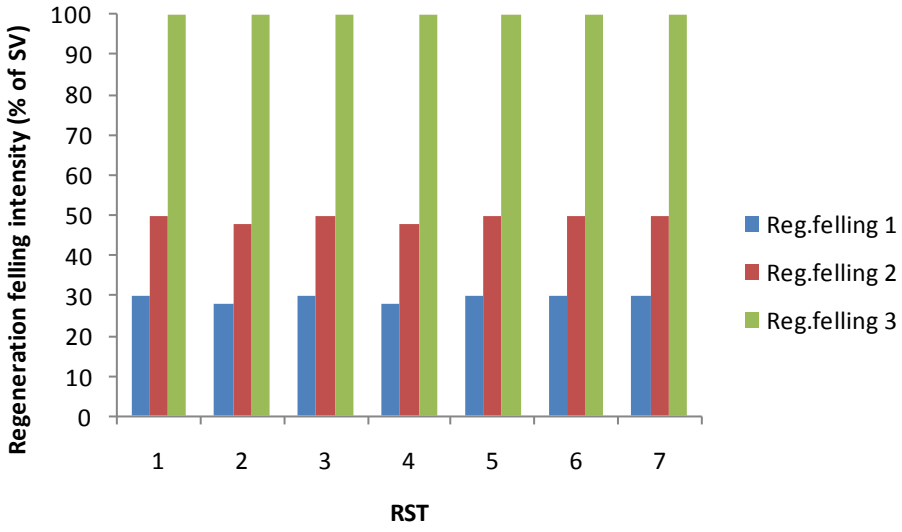


Figure 2.11: Regeneration felling intensities (in % of stand volume) in RSTs subjected to even-aged FM in the CSA7

The first felling is performed at age of 90 years, while next two regeneration fellings follow in approximate 15 years period (at 105 and 120 years of stand's age). The intensity of the first regeneration felling is approximately 30% of the total stand volume, of the second felling varies between 45 and 55 % of total stand volume, while in the third, final felling the entire remaining stand is harvested.

2.4.7.5 No FM practice

There are three RSTs in which no forest management is performed. In the RST 1 (Black pine on steep, xeric sites) the main cause is inaccessibility due to very steep and rocky terrain which impedes silvicultural operations and emphasizes protective ecosystem services.

The RST 9 represents alpine Norway spruce forests on altitudes above 1900 m a.s.l. These stands provide protection against avalanches and soil erosion, but biodiversity conservation is also a very important ecosystem service provided by these stands. These stands are located on the highest part of the Rhodopes and are therefore important for sheltering forest bird species of high conservation value (e.g. Pygmy Owl, Tengmalm's Owl, Three-toed Woodpecker, Black Woodpecker, Capercaillie, Hazel Grouse).

The RST 10 is also represented by alpine Norway spruce forests on altitudes above 1900 m a.s.l., but they were established on former pastures. These stands provide identical ecosystem services as the RST 9.

3 Current harvesting technologies

3.1 Introduction

For all BAU FM as described in the Section 2 of this deliverable, harvesting and logging technologies and systems used in implementation have been collected as well. Here, the structure of the collected data, the concept for a first summary, as well as the results are presented.

3.1.1 Methodology

For data collection on current harvesting technologies in the CSAs, the focus was set on two different scales. The larger scale is the Representative Landscape (RL) for more general data, the smaller one is the Representative Stand type (RST) for more detailed data.

3.1.1.1 Representative Landscape scale

The Representative Landscapes were defined by the CSRs. To get the data, a Microsoft Access® Database with an entry form was developed. The database and a data entry manual in addition were sent to the CSRs for data input. Figure 3.1 shows the structure of the database which covers attributes regarding the road network (road density, accessibility and construction costs, etc.) and more detailed information about construction methods. Second, transportation conditions and methods, third, the system input like labour and fuel costs and, as the last part, information on accidents were requested. Some questions were very detailed; therefore it was impossible to collect the whole compendium of data in all Case study areas.

The detailed description of the database can be found in the Annex 3.

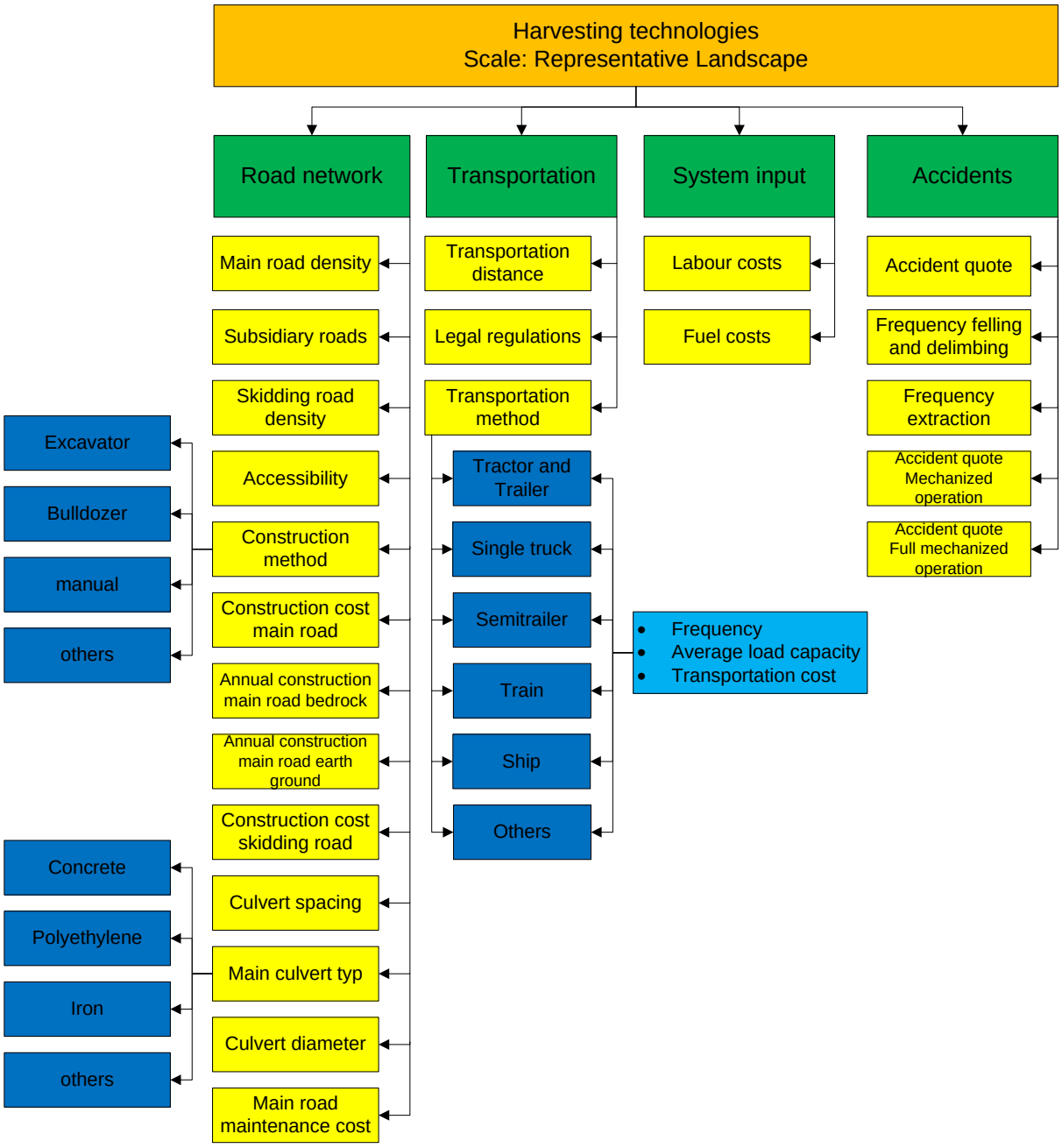


Figure 3.1: Database structure for the Representative Landscape scale

3.1.1.2 Representative Stand type scale

At the RST scale, questions about harvesting technologies were added to the questionnaire on BAU FM mentioned before in Section 2. The structure shown in Figure 3.2 was used for thinning operations as well as for regeneration fellings. Harvesting technologies contain harvesting, felling, delimbing and bucking method, productivity and costs of the operations. Regarding the extraction technology used in the respective CSA, data on method, distance, productivity and costs were requested.

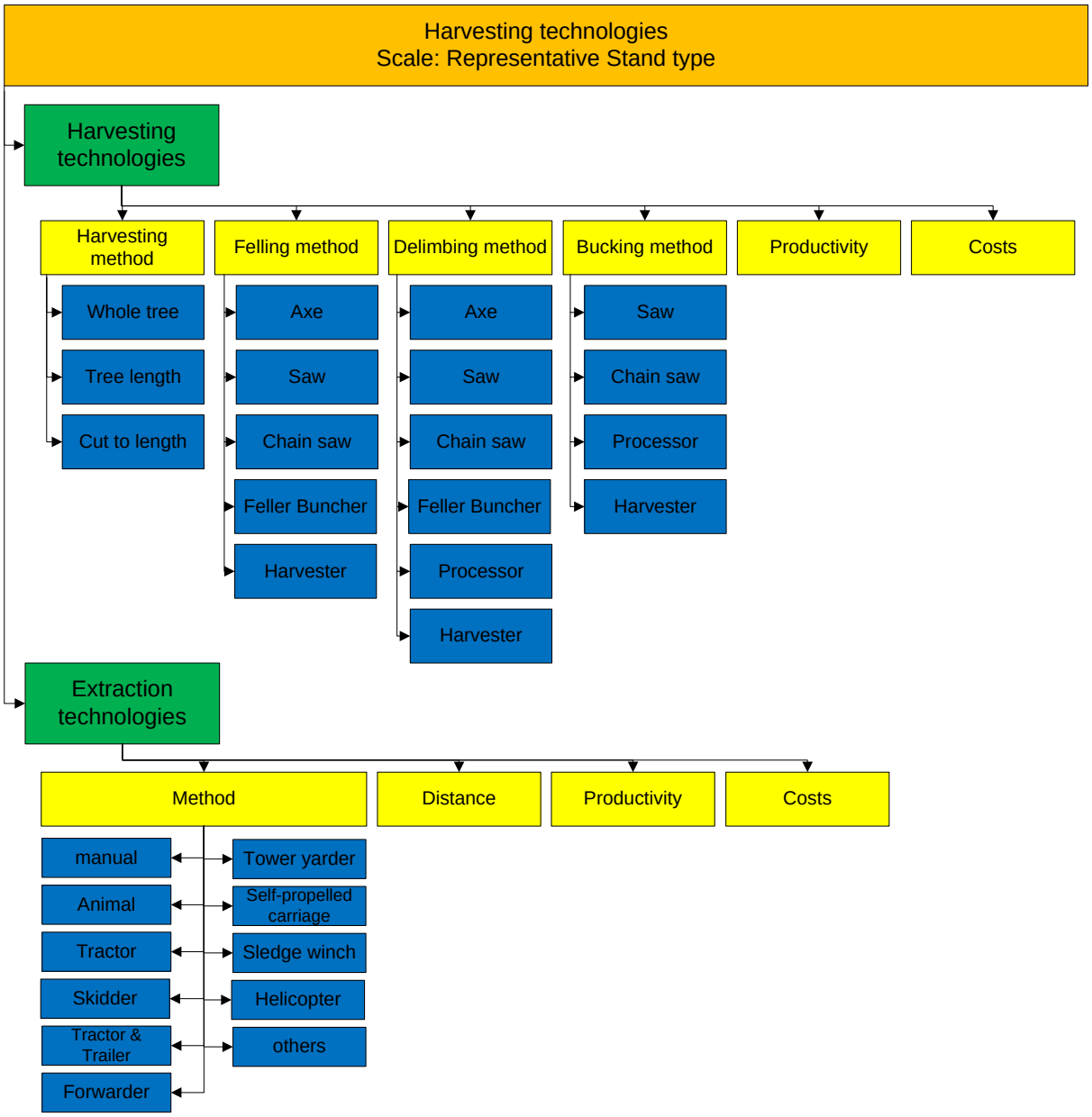


Figure 3.2: Structure of harvesting technologies in the questionnaire at RST scale.

3.1.2 Analyses

The MS Access® database for the RL scale was exported to the statistic package PASW 18 for further analysis.

The data from the questionnaire on the RST scale were also exported to the statistic package PASW 18 syntax screens for subsequent analyses.

Figure 3.3 shows the structure of the analysis. For each BAU FM system descriptive statistics and frequency analyses were conducted on the RST, RL, CSA and ARANGE scale. In the descriptive

statistics, location and dispersion parameters like the mean, maximum, minimum and standard deviation of

- stand age [years],
- dominant height at time of harvesting [m],
- harvested volume [m^3],
- productivity harvesting [m^3/PSH_{15}],
- cost harvesting [€/m^3],
- extraction distance [m],
- productivity extraction [m^3/PSH_{15}] and
- cost extraction [€/m^3]

were quoted (PSH_{15} is a productive system hours spent to do a specific job, including breaks up to 15 minutes).
The frequency analyses shows the frequency of occurrence [%] of

- phase (e.g. early pole phase, mature pole phase, etc.),
- harvesting method,
- extraction method,
- felling method,
- delimbing method,
- bucking method and
- harvested species (frequency).

In a first step it is shown per ARANGE area, afterwards per CSA and in the annex per RL and RST.

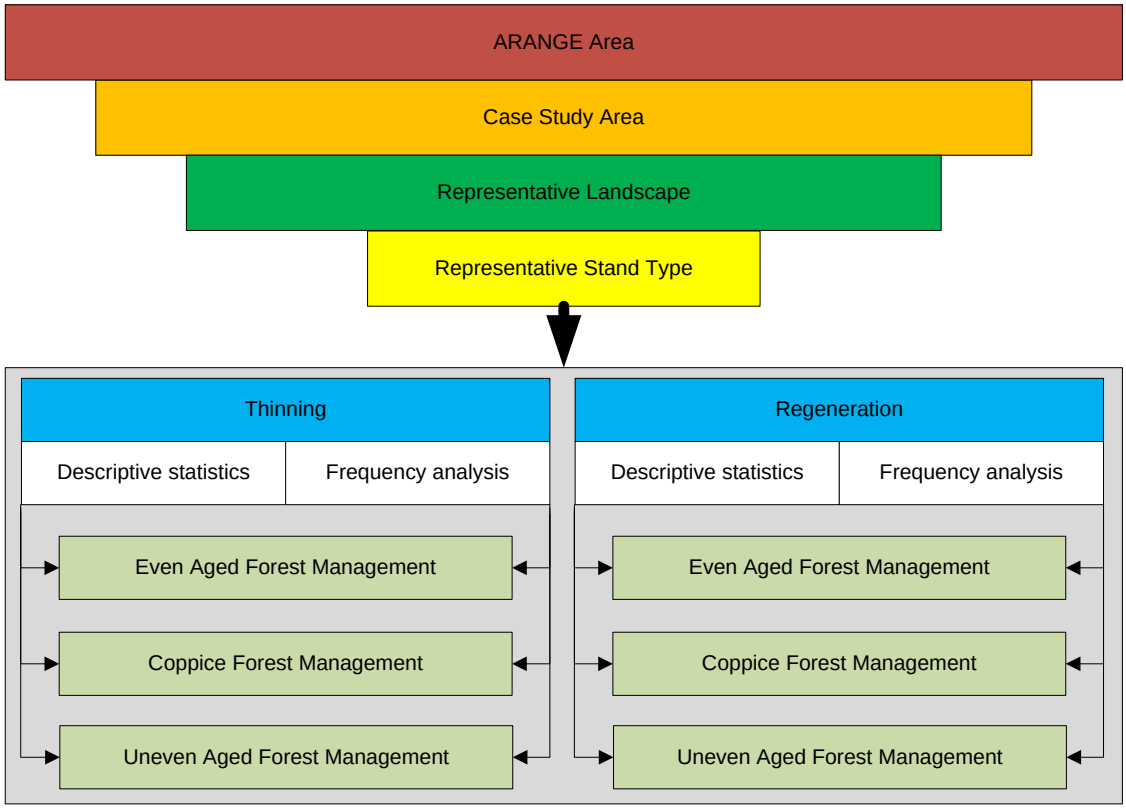


Figure 3.3: Structure of analysis of harvesting & logging data.

3.1.3 Structure of the report

Subsequently, reports were given across CSAs separated by BAU FM first, and afterwards also separately for each CSA for all BAU FM systems present in a CSA. For each CSA the reports on RL can be found as well, processed from data from the MS Access database (see Section 3.1.1.2).

In the Annex 3 the data for each RL can be found, as well as for each RST per CSA

3.2 Reports across case study areas

The following data were extracted from the questionnaire on BAU FM (see Section 2.1.1**Error! eference source not found.**).

3.2.1 Overview

Table 3.1**Error! Reference source not found.** shows the structure of the CSAs. For example, CSA1 (Spain) was separated into 4 RLs and has 6 RSTs within even-aged BAU FM and 10 RSTs within coppice BAU FM. RSTs without active management (no FM) were not included in the analyses as no harvesting operations were conducted there.

Table 3.1: Number of Representative Landscapes (RL) separated by CSAs and Number of Representative Stand types (RST) separated by BAU FM and CSAs.

	Number of RLs	***Number of RSTs in FM even-aged***	***Number of RSTs in FM coppice***	***Number of RSTs in FM uneven-aged***	***Sum***
CSA 1	4	6	10	-	16
CSA 2	1	-	-	18	18
CSA 3	2	-	-	71	71
CSA 4	2	10	-	11	21
CSA 5	1	15	-	-	15
CSA 6	1	45	-	-	45
CSA 7	2	7	-	-	7
Sum	12	83	10	100	193

Across all BAU FM systems 290 thinning operations and 324 regeneration fellings were described (TTable 3.2), excluding CSA2. In the CSA 2 thinning operations and felling operations are coupled, so the reported data cannot be assigned clearly.

Table 3.2: Number of thinning operations and regeneration fellings indicated per CSA and BAU FM type.

CSA	***Operation***	***Number of operations in***			***Sum***
		even-aged FM	***coppice FM***	***uneven-aged FM***	
CSA 1	Thinning	18	33	-	51
	Regeneration	23	10	-	33
CSA 2	*Thinning*			*18*	*18*
	Regeneration				
CSA 3	Thinning	-	-	-	-
	Regeneration	-	-	71	71
CSA 4	Thinning	13	-	44	57
	Regeneration	28	-	11	39
CSA 5	Thinning	15	-	-	15
	Regeneration	15	-	-	15
CSA 6	Thinning	146	-	-	146
	Regeneration	145	-	-	145
CSA 7	Thinning	21	-	-	21
	Regeneration	21	-	-	21
Sum	Thinning	213	33	44	290
	Regeneration	232	10	82	324

3.2.2 Even-aged forest management

CSAs 1, 4, 5, 6 and 7 have 83 RSTs managed by even-aged FM. In these RSTs 213 thinning operations and 232 regeneration fellings were conducted.

3.2.2.1 Thinning

The most commonly used harvesting method is the tree length method. In 9.73 % of the operations extraction was done manually. Cable based extraction has not been mentioned (Figure 3.4). Partly mechanized harvesting was the most frequent harvesting system (Figure 3.5). Altogether, there are four steps of mechanization:

- *non mechanized harvesting system:* Felling, delimbing and bucking is done by saw or axe. Extraction is carried out manually or by animal.
- *partly mechanized harvesting system:* Felling, delimbing and bucking is done by chain saw. Extraction is carried out in miscellaneous ways (e.g. animal, manual, skidder, forwarder, etc.)
- *highly mechanized harvesting system*: Felling and sometimes rough delimbing is done by chain saw, delimbing and bucking is done by processor. Extraction is carried out by motor-driven machines.
- *fully mechanized harvesting system:* Felling, delimbing and bucking is done by harvester. Extraction is carried out by forwarder.

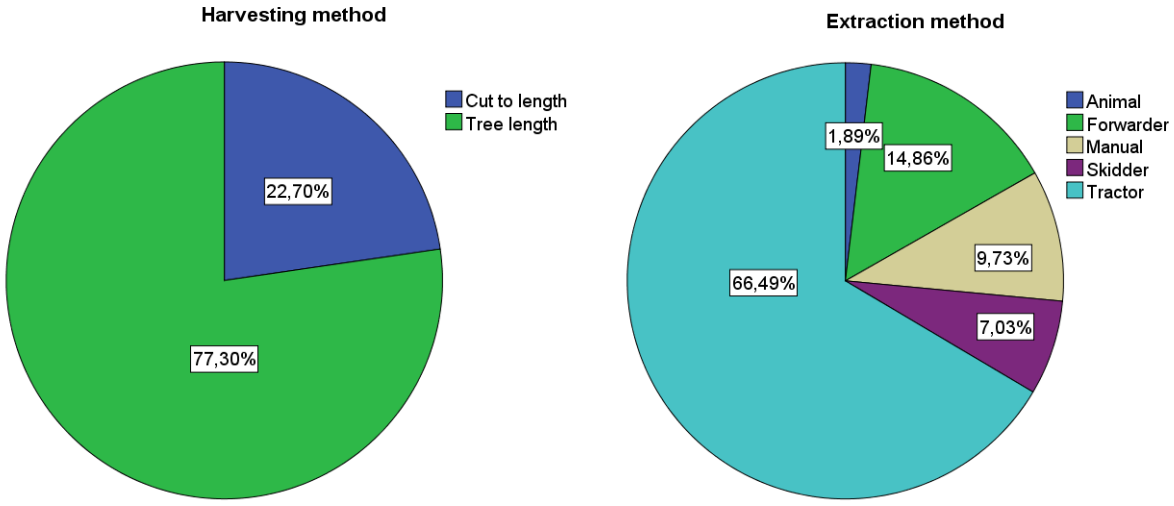


Figure 3.4: Harvesting methods (left panel) and extraction methods (right panel) for thinning operations in even aged BAU FM in five CSAs. number of RST = 83, number of operations = 213.

The most common felling, delimbing and bucking method was the chainsaw. In around 52 % of the operations *Picea abies* was harvested (Figure 3.5).

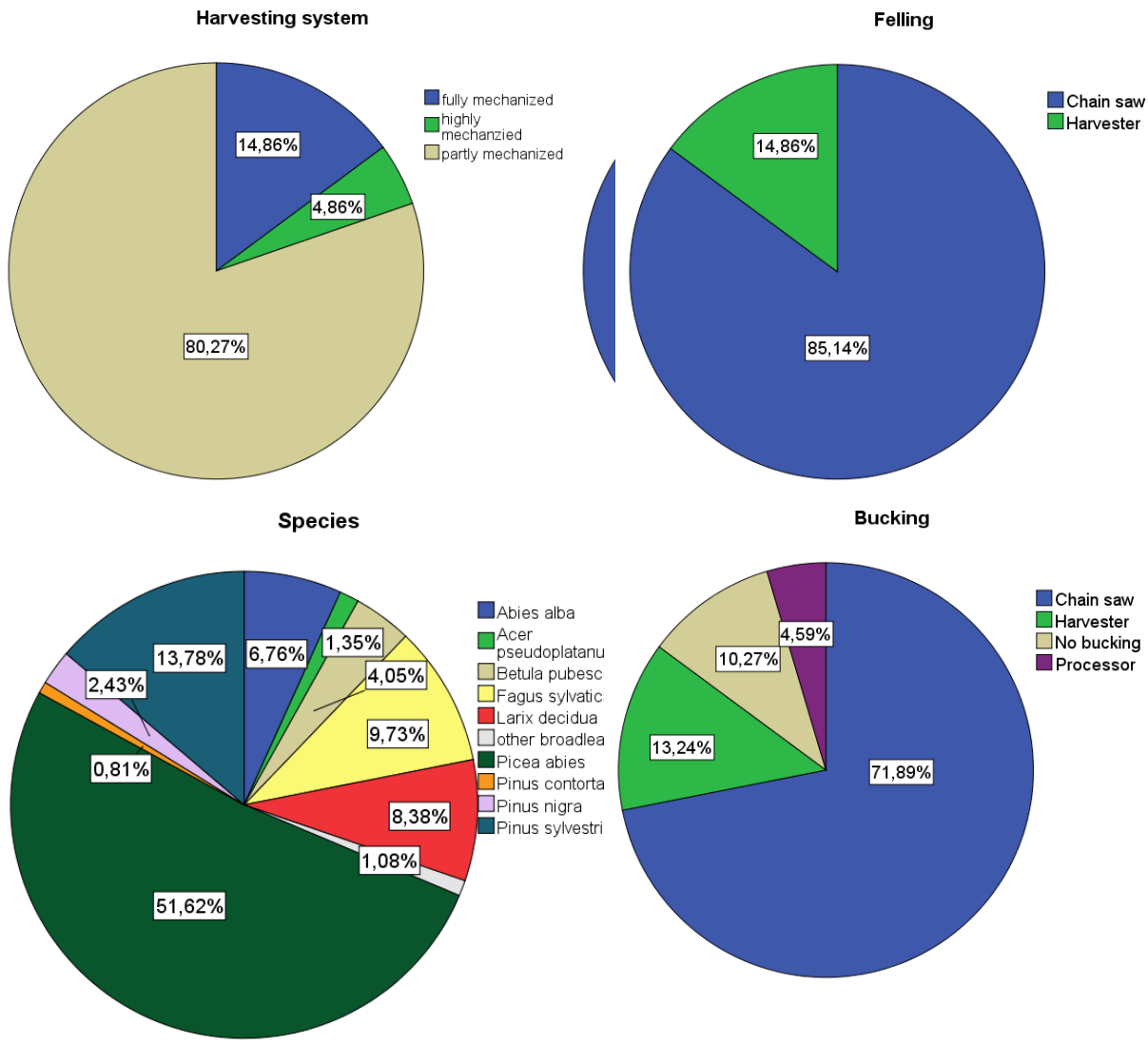


Figure 3.5: Harvesting system (first row, left panel), felling method (first row, right panel), delimbing method (second row, left panel), bucking method (second row, right panel), and harvested species (frequency; third row) for thinning operations in even aged BAU FM in five CSAs. Number of RST = 83, number of operations = 213.

The average productivity of thinning operations in even-aged stands was 5.03 m^3 per productive system hour 15 (PSH_{15}) (Table 3.3). CSA 6 delivered no data on productivity (harvesting, extraction) as well as separate data on costs (harvesting, extraction) and were therefore not included.

Table 3.3: Descriptive statistics for thinning operations in even-aged FM practice in 5 CSAs. Hdom = dominant height at time of harvesting, volume = harvested volume, number of RST = 55, number of operations = 121.

	Minimum	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	80.00	52.86	17.08
H_{dom} [m]	7.90	26.40	14.27	3.54

Volume [m^3]	1.00	200.00	34.07	28.79
Productivity harvesting [m^3/PSH_{15}]	1.00	15.00	5.03	4.11
Cost harvesting [€/m^3]	6.00	34.77	17.68	10.76
Extraction distance [m]	100.00	1400.00	495.34	250.56
Productivity extraction [m^3/PSH_{15}]	1.00	35.00	9.08	7.81
Cost extraction [€/m^3]	8.00	18.06	11.00	3.83

3.2.2.2 Regeneration felling

Compared to thinning operations, changes in harvesting and extraction method could be observed concerning regeneration fellings (Figure **3.6**). Chain saw still was the most important felling, delimbing and bucking method (partly mechanized harvesting method) (Figure **3.7**).

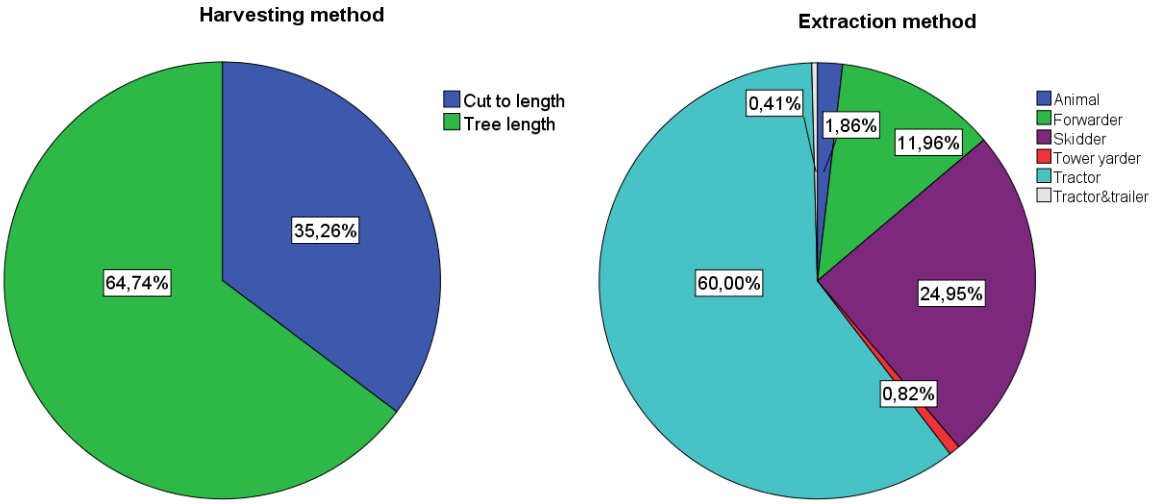


Figure 3.6: Harvesting method (left panel) and extraction method (right panel) for regeneration fellings in even aged FM practice in 5 CSAs. Number of RST = 83, number of operations = 232.

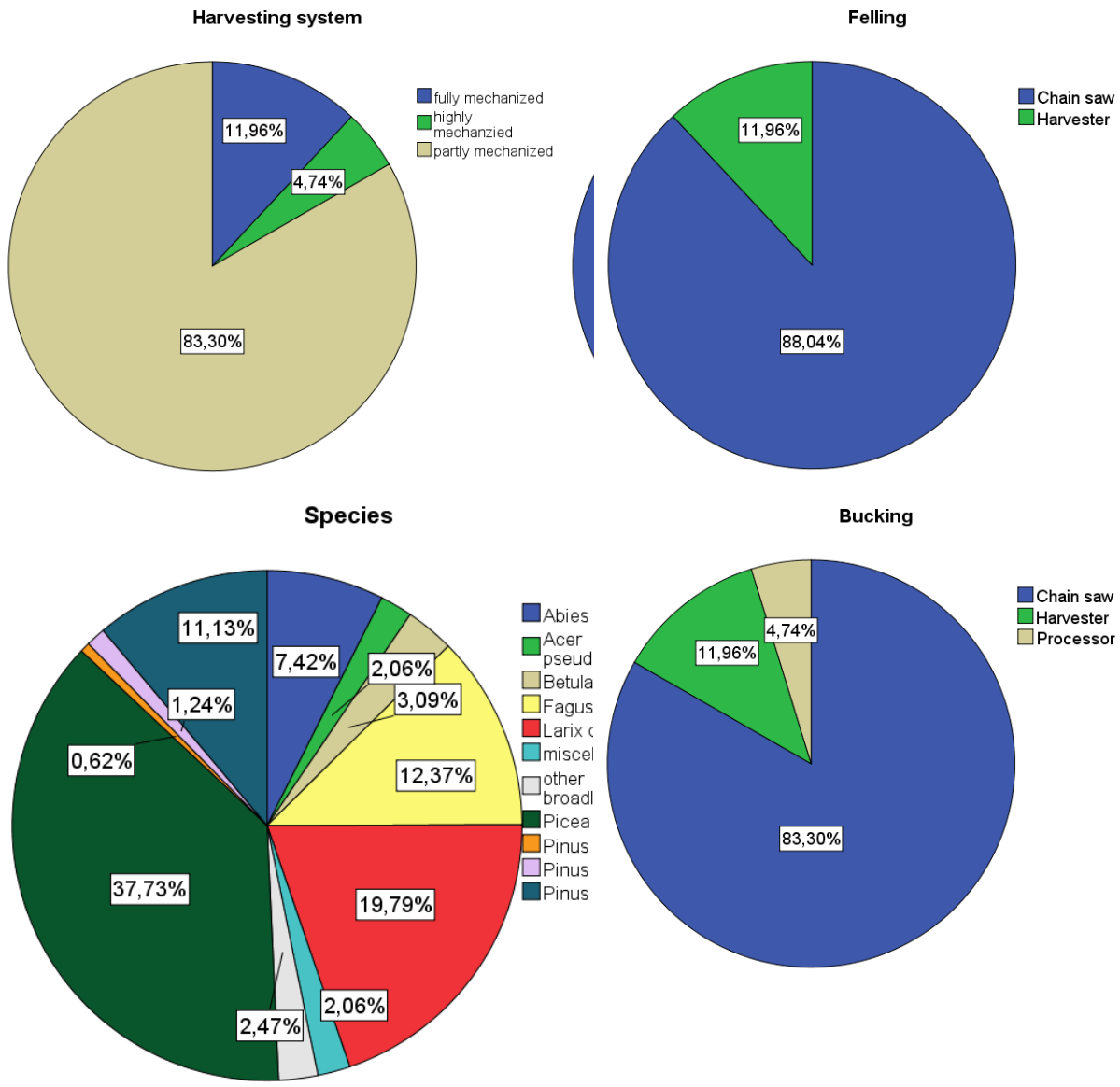


Figure 3.7: Harvesting system (first row, left panel), felling method (first row, right panel), delimbing method (second row, left panel), bucking method (second row, right panel), and harvested species (frequency; third row) for regeneration fellings in even aged BAU FM in five CSAs. Number of RST = 55, number of operations = 117.

In comparison to thinning operations, the productivity rose to 13.60 m^3/PSH_{15} and average harvesting costs were reduced to 7.41 €/m^3 (Table **3.4**). CSA 6 delivered no data on productivity (harvesting, extraction) as well as separate data on costs (harvesting, extraction) and were therefore not included.

Table 3.4: Descriptive statistics for regeneration fellings in even-aged FM practice in 5 CSAs. Hdom = dominat height at time of harvesting, volume = harvested volume. number of RST = 55, number of operations = 117.

	Minimum	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	90.00	120.00	102.96	10.16

H_{dom} [m]	0.00	29.00	2.06	7.23
Volume [m^3]	3.00	404.00	112.09	100.44
Productivity harvesting [m^3/PSH_{15}]	2.00	26.00	13.60	8.75
Cost harvesting [€/m^3]	5.00	9.78	7.45	2.12
Extraction distance [m]	100.00	1400.00	503.12	234.32
Productivity extraction [m^3/PSH_{15}]	2.00	38.00	23.68	14.17
Cost extraction [€/m^3]	4.00	16.00	9.91	4.02

3.2.3 Coppice forest management

Coppice FM is currently applied only in the CSA1 (Spain) in 10 RSTs. 33 thinning operations and 10 regeneration fellings were recognized.

3.2.3.1 Thinning

In Table **3.5** important key figures of the thinning operations in coppice FM are displayed. In this stands only two tree species were relevant, *Quercus pyrenaica* and *Quercus ilex* (Figure **3.8**). Felling and delimbing was done by chain saw, bucking was done by processor (highly mechanized). Only skidders were used for timber extraction (tree length method).

Table 3.5: Descriptive statistics for thinning operations in coppice FM in CSA1. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 10, number of operations = 33.

	Minimum	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	30.00	60.00	43.89	12.25
H_{dom} [m]	7.00	14.60	10.38	2.77
Volume [m^3]	2.00	82.00	17.83	20.94
Productivity harvesting [m^3/PSH_{15}]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	32.39	32.39	32.39	0.00
Extraction distance [m]	400.00	650.00	420.83	70.08
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

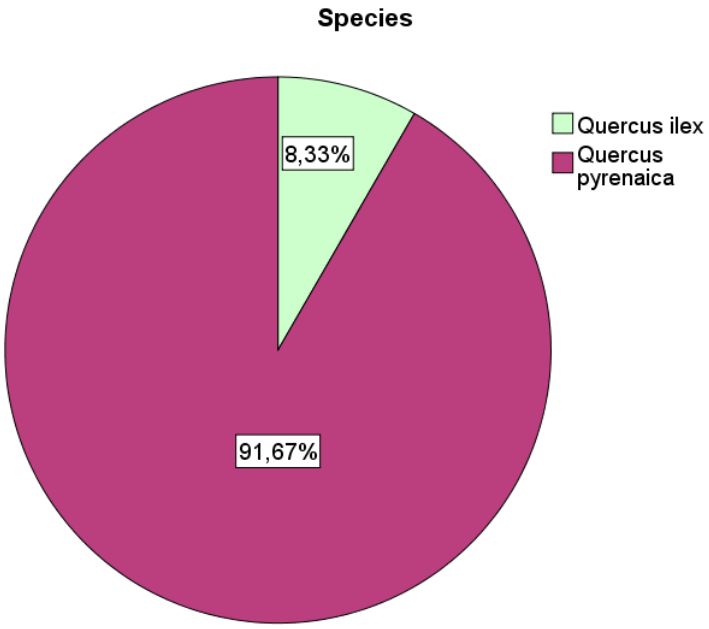


Figure 3.8: Harvested species (frequency) in thinning operations in coppice RSTs in CSA1. Number of RST = 10, number of operations = 33.

3.2.3.2 Regeneration felling

Regeneration felling harvesting costs decreased to 25.03 €/m^3 (Table **3.6**). As in thinning operations, felling and delimbing was done by chain saw, processors bucked the stems. The only harvested species was *Quercus pyrenaica*, extraction was done by skidder employing the tree length method (highly mechanized).

Table 3.6: Descriptive statistics for regeneration felling in coppice FM practice in 1 CSA. Hdom = dominant height at time of harvesting, volume = harvested volume. Number of RST = 10, number of operations = 10.

	Minimum	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	70.00	70.00	70.00	0.00
H_{dom} [m]	20.00	60.00	45.80	16.46
Volume [m^3]	1.00	1.00	1.00	0.00
Productivity harvesting [m^3/PSH$_{15}$]	25.03	25.03	25.03	0.00
Cost harvesting [€/m^3]	400.00	650.00	425.00	79.06
Extraction distance [m]	10.00	10.00	10.00	0.00
Productivity extraction [m^3/PSH$_{15}$]	7.35	7.35	7.35	0.00

3.2.4 Uneven-aged forest management

CSA3 and CSA4 have 82 RSTs within uneven-aged BAU FM. The thinning operations (44 operations) are all located in CSA4. Regeneration fellings (82) are used in both CSAs. In CSA3 almost all RSTs are in steep terrain requiring skyline-based yarding systems (1 RST in skidder terrain only).

In CSA2 also uneven-aged BAU FM is applied. But there, no separation between thinning operations and regeneration fellings were made, so these data are not included here but can be read in section 3.3.2.

3.2.4.1 Thinning

In 75.80 % of the cases skidder was indicated as the extraction method. The harvesting method was divided into 54.78 % cut to length and 45.22 % tree length method (**Error! Reference ource not found.**).

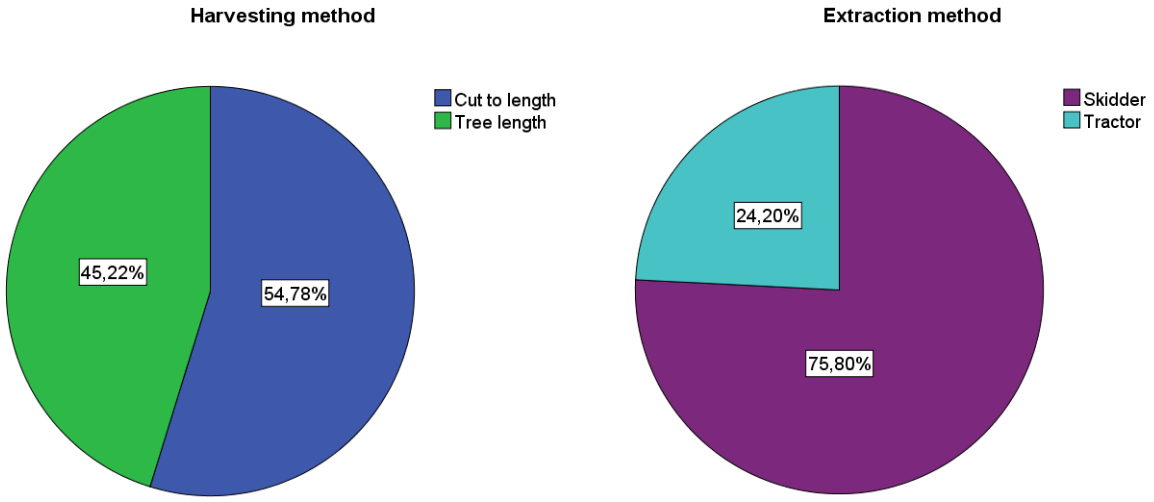


Figure 3.9: Harvesting method (left panel) and extraction method (right panel) for thinning operations in uneven aged FM in CSA4. Number of RST = 11, number of operations = 44.

For felling, delimbing and bucking only chainsaw was used (partly mechanized). A large share of timber was not bucked (Figure **3.10**).

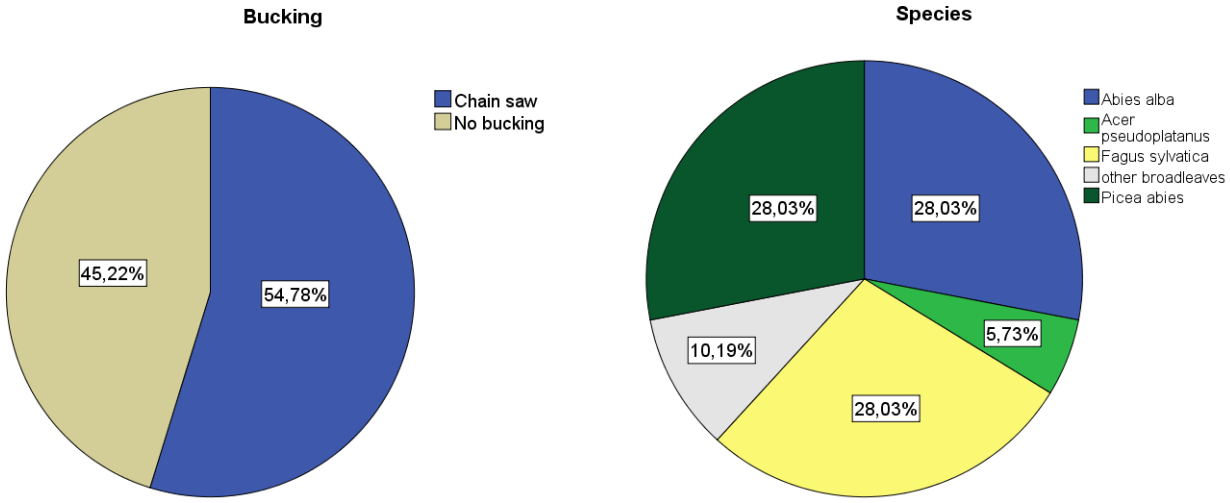


Figure 3.10: Bucking method (left panel) and harvested species (frequency; right panel) for thinning operations in uneven-aged FM in CSA4. Number of RST = 11, number of operations = 44.

The key figures for thinning operations in uneven-aged stands are displayed in Table **3.7**.

Table 3.7: Descriptive statistics for thinning operations in uneven-aged FM in CSA4. Volume = harvested volume. Number of RST = 11, number of operations = 44.

	Minimum	***Maximum***	***Mean***	***Standard deviation***
Volume [m^3]	1.00	40.00	11.70	9.43
Productivity harvesting [m^3/PSH15]	5.00	15.00	12.37	4.20
Cost harvesting [€/m^3]	10.43	31.30	15.64	8.88
Extraction distance [m]	350.00	500.00	409.24	52.87
Productivity extraction [m^3/PSH15]	15.00	35.00	29.11	8.23
Cost extraction [€/m^3]	13.88	18.06	15.38	1.77

3.2.4.2 Regeneration felling

In comparison to the thinning operations in uneven-aged RSTs, extraction costs rose to 18.68 €/m^3 (

Table **3.8**). This is caused by the high proportion of sledge winch usage for extraction in CSA3 (Figure **3.11**).

In the uneven-aged regeneration fellings only the cut to length method was applied and all processing steps were done by the chain saw (partly mechanized).

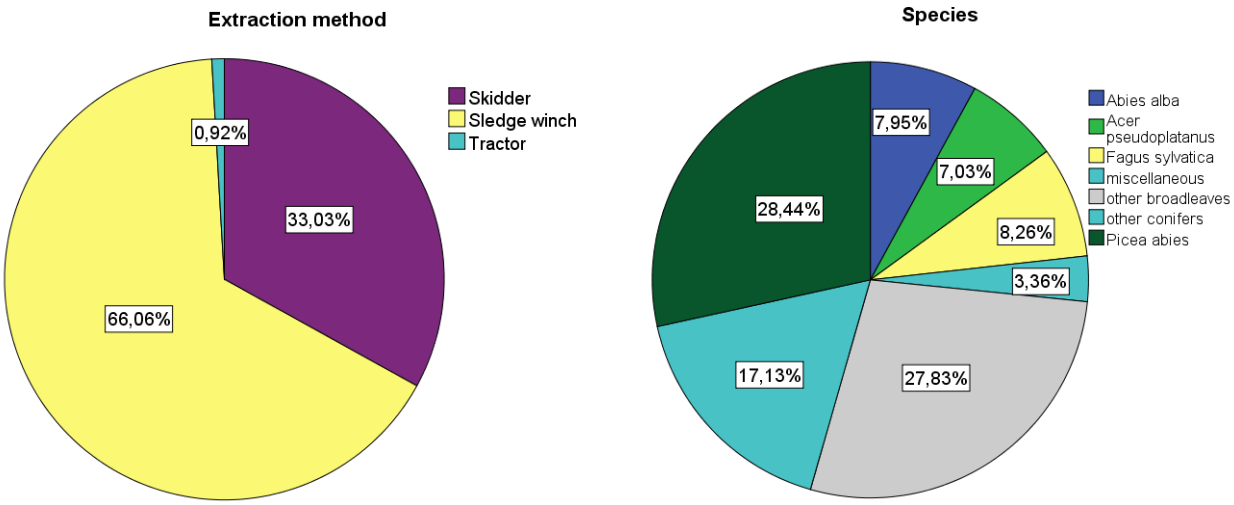


Figure 3.11: Extraction method (left panel) and harvested species (frequencies; right panel) for regeneration fellings in uneven aged FM in 2 CSAs. Number of RST = 82, number of operations = 82.

Table 3.8: Descriptive statistics for regeneration felling in uneven-aged FM in 2 CSAs. Volume = harvested volume. Number of RST = 82, number of operation = 82.

	Minimum	***Maximum***	***Mean***	***Standard deviation***
Volume [m^3]	1.00	340.00	44.05	82.84
Productivity harvesting [m^3/PSH15]	4.00	16.00	7.80	5.43
Cost harvesting [€/m^3]	9.78	20.00	16.73	4.66
Extraction distance [m]	100.00	500.00	466.67	62.90
Productivity extraction [m^3/PSH15]	6.00	38.00	17.39	13.47
Cost extraction [€/m^3]	12.78	25.00	21.05	5.52

3.3 Reports per case study area

The reports per CSA are divided into two parts. In the first part the location and dispersion parameters (descriptive statistic) as well as the frequency analysis separated by the BAU FM types are reported. The underlying data were extracted from the questionnaire on BAU FM (see Section 3.1.1.2).

In the second part the analyses of the road network, transportation method, system input and accidents on the scale of RLs can be found. The underlying data were extracted from the Microsoft Access Database (see Section 3.1.1.1).

3.3.1 CSA1 – Montes Valsain, Iberian Mountains, Spain

CSA1 (Spain) is divided into 4 RLs and has 6 RSTs with applied even-aged FM (18 thinning operations and 23 regeneration fellings identified) and 10 RSTs with implemented coppice FM (33 thinning operations and 10 regeneration fellings identified). Table **3.9** shows the thinning type and regeneration system in the different BAU FM.

Table 3.9: Thinning type and regeneration system in CSA1.

	Thinning type	*Regeneration system*
Even-aged BAU FM	From below	Group system (=Gruppenschirmschlag)
Coppice BAU FM	From below	Coppice system (clear cutting at age 70)

3.3.1.1 Case Study Area scale

Thinning operations in even-aged FM are conducted between 40 and 80 years stand age (Table **3.10**), in coppice FM the age ranges between 30 and 60 years (Table **3.12**).

The harvesting system for thinning operations and regeneration fellings (highly mechanized) (Table **3.11**,

Table **3.13**, Table 3.15, Table **3.17**) is unique among ARANGE CSAs as felling and delimbing is done by chainsaw and bucking is done by harvester respectively processor (Table **3.11**). Perhaps this might be the reason for the low productivity even in the regeneration fellings (Table **3.14**, Table **3.16**).

Table 3.10: Descriptive statistics harvesting in CSA1 (Spain) for thinning operations in even-aged FM. H_{dom} = dominant stand height at time of harvesting, volume = harvested volume. Number of RST = 6, number of operations = 18.

Thinning - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	40.00	80.00	60.00	16.80
H_{dom} [m]	7.90	26.40	17.67	5.59
Volume [m^3]	18.00	200.00	65.33	41.63
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	28.96	28.96	28.96	0.00
Extraction distance [m]	400.00	900.00	641.67	200.18
Productivity extraction [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost extraction [€/m^3]	10.12	10.12	10.12	0.00

Table 3.11: Frequency analysis in CSA1 (Spain) for thinning operations in even-aged FM. Number of RST= 6, number of operations = 18.

Thinning - Even-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	11.10 %
	Older pole phase (20-30 cm DBH)	33.30 %

	Mature phase (30-50 cm DBH)	55.60 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Harvester	5.60 %
	Processor	94.40 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 3.12: Descriptive statistics harvesting in CSA1 (Spain) for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 10, number of operations = 33.

Thinning – Coppice	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	30.00	60.00	43.89	12.25
H_{dom} [m]	7.00	14.60	10.38	2.77
Volume [m^3]	2.00	82.00	17.83	20.94
Productivity harvesting [m^3/PSH_{15}]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	32.39	32.39	32.39	0.00
Extraction distance [m]	400.00	650.00	420.83	70.08
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 3.13: Frequency analysis in CSA1 (Spain) for thinning operations in coppice FM. Number of RST= 10, number of operations = 33.

Thinning – Coppice		***Frequency***
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus ilex*	8.30 %
	Quercus pyrenaica	91.70 %

Table 3.14: Descriptive statistics harvesting in CSA1 (Spain) for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 6, number of operations = 23.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	100.00	120.00	111.09	7.68
H_{dom} [m]	23.00	29.00	26.75	2.87
Volume [m^3]	28.00	346.00	116.39	87.43
Productivity harvesting [m^3/PSH_{15}]	2.00	2.00	2.00	0.00
Cost harvesting [€/m^3]	7.62	7.62	7.62	0.00

Extraction distance [m]	400.00	900.00	608.70	219.32
Productivity extraction [m^3/PSH_{15}]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	13.98	13.98	13.98	0.00

Table 3.15: Frequency analysis in CSA1 (Spain) for regeneration fellings in even-aged FM. Number of RST= 6, number of operations = 23.

Regeneration - Even-aged		***Frequency***
Phase	Mature phase (30-50 cm DBH)	21.70 %
	Over mature (>50 cm DBH)	78.30 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 3.16: Descriptive statistics harvesting in CSA1 (Spain) for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 10, number of operations = 10.

Regeneration – Coppice	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	70.00	70.00	70.00	0.00
H_{dom} [m]				
Volume [m^3]	20.00	60.00	45.80	16.46
Productivity harvesting [m^3/PSH_{15}]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	25.03	25.03	25.03	0.00
Extraction distance [m]	400.00	650.00	425.00	79.06
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 3.17: Frequency analysis in CSA1 (Spain) for regeneration fellings in coppice FM. Number of RST= 10, number of operations = 10.

Regeneration – Coppice		***Frequency***
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

3.3.1.2 Representative Landscape

CSA1 (Spain) has defined 4 RLs within the CSA. The main difference between those RLs is the accessibility influenced by the main road density (

Table **3.18**). Dewatering of forest roads is not done with culverts; an open drain on the surface of forest roads is used with a width of 10 cm (indicated culvert diameter in

Table **3.18**).

The transport of wooden products from forest to the industry is done by truck and trailer as well as by semitrailer (Table **3.19**). The skilled chainsaw operator costs 14.55 €/h (Table **3.20**). Unfortunately no data on accidents in the CSA 1 were available.

Table 3.18: Parameters of road network in the RL 1 to RL 4 in CSA1 (Spain).

Road network				
	RL 1	RL 2	RL 3	RL 4
Area [ha]	847.80	118.48	1077.17	583.85
Main road density [m/ha]	12.50	2.31	17.05	31.12
Relation main road to subsidiary roads [%]	41.92	135.24	201.02	201.51
Skidding road density [m/ha]	42.35	2.23	20.36	14.01
Main road spacing [m]	800.00	4329.00	586.51	321.34
Accessibility [%]	52.31	9.70	71.60	100.00
Construction method	Bulldozer	Bulldozer	Bulldozer	Bulldozer
Construction cost main road [€/m]	20.00	20.00	20.00	20.00
Annual construction main road bedrock [m/years]	0.00	0.00	0.00	0.00
Annual construction main road earth ground [m/years]	0.00	0.00	0.00	0.00
Construction costs skidding road [€/year]	2.00	2.00	2.00	2.00
Culvert spacing [m]	50.00	50.00	50.00	50.00
Main culvert type	Concrete	Concrete	Concrete	Concrete
Culvert diameter [cm]	10.00	10.00	10.00	10.00
Main road maintenance cost [€/year]	8335.57	218.81	14691.09	14534.58

Table 3.19: Transportation parameters from forest to industry in the RL 1 to RL 4 in CSA1 (Spain).

Transportation RL 1 – 4			
	Frequency [%]	Load capacity [m^3/turn]	Costs [€/m^3]
Single Truck	50.00	20.00	8.00
Semitrailer	50.00	30.00	6.00
Transportation distance [km]	100.00		
Max. allowed weight [t]	40.00		

Table 3.20: System Input in the RL1 to RL4 in CSA1 (Spain).

System Input	RL 1 - 4
Costs for a skilled chainsaw operator [€/h]	14.55
Fuel costs [€/l]	1.35

3.3.2 CSA2 – Vercors, Western Alps, France

CSA 2 (France) has just one RL and 18 RSTs. All RSTs are managed with uneven-aged FM. As in this area thinning operations and regeneration fellings are coupled, a clear assignment to thinning or regeneration was not done by the CSR, so everything was subsumed in harvesting. Thinning type and regeneration system can be seen in Table 3.21

Table 3.21: Thinning type and regeneration system in CSA2.

	Thinning type	*Regeneration system*
Coppice BAU FM	Combination from above and from below	Single-tree selection system

3.3.2.1 Case study area

The costs for harvesting and extraction average out at € 14.00/m^3 (Table 3.22). The timber is felled and delimbed by chain saw but no bucking is done (Table 3.23).

Table 3.22: Descriptive statistics harvesting in CSA2 (France) for harvesting in uneven-aged FM. Number of RST = 18, number of operations = 18.

Harvesting - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Productivity harvesting [m^3/PSH_{15}]	3,00	3,00	3,00	0,00
Cost harvesting [€/m^3]	12,00	12,00	12,00	0,00
Extraction distance [m]	300,00	500,00	488,89	47,14
Productivity extraction [m^3/PSH_{15}]	10,00	10,00	10,00	0,00
Cost extraction [€/m^3]	11,00	11,00	11,00	0,00

Table 3.23: Frequency analysis in CSA2 (France) for harvesting in uneven-aged FM. Number of RST= 18, number of operations = 18.

Harvesting - Uneven-aged		***Frequency***
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	40% beech, 30%fir, 20%spruce, 10% other deciduous species	5.60%
	40% beech, 40%fir, 10%spruce, 10% other deciduous species	5.60%

40% spruce, 40%fir, 20%secondary species and mountain pine	5.60%
40%spruce, 40%fir, 20% decidous species (beech dominant)	5.60%
45%fir,45%spruce, 10% deciduous species (beech dominant)	5.60%
50% fir, 20% spruce, 30% decidous species (maple dominant)	11.10%
50% spruce, 25%fir, 25% deciduous species	11.10%
50%fir, 20%spruce, 30% deciduous species (beech dominant)	5.60%
60%fir, 20%spruce, 20% deciduous species (beech dominant)	5.60%
60%spruce, 40%fir	5.60%
70%fir, 15%spruce, 15% deciduous species (beech dominant)	5.60%
70%fir, 20%spruce, 10% deciduous species (beech dominant)	5.60%
70%spruce, 20%mountain pine, 10%fir	5.60%
75%spruce, 25% secondary species and fir	5.60%
75%spruce, 25%fir	5.60%
90%spruce, 10%fir	5.60%

3.3.2.2 Representative Landscape

In CSA 2 (France), RL 1 the main road density reported is 14.3 m/ha (Table 3.24). The harvested timber is transported from the forest to the industry only by Truck and Trailer (Table 3.25). In CSA 2 (France) the highest costs for labor have to be paid (Table 3.26). Additionally the highest accident quote is also located in CSA 2 (from all CSAs, where data were available) (Table 3.27).

Table 3.24: Parameters of road network in in RL 1 in CSA2 (France).

Road network	
	RL1
Area [ha]	5190.00
Main road density [m/ha]	14.3
Relation main road to subsidiary roads [%]	0.00
Skidding road density [m/ha]	60.60
Main road spacing [m]	699.30
Accessibility [%]	57.00
Construction method	Excavator
Construction cost main road [€/m]	35.00
Annual construction main road bedrock [m/years]	No data
Annual construction main road earth ground [m/years]	No data
Construction costs skidding road [€/m]	7.00
Culvert spacing [m]	70.00
Main culvert type	Iron
Culvert diameter [cm]	12.00
Main road maintenance cost [€/year]	5550.00

Table 3.25: Transportation parameters in RL 1 in CSA2 (France).

Transportation RL 1			
	Frequency [%]	Load capacity [m^3/turn]	Costs [€/m^3]

Truck and Trailer	100.00	48.00	10.00
Transportation distance [km]	50		
Max. allowed load [t]	48		

Table 3.26: System Input in RL 1 in CSA2 (France).

System Input	RL1
Costs for a skilled chainsaw operator [€/h]	29.00
Fuel costs [€/l]	1.30

Table 3.27: Accidents in RL 1 in CSA2 (France)

Accidents	
	Silbertal
Accident quote [n/1 mio m^3]	29.00
Frequency felling/delimbing [%]	80.00
Frequency extraction [%]	20.00
Accident quote mechanized operation [n/1 mio m^3]	23.00
Accident quote fully mechanized operation [n/1 mio m^3]	6.00

3.3.3 CSA3 – Montafon, Eastern Alps, Austria

In CSA3 (Austria) 2 RLs and 71 RSTs were defined. All RSTs are managed with uneven-aged FM and only regeneration fellings were identified. The regeneration system is the group selection system (Table 3.28).

Table 3.28: Thinning type and regeneration system in CSA3.

	Thinning type	*Regeneration system*
Uneven-aged BAU FM	No thinnings	Group selection system

3.3.3.1 Case study area

The costs for harvesting and extraction (44.69 €/m^3) are very high (**Table 3.26**). Especially extraction costs are caused by the high share of sledge winch (Table **3.30**).

Table 3.29: Descriptive statistics harvesting in CSA3 (Austria) for regeneration fellings in uneven-aged FM.Number of RST = 71, number of operations = 71.

Regeneration - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Productivity harvesting [m^3/PSH_{15}]	4.00	4.00	4.00	0.00

Cost harvesting [€/m^3]	20.00	20.00	20.00	0.00
Extraction distance [m]	100.00	500.00	494.52	46.60
Productivity extraction [m^3/PSH$_{15}$]	6.00	8.00	7.97	0.23
Cost extraction [€/m^3]	15.00	25.00	24.86	1.17

Table 3.30: Frequency analysis in CSA3 (Austria) for regeneration fellings in uneven-aged FM. Number of RST= 71, number of operations = 71.

Regeneration - Uneven-aged		***Frequency***
Phase	Uneven-aged stand	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Sledge winch	98.60 %
	Tractor	1.40 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	0.50 %
	Fagus sylvatica	2.30 %
	Other broadleaves	32.40 %
	Abies alba	6.80 %
	Picea abies	32.40 %
	Other conifers	25.60 %

3.3.3.2 Representative Landscape

Main road density and subsequently the accessibility differ greatly between the two landscapes (Table 3.31).

Data in Table 3.32 about transportation frequency, load capacity and costs are only valid for transport within the forest. Transportation from forest to the industry is done by train (70 %, approximately 18.00 €/m^3) and by truck and trailer (30 %, 12.00 €/m^3) with approximately 50 km distance to the industry. In CSA 3 0.01 accidents occur per 1 million m^3 harvested timber (Table 3.33).

Table 3.31: Parameters of road network in in RL Silbertal and RL Rellstal in CSA3 (Austria).

Road network		
	Silbertal	Rellstal
Area [ha]	369.00	210.00
Main road density [m/ha]	13.65	7.57
Relation main road to subsidiary roads [%]	161.00	119.00
Skidding road density [m/ha]	No data	No data
Main road spacing [m]	732.60	1321.00
Accessibility [%]	84.10	64.00
Construction method	Excavator	Excavator
Construction cost main road [€/m]	95.00	95.00
Annual construction main road bedrock [m/years]	No data	No data

Annual construction main road earth ground [m/years]	No data	No data
Construction costs skidding road [€/year]	40.00	40.00
Culvert spacing [m]	200.00	200.00
Main culvert type	Polyethylen	Polyethylen
Culvert diameter [cm]	50.00	50.00
Main road maintenance cost [€/year]	13149.00	3480.00

Table 3.32: Transportation parameters in RL Silbertal und RL Rellstal in CSA3 (Austria).

Transportation Silbertal/Rellstal			
	Frequency [%]	Load capacity [m^3/turn]	Costs [€/m^3]
Tractor and Trailer	5.00	10.00	2.50
Single Truck	75.00	14.00	10.00
Truck and Trailer	20.00	26.00	10.00
Transportation distance [km]	50		
Max. allowed load [t]	42		

Table 3.33: System Input in RL Silbertal and RL Rellstal in CSA3 (Austria).

System Input	Silbertal	Rellstal
Costs for a skilled chainsaw operator [€/h]	13.50	13.50
Fuel costs [€/l]	1.40	1.40

Table 3.34: Accidents in RL Silbertal and RL Rellstal in CSA3 (Austria)

Accidents		
	Silbertal	Rellstal
Accident quote [n/1 mio m^3]	0.01	0.01
Frequency felling/delimbing [%]	50.00	50.00
Frequency extraction [%]	50.00	50.00
Accident quote mechanized operation [n/1 mio m^3]	0.01	0.01
Accident quote fully mechanized operation [n/1 mio m^3]	0.00	0.00

3.3.4 CSA4 – Sneznik, Dinaric Mountains, Slovenia

CSA4 (Slovenia) has 10 RSTs managed by even-aged FM (13 thinning operations and 28 regeneration fellings identified), while another 11 RSTs are managed by uneven-aged FM (44 thinning operations and 11 regeneration fellings indicated). Table 3.35 shows the thinning types and regeneration systems depending on BAU FM.

Table 3.35: Thinning type and regeneration system in CSA4.

	Thinning type	*Regeneration system*
Even-aged BAU FM	From below	Group system (=Gruppenschirmschlag)
Uneven-aged BAU FM	From above	Group system (=Gruppenschirmschlag)
		Group selection system

3.3.4.1 Case study area

For descriptive statistics of CSA4 (Slovenia), RST 9 and RST 10 were excluded as the indicated productivities for harvesting and extraction were not reliable.

CSA4 (Slovenia) has very high productivities in harvesting (thinning operations as well as at regeneration fellings) in comparison to other CSAs (except CSA5) and the highest productivity in extraction (Table **3.36**, Table **3.38**, Table **3.40**, Table **3.42**). A unique characteristic of CSA4 is a very high percentage of "no bucking" indicated in thinning operations (Table **3.37**, Table **3.39**) and the declaration of miscellaneous harvested species in regeneration fellings (Table **3.41**, Table **3.43**). CSA4 and CSA5 are the only ARANGE CSAs where fully mechanized harvesting is applied.

Table 3.36: Descriptive statistics harvesting in CSA4 (Slovenia) for thinning operations in even-aged FM. Volume = harvested volume. Number of RST = 10, number of operations = 13.

Thinning - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Volume [m^3]	1.00	43.00	9.59	10.90
Productivity harvesting [m^3/PSH_{15}]	4.00	15.00	6.11	4.29
Cost harvesting [€/m^3]	10.43	34.77	30.00	9.56
Extraction distance [m]	350.00	650.00	494.86	68.34
Productivity extraction [m^3/PSH_{15}]	15.00	35.00	18.65	7.70
Cost extraction [€/m^3]	9.03	18.06	17.10	2.06

Table 3.37: Frequency analysis in CSA4 (Slovenia) for thinning operations in even-aged FM. Number of RST= 10, number of operations = 13.

Thinning - Even-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	84.10 %
	Older pole phase (20-30 cm DBH)	2.30 %
	Mature phase (30-50 cm DBH)	13.70 %
Harvesting method	Cut to length	13.60 %
	Tree length	86.40 %
Extraction method	Forwarder	15.90 %
	Skidder	13.60 %
	Tractor	70.50 %
Harvesting system	Fully mechanized	15.90 %
	Partly mechanized	84.10 %

Felling	Harvester	15.90 %
	Chain saw	84.10 %
Delimbing	Harvester	15.90 %
	Chain saw	84.10 %
Bucking	Chainsaw	13.60 %
	No bucking	86.40 %
Species (frequency)	*Acer pseudoplatanus*	11.40 %
	Fagus sylvatica	27.30 %
	Other broadleaves	9.00 %
	Abies alba	25.00 %
	Picea abies	27.30 %

Table 3.38: Descriptive statistics harvesting in CSA4 (Slovenia) for thinning operations in uneven-aged FM. Volume = harvested volume. Number of RST = 11, number of operations = 44.

Thinning - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Volume [m^3]	1.00	40.00	11.70	9.43
Productivity harvesting [m^3/PSH_{15}]	5.00	15.00	12.37	4.20
Cost harvesting [€/m^3]	10.43	31.30	15.64	8.88
Extraction distance [m]	350.00	500.00	409.24	52.87
Productivity extraction [m^3/PSH_{15}]	15.00	35.00	29.11	8.23
Cost extraction [€/m^3]	13.88	18.06	15.38	1.77

Table 3.39: Frequency analysis in CSA4 (Slovenia) for thinning operations in uneven-aged FM. Number of RST= 11, number of operations = 44.

Thinning - Uneven-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	24.20 %
	Older pole phase (20-30 cm DBH)	21.00 %
	Mature phase (30-50 cm DBH)	54.80 %
Harvesting method	Cut to length	54.80 %
	Tree length	45.20 %
Extraction method	Skidder	75.80 %
	Tractor	24.20 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	54.80 %
	No bucking	45.20 %
Species (frequency)	*Acer pseudoplatanus*	5.70 %
	Fagus sylvatica	28.00 %
	Other broadleaves	10.30 %
	Abies alba	28.00 %
	Picea abies	28.00 %

Table 3.40: Descriptive statistics harvesting in CSA4 (Slovenia) for regeneration fellings in even-aged FM. Volume = harvested volume. Number of RST = 10, number of operations = 28.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Volume [m^3]	3.00	290.00	66.99	82.91
Productivity harvesting [m^3/PSH_{15}]	16.00	16.00	16.00	0.00
Cost harvesting [€/m^3]	9.78	9.78	9.78	0.00
Extraction distance [m]	350.00	650.00	494.47	75.85
Productivity extraction [m^3/PSH_{15}]	38.00	38.00	38.00	0.00
Cost extraction [€/m^3]	12.78	12.78	12.78	0.00

Table 3.41: Frequency analysis in CSA4 (Slovenia) for regeneration fellings in even-aged FM. Number of RST= 10, number of operations = 28.

Regeneration - Even-aged		***Frequency***
Phase	Mature phase (30-50 cm DBH)	3.50 %
	Over mature (>50 cm DBH)	84.90 %
	Rejuvenation phase	11.60 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	11.60 %
	Skidder	88.40 %
Harvesting system	Fully mechanized	11.60 %
	Partly mechanized	88.40 %
Felling	Harvester	11.60 %
	Chain saw	88.40 %
Delimbing	Harvester	11.60 %
	Chain saw	88.40 %
Bucking	Harvester	11.60 %
	Chain saw	88.40 %
Species (frequency)	*Acer pseudoplatanus*	11.70 %
	Fagus sylvatica	20.90 %
	Other broadleaves	14.00 %
	Abies alba	20.90 %
	Picea abies	20.90 %
	Miscellaneous	11.60 %

Table 3.42: Descriptive statistics harvesting in CSA4 (Slovenia) for regeneration fellings in uneven-aged FM. Volume = harvested volume. Number of RST = 11, number of operations = 11.

Regeneration - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Volume [m^3]	1.00	340.00	44.05	82.84
Productivity harvesting [m^3/PSH_{15}]	15.00	16.00	15.50	0.50
Cost harvesting [€/m^3]	9.78	10.43	10.11	0.33
Extraction distance [m]	350.00	500.00	410.19	53.11
Productivity extraction [m^3/PSH_{15}]	35.00	38.00	36.50	1.51
Cost extraction [€/m^3]	12.78	13.88	13.33	0.55

Table 3.43: Frequency analysis in CSA4 (Slovenia) for regeneration fellings in uneven-aged FM. Number of RST= 11, number of operations = 11.

Regeneration - Uneven-aged		***Frequency***
Phase	Over mature (>50 cm DBH)	39.80 % %
	Rejuvenation phase	10.20 %
	Uneven-aged stand	50.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.40 %
	Fagus sylvatica	20.40 %
	Other broadleaves	18.50 %
	Abies alba	10.20 %
	Picea abies	20.40 %
	Miscellaneous	10.10 %

3.3.4.2 Representative Landscape

Not data are currently available on Road Network, Transportation, System Input and Accidents.

3.3.5 CSA5 – Vilhelmina, Scandinavian Mountains, Sweden

CSA5 (Sweden) is organized in 1 RL and 15 RSTs in even-aged FM. There are 15 thinning operations as well as 15 regeneration fellings indicated. The regeneration system is a clear cutting system (Table 3.44).

Table 3.44: Thinning type and regeneration system in CSA5.

	Thinning type	*Regeneration system*
Even-aged BAU FM	Combination from above and from below	Clear cutting

3.3.5.1 Case study area

CSA5 (Sweden) has the highest productivity in harvesting operations (Table **3.45**, Table **3.47**). The reason is that only fully mechanized harvesting systems are applied. (Table **3.46**, Table **3.48**).

Table 3.45: Descriptive statistics harvesting in CSA 5 (Sweden) for thinning operations in even-aged FM practice. Hdom = dominant height at time of harvesting, volume = harvested volume. Number of RST = 15, number of operations = 15.

Thinning - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	1.00	49.00	17.15	18.72
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 3.46: Frequency analysis in CSA 5 (Sweden) for thinning operations in even-aged FM practice. Number of RST= 15, number of operations = 15.

Thinning - Even-aged		***Frequency***
Phase	Thicket phase (>130 cm DBH)	4.20 %
	Early pole phase (10-20 cm DBH)	95.80 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	31.20 %
	Picea abies	31.20 %
	Pinus contorta	6.30 %
	Pinus sylvestris	31.30 %

Table 3.47: Descriptive statistics harvesting in CSA 5 (Sweden) for regeneration fellings in even-aged FM practice. Hdom = dominant height at time of harvesting, volume = harvested volume. Number of RST = 15, number of operations = 15.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	90.00	110.00	100.00	8.25
Volume [m^3]	3.00	404.00	90.92	112.86
Productivity harvesting [m^3/PSH15]	21.00	26.00	24.25	1.50
Cost harvesting [€/m^3]	5.00	7.00	5.58	0.65
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	21.00	26.00	24.25	1.50
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 3.48: Frequency analysis in CSA 5 (Sweden) for regeneration fellings in even-aged FM practice. Number of RST= 15, number of operations = 15.

Regeneration - Even-aged		***Frequency***
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %

Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	31.20 %
	Picea abies	33.30 %
	Pinus contorta	6.30 %
	Pinus sylvestris	29.20 %

3.3.5.2 Representative Landscape

In CSA5 no skidding roads are indicated (Table **3.49**). The high transportation distance indicated in Table **3.50** is caused by the closing of the nearby industry a few months ago.

In comparison to all other CSAs, the highest price for a skilled chainsaw operator has to be paid (Table **3.51**). The accident rate quoted in Table **3.52** is the official quote of Sweden; the other figures refer to the CSA5.

Table 3.49: Parameters of road network in CSA5 (Sweden).

Road network	
	RL 1
Area [ha]	10405.00
Main road density [m/ha]	7
Relation main road to subsidiary roads [%]	0
Skidding road density [m/ha]	0
Main road spacing [m]	1428.57
Accessibility [%]	35
Construction method	Excavator
Construction cost main road [€/m]	20.00
Annual construction main road bedrock [m/years]	0
Annual construction main road earth ground [m/years]	500
Construction costs skidding road [€/year]	No data
Culvert spacing [m]	500.00
Main culvert type	Polyethylen
Culvert diameter [cm]	30.00
Main road maintenance cost [€/year]	10000.00

Table 3.50: Transportation parameters from forest to industry in CSA5 (Sweden)

Transportation RL 1			
	Frequency [%]	Load capacity [m^3/turn]	Costs [€/m^3]
Truck and Trailer	100.00	49.00	18.00
Transportation distance [km]	260.00		
Max. allowed weight [t]	42.00		

Table 3.51: System Input CSA5 (Sweden)

System Input	RL 1
Costs for a skilled chainsaw operator [€/h]	25.00
Fuel costs [€/l]	1.40

Table 3.52: Accidents in CSA5 (Sweden). Accident quote = quote for whole Sweden.

Accidents	
	RL 1
Accident quote [n/1 mio m^3]	1.50
Frequency felling/delimbing [%]	70.00
Frequency extraction [%]	30.00
Accident quote mechanized operation [n/1 mio m^3]	0.10
Accident quote fully mechanized operation [n/1 mio m^3]	0.10

3.3.6 CSA6 – Kozie chrbty, Western Carpathians, Slovakia

CSA6 (Slovakia) has 1 RL and 45 RSTs in even-aged FM. There were 146 thinning operations and 145 regeneration fellings indicated in the FM descriptions.

3.3.6.1 Case study area

CSA 6 only delivered data on volume, extraction distance and combined cost of harvesting and extraction (Table 3.53, Table 3.55). So the comparability to other CSAs is very difficult. For the extraction tractors with the tree length method is the most common indicated system (Table **3.54**, Table **3.56**).

Table 3.53: Descriptive statistics harvesting in CSA6 (Slovakia) for thinning operations in even-aged FM. Volume = harvested volume. Number of RST = 45, number of operations = 146.

Thinning - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Volume [m^3]	2.00	130.00	39.44	26.72
Extraction distance [m]	100.00	1400.00	571.16	265.91
Cost harvesting and extraction [€/m^3]	10.00	20.00	13.82	2.28

Table 3.54: Frequency analysis in CSA6 (Slovakia) for thinning operations in even-aged FM. Number of RST= 45, number of operations = 146.

Thinning - Even-aged		***Frequency***
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %

Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	5.60 %
	Larix decidua	14.40 %
	Abies alba	5.10 %
	Picea abies	67.90 %
	Pinus sylvestris	7.00 %

Table 3.55: Descriptive statistics harvesting in CSA6 (Slovakia) for regeneration fellings in even-aged FM. Volume = harvested volume. Number of RST = 45, number of operations = 145.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Volume [m^3]	4.00	300.00	127.02	99.74
Extraction distance [m]	100.00	1400.00	554.98	256.17
Cost harvesting and extraction [€/m^3]	10.00	20.00	13.97	2.42

Table 3.56: Frequency analysis in CSA 6 (Slovakia) for regeneration fellings in even-aged FM practice. Number of RST= 45, number of operations = 145.

Thinning - Even-aged		***Frequency***
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	10.30 %
	Larix decidua	33.00 %
	Abies alba	5.20 %
	Picea abies	46.30 %
	Pinus sylvestris	5.20 %

3.3.6.2 Representative Landscape

In CSA6 1 RL has been defined.

In the Slovakian CSA, culverts with the largest diameter (60 cm) are recommended in comparison to all other ARANGE CSAs (Table **3.57**). As mentioned before harvesting costs are very low, also costs for transportation (Table **3.58**) and costs for a skilled chainsaw operator are on a very low level as well (Table **3.59**). In CSA 6 the highest accident quote of all CSAs within ARANGE is observed (Table **3.60**).

Table 3.57: Parameters of road network in CSA6 (Slovakia).

Road network	
	RL 1
Area [ha]	5129.97
Main road density [m/ha]	4.46
Relation main road to subsidiary roads [%]	8.92
Skidding road density [m/ha]	5.85
Main road spacing [m]	2242.15
Accessibility [%]	98.52
Construction method	Bulldozer
Construction cost main road [€/m]	39.00
Annual construction main road bedrock [m/years]	No data
Annual construction main road earth ground [m/years]	No data
Construction costs skidding road [€/year]	No data
Culvert spacing [m]	430.00
Main culvert type	Concrete
Culvert diameter [cm]	60.00
Main road maintenance cost [€/year]	170000.00

Table 3.58: Transportation parameters from forest to industry in CSA6 (Slovakia).

Transportation RL 1			
	Frequency [%]	Load capacity [m^3/turn]	Costs [€/m^3]
Truck and Trailer	100.00	30.00	4.00
Transportation distance [km]	40.00		
Max. allowed weight [t]	40.00		

Table 3.59: System Input in CSA6 (Slovakia).

System Input	RL 1
Costs for a skilled chainsaw operator [€/h]	10.00
Fuel costs [€/l]	1.40

Table 3.60: Accidents in CSA6 (Slovakia).

Accidents	
	RL 1
Accident quote [n/1 mio m^3]	10.00
Frequency felling/delimbing [%]	No data
Frequency extraction [%]	No data
Accident quote mechanized operation [n/1 mio m^3]	No data
Accident quote fully mechanized operation [n/1 mio m^3]	No data

3.3.7 CSA7 – Shiroka laka, Rhodope Mountains, Bulgaria

CSA7 (Bulgaria) is organized in 2 RL and 7 RSTs in even-aged FM. In these RSTs 21 thinning operations and 21 felling operations were described. The used thinning type is a combination from above and from below (Table 3.61).

Table 3.61: Thinning type and regeneration system in CSA7.

	Thinning type	*Regeneration system*
Even-aged BAU FM	Combination from above and from below	Group system (=Gruppenschirmschlag)

3.3.7.1 Case study area

The CSA of Bulgaria has the lowest productivity from all ARANGE CSAs for extraction in thinning operations (Table **3.62**). The reason for this is the high percentage of manual extraction (Table **3.63**).

Table 3.62: Descriptive statistics harvesting in CSA 7 (Bulgaria) for thinning operations in even-aged FM practice. Hdom = dominant height at time of harvesting, volume = harvested volume. Number of RST = 7, number of operations = 21.

Thinning - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	30.00	70.00	50.00	16.51
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	1.00	9.00	1.53	2.02
Cost harvesting [€/m^3]	6.00	7.00	6.96	0.21
Extraction distance [m]	150.00	300.00	176.67	51.79
Productivity extraction [m^3/PSH15]	1.00	2.00	1.20	0.41
Cost extraction [€/m^3]	9.00	14.00	9.53	1.42

Table 3.63: Frequency analysis in CSA7 (Bulgaria) for thinning operations in even-aged FM. Number of RST= 7, number of operations = 21.

Thinning - Even-aged		***Frequency***
Harvesting method	Cut to length	66.70%
	Tree length	33.30%
Extraction method	Manual	80.00%
	Animal	15.60 %
	Skidder	4.40 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Fagus sylvatica*	26.70 %
	Abies alba	6.70 %
	Picea abies	40.00 %
	Pinus nigra	20.00 %

	Pinus sylvestris	6.60 %

Table 3.64: Descriptive statistics harvesting in CSA7 (Bulgaria) for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 7, number of operations = 21.

Regeneration - Even-aged	***N***	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	37	90.00	120.00	101.76	11.26
H_{dom} [m]	0				
Volume [m^3]	0				
Productivity harvesting [m^3/PSH15]	37	2.00	3.00	2.05	0.23
Cost harvesting [€/m^3]	37	5.00	5.00	5.00	0.00
Extraction distance [m]	37	150.00	300.00	181.08	55.72
Productivity extraction [m^3/PSH15]	37	2.00	5.00	3.30	0.88
Cost extraction [€/m^3]	37	8.00	16.00	9.14	2.65

Table 3.65: Frequency analysis in CSA7 (Bulgaria) for regeneration fellings in even-aged FM. Number of RST = 7, number of operations = 21.

Thinning - Even-aged		***Frequency***
Harvesting method	Cut to length	66.70%
	Tree length	33.30%
Extraction method	Animal	24.30 %
	Skidder	59.50 %
	Tower yarder	10.80 %
	Tractor&trailer	5.40 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Fagus sylvatica*	32.40 %
	Abies alba	8.10 %
	Picea abies	37.80 %
	Pinus nigra	16.20 %
	Pinus sylvestris	5.40 %

3.3.7.2 Representative Landscape

CSA7 (Bulgaria) has 2 RLs. The major difference is the lower main road and skidding road density in RL 2 (Table **3.66**) resulting in higher costs for transportation (Table **3.68**). Table **3.70** displays a very high quote compared to CSA3 and CSA5 (Table **3.70**).

Table 3.66: Parameters of road network in RL1 and RL 2 in CSA7 (Bulgaria).

Road network		
	RL 1	RL 2
Area [ha]	736.00	1001.00
Main road density [m/ha]	13.00	10.00

Relation main road to subsidiary roads [%]	83.00	83.00
Skidding road density [m/ha]	10.00	5.00
Main road spacing [m]	769.23	1000.00
Accessibility [%]	85.00	70.00
Construction method	Bulldozer	Bulldozer
Construction cost main road [€/m]	25.00	25.00
Annual construction main road bedrock [m/years]	0.00	0.00
Annual construction main road earth ground [m/years]	150.00	100.00
Construction costs skidding road [€/year]	10.00	10.00
Culvert spacing [m]	50.00	50.00
Main culvert type	Concrete	Concrete
Culvert diameter [cm]	50.00	50.00
Main road maintenance cost [€/year]	750.00	1000.00

Table 3.67: Transportation parameters from forest to industry in RL 1 in CSA7 (Bulgaria).

Transportation RL 1			
	Frequency [%]	Load capacity [m^3/turn]	Costs [€/m^3]
Single Truck	90.00	14.00	6.00
Truck and Trailer	10.00	28.00	6.00
Transportation distance [km]	50.00		
Max. allowed weight [t]	No data		

Table 3.68: Transportation parameters from forest to industry in RL 2 in CSA7 (Bulgaria).

Transportation RL 2			
	Frequency [%]	Load capacity [m^3/turn]	Costs [€/m^3]
Single Truck	100.00	14.00	8.00
Transportation distance [km]	50		
Max. allowed load [t]	No data		

Table 3.69: System Input in RL1 and RL2 in CSA7 (Bulgaria).

System Input	RL 1	RL 2
Costs for a skilled chainsaw operator [€/h]	15.00	15.00
Fuel costs [€/l]	1.30	1.30

Table 3.70: Accidents in RL1 and RL2 in CSA7 (Bulgaria).

Accidents		
	RL 1	RL 2
Accident quote [n/1 mio m^3]	4,00	4,00
Frequency felling/delimbing [%]	75,00	75,00
Frequency extraction [%]	25,00	25,00

Accident quote mechanized operation [n/1 mio m^3]	2,00	2,00
Accident quote fully mechanized operation [n/1 mio m^3]	0,00	0,00

4 Historical forest management

4.1 Introduction

Historical forest management represent the silvicultural measures which have been applied in a RST in the past. Thus, historical management is not necessarily different from what is defined as a BAU FM. Key feature of historical FM in the context of the ARANGE project is that it has been applied before present and that observational data on forest stand conditions as affected by such historic management practices are available.

Historical data on FM and related time series of forest characteristics will be used to reconstruct past ecosystem services (ES) provisioning as a function of FM in a given forest context (Task 2.3). There are various methods which can be used to assess the influence of FM on the provisioning of ES:

(1) Forest models: forest models that are capable of simulating stand structure can reproduce past stand development using historic FM data as a model driver.
(2) Permanent sample plots: The monitoring of permanent plots over time can provide valuable information about the effect of silviculture on the provision of ES. However, this method requires long time series to obtain results and such detailed information are not always available.
(3) Temporary sample plots: we can study the relation of FM and stand conditions (and subsequently the provisioning of ES) using temporary transects or plots located in stands in different developmental stages as produced by a specific FM.

In Task 2.3 within the ARANGE project the focus is on approaches (2) and (3). As an additional task model evaluation by means of historical time series data of stand conditions, harvests and management interventions will be done within the ARANGE project.

Prerequisite is the availability of suitable data on historic FM and the empirical data on the related stand conditions. In this deliverable the focus is on the data collection procedure as well as a brief summary of available data.

4.2 Data collection procedures

The gathering of data on historical FM and related forest time series has been done in a sequence of steps.

Step 1: Screening

A first questionnaire was sent to each CSR to identify the availability of data regarding historical FM and forest time series data. The questions included in this questionnaire were:

(1) Is there any information on historic forest management available in your case study area? Please characterize the nature of the available information.

Time series data? [yes/no] Which period? [start/ end]

(2) Please specify the temporal nature of the available information in more detail (e.g. annually, 5year periods for forest state plus annual harvests, etc.)

(3) Please specify how historic management is characterized.

- Qualitative description of management regime? [yes/no]
- Which quantitative attributes are available on historic forest management:
  - basal area/ha (total) [yes/no]
  - basal area/ha per tree species [yes/no]
  - stem numbers/ha [yes/no]
  - volume/ha [yes/no]
  - diameter distribution [stem numbers/ha per diameter class] [yes/no]
  - other [please specify]

(4) Please specify the entity(ies) for which the information is available (e.g. stand polygons, stand types (non-spatial), forest management units (FMU), inventory plots, etc.)

Based on the responses to this questionnaire, 5 of the 7 ARANGE CSAs were identified as potential providers of historical FM and time series data: CSA1 (Montes Valsain, Spain), CSA2 (Western Alps, France), CSA4 (Dinaric Mountains, Slovenia), CSA5 (Scandinavian Mountains, Sweden), and CSA6 (Kozie chrbty, Slovakia).

Step 2: Data collection

A second questionnaire in MS Excel® was sent to the 5 CSRs to collect the available information on historical FM and forest time series data (Figure 4.1). The questionnaire had two parts: (1) a quantitative time series data of forest development (i.e. data from different inventories, compartments and measured variables); (2) a textual description of FM operations which were driving forest development during the observation period (i.e. Which type of management intervention? When applied? etc.).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	CS	year of	Management	Average MU	GIS or map available	Species		No. trees per ha per diameter class					Total no. trees		Volume per ha per diameter class						total volume	Other measured
2		inventory	units (MU)	area (ha)	for each MU		<10	10-20	20-30	30-40	40-50	>50	per ha	<10	10-20	20-30	30-40	40-50	>50	per ha	variables
3																					
4																					
5																					

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	CS	year of	Management	Average MU	Species	Do you have any record about the Forest Management					Textual description of the management operations					
2		inventory	units (MU)	area (ha)												
3							Forest	Weeding	Tending	Thinnings	Regeneration fellings					
4							management									
5							system									

PLEASE COMPLETE THE TABLE FOR EACH YEAR OF INVENTORY AVAILABLE, SEE EXAMPLE FOR HELP

(1) CS: case study. If historical data refers to more than a forest, please add a new column for each forest
(2) Management unit (MU): unit in which data is available . Note that the number of MU can vary between inventories
(3) Average MU Area (ha): As the MU can have different sizes, the averagesize is requested. Note that the size of the MU can vary between inventories
(4) GIS or map available for each MU: it is necessary to know the shape of the MU, as MU can change between inventories
(5) **Species:** species included in the inventory. Use a different row for each species, if data is available separately. The ideal situation is that the inventories are available for each species.
However, usually, inventories from past decades did not differentiate between species. Then, we can find that the older inventories had the inventories with all species together, but in the recent inventories, we have data separately for each species
(6) No. trees per ha per diameter class: indicate the diameter classes used and mark with a cross if data is available for each diameter class
(7) Total no. trees per ha: you could have the total no. Trees per ha not divided by diameter class, but only the total number of trees per ha for the MU
(8) Volume per ha per diameter class: same explanation than for no. trees per ha per diameter class
(9) Total Volume per ha : same explanation than for Total no. trees per ha
(10) Other measured variables: add new columns similar to no. Trees and volume, if necessary
(11) Do you have any records about the Forest Management applied at the MU?: this information will be obtained from the Management Plans. See classification in the above tables
(11.1) Forest management system
(11.2) Weeding
(11.3) Tending
(11.4) Thinnings
(11.5) Regeneration fellings

(11.1) FM system
Even-aged FM
Two-aged FM
Uneven-aged FM
Coppice FM
Short rotation FM
Agro-forestry
Transformation FM
No management

(11.4) Thinning type
From below
From above
Combination from above and from below
No thinning
Other

(11.5) Regeneration system
Clear cutting
Uniform shelterwood system
Group system (=Grupenschirmschlag)
Shelterwood strip system (=Saumschirmschlag)
Seed tree system and High forest with reserves system
Other

(12) Textual description of the management operations: describe the year and MU where the forest management information is available

Figure 4.1: Questionnaire on forest time series data and related historical management.

Step 3: Data base preparation

From the data collected in the second questionnaire, a database for the 5 CSAs was elaborated (Figure 4.2). The number of trees per diameter class was the variable chosen for the analysis, as it is available in all 5 CSAs. For each CSA, the database includes a number of trees/ha per diameter class for each tree species in several compartments.

With these data the evaluation of FM effects on the provision of timber production is possible. Timber production indicators and stand structure will be linked to other ES (protection against gravitational natural hazards, climate change mitigation through in situ Carbon sequestration, nature conservation and maintenance of biodiversity) whenever possible, through indicators or specific linker functions.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1						no. trees per diameter classes							Increment in no. trees per diameter class					
2	CS	year	sp	MU	area	cd0	cd1	cd2	cd3	cd4	cd5	cd6	Δcd1	Δcd2	Δcd3	Δcd4	Δcd5	Δcd6
3	Valsain	1941	44	1	137.63	30732	12073	9506	3268	489	88	11	0	0	0	0	0	0
4		1948	44	1	137.63	30032	12443	9596	4617	800	152	31	-1600.45349	-629.172623	639.704737	72.04717	29.8514381	14.7019008
5		1958	44	1	137.63	72314	18881	9996	2245	342	76	8	3732.18961	-517.737766	-3353.45847	-936.857267	-154.495401	-34.893692
6		1965	44	1	137.63	62659	21834	12005	5673	758	147	37	-2821.16106	627.327654	2663.85639	252.988661	47.1834457	24.3211592
7		1984	44	1									-34515.8258	-15666.6091	-8056.97568	-1885.92363	-286.861435	-57.5436498
8		1998	44	1	121.69	12995.6605	15012.467	9385.3755	4532.5795	1942.8015	262.291	0	15012.467	9385.3755	4532.5795	1942.8015	262.291	0
9		1941	44	2	171.31	12633	14718	17524	12704	3857	728	118	0	0	0	0	0	0
10		1948	44	2	171.31	10289	13822	19425	14785	4709	981	234	-459.937103	1755.74275	1026.41693	-41.9848757	-14.0918992	74.0280455
11		1958	44	2	171.31	13465	12156	15093	11522	4272	932	181	-506.578462	-4176.51885	-4881.70781	-1908.42502	-505.591737	-126.426347
12		1965	44	2	171.31	27184	11346	13036	9219	0	0	0	-681.115437	-2091.08055	-3136.89353	-5060.42662	-1223.97428	-232.673669
13		1984	44	2									-14985.8564	-13471.9918	-11939.9168	-1891.82855	0	0
14		1998	44	2	242.48	47359.0417	25546.9892	10430.9289	4707.06819	2114.51739	962.662333	548.207583	25546.9892	10430.9289	4707.06819	2114.51739	962.662333	548.207583
15		1941	44	3	140.45	5924	10173	13558	10190	4048	747	180	0	0	0	0	0	0
16		1948	44	3	140.45	5267	9063	13572	11009	4305	913	160	-421.306245	34.555897	85.12022	-444.851936	-110.507983	-59.0132757
17		1958	44	3	140.45	11825	10358	13764	13180	5846	1514	289	2355.73932	450.995854	1153.92962	468.30248	178.352713	54.9838836
18		1965	44	3	140.46	16731	8645	10115	11116	5569	2023	616	-1558.74696	-3403.85627	-2665.21102	-1143.14804	113.040726	242.712059
19		1984	44	3	185.4	66355	23724	10112	8593	4885	1571	319	13361.9232	556.350674	-3443.87181	-2514.77117	-1407.24473	-559.771958
20		1998	44	3	190.93	37436.995	17247.8626	8821.46131	5659.06665	3926.59106	781.073885	200.6785	-16807.8667	-3866.62085	-3737.72401	-1995.94515	-1439.07757	-290.612933
21		1941	44	4	104.71	2635	5055	10610	10408	4476	1211	228	0	0	0	0	0	0
22		1948	44	4	104.71	3590	5043	10534	9938	5005	1464	330	691.066821	383.872206	-934.645427	-154.385116	-49.5414129	34.3632275
23		1958	44	4	104.71	5530	5288	9661	11222	6239	2117	475	1111.94896	-268.917067	683.07557	337.265272	177.588046	33.5334979
24		1965	44	4	104.71	8446	5455	8052	10455	6546	2767	759	519.042396	-1109.33638	-1018.81441	-366.295284	240.457144	171.019755
25		1984	44	4	189.3	13356	6727	7535	11670	7292	2362	454	1114.44434	609.020026	934.789298	-794.138518	-1517.98865	-680.01499
26		1998	44	4	151.23	17896.3128	4825.19358	4330.1673	6907.7621	4265.90739	2575.55279	945.570586	-3007.10771	-2404.54646	-4762.4202	-4397.46804	-758.403179	229.005048
27		1941	44	5	165.48	5723	8036	13399	12262	6649	1762	262	0	0	0	0	0	0
28		1948	44	5	165.48	5311	7529	13645	13926	8195	2681	377	169.575243	614.5958	1148.6492	770.035544	464.188751	11.7902759
29		1958	44	5	165.48	11098	7283	12890	14368	7122	2256	380	799.987787	25.8558351	-144.853239	-2258.70858	-1218.20284	-223.471623
30		1965	44	5	165.48	12028	5439	9765	13350	8906	6009	1070	-1721.40676	-2526.23046	-1447.54736	886.085759	3273.82839	560.919038
31		1984	44	5	120.6	15789	6391	5909	8541	6219	2512	623	280.425533	-2071.07064	-4942.25642	-4164.68631	-4985.14412	-1369.40988
32		1998	44	5	146.67	26368.3025	11036.532	6677.00608	5686.46568	4306.41409	2986.08608	935.46108	2799.59548	1106.64487	-2784.38835	-2797.09877	-319.274614	52.5101877
33		1941	44	6	84.44	3119	9940	16139	10471	3404	749	105	0	0	0	0	0	0
34		1948	44	6	84.44	2722	8527	13670	8295	2330	561	97	-241.870411	-2391.35402	-3163.86947	-1799.30795	-423.328778	-52.3113749
35		1958	44	6	84.44	4032	4672	10492	7552	1929	398	58	-2447.39934	-3162.85862	-2001.72448	-1227.06912	-390.427424	-84.6088686
36		1965	44	6	84.44	4007	3187	8811	8726	3928	884	166	-926.212696	-1417.52566	513.608972	1463.73126	352.456024	84.6057959
37		1984	44	6	100.8	7137	9596	7497	9797	5691	1459	222	7508.34739	-24.3124442	67.940893	183.962878	-153.534818	-78.0940054
38		1998	44	6	123.47	17526.1442	6064.05274	3600.91202	5102.76826	4857.24197	2216.04	181.897813	-3430.31914	-3887.72393	-4946.97565	-2063.56809	-22.1406409	-210.329426
39																		

Figure 4.2: Database for historical forest time series data. Data for CSA1 (Spain) is shown as an example.

As mentioned above, apart from the quantitative time series data, a textual description of the FM operations is available which were driving forest development during the observation period. This information will enable ARANGE to describe the intervention sequence along the time series for each compartment in a particular CSA.

4.3 Data preparation

Following the FM types for characterization of BAU FM (see Section 2.1.2 for a detailed description of the FM systems) eight FM systems were used to characterize the historical FM in a CSA: even-aged FM, two-aged FM, uneven-aged FM, coppice FM, short rotation FM, agro-forestry, transformation FM and no FM. Each FM system is related to a regeneration system. Within T1.3, nine different regeneration systems have been defined (see Section 2.1.3 for a detailed description of the regeneration systems): clear cutting system, uniform shelterwood system, group system, shelterwood strip system, seed tree system and high forest with reserve system, single tree selection system, group selection system, coppice system, other regeneration system. In addition, five groups of silvicultural operations – regeneration operations, weeding, tending, thinning, and regeneration felling operations – are described (see Section 2.2 for a detailed description).

In the CSA four different systems of FM could be found: even-aged (Spain, Sweden, Slovakia and Slovenia), coppice (Spain), uneven-aged (France, Slovenia and Spain)and no FM (Spain and

Slovenia). The even-aged forests have been usually regenerated naturally, although in some CS (Slovakia and Sweden) it has been combined with artificial regeneration (planting). Clear cutting, followed by plantation has been usually applied in Sweden. Thinnings are from above, below or random, or sanitary fellings (Slovakia), or fellings with a nature conservation concern (Sweden, since 1980's). Coppice has only been applied in Spain, where *Quercus pyrenaica* is present. Uneven-aged FM is the management practice in French CSA; in Spain and Slovenia it is usually performed as a group selection system at small scale. The absence of FM is usually related to nature conservation purposes.

4.4 Reports per case study area

The available raw information for each CSA is summarized in Table 4.7 at the end of this Section.

4.4.1 CSA1 – Montes Valsain, Iberian Mountains, Spain

Spanish CSA is mainly a pure even-aged *Pinus sylvestris* forest (70% of Montes de Valsain), while the other 30% is occupied by mixed stands of *Pinus sylvestris* and *Quercus pyrenaica*, pure stands of *Quercus pyrenaica* and pure stands of *Quercus ilex*. Being one of the most productive *P. sylvestris* forests in Spain, the main ES since 1889 until 1965 was timber production, thus all the historical records until then refer only to *Pinus sylvestris* stands. Even-aged FM practice has been the common practice in *P. sylvestris* stands. Initially, a uniform shelterwood system in permanent blocks with a rotation of 120 years and a 20 years regeneration period was applied. This method was changed to (shelterwood) group system, extending the regeneration period to 40 years, if necessary, to assure sufficient natural regeneration. Regeneration is always natural after regeneration fellings. Coppice FM is the practice used for *Q. pyrenaica*, both in pure and mixed stands and in *Q. ilex* when mixed with *Q. pyrenaica*. No management has been applied to pure *Q. ilex* stands. Thinnings are from below and random.

The Spanish CSA1 has complete historic FM data from 1941 to 1998, with 6 successive inventories. Until 1965 (54 compartments, 130 ha of size each), inventories were made by counting all trees with a dbh greater than 10cm and classifying them in 10 cm diameter classes. Since 1988, systematic sampling (288 circular plots, radius 9.8 cm) has been employed and the same stem diameter classification (10 cm diameter classes) has been used. Data regarding silvicutural treatments were compiled from the management plans.

Until 1965 only *Pinus sylvestris* was recorded because only the productive areas were inventoried. Since then, also *Quercus pyrenaica* was recorded. Data includes total volume/ha and number of trees per diameter distribution. The records about FM include information at compartment level and each period about the forest management system, the thinnings and the regeneration fellings.

Table 4.1 shows silvicultural treatments along the five inventories available for the Spanish CSA (1941, 1948, 1956, 1965, 1988 and 1988).

Table 4.1: Silvicultural treatments in the pure *Pinus sylvestris* stands for each compartment represented on a time scale in which compartments with a similar intervention sequence have been grouped.

Block	Grouping Reference	1941	1948	1956	1965	1988	1998
I	a	release old stand/thinning*			thinning		
I	b	release old stand/thinning*				thinning	
II	c		uniform shelterwood felling				
II	d		uniform shelterwood felling			thinning	
II	e	uniform shelterwood felling				thinning/overhead rel.	
II	f	uniform shelterwood felling				thinning	
II	g	uniform shelterwood felling					
III	h			uniform shelterwood felling			
III	i			uniform shelterwood felling		thinning	
III	j			uniform shelterwood felling			
IV, V, VI	k	individual tree selection/thinning*			thinning		
IV, V, VI	l					thinning	
IV, V, VI	m	individual tree selection*					
IV, V, VI	n				uniform shelterwood felling		
IV, V, VI	o				u. shelter. felling (low intensity)		

Blanks indicate periods where no significant silvicultural treatments could be identified.
Treatments that were not consistently applied are shown in dotted frames.

4.4.2 CSA2 – Vercors, Western Alps, France

The French CSA has available historic data from two forests: Engins and Autrans-4, most of them in productive areas. Both forests are broadleaved-coniferous uneven-aged forests of *Picea abies*, *Abies alba* and *Fagus sylvatica*.

Individual tree selection system was applied, with a mean harvest interval of 15 years. All the developmental stages are represented at the compartment level, i.e. the stand is a mixture of trees of all age classes. Thus, individual tree selection cuttings have been applied to all age classes. The diameter distribution remained constant during the available time period.

Data is available from inventories and management plans. Engins includes four inventories from 1909 to 1993 in 11 compartments. The size of the compartments varies between 6.8 and 26.3 ha, but it is the same between inventories within each compartment. Autrans-4 includes 3 inventories between 1912 and 1997 in 25 compartments (between 6.9 and 20.5 ha of size).

In Engins five compartments out of twelve have records of cuttings every 15 years (cuttings were made every 10 to 18 years) (Table 4.2). The first cuttings were done in 1918, the last fellings correspond to 2005. The number of cuttings was usually 6-7, although one compartment has only 4 cuttings (last cutting was made in 1994). The harvests (m^3/ha/year) were highly variable depending on the compartment (between 0.93 and 4.49 m^3/ha*yr). Five compartments in Autrans4 forest have records of historical management practices. The rotation period was the same as in Engins and the number of cuttings also varied between 6 and 7. First cuttings started in 1918, while the last cuttings were done in 2008. Harvest was between 0.19 and 0.52 m^3/ha/year.

Data are available for Norway spruce, silver fir and beech, although the two conifers were not distinguished in the first inventories. The quantitative attributes available are basal area/ha, volume/ha and the diameter distribution [stem numbers/ha per diameter class].

Table 4.2: Summary of historical forest management practices in the French CSA (CSA 2).

Forest	Compartment	FM practice	Regeneration system	Harvest interval	Harvest [m3/ha/yr]	Year of main cuts
Engins	Engins-A	Uneven-aged FM type	Individual tree selection system	15 years	2.83	1929 - 1947 - 1952 - 1972 - 1991 - 2003
	Engins-A1				2.16	1931 - 1949 - 1974 - 1994
	Engins-B				3.9	1926 - 1956 - 1976 -1981- 1983-1992- 2002
	Engins-C					
	Engins-C1					
	Engins-D				4.49	1918 - 1936 - 1963 - 1984 - 1995 – 2005
	Engins-E				0.93	1918 - 1921 - 1923 - 1936 - 1985 - 1995 – 2005
	Engins-F					
	Engins-F1					
	Engins-G					
	Engins-H					
	Engins-I					
Autrans4	Autrans4-A				0.21	1914 - 1936 - 1948 - 1961 - 1972 - 1986 - 1999
	Autrans4-D				0.204	1919 - 1950 - 1962 - 1974 - 1987 – 2000
	Autrans4-K				0.437	1929 - 1941 - 1953 - 1968 - 1990 – 2004
	Autrans4-N				0.192	1931 - 1942 - 1955 - 1979 - 1991 – 2005
	Autrans4-U				0.518	1945 - 1959 - 1970 - 1984 - 1996 - 2008

Annual data on the volumes of conifers harvested (separating fresh wood from salvage logging but not separating among fir and spruce) is available. A state-space Bayesian model has been developed to interpolate standing volumes between inventories. Using this model annual time series of standing volumes, harvests and mortality (salvage volumes) were calculated. Details of

the timing of harvests, the standing volumes and the volumes harvested are available. In some stands also the number of harvested stems is known. In these cases it is possible to reconstruct the distribution of diameters of harvested trees.

4.4.3 CSA4 – Sneznik, Dinaric Mountains, Slovenia

The Slovenian CSA4 is represented by mixed uneven-aged forests, where silver fir (53%), European beech (26%) and Norway spruce (18%) are the main tree species.

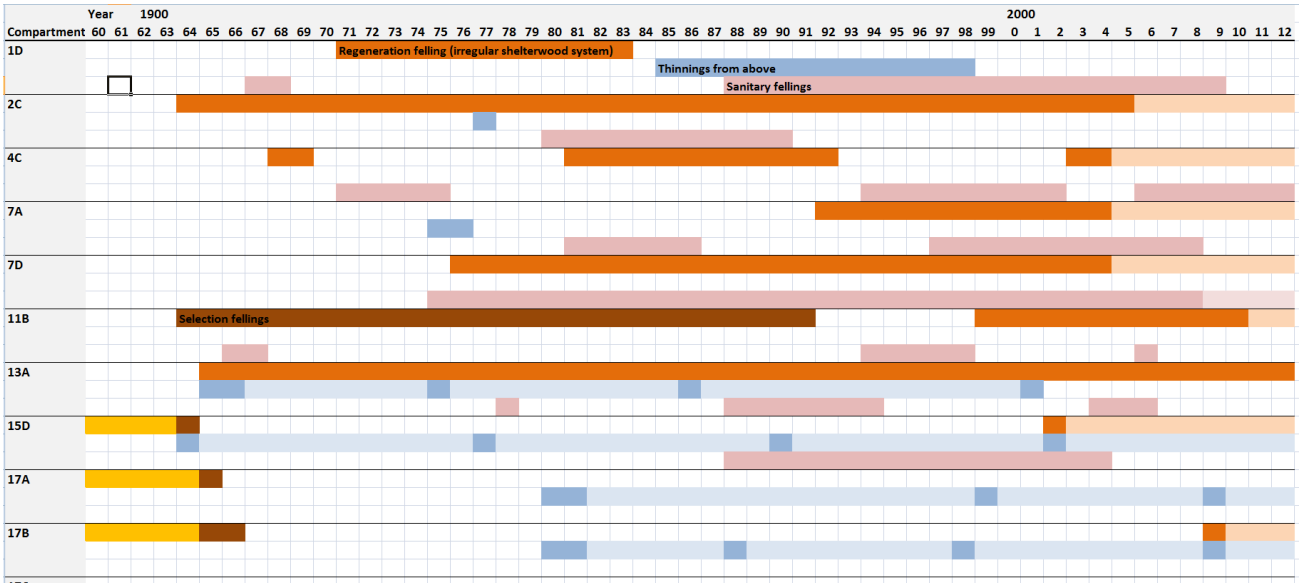
Uneven-aged and even-aged FM are the general FM systems used. In the uneven-aged stands, single tree selection was the main system practiced in the CSA until 1970s. Since then, group selection system and small-scale irregular shelterwood system has been applied. In the even-aged stands, the irregular shelterwood system has been used.

Slovenian CSA has detailed historic FM data for a part of the CSA (approx. 3000 ha). Data was gathered from inventories and management plans. It includes two types of inventories: (i) from 1953 to 1983, 4 inventories, 24 to 183 compartments (number of compartments varied in each inventory), between 9 and 59 ha of size; (ii) from 1993 to 2003, 2 inventories, in which the data were gathered on permanent circular sampling plots (almost 900 in each inventory). Silvicultural treatments are currently available only for the period 1963-2012.

From 1953 to 1983 data is available separately for the following species: *Picea abies*, *Abies alba*, *Fagus sylvatica*, *Acer pseudoplatanus*, *Ulmus glabra*. Data includes total volume/ha and number of trees per diameter classes. Since the 1963 inventory the silvicultural measures applied were registered for a part of the CSA (Table 4.3). Thirteen compartments from this area will be included in the procedure for model evaluation on historical data.

From 1993 to 2003 there are data on tree species composition and stand volume, but data on diameter distribution on a compartment level cannot be provided. However, diameter distributions for inventories 1993 and 2003 can be adopted from the RST definition. We can calculate it from the diameter distribution for each RST in compartment and from the area proportion of each RST.

Table 4.3: Silvicultural treatments in some compartments represented for the period 1960-2012 – preliminary results (brown – regeneration felling according to group system; light brown – period of regeneration felling, but it cannot be surely defined; dark brown – selection felling; yellow – probable selection fellings before the registered fellings; blue – thinning from above; light blue – period when thinning were not consistently applied or cannot be surely defined; violet – sanitary fellings; light violet – period of regeneration felling, which cannot be surely defined)



4.4.4 CSA5 – Vilhelmina, Scandinavian Mountains, Sweden

The Swedish CSA5 is characterized by an even-aged forest dominated by *Pinus sylvestris* and *Picea abies*. Timber production was the only focus of forest policies for decades, yet nature conservation was successively introduced into FM in the 1980's. In the Forest Act from 1993, other ES are stated to be as important as timber production. Since then, most fellings are done with nature conservation concern (cca. 3-7% of the volume at the stand level are set aside permanently), always in communication with the reindeer herders. All forest companies are certified according to FSC from 1995-2000. Now (and since 5-10 years) most private forest owners that make forest management plans for their estate set aside 5 per cent of the productive forest land for nature conservation.

Since 1850 until 1950s cuttings were done as selection cuttings, cutting first the largest trees that went to the saw mill. The cuttings were too strong and led to degraded forests, with low stocking and growth. Even-aged FM has been the dominant FM system since 1950s, when clear cuttings were introduced more gradually. Regeneration included burning and later mechanical soil preparation, and planting seedlings. Natural regeneration in pine is only used in a small area of the CSA. A precommercial thinning is done when trees are 3-6 m. Thinnings are done when stand density is ca. 25m^2/ha down to 17m^2/ha. The clearcut is done at the age of 70-100 years. Almost all thinnings and clear cutting are done with harvesters since the 1980s.

No treatment has been the most common practice in Vilhemina because in 120 years approximately one clear cutting, none or maybe one (or two) thinnings, most often none or one precommercial thinning have been applied (Figure 4.3). From 1985 (average of 1983-1987) to

2010 (average of 2008-2011, 2012 missing) 15.2% of the 191 plots found in productive forest land have been clearcutted indicating an average rotation period of 151 years; 3.7% of the plots were thinned; other cuttings were done in 14.7% of the plots and pre-commercial thinnings were done in 5.8% of the plots. Clearcuttings were done at different age of the forest in the different plots as there are many different land owners which take their own decisions on management. Thus, the different plots were clearcutted in some year between 1984 and 2011. Only in 10 plots two types of cuttings were applied. The period between these two types of cuttings is usually around 10 years.

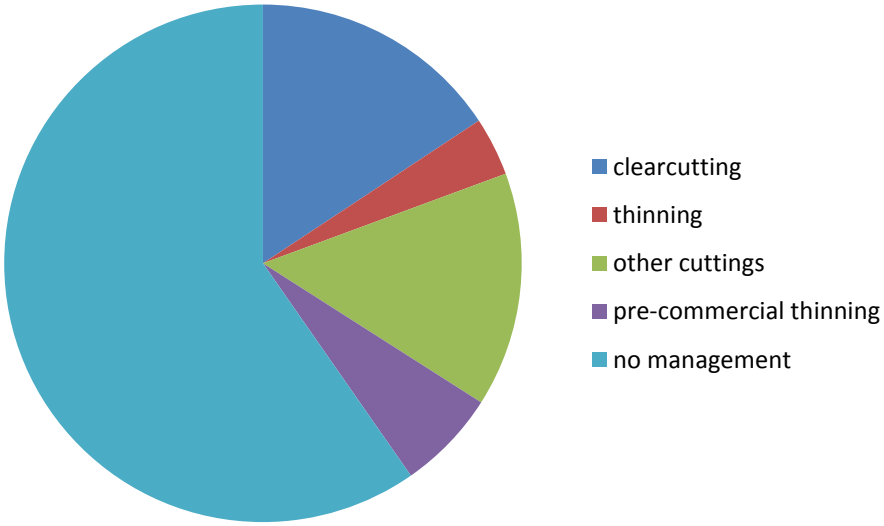


Figure 4.3: Pie chart summarizing the percentage representing each silvicultural practices applied in the 191 plots found in the productive forest land for the period 1983 to 2011.

National forest inventories (NFI) were performed since 1925, but historical FM data can only be used from 1983 to 2003, when permanent sampling plots were introduced (359 circular plots, 7 m radius). Available data are volume, tree species composition, diameter distribution and age class distribution. These data are available for "productive forest land" defined as having a production potential ≥1 m^3/ha·yr. Area and volume of management activities could be available. Data on total volume/ha and number of trees per diameter distribution is available for *Pinus sylvestris*, *Pinus contorta*, *Pice aabies* and *Betula pubescens*. The records about FM include information at plot level about clearcutting, soil preparation, planting, precommercial thinning.

4.4.5 CS6 – Kozie chrbty, Western Carpathians, Slovakia

The Slovakian CSA6 is represented by mixed even-aged forests of *Picea abies*, *Abies alba* and *Larix decidua*, with a rotation period between 100 and 160 years. Natural regeneration is combined with plantations to ensure stand regeneration. Decennial thinnings from below have

been historically applied since 1977 (records are available for 1977, 1987, 1996 and 2006) in variable areas (up to 3 ha) to obtain between 50 and 500 m^3 of timber. Sanitary fellings are frequently applied as a consequence of regular windstorms and insect damages.

Slovakian CSA has historic FM data from 1977 to 2012; 5 inventories in 14 compartments of variable size (3 to 17 ha) are available. Number of trees per diameter distribution and total volume (not in all compartments) are available for *Picea abies*, *Abies alba* and *Larix decidua*.

Forest management plans (every 10 years) are processed for the highest forest management unit that currently is the so-called forest tenure unit (forests of one or several owners in common tenure). There is also an annual Forest Management Record that contains three types of information at compartment level: harvest report, forestation report and planting report. Records about the FM applied include information of thinnings, regeneration fellings and sanitary fellings.

The summary of the planned interventions (as recorded in the Management Plans) in the 14 compartments of the Slovakian CSA between 1977 and 2012 (inventories in 1977, 1987, 1996 and 2006, data from 2012 is not available yet) is shown in Table 4.4. For some areas, there is also information about the real interventions done. All silvicultural interventions affected beech and spruce.

Table 4.4: Planned silvicultural treatments in the Slovakian CSA for each compartment represented on a time scale. If available, the information on the real interventions is also shown.

	Intervention planned in Forest Management Plans					Real interventions
Management unit	1977	1987	1996	2006	2012	
1003	planting in bigger gaps	Decenial thinnig 250m³	Decenial thinnig 60m3 on 3 ha	Decennial felling 50m³ on 0.14 ha. Planting spruce on 0.14 ha.		1994 - 14 m3/ha of spruce thinned; 1998 - 3.3 m3/ha of spruce thinned
1060	thinnig: 124 m3 on sub-area 1.91 ha	Thinnig 200 m³ on sub-area 6 ha	Planned thinnig 150 m³	Planned thinnig 75 m³		1985 - 11.2 m3/ha of spruce thinned; 1994 - 17.2 m3/ha of spruce thinned; 1998 - 12.8 m3/ha of spruce thinned
1080	Thinnig: 19 m3 on sub-area 2.66ha	Cleannig and then thinnig: 80 m³ on sub-area 3.32ha.	Thinnig: 130 m³ on sub-area 3.00ha.	Thinnig: 83 m³ on sub-area 3.00ha + process 2 m³ of calamity		1981 - 2 m3/ha of spruce thinned; 1985 - 3.4 m3/ha of spruce thinned; 1991 - 11 m3/ha of spruce thinned; 1994 - 12.4 m3/ha of spruce thinned; 1998 - 39.2 m3/ha of spruce thinned
1090						1985 - 2.2 m3/ha of spruce thinned; 1994 - 9.3 m3/ha of spruce thinned; 1998 - 15 m3/ha of spruce thinned
1283	?	?	?	Felling per next decenium: 170 m3 on 0.68 ha		no record
1343	Decennial thinnig: 50m3/ha (totally 560 m3 on sub-area 10 ha)	Decennial thinnig: 37m3/ha (totally 300 m3 on sub-area 6 ha)	Decennial thinning: 17m3/ha (totally 195 m3 on 11.36 ha)	Decennial regeneration felling: 2000 m3 on 4.01 ha. Reforestation 4.01 ha		
1526	Thinnig: 800 m3 on whole compartment area	Thinnig: 350 m3 on whole compartment area	Thinnig: 350 m3 on whole compartment	Thinnig: 50 m3 on area 3.5 ha. Reforestation with beech at 0.2 ha		
1543	Cross-cut at 6.16 ha; Reforestation in 0.20 ha	Decennial thinning 23 m3 on entire compartment area; Cross-cut at 8.15 ha; Reforestation 0.20 ha.	Decennial thinning 100 m3 on 6 ha; Cross-cut at 1.2 ha.	Decennial thinnig: 230 m3 on sub-area 6.11 ha		
1612	No intervention	No intervention	Thinnig: 30m3 on 3 ha	Thinnig: 10m3 (damaged trees)		
1635	Two thinnings: 260 m3 per whole stand area	Two thinnings: 600 m3 per whole stand area	Two thinnings: 290 m3 per whole stand area	No intervention		
140_X	Thinnig: 500 m3 on compartment's sub-area	Thinnig: 500 m3 on compartment's sub-area		Thinnig: 200 m3 on whole compartment area + process calamity 100 m3		
310	Thinnig: 50 m3 on sub-area, gaps reforestation	No intervention		Regeneration in 0.15 ha, Small area felling: 20 m3, Processing calamity 20 m3		
1404	Regeneration at 6.10 ha, Small area felling: 2800 m3 then reforestation	Regeneration at 2.86 ha, Small area felling: 1073 m3	Forestation of gaps, in highly developed thicket - cross-cut.	Cross-cut at 17.03 ha		
1496	No intervention	Decennial thinnig 18 m3 at area 5 ha	Sanitary felling: 200 m3 at 16,24 ha	Regeneration - 6.56 ha, Small area shelterwood felling: 2650 m3.		

Table 4.5: Summary of the available information on historical data for each CSA.

Case study	No. compartments	Area compartment [ha]	Time period	No. inventories	data source	Species	N_dbh distribution	Volume	Record about FM
CSA1: Valsaín, Iberian Mountains (SPAIN)	54 (1941 to 1965) 288 (1988-1998)	130 26.51	1941-1998	6	Inventories & Management Plans	*Pinus sylvestris* *Quercus pyrenaica (since 1984)*	Yes Only total por Qp	yes	Forest management system, Thinning, regen. fellings (period and compartment)
CSA2: Vercors, Western Alps (FRANCE)	Engins: 11 Autrans-4: 25	6.8-26.3 6.9-20.5	1909-1993 1912-1997	4 3	Inventories & Management Plans	*Picea abies* *Abies alba* *Fagus sylvatica*	yes	total	Forest management system
CSA4: Sneznik, Dinaric mountains (SLOVENIA)	24-183 (vary with inventory) 899 circular plots	9-59 0.05	1953-1983 1993-2003	4 2	Inventories & Management Plans Inventories	*Picea abies* *Abies alba* *Fagus sylvatica* *Acer pseudoplatanus* *Ulmus glabra* *other conifers* *other broadleaves* *all species*	Yes Since 1963: on a larger spatial scale	Total yes	From 1963: registered silvicultural measures for a part of the CSA
CSA5: Vilhelmina Scandinavian mountains (SWEDEN)	359 circular plots 45 clusters (each plot in different compartments)	7 m radius	1983-2008	5	NFI	*Picea abies* *Pinus sylvestris* *Picea contorta* *Betula pubescens*	yes	total	At plot level. Clearcutting, Soil preparation, Planting, Precommerci al thinning,

									Thinning, Clearcutting
CSA6: Kozik chrbty Western Carpathians (SLOVAKIA)	14	3-17	1977-2012	5	Inventories & Management Plans	*Picea abies* *Abies alba* *Larix decidua*	Yes (usually total N)	Total, but not in all compartments	Thinning, regen. fellings, sanitary fellings

4.5 Brief outlook on analysis procedures

Data from the different forest inventories include two types of information: (a) quantitative information: the number of trees per species and diameter classes at the compartment level, thus enabling the identification of forest evolution over time, and (b) qualitative information obtained from the management plans: the silvicultural treatment carried out in each compartment during each period.

For each compartment in a CSA the difference between the diameter distribution at the end of a period and that obtained by adding an estimate of the diameter increment to the initial diameter distribution at the beginning of the period will be analyzed. For this purpose, a diameter increment model for each species will be needed.

The number of trees in diameter class *j* at the end of the period, assuming there is neither natural tree mortality nor fellings, must equal the number of trees at the beginning, plus the growth from the previous diameter class, minus the number of trees which enter the next diameter class. When data from inventories is used, the true distribution within each diameter class is unknown. Thus, the increment in the number of trees in the diameter class *j* (iN_j) is calculated by interpolation using Lachaussée's equation:

$$iNj = \frac{1}{2}\left[\frac{N_j - N_{j-1}}{tp_{j-1,j}}\right]\left[\frac{N_{j+1} - N}{tp_{j,j+1}}\right]$$

where $N_j$is the number of trees in the diameter class *j*, $N_{j-1}$and N_{j+1} are the number of trees in the previous and subsequent diameter classes respectively and $tp_{j-1,j}$ is the time required by a tree to grow from diameter class *j-1* to diameter class *j*, and $tp_{j+1,j}$ is the same but with diameter class *j* and the following one. $tp_{j+1,j}$is obtained by dividing the difference between the mid diameters of diameter classes *j* and *j+1* by the estimated annual diameter growth.

The evolution over time of the number of trees per diameter class will allow to analyse the effect of the management applied.

Through the analysis of the qualitative information and the comparisons between forest inventories we can first identify for each compartment the silvicultural treatments applied in each compartment and then classify the compartments and the forest management which has been applied on them according to this information.

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6 Annexes

Annex 1: Forest management practices in Case study areas: the operational description of a questionnaire

ARANGE Deliverable D1.3 – Annex 1

Forest management practices in Case study areas: the operational description of a questionnaire

16. 01. 2013

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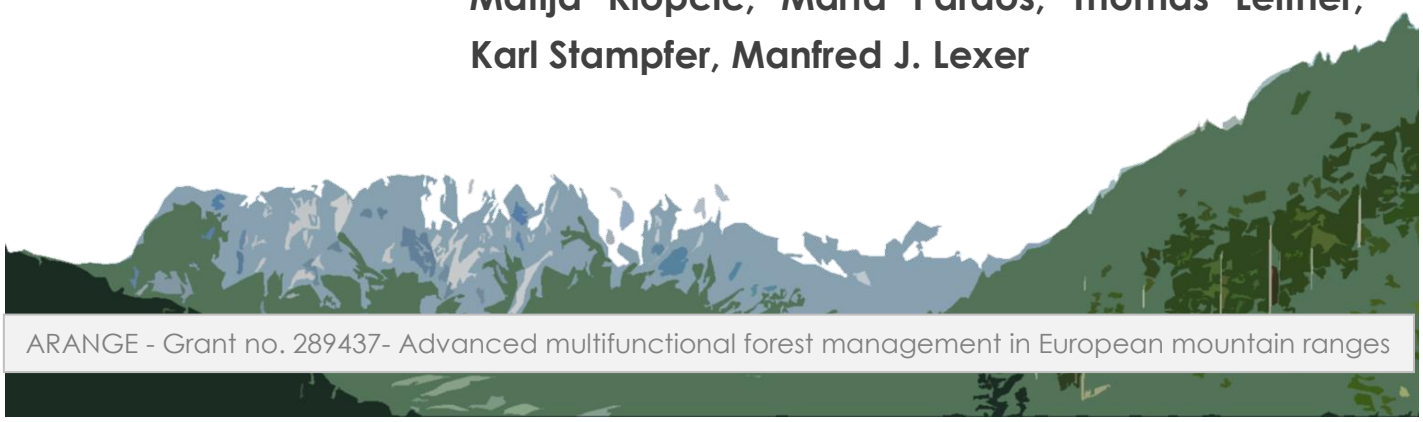

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Keywords:

Forest management; business-as-usual forest management; representative stands; harvesting technologies

Abstract:

The purpose of this document is to get an overview on current management concepts (business-as-usual FM) in Case study areas and on (currently) used harvesting technologies used to implement specific silvicultural treatments. The document represents an operational description of the questionnaire and gives an overview on the conceptual construction of the questionnaire and detailed descriptions of data, parameters and other information to be collected. The document is the basis for a digital web-designed data-collector, which will be sent to the case study responsible persons to be completed.

TABLE OF CONTENTS

1 Introduction

In the frame of Task 1.3 Management practices & harvesting technology of Work Package 1, a questionnaire on 1) current management practices, and 2) harvesting technologies and systems in European mountain forests needs to be developed to provide sufficient information to finalize the deliverable D1.3 "Current and historical forest management practices". D1.3 is described as an operational description of current and historical management practices and management plans at larger scales including employed harvesting technologies and approaches (DOW, 2012: page 7).

Therefore, the main scopes of this questionnaire and the related D1.3 are:

a) to get an overview on current management concepts (business-as-usual FM) in Case study areas;
b) to get an overview on (currently) used harvesting technologies in Case study areas used to implement specific silvicultural treatments.

This document represents an operational description of the questionnaire. First, it gives an overview on the conceptual construction of the questionnaire (Chapter 2). Subsequent chapters comprise descriptions of different parts of the questionnaire with catalogues of parameters and other information to be collected. On the basis of the final version of this operational description, a digital web-designed data-collector will be developed and sent to the case study responsible persons to be completed.

In the appendices at the end of this document some examples on how to fill-in the questionnaire are presented.

2 Concept of the questionnaire

The concept of characterization of Business-As-Usual (BAU) FM practices in European mountain forests is based on the identification of Representative Stand Types (RST) in each Case study (CS). Please see the document on the definition of representative stands and landscapes from WP1, T1.1.

2.1 "Representative Stand Type" definition and identification

Forests and forest conditions are in each Case study area (CSA) represented by Representative Stand Types (hereafter RST). The definition of a RST was developed by the Case Study Task Force (CSTF) on its meeting on November, 15th, 2012. The definition and identification of RSTs in CSA should be done by Case Study Responsible Person (CSR). See also the related documents within WP1, T1.1.

In general, a RST is defined via i) tree species mixture and ii) site type (including current climate). Tree species mixture is defined with the proportion of each admixed tree species. Site type includes the baseline climate record and soil characteristics (bedrock type, soil type, soil depth, stoniness, pH of the top mineral soil horizon, nutrient supply, and water storage capacity). Within each RST different stand development stages can be distinguished. This leads to a formal ID of a RST defined in WP1, T1.1. However, since business-as-usual FM practice (and therefore also this questionnaire) refers to a RST in general, the identification of development phase within RST does not have any purpose and only the first part (two digits before delimiting comma) of the RST ID will be used here.

For the use of RSTs in this questionnaire, the RST is additionally linked with iii) a FM type. FM type identifies the general FM concept, i.e. even-aged, two-aged, uneven-aged, coppice, etc.

In this questionnaire each RST is identified by its ID RST×FM, which will consist of 5 (may also be 4 or 6) digits delimited by two underlines (in the questionnaire the ID is named ID RST×FM in order to distinguish between RSTs in WP2 and RSTs in this questionnaire): 2 digits for Representative stand identification (e.g. RST ID; see related documents); underline; 2 digits for FM type identification (see Table 1 below); underline; a running number which links a RST-case to the specific attributes describing this management concept.

Two examples:

1. if in a RST #12 even-aged FM type is practiced (the code for FM type = 10) and only one BAU FM practice is used, then the code would be 12_10_1;
2. if in a RST #13 uneven-aged FM type is practiced (the code for FM type = 30) and two BAU FM practices are used, then the codes would be 13_30_1 and 13_30_2.

Table 1: FM types with their identification codes

FM type	Title of FM type
10	Even-aged FM
20	Two-aged FM
30	Uneven-aged FM
40	Coppice FM
50	Short rotation FM
60	Agro-forestry
70	Conversion of FM type
80	No management

2.2 "Business-as-usual FM practice" definition

The Business-As-Usual (BAU) FM practice is defined as the currently practiced silvicultural regime for a RST. In a particular RST there could be more than one BAU FM in practice.

2.3 Conceptual construction of the questionnaire

Figure 1 illustrates conceptually how the questionnaire is constructed. The main table is the Identification Table, which gives each CSA and each RST its ID. ID_RST×FM is a connection to Forest management system table (Figure 1).

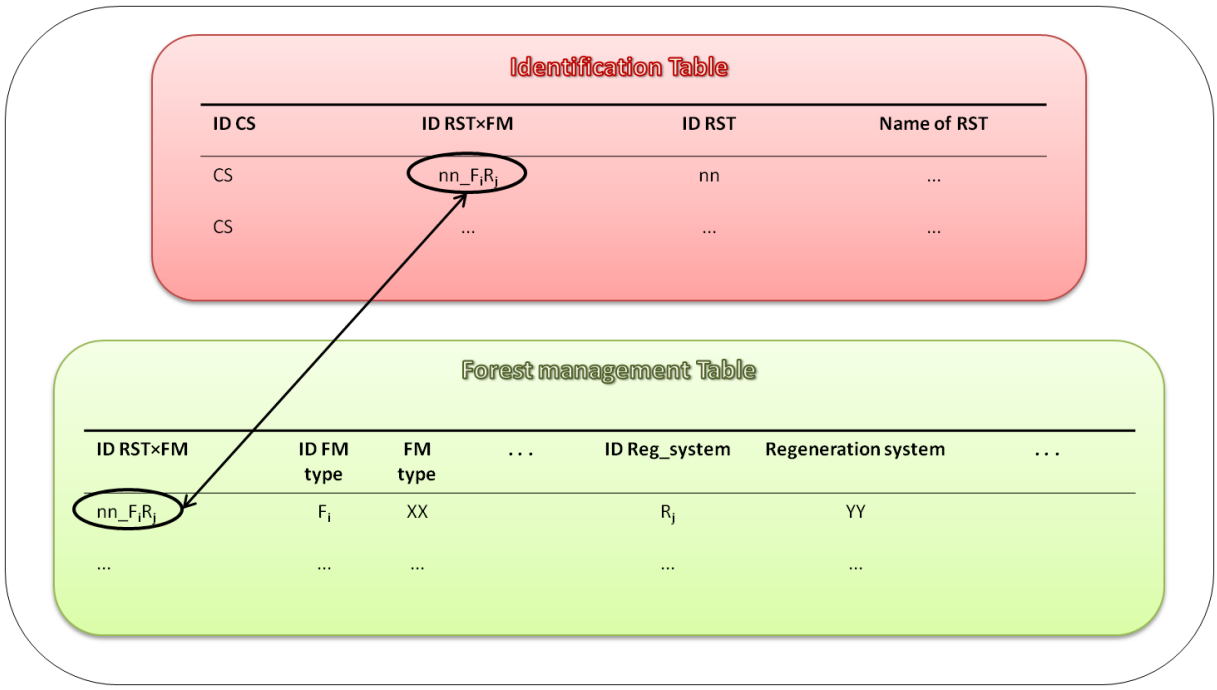

Figure 1: The conceptual construction of the questionnaire on forest management practices in European mountain forests; the link between Identification table and Description tables is exposed

The link between the Identification Table and Forest management Table will be ID RST×FM. FM table comprises description tables at more than one hierarchical level. There are minor differences in data to be full-filled for different FM types, therefore this hierarchical structure of the questionnaire needs to be established. Within the Forest management table also some basic information on harvesting technology are collected.

All gathered information will be saved in a database for each FM type separately and also in a joint database.

3 Identification Table

The »Identification Table« contains data to identify each RST within the CSA.

Table Identification	
ID Case study	Unique identifier for the Case study (global key defined by ARANGE)
ID RST×FM	Unique numerical ID composed of 1-2 digits for RST identification (i.e. serial number), 2 digits for FM type identification (according to the list), and 1-2 digits for a running number of BAU FM practice; digits are delimited by underline
ID RST	Unique numerical ID (i.e. serial number) composed of 1-2 digits for each RST (IMPORTANT: must be the same as in WP2)
RST name	Name of a RST

ID Case study

Case study identifiers were already defined within the Annex I – Description of work and are as follows:

Case study identification		
CS1	Montes Valsain	Spain
CS2	Vercors	France
CS3	Montafon	Austria
CS4	Dinaric Mountains (Sneznik)	Slovenia
CS5	Vilhelmina	Sweden
CS6	Kozie chrbty	Slovakia
CS7	Shiroka laka	Bulgaria

ID RST×FM

ID RST×FM is a unique numerical ID composed of 1-2 digits for RST identification (i.e. serial number of a RST), 2 digits for FM type identification (according to the list in Chapter 2.1 on page 4), and 1-2 digits for a running number of BAU FM practice. Digits are delimited by an underline.
An example:

ID RST×FM = 12_10_1 <= code 12 addresses the RST identification (meaning RST type #12), 10 identifies the FM type (meaning even-aged FM type), and 1 is a running number of BAU practice in RST #12.

THIS CODE WILL BE GENERATED AVTOMATICALLY BY THE SOFTWARE!

ID RST

In general RST is defined with consideration of (i) species mixture, (ii) age/stand development stage, (iii) site type (altitude, water storage capacity, nutrient supply, current climate).
RST codes are the same as defined for WP1, T1.1, just without a consideration of development phase.

RST name

Write a name/title of a Representative stand type (e.g. uneven-aged pure spruce stand, or even-aged mixed beech-fir-spruce stand, or coppice oak stand, etc.).

4 Forest Management Table

The Forest management table contains data on forest management practices in each RST. Forest management Table is directly linked to tables which describe FM types (see Chapters 4.1-4.8).

Table Forest management	
ID Case study	Unique identifier for the Case study (global key defined by ARANGE)
ID RST	Unique numerical ID (i.e. serial number) composed of 1-2 digits for each RST (IMPORTANT: must be the same as in WP2)
RST name	Name of a representative stand
FM type	Reference to the "FM type" catalogue; according to the chosen FM type a list of questions on silvicultural measures related to this FM type will be addressed (chapters 4.3.1-4.3.8)

FM type

Identify forest management type in Representative stand. Detailed descriptions of FM types may be found in Mathews (1999) and Nyland (2002), but also in other scientific literature on silviculture.

Catalogue:

FM type	Title of FM type
10	Even-aged FM
20	Two-aged FM
30	Uneven-aged FM
40	Coppice FM
50	Short rotation FM
60	Agro-forestry
70	Transformation FM
80	No management

Even-aged FM type

Regeneration in even-aged FM type is usually accomplished over a relatively short time period, the canopy is removed in one or a few fellings. Such concept produces even-aged stands, which mean that canopy trees are about the same height and diameters are distributed in a "bell-shaped" distribution. Even-aged stands are usually >1 ha large. A rotation period of even-aged forest should not be shorter than 50 years. If shorter, Short rotation FM type should be identified.

Two-aged FM type

Two-aged FM creates two-storied high forests composed of an upper and a lower storey of trees. Usually, two or more tree species are involved, the upperstorey usually comprising a

light-demanding tree-species under which a shade-tolerant species can grow in the understorey.

Uneven-aged FM type

Uneven-aged FM type is characterized by silvicultural practices that create stands in which trees of all ages and sizes are present at a relatively small area. Trees in a stand are either intimately mixed or in small groups. The canopy is continuously present throughout the stand; regeneration, but recruitment as well, need to be continuous.

Coppice FM type

The coppice FM type involves reproduction of trees by suckers and harvesting of (usually) poles in a certain rotation period. The rotation period is determined by the tree species and the size of material required. The method of annual coupes by area is most usually practiced, and thinnings may be practiced as well. Coppice with standards (i.e. Mittelwald) is included in this FM type as well.

Short rotation FM type

Short rotation FM type consists of planting young trees of particular tree species on a site, which are after reaching a target dbh usually all harvested. This FM type includes tree plantation FM for bioenergy or timber production or for any other purpose with a rotation period of 50 years or shorter.

Agro-forestry

Agro-forestry should be identified if growing forest stand or trees is combined with agricultural crops and/or animals. Different systems of agro-forestry may be distinguished: agro-silvicultural, silvo-pastoral, and agro-silvo-pastural systems.

Transformation FM

Transformation/conversion from FM type X to FM type Y should be identified if RST is in the phase of active transition from one FM type to another one. As X the FM type from which RST is converted from should be identified, while Y refers to FM type to which RST is supposed to be converted. For example, pure even-aged stands may be converted to uneven-aged stands, or coppice stands to even-aged high forests, etc.

No management

Applicable if no FM has been applied in Representative stand. Several reasons for that could be identified: environmental protection (conservation) as forest reserves, forest areas of pronounced protective role (slopes, erosion, etc.), inaccessibility, etc.

4.1 Even-aged FM

Table Even-aged FM	
FM type	Unique identifier (ID FM type = 10)
FM description	General description of FM type/concept with some additional information
Rotation period *	(Average) rotation period in years
Target diameter	Target diameter in cm for the main species
Regeneration period *	Duration of regeneration period in years
Regeneration type *	Identification of a general regeneration concept; catalogue
Regeneration operations *	Table of regeneration operations, their characteristics and time reference
Regeneration description *	Short description of regeneration process
Weeding operations *	Table of weeding operations, their characteristics and time reference
Weeding description	Short description of weeding process with time reference table
Tending operations *	Table of tending operations, their characteristics and time reference
Tending description	Short description of tending process with time reference table
Thinning type *	Identification of a general thinning concept; catalogue
Thinning operations *	Table of thinning operations, their characteristics and time reference
Thinning description	Short description of thinning operations
Regeneration system*	Identification of a general regeneration concept; catalogue
Regeneration felling operations *	Table of regeneration felling operations, their characteristics and time reference
Regeneration felling description	Short description of regeneration felling operations

* indicates which information are mandatory to fill in

4.1.1 General information

FM concept description

Short general textual description of FM concept in RST (up to 750 characters). A qualitative description of FM objectives could be addressed here as well.

Rotation period

A time period between regeneration establishment and final cut. A rotation period in years should be given.

Target diameter

Target diameter is a diameter of trees of a particular species at which a tree should be considered for cutting. Tree species should be selected from the catalogue (see chapter 4.1.2) and target diameter [in cm] should be given.

Regeneration period

Time period in which mature and over mature stands are regenerated. It is the time between the initial felling (i.e. seeding felling) and the successful re-establishment of a new stand (i.e. regeneration).

4.1.2 Regeneration

Regeneration type

Identification of the prevailing regeneration type.

Catalogue:

Regeneration type
Natural
Artificial – planting
Artificial – seeding
Artificial – combination planting-seeding
Mixed natural-planting
Mixed natural-seeding
Mixed natural planting and seeding

Regeneration operations

Regeneration characteristics identification and time reference of particular silvicultural measures.

Ser. no.	Time reference			Species	Regene-ration origin	% of N/area	Seedling density	Seed density*	Spatial arrangement	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}				N/ha	kg/ha		h/ha	€/ha
Num ber	number optional	catalogue optional	number optional	catalogue	catalogue	number	number	number	random/ systematic/ in patches	num ber	number
etc.											

* fill in only when seeding was identified as regeneration type

** fill in only when planting or seeding was identified as regeneration type

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height in meters (= mean height of 100 largest trees per hectare)

Species:

Identify up to 5 tree species which naturally regenerate or were planted/seeded. Species should be selected from the catalogue below.

Catalogue of tree species:

Tree species	
Scientific name	English name
Abies alba	silver fir
Abies concolor	white fir
Abies grandis	grand fir
Abies nordmanniana	Caucasian fir
Abies procera	noble fir
Acer campestre	field maple, hedge maple
Acer negundo	box elder
Acer platanoides	Norway maple
Acer pseudoplatanus	sycamore maple
Aesculus hippocastanum	horse chestnut
Ailanthus altissima	tree of haven
Alnus glutionsa	black alder, common alder
Alnus incana	speckled alder
Alnus viridis	American green alder
Betula pendula	silver birch
Betula verrucosa	common birch, European birch
Carpinus betulus	European hornbeam
Castanea sativa	sweet chestnut
Eucalyptus globulus	eucalyptus
Fagus sylvatica	European beech
Frangula alnus	alder buckthorn
Fraxinus americana	white ash
Fraxinus angustifolia	narrow-leafed ash
Fraxinus excelsior	European ash, common ash
Ilex aquifolium	holly
Juniperus communis	common juniper
Juglans nigra	black walnut
Juglans regia	common walnut

Larix decidua	European larch
Malus sylvestris	crab apple
Ostrya carpinifolia	Hop hornbeam
Picea abies	Norway spruce
Picea engelmanni	engleman spruce
Picea glauca	white spruce
Picea mariana	black spruce
Picea omorika	Serbian spruce
Picea pungens	blue spruce
Picea sitchensis	sitka spruce
Pinus banksiana	Jack pine
Pinus cembra	Swiss stone pine
Pinus contorta	lodgepole pine
Pinus mugo	mountain pine
Pinus nigra	black pine
Pinus pinaster	maritime pine
Pinus strobus	eastern white pine
Pinus sylvestris	Scots pine
Platanus acerifolia	London plane
Populus alba	white poplar
Populus nigra	black poplar
Populous tremula	aspen
Prunus avium	wild cherry
Prunus serotina	black cherry
Pseudotsuga menziesii	Douglas fir
Pyrus communis	wild pear
Quercus cerris	turkey oak
Quercus ilex	holm oak
Quercus palustris	pin oak
Quercus petraea	sessile oak
Quercus pyrenaica	Pyrenean oak
Quercus pubescenc	downy oak
Quercus robur	pedunculate oak
Quercus rubra	red oak
Quercus suber	cork oak
Robinia pseudoacacia	robinia, locust
Salix caprea	goat willow
Salix sp.	other willows
Sorbus aria	white beam
Sorbus aucuparia	rowan, European mountain ash
Sorbus torminalis	wild service tree
Taxus baccata	common yew
Thuja plicata	western redcedar
Tilia cordata	small-leaved linden
Tilia platyphyllos	large-leaved linden
Tilia tomentosa	silver lime
Ulmus carpinifolia	field elm
Ulmus laevis	European white elm
Ulmus glabra	wych elm
other conifers	other conifers
other broadleaves	other broadleaves
all species in RST	all species in RST

Regeneration origin:
Identify for each species what is the origin of regeneration;
Catalogue:

Regeneration origin
Natural
Planted
Seeded
Natural and planted
Natural and seeded
Planted and seeded
Natural, planted and seeded

% of N/area:
Proportion of a particular tree species in number/area of seedlings/regeneration.

Seedling density:
Give a number of seedlings per hectare.

Seed density:
Give an amount of seed used for seeding (in kg/ha).

Spatial arrangement:
According to the catalogue below, identify the spatial arrangement of seedlings of a particular tree species.
Catalogue:

Spatial arrangement	**Description**
Random	random distribution of seedlings in a stand
Systematic	systematic distribution; usually when seedlings are planted
In patches	seedlings are clustered in patches or groups

IMPORTANT: If "spatial arrangement" of regeneration "in patches" was chosen, some data on number of patches per hectare and their size must be given in Regeneration description below.

Labour and costs:
Identify time spent (in hours per hectare) and total costs for each regeneration operation.

Regeneration description
Short textual description of regeneration operations in RST (up to 400 characters). As already indicated some data on number of patches per hectare and their size must be given here, if "spatial arrangement" of regeneration "in patches" was chosen.

4.1.3 Weeding

Weeding operations

Identify weeding operations' characteristics and time reference.

Ser. no.	Time reference			Weeding technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}		h/ha	€/ha
Num ber	number optional	catalogue optional	number optional	catalogue	number	number
etc.						

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)

Weeding technology:

Identify the prevailing technology for weeding operations.

Catalogue:

Weeding technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:

Identify time spent (in hours per hectare) and total costs for weeding operations.

Weeding description

Short textual description of weeding operations in RST (up to 400 characters).

4.1.4 Tending

Tending operations

Identify tending operations' characteristics and time reference.

Ser. no.	Time reference					Removals	Tending technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}	DBH_{dom}	DBH_{mean}	% of seedling and saplings/ha		h/ha	€/ha
Number	number optional	catalogue optional	number optional	number optional	number optional	number	catalogue	number	number
etc.									

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Removals:
Identify the share of removed seedlings and saplings

Tending technology:
Identify the prevailing technology for tending operations.
Catalogue:

Tending technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:
Identify time spent (in hours per hectare) and total costs for tending operations.

<u>Tending description</u>
Short textual description of tending operations in RST (up to 400 characters).

4.1.5 Thinning

Thinning type

Identification of general thinning concept, which describes how trees to be removed from a stand are chosen in order to improve a growth rate (or health) of the remaining trees (see Nyland, 2002).

Catalogue:

Thinning type
From below
From above
Combination from above and from below
No thinning
Other

Thinning from below (=low thinning)

It is a thinning method that removes trees from lower canopy positions (overtopped trees, intermediate trees, sometimes codominant trees) and retains most vigorous trees with largest, well-developed crowns.

Thinning from above (=crown thinning)

It is a thinning method that removes trees from middle and upper layer of a canopy (codominant and dominant trees) in order to favour desirable trees, which are usually most vigorous trees with well-developed crowns and of good timber quality.

Thinning operations:

Identify thinning operations' characteristics and time reference.

Ser. No.	Time reference					Tree removals							
	Stand age	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years		m	cm	Cm		m^3	%					
Number	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	number	number	Number	Number	Number	Number	Number
...													

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Number	**Continued from table above...**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
...											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in thinning process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe

Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:

average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}].

Thinning description
Textual description of thinning type and measures in RST (up to 400 characters). If thinning type "other" was chosen, then the description is mandatory.

4.1.6 Regeneration felling

Regeneration system
Identification of the prevailing regeneration system (i.e. a cutting procedure by which new stands are created) in RST.
Catalogue:

IDReg_system	Regeneration system
1	Clear cutting
2	Uniform shelterwood system
3	Group system (=Grupenschirmschlag)
4	Shelterwood strip system (=Saumschirmschlag)
5	Seed tree system and High forest with reserves system
6	Single-tree selection system
7	Group selection system
8	Coppice system
9	Other

Clear cutting
Successive areas – coupes are clear felled, some pre-existing poles or groups of sapling may be left if they are large enough to form self-contained crops. Afterwards, coupes are (usually artificially) regenerated.

Uniform shelterwood system
It is a system of successive regeneration fellings on a large area and usually implies a uniform opening of the canopy. When the stand approaches the age at which it will be harvested and regenerated, the harvest is made in several steps. First step is seeding felling, which removes a certain portion of trees evenly across a stand to open stand canopy and provide sufficient light to ensure germination and survival of seedlings. Seeding felling is followed by one or several secondary fellings to admit more light for seedlings' growth. The last is the final felling of "old" stand, when the regeneration is already well established.

Group system (=Grupenschirmschlag)
It is a system of successive regeneration fellings in gaps. First, natural gaps with groups of advance regeneration in a stand are to be found and usually a gap around each group is widened. If there are no natural gaps and groups of advance regeneration, "artificial" gaps could be made over the regeneration area and it should be waited for regeneration to occur. Afterwards, a seeding felling in a form of a ring is made around the gap. Usually seeding felling is followed by several secondary fellings, while seeding feeling continues outwards into an unopened old stand in ever-widening circles. The final felling removes the last remaining seed bearers separating the various groups of regeneration.
This regeneration system includes also *Irregular shelterwood and other similar systems*.

Shelterwood strip system (=Saumschirmschlag)
Shelterwood strip system is a system of successive regeneration fellings which are made in strips of different widths. Regeneration begins with a seeding felling carried out along one edge in a form of a strip. When regeneration on a strip is sufficiently advanced, a secondary felling is made over it and a seeding felling is carried out on a strip next to the first one. When regeneration on the second strip is sufficiently advanced, a secondary felling is made there, another secondary or final felling is made on the first strip and a seeding felling is made on an adjacent strip to the second one. The process is continuously repeated until the intended forest area is regenerated.

Seed tree system and High forest with reserves system
Both are systems in which selected trees or tree groups are not harvested, but are left standing to provide a seed source for natural regeneration and/or to produce large-sized high quality timber. The majority of old stand is usually clear felled.

Single tree selection system
In single tree selection system scattered individual trees of multiple age classes are selected to be harvested over the whole area. This regeneration system produces small canopy openings, which are especially conducive to the establishment and growth of shade-tolerant tree species.

Group selection system (=patch cut)
In group selection system small groups of trees are selected to be harvested over the whole area. This regeneration system produces canopy openings of sizes up to 0.1 ha (i.e. circular gaps approximately one tree height wide), in more extreme versions up to 1 ha (i.e. circular gaps approximately 2-3 tree heights wide).

Coppice system
At this point, a simple coppice system is understood under this term. It is a silvicultural system in which a (fixed) area of old crop (i.e. an annual coupe) is annually clear felled. The entire forest area of coppice is divided into annual coupes in numbers equal to the number of years in rotation period. A result of simple coppice system is even-aged coppice stands. If other coppice systems are used in Representative stands, it should be mentioned in the description of the regeneration felling.

Regeneration felling operations:

Identify regeneration felling operations' characteristics and time reference.

Ser. No.	Time reference					Tree removals							
	Stand age	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years		m	cm	Cm		m^3	%					
Num-ber	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	number	number	Num-ber	Num-ber	Num-ber	Num-ber	Num-ber
...													

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Num-ber	**Continued from table above...**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
...											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in regeneration felling process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe
Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:
average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}]. PSH_{15} means productive system hours spent to do a specific job, including breaks up to 15 minutes.

Regeneration felling description
Textual description of regeneration felling in RST (up to 400 characters). If regeneration felling type "other" was chosen, then the description is mandatory.

4.2 Two-aged FM (also Two-storeyed FM)

Table Two-aged FM	
IDFM type	Unique identifier (ID FM type = 20)
FM description	General description of FM type/concept with some additional information
Rotation period *	(Average) rotation period in years
Target diameter	Target diameter in cm for the main species
Regeneration period *	Duration of regeneration period in years
Regeneration type *	Identification of a general regeneration type in the upper and lower storey; catalogue
Regeneration operations *	Table of regeneration operations, their characteristics and time reference
Regeneration description	Short description of regeneration process
Weeding operations *	Table of weeding operations, their characteristics and time reference
Weeding description	Short description of weeding process with time reference table
Tending operations *	Table of tending operations, their characteristics and time reference
Tending description	Short description of tending process with time reference table
Thinning type *	Identification of a general thinning concept; catalogue
Thinning operations *	Table of thinning operations, their characteristics and time reference
Thinning description	Short description of thinning operations
Regeneration system*	Identification of a general regeneration concept; catalogue
Regeneration felling operations *	Table of regeneration felling operations, their characteristics and time reference
Regeneration felling description	Short description of regeneration felling operations

* indicates which information are mandatory to fill in

4.2.1 General information

FM concept description (not mandatory)

Short general textual description of FM concept in RST (up to 750 characters). A qualitative description of FM objectives could be addressed here as well.

Rotation period

A time period between regeneration establishment and final cut. A rotation period in years should be given.

Target diameter (not mandatory)

Target diameter is a diameter of trees of a particular species at which a tree should be considered for cutting. Tree species should be selected from the catalogue (see chapter 4.1.2) and target diameter [in cm] should be given.

Regeneration period

Time period in which mature and over mature stands are regenerated. It is the time between the initial felling (i.e. seeding felling) and the successful re-establishment of a new stand (i.e. regeneration).

4.2.2 Regeneration

Regeneration type upper storey

Identification of the prevailing regeneration type in the upper storey.

Catalogue:

Regeneration type
Natural
Artificial – planting
Artificial – seeding
Artificial – combination planting-seeding
Mixed natural-planting
Mixed natural-seeding
Mixed natural planting and seeding

Regeneration type lower storey

Identification of the prevailing regeneration type in the lower storey. See catalogue above.

Regeneration operations

Regeneration characteristics identification and time reference of particular silvicultural measures.

Ser. no.	Time reference			Species	Stand storey	Regene-ration origin	% of N/ area	Seedling density	Seed density*	Spatial arrangement	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}					N/ha	kg/ha		h/ha	€/ha
Number	number optional	catalogue optional	number optional	catalogue	Upper/ lower/ both	catalogue	number	number	number	random/ systematic/ in patches	number	number
etc.												

* fill in only when seeding was identified as regeneration type

** fill in only when planting or seeding was identified as regeneration type

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height in meters (= mean height of 100 largest trees per hectare)

Species:
Identify up to 5 tree species which naturally regenerate or were planted/seeded. Species should be selected from the catalogue below.

Stand storey:
Identify stand storey (upper / lower / both) in which a particular tree species prevails.

Regeneration origin:
Identify for each species what is the origin of regeneration;
Catalogue:

Regeneration origin
Natural
Planted
Seeded
Natural and planted
Natural and seeded
Planted and seeded
Natural, planted and seeded

% of N/area:
Proportion of a particular tree species in number/area of seedlings/regeneration.

Seedling density:
Give a number of seedlings per hectare.

Seed density:
Give an amount of seed used for seeding (in kg/ha).

Spatial arrangement:
According to the catalogue below, identify the spatial arrangement of seedlings of a particular tree species.

Catalogue:

Spatial arrangement	Description
Random	random distribution of seedlings in a stand
Systematic	systematic distribution; usually when seedlings are planted
In patches	seedlings are clustered in patches or groups

IMPORTANT: If "spatial arrangement" of regeneration "in patches" was chosen, some data on number of patches per hectare and their size must be given in Regeneration operations description.

Labour and costs:
Identify time spent (in hours per hectare) and total costs for each regeneration operation.

Regeneration description (not mandatory)
Short textual description of regeneration operations in RST (up to 400 characters). As already indicated some data on number of patches per hectare and their size must be given here, if "spatial arrangement" of regeneration "in patches" was chosen.

4.2.3 Weeding

Weeding operations
Identify weeding operations' characteristics and time reference.

Ser. no.	Time reference			Weeding technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}		h/ha	€/ha
Number	number optional	catalogue optional	number optional	catalogue	number	number
etc.						

Description of characteristics in table:

Ser. no.:
serial number of silvicultural operation;

Time reference:
Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:
1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}.
Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)

Weeding technology:
Identify the prevailing technology for weeding operations.
Catalogue:

Weeding technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:
Identify time spent (in hours per hectare) and total costs for weeding operations.

Weeding description
Short textual description of weeding operations in RST (up to 400 characters).

4.2.4 Tending

Tending operations

Identify tending operations' characteristics and time reference.

Ser. no.	Time reference					Removals		Tending technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}	DBH_{dom}	DBH_{mean}	% of seedling and saplings/ha	Stand storey		h/ha	€/ha
Number	number optional	catalogue optional	number optional	number optional	number optional	number	upper/ lower/ both	catalogue	number	number
etc.										

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Removals:
Identify the share of removed seedlings and saplings

Stand storey:
Identify storey (upper / lower / both) from which seedlings and/or saplings are removed.

Tending technology:
Identify the prevailing technology for tending operations.
Catalogue:

Tending technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:
Identify time spent (in hours per hectare) and total costs for tending operations.

Tending description
Short textual description of tending operations in RST (up to 400 characters).

4.2.5 Thinning

Thinning type

Identification of general thinning concept, which describes how trees to be removed from a stand are chosen in order to improve a growth rate (or health) of the remaining trees (see Nyland, 2002).

Catalogue:

Thinning type
From below
From above
Combination from above and from below
No thinning
Other

Thinning from below (=low thinning)

It is a thinning method that removes trees from lower canopy positions (overtopped trees, intermediate trees, sometimes codominant trees) and retains most vigorous trees with largest, well-developed crowns.

Thinning from above (=crown thinning)

It is a thinning method that removes trees from middle and upper layer of a canopy (codominant and dominant trees) in order to favour desirable trees, which are usually most vigorous trees with well-developed crowns and of good timber quality.

Thinning operations:

Identify thinning operations' characteristics and time reference.

Ser. No.	Time reference					Tree removals								
	Stand age	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Stand storey**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years		m	cm	Cm			m^3	%					
Num-ber	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	upper/ lower/ both	number	number	Num-ber	Num-ber	Num-ber	Num-ber	Num-ber
...														

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Num ber	**Continued from table above...**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
...											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in thinning process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe
Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:
average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}]. PSH_{15} means productive system hours spent to do a specific job, including breaks up to 15 minutes.

Thinning description
Textual description of thinning type and measures in RST (up to 400 characters). If thinning type "other" was chosen, then the description is mandatory.

4.2.6 Regeneration felling

Regeneration system
Identification of the prevailing regeneration system (i.e. a cutting procedure by which new stands are created) in Representative stand.
Catalogue:

IDReg_system	Regeneration system
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4	Shelterwood strip system (=Saumschirmschlag)
5	Seed tree system and High forest with reserves system
6	Single-tree selection system
7	Group selection system
8	Coppice system
9	Other

For regeneration system descriptions see page 23.

Regeneration felling operations:

Identify regeneration felling operations' characteristics and time reference.

Ser. No.	Time reference					Tree removals								
	Stand age	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Stand storey**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years		m	cm	Cm			m^3	%					
Num-ber	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	upper/ lower/ both	number	number	Num-ber	Num-ber	Num-ber	Num-ber	Num-ber
...														

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Num ber	**Continued from table above...**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
...											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in regeneration felling process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe
Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:
average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}]. PSH_{15} means productive system hours spent to do a specific job, including breaks up to 15 minutes.

Regeneration felling description
Textual description of regeneration felling in RST (up to 400 characters). If regeneration felling type "other" was chosen, then the description is mandatory.

4.3 Uneven-aged FM

Table Uneven-aged FM	
IDFM type	Unique identifier (ID FM type = 30)
FM description	General description of FM type/concept with some additional information
Target diameter	Target diameter in cm for the main species
Regeneration type *	Identification of a general regeneration type; catalogue
Regeneration operations *	Table of regeneration operations, their characteristics and time reference
Regeneration description	Short description of regeneration process
Weeding operations *	Table of weeding operations, their characteristics and time reference
Weeding description	Short description of weeding process with time reference table
Tending operations *	Table of tending operations, their characteristics and time reference
Tending description	Short description of tending process with time reference table
Thinning type *	Identification of a general thinning concept; catalogue
Thinning operations *	Table of thinning operations, their characteristics and time reference
Thinning description	Short description of thinning operations
Regeneration system*	Identification of a general regeneration concept; catalogue
Regeneration felling operations *	Table of regeneration felling operations, their characteristics and time reference
Regeneration felling description	Short description of regeneration felling operations

* indicates which information are mandatory to fill in

4.3.1 General information

FM concept description (not mandatory)

Short general textual description of FM concept in RST (up to 750 characters). A qualitative description of FM objectives could be addressed here as well.

Target diameter (not mandatory)

Target diameter is a diameter of trees of a particular species at which a tree should be considered for cutting. Tree species should be selected from the catalogue (see chapter 4.1.2) and target diameter [in cm] should be given.

4.3.2 Regeneration

Regeneration type

Identification of the prevailing regeneration type. See catalogue on page 10.

Regeneration operations

Regeneration characteristics identification and time reference of particular silvicultural measures.

Ser. no.	Time reference			Species	Regene-ration origin	% of N/area	Seedling density	Seed density*	Spatial arrangement	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}				N/ha	kg/ha		h/ha	€/ha
Num ber	number optional	catalogue optional	number optional	catalogue	catalogue	number	number	number	random/ systematic/ in patches	num ber	number
etc.											

* fill in only when seeding was identified as regeneration type

** fill in only when planting or seeding was identified as regeneration type

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height in meters (= mean height of 100 largest trees per hectare)

Species:
Identify up to 5 tree species which naturally regenerate or were planted/seeded. Species should be selected from the catalogue below.

Regeneration origin:
Identify for each species what is the origin of regeneration;
Catalogue:

Regeneration origin
Natural
Planted
Seeded
Natural and planted
Natural and seeded
Planted and seeded
Natural, planted and seeded

% of N/area:
Proportion of a particular tree species in number/area of seedlings/regeneration.

Seedling density:
Give a number of seedlings per hectare.

Seed density:
Give an amount of seed used for seeding (in kg/ha).

Spatial arrangement:
According to the catalogue below, identify the spatial arrangement of seedlings of a particular tree species.

Catalogue:

Spatial arrangement	Description
Random	random distribution of seedlings in a stand
Systematic	systematic distribution; usually when seedlings are planted
In patches	seedlings are clustered in patches or groups

IMPORTANT: If "spatial arrangement" of regeneration "in patches" was chosen, some data on number of patches per hectare and their size must be given in Regeneration operations description.

Labour and costs:
Identify time spent (in hours per hectare) and total costs for each regeneration operation.

Regeneration description (not mandatory)
Short textual description of regeneration operations in RST (up to 400 characters). As already indicated some data on number of patches per hectare and their size must be given here, if "spatial arrangement" of regeneration "in patches" was chosen.

4.3.3 Weeding

Weeding operations
Identify weeding operations' characteristics and time reference.

Ser. no.	Time reference			Weeding technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}		h/ha	€/ha
Number	number optional	catalogue optional	number optional	catalogue	number	number
etc.						

Description of characteristics in table:

Ser. no.:
serial number of silvicultural operation;

Time reference:
Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:
1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}.
Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)

Weeding technology:
Identify the prevailing technology for weeding operations.
Catalogue:

Weeding technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:
Identify time spent (in hours per hectare) and total costs for weeding operations.

Weeding description
Short textual description of weeding operations in RST (up to 400 characters).

4.3.4 Tending

Tending operations

Identify tending operations' characteristics and time reference.

Ser. no.	Time reference					Removals	Tending technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}	DBH_{dom}	DBH_{mean}	% of seedling and saplings/ha		h/ha	€/ha
Number	number optional	catalogue optional	number optional	number optional	number optional	number	catalogue	number	number
etc.									

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years

- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Removals:
Identify the share of removed seedlings and saplings

Stand storey:
Identify storey (upper / lower / both) from which seedlings and/or saplings are removed.

Tending technology:
Identify the prevailing technology for tending operations.
Catalogue:

Tending technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:
Identify time spent (in hours per hectare) and total costs for tending operations.

Tending description
Short textual description of tending operations in RST (up to 400 characters).

4.3.5 Thinning

Thinning type

Identification of general thinning concept, which describes how trees to be removed from a stand are chosen in order to improve a growth rate (or health) of the remaining trees (see Nyland, 2002).

Catalogue:

Thinning type
From below
From above
Combination from above and from below
No thinning
Other

Thinning from below (=low thinning)

It is a thinning method that removes trees from lower canopy positions (overtopped trees, intermediate trees, sometimes codominant trees) and retains most vigorous trees with largest, well-developed crowns.

Thinning from above (=crown thinning)

It is a thinning method that removes trees from middle and upper layer of a canopy (codominant and dominant trees) in order to favour desirable trees, which are usually most vigorous trees with well-developed crowns and of good timber quality.

Thinning operations:

Identify thinning operations' characteristics and time reference.

Ser. No.	Time reference					Tree removals							
	Stand age	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years		m	cm	Cm		m^3	%					
Number	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	number	number	Number	Number	Number	Number	Number
...													

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Number	**Continued from table above...**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
...											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in thinning process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe
Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:
average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}]. PSH_{15} means productive system hours spent to do a specific job, including breaks up to 15 minutes.

Thinning description
Textual description of thinning type and measures in RST (up to 400 characters). If thinning type "other" was chosen, then the description is mandatory.

4.3.6 Regeneration/Selection felling

Regeneration system
Identification of the prevailing regeneration system (i.e. a cutting procedure by which new stands are created) in RST.
Catalogue:

IDReg_system	Regeneration system
1	Clear cutting
2	Uniform shelterwood system
3	Group system (=Grupenschirmschlag)
4	Shelterwood strip system (=Saumschirmschlag)
5	Seed tree system and High forest with reserves system
6	Single-tree selection system
7	Group selection system
8	Coppice system
9	Other

For regeneration system descriptions see page 23.

Regeneration/Selection felling operations:

Identify regeneration felling operations' characteristics and time reference.

Ser. No.	Time reference						Tree removals							
	Harvest interval	**Stand age**	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years	years		m	cm	Cm		m^3	%	%	%	%	%	%
Num-ber	Number optional	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	number	number	Num-ber	Num-ber	Num-ber	Num-ber	Num-ber
...														

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Num-ber	**Continued from table above...**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
...											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. harvest interval in years or
2. stand age in years or

3. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in regeneration felling process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe
Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:
average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}]. PSH_{15} means productive system hours spent to do a specific job, including breaks up to 15 minutes.

Regeneration felling description
Textual description of regeneration felling in RST (up to 400 characters). If regeneration felling type "other" was chosen, then the description is mandatory.

4.4 Coppice FM

Table Coppice FM	
IDFM type	Unique identifier (ID FM type = 40)
FM description	General description of FM type/concept with some additional information
Coppice form *	Identify coppice form; catalogue
Rotation period *	(Average) rotation period in years
Target diameter	Target diameter in cm for the main species
Regeneration period *	Duration of regeneration period in years
Regeneration type *	Identification of a general regeneration concept; catalogue
Regeneration operations *	Table of regeneration operations, their characteristics and time reference
Regeneration description	Short description of regeneration process
Weeding operations *	Table of weeding operations, their characteristics and time reference
Weeding description	Short description of weeding process with time reference table
Tending operations *	Table of tending operations, their characteristics and time reference
Tending description	Short description of tending process with time reference table
Thinning type *	Identification of a general thinning concept; catalogue
Thinning operations *	Table of thinning operations, their characteristics and time reference
Thinning description	Short description of thinning operations
Regeneration system*	Identification of a general regeneration concept; catalogue
Regeneration felling operations *	Table of regeneration felling operations, their characteristics and time reference
Regeneration felling description	Short description of regeneration felling operations

* indicates which information are mandatory to fill in

4.4.1 General information

FM concept description (not mandatory)

Short general textual description of FM concept in RST (up to 750 characters). A qualitative description of FM objectives could be addressed here as well.

Coppice form

Identify coppice form.

Catalogue:

Coppice form
Simple coppice (even-aged coppice)
Short rotation coppice for bioenergy
Selection coppice
Coppice with standards (= Mittelwald)
Other

Simple coppice system (=even-aged coppice)
It is a silvicultural system in which a (fixed) area of old crop (i.e. an annual coupe) is annually clear felled. The entire forest area of coppice is divided into annual coupes in numbers equal to the number of years in rotation period. A result of simple coppice system is even-aged coppice stands.

Short rotation coppice for bioenergy
Short rotation coppice is coppice grown as a bioenergy crop. A rotation is very short and is usually only up to 5-10 years.

Selection coppice system
It is a coppice system in which fellings are done by the principles of the selection system, while coppice is the way of stand's regeneration. Each year fellings are carried out in one of the annual coupes, but only shoots that have reached target diameter (i.e. exploitable size) are cut. Selection fellings may be carried out several times during the rotation period.

Coppice with standards (=Mittelwald)
Coppice with standards consists of two elements: underwood (i.e. a lower even-aged storey treated as coppice) and overwood (i.e. an upperstorey of standards treated as high forest). Annual coupes are formed as in simple coppice system. In a coupe, coppice is usually clear felled, while some standards are also felled, some are retained in a stand, and a certain number of new (young) standards are reserved. The rotation of the standards is a multiple of the coppice rotation.

Rotation period
A time period between regeneration establishment and final cut. A rotation period in years should be given.

Target diameter (not mandatory)
Target diameter is a diameter of trees of a particular species at which a tree should be considered for cutting. Tree species should be selected from the catalogue (see chapter 4.1.2) and target diameter [in cm] should be given.

Regeneration period
Time period in which mature and over mature stands are regenerated. It is the time between the initial felling (i.e. seeding felling) and the successful re-establishment of a new stand (i.e. regeneration).

4.4.2 Regeneration

Regeneration type

Identification of the prevailing regeneration type.

Catalogue:

Regeneration type
Natural
Artificial – planting
Artificial – seeding
Artificial – combination planting-seeding
Mixed natural-planting
Mixed natural-seeding
Mixed natural planting and seeding

Regeneration operations

Regeneration characteristics identification and time reference of particular silvicultural measures.

Ser. no.	Time reference			Species	Regene-ration origin	% of N/area	Seedling density	Seed density*	Spatial arrangement	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}				N/ha	kg/ha		h/ha	€/ha
Num ber	number optional	catalogue optional	number optional	catalogue	catalogue	number	number	number	random/ systematic/ in patches	num ber	number
etc.											

* fill in only when seeding was identified as regeneration type

** fill in only when planting or seeding was identified as regeneration type

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height in meters (= mean height of 100 largest trees per hectare)

Species:
Identify up to 5 tree species which naturally regenerate or were planted/seeded. Species should be selected from the catalogue below.

Regeneration origin:
Identify for each species what is the origin of regeneration;
Catalogue:

Regeneration origin
Natural
Planted
Seeded
Natural and planted
Natural and seeded
Planted and seeded
Natural, planted and seeded

% of N/area:
Proportion of a particular tree species in number/area of seedlings/regeneration.

Seedling density:
Give a number of seedlings per hectare.

Seed density:
Give an amount of seed used for seeding (in kg/ha).

Spatial arrangement:
According to the catalogue below, identify the spatial arrangement of seedlings of a particular tree species.

Catalogue:

Spatial arrangement	Description
Random	random distribution of seedlings in a stand
Systematic	systematic distribution; usually when seedlings are planted
In patches	seedlings are clustered in patches or groups

IMPORTANT: If "spatial arrangement" of regeneration "in patches" was chosen, some data on number of patches per hectare and their size must be given in Regeneration operations description.

Labour and costs:
Identify time spent (in hours per hectare) and total costs for each regeneration operation.

Regeneration description (not mandatory)
Short textual description of regeneration operations in RST (up to 400 characters). As already indicated some data on number of patches per hectare and their size must be given here, if "spatial arrangement" of regeneration "in patches" was chosen.

4.4.3 Weeding

Weeding operations
Identify weeding operations' characteristics and time reference.

Ser. no.	Time reference			Weeding technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}		h/ha	€/ha
Number	number optional	catalogue optional	number optional	catalogue	number	number
etc.						

Description of characteristics in table:

Ser. no.:
serial number of silvicultural operation;

Time reference:
Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:
1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}.
Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)

Weeding technology:
Identify the prevailing technology for weeding operations.
Catalogue:

Weeding technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:
Identify time spent (in hours per hectare) and total costs for weeding operations.

Weeding description
Short textual description of weeding operations in RST (up to 400 characters).

4.4.4 Tending

Tending operations

Identify tending operations' characteristics and time reference.

Ser. no.	Time reference					Removals	Tending technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}	DBH_{dom}	DBH_{mean}	% of seedling and saplings/ha		h/ha	€/ha
Number	number optional	catalogue optional	number optional	number optional	number optional	number	catalogue	number	number
etc.									

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Removals:
Identify the share of removed seedlings and saplings

Tending technology:
Identify the prevailing technology for tending operations.
Catalogue:

Tending technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:
Identify time spent (in hours per hectare) and total costs for tending operations.

<u>Tending description</u>
Short textual description of tending operations in RST (up to 400 characters).

4.1.5 Thinning

Thinning type

Identification of general thinning concept, which describes how trees to be removed from a stand are chosen in order to improve a growth rate (or health) of the remaining trees (see Nyland, 2002).

Catalogue:

Thinning type
From below
From above
Combination from above and from below
No thinning
Other

Thinning from below (=low thinning)

It is a thinning method that removes trees from lower canopy positions (overtopped trees, intermediate trees, sometimes codominant trees) and retains most vigorous trees with largest, well-developed crowns.

Thinning from above (=crown thinning)

It is a thinning method that removes trees from middle and upper layer of a canopy (codominant and dominant trees) in order to favour desirable trees, which are usually most vigorous trees with well-developed crowns and of good timber quality.

Thinning operations:

Identify thinning operations' characteristics and time reference.

Ser. No.	Time reference					Tree removals							
	Stand age	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years		m	cm	Cm		m^3	%					
Number	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	number	number	Number	Number	Number	Number	Number
...													

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Number	**Continued from table above...**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
...											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in thinning process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe
Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:
average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}]. PSH_{15} means productive system hours spent to do a specific job, including breaks up to 15 minutes.

Thinning description
Textual description of thinning type and measures in RST (up to 400 characters). If thinning type "other" was chosen, then the description is mandatory.

4.4.6 Regeneration felling

Regeneration system
Identification of the prevailing regeneration system (i.e. a cutting procedure by which new stands are created) in RST.
Catalogue:

IDReg_system	Regeneration system
1	Clear cutting
2	Uniform shelterwood system
3	Group system (=Grupenschirmschlag)
4	Shelterwood strip system (=Saumschirmschlag)
5	Seed tree system and High forest with reserves system
6	Single-tree selection system
7	Group selection system
8	Coppice system
9	Other

For regeneration system descriptions see page 23.

Regeneration felling operations:

Identify regeneration felling operations' characteristics and time reference.

Ser. No.	Time reference					Tree removals							
	Stand age	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years		m	cm	Cm		m^3	%					
Number	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	number	number	Number	Number	Number	Number	Number
...													

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Number	**Continued from table above...**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
...											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in regeneration felling process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe
Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:
average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}]. PSH_{15} means productive system hours spent to do a specific job, including breaks up to 15 minutes.

Regeneration felling description
Textual description of regeneration felling in RST (up to 400 characters). If regeneration felling type "other" was chosen, then the description is mandatory.

4.5 Short-rotation FM

Table Short-rotation FM	
IDFM type	Unique identifier (ID FM type = 50)
FM description	General description of FM type/concept with some additional information
Rotation period *	(Average) rotation period in years
Target diameter	Target diameter in cm for the main species
Regeneration period *	Duration of regeneration period in years
Regeneration type *	Identification of a general regeneration concept; catalogue
Regeneration operations *	Table of regeneration operations, their characteristics and time reference
Regeneration description	Short description of regeneration process
Weeding operations *	Table of weeding operations, their characteristics and time reference
Weeding description	Short description of weeding process with time reference table
Tending operations *	Table of tending operations, their characteristics and time reference
Tending description	Short description of tending process with time reference table
Thinning type *	Identification of a general thinning concept; catalogue
Thinning operations *	Table of thinning operations, their characteristics and time reference
Thinning description	Short description of thinning operations
Regeneration system*	Identification of a general regeneration concept; catalogue
Regeneration felling operations *	Table of regeneration felling operations, their characteristics and time reference
Regeneration felling description	Short description of regeneration felling operations

* indicates which information are mandatory to fill in

4.5.1 General information

FM concept description (not mandatory)

Short general textual description of FM concept in RST (up to 750 characters). A qualitative description of FM objectives could be addressed here as well.

Rotation period

A time period between regeneration establishment and final cut. A rotation period in years should be given.

Target diameter (not mandatory)

Target diameter is a diameter of trees of a particular species at which a tree should be considered for cutting. Tree species should be selected from the catalogue (see chapter 4.1.2) and target diameter [in cm] should be given.

Regeneration period

Time period in which mature and over mature stands are regenerated. It is the time between the initial felling (i.e. seeding felling) and the successful re-establishment of a new stand (i.e. regeneration).

4.5.2 Regeneration

Regeneration type

Identification of the prevailing regeneration type.

Catalogue:

Regeneration type
Natural
Artificial – planting
Artificial – seeding
Artificial – combination planting-seeding
Mixed natural-planting
Mixed natural-seeding
Mixed natural planting and seeding

Regeneration operations

Regeneration characteristics identification and time reference of particular silvicultural measures.

Ser. no.	Time reference			Species	Regene-ration origin	% of N/area	Seedling density	Seed density*	Spatial arrangement	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}				N/ha	kg/ha		h/ha	€/ha
Num ber	number optional	catalogue optional	number optional	catalogue	catalogue	number	number	number	random/ systematic/ in patches	num ber	number
etc.											

* fill in only when seeding was identified as regeneration type

** fill in only when planting or seeding was identified as regeneration type

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height in meters (= mean height of 100 largest trees per hectare)

Species:
Identify up to 5 tree species which naturally regenerate or were planted/seeded. Species should be selected from the catalogue below.

Regeneration origin:
Identify for each species what is the origin of regeneration;
Catalogue:

Regeneration origin
Natural
Planted
Seeded
Natural and planted
Natural and seeded
Planted and seeded
Natural, planted and seeded

% of N/area:
Proportion of a particular tree species in number/area of seedlings/regeneration.

Seedling density:
Give a number of seedlings per hectare.

Seed density:
Give an amount of seed used for seeding (in kg/ha).

Spatial arrangement:
According to the catalogue below, identify the spatial arrangement of seedlings of a particular tree species.

Catalogue:

Spatial arrangement	Description
Random	random distribution of seedlings in a stand
Systematic	systematic distribution; usually when seedlings are planted
In patches	seedlings are clustered in patches or groups

IMPORTANT: If "spatial arrangement" of regeneration "in patches" was chosen, some data on number of patches per hectare and their size must be given in Regeneration operations description.

Labour and costs:
Identify time spent (in hours per hectare) and total costs for each regeneration operation.

Regeneration description (not mandatory)
Short textual description of regeneration operations in RST (up to 400 characters). As already indicated some data on number of patches per hectare and their size must be given here, if "spatial arrangement" of regeneration "in patches" was chosen.

4.5.3 Weeding

Weeding operations
Identify weeding operations' characteristics and time reference.

Ser. no.	Time reference			Weeding technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}		h/ha	€/ha
Number	number optional	catalogue optional	number optional	catalogue	number	number
etc.						

Description of characteristics in table:

Ser. no.:
serial number of silvicultural operation;

Time reference:
Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:
1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}.
Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)

Weeding technology:
Identify the prevailing technology for weeding operations.
Catalogue:

Weeding technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:
Identify time spent (in hours per hectare) and total costs for weeding operations.

Weeding description
Short textual description of weeding operations in RST (up to 400 characters).

4.5.4 Tending

Tending operations

Identify tending operations' characteristics and time reference.

Ser. no.	Time reference					Removals	Tending technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}	DBH_{dom}	DBH_{mean}	% of seedling and saplings/ha		h/ha	€/ha
Number	number optional	catalogue optional	number optional	number optional	number optional	number	catalogue	number	number
etc.									

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Removals:
Identify the share of removed seedlings and saplings

Tending technology:
Identify the prevailing technology for tending operations.
Catalogue:

Tending technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:
Identify time spent (in hours per hectare) and total costs for tending operations.

<u>Tending description</u>
Short textual description of tending operations in RST (up to 400 characters).

4.5.5 Thinning

Thinning type

Identification of general thinning concept, which describes how trees to be removed from a stand are chosen in order to improve a growth rate (or health) of the remaining trees (see Nyland, 2002).

Catalogue:

Thinning type
From below
From above
Combination from above and from below
No thinning
Other

Thinning from below (=low thinning)

It is a thinning method that removes trees from lower canopy positions (overtopped trees, intermediate trees, sometimes codominant trees) and retains most vigorous trees with largest, well-developed crowns.

Thinning from above (=crown thinning)

It is a thinning method that removes trees from middle and upper layer of a canopy (codominant and dominant trees) in order to favour desirable trees, which are usually most vigorous trees with well-developed crowns and of good timber quality.

Thinning operations:

Identify thinning operations' characteristics and time reference.

Ser. No.	Time reference					Tree removals							
	Stand age	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years		m	cm	Cm		m^3	%					
Number	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	number	number	Number	Number	Number	Number	Number
...													

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Number	**Continued from table above...**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
...											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in thinning process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe
Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:
average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}]. PSH_{15} means productive system hours spent to do a specific job, including breaks up to 15 minutes.

Thinning description
Textual description of thinning type and measures in RST (up to 400 characters). If thinning type "other" was chosen, then the description is mandatory.

4.5.6 Regeneration felling

Regeneration system
Identification of the prevailing regeneration system (i.e. a cutting procedure by which new stands are created) in RST.
Catalogue:

IDReg_system	Regeneration system
1	Clear cutting
2	Uniform shelterwood system
3	Group system (=Grupenschirmschlag)
4	Shelterwood strip system (=Saumschirmschlag)
5	Seed tree system and High forest with reserves system
6	Single-tree selection system
7	Group selection system
8	Coppice system
9	Other

For regeneration system descriptions see page 23.

Regeneration felling operations:

Identify regeneration felling operations' characteristics and time reference.

Ser. No.	Time reference					Tree removals							
	Stand age	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years		m	cm	Cm		m^3	%					
Number	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	number	number	Number	Number	Number	Number	Number
...													

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Number	**Continued from table above...**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
...											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in regeneration felling process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe
Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:
average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}]. PSH_{15} means productive system hours spent to do a specific job, including breaks up to 15 minutes.

Regeneration felling description
Textual description of regeneration felling in RST (up to 400 characters). If regeneration felling type "other" was chosen, then the description is mandatory.

4.6 Agro-forestry

Table Agro-forestry FM	
IDFM type	Unique identifier (ID FM type = 60)
FM description	General description of FM type/concept with some additional information
Agro-forestry system *	Identify the prevailing agro-forestry system; catalogue
Rotation period *	(Average) rotation period in years
Target diameter	Target diameter in cm for the main species
Regeneration period *	Duration of regeneration period in years
Regeneration type *	Identification of a general regeneration concept; catalogue
Regeneration operations *	Table of regeneration operations, their characteristics and time reference
Regeneration description	Short description of regeneration process
Weeding operations *	Table of weeding operations, their characteristics and time reference
Weeding description	Short description of weeding process with time reference table
Tending operations *	Table of tending operations, their characteristics and time reference
Tending description	Short description of tending process with time reference table
Thinning type *	Identification of a general thinning concept; catalogue
Thinning operations *	Table of thinning operations, their characteristics and time reference
Thinning description	Short description of thinning operations
Regeneration system*	Identification of a general regeneration concept; catalogue
Regeneration felling operations *	Table of regeneration felling operations, their characteristics and time reference
Regeneration felling description	Short description of regeneration felling operations

* indicates which information are mandatory to fill in

4.6.1 General information

FM concept description (not mandatory)

Short general textual description of FM concept in RST (up to 750 characters). A qualitative description of FM objectives could be addressed here as well.

Agro-forestry system

Identification of the prevailing agro-forestry system in RST.

Catalogue:

Agro-forestry system
Agro-silvicultural
Silvo-pastural
Agro-silvo-pastoral
Other

Rotation period

A time period between regeneration establishment and final cut. A rotation period in years should be given.

Target diameter (not mandatory)

Target diameter is a diameter of trees of a particular species at which a tree should be considered for cutting. Tree species should be selected from the catalogue (see chapter 4.1.2) and target diameter [in cm] should be given.

Regeneration period

Time period in which mature and over mature stands are regenerated. It is the time between the initial felling (i.e. seeding felling) and the successful re-establishment of a new stand (i.e. regeneration).

4.6.2 Regeneration

Regeneration type

Identification of the prevailing regeneration type.

Catalogue:

Regeneration type
Natural
Artificial – planting
Artificial – seeding
Artificial – combination planting-seeding
Mixed natural-planting
Mixed natural-seeding
Mixed natural planting and seeding

Regeneration operations

Regeneration characteristics identification and time reference of particular silvicultural measures.

Ser. no.	Time reference			Species	Regene-ration origin	% of N/area	Seedling density	Seed density*	Spatial arrangement	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}				N/ha	kg/ha		h/ha	€/ha
Num ber	number optional	catalogue optional	number optional	catalogue	catalogue	number	number	number	random/ systematic/ in patches	num ber	number
etc.											

* fill in only when seeding was identified as regeneration type

** fill in only when planting or seeding was identified as regeneration type

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height in meters (= mean height of 100 largest trees per hectare)

Species:
Identify up to 5 tree species which naturally regenerate or were planted/seeded. Species should be selected from the catalogue below.

Regeneration origin:
Identify for each species what is the origin of regeneration;
Catalogue:

Regeneration origin
Natural
Planted
Seeded
Natural and planted
Natural and seeded
Planted and seeded
Natural, planted and seeded

% of N/area:
Proportion of a particular tree species in number/area of seedlings/regeneration.

Seedling density:
Give a number of seedlings per hectare.

Seed density:
Give an amount of seed used for seeding (in kg/ha).

Spatial arrangement:
According to the catalogue below, identify the spatial arrangement of seedlings of a particular tree species.
Catalogue:

Spatial arrangement	Description
Random	random distribution of seedlings in a stand
Systematic	systematic distribution; usually when seedlings are planted
In patches	seedlings are clustered in patches or groups

IMPORTANT: If "spatial arrangement" of regeneration "in patches" was chosen, some data on number of patches per hectare and their size must be given in Regeneration operations description.

Labour and costs:
Identify time spent (in hours per hectare) and total costs for each regeneration operation.

Regeneration description
Short textual description of regeneration operations in RST (up to 400 characters). As already indicated some data on number of patches per hectare and their size must be given here, if "spatial arrangement" of regeneration "in patches" was chosen.

4.6.3 Weeding

Weeding operations
Identify weeding operations' characteristics and time reference.

Ser. no.	Time reference			Weeding technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}		h/ha	€/ha
Number	number optional	catalogue optional	number optional	catalogue	number	number
etc.						

Description of characteristics in table:

Ser. no.:
serial number of silvicultural operation;

Time reference:
Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:
1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}.
Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)

Weeding technology:
Identify the prevailing technology for weeding operations.
Catalogue:

Weeding technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:
Identify time spent (in hours per hectare) and total costs for weeding operations.

Weeding description
Short textual description of weeding operations in RST (up to 400 characters).

4.6.4 Tending

Tending operations

Identify tending operations' characteristics and time reference.

Ser. no.	Time reference					Removals	Tending technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}	DBH_{dom}	DBH_{mean}	% of seedling and saplings/ha		h/ha	€/ha
Number	number optional	catalogue optional	number optional	number optional	number optional	number	catalogue	number	number
etc.									

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Removals:
Identify the share of removed seedlings and saplings

Tending technology:
Identify the prevailing technology for tending operations.
Catalogue:

Tending technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:
Identify time spent (in hours per hectare) and total costs for tending operations.

<u>Tending description</u>
Short textual description of tending operations in RST (up to 400 characters).

4.6.5 Thinning

Thinning type

Identification of general thinning concept, which describes how trees to be removed from a stand are chosen in order to improve a growth rate (or health) of the remaining trees (see Nyland, 2002).

Catalogue:

Thinning type
From below
From above
Combination from above and from below
No thinning
Other

Thinning from below (=low thinning)

It is a thinning method that removes trees from lower canopy positions (overtopped trees, intermediate trees, sometimes codominant trees) and retains most vigorous trees with largest, well-developed crowns.

Thinning from above (=crown thinning)

It is a thinning method that removes trees from middle and upper layer of a canopy (codominant and dominant trees) in order to favour desirable trees, which are usually most vigorous trees with well-developed crowns and of good timber quality.

Thinning operations:

Identify thinning operations' characteristics and time reference.

Ser. No.	Time reference					Tree removals							
	Stand age	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years		m	cm	Cm		m^3	%					
Num-ber	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	number	number	Num-ber	Num-ber	Num-ber	Num-ber	Num-ber
...													

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Num-ber	**Continued from table above...**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
...											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in thinning process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe
Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:
average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}]. PSH_{15} means productive system hours spent to do a specific job, including breaks up to 15 minutes.

Thinning description
Textual description of thinning type and measures in RST (up to 400 characters). If thinning type "other" was chosen, then the description is mandatory.

4.6.6 Regeneration felling

Regeneration system
Identification of the prevailing regeneration system (i.e. a cutting procedure by which new stands are created) in RST.
Catalogue:

IDReg_system	Regeneration system
1	Clear cutting
2	Uniform shelterwood system
3	Group system (=Grupenschirmschlag)
4	Shelterwood strip system (=Saumschirmschlag)
5	Seed tree system and High forest with reserves system
6	Single-tree selection system
7	Group selection system
8	Coppice system
9	Other

For regeneration system descriptions see page 23.

Regeneration felling operations:

Identify regeneration felling operations' characteristics and time reference.

Ser. No.	Time reference					Tree removals							
	Stand age	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years		m	cm	Cm		m^3	%					
Number	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	number	number	Number	Number	Number	Number	Number
...													

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Number	**Continued from table above...**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
...											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in regeneration felling process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe
Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:
average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}]. PSH_{15} means productive system hours spent to do a specific job, including breaks up to 15 minutes.

Regeneration felling description
Textual description of regeneration felling in RST (up to 400 characters). If regeneration felling type "other" was chosen, then the description is mandatory.

4.7 Transformation FM

Table Transformation FM	
IDFM type	Unique identifier (ID FM type = 70)
FM description	General description of FM type/concept with some additional information
Initial FM type *	Identify the initial FM type X; catalogue
Target FM type *	Identify the target FM type Y; catalogue
Conversion period *	Duration of conversion period in years
Rotation period *	(Average) rotation period in years
Target diameter	Target diameter in cm for the main species
Regeneration period *	Duration of regeneration period in years
Regeneration type *	Identification of a general regeneration concept; catalogue
Regeneration operations *	Table of regeneration operations, their characteristics and time reference
Regeneration description	Short description of regeneration process
Weeding operations *	Table of weeding operations, their characteristics and time reference
Weeding description	Short description of weeding process with time reference table
Tending operations *	Table of tending operations, their characteristics and time reference
Tending description	Short description of tending process with time reference table
Thinning type *	Identification of a general thinning concept; catalogue
Thinning operations *	Table of thinning operations, their characteristics and time reference
Thinning description	Short description of thinning operations
Regeneration system*	Identification of a general regeneration concept; catalogue
Regeneration felling operations *	Table of regeneration felling operations, their characteristics and time reference
Regeneration felling description	Short description of regeneration felling operations

* indicates which information are mandatory to fill in

4.7.1 General information

FM concept description (not mandatory)

Short general textual description of FM concept in RST (up to 750 characters). A qualitative description of FM objectives could be addressed here as well.

Initial FM type

Identify initial FM type from which RST should be converted.

Catalogue:

FM type
Even-aged FM
Two-aged FM
Uneven-aged FM
Coppice FM
Short rotation FM

Agro-forestry
No management

Target FM type

Identify target FM type to which RST should be converted.
Catalogue as above.

Conversion period

A time period (in years) in which conversion should be performed.

Rotation period

A time period between regeneration establishment and final cut. A rotation period in years should be given.

Target diameter (not mandatory)

Target diameter is a diameter of trees of a particular species at which a tree should be considered for cutting. Tree species should be selected from the catalogue (see chapter 4.1.2) and target diameter [in cm] should be given.

Regeneration period

Time period in which mature and over mature stands are regenerated. It is the time between the initial felling (i.e. seeding felling) and the successful re-establishment of a new stand (i.e. regeneration).

4.7.2 Regeneration

Regeneration type

Identification of the prevailing regeneration type.
Catalogue:

Regeneration type
Natural
Artificial – planting
Artificial – seeding
Artificial – combination planting-seeding
Mixed natural-planting
Mixed natural-seeding
Mixed natural planting and seeding

Regeneration operations

Regeneration characteristics identification and time reference of particular silvicultural measures.

Ser. no.	Time reference			Species	Regene-ration origin	% of N/area	Seedling density	Seed density*	Spatial arrangement	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}				N/ha	kg/ha		h/ha	€/ha
Num ber	number optional	catalogue optional	number optional	catalogue	catalogue	number	number	number	random/ systematic/ in patches	num ber	number
etc.											

* fill in only when seeding was identified as regeneration type

** fill in only when planting or seeding was identified as regeneration type

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height in meters (= mean height of 100 largest trees per hectare)

Species:
Identify up to 5 tree species which naturally regenerate or were planted/seeded. Species should be selected from the catalogue below.

Regeneration origin:
Identify for each species what is the origin of regeneration;
Catalogue:

Regeneration origin
Natural
Planted
Seeded
Natural and planted
Natural and seeded
Planted and seeded
Natural, planted and seeded

% of N/area:
Proportion of a particular tree species in number/area of seedlings/regeneration.

Seedling density:
Give a number of seedlings per hectare.

Seed density:
Give an amount of seed used for seeding (in kg/ha).

Spatial arrangement:
According to the catalogue below, identify the spatial arrangement of seedlings of a particular tree species.

Catalogue:

Spatial arrangement	Description
Random	random distribution of seedlings in a stand
Systematic	systematic distribution; usually when seedlings are planted
In patches	seedlings are clustered in patches or groups

IMPORTANT: If "spatial arrangement" of regeneration "in patches" was chosen, some data on number of patches per hectare and their size must be given in Regeneration operations description.

Labour and costs:
Identify time spent (in hours per hectare) and total costs for each regeneration operation.

Regeneration description
Short textual description of regeneration operations in RST (up to 400 characters). As already indicated some data on number of patches per hectare and their size must be given here, if "spatial arrangement" of regeneration "in patches" was chosen.

4.7.3 Weeding

Weeding operations
Identify weeding operations' characteristics and time reference.

Ser. no.	Time reference			Weeding technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}		h/ha	€/ha
Number	number optional	catalogue optional	number optional	catalogue	number	number
etc.						

Description of characteristics in table:

Ser. no.:
serial number of silvicultural operation;

Time reference:
Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:
1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}.
Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)

Weeding technology:
Identify the prevailing technology for weeding operations.
Catalogue:

Weeding technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:
Identify time spent (in hours per hectare) and total costs for weeding operations.

Weeding description
Short textual description of weeding operations in RST (up to 400 characters).

4.7.4 Tending

Tending operations

Identify tending operations' characteristics and time reference.

Ser. no.	Time reference					Removals	Tending technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}	DBH_{dom}	DBH_{mean}	% of seedling and saplings/ha		h/ha	€/ha
Number	number optional	catalogue optional	number optional	number optional	number optional	number	catalogue	number	number
etc.									

Description of characteristics in table:

Ser. no.:

serial number of silvicultural operation;

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Removals:
Identify the share of removed seedlings and saplings

Tending technology:
Identify the prevailing technology for tending operations.
Catalogue:

Tending technology
Pruning knife
Axe
Saw
Chain saw

Labour and costs:
Identify time spent (in hours per hectare) and total costs for tending operations.

<u>Tending description</u>
Short textual description of tending operations in RST (up to 400 characters).

4.7.5 Thinning

Thinning type

Identification of general thinning concept, which describes how trees to be removed from a stand are chosen in order to improve a growth rate (or health) of the remaining trees (see Nyland, 2002).

Catalogue:

Thinning type
From below
From above
Combination from above and from below
No thinning
Other

Thinning from below (=low thinning)

It is a thinning method that removes trees from lower canopy positions (overtopped trees, intermediate trees, sometimes codominant trees) and retains most vigorous trees with largest, well-developed crowns.

Thinning from above (=crown thinning)

It is a thinning method that removes trees from middle and upper layer of a canopy (codominant and dominant trees) in order to favour desirable trees, which are usually most vigorous trees with well-developed crowns and of good timber quality.

Thinning operations:

Identify thinning operations' characteristics and time reference.

Ser. No.	Time reference					Tree removals							
	Stand age	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years		m	cm	Cm		m^3	%					
Num-ber	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	number	number	Num-ber	Num-ber	Num-ber	Num-ber	Num-ber
…													

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Num-ber	**Continued from table above…**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
…											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in thinning process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe
Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:
average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}]. PSH_{15} means productive system hours spent to do a specific job, including breaks up to 15 minutes.

Thinning description
Textual description of thinning type and measures in RST (up to 400 characters). If thinning type "other" was chosen, then the description is mandatory.

4.7.6 Regeneration felling

Regeneration system
Identification of the prevailing regeneration system (i.e. a cutting procedure by which new stands are created) in RST.
Catalogue:

IDReg_system	Regeneration system
1	Clear cutting
2	Uniform shelterwood system
3	Group system (=Grupenschirmschlag)
4	Shelterwood strip system (=Saumschirmschlag)
5	Seed tree system and High forest with reserves system
6	Single-tree selection system
7	Group selection system
8	Coppice system
9	Other

For regeneration system descriptions see page 23.

Regeneration felling operations:

Identify regeneration felling operations' characteristics and time reference.

Ser. No.	Time reference					Tree removals							
	Stand age	**Development phase**	**H_{top}**	**DBH_{dom}**	**DBH_{mean}**	**Species**	**Volume**	**% BA/SV**	**DBH class 1**	**DBH class 2**	**DBH class 3**	**DBH class 4**	**DBH class 5**
	years		m	cm	Cm		m^3	%					
Number	Number optional	Catalogue optional	Number optional	Number optional	Number optional	Catalogue; up to 5 species	number	number	Number	Number	Number	Number	Number
...													

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	**Felling method**	**Delimbing method**	**Bucking method**	**Method**	**Distance**	**Harvest**	**Extraction**	**Harvest**	**Extraction**
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
Number	**Continued from table above...**	catalogue	catalogue	catalogue	catalogue	catalogue	number	number	number	number	number
...											

Description of characteristics in table:

Ser. no.:

Serial number of silvicultural operation.

Time reference:

Give a time reference for a particular silvicultural operation. Two different combinations of stand parameters could be used:

1. stand age in years or
2. stand development stage with additional information on dominant stand height H_{top}, dominant stand diameter DBH_{dom} or mean stand diameter DBH_{mean}.

Descriptions of parameters are listed below:

- stand age – age of a stand in years
- development phase – a development phase of a stand

Development phase
Regeneration / seedling phase (0-130 cm in height)
Thicket phase (>130cm height, <10cm DBH)
Early pole phase (10-20cm DBH)
Older pole phase (20-30cm DBH)
Mature phase (30-50cm DBH)
Over mature (>50cm DBH)
Rejuvenation phase
Uneven-aged stand

- H_{top} – dominant stand height (= mean height of 100 largest trees per hectare)
- DBH_{dom} – dominant DBH in a stand (= mean DBH of 100 largest trees per hectare)
- DBH_{mean} – mean DBH in a stand

Tree removals:

Identify removals by tree species in total and divided in relative DBH classes.

Species:

Identify the main species for which removals will be given. Species should be selected from the catalogue.

Volume:

give a total volume of removed trees of a particular tree species

% of BA/SV:

give a proportion of removed trees of a particular tree species in total stand basal area or stand volume

DBH class 1-5:

give a proportion of removed trees of a particular tree species per a particular relative DBH class

RELATIVE DBH CLASSES are defined proportionally in regard to minimum and maximum DBH in a stand (i.e. divide the range of DBH_{min} and DBH_{max} in a stand in 5 equal classes).

Harvesting technologies:

Identify harvesting technologies in regeneration felling process. First, identify the harvesting method, and continue with identification of felling, delimbing, and bucking methods.

Catalogues:

Harvesting method:

Harvesting method	
Whole tree	only felling before extraction
Tree length	felling, delimbing before extraction
Cut to length	felling, delimbing, bucking before extraction

Felling method:

Felling
Axe
Saw
Chain saw
Feller Buncher
Harvester

Delimbing method:

Delimbing
No delimbing
Axe
Saw
Chain saw
Stationary delimber
Processor
Harvester

Bucking method:

Bucking
No bucking
Saw
Chain saw
Processor
Harvester

Extraction technology:

Identify extraction technology and average extraction distance from stand to forest road.

Extraction method:

Catalogue:

Extraction method	
No extraction	
Manual	hand delivery, chutes...
Animal	horse, mule, donkey…
Tractor	
Skidder	
Tractor&trailer	
Forwarder	
Tower yarder	
Self-propelled carriage	
Sledge winch	
Helicopter	
Other	indicate the extraction type in textual Regeneration felling description

Extraction distance:
average extraction distance in a Representative stand in meters

Labour and costs:
Identify costs for harvest and extraction operations (in €/m^3).

Productivity:
Identify productivity for harvest and extraction operations in m^3 of timber per productive working hours excluding breaks [m^3/PSH_{15}]. PSH_{15} means productive system hours spent to do a specific job, including breaks up to 15 minutes.

Regeneration felling description
Textual description of regeneration felling in RST (up to 400 characters). If regeneration felling type "other" was chosen, then the description is mandatory.

4.8 No FM

Table No management	
IDFM type	Unique identifier (ID FM type = 80)
NM cause	Catalogue
FM description	Additional description why there is no management in Representative stand.

NM cause

Identification of the main cause for the absence of FM in RST.

Catalogue:

NM cause
Conservation (i.e. forest reserves)
Emphasised protective roles of forests
Inaccessibility
No management due to other causes

FM description

Short general description of main reasons for the absence of FM in RST.

5 Literature

DOW, 2012. Advanced multifunctional forest management in European mountain Ranges – ARANGE. Annex I - Description of Work.

EEA, 2006. European Forest Types: Categories and Types for Sustainable Forest Management Reporting and Policy. EEA Technical Report, No. 9/2006. European Environment Agency, Copenhagen.

Mathews, J.D., 1999. Silvicultural systems. Oxford University Press Inc., New York.

Nyland, R.D., 2002. Silviculture: Concepts and Applications, 2nd Edition. The McGraw-Hill Companies, Inc., New York.

6 Appendicies

Appendix 1: Example Even-aged pure (100 %) *Picea abies* RST #1

Identification data

ID Case study:	CS4	Dinaric Mountains	Slovenia
ID RST×FM:	30_10_1		(This code is generated automatically by the software!)
ID RST:	30		
RST name:	Even-aged pure *Picea abies* RST		

Forest management type

FM type:	10	Even-aged FM

General information

FM concept description:	/	
Rotation period:	120 years	
Target diameter:	*Picea abies*	60 cm
Regeneration period:	35 years	

Regeneration

Regeneration type: mixed natural-planting

Regeneration operations:

Ser. no.	Time reference			Species	Regene-ration origin	% of N/area	Seedling density	Seed density*	Spatial arrangement	Labour and costs	
	Stand age	Develop-ment phase	H_{top}				N/ha	kg/ha		h/ha	€/ha
1	0			*Picea abies*	natural	90	14000		random	0	0
2		Regenera tion	0.5	*Picea abies*	planted	10	1000		In patches	30	525

Regeneration description: Natural regeneration is preffered. *Picea abies* regenerates well, but on locations where regeneration was not established *Picea abies* seedlings are additionally planted in small patches (systematically on a grid 2×2 m within the patches; N=10/ha; area=0,04 ha).

Weeding

Weeding operations:

Ser. no.	Time reference			Weeding technology	Labour and costs	
	Stand age	Development phase	H_{top}		h/ha	€/ha
1		Regeneration	0.5	Pruning knife	30	525
2		Regeneration	0.8	Pruning knife	28	490
3		Regeneration	1.0	Pruning knife	24	420

Weeding description: In weeding operations regeneration, but especially planted seedlings, must be cut out from the weeds (mostly ferns).

Tending

Tending operations:

Ser. no.	Time reference					Removals	Tending technology	Labour and costs	
	Stand age	Develop-ment phase	H_{top}	DBH_{dom}	DBH_{mean}	% of seedling and saplings/ha		h/ha	€/ha
1		Regenera tion	2.0			30	Pruning knife	20	350
2		Thicket phase	3.0			30	Pruning knife, axe	24	420
3		Thicket phase	5.0			25	Pruning knife, axe	24	420
4		Thicket phase		5		20	Chain saw	24	469

Tending description: In the first 3 tending operations saplings with obvious negative characteristics are removed. In the last operation some saplings may be removed also to help other saplings of good quality.

Thinning

Thinning type: From above

Thinning operations:

Ser. No.	Time reference					Species	Tree removals						
	Stand age	Development phase	H_{top}	DBH_{dom}	DBH_{mean}		Volume	% BA/SV	DBH class 1	DBH class 2	DBH class 3	DBH class 4	DBH class 5
	years		m	cm	cm		m^3/ha	%	10-19	20-29	30-39	40-49	50+
1		Thicket phase		10		*Picea abies*	10	25	100				
2		Early pole phase		15		*Picea abies*	24	25	100				
3		Early pole phase		20		*Picea abies*	30	20	60	40			
4		Older pole phase		28		*Picea abies*	34	18	40	40	20		

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	Felling method	Delimbing method	Bucking method	Method	Distance	Harvest	Extraction	Harvest	Extraction
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
1	**Continued from table above...**	Tree length	Chain saw	Chain saw	Chain saw	Tractor	300	15.6	13.5	10	20
2		Tree length	Chain saw	Chain saw	Chain saw	Tractor	300	13.0	13.5	12	20
3		Tree length	Chain saw	Chain saw	Chain saw	Tractor	300	12.0	10.8	13	25
4		Cut to length	Chain saw	Chain saw	Chain saw	Tractor	300	11.2	9.0	14	30

Thinning description: /

Regeneration felling

Regeneration system: 2 Uniform shelterwood system

Regeneration felling operations:

Ser. No.	Time reference					Species	Tree removals						
	Stand age	Development phase	H_{top}	DBH_{dom}	DBH_{mean}		Volume	% BA/SV	DBH class 1	DBH class 2	DBH class 3	DBH class 4	DBH class 5
	years		m	cm	cm		m^3/ha	%	10-19	20-29	30-39	40-49	50+
1		Over mature phase		55		*Picea abies*	280	35			10	10	80
2		Rejuvenation phase		63		*Picea abies*	320	50				10	90
3		Rejuvenation phase		70		*Picea abies*	400	100					100

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	Felling method	Delimbing method	Bucking method	Method	Distance	Harvest	Extraction	Harvest	Extraction
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
1	**Continued from table above...**	Cut to length	Chain saw	Chain saw	Chain saw	Skidder	300	10.4	7.7	15	35
2		Cut to length	Chain saw	Chain saw	Chain saw	Skidder	300	10.4	7.7	15	35
3		Cut to length	Chain saw	Chain saw	Chain saw	Skidder	300	10.4	7.7	15	35

Regeneration felling description: Rejuvenation of RST is made in 3 regeneration fellings. In the last felling all remaining trees are harvested (independent of their DBH).

Appendix 2: Example Even-aged pure (100 %) *Picea abies* RST #2

Identification data

ID Case study:	CS4	Dinaric Mountains	Slovenia
ID RST×FM:	30_10_2		(This code is generated automatically by the software!)
ID RST:	30		
RST name:	Even-aged pure *Picea abies* RST		

Forest management type

FM type:	10	Even-aged FM

General information

FM concept description:	/	
Rotation period:	120 years	
Target diameter:	*Picea abies*	60 cm
Regeneration period:	35 years	

Regeneration

Regeneration type:	mixed natural-planting

Regeneration operations:

Ser. no.	Time reference			Species	Regeneration origin	% of N/area	Seedling density	Seed density*	Spatial arrangement	Labour and costs**	
	Stand age	Development phase	H_{top}				N/ha	kg/ha		h/ha	€/ha
1	0			*Picea abies*	planted	100	10000		systematic	100	14,000

Regeneration description: 3+2 years old *Picea abies* seedlings are planted systematically on a grid 1×1 m.

Weeding

Weeding operations:

Ser. no.	Time reference			Weeding technology	Labour and costs**	
	Stand age	Development phase	H_{top}		h/ha	€/ha
1		Regeneration	0.5	Pruning knife	30	525
2		Regeneration	0.8	Pruning knife	28	490
3		Regeneration	1.0	Pruning knife	24	420

Weeding description: Ferns and bramble are cut around planted seedlings in a cone shape.

Tending

Tending operations:

Ser. no.	Time reference					Removals	Tending technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}	DBH_{dom}	DBH_{mean}	% of seedling and saplings/ha		h/ha	€/ha
1		Regenera tion	2.0			30	Pruning knife	20	350
2		Thicket phase	3.0			30	Pruning knife, axe	24	420
3		Thicket phase	5.0			25	Pruning knife, axe	24	420
4		Thicket phase		7.5		20	Chain saw	24	469

Tending description: In the first 3 tending operations saplings with obvious negative characteristics are removed. In the last operation some saplings may be removed also to help other saplings of good quality.

Thinning

Thinning type: From above

Thinning operations:

Ser. No.	Time reference					Species	Tree removals						
	Stand age	Development phase	H_{top}	DBH_{dom}	DBH_{mean}		Volume	% BA/SV	DBH class 1	DBH class 2	DBH class 3	DBH class 4	DBH class 5
	years		m	cm	cm		m^3/ha	%	10-19	20-29	30-39	40-49	50+
1		Thicket phase		10		*Picea abies*	10	25	100				
2		Early pole phase		15		*Picea abies*	24	25	100				
3		Early pole phase		20		*Picea abies*	30	20	60	40			
4		Older pole phase		28		*Picea abies*	34	18	20	70	10		

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	Felling method	Delimbing method	Bucking method	Method	Distance	Harvest	Extraction	Harvest	Extraction
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
1	**Continued from table above...**	Tree length	Chain saw	Chain saw	Chain saw	Tractor	300	15.6	13.5	10	20
2		Tree length	Chain saw	Chain saw	Chain saw	Tractor	300	13.0	13.5	12	20
3		Tree length	Chain saw	Chain saw	Chain saw	Tractor	300	12.0	10.8	13	25
4		Cut to length	Chain saw	Chain saw	Chain saw	Tractor	300	11.2	9.0	14	30

Thinning description: /

Regeneration felling

Regeneration system: 1 Clear-cut system

Regeneration felling operations:

Ser. No.	Time reference					Species	Tree removals						
	Stand age	Development phase	H_{top}	DBH_{dom}	DBH_{mean}		Volume	% BA/SV	DBH class 1	DBH class 2	DBH class 3	DBH class 4	DBH class 5
	years		m	cm	cm		m^3/ha	%	10-19	20-29	30-39	40-49	50+
1		Over mature phase		60		*Picea abies*	800	100				100	100

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	Felling method	Delimbing method	Bucking method	Method	Distance	Harvest	Extraction	Harvest	Extraction
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
1	**Continued from table above...**	Cut to length	Chain saw	Chain saw	Chain saw	Skidder	300	10.4	7.7	15	35

Regeneration felling description: Rejuvenation of RST is made as a clear-cut felling on average area of 1 ha.

Appendix 3: Example Uneven-aged mixed *Abies alba-Fagus sylvatica-Picea abies* RST

Identification data

ID Case study:	CS4	Dinaric Mountains	Slovenia
ID RST×FM:	21_30_1		(This code is generated automatically by the software!)
ID RST:	21		
RST name:	Uneven-aged mixed *Abies alba-Fagus sylvatica-Picea abies* RST		

Forest management type

FM type:	30	Uneven-aged FM

General information

FM concept description:	/	
Target diameter:	*Abies alba*	65 cm
	Fagus sylvatica	55 cm
	Picea abies	60 cm

Regeneration

Regeneration type: natural

Regeneration operations:

Ser. no.	Time reference					Species	Regene-ration origin	% of N/area	Seedling density	Seed density*	Spatial arrangement	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}	DBH_{dom}	DBH_{mean}				N/ha	kg/ha		h/ha	€/ha
1	0					*Abies alba*	natural	15	7,500		In patches	0	0
1	0					*Fagus sylvatica*	natural	60	30,000		Random	0	0
1	0					*Picea abies*	natural	20	10,000		In patches	0	0
1	0					*Acer pseudoplatanus*	natural	5	2,500		Random	0	0

Regeneration description: Natural regeneration of all tree species is preffered. Fagus sylvatica is the most abundant species and is randomly distributed over the entire stand. *Abies alba* and *Picea abies* are present in small patches (*Abies*: N=10/ha, area=0,005 ha; Picea: N=25/ha, area=0,01 ha). *Acer pseudoplatanus* regenerates abundantly, but its survival rate is low. It is distributed randomly over the stand.

Weeding

Weeding operations:

Ser. no.	Time reference					Weeding technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}	DBH_{dom}	DBH_{mean}		h/ha	€/ha
0								

Weeding description: No weeding operations are needed.

Tending

Tending operations:

Ser. no.	Time reference					Removals	Tending technology	Labour and costs**	
	Stand age	Develop-ment phase	H_{top}	DBH_{dom}	DBH_{mean}	% of seedling and saplings/ha		h/ha	€/ha
0									

Tending description: No tending operations are needed.

Thinning

Thinning type: /

Thinning operations:

Ser. No.	Time reference					Species	Tree removals						
	Stand age	Development phase	H_{top}	DBH_{dom}	DBH_{mean}		Volume	% BA/SV	DBH class 1	DBH class 2	DBH class 3	DBH class 4	DBH class 5
	years		m	cm	cm		m^3/ha	%	10-19	20-29	30-39	40-49	50+
0													

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	Felling method	Delimbing method	Bucking method	Method	Distance	Harvest	Extraction	Harvest	Extraction
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
0	**Continued from table above...**										

Thinning description: No special thinning operations are needed.

Regeneration/Selection felling

Regeneration system: 6 Single-tree selection system

Regeneration felling operations:

Ser. No.	Time reference						Species	Tree removals						
	Harvest interval	Stand age	Development phase	H_{top}	DBH_{dom}	DBH_{mean}		Volume	% BA/SV	DBH class 1	DBH class 2	DBH class 3	DBH class 4	DBH class 5
	years	years		m	cm	Cm		m^3/ha	%	10-19	20-29	30-39	40-49	50+
1	10						*Abies alba*	44	11		5	10	25	60
1	10						*Fagus sylvatica*	20	5	2	8	20	30	40
1	10						*Picea abies*	8	2		5	10	25	60

Ser. No.		Harvesting technologies				Extraction technology		Costs		Productivity	
		Harvesting method	Felling method	Delimbing method	Bucking method	Method	Distance	Harvest	Extraction	Harvest	Extraction
							m	€/m^3	€/m^3	m^3/PSH_{15}	m^3/PSH_{15}
1	**Continued from table above...**	Cut to length	Chain saw	Chain saw	Chain saw	Skidder	200	10.4	7.7	15	35
1		Cut to length	Chain saw	Chain saw	Chain saw	Skidder	200	10.4	7.7	15	35
1		Cut to length	Chain saw	Chain saw	Chain saw	Skidder	200	10.4	7.7	15	35

Regeneration felling description: Selection fellings are made in 10 years time interval. In average 18 % of total stand volume is harvested in one felling.

Appendix 4: Manual on BAU FM data input into the web-questionnaire

Manual for BAU FM data input

Introduction

The Web data-collector on Business-as-usual forest management (BAU FM) practices in Case study areas is designed based on document »Forest management practices in Case study areas: the operational description of the questionnaire« (hereafter Operational description). Most of important information and clarification of individual terms and questions the user of this questionnaire may find therein, while this short manual is written only for efficient using and data input into the digital version of the questionnaire.

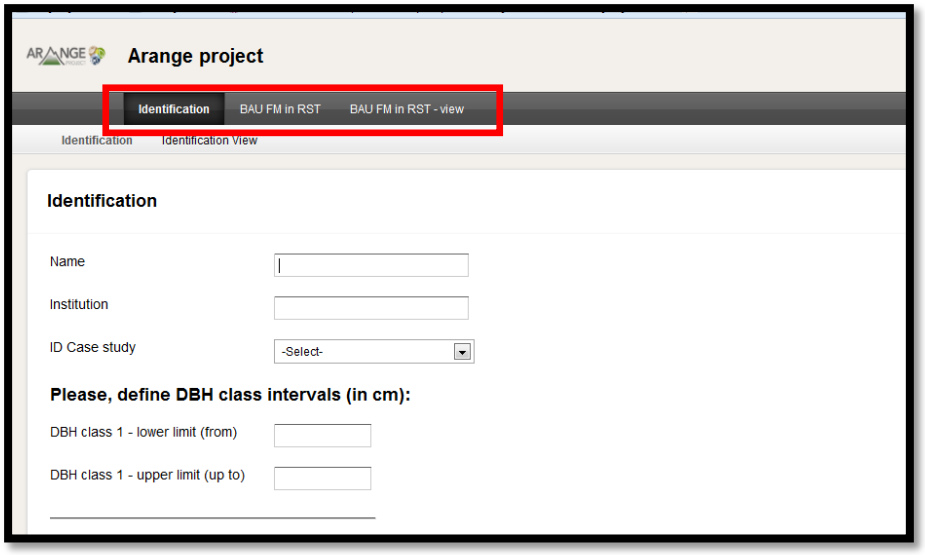
The concept of the digital questionnaire

The digital questionnaire is divided into three main parts:

1. Input of the identification data;
2. Input of data on BAU FM in a particular Representative stand (RST);
3. Viewer of the data on BAU FM in RST (with a possibility of data edit).

All parts are shown in separate worksheets on the first screen appearing when the application is started (Figure 1).

Figure 1: The entry page of the questionnaire; the main worksheets are marked with a frame



Data entry

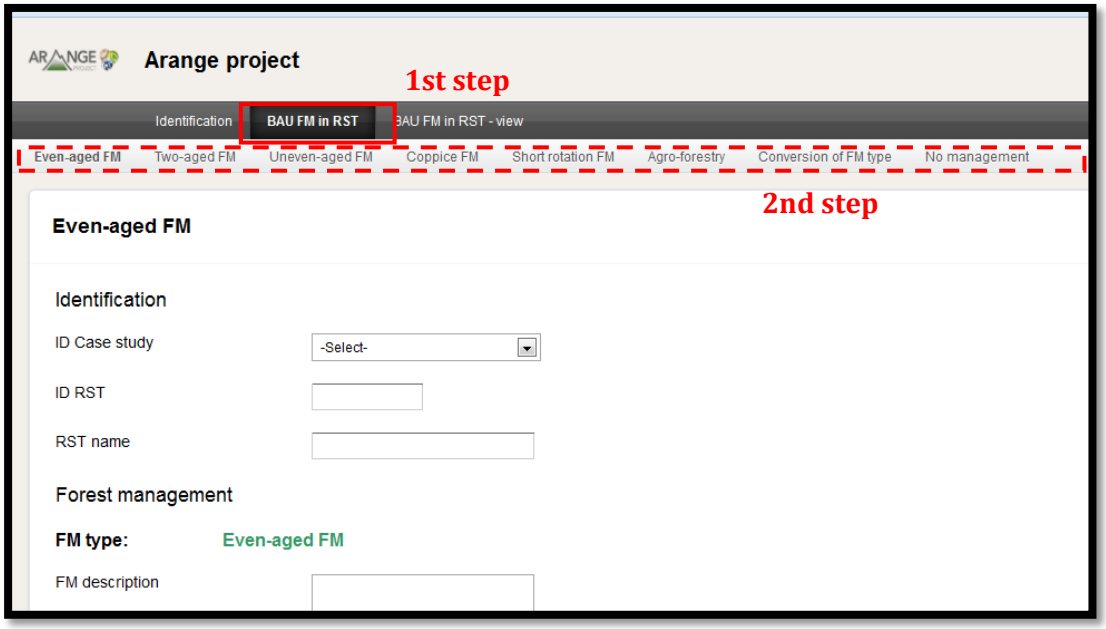
1. »Identification« worksheet:

Choose the »identification« worksheet and entry the data you are asked for. Here you also need to define the 5 relative dbh classes as described in the Operational description (first mentioned on page 22); the user must define the lower and upper limit of all measured trees and the software will calculate the limits for each relative dbh class.

2. »BAU FM in RST« worksheet:

In the second stage, the data on BAU FM practices need to be input for each RST defined. In the first step, the »BAU FM in RST« worksheet should be selected and secondly, the worksheet of correct FM type needs to be selected and opened (Figure 2).

Figure 2: In the first step the »BAU FM in RST« worksheet need to be selected; in the second step the correct »FM type« worksheet need to be selected



3. »FM type« worksheet:

When the correct »FM type« worksheet is chosen, the data on BAU FM practice in a particular RST could be filled in. Sets of questions sligthly differ between the FM types, but the core part remains the same in all FM types.

The worksheet on FM types can be fullfilled following these steps:

CASE STUDY and RST IDENTIFICATION

1. Select the CS ID.

2. Fill in the RST ID (the same as defined in WP1, T1.1: Data harmonization).
3. Write a short name of a RST (*not mandatory*).

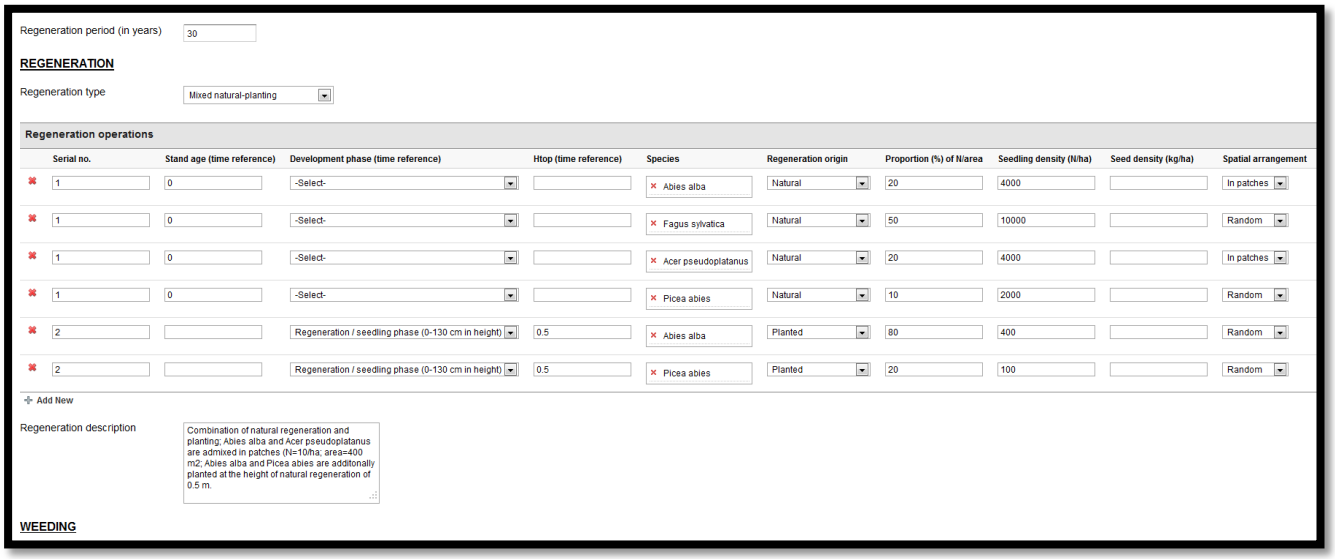
FOREST MANAGEMENT (GENERAL INFORMATION)

4. Describe a BAU FM practice in short (*not mandatory*).
5. Fill in the rotation period (in years) (*not applicable for uneven-aged FM type*).
6. Fill in the target diameter for the main tree species (dbh in cm) (*not mandatory, but anticipated*).
7. Fill in the regeneration period (in years) (*not applicable for uneven-aged FM type*).

REGENERATION

8. Select the (prevailing) regeneration type from the drop-down list.
9. Insert regeneration operations into table:
   - for each tree species in a particular regeneration operation one row should be completed, but
   - the same operation must have the same serial number even if several tree species are involved – see Figure 3;
   - the data should be consistent with the data from RST definition;

Figure 3: An example of completed Regeneration operation table; 2 regeneration operations (see serial numbers) with different number of tree species are shown



a. Fill in the correct serial number of the regeneration operation (please consider that also natural regeneration is a »regeneration operation«);
b. Fill in 1. stand age **OR** 2. (development phase + stand height H_{top}) at the time the operation is implemented;
c. Select tree species;
d. Select the origin of regeneration of a chosen tree species;
e. Fill in the proportion of chosen tree species in total number of seedlings or in regenerated area;
f. Fill in seedling density as the number of seedlings per hectare;

g. If regeneration origin »seeded« was chosen, the seed density must be defined – seed density in kg per hectare;
h. Define spatial arrangement of regeneration – choose from the drop-down list;
i. Fill in how many working hours is needed for a particular regeneration operation;
j. Fill in the costs of a particular regeneration operation;

10. Short description of regeneration process may be given (*not mandatory*);

WEEDING

11. Insert weeding operations into table:
    - for each tree species in a particular regeneration operation one row should be completed, but
    - the same operation must have the same serial number even if several tree species are involved;

    a. Fill in the serial number of a weeding operation;
    b. Fill in 1. stand age **OR** 2. (development phase + stand height H_{top}) at the time the operation is implemented;
    c. Select the technology used for a weeding operation;
    d. Fill in how many working hours is needed for a weeding operation;
    e. Fill in the costs of a weeding operation;
12. Short description of weeding operation if needed (*not mandatory*);

TENDING

13. Insert tending operations into table:
    - for each tree species in a particular regeneration operation one row should be completed, but
    - the same operation must have the same serial number even if several tree species are involved;

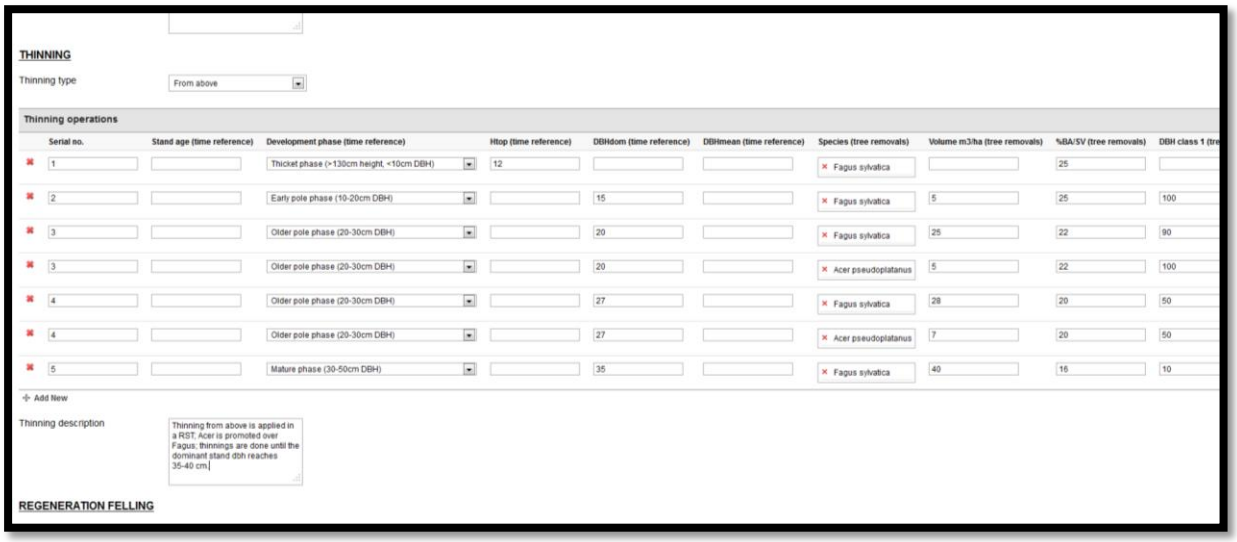
    a. Fill in the serial number;
    b. Fill in 1. stand age **OR** 2. development phase + (stand height H_{top} **OR** dominant dbh D_{dom} **OR** mean dbh DBH_{mean}) at the time the operation is implemented;
    c. Fill in how many seedlings and/or saplings is removed with a tending operation (in % of total number of seedling and saplings);
    d. Select the technology used for a tending operation;
    e. Fill in how many working hours is needed for a tending operation;
    f. Fill in the costs of a tending operation;
14. Short description of tending operation if needed (*not mandatory*);

THINNING

15. Select thinning type;
16. Insert thinning operations into the table:
    - for each tree species in a particular regeneration operation one row should be completed, but

- the same operation must have the same serial number even if several tree species are involved – see Figure 4;

Figure 4: An example of completed Thinning operation table: 2 thinning operations with different number of tree species are shown



a. Fill in the serial number;
b. Fill in 1. stand age **OR** 2. development phase + (stand height H_{top} or dominant dbh D_{dom} or mean dbh DBH_{mean}) at the time the operation is implemented;
c. Select the tree species for which tree removals will be defined;
d. Fill in the volume of a chosen species which is removed in the described operation;
e. Fill in the proportion of removed timber in regard to stand basal area or stand volume (in %);
f. Fill in the dbh structure of removed timber in 5 relative dbh classes (which are defined in the Identification worksheet) (in %);
g. Select a harvesting method, methods of felling, delimbing and bucking;
h. Select extraction method and fill in the average extraction distance (in meters);
i. Fill in the costs of harvest and extraction (in €/m^3);
j. Fill in the productivity of harvest and extraction (in m^3/PSH_{15});

17. Short description of thinning operation (*not mandatory*);

REGENERATION FELLING

18. Select regeneration system;
19. Insert regeneration felling operations into the table:
    - for each tree species in a particular regeneration operation one row should be completed, but
    - the same operation must have the same serial number even if several tree species are involved – see Figure 4 above;

a. Fill in the serial number;

b. Fill in 1. stand age **OR** 2. development phase + (stand height H_{top} or dominant dbh D_{dom} or mean dbh DBH_{mean}) at the time the operation is implemented;
c. Select the tree species for which tree removals will be defined;
d. Fill in the volume of a chosen species which is removed in the described operation;
e. Fill in the proportion of removed timber in regard to stand basal area or stand volume (in %);
f. Fill in the dbh structure of removed timber in 5 relative dbh classes (which are defined in the Identification worksheet) (in %);
g. Select a harvesting method, methods of felling, delimbing and bucking;
h. Select extraction method and fill in the average extraction distance (in meters);
i. Fill in the costs of harvest and extraction (in €/m^3);
j. Fill in the productivity of harvest and extraction (in m^3/PSH_{15});

20. Short description of thinning operation (*not mandatory*);

21. **<u>Click on the »SUBMIT« button on the bottom of the page to submit the data into the database.</u>**

Data view and edit

Choose the »BAU FM in RST - view« worksheet and then choose the worksheet of a FM type you want to view/edit the data.

1. In the database table, choose the input record you want to view/edit/delete/duplicate and on the left side of the table a list of possible operations will show (Figure 5).

Figure 5: To view, edit or delete the input record, position the cursor on the record and select the required operation from the list on the left side of the screen

2. Choose the operation you want to execute on the input data (Edit, Delete, Duplicate, Print or View record)

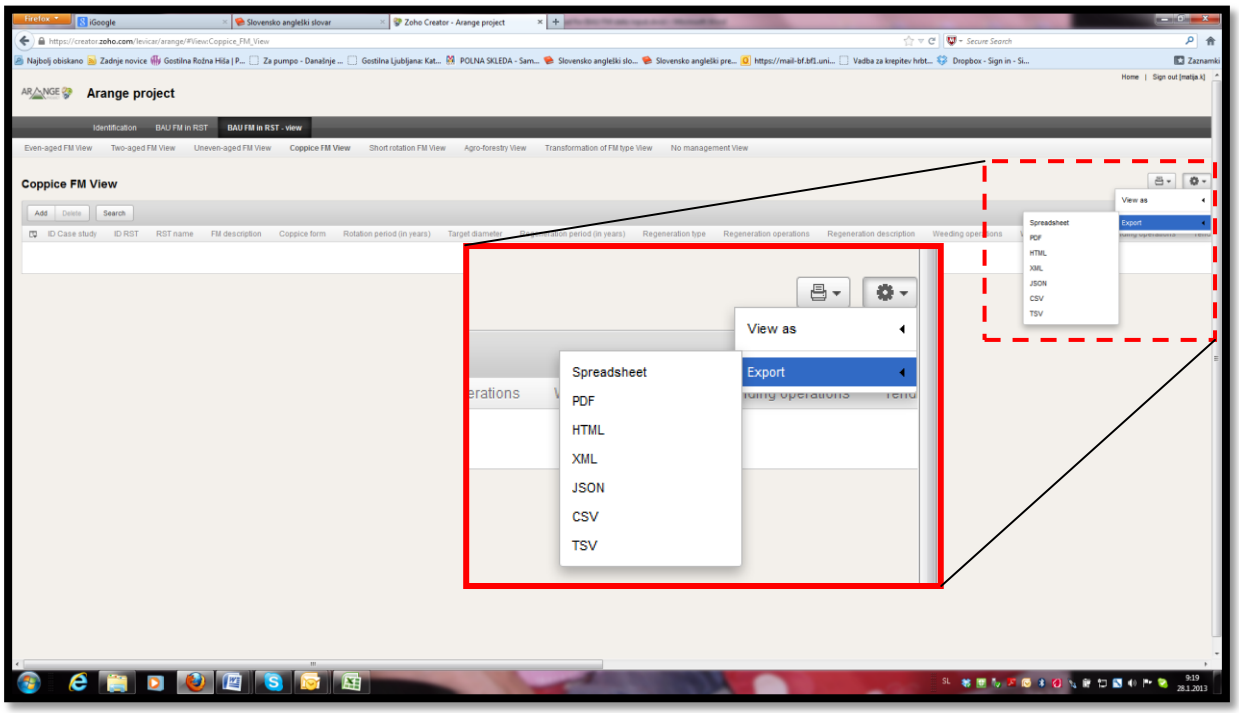
3. **When you finish editing the data record, click the »Update« button at the bottom of the page.**

Export data

Choose the »BAU FM in RST - view« worksheet and then choose the worksheet of a FM type for which you want to export the data.

1. Click on the utmost upper-right button ( ) , on the drop-down menu choose the option »export« and then choose the file format you want to export data in (Figure 6).

Figure 6: Export the data in the correct file format



Contact

If you find some inadequacies or unclearness in the Web data-collector or you may have any other feed-back or question regarding the questionnaire, the use of the Web data-collector or any other issue, please contact us as many times as you need on the email matija.klopcic@bf.uni-lj.si !

Annex 2: Current forest management description in representative stand types per case study areas

ARANGE Deliverable D1.3 – Annex 2

Current forest management description in representative stand types per case study areas

17.11.2013

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Keywords:

current forest management, bussines-as-usual forest management, forest management system, silvicultural measures, regeneration, weeding, tending, thinning, regeneration felling, removals, representative stand type

Abstract:

Annex 2 to D1.3 comprises detailed reports on bussines-as-usual forest management in each representative stand in each case study area.

TABLE OF CONTENTS

1 Introduction

This Annex to D1.3 "Current and historical management in the case study areas" represents a detailed description of current or so called "business-as-usual" forest management (BAU FM) on an individual representative stand (RST) level over the entire lifecycle of a stand type (i.e. silvicultural system).

The description of BAU FM for each RST determines regeneration operations (type of regeneration, time reference of an operation, species composition, origin), weeding and tending operations, thinnings (type, time reference, removals) and regeneration fellings (or selection fellings) (regeneration system, time reference, removals).

Such a detailed description is a basis for Task 2.4 in WP2, dealing with forest simulation models, to implement forest management into these models.

1.1 List of abbreviations

Abbreviation	Description
FM	Forest management
RDC	Relative dbh class
RST	Representative stand
SV	Stand volume

1.2 List of tree species' names

Scientific name	English name
Abies alba	silver fir
Acer pseudoplatanus	sycamore maple
Betula pubescens	downy birch
Fagus sylvatica	European beech
Fraxinus excelsior	European ash, common ash
Larix decidua	European larch
Picea abies	Norway spruce
Pinus contorta	lodgepole pine
Pinus sylvestris	Scots pine
Quercus ilex	holm oak
Quercus pyrenaica	Pyrenean oak
other conifers	other conifers
other broadleaves	other broadleaves
all species in RST	all species in RST

2 Reports per Case study areas (CSA)

2.1 CSA1 – Montes Valsain, Iberian Mountains, Spain

Case study: Montes Valsain
Representative stand: 1 Quercus ilex 100%
FM type: 80 no forest management
ID RST×FM: 1_80_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *No management due to other causes*

Description:
These stands were before grazed pasture lands. Now this activity has been abandoned and no management is applied.

Case study: Montes Valsain
Representative stand: 2 Q. pyrenaica, Q.ilex coppice
FM type: 40 coppice forest management
ID RST×FM: 2_40_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Simple coppice (even-aged coppice)*
Rotation period: *70* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase (0-130 cm in height)*
	Species compostion *Quercus pyrenaica 30 %* (origin: *Natural*, spatial arrangement: *Random*, density: *900*/ha*); Quercus ilex 70 % (Natural, Random, 900*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)*	Removals: *50* % of regeneration
THINNING	Description:	
Operation 1	Type: *From below*	Time reference: mean dbh *13* cm/ *30 years*
	Removals: ∑*36* % SV – *Quercus pyrenaica 44* %; *Quercus ilex 56* %	
	Removals' structure:	
	Quercus pyrenaica: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
	Quercus ilex: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
Operation 2	Type: *other - random*	Time reference:*;* at stand height *12,2* m / mean dbh *15* cm; *40 years*
	Removals: ∑*41* % SV – *Quercus pyrenaica 46* %; *Quercus ilex 54* %	
	Removals' structure:	
	Quercus pyrenaica: RDC1 40 %, RDC2 40 %, RDC3 20 %, RDC4 0 %, RDC5 0 %	
	Quercus ilex: RDC1 40 %, RDC2 40 %, RDC3 20 %, RDC4 0 %, RDC5 0 %	
Operation 3	Type: *other - random*	Time reference: at stand height *14,6* m / mean dbh *15,6* cm/*60 years*
	Removals: ∑*50* % SV – *Quercus pyrenaica 46* %; *Quercus ilex 54* %	
	Removals' structure:	
	Quercus pyrenaica: RDC1 60 %, RDC2 40 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	
	Quercus ilex: RDC1 52 %, RDC2 37 %, RDC3 8 %, RDC4 3 %, RDC5 0 %	
REGENERATION FELLING	Regeneration system: *8 - Coppice system*	
	Regeneration period: *0* years	
	Description: *clearcutting*	
Operation 1	Time reference:*70 years;* at mean dbh *17* cm	
	Removals: ∑*100* % SV – *Quercus pyrenaica 100* %, *Quercus ilex 100%*	
	Removals' structure:	
	All species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Montes Valsain
Representative stand: 3 dense Q. pyrenaica 100% coppice
FM type: 40 coppice forest management
ID RST×FM: 3_40_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Simple coppice (even-aged coppice)*
Rotation period: *70* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase (0-130 cm in height)*
	Species compostion *Quercus pyrenaica 100 %* (origin: *Natural*, spatial arrangement: *Random*, density: 3625/ha)	
WEEDING		
TENDING		
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)*	Removals: *50* % of regeneration
THINNING	Description: -	
Operation 1	Type: *From below*	Time reference: *30 years;* stand at mean dbh *13* cm;
	Removals: ∑*16* % SV – *Quercus pyrenaica 100* % of total removals	
	Removals' structure:	
	Quercus pyrenaica: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
Operation 2	Type: *other - random*	Time reference: *40 years;* stand at mean dbh *15* cm;
	Removals: ∑*19* % SV – *Quercus pyrenaica 100* % of total removals	
	Removals' structure:	
	Quercus pyrenaica: RDC1 40 %, RDC2 40 %, RDC3 20 %, RDC4 0 %, RDC5 0 %	
Operation 3	Type: *other - random*	Time reference: *60 years;* stand at mean dbh *15,6* cm;
	Removals: ∑*23* % SV – *Quercus pyrenaica 100* % of total removals	
	Removals' structure:	
	Quercus pyrenaica: RDC1 41 %, RDC2 34 %, RDC3 19 %, RDC4 6 %, RDC5 0 %	
REGENERATION FELLING	Regeneration system: *8 - Coppice system*	
	Regeneration period: *0* years	
	Description: *clearcutting*	
Operation 1	Time reference:*70 years;* stand at mean dbh *17* cm	
	Removals: ∑*100* % SV – *Quercus pyrenaica 100* % of species volume removed	
	Removals' structure:	
	All species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Montes Valsain
Representative stand: 4 low dense Q. pyrenaica coppice
FM type: 40 coppice forest management
ID RST×FM: 4_40_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Simple coppice (even-aged coppice)*
Rotation period: *70* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species compostion *Quercus pyrenaica 100 %* (origin: *Natural*, spatial arrangement: *Random*, density: *9000*/ha)
WEEDING	
TENDING	
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)* Removals: *67* % of regeneration
THINNING	Description: -
Operation 1	Type: *From below* Time reference: *30 years;* stand at mean dbh *10* cm; Removals: ∑*11* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %
Operation 2	Type: *other - random* Time reference: *40 years;* stand at mean dbh *14* cm; Removals: ∑*24* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 32 %, RDC2 32 %, RDC3 20 %, RDC4 8 %, RDC5 8 %
Operation 3	Type: *other - random* Time reference: *50 years;* stand at mean dbh *15* cm; Removals: ∑*19* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 27 %, RDC2 27 %, RDC3 20 %, RDC4 13 %, RDC5 13 %
Operation 4	Type: *other - random* Time reference: *60 years;* stand at mean dbh *21* cm; Removals: ∑*28* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 25 %, RDC2 42 %, RDC3 28 %, RDC4 5 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *8 - Coppice system* Regeneration period: *0* years Description: clearcutting
Operation 1	Time reference: *70 years;* stand at mean dbh *24* cm Removals: ∑*100* % SV – *Quercus pyrenaica 100* % of species volume removed Removals' structure: *All species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montes Valsain
Representative stand: 5 mature evenaged Psylvestris, coppice Q.pyrenaica
FM type: 10 even-aged forest management
ID RST×FM: 5_1040_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *120* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: - Species compostion *Pinus sylvestris 30 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *1750*/ha*); Quercus pyrenaica 70 %* (*Natural, In patches*, 1850/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)* Removals: *54* % of regeneration
THINNING	Description: *%SV Thinning: first from below. Rest: random*
Operation 1	Type: *From below* Time reference: *40 years; Older pole phase (20-30cm DBH)* at stand height *13,9* m; Removals: ∑*26* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 60 %, RDC2 40 %, RDC3 0 %, RDC4 0 %, RDC5 0 %
Operation 2	Type: *other - random* Time reference: *60 years; Mature phase (30-50cm DBH)* at stand height *21,6* m; Removals: ∑*9* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 6 %, RDC2 56 %, RDC3 38 %, RDC4 0 %, RDC5 0 %
Operation 3	Type: *other - random* Time reference: *80 years; Mature phase (30-50cm DBH)* at stand height *26,3* m; Removals: ∑*23* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 6 %, RDC2 25 %, RDC3 31 %, RDC4 26 %, RDC5 12 %
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)* Regeneration period: *20* years Description: *regeneration fellings are done over a 20 years regeneration period in order to perpetuate the semi-unevenaged structure of the stands. The regeneration fellings are applied at each compartment (ca. 20 ha). In P.sylvestris(30%)-Q. pyrenaica (70%) mixed stands, the opening of the canopy is done along 20 years through 3 steps (density is low): Operation 1 (seeding fellings): half of the trees are cut. It includes fitosanitary fellings (all dead, damaged, dominated and ill trees are removed). In this first step the compartment is visited searching for four to five promising groups of regeneration (>1 ha). If these groups require freeing, the gaps are widened. The seeding felling is made in the form of a ring around each gap. Thus, regeneration spreads centrifugally around each gap. Operation 2 (secondary fellings)should be done only when regeneration is assured. It is done along 15-20 years in order to open gaps to free groups of regeneration that are being supressed under the canopy. This operation removes between ½ and 2/3 of the stand, depending on stoniness, edaphology, slope, and difficulties in the harvesting operations. Operation 3 (final fellings): after this fellings, 5 to 15 large diameter trees/ha are maintained (dbh>55-60 cm).*
Operation 1	Time reference: *100 years; Over mature (>50cm DBH)* at stand height *29* m; Removals: ∑*49* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 0 %, RDC2 0 %, RDC3 4 %, RDC4 24 %, RDC5 72 %
Operation 2	Time reference: *110 years; Over mature (>50cm DBH);* Removals: ∑*32* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 3 %, RDC2 3 %, RDC3 20 %, RDC4 37 %, RDC5 37 %

Operation 3	Time reference: *120 years; Over mature (>50cm DBH);* Removals: ∑*40* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 3 %, RDC2 3 %, RDC3 20 %, RDC4 37 %, RDC5 37 %

Case study: Montes Valsain
Representative stand: 5 evenaged P.sylvestris, coppice Q.pyrenaica
FM type: 40 coppice forest management
ID RST×FM: 5_1040_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Simple coppice (even-aged coppice)*
Rotation period: *70* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase (0-130 cm in height)*
	Species compostion *Pinus sylvestris 30 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *1750*/ha*); Quercus pyrenaica 70 %* (*Natural*, *In patches*, 1850/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)*	Removals: *27* % of regeneration
THINNING	Description: -	
Operation 1	Type: *From below*	Time reference: *30 years;* stand at mean dbh *13* cm;
	Removals: ∑*16* % SV – *Quercus pyrenaica 100* % of total removals	
	Removals' structure:	
	Quercus pyrenaica: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
Operation 2	Type: *other - random*	Time reference: *40 years;* stand at mean dbh *15* cm;
	Removals: ∑*19* % SV – *Quercus pyrenaica 100* % of total removals	
	Removals' structure:	
	Quercus pyrenaica: RDC1 40 %, RDC2 40 %, RDC3 20 %, RDC4 0 %, RDC5 0 %	
Operation 3	Type: *other - random*	Time reference: *60 years;* stand at mean dbh *16* cm;
	Removals: ∑*23* % SV – *Quercus pyrenaica 100* % of total removals	
	Removals' structure:	
	Quercus pyrenaica: RDC1 41 %, RDC2 34 %, RDC3 19 %, RDC4 6 %, RDC5 0 %	
REGENERATION FELLING	Regeneration system: *8 - Coppice system*	
	Regeneration period: *0* years	
	Description: clearcutting	
Operation 1	Time reference: *70 years;* stand at mean dbh *17* cm	
	Removals: ∑*100* % SV – *Quercus pyrenaica 100* % of species volume removed	
	Removals' structure:	
	All species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Montes Valsain
Representative stand: 6 evenaged P.sylvestris, coppice Q.pyrenaica
FM type: 10 even-aged forest management
ID RST×FM: 6_1040_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *120* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: -
	Species compostion: *Pinus sylvestris 70 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); Quercus pyrenaica 30 %* (*Natural, In patches, 1850*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)* Removals: *60* % of regeneration
THINNING	Description: *%SV*
Operation 1	Type: *From below* Time reference: *40 years; Older pole phase (20-30cm DBH)* at stand height *13,9* m;
	Removals: ∑*18* % SV – *Pinus sylvestris 100* % of total removals
	Removals' structure:
	Pinus sylvestris: RDC1 60 %, RDC2 40 %, RDC3 0 %, RDC4 0 %, RDC5 0 %
Operation 2	Type: *other - random* Time reference: *60 years; Mature phase (30-50cm DBH)* at stand height *21,6* m;
	Removals: ∑*14* % SV – *Pinus sylvestris 100* % of total removals
	Removals' structure:
	Pinus sylvestris: RDC1 30 %, RDC2 31 %, RDC3 25 %, RDC4 14 %, RDC5 0 %
Operation 3	Type: *other - random* Time reference: *80 years; Mature phase (30-50cm DBH)* at stand height *26,3* m;
	Removals: ∑*22* % SV – *Pinus sylvestris 100* % of total removals
	Removals' structure:
	Pinus sylvestris: RDC1 1 %, RDC2 31 %, RDC3 40 %, RDC4 29 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *20* years
	Description: *regeneration fellings are done over a 20 years regeneration period in order to perpetuate the semi-unevenaged structure of the stands. The regeneration fellings are applied at each compartment (ca. 20 ha). The opening of the canopy is done along 20 years through 4 steps: Operation 1 (seeding fellings): half of the trees are cut. It includes fitosanitary fellings (all dead, damaged, dominated and ill trees are removed). In this first step the compartment is visited searching for four to five promising groups of regeneration (>1 ha). If these groups require freeing, the gaps are widened. The seeding felling is made in the form of a ring around each gap. Thus, regeneration spreads centrifugally around each gap. Operation 2 (two secondary fellings)should be done only when regeneration is assured. It is done along 15-20 years in order to open gaps to free groups of regeneration that are being supressed under the canopy. This operation removes between ½ and 2/3 of the stand, depending on stoniness, edaphology, slope, and difficulties in the harvesting operations. Operation 3 (final fellings): after this fellings, 5 to 15 large diameter trees/ha are maintained (dbh>55-60 cm).*
Operation 1	Time reference: *100 years; Mature phase (30-50cm DBH)* at stand height *29* m;
	Removals: ∑*44* % SV – *Pinus sylvestris 100* % of total removals
	Removals' structure:
	Pinus sylvestris: RDC1 0 %, RDC2 1 %, RDC3 4 %, RDC4 23 %, RDC5 72 %
Operation 2	Time reference: *110 years; Over mature (>50cm DBH)*
	Removals: ∑*39* % SV – *Pinus sylvestris 100* % of total removals
	Removals' structure:
	Pinus sylvestris: RDC1 4 %, RDC2 4 %, RDC3 20 %, RDC4 36 %, RDC5 36 %
Operation 3	Time reference: *115 years; Over mature (>50cm DBH)*

	Removals: ∑*33* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 4 %, RDC2 4 %, RDC3 20 %, RDC4 36 %, RDC5 36 %
Operation 4	Time reference: *120 years; Over mature (>50cm DBH)* Removals: ∑*40* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 2 %, RDC2 2 %, RDC3 20 %, RDC4 38 %, RDC5 38 %

Case study: Montes Valsain
Representative stand: 6 unevenaged P.sylvestris, coppice Q.pyrenaica
FM type: 40 coppice forest management
ID RST×FM: 6_1040_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Simple coppice (even-aged coppice)*
Rotation period: *70* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species compostion: *Pinus sylvestris 70 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); Quercus pyrenaica 30 %* (*Natural, In patches, 1850*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)* Removals: *76* % of regeneration
Operation 1	Type: *From below* Time reference: *30 years;* stand at mean dbh *13* cm; Removals: ∑*16* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %
Operation 2	Type: *other - random* Time reference: *40 years;* stand at mean dbh *15* cm; Removals: ∑*19* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 40 %, RDC2 40 %, RDC3 20 %, RDC4 0 %, RDC5 0 %
Operation 3	Type: *other - random* Time reference: *60 years;* stand at mean dbh *16* cm; Removals: ∑*23* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 41 %, RDC2 34 %, RDC3 20 %, RDC4 6 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *8 - Coppice system* Regeneration period: *0* years Description: clearcutting
Operation 1	Time reference: *70 years;* stand at mean dbh *17* cm Removals: ∑*100* % SV – *Quercus pyrenaica 100* % of species volume removed Removals' structure: *All species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montes Valsain
Representative stand: 7 dense Q.pyrenaica coppice
FM type: 40 coppice forest management
ID RST×FM: 7_40_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Simple coppice (even-aged coppice)*
Rotation period: *70* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase (0-130 cm in height)*
	Species compostion *Quercus pyrenaica 100 %* (origin: *Natural*, spatial arrangement: *Random*, density: *3625*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)*	Removals: *50* % of regeneration
THINNING	Description: -	
Operation 1	Type: *From below*	Time reference: *30 years;* stand at mean dbh *13* cm;
	Removals: ∑*16* % SV – *Quercus pyrenaica 100* % of total removals	
	Removals' structure:	
	Quercus pyrenaica: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
Operation 2	Type: *other - random*	Time reference: *40 years;* stand at mean dbh *15* cm;
	Removals: ∑*19* % SV – *Quercus pyrenaica 100* % of total removals	
	Removals' structure:	
	Quercus pyrenaica: RDC1 40 %, RDC2 40 %, RDC3 20 %, RDC4 0 %, RDC5 0 %	
Operation 3	Type: *other - random*	Time reference: *60 years;* stand at mean dbh *16* cm;
	Removals: ∑*23* % SV – *Quercus pyrenaica 100* % of total removals	
	Removals' structure:	
	Quercus pyrenaica: RDC1 41 %, RDC2 34 %, RDC3 25 %, RDC4 0 %, RDC5 0 %	
REGENERATION FELLING	Regeneration system: *8 - Coppice system*	
	Regeneration period: *0* years	
	Description: clearcutting	
Operation 1	Time reference: *70 years;* stand at mean dbh *17* cm	
	Removals: ∑*100* % SV – *Quercus pyrenaica 100* % of species volume removed	
	Removals' structure:	
	All species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Montes Valsain
Representative stand: 8 low dense Q. pyrenaica coppice
FM type: 40 coppice forest management
ID RST×FM: 8_40_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Simple coppice (even-aged coppice)*
Rotation period: *70* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase (0-130 cm in height)*
	Species compostion *Quercus pyrenaica 100 %* (origin: *Natural*, spatial arrangement: *Random*, density: *9000*/ha)	
WEEDING		
TENDING		
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)*	Removals: *67* % of regeneration
THINNING	Description: -	
Operation 1	Type: *From below*	Time reference: *30 years;* stand at mean dbh *10* cm;
	Removals: ∑*8* % SV – *Quercus pyrenaica 100* % of total removals	
	Removals' structure:	
	Quercus pyrenaica: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
Operation 2	Type: *other - random*	Time reference: *40 years;* stand at mean dbh *14* cm;
	Removals: ∑*20* % SV – *Quercus pyrenaica 100* % of total removals	
	Removals' structure:	
	Quercus pyrenaica: RDC1 32 %, RDC2 32 %, RDC3 20 %, RDC4 8 %, RDC5 8 %	
Operation 3	Type: *other - random*	Time reference: *50 years;* stand at mean dbh *15* cm;
	Removals: ∑*12* % SV – *Quercus pyrenaica 100* % of total removals	
	Removals' structure:	
	Quercus pyrenaica: RDC1 27 %, RDC2 27 %, RDC3 20 %, RDC4 13 %, RDC5 13 %	
Operation 4	Type: *other - random*	Time reference: *60 years;* stand at mean dbh *21* cm;
	Removals: ∑*21* % SV – *Quercus pyrenaica 100* % of total removals	
	Removals' structure:	
	Quercus pyrenaica: RDC1 25 %, RDC2 42 %, RDC3 28 %, RDC4 5 %, RDC5 0 %	
REGENERATION FELLING	Regeneration system: *8 - Coppice system*	
	Regeneration period: *0* years	
	Description: clearcutting-	
Operation 1	Time reference: *70 years;* stand at mean dbh *24* cm	
	Removals: ∑*100* % SV – *Quercus pyrenaica 100* % of species volume removed	
	Removals' structure:	
	All species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Montes Valsain
Representative stand: 9 dense Q.pyrenaica coppice ST=4
FM type: 40 coppice forest management
ID RST×FM: 9_40_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Simple coppice (even-aged coppice)*
Rotation period: *70* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species compostion *Quercus pyrenaica 100 %* (origin: *Natural*, spatial arrangement: *Random*, density: *4500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)* Removals: *60* % of regeneration
THINNING	Description: -
Operation 1	Type: *From below* Time reference: *30 years;* stand at mean dbh *13* cm; Removals: ∑*16* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %
Operation 2	Type: *other - random* Time reference: *40 years;* stand at mean dbh *15* cm; Removals: ∑*19* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 40 %, RDC2 40 %, RDC3 20 %, RDC4 0 %, RDC5 0 %
Operation 3	Type: *other - random* Time reference: *60 years;* stand at mean dbh *16* cm; Removals: ∑*23* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 41 %, RDC2 34 %, RDC3 19 %, RDC4 6 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *8 - Coppice system* Regeneration period: *0* years Description: clearcutting
Operation 1	Time reference: *70 years;* stand at mean dbh *17* cm Removals: ∑*100* % SV – *Quercus pyrenaica 100* % of species volume removed Removals' structure: *All species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montes Valsain
Representative stand: 10 low dense Q.pyrenaica coppice ST=4
FM type: 40 coppice forest management
ID RST×FM: 10_40_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Simple coppice (even-aged coppice)*
Rotation period: *70* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species compostion *Quercus pyrenaica 100 %* (origin: *Natural*, spatial arrangement: *Random*, density: *4500*/ha)
WEEDING	
TENDING	
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)* Removals: *33* % of regeneration
THINNING	Description: *0*
Operation 1	Type: *From below* Time reference: *30 years;* stand at mean dbh *7,5* cm; Removals: ∑*11* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %
Operation 2	Type: *other - random* Time reference: *40 years;* stand at mean dbh *9,1*cm; Removals: ∑*24* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 32 %, RDC2 32 %, RDC3 20 %, RDC4 8 %, RDC5 8 %
Operation 3	Type: *other - random* Time reference: *50 years;* stand at mean dbh *10,3* cm; Removals: ∑*19* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 27 %, RDC2 27 %, RDC3 20 %, RDC4 13 %, RDC5 13 %
Operation 4	Type: *other - random* Time reference: *60 years;* stand at mean dbh *11,3* cm; Removals: ∑*28* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 25 %, RDC2 43 %, RDC3 28 %, RDC4 4 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *8 - Coppice system*
Operation 1	Regeneration period: *0* years Description: clearcutting Time reference: *70 years;* stand at mean dbh *24* cm Removals: ∑*100* % SV – *Quercus pyrenaica 100* % of species volume removed Removals' structure: *All species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montes Valsain
Representative stand: 11 even-aged pure P.sylvestris, ST=5
FM type: 10 even-aged forest management
ID RST×FM: 11_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *120* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase (0-130 cm in height)*
	Species compostion *Pinus sylvestris 100 %* (origin: *Natural,* spatial arrangement: *In patches*, density: *6500*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)* at stand height *4* m / mean dbh *6,3* cm	Removals: *69* % of regeneration
THINNING	Description: *First thinning is from below, but the rest are selective thinnings; %SV tree removals*	
Operation 1	Type: *From below*	Time reference: *40 years; Older pole phase (20-30cm DBH)* at stand height *12,4* m / mean dbh *18,6* cm;
	Removals: ∑*23* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 60 %, RDC2 40 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	
Operation 2	Type: *other - random*	Time reference: *60 years; Mature phase (30-50cm DBH)* at stand height *19,3* m / mean dbh *33,3* cm;
	Removals: ∑*12* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 8 %, RDC2 68 %, RDC3 24 %, RDC4 0 %, RDC5 0 %	
Operation 3	Type: *other - random*	Time reference: *80 years; Mature phase (30-50cm DBH)* at stand height *23,6* m / mean dbh *42* cm;
	Removals: ∑*28* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 8 %, RDC2 48 %, RDC3 36 %, RDC4 8 %, RDC5 0 %	
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*	
	Regeneration period: *20* years Description: *- regeneration fellings are done over a 20 years regeneration period in order to perpetuate the semi-unevenaged structure of the stands. The regeneration fellings are applied at each compartment (ca. 20 ha). The opening of the canopy is done along 20 years through 4 steps: Operation 1 (seeding fellings): half of the trees are cut. It includes fitosanitary fellings (all dead, damaged, dominated and ill trees are removed). In this first step the compartment is visited searching for four to five promising groups of regeneration (>1 ha). If these groups require freeing, the gaps are widened. The seeding felling is made in the form of a ring around each gap. Thus, regeneration spreads centrifugally around each gap. Operation 2 (two secondary fellings)should be done only when regeneration is assured. It is done along 15-20 years in order to open gaps to free groups of regeneration that are being supressed under the canopy. This operation removes between ½ and 2/3 of the stand, depending on stoniness, edaphology, slope, and difficulties in the harvesting operations. Operation 3 (final fellings): after this fellings, 5 to 15 large diameter trees/ha are maintained (dbh>55-60 cm).*	
Operation 1	Time reference: *100 years; Over mature (>50cm DBH)* at stand height *26* m Removals: ∑*53* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 0 %, RDC2 3 %, RDC3 5 %, RDC4 38 %, RDC5 54 %	
Operation 2	Time reference: *110 years; Over mature (>50cm DBH)* Removals: ∑*38* % SV – *Pinus sylvestris 100* % of total removals	

	Removals' structure: *Pinus sylvestris*: RDC1 0 %, RDC2 3 %, RDC3 5 %, RDC4 38 %, RDC5 54 %
Operation 3	Time reference: *115 years; Over mature (>50cm DBH)* Removals: ∑*32* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 0 %, RDC2 3 %, RDC3 5 %, RDC4 38 %, RDC5 54 %
Operation 4	Time reference: *120 years; Over mature (>50cm DBH)* Removals: ∑*38* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 0 %, RDC2 2 %, RDC3 3 %, RDC4 39 %, RDC5 56 %

Case study: Montes Valsain
Representative stand: 12 evenaged mature P.sylvestris, coppice Q. pyrenaica
FM type: 10 even-aged forest management
ID RST×FM: 12_1040_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *120* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: Species compostion: *Pinus sylvestris 70 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *3000*/ha); *Quercus pyrenaica 30 %* (*Natural*, *In patches*, *925*/ha)
WEEDING	
TENDING	
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)* Removals: *67* % of regeneration at mean dbh *6,3* cm
THINNING	Description: *first thinning: from below; rest: random*
Operation 1	Type: *From below* Time reference: *40 years; Older pole phase (20-30cm DBH)* at stand height *12,4* m; Removals: ∑*18* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 60 %, RDC2 40 %, RDC3 0 %, RDC4 0 %, RDC5 0 %
Operation 2	Type: *other - random* Time reference: *60 years; Mature phase (30-50cm DBH)* at stand height *19,3* m; Removals: ∑*14* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 30 %, RDC2 31 %, RDC3 25 %, RDC4 14 %, RDC5 0 %
Operation 3	Type: *other - random* Time reference: *80 years; Mature phase (30-50cm DBH)* at stand height *23,6* m: Removals: ∑*21* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 1 %, RDC2 30 %, RDC3 40 %, RDC4 29 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *20* years Description: *- regeneration fellings are done over a 20 years regeneration period in order to perpetuate the semi-unevenaged structure of the stands. The regeneration fellings are applied at each compartment (ca. 20 ha). The opening of the canopy is done along 20 years through 4 steps: Operation 1 (seeding fellings): half of the trees are cut. It includes fitosanitary fellings (all dead, damaged, dominated and ill trees are removed). In this first step the compartment is visited searching for four to five promising groups of regeneration (>1 ha). If these groups require freeing, the gaps are widened. The seeding felling is made in the form of a ring around each gap. Thus, regeneration spreads centrifugally around each gap. Operation 2 (two secondary fellings)should be done only when regeneration is assured. It is done along 15-20 years in order to open gaps to free groups of regeneration that are being supressed under the canopy. This operation removes between ½ and 2/3 of the stand, depending on stoniness, edaphology, slope, and difficulties in the harvesting operations. Operation 3 (final fellings): after this fellings, 5 to 15 large diameter trees/ha are maintained (dbh>55-60 cm).*
Operation 1	Time reference: *100 years; Over mature (>50cm DBH)* Removals: ∑*43* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 0 %, RDC2 1 %, RDC3 4 %, RDC4 23 %, RDC5 72 %
Operation 2	Time reference: *110 years; Over mature (>50cm DBH)* Removals: ∑*38* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 4 %, RDC2 4 %, RDC3 20 %, RDC4 36 %, RDC5 36 %
Operation 3	Time reference: *115 years; Over mature (>50cm DBH)*

	Removals: ∑*32* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 4 %, RDC2 4 %, RDC3 20 %, RDC4 36 %, RDC5 36 %
Operation 4	Time reference: *120 years; Over mature (>50cm DBH)* Removals: ∑ *38* % SV – *Pinus sylvestris 100*% of total removals Removals' structure: *Pinus sylvestris*: RDC1 2 %, RDC2 2 %, RDC3 20 %, RDC4 38 %, RDC5 38 %

Case study: Montes Valsain
Representative stand: 12 evenaged P.sylvestris, coppice Q.pyrenaica
FM type: 40 coppice forest management
ID RST×FM: 12_1040_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Simple coppice (even-aged coppice)*
Rotation period: *70* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species compostion: *Pinus sylvestris 70 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *3000*/ha); *Quercus pyrenaica 30 %* (*Natural*, *In patches*, *925*/ha)
WEEDING	
TENDING	
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)* Removals: *51* % of regeneration
THINNING	Description: -
Operation 1	Type: *From below* Time reference: *30 years;* stand at mean dbh *13* cm; Removals: ∑*16* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %
Operation 2	Type: *other - random* Time reference: *40 years;* stand at mean dbh *15* cm; Removals: ∑*19* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 40 %, RDC2 40 %, RDC3 20 %, RDC4 0 %, RDC5 0 %
Operation 3	Type: *other - random* Time reference: *60 years;* stand at mean dbh *15,6* cm; Removals: ∑*9* % SV – *Quercus pyrenaica 100* % of total removals Removals' structure: *Quercus pyrenaica*: RDC1 60 %, RDC2 40 %, RDC3 0 %, RDC4 0 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *8 - Coppice system* Regeneration period: *0* years Description: clearcutting
Operation 1	Time reference: *70 years;* stand at mean dbh *17* cm Removals: ∑*100* % SV – *Quercus pyrenaica 100* % of species volume removed Removals' structure: *All species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montes Valsain
Representative stand: 13 pure even-aged P. sylvestris, ST=6
FM type: 10 even-aged forest management
ID RST×FM: 13_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *120* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: - Species compostion *Pinus sylvestris 100 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *4750*/ha)
WEEDING	
TENDING	
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)* at stand height *3,6* m / mean dbh *5,6* cm Removals: *58* % of regeneration
THINNING	Description: *First thinning is from below; rest: selective thinnings*
Operation 1	Type: *From below* Time reference: *40 years; Early pole phase (10-20cm DBH)* at stand height *10,9* m / mean dbh *14,8* cm; Removals: ∑*19* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 60 %, RDC2 40 %, RDC3 0 %, RDC4 0 %, RDC5 0 %
Operation 2	Type: *other - random* Time reference: *60 years; Older pole phase (20-30cm DBH)* at stand height *16,8* m / mean dbh *26,18* cm; Removals: ∑*11* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 29 %, RDC2 46 %, RDC3 25%, RDC4 0 %, RDC5 0 %
Operation 3	Type: *other - random* Time reference: *80 years; Mature phase (30-50cm DBH)* at stand height *20,6* m / mean dbh *32,7* cm; Removals: ∑*25* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 60 %, RDC2 29 %, RDC3 11 %, RDC4 0 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *20* years Description: *- regeneration fellings are done over a 20 years regeneration period in order to perpetuate the semi-unevenaged structure of the stands. The regeneration fellings are applied at each compartment (ca. 20 ha). The opening of the canopy is done along 20 years through 4 steps: Operation 1 (seeding fellings): half of the trees are cut. It includes fitosanitary fellings (all dead, damaged, dominated and ill trees are removed). In this first step the compartment is visited searching for four to five promising groups of regeneration (>1 ha). If these groups require freeing, the gaps are widened. The seeding felling is made in the form of a ring around each gap. Thus, regeneration spreads centrifugally around each gap. Operation 2 (two secondary fellings)should be done only when regeneration is assured. It is done along 15-20 years in order to open gaps to free groups of regeneration that are being supressed under the canopy. This operation removes between ½ and 2/3 of the stand, depending on stoniness, edaphology, slope, and difficulties in the harvesting operations. Operation 3 (final fellings): after this fellings, 5 to 15 large diameter trees/ha are maintained (dbh>55-60 cm).*
Operation 1	Time reference: *100 years; Over mature (>50cm DBH)* at stand height *23* m Removals: ∑*51* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 0 %, RDC2 3 %, RDC3 13 %, RDC4 30 %, RDC5 54 %
Operation 2	Time reference: *110 years; Over mature (>50cm DBH)* Removals: ∑*36* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 0 %, RDC2 3 %, RDC3 13 %, RDC4 30 %, RDC5 54 %

Operation 3	Time reference: *115 years; Over mature (>50cm DBH)* Removals: ∑*29* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 0 %, RDC2 3 %, RDC3 13 %, RDC4 30 %, RDC5 54 %
Operation 4	Time reference: *120 years; Over mature (>50cm DBH)* Removals: ∑*33* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 0 %, RDC2 2 %, RDC3 11 %, RDC4 30 %, RDC5 57 %

Case study: Montes Valsain
Representative stand: 14 pure even-aged P.sylvestris, ST=7
FM type: 10 even-aged forest management
ID RST×FM: 14_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *120* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: - Species compostion *Pinus sylvestris 100 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *3250*/ha)
WEEDING	
TENDING	
Operation 1	Time reference: *20 years; Thicket phase (>130cm height, <10cm DBH)* Removals: *38* % of regeneration at mean dbh *4,4* cm
THINNING	Description:
Operation 1	Type: *From below* Time reference: *40 years; Early pole phase (10-20cm DBH)* at stand height *7,9* m / mean dbh *14,9* cm; Removals: ∑*17* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 39 %, RDC2 39 %, RDC3 22 %, RDC4 0 %, RDC5 0 %
Operation 2	Type: *other - random* Time reference: *60 years; Older pole phase (20-30cm DBH)* at stand height *12,1* m / mean dbh *20,6* cm; Removals: ∑*9* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 40 %, RDC2 33 %, RDC3 27 %, RDC4 0 %, RDC5 0 %
Operation 3	Type: *other - random* Time reference: *80 years; Mature phase (30-50cm DBH)* at stand height *15,1* m / mean dbh *30* cm; Removals: ∑*23* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 4 %, RDC2 32 %, RDC3 38 %, RDC4 26 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)* Regeneration period: *20* years Description: *- regeneration fellings are done over a 20 years regeneration period in order to perpetuate the semi-unevenaged structure of the stands. The regeneration fellings are applied at each compartment (ca. 20 ha). The opening of the canopy is done along 20 years through 4 steps: Operation 1 (seeding fellings): half of the trees are cut. It includes fitosanitary fellings (all dead, damaged, dominated and ill trees are removed). In this first step the compartment is visited searching for four to five promising groups of regeneration (>1 ha). If these groups require freeing, the gaps are widened. The seeding felling is made in the form of a ring around each gap. Thus, regeneration spreads centrifugally around each gap. Operation 2 (two secondary fellings)should be done only when regeneration is assured. It is done along 15-20 years in order to open gaps to free groups of regeneration that are being supressed under the canopy. This operation removes between ½ and 2/3 of the stand, depending on stoniness, edaphology, slope, and difficulties in the harvesting operations. Operation 3 (final fellings): after this fellings, 5 to 15 large diameter trees/ha are maintained (dbh>55-60 cm).*
Operation 1	Time reference: *100 years; Mature phase (30-50cm DBH)* Removals: ∑*47* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 1 %, RDC2 6 %, RDC3 20 %, RDC4 34 %, RDC5 39 %
Operation 2	Time reference: *110 years; Mature phase (30-50cm DBH)* Removals: ∑*31* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 1 %, RDC2 6 %, RDC3 20 %, RDC4 34 %, RDC5 39 %
Operation 3	Time reference: *115 years; Mature phase (30-50cm DBH)*

	Removals: ∑*23* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 1 %, RDC2 6 %, RDC3 20 %, RDC4 34 %, RDC5 39 %
Operation 4	Time reference: *120 years; Mature phase (30-50cm DBH)* Removals: ∑*25* % SV – *Pinus sylvestris 100* % of total removals Removals' structure: *Pinus sylvestris*: RDC1 1 %, RDC2 6 %, RDC3 20 %, RDC4 34 %, RDC5 39 %

2.2 CSA2 – Vercors, Western Alps, France

Case study: Vercors
Representative stand: 1 Old beech coppice
FM type: 80 no forest management
ID RST×FM: 1_80_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
In private forests, no management can be due to other causes than inaccessibility.

Case study: Vercors
Representative stand: 2 "75%spruce, 25%fir"
FM type: 30 uneven-aged forest management
ID RST×FM: 2_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 58,7 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *400*/ha); *Picea abies 30,4 % (Natural, Random, 207*/ha); *other broadleaves 7,2 % (Natural, Random, 49*/ha); *Acer pseudoplatanus 3,5 % (Natural, Random, 24*/ha); *Fagus sylvatica 0,2 % (Natural, Random, 1*/ha)	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand ;* at stand	Removals: *10* % of regeneration
THINNING	Description: *Thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *8* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG – *Abies alba 25* % of total removals; *Picea abies 75* %; Removals' structure: *Picea abies*: RDC1 5 %, RDC2 15 %, RDC3 15 %, RDC4 40 %, RDC5 25 % *Abies alba* : RDC1 5 %, RDC2 15 %, RDC3 15 %, RDC4 40 %, RDC5 25 %	

Case study: Vercors
Representative stand: 2 "75%spruce, 25%fir"
FM type: 80 no forest management
ID RST×FM: 2_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *No management due to other causes*

Description:
-

Case study: Vercors
Representative stand: 3 "90%spruce, 10%fir"
FM type: 30 uneven-aged forest management
ID RST×FM: 3_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 18 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *53*/ha*); Picea abies 45,9 % (Natural, Random, 138*/ha*); other broadleaves 36 % (Natural, Random, 99*/ha*); Fagus sylvatica 0,1 % (Natural, Random, 10*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand*	
	Removals: ∑ *20* % SG –*Abies alba 10* % of total removals; *Picea abies 90* %; Removals' structure: *Abies alba*: RDC1 25 %, RDC2 30 %, RDC3 30 %, RDC4 15 %, RDC5 0 % *Picea abies* : RDC1 25 %, RDC2 30 %, RDC3 30 %, RDC4 15 %, RDC5 0 %	

Case study: Vercors
Representative stand: 3 "90%spruce, 10%fir"
FM type: 80 no forest management
ID RST×FM: 3_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
In private forests, no management can be due to other causes than inaccessibility.

Case study: Vercors
Representative stand: 4 "60%spruce, 40%fir"
FM type: 30 uneven-aged forest management
ID RST×FM: 4_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 62,3 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *463*/ha*); Picea abies 0,4 % (Natural, Random, 3*/ha*); Fagus sylvatica 21 % (Natural, Random, 156*/ha*); Acer pseudoplatanus 6,6 % (Natural, Random, 49*/ha*); other broadleaves 9,7 % (Natural, Random, 72*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *8* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG –*Abies alba 35* % of total removals; *Picea abies 65* %; Removals' structure: *Abies alba*: RDC1 5 %, RDC2 5 %, RDC3 35 %, RDC4 40 %, RDC5 15 % *Picea abies*: RDC1 5 %, RDC2 5 %, RDC3 35 %, RDC4 40 %, RDC5 15 %	

Case study: Vercors
Representative stand: 4 "60%spruce, 40%fir"
FM type: 80 no forest management
ID RST×FM: 4_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *No management due to other causes*

Description:
-

Case study: Vercors
Representative stand: 5 "70%fir, 15%spruce, 15% deciduous species (beech dominant)"
FM type: 30 uneven-aged forest management
ID RST×FM: 5_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 39,5 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *324*/ha*); Picea abies 10,5 % (Natural, Random, 86*/ha*); Fagus sylvatica 49,6 % (Natural, Random, 408*/ha*); other broadleaves 0,4 % (Natural, Random, 3*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG –*Abies alba 75* % of total removals; *Picea abies 15* %; Fagus *sylvatica 10* % Removals' structure: *Abies alba*: RDC1 10 %, RDC2 15 %, RDC3 25 %, RDC4 35 %, RDC5 15 % *Picea abies*: RDC1 10 %, RDC2 15 %, RDC3 25 %, RDC4 35 %, RDC5 15 % *Fagus sylvatica* : RDC1 10 %, RDC2 15 %, RDC3 25 %, RDC4 35 %, RDC5 15 %	

Case study: Vercors
Representative stand: 5 "70%fir, 15%spruce, 15% deciduous species (beech dominant)"
FM type: 80 no forest management
ID RST×FM: 5_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
In private forests, no management can be due to other causes than inaccesibility.

Case study: Vercors
Representative stand: 6 "60%fir, 20%spruce, 20% deciduous species (beech dominant)"
FM type: 30 uneven-aged forest management
ID RST×FM: 6_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 36,9 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *467*/ha*); Picea abies 8,3 % (Natural, Random, 105*/ha*); Fagus sylvatica 52,6 % (Natural, Random, 667*/ha*); other broadleaves 2,2 % (Natural, Random, 28*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG –*Abies alba 60* % of total removals; *Picea abies 30* %; *Fagus sylvatica 10* % Removals' structure: *Abies alba*: RDC1 10 %, RDC2 20 %, RDC3 50 %, RDC4 20 %, RDC5 0 % *Picea abies*: RDC1 10 %, RDC2 20 %, RDC3 50 %, RDC4 20 %, RDC5 0 % *Fagus sylvatica*: RDC1 10 %, RDC2 20 %, RDC3 50 %, RDC4 20 %, RDC5 0 %	

Case study: Vercors
Representative stand: 6 "60%fir, 20%spruce, 20% deciduous species (beech dominant)"
FM type: 80 no forest management
ID RST×FM: 6_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
In private forests, no management can be due to other causes than inaccessibility.

Case study: Vercors
Representative stand: 7 "45%fir,45%spruce, 10% deciduous species (beech dominant)"
FM type: 30 uneven-aged forest management
ID RST×FM: 7_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 31,8 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *321*/ha*); Fagus sylvatica 49,3 % (Natural, Random, 497*/ha*); Acer pseudoplatanus 4,8 % (Natural, Random, 48*/ha*); other broadleaves 14,1 % (Natural, Random, 142*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG –*Abies alba 50* % of total removals; *Picea abies 50* %; Removals' structure: *Abies alba*: RDC1 10 %, RDC2 10 %, RDC3 35 %, RDC4 25 %, RDC5 15 % *Picea abies*: RDC1 10 %, RDC2 10 %, RDC3 35 %, RDC4 25 %, RDC5 15 % *Fagus sylvatica*: RDC1 10 %, RDC2 10 %, RDC3 35 %, RDC4 25 %, RDC5 15 %	

Case study: Vercors
Representative stand: 7 "45%fir,45%spruce, 10% deciduous species (beech dominant)"
FM type: 80 no forest management
ID RST×FM: 7_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
In private forests, no management can be due to other causes than inaccessibility.

Case study: Vercors
Representative stand: 8 "50% fir, 20% spruce, 30% decidous species (beech dominant)"
FM type: 30 uneven-aged forest management
ID RST×FM: 8_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 16,1 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *362*/ha*); Picea abies 3,7 % (Natural, Random, 84*/ha*); Fagus sylvatica 75,8 % (Natural, Random, 1709*/ha*); Acer pseudoplatanus 2,4 % (Natural, Random, 54*/ha*); other broadleaves 2 % (Natural, Random, 44*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG –*Abies alba 55* % of total removals; *Picea abies 20* %; *Fagus sylvatica 25* % Removals' structure: *Abies alba*: RDC1 15 %, RDC2 10 %, RDC3 40 %, RDC4 25 %, RDC5 10 % *Picea abies*: RDC1 15 %, RDC2 10 %, RDC3 40 %, RDC4 25 %, RDC5 10 % *Fagus sylvatica*: RDC1 15 %, RDC2 10 %, RDC3 40 %, RDC4 25 %, RDC5 10 %	

Case study: Vercors
Representative stand: 8 "50% fir, 20% spruce, 30% decidous species (beech dominant)"
FM type: 80 no forest management
ID RST×FM: 8_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:

In private forests, no management can be due to other causes than inaccessibility.

Case study: Vercors
Representative stand: 9 "50% fir, 20% spruce, 30% decidous species (maple dominant)"
FM type: 30 uneven-aged forest management
ID RST×FM: 9_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 41,4 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *198*/ha*); Picea abies 31,8 % (Natural, Random, 152*/ha*); Acer pseudoplatanus 13,2 % (Natural, Random, 63*/ha*); other broadleaves 13,6 % (Natural, Random, 65*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG –*Abies alba 50* % of total removals; *Picea abies 20* %; *Acer Pseudoplatanus 30* % Removals' structure: *Abies alba*: RDC1 10 %, RDC2 15 %, RDC3 25 %, RDC4 40 %, RDC5 10 % *Picea abies*: RDC1 10 %, RDC2 15 %, RDC3 25 %, RDC4 40 %, RDC5 10 % *Acer Pseudoplatanus*: RDC1 10 %, RDC2 15 %, RDC3 25 %, RDC4 40 %, RDC5 10 %	

Case study: Vercors
Representative stand: 9 "50% fir, 20% spruce, 30% decidous species (maple dominant)"
FM type: 80 no forest management
ID RST×FM: 9_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:

-

Case study: Vercors
Representative stand: 10 "40%spruce, 40%fir, 20% decidous species (beech dominant)"
FM type: 30 uneven-aged forest management
ID RST×FM: 10_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 29,5 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *864*/ha*); Picea abies 20,2 % (Natural, Random, 593*/ha*); Fagus sylvatica 48,6 % (Natural, Random, 1426*/ha*); Acer pseudoplatanus 1,1 % (Natural, Random, 33*/ha*); other broadleaves 0,6 % (Natural, Random, 16*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG –*Abies alba 45* % of total removals; *Picea abies 35* %; *Fagus sylvatica 20* % Removals' structure: *Abies alba*: RDC1 10 %, RDC2 10 %, RDC3 40 %, RDC4 30 %, RDC5 10 % *Picea abies*: RDC1 10 %, RDC2 10 %, RDC3 40 %, RDC4 30 %, RDC5 10 % *Fagus sylvatica*: RDC1 10 %, RDC2 10 %, RDC3 40 %, RDC4 30 %, RDC5 10 %	

Case study: Vercors
Representative stand: 10 "40%spruce, 40%fir, 20% decidous species (beech dominant)"
FM type: 80 no forest management
ID RST×FM: 10_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
In private forests, no management can be due to other causes than inaccessibility.

Case study: Vercors
Representative stand: 11 "50%fir, 20%spruce, 30% deciduous species (beech dominant)"
FM type: 30 uneven-aged forest management
ID RST×FM: 11_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 23,8 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *114*/ha*); Picea abies 5,6 % (Natural, Random, 27*/ha*); Fagus sylvatica 6,5 % (Natural, Random, 31*/ha*); other broadleaves 63,9 % (Natural, Random, 306*/ha*); Acer pseudoplatanus 0,2 % (Natural, Random, 1*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG –*Abies alba 55* % of total removals; *Picea abies 20* %; *Fagus sylvatica 15* % ; *other broadleaves 10* % Removals' structure: *Abies alba*: RDC1 10 %, RDC2 15 %, RDC3 25 %, RDC4 35 %, RDC5 15 % *Picea abies*: RDC1 10 %, RDC2 15 %, RDC3 25 %, RDC4 35 %, RDC5 15 % *Fagus sylvatica*: RDC1 10 %, RDC2 15 %, RDC3 25 %, RDC4 35 %, RDC5 15 % *other broadleaves*: RDC1 10 %, RDC2 15 %, RDC3 25 %, RDC4 35 %, RDC5 15 %	

Case study: Vercors
Representative stand: 11 "50%fir, 20%spruce, 30% deciduous species (beech dominant)"
FM type: 80 no forest management
ID RST×FM: 11_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:

In private forests, no management can be due to other causes than inaccessibility.

Case study: Vercors
Representative stand: 12 "70%fir, 20%spruce, 10% deciduous species (beech dominant)"
FM type: 30 uneven-aged forest management
ID RST×FM: 12_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 44,4 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *434*/ha*); Picea abies 15,9 % (Natural, Random, 155*/ha*); Fagus sylvatica 39,7 % (Natural, Random, 388*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑*20* % SG Removals' structure: *all species in RST*: RDC1 20 %, RDC2 20 %, RDC3 50 %, RDC4 10 %, RDC5 0 %	

Case study: Vercors
Representative stand: 12 "70%fir, 20%spruce, 10% deciduous species (beech dominant)"
FM type: 80 no forest management
ID RST×FM: 12_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
In private forests, no management can be due to other causes than inaccessibility.

Case study: Vercors
Representative stand: 13 "75%spruce, 25% secondary species and fir"
FM type: 30 uneven-aged forest management
ID RST×FM: 13_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 39,4 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *241*/ha*); Picea abies 3,9 % (Natural, Random, 24*/ha*); Fagus sylvatica 8,2 % (Natural, Random, 50*/ha*); Acer pseudoplatanus 4,3 % (Natural, Random, 26*/ha*); other broadleaves 44,2 % (Natural, Random, 270*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG – *Picea abies 80* % of total removals; *Fagus sylvatica 10* %, *other broadleaves 10* % Removals' structure: *Picea abies*: RDC1 5 %, RDC2 5 %, RDC3 15 %, RDC4 60 %, RDC5 15 % *Fagus sylvatica*: RDC1 5 %, RDC2 5 %, RDC3 15 %, RDC4 60 %, RDC5 15 % *other broadleaves*: RDC1 5 %, RDC2 5 %, RDC3 15 %, RDC4 60 %, RDC5 15 %	

Case study: Vercors
Representative stand: 13 "75%spruce, 25% secondary species and fir"
FM type: 80 no forest management
ID RST×FM: 13_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
These stands are also present in a forest reserve.

Case study: Vercors
Representative stand: 14 "40% spruce, 40%fir, 20%secondary species and mountain pine"
FM type: 30 uneven-aged forest management
ID RST×FM: 14_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 18.3 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *479*/ha*); Picea abies 30,1 % (Natural, Random, 789*/ha*); Fagus sylvatica 13,7 % (Natural, Random, 360*/ha*); Acer pseudoplatanus 0.1 % (Natural, Random, 1*/ha*); other broadleaves 37,6 % (Natural, Random, 987*/ha*); Pinus mugo 0,2 % (Natural, Random, 5*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *12* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG –*Abies alba 45* % of total removals; *Picea abies 45* %; *other broadleaves* : *10* % Removals' structure: *Abies alba*: RDC1 40 %, RDC2 30 %, RDC3 30 %, RDC4 0 %, RDC5 0 % *Picea abies*: RDC1 40 %, RDC2 30 %, RDC3 30 %, RDC4 0 %, RDC5 0 % *other broaleaves*: RDC1 40 %, RDC2 30 %, RDC3 30 %, RDC4 0 %, RDC5 0 %	

Case study: Vercors
Representative stand: 14 "40% spruce, 40%fir, 20%secondary species and mountain pine"
FM type: 80 no forest management
ID RST×FM: 14_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
In private forests, no management can be due to other causes than inaccessibility.

Case study: Vercors
Representative stand: 15 "70%spruce, 20%mountain pine, 10%fir"
FM type: 30 uneven-aged forest management
ID RST×FM: 15_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Picea abies 53,8 % (Natural, Random, 127*/ha*); other broadleaves 43,2 % (Natural, Random, 102*/ha*); Pinus mugo 3 % (Natural, Random, 7*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *12* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG –*Abies alba 10* % of total removals; *Picea abies 70* %; *Pinus mugo var. uncinata 20* %, Removals' structure: *Abies alba*: RDC1 30 %, RDC2 40 %, RDC3 30 %, RDC4 0 %, RDC5 0 % *Picea abies*: RDC1 30 %, RDC2 40 %, RDC3 30 %, RDC4 0 %, RDC5 0 % *Pinus mugo var. uncinata*: RDC1 30 %, RDC2 40 %, RDC3 30 %, RDC4 0 %, RDC5 0 %	

Case study: Vercors
Representative stand: 15 "70% spruce, 20% mountain pine, 10% fir"
FM type: 80 no forest management
ID RST×FM: 15_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
-

Case study: Vercors
Representative stand: 16 "40% beech, 40%fir, 15%spruce, 5% other deciduous species"
FM type: 30 uneven-aged forest management
ID RST×FM: 16_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 10,6 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *280*/ha*); Picea abies 5,8 % (Natural, Random, 152*/ha*); Fagus sylvatica 76,7 % (Natural, Random, 2017*/ha*); Acer pseudoplatanus 1,8 % (Natural, Random, 47*/ha*); other broadleaves 5,1 % (Natural, Random, 135*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG –*Abies alba 40* % of total removals; *Picea abies 20* %; *Fagus sylvatica 40* %, Removals' structure: *Abies al*: RDC1 30 %, RDC2 30 %, RDC3 10 %, RDC4 10 %, RDC5 20 % *Picea abies*: RDC1 30 %, RDC2 30 %, RDC3 10 %, RDC4 10 %, RDC5 20 % *Fagus sylvatica*: RDC1 30 %, RDC2 30 %, RDC3 10 %, RDC4 10 %, RDC5 20 %	

Case study: Vercors
Representative stand: 16 "40% beech, 40%fir, 15%spruce, 5% other deciduous species"
FM type: 80 no forest management
ID RST×FM: 16_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
In private forests, no management can be due to other causes than inaccessibility.

Case study: Vercors
Representative stand: 17 "40% beech, 30%fir, 20%spruce, 10% other deciduous species"
FM type: 30 uneven-aged forest management
ID RST×FM: 17_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 28 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *395*/ha*); Picea abies 6,6 % (Natural, Random, 93*/ha*); Fagus sylvatica 51,1 % (Natural, Random, 722*/ha*); Acer pseudoplatanus 6,9 % (Natural, Random, 98*/ha*); other broadleaves 7,4 % (Natural, Random, 104*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SV –*Abies alba 30* % of total removals; *Picea abies 20* %; *Fagus sylvatica 50* %, Removals' structure: *Abies alba*: RDC1 25 %, RDC2 15 %, RDC3 15 %, RDC4 35 %, RDC5 10 % *Picea abies*: RDC1 25 %, RDC2 15 %, RDC3 15 %, RDC4 35 %, RDC5 10 % *Fagus sylvatica*: RDC1 25 %, RDC2 15 %, RDC3 15 %, RDC4 35 %, RDC5 10 %	

Case study: Vercors
Representative stand: 17 "40% beech, 30%fir, 20%spruce, 10% other deciduous species"
FM type: 80 no forest management
ID RST×FM: 17_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
In private forests, no management can be due to other causes than inaccessibility.

Case study: Vercors
Representative stand: 18 "50% spruce, 25%fir, 25% deciduous species"
FM type: 30 uneven-aged forest management
ID RST×FM: 18_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 56,4 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *219*/ha*); Acer pseudoplatanus 1,8 % (Natural, Random, 7*/ha*); other broadleaves 41,8 % (Natural, Random, 162*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SV –*Abies alba 20* % of total removals; *Picea abies 60* %; *Fagus sylvatica 10* %, *other broadleaves 10* % Removals' structure: *Abies alba*: RDC1 10 %, RDC2 10 %, RDC3 25 %, RDC4 50 %, RDC5 0 % *Picea abies*: RDC1 10 %, RDC2 10 %, RDC3 25 %, RDC4 50 %, RDC5 0 % *Fagus sylvatica*: RDC1 10 %, RDC2 10 %, RDC3 25 %, RDC4 50 %, RDC5 0 % *other broadleaves*: RDC1 10 %, RDC2 10 %, RDC3 25 %, RDC4 50 %, RDC5 0 %	

Case study: Vercors
Representative stand: 18 "50% spruce, 25%fir, 25% deciduous species"
FM type: 80 no forest management
ID RST×FM: 18_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
These stands are also present in a forest reserve.

Case study: Vercors
Representative stand: 19 "50% spruce, 25%fir, 25% deciduous species"
FM type: 30 uneven-aged forest management
ID RST×FM: 19_3080_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: -
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Thicket phase (>130cm height, <10cm DBH)*
	Species composition: *Abies alba 41,6 % of N* (origin: *Natural*, spatial arrangement: *Random*, density: *702*/ha*); Picea abies 6,9 % (Natural, Random, 116*/ha*); Fagus sylvatica 11,1 % (Natural, Random, 187*/ha*); other broadleaves 40,4 % (Natural, Random, 683*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH) within unevenaged stand* at stand m	Removals: *10* % of regeneration
THINNING	Description: *thinning consists in favouring trees with high quality whatever the species. However, in public forests, spruce tend to be favoured when possible. In uneven-aged forests, thinning operations and felling operations are coupled.*	
Operation 1	Type: *Combination from above and from below*	Time reference: -
	Removals: - Removals' structure: -	
REGENERATION/SELECTION FELLING	Regeneration system: *6 - Single-tree selection system*	
	Regeneration period: - years Description: *Trees with a dbh superior to the diameter limit are first selected (50% to 80% of the trees). It is then completed with trees with a dbh inferior to diameter limit according to their quality. Reducing local density (competition) is also an objective. Removal is in percentage of basal area and is generally comprised between 15% and 20%. This removal is distributed among species according to their % in basal area (spruce is sometimes favoured in public forests but is is not quantified). Broadleaves are only used for fuelwood and are preserved when rare. Group selection is rarely applied (actually only if several big trees are naturally grouped).*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *20* % SG –*Abies alba 30* % of total removals; *Picea abies 60* %; *Fagus sylvatica 10* %, Removals' structure: *Abies alba*: RDC1 10 %, RDC2 5 %, RDC3 15 %, RDC4 30 %, RDC5 40 % *Picea abies*: RDC1 10 %, RDC2 5 %, RDC3 15 %, RDC4 30 %, RDC5 40 % *Fagus sylvatica*: RDC1 10 %, RDC2 5 %, RDC3 15 %, RDC4 30 %, RDC5 40 %	

Case study: Vercors
Representative stand: 19 "50% spruce, 25%fir, 25% deciduous species"
FM type: 80 no forest management
ID RST×FM: 19_3080_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:
These stands are also present in a forest reserve.

2.3 CSA3 – Montafon, Eastern Alps, Austria

Case study: Montafon
Representative stand: 1 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 1_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *250* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %; other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 2 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 2_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5 m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m. All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %; other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 3 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 3_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation).* A regeneration felling is done in several patches *of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 4 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 4_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 5 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 5_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 6 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 6_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 7 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 7_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 8 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 8_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 9 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 9_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 10 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 10_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 11 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 11_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 12 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 12_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 13 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 13_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 14 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 14_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 15 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 15_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 16 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 16_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 17 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 17_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 18 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 18_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 19 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 19_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 20 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 20_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 21 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 21_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 22 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 22_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 23 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 23_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 24 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 24_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 25 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 25_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 26 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 26_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 27 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 27_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 28 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 28_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 29 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 29_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 30 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 30_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 31 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 31_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 32 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 32_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 33 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 33_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 34 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 34_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 35 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 35_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 36 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 36_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 37 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 37_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 38 Rellstal: Picea abies > 80% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 38_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 92 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 4 % (Natural, Random, 100*/ha*); other broadleaves 4 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years *(between successive harvests in a stand);* Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *other conifers 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 39 Rellstal: Picea abies > 50% AND Fagus sylvatica > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 39_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion *Picea abies 65 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); Fagus sylvatica 25 % (Natural, In patches, 1000*/ha*); Abies alba 7 % (Natural, In patches, 250*/ha*); other broadleaves 3 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *Abies alba 16.5 %*; *other broadleaves 16.5 %*; *Fagus sylvatica 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 40 Rellstal: Picea abies > 50% AND Fagus sylvatica > 10% AND Abies alba > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 40_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 50 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2000*/ha*); Abies alba 24 % (Natural, In patches, 1000*/ha*); Fagus sylvatica 24 % (Natural, In patches, 1000*/ha*); other broadleaves 2 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *Abies alba 16.5 %*; *other broadleaves 16.5 %*; *Fagus sylvatica 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 41 Rellstal: Picea abies > 50% AND Fagus sylvatica > 10% AND Abies alba > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 41_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand*; Species compostion: *Picea abies 50 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2000*/ha*); Abies alba 24 % (Natural, In patches, 1000*/ha*); Fagus sylvatica 24 % (Natural, In patches, 1000*/ha*); other broadleaves 2 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *Abies alba 16.5 %*; *other broadleaves 16.5 %*; *Fagus sylvatica 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 42 Rellstal: Picea abies > 50% AND Acer pseudoplatanus > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 42_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 75 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); Acer pseudoplatanus 15 % (Natural, In patches, 500*/ha*); Abies alba 7 % (Natural, In patches, 250*/ha*); other broadleaves 3 % (Natural, Random, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *Abies alba 16.5 %*; *other broadleaves 16.5 %*; *Acer pseudoplatanus 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Acer pseudoplatanus*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 43 Rellstal: Picea abies > 50% AND Abies alba > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 43_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 65 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2000*/ha*); Abies alba 32 % (Natural, In patches, 1000*/ha*); other broadleaves 3 % (Natural, In patches, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *Abies alba 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 44 Rellstal: Picea abies > 50% AND Abies alba > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 44_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 65 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2000*/ha*); Abies alba 32 % (Natural, In patches, 1000*/ha*); other broadleaves 3 % (Natural, In patches, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *Abies alba 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 45 Rellstal: Picea abies > 50% AND Abies alba > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 45_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 65 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2000*/ha*); Abies alba 32 % (Natural, In patches, 1000*/ha*); other broadleaves 3 % (Natural, In patches, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *Abies alba 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 46 Rellstal: Picea abies > 50% AND Abies alba > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 46_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 65 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2000*/ha*); Abies alba 32 % (Natural, In patches, 1000*/ha*); other broadleaves 3 % (Natural, In patches, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *Abies alba 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 47 Rellstal: Picea abies > 50% AND Abies alba > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 47_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 65 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2000*/ha*); Abies alba 32 % (Natural, In patches, 1000*/ha*); other broadleaves 3 % (Natural, In patches, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *Abies alba 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 48 Rellstal: Picea abies > 50% AND Abies alba > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 48_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 65 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2000*/ha*); Abies alba 32 % (Natural, In patches, 1000*/ha*); other broadleaves 3 % (Natural, In patches, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *Abies alba 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 49 Rellstal: Picea abies > 50% AND Abies alba > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 49_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 65 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2000*/ha*); Abies alba 32 % (Natural, In patches, 1000*/ha*); other broadleaves 3 % (Natural, In patches, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *Abies alba 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 50 Rellstal: Picea abies > 50% AND Abies alba > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 50_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: *0* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 65 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2000*/ha*); Abies alba 32 % (Natural, In patches, 1000*/ha*); other broadleaves 3 % (Natural, In patches, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *Abies alba 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 51 Rellstal: Picea abies > 50% AND Abies alba > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 51_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 65 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2000*/ha*); Abies alba 32 % (Natural, In patches, 1000*/ha*); other broadleaves 3 % (Natural, In patches, 100*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: continuous Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5 %* of species volume removed; *Abies alba 16.5 %*; *other broadleaves 16.5 %* Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Montafon
Representative stand: 52 Rellstal: Fagus sylvatica > 40% AND Abies alba > 10% AND Picea abies > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 52_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion *Picea abies 22 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *1000*/ha*); other broadleaves 2 % (Natural, Random, 100*/ha*); Abies alba 22 % (Natural, Random, 1000*/ha*); Fagus sylvatica 54 % (Natural, In patches, 2500*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed;; *Abies alba 16.5* %; *other broadleaves 16.5* %; *Fagus sylvatica 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 53 Rellstal: Abies alba > 40% AND Fagus sylvatica > 10% AND Picea abies > 10% AND all other species <10%
FM type: 30 uneven-aged forest management
ID RST×FM: 53_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 21 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *1000*/ha*); other conifers 3 % (Natural, Random, 100*/ha*); other broadleaves 3 % (Natural, Random, 100*/ha*); Abies alba 52 % (Natural, In patches, 2500*/ha*); Fagus sylvatica 21 % (Natural, In patches, 1000*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed;; *Abies alba 16.5* %; *other broadleaves 16.5* %; *Fagus sylvatica 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 60 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 60_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed;; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 61 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 61_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 62 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 62_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 63 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 63_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 64 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 64_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 65 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 65_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 66 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 66_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: -years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 67 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 67_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 68 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 68_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *group selection cutting*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: *continuous* Description: A regeneration felling is executed as *group selection cuts with an average diameter of 30-40 m. Every 40 years 2 group selection cuts per ha are carried out. In the group selection cuts all trees > 20 cm in DBH are harvested. The harvests of one regeneration felling(2 group selection cuts/ ha) equal 20% of the total stand volume.*
Operation 1	Selection harvest interval: *40* years (between successive harvests in a stand); Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *20* % SV – *Picea abies 20* % of species volume removed; *other conifers 20* %; *other broadleaves 20* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 69 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 69_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 70 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 70_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 71 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 71_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 72 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 72_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 73 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 73_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 74 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 74_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 75 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 75_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 76 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 76_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

Case study: Montafon
Representative stand: 77 Silbertal: Picea abies > 95% AND all other species <5%
FM type: 30 uneven-aged forest management
ID RST×FM: 77_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *irregular slit cuts diagonal to slope*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Uneven-aged stand* Species compostion: *Picea abies 96 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2500*/ha*); other conifers 2 % (Natural, Random, 50*/ha*); other broadleaves 2 % (Natural, Random, 50*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: *continuous* Description: *Skyline tracks are positioned diagonal across the slope. The distance between the skylines is 50 m. The area 25 m left and right of a skyline track is the working field which is accessible for harvesting via a respective skyline. The skyline track of 5m width is cleared of all trees (>10m height).* *33% of the volume of the working field is harvested per regeneration felling (operation). A regeneration felling is done in several patches of irregular shape within the working field along the skyline track. The patches vary in size and shape and must meet the following limitations: minimum width of patches: 5 m, maximum distance in slope direction of cutting area (note contagous patches!) must not exceed 30m All trees (>20cm DBH) on the patches are harvested. A regeneration cut is executed on one skyline track per hectare every 42 years. Adjacent skyline tracks have to be harvested in alternation.*
Operation 1	Selection harvest interval: *42* years; Time reference: *Uneven-aged stand* at dominant dbh *80* cm Removals: ∑ *16.5* % SV – *Picea abies 16.5* % of species volume removed; *other conifers 16.5* %; *other broadleaves 16.5* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other conifers: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % other broadleaves: RDC1 na%, RDC2 na%, RDC3 na%, RDC4 na%, RDC5 na%

2.4 CSA4 – Sneznik, Dinaric Mountains, Slovenia

Case study: Dinaric Mountains (Sneznik)
Representative stand: 1 even-aged mixed beech dominated stands
FM type: 10 even-aged forest management
ID RST×FM: 1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Practice of irregular shelterwood system with gaps of 1-2 tree lengths (99% of area in RST), including the removal of individual stems only ("free style silviculture"; 1% of area in RST).*
Rotation period: *135* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase*
	Species composition *Abies alba 5 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *4000*/ha*); Picea abies 8 % (Natural, In patches, 6400*/ha*); Fagus sylvatica 80 % (Natural, In patches, 64000*/ha*); Acer pseudoplatanus 5 % (Natural, Random, 4000*/ha*); other broadleaves 2 % (Natural, Random, 1600*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Regeneration / seedling phase* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Regeneration / seedling phase* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: *Promotion of fir, spruce and sycamore over beech.*	
Operation 1	Type: *From above*	Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm
	Removals: ∑*22* % SV – *Abies alba 8* % of total removals; *Picea abies 5* %; *Fagus sylvatica 82* %; *other broadleaves 5* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 40 %, RDC5 20 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 40 %, RDC5 20 %	
Operation 2	Type: *From above*	Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm
	Removals: ∑*15* % SV – *Abies alba 6* % of total removals; *Picea abies 6* %; *Fagus sylvatica 82* %; *other broadleaves 6* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 25 %, RDC4 50 %, RDC5 20 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 60 %, RDC5 10 %	
Operation 3	Type: *From above*	Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm
	Removals: ∑*10* % SV – *Abies alba 10*% of total removals; *Picea abies 10* %; *Fagus sylvatica 80* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 50 %, RDC5 20 %	
Operation 4	Type: *From above*	Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *55* cm

Removals: ∑*10* % SV – *Abies alba 10* % of total removals; *Picea abies 10* %; *Fagus sylvatica 80* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 50 %, RDC5 20 %

REGENERATION FELLING Regeneration system: *3 - Group system (=Grupenschirmschlag)*

Regeneration period: *25* years
Description:
Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.2-0.5 ha large (size of 1-2(3) tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-1 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 2-3(5) ha large stand.
Single-tree selection is practiced in specific small areas where coniferous species are dominant and terrain features conditions this silvicultural system because of soil conservation (high rockiness, steepness, etc.).

Operation 1
Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm
Removals: ∑*33* % SV – *Abies alba 13* % of total removals; *Picea abies 12* %; *Fagus sylvatica 70* %; *other broadleaves 5* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Fagus sylvatica: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 %
other broadleaves: RDC1 5 %, RDC2 5 %, RDC3 20 %, RDC4 40 %, RDC5 30 %

Operation 2
Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm
Removals: ∑*40* % SV – *Abies alba 15* % of total removals; *Picea abies 10* %; *Fagus sylvatica 70* %; *Acer pseudoplatanus 3* %; *other broadleaves 2* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 10 %, RDC4 25 %, RDC5 75 %
Fagus sylvatica: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 %
Acer pseudoplatanus: RDC1 5 %, RDC2 5 %, RDC3 20 %, RDC4 40 %, RDC5 30 %
other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 20 %, RDC4 40 %, RDC5 40 %

Operation 3
Time reference: *Rejuvenation phase* at dominant dbh *85* cm
Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed
Removals' structure:
all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 2 even-aged altimontane beech stands
FM type: 10 even-aged forest management
ID RST×FM: 2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Practice of irregular shelterwood system with gaps of 1-2 tree lengths (99% of area in RST), including the removal of individual stems only ("free style silviculture"; 1% of area in RST).*
Rotation period: *135* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase* Species composition *Picea abies 10 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *8000*/ha*); Fagus sylvatica 89 % (Natural, Random, 71200*/ha*); other broadleaves 1 % (Natural, Random, 800*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Regeneration / seedling phase* at stand height *3,5* m Removals: *25* % of regeneration
Operation 2	Time reference: *Regeneration / seedling phase* at dominant dbh *7,5* cm Removals: *35* % of regeneration
THINNING	Description: *Abies alba, Picea abies and Acer pseudoplatanus are promoted in thinning operations (low removals) despite their quality (FM goal of biodiversity).*
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*22* % SV – *Picea abies 3* % of total removals; *Fagus sylvatica 97* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 40 %, RDC5 20 %
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*15* % SV – *Picea abies 3* % of total removals; *Fagus sylvatica 95* %; *Abies alba 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 25 %, RDC4 50 %, RDC5 20 % *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)* Regeneration period: *20* years Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.2-0.5 ha large (size of 1-2(3) tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-1 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration*

	area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 2-3(5) ha large stand. *Single-tree selection is practiced in specific small areas where coniferous species are dominant and terrain features conditions this silvicultural system because of soil conservation (high rockiness, steepness, etc.).*
Operation 1	Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *45* cm Removals: ∑*35* % SV – *Abies alba 2* % of total removals; *Picea abies 4* %; *Fagus sylvatica 94* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 %
Operation 2	Time reference: *Over mature (>50cm DBH)* at dominant dbh *55* cm Removals: ∑*40* % SV – *Abies alba 3* % of total removals; *Picea abies 6* %; *Fagus sylvatica 88* %; *Acer pseudoplatanus 3* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 5 %, RDC3 10 %, RDC4 35 %, RDC5 50 %
Operation 3	Time reference: *Rejuvenation phase* at dominant dbh *65* cm Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 3 pure beech stands on timber line
FM type: 80 no forest management
ID RST×FM: 3_80_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Conservation (i.e. forest reserves)*

Description:
These stands are protected due to their important role for biodiversity protection (Natura 2000 areas).

Case study: Dinaric Mountains (Sneznik)
Representative stand: 4 even-aged mixed fir dominated stands
FM type: 10 even-aged forest management
ID RST×FM: 4_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Practice of irregular shelterwood system with gaps of 1-2 tree lengths (99% of area in RST), including the removal of individual stems only ("free style silviculture"; 1% of area in RST).*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase*
	Species composition: *Abies alba 2 %* (origin: *Natural,* spatial arrangement: *Random*, density: *1400*/ha*); Picea abies 15 % (Natural, In patches, 10500*/ha*); Fagus sylvatica 80 % (Natural, In patches, 56000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 1400*/ha*); other broadleaves 1 % (Natural, Random, 700*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Thicket phase (>130cm height,* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Thicket phase (>130cm height,* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description:	
Operation 1	Type: *From above*	Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm
	Removals: ∑*22* % SV – *Abies alba 59* % of total removals; *Picea abies 9* %; *Fagus sylvatica 27* %; *other broadleaves 5* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 40 %, RDC5 20 %	
	other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 40 %, RDC5 20 %	
Operation 2	Type: *From above*	Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm
	Removals: ∑*15* % SV – *Abies alba 60* % of total removals; *Picea abies 7* %; *Fagus sylvatica 30* %; *other broadleaves 3* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 50 %, RDC5 10 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %	
	Fagus sylvatica: RDC1 0 %, RDC2 5 %, RDC3 25 %, RDC4 55 %, RDC5 10 %	
	other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 25 %, RDC4 60 %, RDC5 10 %	
Operation 3	Type: *From above*	Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm
	Removals: ∑*10* % SV – *Abies alba 70* % of total removals; *Picea abies 10* %; *Fagus sylvatica 20* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 50 %, RDC5 10 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 50 %, RDC5 20 %	
Operation 4	Type: *From above*	Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *55* cm
	Removals: ∑*10* % SV – *Abies alba 70* % of total removals; *Picea abies 10* %; *Fagus sylvatica 20* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 50 %, RDC5 10 %	

Picea abies: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 50 %, RDC5 20 %

REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *30* years
	Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.2-0.5 ha large (size of 1-2(3) tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-1 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 2-3(5) ha large stand.* *Single-tree selection is practiced in specific small areas where coniferous species are dominant and terrain features conditions this silvicultural system because of soil conservation (high rockiness, steepness, etc.).*
Operation 1	Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm Removals: ∑*33* % SV – *Abies alba 70* % of total removals; *Picea abies 9* %; *Fagus sylvatica 18* %; *other broadleaves 3* % Removals' structure: *Abies alba*: RDC1 *0* %, RDC2 *0* %, RDC3 *0* %, RDC4 *25* %, RDC5 *75* % *Picea abies*: RDC1 *0* %, RDC2 *0* %, RDC3 *0* %, RDC4 *25* %, RDC5 *75* % *Fagus sylvatica*: RDC1 *0* %, RDC2 *5* %, RDC3 *5* %, RDC4 *35* %, RDC5 *55* % *other broadleaves*: RDC1 *5* %, RDC2 *5* %, RDC3 *20* %, RDC4 *40* %, RDC5 *30* %
Operation 2	Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm Removals: ∑*40* % SV – *Abies alba 68* % of total removals; *Picea abies 10* %; *Fagus sylvatica 10* %; *other broadleaves 3* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 % other broadleaves: RDC1 5 %, RDC2 5 %, RDC3 20 %, RDC4 40 %, RDC5 30 %
Operation 3	Time reference: *Rejuvenation phase* at dominant dbh *80* cm Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 5 even-aged mixed fir-beech stands
FM type: 10 even-aged forest management
ID RST×FM: 5_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Practice of irregular shelterwood system with gaps of 1-2 tree lengths (99% of area in RST), including the removal of individual stems only ("free style silviculture"; 1% of area in RST).*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase* Species composition: *Abies alba 2 %* (origin: *Natural,* spatial arrangement: *Random*, density: *1400*/ha*); Picea abies 15 % (Natural, In patches, 10500*/ha*); Fagus sylvatica 80 % (Natural, In patches, 56000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 1400*/ha*); other broadleaves 1 % (Natural, Random, 700*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Thicket phase (>130cm height,* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Thicket phase (>130cm height,* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: *Promotion of sycamore and other valuable and minority species.*	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*22* % SV – *Abies alba 50* % of total removals; *Picea abies 4* %; *Fagus sylvatica 45* %; *Acer pseudoplatanus 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 40 %, RDC5 20 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 40 %, RDC5 20 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*15* % SV – *Abies alba 50* % of total removals; *Picea abies 4* %; *Fagus sylvatica 45* %; *Acer pseudoplatanus 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 25 %, RDC4 50 %, RDC5 20 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 10 %, RDC3 40 %, RDC4 50 %, RDC5 0 %	
Operation 3	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm Removals: ∑*10* % SV – *Abies alba 50* % of total removals; *Picea abies 5* %; *Fagus sylvatica 45* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 50 %, RDC5 10 %	
Operation 4	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *55* cm Removals: ∑*10* % SV – *Abies alba 50* % of total removals; *Picea abies 5* %; *Fagus sylvatica 45* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %	

Picea abies: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 50 %, RDC5 10 %

REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *30* years
	Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.2-0.5 ha large (size of 1-2(3) tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-1 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 2-3(5) ha large stand.* *Single-tree selection is practiced in specific small areas where coniferous species are dominant and terrain features conditions this silvicultural system because of soil conservation (high rockiness, steepness, etc.).*
Operation 1	Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm Removals: ∑*33* % SV – *Abies alba 55* % of total removals; *Picea abies 6* %; *Fagus sylvatica 36* %; *other broadleaves 3* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 % other broadleaves: RDC1 5 %, RDC2 5 %, RDC3 20 %, RDC4 40 %, RDC5 30 %
Operation 2	Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm Removals: ∑*40* % SV – *Abies alba 57* % of total removals; *Picea abies 5* %; *Fagus sylvatica 35* %; *other broadleaves 3* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 % other broadleaves: RDC1 5 %, RDC2 5 %, RDC3 20 %, RDC4 40 %, RDC5 30 %
Operation 3	Time reference: *Rejuvenation phase* at dominant dbh *80* cm Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 6 even-aged mixed fir dominated stands on flat sites around 900 m asl
FM type: 10 even-aged forest management
ID RST×FM: 6_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Practice of irregular shelterwood system with gaps of 1-2 tree lengths (99% of area in RST), including the removal of individual stems only ("free style silviculture"; 1% of area in RST).*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase* Species composition: *Abies alba 2 %* (origin: *Natural,* spatial arrangement: *Random*, density: *1400*/ha*); Picea abies 15 % (Natural, In patches, 10500*/ha*); Fagus sylvatica 80 % (Natural, In patches, 56000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 1400*/ha*); other broadleaves 1 % (Natural, Random, 700*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Thicket phase (>130cm height,* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Thicket phase (>130cm height,* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description:	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*22* % SV – *Abies alba 65* % of total removals; *Picea abies 10* %; *Fagus sylvatica 23* %; *Acer pseudoplatanus 2* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*15* % SV – *Abies alba 65* % of total removals; *Picea abies 10* %; *Fagus sylvatica 23* %; *Acer pseudoplatanus 2* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 25 %, RDC4 55 %, RDC5 15 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 5 %, RDC3 35 %, RDC4 55 %, RDC5 5 %	
Operation 3	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm Removals: ∑*10* % SV – *Abies alba 70* % of total removals; *Picea abies 10* %; *Fagus sylvatica 20* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 50 %, RDC5 10 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 50 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 35 %, RDC4 50 %, RDC5 10 %	
Operation 4	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *55* cm Removals: ∑*10* % SV – *Abies alba 70* % of total removals; *Picea abies 10* %; *Fagus sylvatica 20* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 50 %, RDC5 10 %	

Picea abies: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 50 %, RDC5 10 %
Fagus sylvatica: RDC1 0 %, RDC2 5 %, RDC3 35 %, RDC4 50 %, RDC5 10 %

REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *30* years
	Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.2-0.5 ha large (size of 1-2(3) tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-1 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 2-3(5) ha large stand.* *Single-tree selection is practiced in specific small areas where coniferous species are dominant and terrain features conditions this silvicultural system because of soil conservation (high rockiness, steepness, etc.).*
Operation 1	Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm Removals: ∑*33* % SV – *Abies alba 69* % of total removals; *Picea abies 8* %; *Fagus sylvatica 20* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 45 %, RDC5 45 % other broadleaves: RDC1 5 %, RDC2 5 %, RDC3 20 %, RDC4 40 %, RDC5 30 %
Operation 2	Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm Removals: ∑*39* % SV – *Abies alba 70* % of total removals; *Picea abies 8* %; *Fagus sylvatica 20* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 45 %, RDC5 45 % other broadleaves: RDC1 5 %, RDC2 5 %, RDC3 20 %, RDC4 40 %, RDC5 30 %
Operation 3	Time reference: *Rejuvenation phase* at dominant dbh *80* cm Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 7 even-aged mixed conifers dominated stands on N exposed sites around 900 m asl
FM type: 10 even-aged forest management
ID RST×FM: 7_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Practice of irregular shelterwood system with gaps of 1-2 tree lengths (99% of area in RST), including the removal of individual stems only ("free style silviculture"; 1% of area in RST).*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase*
	Species composition: *Picea abies 10 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *7000*/ha*); Fagus sylvatica 90 % (Natural, Random, 63000*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Thicket phase (>130cm height,* at stand height *3,5* m	Removals: *50* % of regeneration
Operation 3	Time reference: *Thicket phase (>130cm height,* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description:	
Operation 1	Type: *From above*	Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm
	Removals: ∑*22* % SV – *Abies alba 55* % of total removals; *Picea abies 32* %; *Fagus sylvatica 12* %; *Acer pseudoplatanus 1* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 50 %, RDC5 10 %	
	Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 45 %, RDC4 50 %, RDC5 5 %	
Operation 2	Type: *From above*	Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm
	Removals: ∑*15* % SV – *Abies alba 60* % of total removals; *Picea abies 27* %; *Fagus sylvatica 13* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
Operation 3	Type: *From above*	Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm
	Removals: ∑*10* % SV – *Abies alba 55* % of total removals; *Picea abies 35* %; *Fagus sylvatica 10* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
Operation 4	Type: *From above*	Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *55* cm
	Removals: ∑*10* % SV – *Abies alba 55* % of total removals; *Picea abies 35* %; *Fagus sylvatica 10* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	

REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *30* years
	Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.2-0.5 ha large (size of 1-2(3) tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-1 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 2-3(5) ha large stand.* *Single-tree selection is practiced in specific small areas where coniferous species are dominant and terrain features conditions this silvicultural system because of soil conservation (high rockiness, steepness, etc.).*
Operation 1	Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm Removals: ∑*33* % SV – *Abies alba 54* % of total removals; *Picea abies 35* %; *Fagus sylvatica 10* %; *Acer pseudoplatanus 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 40 %, RDC5 55 %
Operation 2	Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm Removals: ∑*70* % SV – *Abies alba 58* % of total removals; *Picea abies 30* %; *Fagus sylvatica 10* %; *Acer pseudoplatanus 2* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 30 %, RDC5 60 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 30 %, RDC5 60 %
Operation 3	Time reference: *Rejuvenation phase* at dominant dbh *80* cm Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 8 even-aged mixed fir dominated stands on S exposed sites around 900 m asl
FM type: 10 even-aged forest management
ID RST×FM: 8_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Practice of irregular shelterwood system with gaps of 1-2 tree lengths (99% of area in RST), including the removal of individual stems only ("free style silviculture"; 1% of area in RST).*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase*
	Species composition: *Abies alba 2 %* (origin: *Natural,* spatial arrangement: *Random*, density: *1400*/ha*); Picea abies 15 % (Natural, In patches, 10500*/ha*); Fagus sylvatica 80 % (Natural, In patches, 56000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 1400*/ha*); other broadleaves 1 % (Natural, Random, 700*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Thicket phase (>130cm height,* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Thicket phase (>130cm height,* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description:	
Operation 1	Type: *From above*	Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm
	Removals: ∑*22* % SV – *Abies alba 65* % of total removals; *Picea abies 10* %; *Fagus sylvatica 23* %; *Acer pseudoplatanus 2* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 40 %, RDC5 20 %	
	Acer pseudoplatanus: RDC1 0 %, RDC2 10 %, RDC3 35 %, RDC4 50 %, RDC5 5 %	
Operation 2	Type: *From above*	Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm
	Removals: ∑*15* % SV – *Abies alba 65* % of total removals; *Picea abies 10* %; *Fagus sylvatica 23* %; *Acer pseudoplatanus 2* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 40 %, RDC5 20 %	
	Acer pseudoplatanus: RDC1 0 %, RDC2 10 %, RDC3 35 %, RDC4 50 %, RDC5 5 %	
Operation 3	Type: *From above*	Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm
	Removals: ∑*10* % SV – *Abies alba 70* % of total removals; *Picea abies 10* %; *Fagus sylvatica 20* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %	
Operation 4	Type: *From above*	Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *55* cm
	Removals: ∑*10* % SV – *Abies alba 70* % of total removals; *Picea abies 10* %; *Fagus sylvatica 20* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	

Picea abies: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %
Fagus sylvatica: RDC1 0 %, RDC2 5 %, RDC3 30 %, RDC4 50 %, RDC5 15 %

REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *30* years
	Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.2-0.5 ha large (size of 1-2(3) tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-1 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 2-3(5) ha large stand.* *Single-tree selection is practiced in specific small areas where coniferous species are dominant and terrain features conditions this silvicultural system because of soil conservation (high rockiness, steepness, etc.).*
Operation 1	Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm Removals: ∑*33* % SV – *Abies alba 70* % of total removals; *Picea abies 10* %; *Fagus sylvatica 15* %; *Acer pseudoplatanus 4* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 40 %, RDC5 50 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 50 %, RDC5 40 %
Operation 2	Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm Removals: ∑*40* % SV – *Abies alba 65* % of total removals; *Picea abies 9* %; *Fagus sylvatica 20* %; *Acer pseudoplatanus 5* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 40 %, RDC5 50 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 50 %, RDC5 40 %
Operation 3	Time reference: *Rejuvenation phase* at dominant dbh *80* cm Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 9 even-aged pure spruce stands
FM type: 10 even-aged forest management
ID RST×FM: 9_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

FM concept description: *Stands were mainly artificially regenerated with spruce planting on beech sites. Nowadays, natural regeneration is favoured and broadleaves (beech) are promoted in silvicultural measures. Transformation of tree species composition is angled for. Practice of irregular shelterwood system with gaps of 1-2 tree lengths (99% of area in RST), including the removal of individual stems only ("free style silviculture"; 1% of area in RST).*

Rotation period: *130* years

Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase* Species composition: *Picea abies 10 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *5000*/ha*); Fagus sylvatica 90 % (Natural, Random, 45000*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Regeneration / seedling phase* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Regeneration / seedling phase* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: *Broadleaves are promoted.*	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*28* % SV – *Abies alba 4* % of total removals; *Picea abies 90* %; *Fagus sylvatica 5* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*28* % SV – *Abies alba 4* % of total removals; *Picea abies 90* %; *Fagus sylvatica 5* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 35 %, RDC4 55 %, RDC5 5 %	
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)* Regeneration period: *20* years Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial*	

	regeneration areas (operation 1) are usually 0.2-0.5 ha large (size of 1-2(3) tree heights in diameter), but can also be up to 0.5-1 ha. In the second regeneration felling (operation 2) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into larger stand. *Single-tree selection is practiced in specific small areas where coniferous species are dominant and terrain features conditions this silvicultural system because of soil conservation (high rockiness, steepness, etc.).*
Operation 1	Time reference: *Over mature (>50cm DBH)* at dominant dbh *55* cm Removals: ∑*40* % SV – *Abies alba 5* % of total removals; *Picea abies 85* %; *Fagus sylvatica 8* %; *other broadleaves 2* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 15 %, RDC4 35 %, RDC5 50 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 15 %, RDC4 40 %, RDC5 45 %
Operation 2	Time reference: *Rejuvenation phase* at dominant dbh *70* cm Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 10 even-aged pure spruce stands
FM type: 10 even-aged forest management
ID RST×FM: 10_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Stands were mainly artificially regenerated with spruce planting on beech sites. Nowadays, natural regeneration is favoured and broadleaves (beech) are promoted in silvicultural measures. Transformation of tree species composition is angled for. Practice of irregular shelterwood system with gaps of 1-2 tree lengths (99% of area in RST), including the removal of individual stems only ("free style silviculture"; 1% of area in RST).*
Rotation period: *130* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase* Species composition: *Picea abies 10 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *5000*/ha*); Fagus sylvatica 90 % (Natural, Random, 45000*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Regeneration / seedling phase* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Regeneration / seedling phase* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: *Broadleaves are promoted.*	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*28* % SV – *Abies alba 2* % of total removals; *Picea abies 92* %; *Fagus sylvatica 5* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*28* % SV – *Abies alba 2* % of total removals; *Picea abies 92* %; *Fagus sylvatica 4* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 5 %, RDC3 40 %, RDC4 55 %, RDC5 0 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 35 %, RDC4 55 %, RDC5 5 %	
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)* Regeneration period: *20* years Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for*	

	regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.2-0.5 ha large (size of 1-2(3) tree heights in diameter), but can also be up to 0.5-1 ha. In the second regeneration felling (operation 2) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into larger stand. *Single-tree selection is practiced in specific small areas where coniferous species are dominant and terrain features conditions this silvicultural system because of soil conservation (high rockiness, steepness, etc.).*
Operation 1	Time reference: *Over mature (>50cm DBH)* at dominant dbh *55* cm Removals: ∑*40* % SV – *Abies alba 3* % of total removals; *Picea abies 90* %; *Fagus sylvatica 5* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 15 %, RDC4 35 %, RDC5 50 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 20 %, RDC4 35 %, RDC5 45 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 20 %, RDC4 35 %, RDC5 45 %
Operation 2	Time reference: *Rejuvenation phase* at dominant dbh *70* cm Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 11 even-aged mixed fir-beech-spruce stands on flat sites around 900 m asl
FM type: 10 even-aged forest management
ID RST×FM: 11_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Practice of irregular shelterwood system with gaps of 1-2 tree lengths (99% of area in RST), including the removal of individual stems only ("free style silviculture"; 1% of area in RST).*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase* Species composition *Abies alba 10 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *5500*/ha*); Picea abies 50 % (Natural, Random, 27500*/ha*); Fagus sylvatica 37 % (Natural, Random, 20350*/ha*); Acer pseudoplatanus 2 % (Natural, In patches, 1100*/ha*); other broadleaves 1 % (Natural, Random, 550*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Thicket phase (>130cm height,* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Thicket phase (>130cm height,* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description:	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*22* % SV – *Abies alba 36* % of total removals; *Picea abies 18* %; *Fagus sylvatica 36* %; *Acer pseudoplatanus 9* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 60 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*15* % SV – *Abies alba 37* % of total removals; *Picea abies 20* %; *Fagus sylvatica 37* %; *Acer pseudoplatanus 3* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 5 %, RDC3 40 %, RDC4 55 %, RDC5 0 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 35 %, RDC4 55 %, RDC5 5 %	
Operation 3	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm Removals: ∑*10* % SV – *Abies alba 37* % of total removals; *Picea abies 22* %; *Fagus sylvatica 37* %; *Acer pseudoplatanus 3* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 *0* %, RDC2 *0* %, RDC3 *40* %, RDC4 *55* %, RDC5 *5* % *Picea abies*: RDC1 *0* %, RDC2 *0* %, RDC3 *40* %, RDC4 *55* %, RDC5 *5* % *Fagus sylvatica*: RDC1 *0* %, RDC2 *5* %, RDC3 *35* %, RDC4 *55* %, RDC5 *5* % *Acer pseudoplatanus*: RDC1 *0* %, RDC2 *5* %, RDC3 40 %, RDC4 55 %, RDC5 0 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 35 %, RDC4 55 %, RDC5 5 %	
Operation 4	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *55* cm Removals: ∑*10* % SV – *Abies alba 37* % of total removals; *Picea abies 22* %; *Fagus*	

sylvatica 37 %; *Acer pseudoplatanus 3* %; *other broadleaves 1* %
Removals' structure:
Abies alba: RDC1 *0* %, RDC2 *0* %, RDC3 *40* %, RDC4 *55* %, RDC5 *5* %
Picea abies: RDC1 *0* %, RDC2 *0* %, RDC3 *40* %, RDC4 *55* %, RDC5 *5* %
Fagus sylvatica: RDC1 *0* %, RDC2 *5* %, RDC3 *35* %, RDC4 *55* %, RDC5 *5* %
Acer pseudoplatanus: RDC1 *0* %, RDC2 *5* %, RDC3 40 %, RDC4 55 %, RDC5 0 %
other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 35 %, RDC4 55 %, RDC5 5 %

REGENERATION FELLING Regeneration system: *3 - Group system (=Grupenschirmschlag)*

Regeneration period: *30* years
Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.2-0.5 ha large (size of 1-2(3) tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-1 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 2-3(5) ha large stand.*
Single-tree selection is practiced in specific small areas where coniferous species are dominant and terrain features conditions this silvicultural system because of soil conservation (high rockiness, steepness, etc.).

Operation 1 Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm
Removals: ∑*33* % SV – *Abies alba 36* % of total removals; *Picea abies 20* %; *Fagus sylvatica 35* %; *Acer pseudoplatanus 6* %; *other broadleaves 3* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 %
Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 40 %, RDC5 55 %
other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 10 %, RDC4 40 %, RDC5 45 %

Operation 2 Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm
Removals: ∑*40* % SV – *Abies alba 36* % of total removals; *Picea abies 20* %; *Fagus sylvatica 35* %; *Acer pseudoplatanus 5* %; *other broadleaves 3* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 %
Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 40 %, RDC5 55 %
other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 10 %, RDC4 40 %, RDC5 45 %

Operation 3 Time reference: *Rejuvenation phase* at dominant dbh *80* cm
Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed
Removals' structure:
all species in RST: RDC1 *na* %, RDC2 *na* %, RDC3 *na* %, RDC4 *na* %, RDC5 *na* %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 12 uneven-aged mixed beech-fir-spruce stands
FM type: 30 uneven-aged forest management
ID RST×FM: 12_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: *135* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 3 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2400*/ha*); Picea abies 15 % (Natural, In patches, 12000*/ha*); Fagus sylvatica 80 % (Natural, Random, 62400*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 1600*/ha); other broadleaves (*Natural, random, 800*/ha)	
WEEDING		
TENDING		
Operation 1	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 2	Time reference: *years; Thicket phase (>130cm height, <10cm DBH)* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: *0*	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*22* % SV – *Abies alba 7* % of total removals; *Picea abies 12* %; *Fagus sylvatica 78* %; *Acer pseudoplatanus 1* %; *other broadleaves 2* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 50 %, RDC5 20 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 40 %, RDC4 50 %, RDC5 5 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*15* % SV – *Abies alba 10* % of total removals; *Picea abies 13* %; *Fagus sylvatica 75* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 50 %, RDC5 20 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 40 %, RDC4 50 %, RDC5 5 %	
Operation 3	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm Removals: ∑*10* % SV – *Abies alba 10* % of total removals; *Picea abies 10* %; *Fagus sylvatica 80* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 45 %, RDC5 15 %	
Operation 4	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *55* cm Removals: ∑*10* % SV – *Abies alba 10* % of total removals; *Picea abies 10* %; *Fagus sylvatica 80* % Removals' structure:	

	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %
REGENERATION/SELECTION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *25* years Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.1-0.3 ha large (size of 1-2 tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-0.75 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 1-2 ha large stand.*
Operation 1	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm Removals: ∑ *33*% SV – *Abies alba 13* % of total removals; *Picea abies 10* %; *Fagus sylvatica 75* %; *other broadleaves 2* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 600 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 10 %, RDC4 35 %, RDC5 55 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 20 %, RDC4 40 %, RDC5 40 %
Operation 2	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm Removals: ∑ *40*% SV – *Abies alba 15* % of total removals; *Picea abies 13* %; *Fagus sylvatica 69* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 55 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 55 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 40 %, RDC5 45 %
Operation 3	Selection harvest interval: - years; Time reference: *Rejuvenation phase* at dominant dbh *80* cm Removals: ∑ *100*% SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 12 uneven-aged mixed beech-fir-spruce stands
FM type: 30 uneven-aged forest management
ID RST×FM: 12_30_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 3 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2400*/ha*); Picea abies 15 % (Natural, In patches, 12000*/ha*); Fagus sylvatica 80 % (Natural, Random, 62400*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 1600*/ha); other broadleaves (*Natural, random, 800*/ha)
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: - years Description: *In a stand, small groups of trees on areas of 0.05-0.2 ha are cut. Several such groups are made over the stand and are irregularly spaced. The groups of trees are felled considering the advanced regeneration established under the canopy, dbh of trees, and species. A combination with single-tree selection system is practiced. Single-tree selection is mainly applied in steep terrain with a high rockiness, but is scattered present all over managed stand.*
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *15* % SV – *Abies alba 21* % of total removals; *Picea abies 13* %; *Fagus sylvatica 63* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Picea abies*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Fagus sylvatica*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Acer pseudoplatanus*: RDC1 5 %, RDC2 10 %, RDC3 15%, RDC4 35 %, RDC5 35 % other broadleaves: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 13 uneven-aged beech stands with Pinus mugo shrub stands
FM type: 80 no forest management
ID RST×FM: 13_80_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Conservation (i.e. forest reserves)*

Description:
These stands are protected as a forest reserve due to their important role for biodiversity conservation (Natura 2000 sites).

Case study: Dinaric Mountains (Sneznik)
Representative stand: 14 uneven-aged almost pure fir stands
FM type: 30 uneven-aged forest management
ID RST×FM: 14_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase (0-130 cm in height)*
	Species composition: *Abies alba 2 %* (origin: *Natural*, spatial arrangement: *Random*, density: *1400*/ha*); Picea abies 15 % (Natural, In patches, 10500*/ha*); Fagus sylvatica 80 % (Natural, Random, 56000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 1400*/ha*); other broadleaves 1 % (Natural, Random, 700*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase (0-130 cm in height)* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: -	
Operation 1	Type: *From above*	Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm
	Removals: ∑*22* % SV – *Abies alba 86* % of total removals; *Picea abies 5* %; *Fagus sylvatica 7* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
	Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
	other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
Operation 2	Type: *From above*	Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm
	Removals: ∑*15* % SV – *Abies alba 86* % of total removals; *Picea abies 5* %; *Fagus sylvatica 7* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
	Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
	other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
Operation 3	Type: *From above*	Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm
	Removals: ∑*10* % SV – *Abies alba 86* % of total removals; *Picea abies 5* %; *Fagus sylvatica 7* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %	
	Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %	
	other broadleaves: RDC1 0 %, RDC2 10 %, RDC3 40 %, RDC4 55 %, RDC5 0 %	
Operation 4	Type: *From above*	Time reference: *Mature phase (30-50cm DBH)* at dominant

dbh *55* cm
Removals: ∑*10* % SV – *Abies alba 86* % of total removals; *Picea abies 5* %; *Fagus sylvatica 7* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %
Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %
other broadleaves: RDC1 0 %, RDC2 10 %, RDC3 40 %, RDC4 55 %, RDC5 0 %

REGENERATION/SELECTION FELLING — Regeneration system: *3 - Group system (=Grupenschirmschlag)*

Regeneration period: *30* years
Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.1-0.3 ha large (size of 1-2 tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-0.75 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 1-2 ha large stand.*

Operation 1
Selection harvest interval: - years;
Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm
Removals: ∑33 % SV – *Abies alba 86* % of total removals; *Picea abies 5* %; *Fagus sylvatica 7* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %
Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %
other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 40 %, RDC4 55 %, RDC5 5 %

Operation 2
Selection harvest interval: - years;
Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm
Removals: ∑ *40*% SV – *Abies alba 86* % of total removals; *Picea abies 5* %; *Fagus sylvatica 7* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %
Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %
other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 40 %, RDC4 55 %, RDC5 5 %

Operation 3
Selection harvest interval: - years;
Time reference: *Rejuvenation phase* at dominant dbh *80* cm
Removals: ∑ *100*% SV – *all species in RST 100* % of species volume removed
Removals' structure:
all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 14 uneven-aged almost pure fir stands
FM type: 30 uneven-aged forest management
ID RST×FM: 14_30_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: - years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase (0-130 cm in height)*
	Species composition: *Abies alba 2 %* (origin: *Natural*, spatial arrangement: *Random*, density: *1400*/ha*); Picea abies 15 % (Natural, In patches, 10500*/ha*); Fagus sylvatica 80 % (Natural, Random, 56000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 1400*/ha*); other broadleaves 1 % (Natural, Random, 700*/ha*)*	
WEEDING		
TENDING		
THINNING		
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*	
	Regeneration period: - years Description: *In a stand, small groups of trees on areas of 0.05-0.2 ha are cut. Several such groups are made over the stand and are irregularly spaced. The groups of trees are felled considering the advanced regeneration established under the canopy, dbh of trees, and species. A combination with single-tree selection system is practiced. Single-tree selection is mainly applied in steep terrain with a high rockiness, but is scattered present all over managed stand.*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *15*% SV – *Abies alba 87* % of total removals; *Picea abies 5* %; *Fagus sylvatica 6* %; *other broadleaves 1* %; *Acer pseudoplatanus 1* % Removals' structure: *Abies alba*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Picea abies*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Fagus sylvatica*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Acer pseudoplatanus*: RDC1 5 %, RDC2 10 %, RDC3 15%, RDC4 35 %, RDC5 35 % other broadleaves: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 %	

Case study: Dinaric Mountains (Sneznik)
Representative stand: 15 uneven-aged mixed fir-beech stands
FM type: 30 uneven-aged forest management
ID RST×FM: 15_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 2 %* (origin: *Natural*, spatial arrangement: *Random*, density: *3000*/ha*); Picea abies 15 % (Natural, In patches, 22500*/ha*); Fagus sylvatica 80 % (Natural, Random, 120000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 3000*/ha*); other broadleaves 1 % (Natural, Random, 1500*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase (0-130 cm in height)* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: *0*	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*22* % SV – *Abies alba 58* %; *Picea abies 7* %; *Fagus sylvatica 35* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*15* % SV – *Abies alba 58* %; *Picea abies 7* %; *Fagus sylvatica 35* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
Operation 3	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm Removals: ∑*11* % SV – *Abies alba 58* %; *Picea abies 7* %; *Fagus sylvatica 33* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 5 %, RDC3 30 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 30 %, RDC4 60 %, RDC5 5 %	
Operation 4	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *55* cm Removals: ∑*11* % SV – *Abies alba 58* %; *Picea abies 7* %; *Fagus sylvatica 33* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	

	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 5 %, RDC3 30 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 30 %, RDC4 60 %, RDC5 5 %
REGENERATION/SELECTION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *30* years Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.1-0.3 ha large (size of 1-2 tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-0.75 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 1-2 ha large stand.*
Operation 1	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm Removals: ∑ *33*% SV – *Abies alba 58* %; *Picea abies 7* %; *Fagus sylvatica 33* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 10 %, RDC4 35 %, RDC5 55 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 10 %, RDC4 35 %, RDC5 55 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 10%, RDC4 40 %, RDC5 45 %
Operation 2	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm Removals: ∑ *40*% SV – *Abies alba 58* %; *Picea abies 7* %; *Fagus sylvatica 33* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 10 %, RDC4 35 %, RDC5 55 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 10 %, RDC4 35 %, RDC5 55 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 10%, RDC4 40 %, RDC5 45 %
Operation 3	Selection harvest interval: - years; Time reference: *Rejuvenation phase* at dominant dbh *80* cm Removals: ∑ *100*% SV – all species in RST 100 % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 15 uneven-aged mixed fir-beech stands
FM type: 30 uneven-aged forest management
ID RST×FM: 15_30_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: - years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase (0-130 cm in height)*
	Species composition: *Abies alba 2 %* (origin: *Natural*, spatial arrangement: *Random*, density: *3000*/ha*); Picea abies 15 % (Natural, In patches, 22500*/ha*); Fagus sylvatica 80 % (Natural, Random, 120000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 3000*/ha*); other broadleaves 1 % (Natural, Random, 1500*/ha*)*	
WEEDING		
TENDING		
THINNING		
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*	
	Regeneration period: - years Description: *In a stand, small groups of trees on areas of 0.05-0.2 ha are cut. Several such groups are made over the stand and are irregularly spaced. The groups of trees are felled considering the advanced regeneration established under the canopy, dbh of trees, and species. A combination with single-tree selection system is practiced. Single-tree selection is mainly applied in steep terrain with a high rockiness, but is scattered present all over managed stand.*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *15*% SV – *Abies alba 56* %; *Picea abies 7* %; *Fagus sylvatica 35* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Picea abies*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Fagus sylvatica*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Acer pseudoplatanus*: RDC1 5 %, RDC2 10 %, RDC3 15%, RDC4 35 %, RDC5 35 % other broadleaves: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 %	

Case study: Dinaric Mountains (Sneznik)
Representative stand: 16 uneven-aged mixed fir dominated stands
FM type: 30 uneven-aged forest management
ID RST×FM: 16_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)*	
	Species composition: *Abies alba 2 %* (origin: *Natural*, spatial arrangement: *Random*, density: *1400*/ha); *Picea abies 15 % (Natural, In patches, 10500*/ha); *Fagus sylvatica 80 % (Natural, Random, 56000*/ha); *Acer pseudoplatanus 2 % (Natural, Random, 1400*/ha); *other broadleaves 1 % (Natural, Random, 700*/ha)	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase (0-130 cm in height)* at stand height *1,3*	Removals: *10* % of regeneration
Operation 2	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: *0*	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm	
	Removals: ∑*22* % SV – *Abies alba 77* % of total removals; *Picea abies 10* %; *Fagus sylvatica 11* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %	
	Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
	other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm	
	Removals: ∑*15* % SV – *Abies alba 73* % of total removals; *Picea abies 10* %; *Fagus sylvatica 15* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
	Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %	
	other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 40 %, RDC4 55 %, RDC5 0 %	
Operation 3	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm	
	Removals: ∑*10* % SV – *Abies alba 72* % of total removals; *Picea abies 10* %; *Fagus sylvatica 16* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* %	
	Removals' structure:	
	Abies alba: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %	
	Picea abies: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	
	Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %	
	other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 40 %, RDC4 55 %, RDC5 0 %	
Operation 4	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant	

	dbh *55* cm Removals: ∑*10* % SV – *Abies alba 72* % of total removals; *Picea abies 10* %; *Fagus sylvatica 16* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 40 %, RDC4 55 %, RDC5 0 %
REGENERATION/SELECTION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *30* years Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.1-0.3 ha large (size of 1-2 tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-0.75 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 1-2 ha large stand.*
Operation 1	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm Removals: ∑ *33*% SV – *Abies alba 70* % of total removals; *Picea abies 10* %; *Fagus sylvatica 17* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 5 %, RDC3 15%, RDC4 35 %, RDC5 45 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 15 %, RDC4 35 %, RDC5 45 %
Operation 2	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm Removals: ∑ *40*% SV – *Abies alba 70* % of total removals; *Picea abies 10* %; *Fagus sylvatica 17* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 5 %, RDC3 15%, RDC4 35 %, RDC5 45 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 15 %, RDC4 35 %, RDC5 45 %
Operation 3	Selection harvest interval: - years; Time reference: *Rejuvenation phase* at dominant dbh *80* cm Removals: ∑ *100*% SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 16 uneven-aged mixed fir dominated stands
FM type: 30 uneven-aged forest management
ID RST×FM: 16_30_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 2 %* (origin: *Natural*, spatial arrangement: *Random*, density: *1400*/ha*); Picea abies 15 % (Natural, In patches, 10500*/ha*); Fagus sylvatica 80 % (Natural, Random, 56000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 1400*/ha*); other broadleaves 1 % (Natural, Random, 700*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: - years Description: *In a stand, small groups of trees on areas of 0.05-0.2 ha are cut. Several such groups are made over the stand and are irregularly spaced. The groups of trees are felled considering the advanced regeneration established under the canopy, dbh of trees, and species. A combination with single-tree selection system is practiced. Single-tree selection is mainly applied in steep terrain with a high rockiness, but is scattered present all over managed stand.*
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *15* % SV – *Abies alba 69* % of total removals; *Picea abies 10* %; *Fagus sylvatica 18* %; *other broadleaves 2* %; *Acer pseudoplatanus 1* % Removals' structure: *Abies alba*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Picea abies*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Fagus sylvatica*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Acer pseudoplatanus*: RDC1 5 %, RDC2 10 %, RDC3 15%, RDC4 35 %, RDC5 35 % other broadleaves: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 17 uneven-aged mixed fir-beech stands
FM type: 30 uneven-aged forest management
ID RST×FM: 17_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 2 %* (origin: *Natural*, spatial arrangement: *Random*, density: *3000*/ha*); Picea abies 15 % (Natural, In patches, 22500*/ha*); Fagus sylvatica 80 % (Natural, In patches, 120000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 3000*/ha*); other broadleaves 1 % (Natural, Random, 1500*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase (0-130 cm in height)* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: -	
Operation 1	Type: *From above* Time reference: *years; Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*22* % SV – *Abies alba 60* % of total removals; *Picea abies 7* %; *Fagus sylvatica 31* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*15* % SV – *Abies alba 59* % of total removals; *Picea abies 7* %; *Fagus sylvatica 32* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
Operation 3	Type: *From above* Time reference: *years; Mature phase (30-50cm DBH)* at dominant dbh *40* cm Removals: ∑*11* % SV – *Abies alba 60* % of total removals; *Picea abies 7* %; *Fagus sylvatica 32* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
Operation 4	Type: *From above* Time reference: *years; Mature phase (30-50cm DBH)* at dominant dbh *55* cm	

	Removals: ∑*11* % SV – *Abies alba 60* % of total removals; *Picea abies 7* %; *Fagus sylvatica 30* %; *Acer pseudoplatanus 1* %; *other broadleaves 2* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %
REGENERATION/SELECTION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *30* years Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.1-0.3 ha large (size of 1-2 tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-0.75 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 1-2 ha large stand.*
Operation 1	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm Removals: ∑ *33* % SV – *Abies alba 58* % of total removals; *Picea abies 7* %; *Fagus sylvatica 32* %; *Acer pseudoplatanus 1* %; *other broadleaves 2* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 5%, RDC4 35 %, RDC5 55 %
Operation 2	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm Removals: ∑ *40*% SV – *Abies alba 58* % of total removals; *Picea abies 7* %; *Fagus sylvatica 32* %; *Acer pseudoplatanus 1* %; *other broadleaves 2* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 %
Operation 3	Selection harvest interval: - years; Time reference: *Rejuvenation phase* at dominant dbh *80* cm Removals: ∑ *100*% SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 17 uneven-aged mixed fir-beech stands
FM type: 30 uneven-aged forest management
ID RST×FM: 17_30_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: - years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase (0-130 cm in height)*
	Species composition: *Abies alba 2 %* (origin: *Natural*, spatial arrangement: *Random*, density: *3000*/ha*); Picea abies 15 % (Natural, In patches, 22500*/ha*); Fagus sylvatica 80 % (Natural, In patches, 120000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 3000*/ha*); other broadleaves 1 % (Natural, Random, 1500*/ha*)*	
WEEDING		
TENDING		
THINNING		
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*	
	Regeneration period: - years Description: *In a stand, small groups of trees on areas of 0.05-0.2 ha are cut. Several such groups are made over the stand and are irregularly spaced. The groups of trees are felled considering the advanced regeneration established under the canopy, dbh of trees, and species. A combination with single-tree selection system is practiced. Single-tree selection is mainly applied in steep terrain with a high rockiness, but is scattered present all over managed stand.*	
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *15*% SV – *Abies alba 58* %; *Picea abies 7* %; *Fagus sylvatica 33* %; *other broadleaves 1* %; *Acer pseudoplatanus 1* % Removals' structure: *Abies alba*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Picea abies*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Fagus sylvatica*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Acer pseudoplatanus*: RDC1 5 %, RDC2 10 %, RDC3 15%, RDC4 35 %, RDC5 35 % other broadleaves: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 %	

Case study: Dinaric Mountains (Sneznik)
Representative stand: 18 uneven-aged mixed fir dominated stands
FM type: 30 uneven-aged forest management
ID RST×FM: 18_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 2 %* (origin: *Natural*, spatial arrangement: *Random*, density: *1400*/ha*); Picea abies 15 % (Natural, In patches, 10500*/ha*); Fagus sylvatica 80 % (Natural, Random, 56000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 1400*/ha*); other broadleaves 1 % (Natural, Random, 700*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase (0-130 cm in height)* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: -	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*22* % SV – *Abies alba 70* % of total removals; *Picea abies 13* %; *Fagus sylvatica 15* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*15* % SV – *Abies alba 70* % of total removals; *Picea abies 13* %; *Fagus sylvatica 15* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
Operation 3	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm Removals: ∑*10* % SV – *Abies alba 70* % of total removals; *Picea abies 13* %; *Fagus sylvatica 15* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
Operation 4	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant	

	dbh *55* cm Removals: ∑*10* % SV – *Abies alba 70* % of total removals; *Picea abies 13* %; *Fagus sylvatica 15* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %
REGENERATION/SELECTION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *30* years Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.1-0.3 ha large (size of 1-2 tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-0.75 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 1-2 ha large stand.*
Operation 1	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm Removals: ∑ *33* % SV – *Abies alba 66* % of total removals; *Picea abies 13* %; *Fagus sylvatica 18* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 10 %, RDC4 35 %, RDC5 55 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 10%, RDC4 35 %, RDC5 55 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 10 %, RDC4 35 %, RDC5 50 %
Operation 2	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at - dominant dbh *75* cm Removals: ∑ *40* % SV – *Abies alba 66* % of total removals; *Picea abies 13* %; *Fagus sylvatica 18* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 10 %, RDC4 35 %, RDC5 55 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 10%, RDC4 35 %, RDC5 55 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 10 %, RDC4 35 %, RDC5 50 %
Operation 3	Selection harvest interval: - years; Time reference: *Rejuvenation phase* at dominant dbh *80* cm Removals: ∑ *100*% SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 18 uneven-aged mixed fir dominated stands
FM type: 30 uneven-aged forest management
ID RST×FM: 18_30_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 2 %* (origin: *Natural*, spatial arrangement: *Random*, density: *1400*/ha*); Picea abies 15 % (Natural, In patches, 10500*/ha*); Fagus sylvatica 80 % (Natural, Random, 56000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 1400*/ha*); other broadleaves 1 % (Natural, Random, 700*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: - years Description: *In a stand, small groups of trees on areas of 0.05-0.2 ha are cut. Several such groups are made over the stand and are irregularly spaced. The groups of trees are felled considering the advanced regeneration established under the canopy, dbh of trees, and species. A combination with single-tree selection system is practiced. Single-tree selection is mainly applied in steep terrain with a high rockiness, but is scattered present all over managed stand.*
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *15* % SV – *Abies alba 65* %; *Picea abies 13* %; *Fagus sylvatica 19* %; *other broadleaves <1* %; *Acer pseudoplatanus <1* % Removals' structure: *Abies alba*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Picea abies*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Fagus sylvatica*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Acer pseudoplatanus*: RDC1 5 %, RDC2 10 %, RDC3 15%, RDC4 35 %, RDC5 35 % other broadleaves: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 19 uneven-aged mixed fir dominated stands on S exposition
FM type: 30 uneven-aged forest management
ID RST×FM: 19_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 2 %* (origin: *Natural*, spatial arrangement: *Random*, density: *1400*/ha*); Picea abies 15 % (Natural, In patches, 10500*/ha*); Fagus sylvatica 80 % (Natural, Random, 56000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 1400*/ha*); other broadleaves 1 % (Natural, Random, 700*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *years; Regeneration / seedling phase (0-130 cm in height)* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *years; Thicket phase (>130cm height, <10cm DBH)* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *years; Thicket phase (>130cm height, <10cm DBH)* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: -	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑ *22* % SV – *Abies alba 66* % of total removals; *Picea abies 12* %; *Fagus sylvatica 20* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 5 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*15* % SV – *Abies alba 67* % of total removals; *Picea abies 12* %; *Fagus sylvatica 19* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 15 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 55 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 5 %	
Operation 3	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm Removals: ∑*10* % SV – *Abies alba 67* % of total removals; *Picea abies 12* %; *Fagus sylvatica 19* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 60 %, RDC5 10 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 5 %	
Operation 4	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant	

	dbh *55* cm Removals: ∑*10* % SV – *Abies alba 67* % of total removals; *Picea abies 12* %; *Fagus sylvatica 19* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 60 %, RDC5 10 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 5 %
REGENERATION/SELECTION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *30* years Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.1-0.3 ha large (size of 1-2 tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-0.75 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 1-2 ha large stand.*
Operation 1	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm Removals: ∑ *33*% SV – *Abies alba 67* % of total removals; *Picea abies 12* %; *Fagus sylvatica 18* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 40 %, RDC5 50 %
Operation 2	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm Removals: ∑ *40*% SV – *Abies alba 64* % of total removals; *Picea abies 11* %; *Fagus sylvatica 22* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 40 %, RDC5 50 %
Operation 3	Selection harvest interval: - years; Time reference: *Rejuvenation phase* at dominant dbh *80* cm Removals: ∑ *100*% SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 19 uneven-aged mixed fir dominated stands on S exposition
FM type: 30 uneven-aged forest management
ID RST×FM: 19_30_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 2 %* (origin: *Natural*, spatial arrangement: *Random*, density: *1400*/ha*); Picea abies 15 % (Natural, In patches, 10500*/ha*); Fagus sylvatica 80 % (Natural, Random, 56000*/ha*); Acer pseudoplatanus 2 % (Natural, Random, 1400*/ha*); other broadleaves 1 % (Natural, Random, 700*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: - years Description: *In a stand, small groups of trees on areas of 0.05-0.2 ha are cut. Several such groups are made over the stand and are irregularly spaced. The groups of trees are felled considering the advanced regeneration established under the canopy, dbh of trees, and species. A combination with single-tree selection system is practiced. Single-tree selection is mainly applied in steep terrain with a high rockiness, but is scattered present all over managed stand.*
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *15*% SV – *Abies alba 65* % of total removals; *Picea abies 11* %; *Fagus sylvatica 21* %; *other broadleaves 2* %; *Acer pseudoplatanus 1* % Removals' structure: *Abies alba*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Picea abies*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Fagus sylvatica*: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 % *Acer pseudoplatanus*: RDC1 5 %, RDC2 10 %, RDC3 15%, RDC4 35 %, RDC5 35 % other broadleaves: RDC1 5 %, RDC2 10 %, RDC3 15 %, RDC4 35 %, RDC5 35 %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 20 uneven-aged mixed fir dominated stands with significatn proportions of beech and spruce; sites on N exposition with high portion of rendzinas
FM type: 30 uneven-aged forest management
ID RST×FM: 20_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (75% of RST area) and group selection system (25% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: *135* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 4 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2800*/ha*); Picea abies 60 % (Natural, Random, 42000*/ha*); Fagus sylvatica 31 % (Natural, Random, 21700*/ha*); Acer pseudoplatanus 5 % (Natural, In patches, 3500*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *years; Regeneration / seedling phase (0-130 cm in height)* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *years; Thicket phase (>130cm height, <10cm DBH)* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *years; Thicket phase (>130cm height, <10cm DBH)* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: -	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*22* % SV – *Abies alba 53* % of total removals; *Picea abies 20* %; *Fagus sylvatica 25* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 60 %, RDC5 10 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 60 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35%, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*15* % SV – *Abies alba 53* % of total removals; *Picea abies 20* %; *Fagus sylvatica 25* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 60 %, RDC5 10 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 30 %, RDC4 60 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35%, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
Operation 3	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm Removals: ∑*10* % SV – *Abies alba 53* % of total removals; *Picea abies 20* %; *Fagus sylvatica 25* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35%, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	

Operation 4 Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *55* cm
Removals: ∑*10* % SV – *Abies alba 53* % of total removals; *Picea abies 20* %; *Fagus sylvatica 25* %; *Acer pseudoplatanus 1* %; *other broadleaves 1* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %
Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 35%, RDC4 60 %, RDC5 5 %
other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %

REGENERATION/SELECTION FELLING Regeneration system: *3 - Group system (=Grupenschirmschlag)*
Regeneration period: *30* years
Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.1-0.3 ha large (size of 1-2 tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-0.75 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 1-2 ha large stand.*

Operation 1 Selection harvest interval: - years;
Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm
Removals: ∑ *33*% SV – *Abies alba 52* % of total removals; *Picea abies 20* %; *Fagus sylvatica 25* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 %
Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 5%, RDC4 35 %, RDC5 60 %
other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 %

Operation 2 Selection harvest interval: - years;
Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm
Removals: ∑ *40*% SV – *Abies alba 52* % of total removals; *Picea abies 20* %; *Fagus sylvatica 25* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 %
Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 5%, RDC4 35 %, RDC5 60 %
other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 %

Operation 3 Selection harvest interval: - years;
Time reference: *Rejuvenation phase* at dominant dbh *80* cm
Removals: ∑ *100*% SV – *all species in RST 100* % of species volume removed
Removals' structure:
all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 20 uneven-aged mixed fir dominated stands with significatn proportions of beech and spruce; sites on N exposition with high portion of rendzinas
FM type: 30 uneven-aged forest management
ID RST×FM: 20_30_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (75% of RST area) and group selection system (25% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 4 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2800*/ha*); Picea abies 60 % (Natural, Random, 42000*/ha*); Fagus sylvatica 31 % (Natural, Random, 21700*/ha*); Acer pseudoplatanus 5 % (Natural, In patches, 3500*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: - years Description: *In a stand, small groups of trees on areas of 0.05-0.2 ha are cut. Several such groups are made over the stand and are irregularly spaced. The groups of trees are felled considering the advanced regeneration established under the canopy, dbh of trees, and species. A combination with single-tree selection system is practiced. Single-tree selection is mainly applied in steep terrain with a high rockiness, but is scattered present all over managed stand.*
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *15*% SV – *Abies alba 56* %; *Picea abies 19* %; *Fagus sylvatica 22* %; *other broadleaves 2* %; *Acer pseudoplatanus 1* % Removals' structure: *Abies alba*: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 % *Picea abies*: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 % *Fagus sylvatica*: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 % *Acer pseudoplatanus*: RDC1 5 %, RDC2 10 %, RDC3 35%, RDC4 35 %, RDC5 15 % other broadleaves: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 21 uneven-aged mixed fir-beech-spruce stands on N expositions
FM type: 30 uneven-aged forest management
ID RST×FM: 21_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: *135* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 4 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2200*/ha*); Picea abies 60 % (Natural, Random, 33000*/ha*); Fagus sylvatica 31 % (Natural, Random, 17500*/ha*); Acer pseudoplatanus 5 % (Natural, In patches, 2750*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase (0-130 cm in height)* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: -	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*22* % SV – *Abies alba 45* % of total removals; *Picea abies 19* %; *Fagus sylvatica 35* %; *Acer pseudoplatanus 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*15* % SV – *Abies alba 45* % of total removals; *Picea abies 19* %; *Fagus sylvatica 35* %; *Acer pseudoplatanus 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
Operation 3	Type: *From above* Time reference: *years; Mature phase (30-50cm DBH)* at dominant dbh *40* cm Removals: ∑*10* % SV – *Abies alba 45* % of total removals; *Picea abies 19* %; *Fagus sylvatica 35* %; *Acer pseudoplatanus 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %	
Operation 4	Type: *From above* Time reference: *years; Mature phase (30-50cm DBH)* at dominant dbh *55* cm Removals: ∑*10* % SV – *Abies alba 45* % of total removals; *Picea abies 19* %; *Fagus sylvatica 35* %; *Acer pseudoplatanus 1* %	

	Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %
REGENERATION/SELECTION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*
	Regeneration period: *30* years Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.1-0.3 ha large (size of 1-2 tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-0.75 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 1-2 ha large stand.*
Operation 1	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm Removals: ∑ *33*% SV – *Abies alba 43* % of total removals; *Picea abies 20* %; *Fagus sylvatica 34* %; *Acer pseudoplatanus 3* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 %
Operation 2	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm Removals: ∑ *40*% SV – *Abies alba 43* % of total removals; *Picea abies 20* %; *Fagus sylvatica 34* %; *Acer pseudoplatanus 3* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 %
Operation 3	Selection harvest interval: - years; Time reference: *Rejuvenation phase* at dominant dbh *80* cm Removals: ∑ *100*% SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 21 uneven-aged mixed fir-beech-spruce stands on N expositions
FM type: 30 uneven-aged forest management
ID RST×FM: 21_30_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (90% of RST area) and group selection system (10% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 4 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2200*/ha*); Picea abies 60 % (Natural, Random, 33000*/ha*); Fagus sylvatica 31 % (Natural, Random, 17500*/ha*); Acer pseudoplatanus 5 % (Natural, In patches, 2750*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: - years Description: *In a stand, small groups of trees on areas of 0.05-0.2 ha are cut. Several such groups are made over the stand and are irregularly spaced. The groups of trees are felled considering the advanced regeneration established under the canopy, dbh of trees, and species. A combination with single-tree selection system is practiced. Single-tree selection is mainly applied in steep terrain with a high rockiness, but is scattered present all over managed stand.*
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *15*% SV – *Abies alba 43* % of total removals; *Picea abies 20* %; *Fagus sylvatica 34* %; *Acer pseudoplatanus 3* % Removals' structure: *Abies alba*: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 % *Picea abies*: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 % *Fagus sylvatica*: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 % *Acer pseudoplatanus*: RDC1 5 %, RDC2 10 %, RDC3 35%, RDC4 35 %, RDC5 15 %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 22 uneven-aged mixed fir-beech-spruce stands on sites of N exposition and high portion of rendzinas
FM type: 30 uneven-aged forest management
ID RST×FM: 22_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (75% of RST area) and group selection system (25% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: *135* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 4 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2200*/ha*); Picea abies 60 % (Natural, Random, 33000*/ha*); Fagus sylvatica 31 % (Natural, Random, 17500*/ha*); Acer pseudoplatanus 5 % (Natural, In patches, 2750*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *years; Regeneration / seedling phase (0-130 cm in height)* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *years; Thicket phase (>130cm height, <10cm DBH)* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *years; Thicket phase (>130cm height, <10cm DBH)* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: -	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*22* % SV – *Abies alba 40* % of total removals; *Picea abies 17* %; *Fagus sylvatica 40* %; *Acer pseudoplatanus 2* %; *other broadleaves 1*% Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 35 %, RDC4 55 %, RDC5 5 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at stand height m / dominant dbh *30* cm / mean dbh cm Removals: ∑*15* % SV – *Abies alba 40* % of total removals; *Picea abies 17* %; *Fagus sylvatica 40* %; *Acer pseudoplatanus 2* %; *other broadleaves 1*% Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 35 %, RDC4 55 %, RDC5 5 %	
Operation 3	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm Removals: ∑*10* % SV – *Abies alba 40* % of total removals; *Picea abies 17* %; *Fagus sylvatica 40* %; *Acer pseudoplatanus 2* %; *other broadleaves 1*% Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 65 %, RDC5 0 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 35 %, RDC4 55 %, RDC5 5 %	

Operation 4	Type: *From above*	Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *55* cm
	Removals: ∑*10* % SV – *Abies alba 40* % of total removals; *Picea abies 17* %; *Fagus sylvatica 40* %; *Acer pseudoplatanus 2* %; *other broadleaves 1*% Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 65 %, RDC5 0 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 35 %, RDC4 55 %, RDC5 5 %	
REGENERATION/SELECTION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*	
	Regeneration period: *30* years Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.1-0.3 ha large (size of 1-2 tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-0.75 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 1-2 ha large stand.*	
Operation 1	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm Removals: ∑ *33*% SV – *Abies alba 44* % of total removals; *Picea abies 17* %; *Fagus sylvatica 35* %; *Acer pseudoplatanus 3* %; *other broadleaves 1*% Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 %	
Operation 2	Selection harvest interval: - years; Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm Removals: ∑ *40*% SV – *Abies alba 44* % of total removals; *Picea abies 17* %; *Fagus sylvatica 34* %; *Acer pseudoplatanus 4* %; *other broadleaves 1*% Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 % other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 %	
Operation 3	Selection harvest interval: - years; Time reference: *Rejuvenation phase* at dominant dbh *80* cm Removals: ∑ *100*% SV – *all species in RST 100* % of species volume removed Removals' structure:	

all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 22 uneven-aged mixed fir-beech-spruce stands on sites of N exposition and high portion of rendzinas
FM type: 30 uneven-aged forest management
ID RST×FM: 22_30_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (75% of RST area) and group selection system (25% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 4 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2200*/ha*); Picea abies 60 % (Natural, Random, 33000*/ha*); Fagus sylvatica 31 % (Natural, Random, 17500*/ha*); Acer pseudoplatanus 5 % (Natural, In patches, 2750*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system*
	Regeneration period: - years Description: *In a stand, small groups of trees on areas of 0.05-0.2 ha are cut. Several such groups are made over the stand and are irregularly spaced. The groups of trees are felled considering the advanced regeneration established under the canopy, dbh of trees, and species. A combination with single-tree selection system is practiced. Single-tree selection is mainly applied in steep terrain with a high rockiness, but is scattered present all over managed stand.*
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *15*% SV – *Abies alba 44* % of total removals; *Picea abies 17* %; *Fagus sylvatica 34* %; *Acer pseudoplatanus 4* %; *other broadleaves 1*% Removals' structure: *Abies alba*: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 % *Picea abies*: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 % *Fagus sylvatica*: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 % *Acer pseudoplatanus*: RDC1 5 %, RDC2 10 %, RDC3 35%, RDC4 35 %, RDC5 15 % other broadleaves: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 23 uneven-aged mixed fir-beech-spruce stands on sites of N exposition around 1200 m asl and high portion of rendzinas
FM type: 30 uneven-aged forest management
ID RST×FM: 23_30_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (75% of RST area) and group selection system (25% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: *135* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 4 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2200*/ha*); Picea abies 60 % (Natural, Random, 33000*/ha*); Fagus sylvatica 31 % (Natural, Random, 17500*/ha*); Acer pseudoplatanus 5 % (Natural, In patches, 2750*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *Regeneration / seedling phase (0-130 cm in height)* at stand height *1,3* m	Removals: *10* % of regeneration
Operation 2	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at stand height *3,5* m	Removals: *40* % of regeneration
Operation 3	Time reference: *Thicket phase (>130cm height, <10cm DBH)* at dominant dbh *7,5* cm	Removals: *35* % of regeneration
THINNING	Description: -	
Operation 1	Type: *From above* Time reference: *Early pole phase (10-20cm DBH)* at dominant dbh *15* cm Removals: ∑*22* % SV – *Abies alba 35* % of total removals; *Picea abies 27* %; *Fagus sylvatica 35* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %	
Operation 2	Type: *From above* Time reference: *Older pole phase (20-30cm DBH)* at dominant dbh *30* cm Removals: ∑*15* % SV – *Abies alba 35* % of total removals; *Picea abies 27* %; *Fagus sylvatica 35* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 55 %, RDC5 10 %	
Operation 3	Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *40* cm Removals: ∑*10* % SV – *Abies alba 34* % of total removals; *Picea abies 28* %; *Fagus sylvatica 35* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Picea abies*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Fagus sylvatica*: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 % *Acer pseudoplatanus*: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 % other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %	

Operation 4 Type: *From above* Time reference: *Mature phase (30-50cm DBH)* at dominant dbh *55* cm
Removals: ∑*10* % SV – *Abies alba 34* % of total removals; *Picea abies 28* %; *Fagus sylvatica 35* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 35 %, RDC4 60 %, RDC5 5 %
Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 60 %, RDC5 0 %
other broadleaves: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 55 %, RDC5 5 %

REGENERATION/SELECTION FELLING Regeneration system: *3 - Group system (=Grupenschirmschlag)*

Regeneration period: *30* years
Description: *Regeneration fellings of irregular shelterwood system begin at "limits of transport" points, which are the areas the most distant from the extraction roads, considering also the terrain features. Fellings are afterwards continued towards the extraction routes, providing the spatial order of the regeneration fellings; however, the fellings need not be regularly spaced in a stand. Several regeneration areas are usually made in a stand under regeneration process, depending on the size of a stand to be regenerated, the harvesting intensity and presence of (advance) regeneration. If there are no groups of natural advance regeneration to be implemented in a new stand, the first regeneration felling (the seeding felling in the sense of shelterwood system with some small canopy gaps) is performed over the regeneration area and it should be waited for regeneration to occur before implementing the second regeneration felling. Initial regeneration areas (operation 1) are usually 0.1-0.3 ha large (size of 1-2 tree heights in diameter) and are enlarged afterwards in 2 steps/operations (up to the size of 0.5-0.75 ha). Second regeneration felling (operation 2) is made by removing most of trees in the initial regenerated area (some could still be left as seed bearers) and some surrounding trees in the form of a ring around the regenerated area (to enlarge the regenerated area), while mature stand around this area is thinned to get more light into the stand. In the third regeneration felling (operation 3) all mature trees in the enlarged regeneration area are removed. The exception may be silver fir trees of up to 20-25 cm in dbh, which can be left in a stand in order to preserve it in an sufficient portion. At the end of regeneration period, all regenerated areas can be grouped (by the final regeneration felling – operation 3) into usually up to 1-2 ha large stand.*

Operation 1 Time reference: *Over mature (>50cm DBH)* at dominant dbh *65* cm
Removals: ∑ *33*% SV – *Abies alba 37* % of total removals; *Picea abies 28* %; *Fagus sylvatica 31* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 %
Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 5%, RDC4 35 %, RDC5 60 %
other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 %

Operation 2 Time reference: *Over mature (>50cm DBH)* at dominant dbh *75* cm
Removals: ∑ *40*% SV – *Abies alba 37* % of total removals; *Picea abies 28* %; *Fagus sylvatica 31* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* %
Removals' structure:
Abies alba: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Picea abies: RDC1 0 %, RDC2 0 %, RDC3 0 %, RDC4 25 %, RDC5 75 %
Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 5 %, RDC4 35 %, RDC5 60 %
Acer pseudoplatanus: RDC1 0 %, RDC2 0 %, RDC3 5%, RDC4 35 %, RDC5 60 %
other broadleaves: RDC1 0 %, RDC2 5 %, RDC3 5 %, RDC4 35 %, RDC5 55 %

Operation 3 Time reference: *Rejuvenation phase* at dominant dbh *80* cm
Removals: ∑ *100*% SV – *all species in RST 100* % of spevies volume removed
Removals' structure:
all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Dinaric Mountains (Sneznik)
Representative stand: 23 uneven-aged mixed fir-beech-spruce stands on sites of N exposition around 1200 m asl and high portion of rendzinas
FM type: 30 uneven-aged forest management
ID RST×FM: 23_30_2

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Combination of small-scale irregular shelterwood system (75% of RST area) and group selection system (25% of RST area), including the removal of individual stems only ("free style silviculture").*
Rotation period: - years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Natural*; Time reference: *Regeneration / seedling phase (0-130 cm in height)* Species composition: *Abies alba 4 %* (origin: *Natural*, spatial arrangement: *In patches*, density: *2200*/ha*); Picea abies 60 % (Natural, Random, 33000*/ha*); Fagus sylvatica 31 % (Natural, Random, 17500*/ha*); Acer pseudoplatanus 5 % (Natural, In patches, 2750*/ha*)*
WEEDING	
TENDING	
THINNING	
REGENERATION/SELECTION FELLING	Regeneration system: *7 - Group selection system* Regeneration period: - years Description: *In a stand, small groups of trees on areas of 0.05-0.2 ha are cut. Several such groups are made over the stand and are irregularly spaced. The groups of trees are felled considering the advanced regeneration established under the canopy, dbh of trees, and species. A combination with single-tree selection system is practiced. Single-tree selection is mainly applied in steep terrain with a high rockiness, but is scattered present all over managed stand.*
Operation 1	Selection harvest interval: *10* years; Time reference: *Uneven-aged stand* Removals: ∑ *15*% SV – *Abies alba 37* % of total removals; *Picea abies 28* %; *Fagus sylvatica 31* %; *Acer pseudoplatanus 2* %; *other broadleaves 1* % Removals' structure: *Abies alba*: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 % *Picea abies*: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 % *Fagus sylvatica*: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 % *Acer pseudoplatanus*: RDC1 5 %, RDC2 10 %, RDC3 35%, RDC4 35 %, RDC5 15 % other broadleaves: RDC1 5 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 15 %

2.5 CSA5 – Vilhelmina, Scandinavian Mountains, Sweden

Case study: Vilhelmina
Representative stand: 1 »#141 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *100* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *1 years; Regeneration / seedling phase* Species compostion: *Picea abies 47 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *1700*/ha*); Picea abies 8 % (Natural, Random, 300*/ha*); Pinus sylvestris 3 % (Natural, Random, 100*/ha*); Betula pubescens 42 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3* m Removals: *55* % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Picea abies 88* % of total removals; *Pinus sylvestris 2* %; *Betula pubescens 10* % Removals' structure: *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 10 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *100 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Picea abies 90* % of species volume removed; *Pinus sylvestris 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose.*

Case study: Vilhelmina
Representative stand: 2 »#145 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *90* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *1 years; Regeneration / seedling phase* Species compostion: *Picea abies 45 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Picea abies 4 % (Natural, Random, 1500*/ha*); Picea abies 2 % (Natural, Random, 1500*/ha*); Betula pubescens 49 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: *55* % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Picea abies 86* % of total removals; *Pinus sylvestris 2* %; *Betula pubescens 12* % Removals' structure: *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 10 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *90 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Picea abies 90* % of species volume removed; *Pinus sylvestris 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose.*

Case study: Vilhelmina
Representative stand: 3 »#148 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 3_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *110* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *0 years; Regeneration / seedling phase* Species compostion: *Picea abies 54 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Picea abies 7 % (Natural, Random, 1500*/ha*); Pinus sylvestris 4 % (Natural, Random, 1500*/ha*); Betula pubescens 35 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: *60* % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Picea abies 89* % of total removals; *Pinus sylvestris 3* %; *Betula pubescens 8* % Removals' structure: *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 10 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *110 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Picea abies 90* % of species volume removed; *Pinus sylvestris 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose.*

Case study: Vilhelmina
Representative stand: 4 »#305 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 4_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *90* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *0 years; Regeneration / seedling phase* Species compostion: *Picea abies 45 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Picea abies 4 % (Natural, Random, 1500*/ha*); Pinus sylvestris 2 % (Natural, Random, 1500*/ha*); Betula pubescens 49 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: *60* % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Picea abies 86* % of total removals; *Pinus sylvestris 2* %; *Betula pubescens 12* % Removals' structure: *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 1 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *90 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Picea abies 90* % of species volume removed; *Pinus sylvestris 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose.*

Case study: Vilhelmina
Representative stand: 5 »#307 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 5_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *100* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *0 years; Regeneration / seedling phase* Species compostion: *Picea abies 49 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Picea abies 6 % (Natural, Random, 1500*/ha*); Pinus sylvestris 1 % (Natural, Random, 1500*/ha*); Betula pubescens 54 % (Natural, In patche, 1500*/ha *s)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: *60* % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Picea abies 88* % of total removals; *Pinus sylvestris 1* %; *Betula pubescens 11* % Removals' structure: *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 10 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *100 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Picea abies 90* % of species volume removed; *Pinus sylvestris 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose.*

Case study: Vilhelmina
Representative stand: 6 »#308 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 6_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *110* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *0 years; Regeneration / seedling phase* Species compostion: *Picea abies 54 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Picea abies 4 % (Natural, Random, 1500*/ha*); Pinus sylvestris 2 % (Natural, Random, 1500*/ha*); Betula pubescens 40 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: *65* % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Picea abies 83* % of total removals; *Pinus sylvestris 2* %; *Betula pubescens 15* % Removals' structure: *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *110 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Picea abies 90* % of species volume removed; *Pinus sylvestris 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose.*

Case study: Vilhelmina
Representative stand: 7 »#395 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 7_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *90* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *0 years; Regeneration / seedling phase* Species compostion: *Pinus contorta 49 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Pinus sylvestris 2 % (Natural, Random, 1500*/ha*); Picea abies 4 % (Natural, Random, 1500*/ha*); Betula pubescens 45 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: *55* % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Pinus contorta 83* % of total removals; *Picea abies 4* %; *Pinus sylvestris 2* %; *Betula pubescens 11* % Removals' structure: *Pinus contorta*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 10 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *90 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Pinus contorta 100* % of species volume removed; *Pinus sylvestris 90* %; *Picea abies 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose. The exception is Pinus contorta which is removed 100 %.*

Case study: Vilhelmina
Representative stand: 8 »#396 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 8_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *100* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *0 years; Regeneration / seedling phase* Species compostion: *Pinus contorta 53 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Pinus sylvestris 5 % (Natural, Random, 1500*/ha*); Picea abies 3 % (Natural, Random, 1500*/ha*); Betula pubescens 39 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: *60* % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Pinus contorta 85* % of total removals; *Pinus sylvestris 2* %; *Picea abies 4* %; *Betula pubescens 9* % Removals' structure: *Pinus contorta*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 10 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *100 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Pinus contorta 100* % of species volume removed; *Pinus sylvestris 90* %; *Picea abies 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose. The exception is Pinus contorta which is removed 100 %.*

Case study: Vilhelmina
Representative stand: 9 »#398 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 9_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *110* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *0 years; Regeneration / seedling phase* Species compostion: *Pinus contorta 58 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Pinus sylvestris 6 % (Natural, Random, 1500*/ha*); Picea abies 3 % (Natural, Random, 1500*/ha*); Betula pubescens 33 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: *65* % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Pinus contorta 86* % of total removals; *Pinus sylvestris 2* %; *Picea abies 5* %; *Betula pubescens 7* % Removals' structure: *Pinus contorta*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 10 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *110 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Pinus contorta 100* % of species volume removed; *Pinus sylvestris 90* %; *Picea abies 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose. The exception is Pinus contorta which is removed 100 %.*

Case study: Vilhelmina
Representative stand: 10 »#443 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 10_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *100* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *0 years; Regeneration / seedling phase* Species compostion: *Pinus sylvestris 53 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Pinus sylvestris 3 % (Natural, Random, 1500*/ha*); Picea abies 5 % (Natural, Random, 1500*/ha*); Betula pubescens 39 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: *60* % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Pinus sylvestris 87* % of total removals; *Picea abies 4* %; *Betula pubescens 9* % Removals' structure: *Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 10 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *100 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Pinus sylvestris 90* % of species volume removed; *Picea abies 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose.*

Case study: Vilhelmina
Representative stand: 11 »#444 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 11_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *110* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *0 years; Regeneration / seedling phase* Species compostion: *Pinus sylvestris 51 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Pinus sylvestris 2 % (Planted, Random, 1500*/ha*); Picea abies 8 % (Planted, Random, 1500*/ha*); Betula pubescens 39 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: *55* % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Pinus sylvestris 85* % of total removals; *Picea abies 6* %; *Betula pubescens 9* % Removals' structure: *Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 10 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *110 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Pinus sylvestris 90* % of species volume removed; *Picea abies 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose.*

Case study: Vilhelmina
Representative stand: 12 »#445 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 12_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *90* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *0 years; Regeneration / seedling phase* Species compostion: *Pinus sylvestris 48 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Pinus sylvestris 2 % (Natural, Random, 1500*/ha*); Picea abies 7 % (Natural, Random, 1500*/ha*); Betula pubescens 43 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: *55* % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Pinus sylvestris 84* % of total removals; *Picea abies 6* %; *Betula pubescens 10* % Removals' structure: *Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 10 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *90 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Pinus sylvestris 90* % of species volume removed; *Picea abies 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose.*

Case study: Vilhelmina
Representative stand: 13 »#992 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 13_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *100* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *0 years; Regeneration / seedling phase* Species compostion: *Picea abies 47 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Picea abies 8 % (Natural, Random, 1500*/ha*); Pinus sylvestris 3 % (Natural, Random, 1500*/ha*); Betula pubescens 42 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: *55* % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Picea abies 88* % of total removals; *Pinus sylvestris 2* %; *Betula pubescens 10* % Removals' structure: *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 %*Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 10 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *100 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Picea abies 90* % of species volume removed; *Pinus sylvestris 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose.*

Case study: Vilhelmina
Representative stand: 14 »#995 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 14_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *90* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *0 years; Regeneration / seedling phase* Species compostion: *Picea abies 44 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Picea abies 7 % (Natural, Random, 1500*/ha*); Pinus sylvestris 2 % (Natural, Random, 1500*/ha*); Betula pubescens 47 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: - % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Picea abies 7* % of total removals; *Pinus sylvestris 86* %; *Betula pubescens 7* % Removals' structure: *Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 %*Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 % *Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 10 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *90 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Picea abies 90* % of species volume removed; *Picea abies 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose.*

Case study: Vilhelmina
Representative stand: 15 »#998 in earlier RST definition«
FM type: 10 even-aged forest management
ID RST×FM: 15_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Regeneration, soil prep, planting, precommercial thinning, but not always thinning, once clear felling.*
Rotation period: *110* years
Silvicultural operations:

REGENERATION	
Operation 1	Regeneration type: *Artificial – planting*; Time reference: *0 years; Regeneration / seedling phase* Species compostion: *Pinus sylvestris 57 %* (origin: *Planted*, spatial arrangement: *Systematic*, density: *4000*/ha*); Pinus sylvestris 3 % (Natural, Random, 1500*/ha*); Picea abies 9 % (Natural, Random, 1500*/ha*); Betula pubescens 31 % (Natural, In patches, 1500*/ha*)*
WEEDING	
TENDING	
Operation 1	Time reference: *Thicket phase (>130cm height,* at stand height *3,00* m Removals: - % of regeneration
THINNING	Description: -
Operation 1	Type: *Combination from above and from below* Time reference: *Early pole phase (10-20cm DBH)* at stand height *13* m Removals: ∑*35* % SV – *Pinus sylvestris 86* % of total removals; *Picea abies 7* %; *Betula pubescens 7* % Removals' structure: *Pinus sylvestris*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 %*Picea abies*: RDC1 29 %, RDC2 34 %, RDC3 25 %, RDC4 9 %, RDC5 3 %*Betula pubescens*: RDC1 30 %, RDC2 35 %, RDC3 25 %, RDC4 10 %, RDC5 0 %
REGENERATION FELLING	Regeneration system: *1 - Clear cutting* Regeneration period: *2* years Description: *Final felling is 90 % of the standing volume, the other 10 % corresponds to nature conservation.*
Operation 1	Time reference: *110 years; Older pole phase (20-30cm DBH)* Removals: ∑*90* % SV – *Picea abies 90* % of species volume removed; *Picea abies 90* %; *Betula pubescens 90* % Removals' structure: *All tree species in RST*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % ** In each RDC 90 % of trees are removed, while 10 % are left for nature conservation purpose.*

2.6 CSA6 – Kozie chrbty, Western Carpathians, Slovakia

Case study: Kozie chrbty
Representative stand: 1.0
FM type: 10 even-aged forest management
ID RST×FM: 1.0_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *Planned thinning: 75 m³, cutting the damaged trees, in the gaps might be soil preparation for reforestation.*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *30* years; *Regeneration / seedling phase* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *14* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 %	Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *22* m and mean dbh *23* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 40 m; distance (restricted zone) from the nearest one 80 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *120* years; *Mature phase (30-50cm DBH)* at stand height *27* m and mean dbh *30* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 %	
Operation 2	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *32* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 %	
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *100* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Kozie chrbty
Representative stand: 2.1
FM type: 10 even-aged forest management
ID RST×FM: 2.1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *90* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *36* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *22* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *12* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 %	
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 %	
Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm Removals: ∑ *100* % SV – *Picea abies 100* % of total removals	

Removals' structure:
Picea abies: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 2.2
FM type: 10 even-aged forest management
ID RST×FM: 2.2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *90* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *28* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *11* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *6* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 %	
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 %	
Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm Removals: ∑ *100* % SV – *Picea abies 100* % of total removals	

Removals' structure:
Picea abies: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 2.3
FM type: 10 even-aged forest management
ID RST×FM: 2.3_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *According to Forest management plan: Planned timber felling: 50m³ on 0.14 ha + process calamity 20m³. Reaforestation on 0.14 ha with spruce.*
Rotation period: *90* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *28* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *11* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *6* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 %	
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 %	
Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm	

Removals: ∑ *100* % SV – *Picea abies 100* % of total removals
Removals' structure:
Picea abies: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 3.1
FM type: 10 even-aged forest management
ID RST×FM: 3.1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *115* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *20* years; *Thicket phase (>130cm height,* at stand height *5* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *14* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *40* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *13* cm
Operation 2	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *19* cm
Operation 3	Type: *From below* Removals: ∑ *4* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 37 %, RDC4 5 %, RDC5 0 %	Time reference: *80* years; *Older pole phase (20-30cm DBH)* at stand height *27* m and mean dbh *27* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 50 m; distance (restricted zone) from the nearest one 100 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *31* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 46 %, RDC3 34 %, RDC4 18 %, RDC5 2 %	
Operation 2	Time reference: *105* years; *Mature phase (30-50cm DBH)* at stand height *31* m and mean dbh *34* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 %	
Operation 3	Time reference: *115* years; *Mature phase (30-50cm DBH)* at stand height *32* m and mean dbh *37* cm Removals: ∑ *100* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Kozie chrbty
Representative stand: 3.2
FM type: 10 even-aged forest management
ID RST×FM: 3.2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *According to Forest management plan: Planned timber felling: 50m³ on 0.14 ha + process calamity 20m³. Reaforestation on 0.14 ha with spruce.*
Rotation period: *115* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *20* years; *Thicket phase (>130cm height,* at stand height *5* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *14* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *40* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *13* cm
Operation 2	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *19* cm
Operation 3	Type: *From below* Removals: ∑ *4* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 37 %, RDC4 5 %, RDC5 0 %	Time reference: *80* years; *Older pole phase (20-30cm DBH)* at stand height *27* m and mean dbh *27* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 50 m; distance (restricted zone) from the nearest one 100 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *31* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 46 %, RDC3 34 %, RDC4 18 %, RDC5 2 %	
Operation 2	Time reference: *105* years; *Mature phase (30-50cm DBH)* at stand height *31* m and mean dbh *34* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 %	
Operation 3	Time reference: *115* years; *Mature phase (30-50cm DBH)* at stand height *32* m and mean dbh *37* cm Removals: ∑ *100* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Kozie chrbty
Representative stand: 4.1
FM type: 10 even-aged forest management
ID RST×FM: 4.1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *90* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *36* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *22* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *12* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 %	
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 %	
Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm Removals: ∑ *100* % SV – *Picea abies 100* % of total removals	

Removals' structure:
Picea abies: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 4.2
FM type: 10 even-aged forest management
ID RST×FM: 4.2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *90* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *28* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *11* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *6* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 %	
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 %	
Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm Removals: ∑ *100* % SV – *Picea abies 100* % of total removals	

Removals' structure:
Picea abies: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 4.3
FM type: 10 even-aged forest management
ID RST×FM: 4.3_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *According to Forest management plan: Planned timber felling: 50m³ on 0.14 ha + process calamity 20m³. Reaforestation on 0.14 ha with spruce.*
Rotation period: *90* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *28* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *11* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *6* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 %	
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 %	
Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm	

Removals: ∑ *100* % SV – *Picea abies 100* % of total removals
Removals' structure:
Picea abies: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 5.1
FM type: 10 even-aged forest management
ID RST×FM: 5.1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *30* years; *Regeneration / seedling phase* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *14* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 %	Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *22* m and mean dbh *23* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 40 m; distance (restricted zone) from the nearest one 80 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *120* years; *Mature phase (30-50cm DBH)* at stand height *27* m and mean dbh *30* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 %	
Operation 2	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *32* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 %	
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *100* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Kozie chrbty
Representative stand: 5.2
FM type: 10 even-aged forest management
ID RST×FM: 5.2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *30* years; *Regeneration / seedling phase* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *14* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 %	Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *22* m and mean dbh *23* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 40 m; distance (restricted zone) from the nearest one 80 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *120* years; *Mature phase (30-50cm DBH)* at stand height *27* m and mean dbh *30* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 %	
Operation 2	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *32* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 %	
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *100* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Kozie chrbty
Representative stand: 5.3
FM type: 10 even-aged forest management
ID RST×FM: 5.3_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *According to Forest management plan: Planned timber felling: 50m³ on 0.14 ha + process calamity 20m³. Reaforestation on 0.14 ha with spruce.*
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *30* years; *Regeneration / seedling phase* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *14* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 %	Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *22* m and mean dbh *23* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 40 m; distance (restricted zone) from the nearest one 80 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *120* years; *Mature phase (30-50cm DBH)* at stand height *27* m and mean dbh *30* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 %	
Operation 2	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *32* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 %	
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *100* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Kozie chrbty
Representative stand: 6.1
FM type: 10 even-aged forest management
ID RST×FM: 6.1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *100* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *5* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *21* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *30* years; *Early pole phase (10-20cm DBH)* at stand height *13* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *14* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *40* years; *Early pole phase (10-20cm DBH)* at stand height *19* m and mean dbh *17* cm
Operation 3	Type: *From below* Removals: ∑ *8* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Older pole phase (20-30cm DBH)* at stand height *25* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *4* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 %	Time reference: *75* years; *Mature phase (30-50cm DBH)* at stand height *31* m and mean dbh *32* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 60 m; distance (restricted zone) from the nearest one 120 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *32* m and mean dbh *34* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 21 %, RDC3 47 %, RDC4 24 %, RDC5 7 %	
Operation 2	Time reference: *90* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *37* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 12 %, RDC3 40 %, RDC4 32 %, RDC5 16 %	
Operation 3	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *35* m and mean dbh *39* cm Removals: ∑ *100* % SV – *Picea abies 100* % of total removals	

Removals' structure:
Picea abies: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 6.2
FM type: 10 even-aged forest management
ID RST×FM: 6.2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *According to Forest management plan: Planned timber felling: 50m³ on 0.14 ha + process calamity 20m³. Reaforestation on 0.14 ha with spruce.*
Rotation period: *160* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: *Picea abies 100* %	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *5* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *21* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *30* years; *Early pole phase (10-20cm DBH)* at stand height *13* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *14* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *40* years; *Early pole phase (10-20cm DBH)* at stand height *19* m and mean dbh *17* cm
Operation 3	Type: *From below* Removals: ∑ *8* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Older pole phase (20-30cm DBH)* at stand height *25* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *4* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 %	Time reference: *75* years; *Mature phase (30-50cm DBH)* at stand height *31* m and mean dbh *32* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 60 m; distance (restricted zone) from the nearest one 120 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *32* m and mean dbh *34* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 21 %, RDC3 47 %, RDC4 24 %, RDC5 7 %	
Operation 2	Time reference: *90* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *37* cm Removals: ∑ *50* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 12 %, RDC3 40 %, RDC4 32 %, RDC5 16 %	
Operation 3	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *35* m and mean dbh *39* cm	

Removals: ∑ *100* % SV – *Picea abies 100* % of total removals
Removals' structure:
Picea abies: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 7.1
FM type: 10 even-aged forest management
ID RST×FM: 7.1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *150* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *30* years; *Regeneration / seedling phase* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *14* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 %	Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *22* m and mean dbh *23* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 40 m; distance (restricted zone) from the nearest one 80 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *120* years; *Mature phase (30-50cm DBH)* at stand height *27* m and mean dbh *30* cm Removals: ∑ *33* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	
Operation 2	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *32* cm Removals: ∑ *50* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *100* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Kozie chrbty
Representative stand: 7.2
FM type: 10 even-aged forest management
ID RST×FM: 7.2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description:
Rotation period: *150* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *30* years; *Regeneration / seedling phase* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *14* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 %	Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *22* m and mean dbh *23* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 40 m; distance (restricted zone) from the nearest one 80 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *120* years; *Mature phase (30-50cm DBH)* at stand height *27* m and mean dbh *30* cm Removals: ∑ *33* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	
Operation 2	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *32* cm Removals: ∑ *50* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *100* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Kozie chrbty
Representative stand: 8.1
FM type: 10 even-aged forest management
ID RST×FM: 8.1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *90* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *36* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *22* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *12* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %	
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %	

Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm Removals: ∑ *100* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 8.2
FM type: 10 even-aged forest management
ID RST×FM: 8.2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *90* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *36* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *22* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *12* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %	
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %	

Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm Removals: ∑ *100* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 8.3
FM type: 10 even-aged forest management
ID RST×FM: 8.3_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *110* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *36* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *22* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *12* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %	
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %	

Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm Removals: ∑ *100* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 9.1
FM type: 10 even-aged forest management
ID RST×FM: 9.1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *120* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
TENDING		
Operation 1	Time reference: *20* years; *Thicket phase (>130cm height,* at stand height *5* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *24* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *40* years; *Early pole phase (10-20cm DBH)* at stand height *15* m and mean dbh *17* cm
Operation 2	Type: *From below* Removals: ∑ *18* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 24 %, RDC2 66 %, RDC3 10 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Older pole phase (20-30cm DBH)* at stand height *21* m and mean dbh *20* cm
Operation 3	Type: *From below* Removals: ∑ *13* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 2 %, RDC2 35 %, RDC3 47 %, RDC4 14 %, RDC5 2 %	Time reference: *80* years; *Older pole phase (20-30cm DBH)* at stand height *28* m and mean dbh *29* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 50 m; distance (restricted zone) from the nearest one 100 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *31* cm Removals: ∑ *33* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 46 %, RDC3 34 %, RDC4 18 %, RDC5 2 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	
Operation 2	Time reference: *105* years; *Mature phase (30-50cm DBH)* at stand height *31* m and mean dbh *34* cm Removals: ∑ *50* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %	
Operation 3	Time reference: *115* years; *Mature phase (30-50cm DBH)* at stand height *32* m and mean dbh *37* cm Removals: ∑ *100* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Kozie chrbty
Representative stand: 9.2
FM type: 10 even-aged forest management
ID RST×FM: 9.2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *115* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
TENDING		
Operation 1	Time reference: *20* years; *Thicket phase (>130cm height,* at stand height *5* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below*	Time reference: *40* years; *Early pole phase (10-20cm DBH)* at stand height *15* m and mean dbh *17* cm
	Removals: ∑ *24* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	
Operation 2	Type: *From below*	Time reference: *55* years; *Older pole phase (20-30cm DBH)* at stand height *21* m and mean dbh *20* cm
	Removals: ∑ *18* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 24 %, RDC2 66 %, RDC3 10 %, RDC4 0 %, RDC5 0 %	
Operation 3	Type: *From below*	Time reference: *80* years; *Older pole phase (20-30cm DBH)* at stand height *28* m and mean dbh *29* cm
	Removals: ∑ *13* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 2 %, RDC2 35 %, RDC3 47 %, RDC4 14 %, RDC5 2 %	
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system*	
	Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 50 m; distance (restricted zone) from the nearest one 100 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *31* cm Removals: ∑ *33* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 46 %, RDC3 34 %, RDC4 18 %, RDC5 2 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	
Operation 2	Time reference: *105* years; *Mature phase (30-50cm DBH)* at stand height *31* m and mean dbh *34* cm Removals: ∑ *50* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %	
Operation 3	Time reference: *115* years; *Mature phase (30-50cm DBH)* at stand height *32* m and mean dbh *37* cm Removals: ∑ *100* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Kozie chrbty
Representative stand: 10.1
FM type: 10 even-aged forest management
ID RST×FM: 10.1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *90* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *36* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *22* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *12* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %	
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 %	

	Larix decidua: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %
Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm Removals: ∑ *100* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 10.2
FM type: 10 even-aged forest management
ID RST×FM: 10.2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *90* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *36* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *22* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *12* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %	
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %	

Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm Removals: ∑ *100* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 10.3
FM type: 10 even-aged forest management
ID RST×FM: 10.3_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *90* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *36* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *22* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *12* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %	
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %	

Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm Removals: ∑ *100* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 11.1
FM type: 10 even-aged forest management
ID RST×FM: 11.1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *30* years; *Regeneration / seedling phase* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *14* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 %	Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *22* m and mean dbh *23* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 40 m; distance (restricted zone) from the nearest one 80 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *120* years; *Mature phase (30-50cm DBH)* at stand height *27* m and mean dbh *30* cm Removals: ∑ *33* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	
Operation 2	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *32* cm Removals: ∑ *50* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *100* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Kozie chrbty
Representative stand: 11.2
FM type: 10 even-aged forest management
ID RST×FM: 11.2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *30* years; *Regeneration / seedling phase* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *14* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 %	Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *22* m and mean dbh *23* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 40 m; distance (restricted zone) from the nearest one 80 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *120* years; *Mature phase (30-50cm DBH)* at stand height *27* m and mean dbh *30* cm Removals: ∑ *33* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	
Operation 2	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *32* cm Removals: ∑ *50* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *100* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Kozie chrbty
Representative stand: 11.3
FM type: 10 even-aged forest management
ID RST×FM: 11.3_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *30* years; *Regeneration / seedling phase* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *14* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 %	Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *22* m and mean dbh *23* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 40 m; distance (restricted zone) from the nearest one 80 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *120* years; *Mature phase (30-50cm DBH)* at stand height *27* m and mean dbh *30* cm Removals: ∑ *33* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	
Operation 2	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *32* cm Removals: ∑ *50* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *100* % SV – *Picea abies 90* % of total removals; *Larix decidua 10* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Kozie chrbty
Representative stand: 12.1
FM type: 10 even-aged forest management
ID RST×FM: 12.1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *95* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *5* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *21* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *30* years; *Early pole phase (10-20cm DBH)* at stand height *13* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *14* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *40* years; *Early pole phase (10-20cm DBH)* at stand height *19* m and mean dbh *17* cm
Operation 3	Type: *From below* Removals: ∑ *8* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Older pole phase (20-30cm DBH)* at stand height *25* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *4* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 %	Time reference: *75* years; *Mature phase (30-50cm DBH)* at stand height *31* m and mean dbh *32* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 60 m; distance (restricted zone) from the nearest one 120 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *32* m and mean dbh *34* cm Removals: ∑ *33* % SV – *Picea abies 98* %, *Larix decidua 2* % of total removals Removals' structure: *Picea abies*: RDC1 1 %, RDC2 21 %, RDC3 47 %, RDC4 24 %, RDC5 7 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %	
Operation 2	Time reference: *90* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *37* cm Removals: ∑ *50* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 12 %, RDC3 40 %, RDC4 32 %, RDC5 16 % *Larix decidua*: RDC1 0 %, RDC2 19 %, RDC3 51 %, RDC4 26 %, RDC5 4 %	

Operation 3	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *35* m and mean dbh *39* cm Removals: ∑ *100* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 12.2
FM type: 10 even-aged forest management
ID RST×FM: 12.2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *95* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *5* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *21* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *30* years; *Early pole phase (10-20cm DBH)* at stand height *13* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *14* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *40* years; *Early pole phase (10-20cm DBH)* at stand height *19* m and mean dbh *17* cm
Operation 3	Type: *From below* Removals: ∑ *8* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Older pole phase (20-30cm DBH)* at stand height *25* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *4* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 %	Time reference: *75* years; *Mature phase (30-50cm DBH)* at stand height *31* m and mean dbh *32* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 60 m; distance (restricted zone) from the nearest one 120 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *32* m and mean dbh *34* cm Removals: ∑ *33* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 1 %, RDC2 21 %, RDC3 47 %, RDC4 24 %, RDC5 7 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %	
Operation 2	Time reference: *90* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *37* cm Removals: ∑ *50* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 12 %, RDC3 40 %, RDC4 32 %, RDC5 16 % *Larix decidua*: RDC1 0 %, RDC2 19 %, RDC3 51 %, RDC4 26 %, RDC5 4 %	

Operation 3	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *35* m and mean dbh *39* cm Removals: ∑ *100* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 12.3
FM type: 10 even-aged forest management
ID RST×FM: 12.3_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *95* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *5* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *21* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *30* years; *Early pole phase (10-20cm DBH)* at stand height *13* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *14* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *40* years; *Early pole phase (10-20cm DBH)* at stand height *19* m and mean dbh *17* cm
Operation 3	Type: *From below* Removals: ∑ *8* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Older pole phase (20-30cm DBH)* at stand height *25* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *4* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 %	Time reference: *75* years; *Mature phase (30-50cm DBH)* at stand height *31* m and mean dbh *32* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 60 m; distance (restricted zone) from the nearest one 120 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *32* m and mean dbh *34* cm Removals: ∑ *33* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 1 %, RDC2 21 %, RDC3 47 %, RDC4 24 %, RDC5 7 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %	
Operation 2	Time reference: *90* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *37* cm Removals: ∑ *50* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 12 %, RDC3 40 %, RDC4 32 %, RDC5 16 % *Larix decidua*: RDC1 0 %, RDC2 19 %, RDC3 51 %, RDC4 26 %, RDC5 4 %	

Operation 3	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *35* m and mean dbh *39* cm Removals: ∑ *100* % SV – *Picea abies 98* % of total removals; *Larix decidua 2* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 13.1
FM type: 10 even-aged forest management
ID RST×FM: 13.1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *30* years; *Regeneration / seedling phase* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 % *Pinus silvestris*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *14* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 % *Larix decidua*: RDC1 8 %, RDC2 80 %, RDC3 12 %, RDC4 0 %, RDC5 0 %% *Pinus silvestris*: RDC1 8 %, RDC2 80 %, RDC3 12 %, RDC4 0 %, RDC5 0 %	Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *22* m and mean dbh *23* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 40 m; distance (restricted zone) from the nearest one 80 m;* *b) next one adjacent against west/south.*	
Operation 1	Removals: ∑ *33* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 % *Pinus silvestris*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	Time reference: *120* years; *Mature phase (30-50cm DBH)* at stand height *27* m and mean dbh *30* cm
Operation 2	Removals: ∑ *50* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *32* cm

	Pinus silvestris: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *100* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Pinus silvestris*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 13.2
FM type: 10 even-aged forest management
ID RST×FM: 13.2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description:
Rotation period: *140* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *30* years; *Regeneration / seedling phase* at stand height *9* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 12* % of total removals; *Larix decidua 48* %, , *Pinus silvestris 40* % Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 % *Pinus silvestris*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *16* m and mean dbh *17* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 12* % of total removals; *Larix decidua 48* %, , *Pinus silvestris 40* % Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 % *Larix decidua*: RDC1 8 %, RDC2 80 %, RDC3 12 %, RDC4 0 %, RDC5 0 %% *Pinus silvestris*: RDC1 8 %, RDC2 80 %, RDC3 12 %, RDC4 0 %, RDC5 0 %	Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *22* m and mean dbh *23* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 40 m; distance (restricted zone) from the nearest one 80 m;* *b) next one adjacent against west/south.*	
Operation 1	Removals: ∑ *33* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 % *Pinus silvestris*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	Time reference: *120* years; *Mature phase (30-50cm DBH)* at stand height *27* m and mean dbh *30* cm
Operation 2	Removals: ∑ *50* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *32* cm

	Pinus silvestris: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *100* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Pinus silvestris*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 14.1
FM type: 10 even-aged forest management
ID RST×FM: 14.1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *90* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *36* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 % *Pinus silvestris*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *22* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 34 %, RDC2 63 %, RDC3 3 %, RDC4 0 %, RDC5 0 % *Pinus silvestris*: RDC1 34 %, RDC2 63 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 % *Pinus silvestris*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *12* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %% *Pinus silvestris*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	

Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 % *Pinus silvestris*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 % *Pinus silvestris*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %
Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm Removals: ∑ *100* % SV – *Picea abies 70* % of total removals; *Larix decidua 15* %, , *Pinus silvestris 15* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Pinus silvestris*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 14.2
FM type: 10 even-aged forest management
ID RST×FM: 14.2_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description:
Rotation period: *90* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *36* % SV – *Picea abies 12* % of total removals; *Larix decidua 48* %, , *Pinus silvestris 40* % Removals' structure: *Picea abies*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 % *Pinus silvestris*: RDC1 100 %, RDC2 0 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *22* % SV – *Picea abies 12* % of total removals; *Larix decidua 48* %, , *Pinus silvestris 40* % Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 34 %, RDC2 63 %, RDC3 3 %, RDC4 0 %, RDC5 0 % *Pinus silvestris*: RDC1 34 %, RDC2 63 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 3	Type: *From below* Removals: ∑ *16* % SV – *Picea abies 12* % of total removals; *Larix decidua 48* %, , *Pinus silvestris 40* % Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 42 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 % *Pinus silvestris*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm
Operation 4	Type: *From below* Removals: ∑ *12* % SV – *Picea abies 12* % of total removals; *Larix decidua 48* %, , *Pinus silvestris 40* % Removals' structure: *Picea abies*: RDC1 1 %, RDC2 59 %, RDC3 40 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %% *Pinus silvestris*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 70 m; distance (restricted zone) from the nearest one 140 m;* *b) next one adjacent against west/south.*	

Operation 1	Time reference: *70* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *36* cm Removals: ∑ *33* % SV – *Picea abies 12* % of total removals; *Larix decidua 48* %, , *Pinus silvestris 40* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 % *Pinus silvestris*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %
Operation 2	Time reference: *80* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *41* cm Removals: ∑ *50* % SV – *Picea abies 12* % of total removals; *Larix decidua 48* %, , *Pinus silvestris 40* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 13 %, RDC3 30 %, RDC4 34 %, RDC5 23 % *Larix decidua*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 % *Pinus silvestris*: RDC1 0 %, RDC2 23 %, RDC3 56 %, RDC4 17 %, RDC5 4 %
Operation 3	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *43* cm Removals: ∑ *100* % SV – *Picea abies 12* % of total removals; *Larix decidua 48* %, , *Pinus silvestris 40* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Pinus silvestris*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 15.0
FM type: 10 even-aged forest management
ID RST×FM: 15.0_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description:
Rotation period: *115* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
TENDING		
Operation 1	Time reference: *20* years; *Thicket phase (>130cm height,* at stand height *5* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *24* % SV – *Picea abies 76* % of total removals; *Larix decidua 15* %, *Pinus silvestris 9* % Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 63 %, RDC2 36 %, RDC3 0 %, RDC4 0%, RDC5 0 % *Pinus silvestris*: RDC1 63 %, RDC2 36 %, RDC3 0 %, RDC4 0%, RDC5 0 %	Time reference: *40* years; *Early pole phase (10-20cm DBH)* at stand height *15* m and mean dbh *17* cm
Operation 2	Type: *From below* Removals: ∑ *18* % SV – *Picea abies 76* % of total removals; *Larix decidua 15* %, *Pinus silvestris 9* % Removals' structure: *Picea abies*: RDC1 24 %, RDC2 66 %, RDC3 10 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 34 %, RDC2 63 %, RDC3 3 %, RDC4 0 %, RDC5 0 % *Pinus silvestris*: RDC1 34 %, RDC2 63 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Older pole phase (20-30cm DBH)* at stand height *21* m and mean dbh *20* cm
Operation 3	Type: *From below* Removals: ∑ *13* % SV – *Picea abies 76* % of total removals; *Larix decidua 15* %, *Pinus silvestris 9* % Removals' structure: *Picea abies*: RDC1 2 %, RDC2 35 %, RDC3 47 %, RDC4 14 %, RDC5 2 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 % *Pinus silvestris*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	Time reference: *80* years; *Older pole phase (20-30cm DBH)* at stand height *28* m and mean dbh *29* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill clear cuts; width 50 m; distance (restricted zone) from the nearest one 100 m;* *b) next one adjacent against west/south.*	
Operation 1	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *31* cm Removals: ∑ *33* % SV – *Picea abies 76* % of total removals; *Larix decidua 15* %, *Pinus silvestris 9* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 46 %, RDC3 34 %, RDC4 18 %, RDC5 2 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 % *Pinus silvestris*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	
Operation 2	Time reference: *105* years; *Mature phase (30-50cm DBH)* at stand height *31* m and	

	mean dbh *34* cm Removals: ∑ *50* % SV – *Picea abies 76* % of total removals; *Larix decidua 15* %, *Pinus silvestris 9* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 19 %, RDC3 43 %, RDC4 28 %, RDC5 10 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 % *Pinus silvestris*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %
Operation 3	Time reference: *115* years; *Mature phase (30-50cm DBH)* at stand height *32* m and mean dbh *37* cm Removals: ∑ *100* % SV – *Picea abies 76* % of total removals; *Larix decidua 15* %, *Pinus silvestris 9* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Pinus silvestris*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 16.0
FM type: 10 even-aged forest management
ID RST×FM: 16.0_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *150* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *30* years; *Regeneration / seedling phase* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *14* cm
Operation 2	Type: *From above* Removals: ∑ *20* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 9 %, RDC2 60 %, RDC3 29 %, RDC4 2 %, RDC5 0 % *Larix decidua*: RDC1 27 %, RDC2 51 %, RDC3 12 %, RDC4 0 %, RDC5 0 %	Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *23* m and mean dbh *23* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill thinning from below; width 50 m; distance from the nearest one 100 m;reduction of stock to 0.5* *b) Clear cut on the thinned strips + same thinning of next stripes adjacent against west/south.* *c) Clear cut of the rests of the stands.*	
Operation 1	Time reference: *115* years; *Mature phase (30-50cm DBH)* at stand height *26* m and mean dbh *28* cm Removals: ∑ *16* % SV – *Picea abies 70* % of total removals; *Larix decidua 30* % Removals' structure: *Picea abies*: RDC1 4 %, RDC2 44 %, RDC3 43 %, RDC4 9 %, RDC5 0 % *Larix decidua*: RDC1 0 %, RDC2 32 %, RDC3 50 %, RDC4 17 %, RDC5 1 %	
Operation 2	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *32* cm Removals: ∑ *40* % SV – *Picea abies 70* % of total removals; *Larix decidua 28* %, *Fagus sylvatica 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 %	
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *66* % SV – *Picea abies 70* % of total removals; *Larix decidua 28* %, *Fagus sylvatica 2* %	

	Removals' structure: *Picea abies*: RDC1 2 %, RDC2 35 %, RDC3 47 %, RDC4 14 %, RDC5 2 % *Larix decidua*: RDC1 0 %, RDC2 32 %, RDC3 50 %, RDC4 17 %, RDC5 1 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 %
Operation 4	Time reference: *150* years; *Mature phase (30-50cm DBH)* at stand height *30* m and mean dbh *35* cm Removals: ∑ *100* % SV – *Larix decidua 100* % of species volume removed; *Fagus sylvatica 100* % Removals' structure: *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 17.0
FM type: 10 even-aged forest management
ID RST×FM: 17.0_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *110* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *15* years; *Regeneration / seedling phase* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *13* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 9 %, RDC2 60 %, RDC3 29 %, RDC4 2 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *25* m and mean dbh *23* cm
Operation 3	Type: *From above* Removals: ∑ *20* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 1 %, RDC2 21 %, RDC3 47 %, RDC4 24 %, RDC5 7 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *33* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill thinning from below; width 70 m; distance from the nearest one 140 m;reduction of stock to 0.5* *b) Clear cut on the thinned strips + same thinning of next stripes adjacent against west/south.* *c) Clear cut of the rests of the stands.*	
Operation 1	Removals: ∑ *16* % SV – *Picea abies 70* % of total removals; *Larix decidua 30* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 12 %, RDC3 40 %, RDC4 32 %, RDC5 16 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %	Time reference: *75* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *38* cm
Operation 2		Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *42* cm

	Removals: ∑ *40* % SV – *Picea abies 70* % of total removals; *Larix decidua 28* %, *Fagus sylvatica 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 7 %, RDC3 30 %, RDC4 34 %, RDC5 29 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 %
Operation 3	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *41* m and mean dbh *46* cm Removals: ∑ *66* % SV – *Picea abies 70* % of total removals; *Larix decidua 28* %, *Fagus sylvatica 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 7 %, RDC3 30 %, RDC4 34 %, RDC5 29 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %% *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 %
Operation 4	Time reference: *105* years; *Mature phase (30-50cm DBH)* at stand height *42* m and mean dbh *50* cm Removals: ∑ *100* % SV – *Larix decidua 100* % of species volume removed; *Fagus sylvatica 100* % Removals' structure: *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 18.0
FM type: 10 even-aged forest management
ID RST×FM: 18.0_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *125* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *20* years; *Regeneration / seedling phase* at stand height *5* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *40* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *13* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 %	Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *19* m and mean dbh *18* cm
Operation 3	Type: *From above* Removals: ∑ *20* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 6 %, RDC2 52 %, RDC3 37 %, RDC4 5 %, RDC5 0 % *Larix decidua*: RDC1 0 %, RDC2 32 %, RDC3 50 %, RDC4 17 %, RDC5 1 %	Time reference: *80* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *27* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill thinning from below; width 50 m; distance from the nearest one 100 m;reduction of stock to 0.5* *b) Clear cut on the thinned strips + same thinning of next stripes adjacent against west/south.* *c) Clear cut of the rests of the stands.*	
Operation 1	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *26* m and mean dbh *28* cm Removals: ∑ *16* % SV – *Picea abies 70* % of total removals; *Larix decidua 30* % Removals' structure: *Picea abies*: RDC1 4 %, RDC2 44 %, RDC3 43 %, RDC4 9 %, RDC5 0 % *Larix decidua*: RDC1 0 %, RDC2 32 %, RDC3 50 %, RDC4 17 %, RDC5 1 %	
Operation 2	Time reference: *105* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *32* cm Removals: ∑ *40* % SV – *Picea abies 70* % of total removals; *Larix decidua 28* %, *Fagus sylvatica 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 35 %, RDC3 44 %, RDC4 16 %, RDC5 3 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %	

	Fagus sylvatica: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 %
Operation 3	Time reference: *115* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *66* % SV – *Picea abies 70* % of total removals; *Larix decidua 28* %, *Fagus sylvatica 2* % Removals' structure: *Picea abies*: RDC1 2 %, RDC2 35 %, RDC3 47 %, RDC4 14 %, RDC5 2 % *Larix decidua*: RDC1 0 %, RDC2 32 %, RDC3 50 %, RDC4 17 %, RDC5 1 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 %
Operation 4	Time reference: *125* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *100* % SV – *Larix decidua 100* % of species volume removed; *Fagus sylvatica 100* % Removals' structure: *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 19.0
FM type: 10 even-aged forest management
ID RST×FM: 19.0_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *110* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *15* years; *Regeneration / seedling phase* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *10* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *13* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 %	Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm
Operation 2	Type: *From below* Removals: ∑ *3* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 9 %, RDC2 60 %, RDC3 29 %, RDC4 2 %, RDC5 0 %	Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *25* m and mean dbh *23* cm
Operation 3	Type: *From above* Removals: ∑ *20* % SV – *Picea abies 80* % of total removals; *Larix decidua 20* % Removals' structure: *Picea abies*: RDC1 1 %, RDC2 21 %, RDC3 47 %, RDC4 24 %, RDC5 7 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *33* m and mean dbh *34* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill thinning from below; width 70 m; distance from the nearest one 140 m;reduction of stock to 0.5* *b) Clear cut on the thinned strips + same thinning of next stripes adjacent against west/south.* *c) Clear cut of the rests of the stands.*	
Operation 1	Time reference: *75* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *38* cm Removals: ∑ *16* % SV – *Picea abies 70* % of total removals; *Larix decidua 30* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 12 %, RDC3 40 %, RDC4 32 %, RDC5 16 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %	
Operation 2	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *42* cm	

	Removals: ∑ *40* % SV – *Picea abies 70* % of total removals; *Larix decidua 28* %, *Fagus sylvatica 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 7 %, RDC3 30 %, RDC4 34 %, RDC5 29 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 %
Operation 3	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *41* m and mean dbh *46* cm Removals: ∑ *66* % SV – *Picea abies 70* % of total removals, *Larix decidua 28* %, *Fagus sylvatica 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 7 %, RDC3 30 %, RDC4 34 %, RDC5 29 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %% *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 %
Operation 4	Time reference: *105* years; *Mature phase (30-50cm DBH)* at stand height *42* m and mean dbh *50* cm Removals: ∑ *100* % SV – *Larix decidua 100* % of species volume removed; *Fagus sylvatica 100* % Removals' structure: *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 20.0
FM type: 10 even-aged forest management
ID RST×FM: 20.0_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: *According to Forest management plan: weed control, protection against game; in highly developed thicket - cross-cut at 17.03 ha; compartment segmentation.*
Rotation period: *115* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Species composition: -	Time reference: -
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weeding and protection against game browsing*
TENDING		
Operation 1	Time reference: *15* years; *Regeneration / seedling phase* at stand height *5* m;	Removals: *50* % of regeneration
THINNING	Description: *Moderate thinning from below using relative volume removal.*	
Operation 1	Type: *From below* Removals: ∑ *27* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	Time reference: *30* years; *Early pole phase (10-20cm DBH)* at stand height *13* m and mean dbh *12* cm
Operation 2	Type: *From below* Removals: ∑ *18* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 11 %, RDC2 81 %, RDC3 6 %, RDC4 2 %, RDC5 0 %	Time reference: *40* years; *Early pole phase (10-20cm DBH)* at stand height *18* m and mean dbh *17* cm
Operation 3	Type: *From below* Removals: ∑ *13* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 9 %, RDC2 60 %, RDC3 29 %, RDC4 2 %, RDC5 0 %	Time reference: *55* years; *Older pole phase (20-30cm DBH)* at stand height *25* m and mean dbh *23* cm
Operation 4	Type: *From above* Removals: ∑ *20* % SV – *Picea abies 20* % of species volume removed; *Larix decidua 20* %, *Fagus sylvatica 20* % Removals' structure: *Picea abies*: RDC1 1 %, RDC2 21 %, RDC3 47 %, RDC4 24 %, RDC5 7 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 %	Time reference: *75* years; *Mature phase (30-50cm DBH)* at stand height *30* m and mean dbh *32* cm
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system*	
	Regeneration period: *30* years Description: *a) Multiple stripe downhill thinning from below; width 70 m; distance from the nearest one 140 m;reduction of stock to 0.5* *b) Clear cut on the thinned strips + same thinning of next stripes adjacent against west/south.* *c) Clear cut of the rests of the stands.*	
Operation 1	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *33* m and mean dbh *36* cm Removals: ∑ *16* % SV – *Picea abies 65* % of total removals; *Picea pungens 5* %, *Larix decidua 30* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 16 %, RDC3 44 %, RDC4 28 %, RDC5 12 %	

	Picea pungens: RDC1 0 %, RDC2 16 %, RDC3 44 %, RDC4 28 %, RDC5 12 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %
Operation 2	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *35* m and mean dbh *39* cm Removals: ∑ *40* % SV – *Picea abies and Picea pungens 70* % of total removals; *Larix decidua 28* %, *Fagus sylvatica 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 12 %, RDC3 40 %, RDC4 32 %, RDC5 16 % *Picea pungens*: RDC1 0 %, RDC2 12 %, RDC3 40 %, RDC4 32 %, RDC5 16 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Acer pseudoplatanus*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 %
Operation 3	Time reference: *105* years; *Mature phase (30-50cm DBH)* at stand height *37* m and mean dbh *42* cm Removals: ∑ *66* % SV – *Picea abies and Picea Pungens 70* % of total removals; *Larix decidua 28* %, *Fagus sylvatica 2* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 7 %, RDC3 30 %, RDC4 34 %, RDC5 29 % *Picea pungens*: RDC1 0 %, RDC2 7 %, RDC3 30 %, RDC4 34 %, RDC5 29 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %% *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Acer pseudoplatanus*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 %
Operation 4	Time reference: *115* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *45* cm Removals: ∑ *100* % SV – *Larix decidua 100* % of species volume removed; *Fagus sylvatica 100* %, *Acer pseudoplatanus 100* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Picea pungens*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Acer pseudoplatanus*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 21.0
FM type: 10 even-aged forest management
ID RST×FM: 21.0_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *150* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Time reference: *Regeneration / seedling phase* Species composition *Abies alba 20%* (origin: *Planted*, spatial arrangement: *Systematic*, density: *720*/ha*); Picea abies 40% (Planted, Systematic, 720*/ha*); Larix decidua 30% (Planted, Systematic, 720*/ha*); Fagus sylvatica 10 % (Planted, Systematic, 1200*/ha*)*	
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weed control and protection of young trees against game.*
TENDING		
Operation 1	Time reference: *30* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *First two moderate thinning from below using relative volume removal, support of beech/fir admixture. Third more intensive thinning from above: reduction of canopy (stock) to the density 0,8; preparing to fructification of beech.*	
Operation 1	Type: *From below* Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *13* cm Removals: ∑ *24* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	
Operation 2	Type: *From above* Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *23* m and mean dbh *23* cm Removals: ∑ *13* % SV – *Picea abies 13* % of species volume removed; *Fagus sylvatica 13* %; *Larix decidua 13* %, *Abies alba 13* % Removals' structure: *Picea abies*: RDC1 9 %, RDC2 60 %, RDC3 29 %, RDC4 2 %, RDC5 0 % *Fagus sylvatica*: RDC1 35 %, RDC2 60 %, RDC3 5 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 27 %, RDC2 51 %, RDC3 12 %, RDC4 0 %, RDC5 0 % *Abies alba*: RDC1 6 %, RDC2 52 %, RDC3 37 %, RDC4 5 %, RDC5 0 %	
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill thinning from below; width 40 m; distance from the nearest one 80 m, reduction of stock to 0,5;* *b) Clear cut on the thinned strips + same thinning of next stripes adjacent against west/south.* *c) Clear cut of the rests of the stands.*	
Operation 1	Time reference: *115* years; *Mature phase (30-50cm DBH)* at stand height *26* m and mean dbh *29* cm Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 %	
Operation 2	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *31* cm Removals: ∑ *40* % SV – *Picea abies 50* % of species volume removed; *Fagus sylvatica 33* %, *Larix decidua 33* %, *Abies alba 33* % Removals' structure: *Picea abies*: RDC1 1 %, RDC2 21 %, RDC3 47 %, RDC4 24 %, RDC5 7 % *Fagus sylvatica*: RDC1 2 %, RDC2 26 %, RDC3 43 %, RDC4 20 %, RDC5 9 %	

	Larix decidua: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 % *Abies alba*: RDC1 2 %, RDC2 35 %, RDC3 47 %, RDC4 14 %, RDC5 2 %
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *66* % SV – *Picea abies 100* % of species volume removed; *Fagus sylvatica 50* %; *Larix decidua 50* %; *Abies alba 50* % Removals' structure: *Picea abies*: RDC1 1 %, RDC2 21 %, RDC3 47 %, RDC4 24 %, RDC5 7 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Larix decidua*: RDC1 2 %, RDC2 26 %, RDC3 43 %, RDC4 20 %, RDC5 9 % *Abies alba*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 %
Operation 4	Time reference: *150* years; *Mature phase (30-50cm DBH)* at stand height *30* m and mean dbh *35* cm Removals: ∑ *100* % SV – *Fagus sylvatica 100* % of species volume removed; *Larix decidua 100* %, *Abies alba 100* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica* RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 22.0
FM type: 10 even-aged forest management
ID RST×FM: 22.0_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *105* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Time reference: *Regeneration / seedling phase* Species composition *Abies alba 20%* (origin: *Planted*, spatial arrangement: *Systematic*, density: *720*/ha*); Picea abies 40% (Planted, Systematic, 720*/ha*); Larix decidua 30% (Planted, Systematic, 720*/ha*); Fagus sylvatica 10 % (Planted, Systematic, 1200*/ha*)*	
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weed control and protection of young trees against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *First three moderate thinning from below using relative volume removal, support of beech/fir admixture. Fourth more intensive thinning from above: reduction of canopy (stock) to the density 0,8; preparing to fructification of beech.*	
Operation 1	Type: *From below* Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *13* m and mean dbh *12* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	
Operation 2	Type: *From below* Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm Removals: ∑ *22* % SV – *Picea abies 22* % of species volume removed; *Fagus sylvatica 22* %; *Larix decidua 22* %, *Abies alba 22* % Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 % *Fagus sylvatica*: RDC1 35 %, RDC2 60 %, RDC3 5 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 34 %, RDC2 63 %, RDC3 3 %, RDC4 0 %, RDC5 0 % *Abies alba*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	
Operation 3	Type: *From below* Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm Removals: ∑ *16* % SV – *Picea abies 16* % of species volume removed; *Fagus sylvatica 16* %; *Larix decidua 16* %, *Abies alba 16* % Removals' structure: *Picea abies*: RDC1 9 %, RDC2 60 %, RDC3 29 %, RDC4 2 %, RDC5 0 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Larix decidua*: RDC1 27 %, RDC2 51 %, RDC3 12 %, RDC4 0 %, RDC5 0 % *Abies alba*: RDC1 6 %, RDC2 52 %, RDC3 37 %, RDC4 5 %, RDC5 0 %	
Operation 4	Type: *From above* Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm Removals: ∑ *20* % SV – *Picea abies 20* % of species volume removed; *Fagus sylvatica 20* %; *Larix decidua 20* %, *Abies alba 20* % Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 % *Abies alba*: RDC1 2 %, RDC2 35 %, RDC3 47 %, RDC4 14 %, RDC5 2 %	
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years	

	Description: *a) Multiple stripe downhill thinning from below; width 70 m; distance from the nearest one 140 m, reduction of stock to 0,5;* *b) Clear cut on the thinned strips + same thinning of next stripes adjacent against west/south.* *c) Clear cut of the rests of the stands.*
Operation 1	Time reference: *75* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *38* cm Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 12 %, RDC3 40 %, RDC4 32 %, RDC5 16 %
Operation 2	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *42* cm Removals: ∑ *40* % SV – *Picea abies 50* % of species volume removed; *Fagus sylvatica 33* %, *Larix decidua 33* %, *Abies alba 33* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 7 %, RDC3 30 %, RDC4 34 %, RDC5 29 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Abies alba*: RDC1 2 %, RDC2 35 %, RDC3 47 %, RDC4 14 %, RDC5 2 %
Operation 3	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *41* m and mean dbh *46* cm Removals: ∑ *66* % SV – *Picea abies 100* % of species volume removed; *Fagus sylvatica 50* %; *Larix decidua 50* %; *Abies alba 50* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 7 %, RDC3 30 %, RDC4 34 %, RDC5 29 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %% *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Abies alba*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 %
Operation 4	Time reference: *105* years; *Mature phase (30-50cm DBH)* at stand height *43* m and mean dbh *50* cm Removals: ∑ *100* % SV – *Fagus sylvatica 100* % of species volume removed; *Larix decidua 100* %, *Abies alba 100* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica* RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 23.0
FM type: 10 even-aged forest management
ID RST×FM: 23.0_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *105* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Time reference: *Regeneration / seedling phase* Species composition *Abies alba 20%* (origin: *Planted*, spatial arrangement: *Systematic*, density: *720*/ha*); Picea abies 40% (Planted, Systematic, 720*/ha*); Larix decidua 30% (Planted, Systematic, 720*/ha*); Fagus sylvatica 10 % (Planted, Systematic, 1200*/ha*)*	
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weed control and protection of young trees against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *First three moderate thinning from below using relative volume removal, support of beech/fir admixture. Fourth more intensive thinning from above: reduction of canopy (stock) to the density 0,8; preparing to fructification of beech.*	
Operation 1	Type: *From below* Time reference: *25* years; *Early pole phase (10-20cm DBH)* at stand height *13* m and mean dbh *12* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	
Operation 2	Type: *From below* Time reference: *35* years; *Early pole phase (10-20cm DBH)* at stand height *20* m and mean dbh *18* cm Removals: ∑ *22* % SV – *Picea abies 22* % of species volume removed; *Fagus sylvatica 22* %; *Larix decidua 22* %, *Abies alba 22* % Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 % *Fagus sylvatica*: RDC1 35 %, RDC2 60 %, RDC3 5 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 34 %, RDC2 63 %, RDC3 3 %, RDC4 0 %, RDC5 0 % *Abies alba*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	
Operation 3	Type: *From below* Time reference: *45* years; *Older pole phase (20-30cm DBH)* at stand height *26* m and mean dbh *24* cm Removals: ∑ *16* % SV – *Picea abies 16* % of species volume removed; *Fagus sylvatica 16* %; *Larix decidua 16* %, *Abies alba 16* % Removals' structure: *Picea abies*: RDC1 9 %, RDC2 60 %, RDC3 29 %, RDC4 2 %, RDC5 0 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Larix decidua*: RDC1 27 %, RDC2 51 %, RDC3 12 %, RDC4 0 %, RDC5 0 % *Abies alba*: RDC1 6 %, RDC2 52 %, RDC3 37 %, RDC4 5 %, RDC5 0 %	
Operation 4	Type: *From above* Time reference: *65* years; *Mature phase (30-50cm DBH)* at stand height *34* m and mean dbh *34* cm Removals: ∑ *20* % SV – *Picea abies 20* % of species volume removed; *Fagus sylvatica 20* %; *Larix decidua 20* %, *Abies alba 20* % Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 % *Abies alba*: RDC1 2 %, RDC2 35 %, RDC3 47 %, RDC4 14 %, RDC5 2 %	
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years	

	Description: *a) Multiple stripe downhill thinning from below; width 70 m; distance from the nearest one 140 m, reduction of stock to 0,5;* *b) Clear cut on the thinned strips + same thinning of next stripes adjacent against west/south.* *c) Clear cut of the rests of the stands.*
Operation 1	Time reference: *75* years; *Mature phase (30-50cm DBH)* at stand height *36* m and mean dbh *38* cm Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 0 %, RDC2 12 %, RDC3 40 %, RDC4 32 %, RDC5 16 %
Operation 2	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *39* m and mean dbh *42* cm Removals: ∑ *40* % SV – *Picea abies 50* % of species volume removed; *Fagus sylvatica 33* %, *Larix decidua 33* %, *Abies alba 33* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 7 %, RDC3 30 %, RDC4 34 %, RDC5 29 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Abies alba*: RDC1 2 %, RDC2 35 %, RDC3 47 %, RDC4 14 %, RDC5 2 %
Operation 3	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *41* m and mean dbh *46* cm Removals: ∑ *66* % SV – *Picea abies 100* % of species volume removed; *Fagus sylvatica 50* %; *Larix decidua 50* %; *Abies alba 50* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 7 %, RDC3 30 %, RDC4 34 %, RDC5 29 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %% *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Abies alba*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 %
Operation 4	Time reference: *105* years; *Mature phase (30-50cm DBH)* at stand height *43* m and mean dbh *50* cm Removals: ∑ *100* % SV – *Fagus sylvatica 100* % of species volume removed; *Larix decidua 100* %, *Abies alba 100* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica* RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 24.0
FM type: 10 even-aged forest management
ID RST×FM: 24.0_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *150* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Time reference: *Regeneration / seedling phase* Species composition *Abies alba 20%* (origin: *Planted*, spatial arrangement: *Systematic*, density: *720*/ha*); Picea abies 40% (Planted, Systematic, 720*/ha*); Larix decidua 30% (Planted, Systematic, 720*/ha*); Fagus sylvatica 10 % (Planted, Systematic, 1200*/ha*)*	
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weed control and protection of young trees against game.*
TENDING		
Operation 1	Time reference: *30* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *First two moderate thinning from below using relative volume removal, support of beech/fir admixture. Third more intensive thinning from above: reduction of canopy (stock) to the density 0,8; preparing to fructification of beech.*	
Operation 1	Type: *From below* Time reference: *55* years; *Early pole phase (10-20cm DBH)* at stand height *14* m and mean dbh *13* cm Removals: ∑ *24* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	
Operation 2	Type: *From above* Time reference: *90* years; *Older pole phase (20-30cm DBH)* at stand height *23* m and mean dbh *23* cm Removals: ∑ *13* % SV – *Picea abies 13* % of species volume removed; *Fagus sylvatica 13* %; *Larix decidua 13* %, *Abies alba 13* % Removals' structure: *Picea abies*: RDC1 9 %, RDC2 60 %, RDC3 29 %, RDC4 2 %, RDC5 0 % *Fagus sylvatica*: RDC1 35 %, RDC2 60 %, RDC3 5 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 27 %, RDC2 51 %, RDC3 12 %, RDC4 0 %, RDC5 0 % *Abies alba*: RDC1 6 %, RDC2 52 %, RDC3 37 %, RDC4 5 %, RDC5 0 %	
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years Description: *a) Multiple stripe downhill thinning from below; width 40 m; distance from the nearest one 80 m, reduction of stock to 0,5;* *b) Clear cut on the thinned strips + same thinning of next stripes adjacent against west/south.* *c) Clear cut of the rests of the stands.*	
Operation 1	Time reference: *115* years; *Mature phase (30-50cm DBH)* at stand height *26* m and mean dbh *29* cm Removals: ∑ *16* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 %	
Operation 2	Time reference: *130* years; *Mature phase (30-50cm DBH)* at stand height *28* m and mean dbh *31* cm Removals: ∑ *40* % SV – *Picea abies 50* % of species volume removed; *Fagus sylvatica 33* %, *Larix decidua 33* %, *Abies alba 33* % Removals' structure: *Picea abies*: RDC1 1 %, RDC2 21 %, RDC3 47 %, RDC4 24 %, RDC5 7 % *Fagus sylvatica*: RDC1 2 %, RDC2 26 %, RDC3 43 %, RDC4 20 %, RDC5 9 %	

	Larix decidua: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 % *Abies alba*: RDC1 2 %, RDC2 35 %, RDC3 47 %, RDC4 14 %, RDC5 2 %
Operation 3	Time reference: *140* years; *Mature phase (30-50cm DBH)* at stand height *29* m and mean dbh *33* cm Removals: ∑ *66* % SV – *Picea abies 100* % of species volume removed; *Fagus sylvatica 50* %; *Larix decidua 50* %; *Abies alba 50* % Removals' structure: *Picea abies*: RDC1 1 %, RDC2 21 %, RDC3 47 %, RDC4 24 %, RDC5 7 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Larix decidua*: RDC1 2 %, RDC2 26 %, RDC3 43 %, RDC4 20 %, RDC5 9 % *Abies alba*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 %
Operation 4	Time reference: *150* years; *Mature phase (30-50cm DBH)* at stand height *30* m and mean dbh *35* cm Removals: ∑ *100* % SV – *Fagus sylvatica 100* % of species volume removed; *Larix decidua 100* %, *Abies alba 100* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica* RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Abies alba*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Kozie chrbty
Representative stand: 25.0
FM type: 10 even-aged forest management
ID RST×FM: 25.0_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE
FM concept description: -
Rotation period: *115* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Mixed natural-planting*; Time reference: *Regeneration / seedling phase* Species composition *Abies alba 20%* (origin: *Planted*, spatial arrangement: *Systematic*, density: *720*/ha*); Picea abies 40% (Planted, Systematic, 720*/ha*); Larix decidua 30% (Planted, Systematic, 720*/ha*); Fagus sylvatica 10 % (Planted, Systematic, 1200*/ha*)*	
WEEDING		
Operation 1	Time reference: *2 years;*	Description: *weed control and protection of young trees against game.*
TENDING		
Operation 1	Time reference: *15* years; *Thicket phase (>130cm height,* at stand height *6* m;	Removals: *50* % of regeneration
THINNING	Description: *First three moderate thinning from below using relative volume removal, support of beech/fir admixture. Fourth more intensive thinning from above: reduction of canopy (stock) to the density 0,8; preparing to fructification of beech.*	
Operation 1	Type: *From below* Time reference: *30* years; *Early pole phase (10-20cm DBH)* at stand height *13* m and mean dbh *12* cm Removals: ∑ *33* % SV – *Picea abies 100* % of total removals Removals' structure: *Picea abies*: RDC1 90 %, RDC2 10 %, RDC3 0 %, RDC4 0 %, RDC5 0 %	
Operation 2	Type: *From below* Time reference: *40* years; *Early pole phase (10-20cm DBH)* at stand height *18* m and mean dbh *17* cm Removals: ∑ *22* % SV – *Picea abies 22* % of species volume removed; *Fagus sylvatica 22* %; *Larix decidua 22* %, *Abies alba 22* % Removals' structure: *Picea abies*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 % *Fagus sylvatica*: RDC1 35 %, RDC2 60 %, RDC3 5 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 34 %, RDC2 63 %, RDC3 3 %, RDC4 0 %, RDC5 0 % *Abies alba*: RDC1 36 %, RDC2 61 %, RDC3 3 %, RDC4 0 %, RDC5 0 %	
Operation 3	Type: *From below* Time reference: *55* years; *Older pole phase (20-30cm DBH)* at stand height *25* m and mean dbh *23* cm Removals: ∑ *16* % SV – *Picea abies 16* % of species volume removed; *Fagus sylvatica 16* %; *Larix decidua 16* %, *Abies alba 16* % Removals' structure: *Picea abies*: RDC1 9 %, RDC2 60 %, RDC3 29 %, RDC4 2 %, RDC5 0 % *Fagus sylvatica*: RDC1 35 %, RDC2 60 %, RDC3 5 %, RDC4 0 %, RDC5 0 % *Larix decidua*: RDC1 27 %, RDC2 51 %, RDC3 12 %, RDC4 0 %, RDC5 0 % *Abies alba*: RDC1 6 %, RDC2 52 %, RDC3 37 %, RDC4 5 %, RDC5 0 %	
Operation 4	Type: *From above* Time reference: *75* years; *Mature phase (30-50cm DBH)* at stand height *30* m and mean dbh *32* cm Removals: ∑ *20* % SV – *Picea abies 20* % of species volume removed; *Fagus sylvatica 20* %; *Larix decidua 20* %, *Abies alba 20* % Removals' structure: *Picea abies*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Larix decidua*: RDC1 4 %, RDC2 59 %, RDC3 34 %, RDC4 3 %, RDC5 0 % *Abies alba*: RDC1 2 %, RDC2 35 %, RDC3 47 %, RDC4 14 %, RDC5 2 %	
REGENERATION FELLING	Regeneration system: *2 - Uniform shelterwood system* Regeneration period: *30* years	

	Description: *a) Multiple stripe downhill thinning from below; width 60 m; distance from the nearest one 120 m, reduction of stock to 0,5;* *b) Clear cut on the thinned strips + same thinning of next stripes adjacent against west/south.* *c) Clear cut of the rests of the stands.*
Operation 1	Time reference: *85* years; *Mature phase (30-50cm DBH)* at stand height *33* m and mean dbh *36* cm Removals: ∑ *16* % SV – *Picea abies 70* % of total removals, *Larix decidua 30* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 16 %, RDC3 44 %, RDC4 28 %, RDC5 12 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %
Operation 2	Time reference: *95* years; *Mature phase (30-50cm DBH)* at stand height *35* m and mean dbh *39* cm Removals: ∑ *40* % SV – *Picea abies 50* % of species volume removed; *Fagus sylvatica 33* %, *Larix decidua 33* %, *Abies alba 33* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 12 %, RDC3 40 %, RDC4 32 %, RDC5 16 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 % *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Abies alba*: RDC1 2 %, RDC2 35 %, RDC3 47 %, RDC4 14 %, RDC5 2 %
Operation 3	Time reference: *105* years; *Mature phase (30-50cm DBH)* at stand height *37* m and mean dbh *42* cm Removals: ∑ *66* % SV – *Picea abies 100* % of species volume removed; *Fagus sylvatica 50* %; *Larix decidua 50* %; *Abies alba 50* % Removals' structure: *Picea abies*: RDC1 0 %, RDC2 7 %, RDC3 30 %, RDC4 34 %, RDC5 29 % *Larix decidua*: RDC1 0 %, RDC2 29 %, RDC3 46 %, RDC4 23 %, RDC5 4 %% *Fagus sylvatica*: RDC1 2 %, RDC2 34 %, RDC3 43 %, RDC4 17 %, RDC5 4 % *Abies alba*: RDC1 2 %, RDC2 27 %, RDC3 49 %, RDC4 19 %, RDC5 3 %
Operation 4	Time reference: *115* years; *Mature phase (30-50cm DBH)* at stand height *38* m and mean dbh *45* cm Removals: ∑ *100* % SV – *Fagus sylvatica 100* % of species volume removed; *Larix decidua 100* %, *Abies alba 100* % Removals' structure: *Picea abies*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Fagus sylvatica* RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na % *Larix decidua*: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

2.7 CSA7 – Shiroka laka, Rhodope Mountains, Bulgaria

Case study: Shiroka laka
Representative stand: 1 beech forests
FM type: 10 even-aged forest management
ID RST×FM: 1_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

FM concept description: *Beech forests grow on mesotrophic submesic sites on Cambisols in landscape 1. Targeted stands are located in the altitudinal belt 1000-1150m a.s.l.*
Rotation period: *120* years
Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase*
	Species composition: *Fagus sylvatica 100 %* (origin: *natural*, spatial arrangement: *random*, density: *20000*/ha)	
WEEDING		
TENDING		
Operation 1	Time reference: *20 years;*	Removals: *20* % of regeneration
THINNING		
Operation 1	Type: *From above*	Time reference: *30 years;*
	Removals: ∑*20* % SV – *Fagus sylvatica 100* % of total removals	
	Removals' structure:	
	Fagus sylvatica: RDC1 0 %, RDC2 0 %, RDC3 40 %, RDC4 40 %, RDC5 20 %	
Operation 2	Type: *From above*	Time reference: *50 years;*
	Removals: ∑*25* % SV – *Fagus sylvatica 100* % of total removals	
	Removals' structure:	
	Fagus sylvatica: RDC1 0 %, RDC2 10 %, RDC3 35 %, RDC4 35 %, RDC5 20 %	
Operation 3	Type: *From above*	Time reference: *70 years;*
	Removals: ∑*25* % SV – *Fagus sylvatica 100* % of total removals	
	Removals' structure:	
	Fagus sylvatica: RDC1 10 %, RDC2 10 %, RDC3 30 %, RDC4 30 %, RDC5 20 %	
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*	
	Regeneration period: *30* years	
	Description: *Advanced regeneration is released in patches by removing the mature community in two successive cuttings (seed cutting and final cutting of the shelterwood system). If there is no advance regeneration, preparatory cutting of the shelterwood system is performed over the entire area and it should be waited for the regeneration to occur before implementation of the second regeneration felling. Initial regeneration patches are around 0.15-0.25 ha in area and are enlarged afterwards in 2 steps. There are 1-3 initial patches ha^{-1}, depending on the harvesting intensity. Such process is continuously repeated until the intended forest area is regenerated.*	
Operation 1	Time reference: *90 years;*	
	Removals: ∑*30* % SV – *Fagus sylvatica 100* % of total removals	
	Removals' structure:	
	Fagus sylvatica: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 15 %, RDC5 10 %	
Operation 2	Time reference: *105 years;*	
	Removals: ∑*50* % SV – *Fagus sylvatica 100* % of total removals	
	Removals' structure:	
	Fagus sylvatica: RDC1 20 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 10 %	
Operation 3	Time reference: *120 years;*	
	Removals: ∑*100* % SV – *Fagus sylvatica 100* % of total removals	
	Removals' structure:	

Fagus sylvatica: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Shiroka laka
Representative stand: 2 Black pine dominated forests on limestone
FM type: 80 no forest management
ID RST×FM: 2_80_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Inaccessibility*

Description:

Black pine forests on oligotrophic xeric sites covers a small area of approximately 60ha in landscape 1. Steep and stony terrain impedes harvest operations. Forests have important protective function.

Case study: Shiroka laka
Representative stand: 3 Black pine dominated forests on Rendzina
FM type: 10 even-aged forest management
ID RST×FM: 3_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

FM concept description: *Black pine dominated forests on Leptosols grow on moderately poor sites in landscape 1. Targeted stands are located in the altitudinal belt 1200-1450m a.s.l.*

Rotation period: *120* years

Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase*;
	Species composition *Fagus sylvatica 18 %* (origin: *Natural,* spatial arrangement: *Random* density: *3900*/ha*); Picea abies 60 % (Natural, In patches, 18000*/ha*); Pinus nigra 22 % (Natural, In patches, 4500*/ha*).*	
WEEDING		
TENDING		
Operation 1	Time reference: *20 years;*	Removals: *20* % of regeneration
THINNING		
Operation 1	Type: *Combination from above and from below*	Time reference: *30 years;*
	Removals: ∑*25* % SV – *Fagus sylvatica 15* % of total removals; *Picea abies 80* %; *Pinus nigra 5* %	
	Removals' structure:	
	Fagus sylvatica: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
	Picea abies: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
	Pinus nigra: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
Operation 2	Type: *Combination from above and from below*	Time reference: *50 years;*
	Removals: ∑*15* % SV – *Fagus sylvatica 15* % of total removals; *Picea abies 80* %; *Pinus nigra 5* %	
	Removals' structure:	
	Fagus sylvatica: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
	Picea abies: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
	Pinus nigra: RDC1 25 %, RDC2 25 %, RDC3 20 %, RDC4 20 %, RDC5 10 %	
Operation 3	Type: *Combination from above and from below*	Time reference: *70 years;*
	Removals: ∑*25* % SV – *Fagus sylvatica 15* % of total removals; *Picea abies 80* %; *Pinus nigra 5* %	
	Removals' structure:	
	Fagus sylvatica: RDC1 20 %, RDC2 25%, RDC3 25 %, RDC4 15 %, RDC5 15 %	
	Picea abies: RDC1 20 %, RDC2 25%, RDC3 25 %, RDC4 15 %, RDC5 15 %	
	Pinus nigra: RDC1 25%, RDC2 25%, RDC3 25 %, RDC4 15 %, RDC5 10 %	
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*	
	Regeneration period: *30* years	
	Description: *Advanced regeneration is released in paches by removing the mature community in two successive cuttings (seed cutting and final cutting of the shelterwood system). If there is no advance regeneration, preparatory cutting of the shelterwood system is performed over the entire area and it should be waited for the regeneration to occur before implementation of the second regeneration felling. Due to better growth of black pine on the particular site conditions, assuring of adequate regeneration with black pine during regeneration cuts is targeted. Desired species composition prior to final harvest (third regeneration cut): Fagus sylvatica 20 %; Picea abies 30 %; Pinus nigra 50 %. Initial regeneration paches are around 0.20-0.30 ha in area and are enlarged afterwards in 2 steps. There are 1-2 (rarely 3) initial paches ha^{-1}, depending on the harvesting intensity. Such process is continuously repeated until the intended forest area is regenerated.*	
Operation 1	Time reference: *90 years;*	
	Removals: ∑*28* % SV – *Fagus sylvatica 30* % of total removals; *Picea abies 60* %; *Pinus nigra*	

	10 % Removals' structure: *Fagus sylvatica*: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 15 %, RDC5 10 % *Picea abies*: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 15 %, RDC5 10 % *Pinus nigra*: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 5 %
Operation 2	Time reference: *105 years;* Removals: ∑*48* % SV – *Fagus sylvatica 25* % of total removals; *Picea abies 40* %; *Pinus nigra 35* % Removals' structure: *Fagus sylvatica*: RDC1 20 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 10 % *Picea abies*: RDC1 20 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 10 % *Pinus nigra*: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 5 %
Operation 3	Time reference: *120 years;* Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Shiroka laka
Representative stand: 4 Mixed forests on Cambisols
FM type: 10 even-aged forest management
ID RST×FM: 4_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

FM concept description: *Mixed forests on Cambisols grow on Mesotrophic submesic sites in the altitudinal belt 1200-1400 m a.s.l in landscape 1. All three species are characterised by good growth. Pine and spruce are expected to dominate the next generation but presence of beech is anticipated as well.*

Rotation period: *120* years

Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase*
	Species composition *Fagus sylvatica 20 %* (origin: *Natural*, spatial arrangement: *Random*, density: *4200*/ha*); Picea abies 60 % (Natural, In patches, 19000*/ha*); Pinus nigra 20 % (Natural, In patches, 3900*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *20 years;*	Removals: *20* % of regeneration
THINNING		
Operation 1	Type: *Combination from above and from below*	Time reference: *30 years;*
	Removals: ∑*22* % SV – *Fagus sylvatica 20* % of total removals; *Picea abies 65* %; *Pinus nigra 15* %	
	Removals' structure:	
	Fagus sylvatica: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
	Picea abies: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
	Pinus nigra: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
Operation 2	Type: *Combination from above and from below*	Time reference: *50 years;*
	Removals: ∑*22* % SV – *Fagus sylvatica 20* % of total removals; *Picea abies 70* %; *Pinus nigra 10* %	
	Removals' structure:	
	Fagus sylvatica: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
	Picea abies: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
	Pinus nigra: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
Operation 3	Type: *Combination from above and from below*	Time reference: *70 years;*
	Removals: ∑*22* % SV – *Fagus sylvatica 20* % of total removals; *Picea abies 70* %; *Pinus nigra 10* %	
	Removals' structure:	
	Fagus sylvatica: RDC1 20 %, RDC2 25%, RDC3 25 %, RDC4 15 %, RDC5 15 %	
	Picea abies: RDC1 20 %, RDC2 25%, RDC3 25 %, RDC4 15 %, RDC5 15 %	
	Pinus nigra: RDC1 20 %, RDC2 25%, RDC3 25 %, RDC4 15 %, RDC5 15 %	
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*	
	Regeneration period: *30* years	
	Description: *Description: Advanced regeneration is released in paches by removing the mature community in two successive cuttings (seed cutting and final cutting of the shelterwood system). If there is no advance regeneration, preparatory cutting of the shelterwood system is performed over the entire area and it should be waited for the regeneration to occur before implementation of the second regeneration felling. Desired species composition prior to final harvest (third regeneration cut): Fagus sylvatica 10 %; Picea abies 40 %; Pinus nigra 50 %. Initial regeneration paches are around 0.15-0.25 ha in area and are enlarged afterwards in 2 steps. There are 1-3 initial paches ha-1, depending on the harvesting intensity. Such process is continuously repeated until the intended forest area is regenerated.*	
Operation 1	Time reference: *90 years;*	
	Removals: ∑*30* % SV – *Fagus sylvatica 25* % of total removals; *Picea abies 60* %; *Pinus nigra*	

	15 % Removals' structure: *Fagus sylvatica*: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 15 %, RDC5 10 % *Picea abies*: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 15 %, RDC5 10 % *Pinus nigra*: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 15 %, RDC5 10 %
Operation 2	Time reference: *105 years;* Removals: ∑*50* % SV – *Fagus sylvatica 10* % of total removals; *Picea abies 45* %; *Pinus nigra 45* % Removals' structure: *Fagus sylvatica*: RDC1 20 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 10 % *Picea abies*: RDC1 20 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 10 % *Pinus nigra*: RDC1 20 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 10 %
Operation 3	Time reference: *120 years;* Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Shiroka laka
Representative stand: 5 Scots pine dominated forests on Cambisols
FM type: 10 even-aged forest management
ID RST×FM: 5_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

FM concept description: *Scots pine dominated forests on Cambisols grow on moderately poor sites in landscape 1. Targeted stands are located in the altitudinal belt 1100-1300 m a.s.l.*

Rotation period: *120* years

Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase*
	Species composition *Fagus sylvatica 20 %* (origin: *Natural,* spatial arrangement: *Random,* density: *3600*/ha*); Picea abies 50 % (Natural, In patches, 15500*/ha*); Pinus nigra 10 % (Natural, In patches, 1500*/ha*); Pinus sylvestris 20 % (Natural, In patches, 3300*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *20 years;*	Removals: *20* % of regeneration
THINNING		
Operation 1	Type: *Combination from above and from below*	Time reference: *30 years;*
	Removals: ∑*25* % SV – *Fagus sylvatica 20* % of total removals; *Picea abies 60* %; *Pinus nigra 10* %; *Pinus sylvestris 10* %	
	Removals' structure:	
	Fagus sylvatica: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
	Picea abies: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
	Pinus nigra: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
	Pinus sylvestris: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
Operation 2	Type: *Combination from above and from below*	Time reference: *50 years;*
	Removals: ∑*22* % SV – *Fagus sylvatica 20* % of total removals; *Picea abies 65* %; *Pinus nigra 5* %; *Pinus sylvestris 10* %	
	Removals' structure:	
	Fagus sylvatica: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
	Picea abies: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
	Pinus nigra: RDC1 25 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 15 %	
	Pinus sylvestris: RDC1 25 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 15 %	
Operation 3	Type: *Combination from above and from below*	Time reference: *70 years;*
	Removals: ∑*22* % SV – *Fagus sylvatica 20* % of total removals; *Picea abies 60* %; *Pinus nigra 10* %; *Pinus sylvestris 10* %	
	Removals' structure:	
	Fagus sylvatica: RDC1 20 %, RDC2 25%, RDC3 25 %, RDC4 15 %, RDC5 15 %	
	Picea abies: RDC1 20 %, RDC2 25%, RDC3 25 %, RDC4 15 %, RDC5 15 %	
	Pinus nigra: RDC1 25 %, RDC2 25%, RDC3 25 %, RDC4 15 %, RDC5 10 %	
	Pinus sylvestris: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 15 %, RDC5 10 %	
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*	
	Regeneration period: *30* years	
	Description: *Description: Advanced regeneration is released in paches by removing the mature community in two successive cuttings (seed cutting and final cutting of the shelterwood system). If there is no advance regeneration, preparatory cutting of the shelterwood system is performed over the entire area and it should be waited for the regeneration to occur before implementation of the second regeneration felling. Due to better growth of Scots pine on the particular site conditions, priority is given to assuring adequate regeneration with Scots pine (and black pine) during regeneration cuts. Desired species composition prior to final harvest (third regeneration cut): Fagus sylvatica 10 %; Picea abies 25 %; Pinus nigra 30 %; Pinus sylvestris 35 %. Initial regeneration paches are*	

	around 0.20-0.30 ha in area and are enlarged afterwards in 2 steps. There are 1-2 (rarely 3) initial paches ha^{-1}, depending on the harvesting intensity. Such process is continuously repeated until the intended forest area is regenerated.
Operation 1	Time reference: *90 years;* Removals: ∑*28* % SV – *Fagus sylvatica 20* % of total removals; *Picea abies 55* %; *Pinus nigra 10* %; *Pinus sylvestris 15* % Removals' structure: *Fagus sylvatica*: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 15 %, RDC5 10 % *Picea abies*: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 15 %, RDC5 10 % *Pinus nigra*: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 5 % *Pinus sylvestris*: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 5 %
Operation 2	Time reference: *105 years;* Removals: ∑*48* % SV – *Fagus sylvatica 10* % of total removals; *Picea abies 40* %; *Pinus nigra 25* %; *Pinus sylvestris 25* % Removals' structure: *Fagus sylvatica*: RDC1 20 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 10 % *Picea abies*: RDC1 20 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 10 % *Pinus nigra*: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 5 % *Pinus sylvestris*: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 5 %
Operation 3	Time reference: *120 years;* Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed Removals' structure: all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Shiroka laka
Representative stand: 6 Mixed coniferous forests on Cambisols
FM type: 10 even-aged forest management
ID RST×FM: 6_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

FM concept description: *Mixed coniferous forests on Cambisols grow on mesotrophic submesic sites in the altitudinal belt 1200-1350 m a.s.l in landscape 1. Stands are of greatest productivity among those in landscape 1.*

Rotation period: *120* years

Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase*
	Species composition *Abies alba 50 %* (origin: *Natural*, spatial arrangement: *In patches,* density: *12000*/ha*); Picea abies 50 % (Natural, In patches, 16000*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *20 years;*	Removals: *20* % of regeneration
THINNING		
Operation 1	Type: *Combination from above and from below*	Time reference: *30 years;*
	Removals: ∑*20* % SV – *Abies alba 50* % of total removals; *Picea abies 50* %	
	Removals' structure:	
	Abies alba: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
	Picea abies: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
Operation 2	Type: *Combination from above and from below*	Time reference: *50 years;*
	Removals: ∑*25* % SV – *Abies alba 50* % of total removals; *Picea abies 50* %	
	Removals' structure:	
	Abies alba: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
	Picea abies: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
Operation 3	Type: *Combination from above and from below*	Time reference: *70 years;*
	Removals: ∑*25* % SV – *Abies alba 50* % of total removals; *Picea abies 50* %	
	Removals' structure:	
	Abies alba: RDC1 20 %, RDC2 25%, RDC3 25 %, RDC4 15 %, RDC5 15 %	
	Picea abies: RDC1 20 %, RDC2 25%, RDC3 25 %, RDC4 15 %, RDC5 15 %	
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*	
	Regeneration period: *30* years	
	Description: *Advanced regeneration is released in paches by removing the mature community in two successive cuttings (seed cutting and final cutting of the shelterwood system). If there is no advance regeneration, preparatory cutting of the shelterwood system is performed over the entire area and it should be waited for the regeneration to occur before implementation of the second regeneration felling. Initial regeneration paches are around 0.15-0.25 ha in area and are enlarged afterwards in 2 steps. There are 1-3 initial paches ha^{-1}, depending on the harvesting intensity. Such process is continuously repeated until the intended forest area is regenerated.*	
Operation 1	Time reference: *100 years;*	
	Removals: ∑*30* % SV – *Abies alba 50* % of total removals; *Picea abies 50* %	
	Removals' structure:	
	Abies alba: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 15 %, RDC5 10 %	
	Picea abies: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 15 %, RDC5 10 %	
Operation 2	Time reference: *115 years;*	
	Removals: ∑*50* % SV – *Abies alba 50* % of total removals; *Picea abies 50* %	
	Removals' structure:	
	Abies alba: RDC1 20 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 10 %	
	Picea abies: RDC1 20 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 10 %	
Operation 3	Time reference: *130 years;*	

Removals: ∑*100* % SV – *all species in RST 100* % of species volume removed
all species in RST: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %

Case study: Shiroka laka
Representative stand: 7 Mountainous spruce forests on permesotrophic soils
FM type: 10 even-aged forest management
ID RST×FM: 7_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

FM concept description: *The mountainous spruce forests on permesotrophic soils represent the most productive RST in Shiroka Laka Forest Enterprise. They growth in the altitudinal belt 1550-1850 m a.s.l in landscape 2.*

Rotation period: *120* years

Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase at* stand height - m;
	Species composition *Picea abies 30 %* (origin: *Natural,* spatial arrangement: *In patches* density: *30000*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *20 years;*	Removals: *20* % of regeneration
THINNING		
Operation 1	Type: *Combination from above and from below*	Time reference: *30 years;*
	Removals: ∑*20* % SV – *Picea abies 100* % of total removals	
	Removals' structure:	
	Picea abies: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
Operation 2	Type: *Combination from above and from below*	Time reference: *50 years;*
	Removals: ∑*25* % SV – *Picea abies 100* % of total removals	
	Removals' structure:	
	Picea abies: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
Operation 3	Type: *Combination from above and from below*	Time reference: *70 years;*
	Removals: ∑*25* % SV – *Picea abies 100* % of total removals	
	Removals' structure:	
	Picea abies: RDC1 20 %, RDC2 25%, RDC3 25 %, RDC4 15 %, RDC5 15 %	
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*	
	Regeneration period: *30* years	
	Description: *Advanced regeneration is released in paches by removing the mature community in two successive cuttings (seed cutting and final cutting of the shelterwood system). If there is no advance regeneration, preparatory cutting of the shelterwood system is performed over the entire area and it should be waited for the regeneration to occur before implementation of the second regeneration felling. Initial regeneration paches are around 0.15-0.25 ha in area and are enlarged afterwards in 2 steps. There are 1-3 initial paches ha^{-1}, depending on the harvesting intensity. Such process is continuously repeated until the intended forest area is regenerated.*	
Operation 1	Time reference: *100 years;*	
	Removals: ∑*30* % SV – *Picea abies 100* % of total removals	
	Removals' structure:	
	Picea abies: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 15 %, RDC5 10 %	
Operation 2	Time reference: *115 years;*	
	Removals: ∑*50* % SV – *Picea abies 100* % of total removals	
	Removals' structure:	
	Picea abies: RDC1 20 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 10 %	
Operation 3	Time reference: *130 years;*	
	Removals: ∑*100* % SV – *Picea abies 100* % of total removals	
	Removals' structure:	
	Picea abies: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Shiroka laka
Representative stand: 8 Mountainous spruce forests on submesotrophic soils
FM type: 10 even-aged forest management
ID RST×FM: 8_10_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

FM concept description: *The mountainous spruce forests on submesotrophic soils growth on steep slopes in the altitudinal belt 1550-1850 m a.s.l in landscape 2.*

Rotation period: *120* years

Silvicultural operations:

REGENERATION		
Operation 1	Regeneration type: *Natural*;	Time reference: *Regeneration / seedling phase at* stand height - m;
	Species composition *Picea abies 40 %* (origin: *Natural,* spatial arrangement: *In patches,* density: *30000*/ha*)*	
WEEDING		
TENDING		
Operation 1	Time reference: *20 years;*	Removals: *20* % of regeneration
THINNING		
Operation 1	Type: *Combination from above and from below*	Time reference: *30 years;*
	Removals: ∑*20* % SV – *Picea abies 100* % of total removals	
	Removals' structure:	
	Picea abies: RDC1 15 %, RDC2 15 %, RDC3 25 %, RDC4 25 %, RDC5 20 %	
Operation 2	Type: *Combination from above and from below*	Time reference: *50 years;*
	Removals: ∑*25* % SV – *Picea abies 100* % of total removals	
	Removals' structure:	
	Picea abies: RDC1 20 %, RDC2 20 %, RDC3 20 %, RDC4 20 %, RDC5 20 %	
Operation 3	Type: *Combination from above and from below*	Time reference: *70 years;*
	Removals: ∑*25* % SV – *Picea abies 100* % of total removals	
	Removals' structure:	
	Picea abies: RDC1 20 %, RDC2 25%, RDC3 25 %, RDC4 15 %, RDC5 15 %	
REGENERATION FELLING	Regeneration system: *3 - Group system (=Grupenschirmschlag)*	
	Regeneration period: *30* years	
	Description: *Advanced regeneration is released in paches by removing the mature community in two successive cuttings (seed cutting and final cutting of the shelterwood system). If there is no advance regeneration, preparatory cutting of the shelterwood system is performed over the entire area and it should be waited for the regeneration to occur before implementation of the second regeneration felling. Initial regeneration paches are around 0.15-0.25 ha in area and are enlarged afterwards in 2 steps. There are 1-3 initial paches ha^{-1}, depending on the harvesting intensity. Such process is continuously repeated until the intended forest area is regenerated.*	
Operation 1	Time reference: *90 years;*	
	Removals: ∑*30* % SV – *Picea abies 100* % of total removals	
	Removals' structure:	
	Picea abies: RDC1 25 %, RDC2 25 %, RDC3 25 %, RDC4 15 %, RDC5 10 %	
Operation 2	Time reference: *105 years;*	
	Removals: ∑*50* % SV – *Picea abies 100* % of total removals	
	Removals' structure:	
	Picea abies: RDC1 20 %, RDC2 25 %, RDC3 25 %, RDC4 20 %, RDC5 10 %	
Operation 3	Time reference: *120 years;*	
	Removals: ∑*100* % SV – *Picea abies 100* % of total removals	
	Removals' structure:	
	Picea abies: RDC1 na %, RDC2 na %, RDC3 na %, RDC4 na %, RDC5 na %	

Case study: Shiroka laka
Representative stand: 9 Alpine spruce forests
FM type: 80 no forest management
ID RST×FM: 9_80_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Emphasised protective roles of forests*

Description:

Alpine spruce forests grow on altitude 1900-2050m a.s.l. Forests provide protection against avalanches and soil erosion. Maintaining of old-growth structural features of forests is vital for key elements of biodiversity conservation. The massif of Perelik is the highest one in the Rhodopes and it is important for sheltering forest bird species of high conservation value on a European scale. Among them are at least two species of owls (Pygmy Owl, Tengmalm's Owl), some woodpeckers (Three-toed Woodpecker, Black Woodpecker), two species of tetraonids (Capercaillie, Hazel Grouse), etc.

Case study: Shiroka laka
Representative stand: 10 Alpine spruce forests on former pastures
FM type: 80 no forest management
ID RST×FM: 10_80_1

BUSINESS-AS-USUAL FOREST MANAGEMENT PRACTICE

Main cause for the absence of forest management: *Emphasised protective roles of forests*

Description:

Alpine spruce forests on former pastures grow on altitude 1900-2050m a.s.l. Forests provide protection against avalanches and soil erosion. Achievement of old-growth structural features of forests is considered as vital for key elements of biodiversity conservation. The massif of Perelik is the highest one in the Rhodopes and it is important for sheltering forest bird species of high conservation value on a European scale. Among them are at least two species of owls (Pygmy Owl, Tengmalm's Owl), some woodpeckers (Three-toed Woodpecker, Black Woodpecker), two species of tetraonids (Capercaillie, Hazel Grouse), etc.

Annex 3: Harvesting technologies in representative stand types per case study areas

ARANGE Deliverable D1.3 – Annex 3

Harvesting technologies in representative stand types per case study areas

17.11. 2013

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harvesting technology, harvesting method, felling, delimbing, bucking, extraction method, productivity, costs, representative landscape, representative stand type

Abstract:

Annex 3 to D1.3 comprise detailed reports on harvesting and extraction technologies on spatial level of 1) representative landscape and 2) representative stand type in each case study area.

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1 Introduction

Annex 3 to D1.3 “Current and historical management in the case study areas” represents a detailed description of current harvesting and extraction technologies on two different spatial levels: 1) a representative landscape (RL) spatial level, and 2) an individual representative stand (RST) level.

The detailed reports on both RL and RST levels designate some basic parameters of harvesting and extraction operations practiced in RL or RST (e.g. productivity and costs of harvesting and extraction, harvesting system, harvesting and extraction method, methods of specific harvesting operations); separate reports are given for thinning and regeneration felling.

2 Reports per case study area (CSA)

2.1 CSA1 – Montes Valsain, Iberian Mountains, Spain

2.1.1 Representative Landscape 1

Included RSTs:

- Even-aged FM: RST 11, RST 12, RST 13
- Coppice FM: RST 12

Table 2.1: Descriptive statistics harvesting in CSA 1 (Spain) in RL 1 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 3, number of operations = 9.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	40.00	80.00	60.00	17.32
H_{dom} [m]	10.90	23.60	17.68	4.83
Volume [m^3]	36.00	200.00	79.22	51.20
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	28.96	28.96	28.96	0.00
Extraction distance [m]	650.00	850.00	716.67	100.00
Productivity extraction [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost extraction [€/m^3]	10.12	10.12	10.12	0.00

Table 2.2: Frequency analysis in CSA 1 (Spain) in RL 1 for thinning operations in even-aged FM. Number of RST = 3, number of operations = 9.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	11.10 %
	Older pole phase (20-30 cm DBH)	33.30 %
	Mature phase (30-50 cm DBH)	55.60 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.3: Descriptive statistics harvesting in CSA 1 (Spain) in RL 1 for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 1, number of operations = 3.

Thinning – Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	60.00	43.33	15.28

H_{dom} [m]				
Volume [m^3]	2.00	5.00	3.67	1.53
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	32.39	32.39	32.39	0.00
Extraction distance [m]	650.00	650.00	650.00	0.00
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 2.4: Frequency analysis in CSA 1 (Spain) in RL 1 for thinning operations in coppice FM. Number of RST = 1, number of operations = 3.

Thinning – Coppice		***Frequency***
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

Table 2.5: Descriptive statistics harvesting in CSA 1 (Spain) in RL 1 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 3, number of operations = 12.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	100.00	120.00	111.25	7.72
H_{dom} [m]	23.00	26.00	24.50	2.12
Volume [m^3]	42.00	346.00	127.08	100.03
Productivity harvesting [m^3/PSH15]	2.00	2.00	2.00	0.00
Cost harvesting [€/m^3]	7.62	7.62	7.62	0.00
Extraction distance [m]	400.00	850.00	633.33	192.28
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	13.98	13.98	13.98	0.00

Table 2.6: Frequency analysis in CSA 1 (Spain) in RL1 for regeneration fellings in even-aged FM. Number of RST = 3, number of operations = 12.

Regeneration - Even-aged		***Frequency***
Phase	Over mature (>50 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.7: Descriptive statistics harvesting in CSA 1 (Spain) in RL 1 for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 1, number of operations = 1.

Regeneration – Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	70.00	70.00	70.00	
H_{dom} [m]				
Volume [m^3]	20.00	20.00	20.00	
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	
Cost harvesting [€/m^3]	25.03	25.03	25.03	
Extraction distance [m]	650.00	650.00	650.00	
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	
Cost extraction [€/m^3]	7.35	7.35	7.35	

Table 2.8: Frequency analysis in CSA 1 (Spain) in RL 1 for regeneration fellings in coppice FM. Number of RST = 1, number of operations = 1.

Regeneration – Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

2.1.2 Representative Landscape 2

In RL 2 only RST 14 is included (see section 2.1.17).

2.1.3 Representative Landscape 3

Included RSTs:

- Even-aged FM: RST 5, RST 6,
- Coppice FM: RST 2, RST 3, RST 4, RST 5, RST 6, RST 7, RST 8, RST 9, RST 10

Table 2.9: Descriptive statistics harvesting in CSA 1 (Spain) in RL 3 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 2, number of operations = 6.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	40.00	80.00	60.00	17.89
H_{dom} [m]	13.90	26.40	20.63	5.64
Volume [m^3]	26.00	94.00	57.83	24.76

Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	28.96	28.96	28.96	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost extraction [€/m^3]	10.12	10.12	10.12	0.00

Table 2.10: Frequency analysis in CSA 1 (Spain) in RL 3 for thinning operations in even-aged FM. Number of RST = 2, number of operations = 6.

Thinning - Even-aged		***Frequency***
Phase	Older pole phase (20-30 cm DBH)	33.30 %
	Mature phase (30-50 cm DBH)	66.70 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Harvester	16.70 %
	Processor	83.30 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.11: Descriptive statistics harvesting in CSA 1 (Spain) in RL 3 for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 9, number of operations = 30.

Thinning – Coppice	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	30.00	60.00	43.94	12.23
H_{dom} [m]	7.00	14.60	10.38	2.77
Volume [m^3]	5.00	82.00	19.12	21.43
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	32.39	32.39	32.39	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 2.12: Frequency analysis in CSA 1 (Spain) in RL 3 for thinning operations in coppice FM practice. Number of RST = 9, number of operations = 30.

Thinning – Coppice		***Frequency***
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus ilex*	9.10 %
	Quercus pyrenaica	90.90 %

Table 2.13: Descriptive statistics harvesting in CSA 1 (Spain) in RL 3 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 2, number of operations = 7.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	100.00	120.00	110.71	8.38
H_{dom} [m]	29.00	29.00	29.00	0.00
Volume [m^3]	62.00	257.00	122.43	77.35
Productivity harvesting [m^3/PSH15]	2.00	2.00	2.00	0.00
Cost harvesting [€/m^3]	7.62	7.62	7.62	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	13.98	13.98	13.98	0.00

Table 2.14: Frequency analysis in CSA 1 (Spain) in RL 3 for regeneration fellings in even-aged FM. Number of RST = 2, number of operations = 7.

Regeneration - Even-aged		*Frequency*
Phase	Mature phase (30-50 cm DBH)	14.30 %
	Over mature (>50 cm DBH)	85.70 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.15: Descriptive statistics harvesting in CSA 1 (Spain) in RL 3 for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 9, number of operations = 9.

Regeneration – Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	70.00	70.00	70.00	0.00
H_{dom} [m]				
Volume [m^3]	24.00	60.00	48.67	14.58
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	25.03	25.03	25.03	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 2.16: Frequency analysis in CSA 1 (Spain) in RL 3 for regeneration fellings in coppice FM. Number of RST = 9, number of operations = 9.

Regeneration – Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %

Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

2.1.4 Representative Landscape 4

Included RSTs:

- Even-aged FM: RST 5, RST 6
- Coppice FM: RST 5, RST 6, RST 7, RST 8

Table 2.17: Descriptive statistics harvesting in CSA 1 (Spain) in RL 4 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 2, number of operations = 6.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	40.00	80.00	60.00	17.89
H_{dom} [m]	13.90	26.40	20.63	5.64
Volume [m^3]	26.00	94.00	57.83	24.76
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	28.96	28.96	28.96	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost extraction [€/m^3]	10.12	10.12	10.12	0.00

Table 2.18: Frequency analysis in CSA 1 (Spain) in RL 4 for thinning operations in even-aged FM. Number of RST = 2, number of operations = 6.

Thinning - Even-aged		*Frequency*
Phase	Older pole phase (20-30 cm DBH)	33.30 %
	Mature phase (30-50 cm DBH)	66.70 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Harvester	16.70 %
	Processor	83.30 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.19: Descriptive statistics harvesting in CSA 1 (Spain) in RL 4 for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 4, number of operations = 13.

Thinning – Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	60.00	43.85	12.61

H_{dom} [m]				
Volume [m^3]	5.00	82.00	30.31	31.08
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	32.39	32.39	32.39	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 2.20: Frequency analysis in CSA 1 (Spain) in RL 4 for thinning operations in coppice FM. Number of RST = 4, number of operations = 13.

Thinning – Coppice		***Frequency***
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus ilex*	9.10 %
	Quercus pyrenaica	90.90 %

Table 2.21: Descriptive statistics harvesting in CSA 1 (Spain) in RL 4 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 2, number of operations = 7.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	100.00	120.00	110.71	8.38
H_{dom} [m]	29.00	29.00	29.00	0.00
Volume [m^3]	62.00	257.00	122.43	77.35
Productivity harvesting [m^3/PSH15]	2.00	2.00	2.00	0.00
Cost harvesting [€/m^3]	7.62	7.62	7.62	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	13.98	13.98	13.98	0.00

Table 2.22: Frequency analysis in CSA 1 (Spain) in RL 4 for regeneration fellings in even-aged FM. Number of RST = 2, number of operations = 7.

Regeneration - Even-aged		***Frequency***
Phase	Mature phase (30-50 cm DBH)	14.30 %
	Over mature (>50 cm DBH)	85.70 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.23: Descriptive statistics harvesting in CSA 1 (Spain) in RL 4 for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 4, number of operations = 4.

Regeneration – Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	70.00	70.00	70.00	0.00
H_{dom} [m]				
Volume [m^3]	24.00	60.00	48.25	16.78
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	25.03	25.03	25.03	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 2.24: Frequency analysis in CSA 1 (Spain) in RL 4 for regeneration fellings in coppice FM. Number of RST = 4, number of operations = 4.

Regeneration – Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

2.1.5 Representative stand (RST) 2 (RL 3)

Table 2.25: Descriptive statistics harvesting in CSA 1 (Spain) in RST 2 for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	60.00	43.33	13.66
H_{dom} [m]	7.00	14.60	10.38	2.77
Volume [m^3]	5.00	11.00	8.00	2.61
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	32.39	32.39	32.39	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 2.26: Frequency analysis in CSA 1 (Spain) in RST 2 for thinning operations in coppice FM. Number of operations = 3.

Thinning - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %

Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus ilex*	50.00 %
	Quercus pyrenaica	50.00 %

Table 2.27: Descriptive statistics harvesting in CSA 1 (Spain) in RST 2 for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	70.00	70.00	70.00	
H_{dom} [m]				
Volume [m^3]	24.00	24.00	24.00	
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	
Cost harvesting [€/m^3]	25.03	25.03	25.03	
Extraction distance [m]	400.00	400.00	400.00	
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	
Cost extraction [€/m^3]	7.35	7.35	7.35	

Table 2.28: Frequency analysis in CSA 1 (Spain) in RST 2 for regeneration fellings in coppice FM. Number of operations = 1.

Regeneration - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

2.1.6 RST 3 (RL 3)

Table 2.29: Descriptive statistics harvesting in CSA 1 (Spain) in RST 3 for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	60.00	43.33	15.28
H_{dom} [m]				
Volume [m^3]	12.00	16.00	14.33	2.08
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	32.39	32.39	32.39	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 2.30: Frequency analysis in CSA 1 (Spain) in RST 3 for thinning operations in coppice FM. Number of operations = 3.

Thinning - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

Table 2.31: Descriptive statistics harvesting in CSA 1 (Spain) in RST 3 for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	70.00	70.00	70.00	
H_{dom} [m]				
Volume [m^3]	60.00	60.00	60.00	
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	
Cost harvesting [€/m^3]	25.03	25.03	25.03	
Extraction distance [m]	400.00	400.00	400.00	
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	
Cost extraction [€/m^3]	7.35	7.35	7.35	

Table 2.32: Frequency analysis in CSA 1 (Spain) in RST 3 for regeneration fellings in coppice FM. Number of operations = 1.

Regeneration - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

2.1.7 RST 4 (RL 3)

Table 2.33: Descriptive statistics harvesting in CSA 1 (Spain) in RST 4 for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. number of operations = 4.

Thinning - Coppice	*N*	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	4	30.00	60.00	45.00	12.91
H_{dom} [m]	0				
Volume [m^3]	4	8.00	21.00	15.25	6.29
Productivity harvesting [m^3/PSH15]	4	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	4	32.39	32.39	32.39	0.00
Extraction distance [m]	4	400.00	400.00	400.00	0.00

Productivity extraction [m^3/PSH15]	4	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	4	7.35	7.35	7.35	0.00

Table 2.34: Frequency analysis in CSA 1 (Spain) in RST 4 for thinning operations in coppice FM. Number of operations = 4.

Thinning - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

Table 2.35: Descriptive statistics harvesting in CSA 1 (Spain) in RST 4 for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Coppice	*N*	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	1	70.00	70.00	70.00	
H_{dom} [m]	0				
Volume [m^3]	1	59.00	59.00	59.00	
Productivity harvesting [m^3/PSH15]	1	1.00	1.00	1.00	
Cost harvesting [€/m^3]	1	25.03	25.03	25.03	
Extraction distance [m]	1	400.00	400.00	400.00	
Productivity extraction [m^3/PSH15]	1	10.00	10.00	10.00	
Cost extraction [€/m^3]	1	7.35	7.35	7.35	

Table 2.36: Frequency analysis in CSA 1 (Spain) in RST 4 for regeneration fellings in coppice FM. Number of operations = 1.

Regeneration - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

2.1.8 RST 5 (RL 3, 4)

Table 2.37: Descriptive statistics harvesting in CSA 1 (Spain) in RST 5 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	40.00	80.00	60.00	20.00
H_{dom} [m]	13.90	26.40	20.63	6.31

Volume [m^3]	26.00	76.00	50.33	25.03
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	28.96	28.96	28.96	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost extraction [€/m^3]	10.12	10.12	10.12	0.00

Table 2.38: Frequency analysis in CSA 1 (Spain) in RST 5 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		***Frequency***
Phase	Older pole phase (20-30 cm DBH)	66.70 %
	Mature phase (30-50 cm DBH)	33.30 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Harvester	33.30 %
	Processor	66.70 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.39: Descriptive statistics harvesting in CSA 1 (Spain) in RST 5 for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Coppice	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	30.00	60.00	43.33	15.28
H_{dom} [m]				
Volume [m^3]	10.00	13.00	12.00	1.73
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	32.39	32.39	32.39	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 2.40: Frequency analysis in CSA 1 (Spain) in RST 5 for thinning operations in coppice FM. Number of operations = 3.

Thinning - Coppice		***Frequency***
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

Table 2.41: Descriptive statistics harvesting in CSA 1 (Spain) in RST 5 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	100.00	120.00	110.00	10.00
H_{dom} [m]	29.00	29.00	29.00	.
Volume [m^3]	62.00	193.00	108.33	73.43
Productivity harvesting [m^3/PSH15]	2.00	2.00	2.00	0.00
Cost harvesting [€/m^3]	7.62	7.62	7.62	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	13.98	13.98	13.98	0.00

Table 2.42: Frequency analysis in CSA 1 (Spain) in RST 5 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.43: Descriptive statistics harvesting in CSA 1 (Spain) in RST 5 for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Coppice	*N*	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	1	70.00	70.00	70.00	
H_{dom} [m]	0				
Volume [m^3]	1	50.00	50.00	50.00	
Productivity harvesting [m^3/PSH15]	1	1.00	1.00	1.00	
Cost harvesting [€/m^3]	1	25.03	25.03	25.03	
Extraction distance [m]	1	400.00	400.00	400.00	
Productivity extraction [m^3/PSH15]	1	10.00	10.00	10.00	
Cost extraction [€/m^3]	1	7.35	7.35	7.35	

Table 2.44: Frequency analysis in CSA 1 (Spain) in RST 5 for regeneration fellings in coppice FM practice. Number of operations = 1.

Regeneration - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

2.1.9 RST 6 (RL 3, 4)

Table 2.45: Descriptive statistics harvesting in CSA 1 (Spain) in RST 6 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	40.00	80.00	60.00	20.00
H_{dom} [m]	13.90	26.40	20.63	6.31
Volume [m^3]	40.00	94.00	65.33	27.15
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	28.96	28.96	28.96	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost extraction [€/m^3]	10.12	10.12	10.12	0.00

Table 2.46: Frequency analysis in CSA 1 (Spain) in RST 6 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Phase	Older pole phase (20-30 cm DBH)	66.70 %
	Mature phase (30-50 cm DBH)	33.30 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.47: Descriptive statistics harvesting in CSA 1 (Spain) in RST 6 for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3

Thinning - Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	60.00	43.33	15.28
H_{dom} [m]				
Volume [m^3]	5.00	6.00	5.67	0.58
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	32.39	32.39	32.39	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 2.48: Frequency analysis in CSA 1 (Spain) in RST 6 for thinning operations in coppice FM. Number of operations = 3.

Thinning - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %

Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

Table 2.49: Descriptive statistics harvesting in CSA 1 (Spain) in RST 6 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	100.00	120.00	111.25	8.54
H_{dom} [m]	29.00	29.00	29.00	
Volume [m^3]	62.00	257.00	133.00	89.57
Productivity harvesting [m^3/PSH15]	2.00	2.00	2.00	0.00
Cost harvesting [€/m^3]	7.62	7.62	7.62	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	13.98	13.98	13.98	0.00

Table 2.50: Frequency analysis in CSA 1 (Spain) in RST 6 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		*Frequency*
Phase	Mature phase (30-50 cm DBH)	25.00 %
	Over mature (>50 cm DBH)	75.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.51: Descriptive statistics harvesting in CSA 1 (Spain) in RST 5 for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	70.00	70.00	70.00	
H_{dom} [m]				
Volume [m^3]	24.00	24.00	24.00	
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	
Cost harvesting [€/m^3]	25.03	25.03	25.03	
Extraction distance [m]	400.00	400.00	400.00	
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	
Cost extraction [€/m^3]	7.35	7.35	7.35	

Table 2.52: Frequency analysis in CSA 1 (Spain) in RST 5 for regeneration fellings in coppice FM. Number of operations = 1.

Regeneration - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

2.1.10 RST 7 (RL 3, 4)

Table 2.53: Descriptive statistics harvesting in CSA 1 (Spain) in RST 7 for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3

Thinning - Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	60.00	43.33	15.28
H_{dom} [m]				
Volume [m^3]	12.00	16.00	14.33	2.08
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	32.39	32.39	32.39	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 2.54: Frequency analysis in CSA 1 (Spain) in RST 7 for thinning operations in coppice FM. Number of operations = 3.

Thinning - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

Table 2.55: Descriptive statistics harvesting in CSA 1 (Spain) in RST 7 for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Coppice	*N*	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	1	70.00	70.00	70.00	
H_{dom} [m]	0				
Volume [m^3]	1	60.00	60.00	60.00	
Productivity harvesting [m^3/PSH15]	1	1.00	1.00	1.00	
Cost harvesting [€/m^3]	1	25.03	25.03	25.03	
Extraction distance [m]	1	400.00	400.00	400.00	

Productivity extraction [m^3/PSH15]	1	10.00	10.00	10.00
Cost extraction [€/m^3]	1	7.35	7.35	7.35

Table 2.56: Frequency analysis in CSA 1 (Spain) in RST 5 for regeneration fellings in coppice FM. Number of operations = 1.

Regeneration - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

2.1.11 RST 8 (RL 3, 4)

Table 2.57: Descriptive statistics harvesting in CSA 1 (Spain) in RST 8 for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Coppice	*N*	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	4	30.00	60.00	45.00	12.91
H_{dom} [m]	0				
Volume [m^3]	4	64.00	82.00	74.50	7.59
Productivity harvesting [m^3/PSH15]	4	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	4	32.39	32.39	32.39	0.00
Extraction distance [m]	4	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	4	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	4	7.35	7.35	7.35	0.00

Table 2.58: Frequency analysis in CSA 1 (Spain) in RST 8 for thinning operations in coppice FM. Number of operations = 4.

Thinning - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

Table 2.59: Descriptive statistics harvesting in CSA 1 (Spain) in RST 8 for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Coppice	*N*	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	1	70.00	70.00	70.00	
H_{dom} [m]	0				

Volume [m^3]	1	59.00	59.00	59.00
Productivity harvesting [m^3/PSH15]	1	1.00	1.00	1.00
Cost harvesting [€/m^3]	1	25.03	25.03	25.03
Extraction distance [m]	1	400.00	400.00	400.00
Productivity extraction [m^3/PSH15]	1	10.00	10.00	10.00
Cost extraction [€/m^3]	1	7.35	7.35	7.35

Table 2.60: Frequency analysis in CSA 1 (Spain) in RST 8 for regeneration fellings in coppice FM. Number of operations = 1.

Regeneration - Coppice		***Frequency***
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

2.1.12 RST 9 (RL 3)

Table 2.61: Descriptive statistics harvesting in CSA 1 (Spain) in RST 9 for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3

Thinning - Coppice	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	30.00	60.00	43.33	15.28
H_{dom} [m]				
Volume [m^3]	10.00	13.00	11.67	1.53
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	32.39	32.39	32.39	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 2.62: Frequency analysis in CSA 1 (Spain) in RST 9 for thinning operations in coppice FM. Number of operations = 3.

Thinning - Coppice		***Frequency***
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

Table 2.63: Descriptive statistics harvesting in CSA 1 (Spain) in RST 9 for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	70.00	70.00	70.00	
H_{dom} [m]				
Volume [m^3]	51.00	51.00	51.00	
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	
Cost harvesting [€/m^3]	25.03	25.03	25.03	
Extraction distance [m]	400.00	400.00	400.00	
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	
Cost extraction [€/m^3]	7.35	7.35	7.35	

Table 2.64: Frequency analysis in CSA 1 (Spain) in RST 9 for regeneration fellings in coppice FM practice. Number of operations = 1.

Regeneration - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

2.1.13 RST 10 (RL 3)

Table 2.65: Descriptive statistics harvesting in CSA 1 (Spain) in RST 10 for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	60.00	45.00	12.91
H_{dom} [m]				
Volume [m^3]	6.00	18.00	12.50	5.51
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	32.39	32.39	32.39	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 2.66: Frequency analysis in CSA 1 (Spain) in RST 10 for thinning operations in coppice FM. Number of operations = 4.

Thinning - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %

Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

Table 2.67: Descriptive statistics harvesting in CSA 1 (Spain) in RST 10 for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	70.00	70.00	70.00	
H_{dom} [m]				
Volume [m^3]	51.00	51.00	51.00	
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	
Cost harvesting [€/m^3]	25.03	25.03	25.03	
Extraction distance [m]	400.00	400.00	400.00	
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	
Cost extraction [€/m^3]	7.35	7.35	7.35	

Table 2.68: Frequency analysis in CSA 1 (Spain) in RST 10 for regeneration fellings in coppice FM. Number of operations = 1.

Regeneration - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

2.1.14 RST 11 (RL 1)

Table 2.69: Descriptive statistics harvesting in CSA 1 (Spain) in RST 11 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	40.00	80.00	60.00	20.00
H_{dom} [m]	12.40	23.60	18.43	5.65
Volume [m^3]	73.00	200.00	117.00	71.92
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	28.96	28.96	28.96	0.00
Extraction distance [m]	650.00	650.00	650.00	0.00
Productivity extraction [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost extraction [€/m^3]	10.12	10.12	10.12	0.00

Table 2.70: Frequency analysis in CSA 1 (Spain) in RST 11 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Phase	Older pole phase (20-30 cm DBH)	66.70 %
	Mature phase (30-50 cm DBH)	33.30 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.71: Descriptive statistics harvesting in CSA 1 (Spain) in RST 11 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	100.00	120.00	111.25	8.54
H_{dom} [m]	26.00	26.00	26.00	
Volume [m^3]	55.00	346.00	148.00	135.68
Productivity harvesting [m^3/PSH15]	2.00	2.00	2.00	0.00
Cost harvesting [€/m^3]	7.62	7.62	7.62	0.00
Extraction distance [m]	650.00	650.00	650.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	13.98	13.98	13.98	0.00

Table 2.72: Frequency analysis in CSA 1 (Spain) in RST 11 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

2.1.15 RST 12 (RL 1)

Table 2.73: Descriptive statistics harvesting in CSA 1 (Spain) in RST 12 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	40.00	80.00	60.00	20.00
H_{dom} [m]	12.40	23.60	18.43	5.65
Volume [m^3]	36.00	84.00	58.33	24.17
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00

Cost harvesting [€/m^3]	28.96	28.96	28.96	0.00
Extraction distance [m]	650.00	650.00	650.00	0.00
Productivity extraction [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost extraction [€/m^3]	10.12	10.12	10.12	0.00

Table 2.74: Frequency analysis in CSA 1 (Spain) in RST 12 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		***Frequency***
Phase	Older pole phase (20-30 cm DBH)	66.70 %
	Mature phase (30-50 cm DBH)	33.30 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.75: Descriptive statistics harvesting in CSA 1 (Spain) in RST 12 for thinning operations in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3

Thinning - Coppice	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	30.00	60.00	43.33	15.28
H_{dom} [m]				
Volume [m^3]	2.00	5.00	3.67	1.53
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	32.39	32.39	32.39	0.00
Extraction distance [m]	650.00	650.00	650.00	0.00
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	7.35	7.35	7.35	0.00

Table 2.76: Frequency analysis in CSA 1 (Spain) in RST 12 for thinning operations in coppice FM. Number of operations = 3.

Thinning - Coppice		***Frequency***
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

Table 2.77: Descriptive statistics harvesting in CSA 1 (Spain) in RST 12 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	100.00	120.00	111.25	8.54
H_{dom} [m]				
Volume [m^3]	55.00	231.00	119.25	80.84
Productivity harvesting [m^3/PSH15]	2.00	2.00	2.00	0.00
Cost harvesting [€/m^3]	7.62	7.62	7.62	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	13.98	13.98	13.98	0.00

Table 2.78: Frequency analysis in CSA 1 (Spain) in RST 12 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.79: Descriptive statistics harvesting in CSA 1 (Spain) in RST 12 for regeneration fellings in coppice FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Coppice	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	70.00	70.00	70.00	
H_{dom} [m]				
Volume [m^3]	20.00	20.00	20.00	
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	
Cost harvesting [€/m^3]	25.03	25.03	25.03	
Extraction distance [m]	650.00	650.00	650.00	
Productivity extraction [m^3/PSH15]	10.00	10.00	10.00	
Cost extraction [€/m^3]	7.35	7.35	7.35	

Table 2.80: Frequency analysis in CSA 1 (Spain) in RST 12 for regeneration fellings in coppice FM. Number of operations = 1.

Regeneration - Coppice		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Quercus pyrenaica*	100.00 %

2.1.16 RST 13 (RL 1)

Table 2.81: Descriptive statistics harvesting in CSA 1 (Spain) in RST 13 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	40.00	80.00	60.00	20.00
H_{dom} [m]	10.90	20.70	16.17	4.94
Volume [m^3]	37.00	107.00	62.33	38.80
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	28.96	28.96	28.96	0.00
Extraction distance [m]	850.00	850.00	850.00	0.00
Productivity extraction [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost extraction [€/m^3]	10.12	10.12	10.12	0.00

Table 2.82: Frequency analysis in CSA 1 (Spain) in RST 13 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	33.33%
	Older pole phase (20-30 cm DBH)	33.33 %
	Mature phase (30-50 cm DBH)	33.33 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.83: Descriptive statistics harvesting in CSA 1 (Spain) in RST 13 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	100.00	120.00	111.25	8.54
H_{dom} [m]	23.00	23.00	23.00	.
Volume [m^3]	42.00	266.00	114.00	104.16
Productivity harvesting [m^3/PSH15]	2.00	2.00	2.00	0.00
Cost harvesting [€/m^3]	7.62	7.62	7.62	0.00
Extraction distance [m]	850.00	850.00	850.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	13.98	13.98	13.98	0.00

Table 2.84: Frequency analysis in CSA 1 (Spain) in RST 13 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %

Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

2.1.17 RST 14 (RL 2)

Table 2.85: Descriptive statistics harvesting in CSA 1 (Spain) in RST 14 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	40.00	80.00	60.00	20.00
H_{dom} [m]	7.90	15.10	11.70	3.62
Volume [m^3]	18.00	66.00	38.67	24.69
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	28.96	28.96	28.96	0.00
Extraction distance [m]	900.00	900.00	900.00	0.00
Productivity extraction [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost extraction [€/m^3]	10.12	10.12	10.12	0.00

Table 2.86: Frequency analysis in CSA 1 (Spain) in RST 14 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	33.33%
	Older pole phase (20-30 cm DBH)	33.33 %
	Mature phase (30-50 cm DBH)	33.33 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

Table 2.87: Descriptive statistics harvesting in CSA 1 (Spain) in RST 14 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	100.00	120.00	111.25	8.54
H_{dom} [m]				
Volume [m^3]	28.00	171.00	73.75	66.65
Productivity harvesting [m^3/PSH15]	2.00	2.00	2.00	0.00
Cost harvesting [€/m^3]	7.62	7.62	7.62	0.00
Extraction distance [m]	900.00	900.00	900.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	13.98	13.98	13.98	0.00

Table 2.88: Frequency analysis in CSA 1 (Spain) in RST 14 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		***Frequency***
Phase	Mature phase(30-50 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Highly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Processor	100.00 %
Species (frequency)	*Pinus sylvestris*	100.00 %

2.2 CSA2 – Vercors, Western Alps, France

2.2.1 Representative Landscape 1

Included RSTs:

- Uneven-aged FM: RST 2 to RST 19

Table 2.89: Descriptive statistics harvesting in CSA2 (France) RL 1 for harvesting in uneven-aged FM. Number of RST = 18, number of operations = 18.

Harvesting - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Productivity harvesting [m^3/PSH_{15}]	3,00	3,00	3,00	0,00
Cost harvesting [€/m^3]	12,00	12,00	12,00	0,00
Extraction distance [m]	300,00	500,00	488,89	47,14
Productivity extraction [m^3/PSH_{15}]	10,00	10,00	10,00	0,00
Cost extraction [€/m^3]	11,00	11,00	11,00	0,00

Table 2.90: Frequency analysis in CSA2 (France) in RL 1for harvesting in uneven-aged FM. Number of RST= 18, number of operations = 18.

Harvesting - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	40 % beech, 30 % fir, 20 % spruce, 10 % other deciduous species	5.60 %
	40 % beech, 40 % fir, 10 % spruce, 10 % other deciduous species	5.60 %
	40 % spruce, 40 % fir, 20 % secondary species and mountain pine	5.60 %
	40 % spruce, 40 % fir, 20 % decidous species (beech dominant)	5.60 %
	45 % fir, 45 % spruce, 10 % deciduous species (beech dominant)	5.60 %
	50 % fir, 20 % spruce, 30 % decidous species (maple dominant)	11.10 %
	50 % spruce, 25 % fir, 25 % deciduous species	11.10 %
	50 % fir, 20 % spruce, 30 % deciduous species (beech dominant)	5.60 %
	60 % fir, 20 % spruce, 20 % deciduous species (beech dominant)	5.60 %
	60 % spruce, 40 % fir	5.60 %
	70 % fir, 15 % spruce, 15 % deciduous species (beech dominant)	5.60 %
	70 % fir, 20 % spruce, 10 % deciduous species (beech dominant)	5.60 %
	70 % spruce, 20 % mountain pine, 10 % fir	5.60 %
	75 % spruce, 25 % secondary species and fir	5.60 %
	75 % spruce, 25 % fir	5.60 %
	90 % spruce, 10 % fir	5.60 %

2.2.2 RST 2

Table 2.91: Descriptive statistics harvesting in CSA2 (France) in RST 2 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	300.00	300.00	300.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.92: Frequency analysis in CSA2 (France) in RST 2for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	75 % spruce, 25 % fir	100.00 %

2.2.3 RST 3

Table 2.93: Descriptive statistics harvesting in CSA2 (France) in RST 3 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.94: Frequency analysis in CSA2 (France) in RST 3for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	90 % spruce, 10 % fir	100.00 %

2.2.4 RST 4

Table 2.95: Descriptive statistics harvesting in CSA2 (France) RST 4 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.96: Frequency analysis in CSA2 (France) in RST 4for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	60 % spruce, 40 % fir	100.00 %

2.2.5 RST 5

Table 2.97: Descriptive statistics harvesting in CSA2 (France) RST 5 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.98: Frequency analysis in CSA2 (France) in RST 5 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	70 % *Abies alba*, 15 % *Picea abies*, deciduous species (*Fagus sylvatica* dominant)	100.00 %

2.2.6 RST 6

Table 2.99: Descriptive statistics harvesting in CSA2 (France) RST 6 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.100: Frequency analysis in CSA2 (France) in RST 6 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	60 % *Abies alba*, 20 % *Picea abies*, 20 % deciduous species (*Fagus sylvatica* dominant)	100.00 %

2.2.7 RST 7

Table 2.101: Descriptive statistics harvesting in CSA2 (France) RST 7 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.102: Frequency analysis in CSA2 (France) in RST 7 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	45 % *Abies alba*, 45 % *Picea abies*, 10 % deciduous species (*Fagus sylvatica* dominant)	100.00 %

2.2.8 RST 8

Table 2.103: Descriptive statistics harvesting in CSA2 (France) RST 8 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.104: Frequency analysis in CSA2 (France) in RST 8 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	50 % *Abies alba*, 20 % *Picea abies*, 30 % deciduous species (*Acer* dominant)	100.00 %

2.2.9 RST 9

Table 2.105: Descriptive statistics harvesting in CSA2 (France) RST 9 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.106: Frequency analysis in CSA2 (France) in RST 9 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %

Species (frequency)	50 % *Abies alba*, 20 % *Picea abies*, 30 % deciduous species (*Acer* dominant)	100.00 %

2.2.10 RST 10

Table 2.107: Descriptive statistics harvesting in CSA2 (France) RST 10 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.108: Frequency analysis in CSA2 (France) in RST 10 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	40 % *Abies alba*, 40 % *Picea abies*, 20 % deciduous species (*Fagus sylvatica* dominant)	100.00 %

2.2.11 RST 11

Table 2.109: Descriptive statistics harvesting in CSA2 (France) RST 11 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.110: Frequency analysis in CSA2 (France) in RST 11 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %

Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	50 % *Abies alba*, 20 % *Picea abies*, 30 % deciduous species (*Fagus sylvatica* dominant)	100.00 %

2.2.12 RST 12

Table 2.111: Descriptive statistics harvesting in CSA2 (France) RST 12 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.112: Frequency analysis in CSA2 (France) in RST 12 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	70 % *Abies alba*, 20 % *Picea abies*, 10 % deciduous species (*Fagus sylvatica* dominant)	100.00 %

2.2.13 RST 13

Table 2.113: Descriptive statistics harvesting in CSA2 (France) RST 13 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.114: Frequency analysis in CSA2 (France) in RST 13 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %

Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	75 % *Picea abies*, 25 % secondary species and *Abies alba*	100.00 %

2.2.14 RST 14

Table 2.115: Descriptive statistics harvesting in CSA2 (France) RST 14 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.116: Frequency analysis in CSA2 (France) in RST 14 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		***Frequency***
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	40 % *Abies alba*, 40 % *Picea abies*, 20 % secondary species and *Pinus mugo*	100.00 %

2.2.15 RST 15

Table 2.117: Descriptive statistics harvesting in CSA2 (France) RST 15 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.118: Frequency analysis in CSA2 (France) in RST 15 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		***Frequency***
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	10 % *Abies alba*, 70 % *Picea abies*, 20 % *Pinus mugo*	100.00 %

2.2.16 RST 16

Table 2.119: Descriptive statistics harvesting in CSA2 (France) RST 16 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.120: Frequency analysis in CSA2 (France) in RST 16 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		***Frequency***
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	40 % *Abies alba*, 10 % *Picea abies*, 40 % *Fagus sylvatica,* 10 % deciduous species	100.00 %

2.2.17 RST 17

Table 2.121: Descriptive statistics harvesting in CSA2 (France) RST 17 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.122: Frequency analysis in CSA2 (France) in RST 17 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		***Frequency***
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	30 % *Abies alba*, 20 % *Picea abies*, 40 % *Fagus sylvatica,* 10 % deciduous species	100.00 %

2.2.18 RST 18

Table 2.123: Descriptive statistics harvesting in CSA2 (France) RST 18 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.124: Frequency analysis in CSA2 (France) in RST 18 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		***Frequency***
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	25 % *Abies alba*, 50 % *Picea abies*, 40 % *Fagus sylvatica,* 25 % deciduous species	100.00 %

2.2.19 RST 19

Table 2.125: Descriptive statistics harvesting in CSA2 (France) RST 18 for harvesting in uneven-aged FM. Number of RST = 1, number of operations = 1.

Harvesting - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Productivity harvesting [m^3/PSH_{15}]	3.00	3.00	3.00	0.00
Cost harvesting [€/m^3]	12.00	12.00	12.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00

Productivity extraction [m^3/PSH_{15}]	10.00	10.00	10.00	0.00
Cost extraction [€/m^3]	11.00	11.00	11.00	0.00

Table 2.126: Frequency analysis in CSA2 (France) in RST 18 for harvesting in uneven-aged FM. Number of RST= 1, number of operations = 1.

Harvesting - Uneven-aged		***Frequency***
Phase	Uneven-aged stand	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No Bucking	100.00 %
Species (frequency)	25 % *Abies alba*, 50 % *Picea abies*, 25 % deciduous species	100.00 %

2.3 CSA3 – Montafon, Eastern Alps, Austria

2.3.1 Representative Landscape Rellstal

Included RSTs:

- Uneven-aged FM: RST 1 to RST 53

Table 2.127: Descriptive statistics harvesting in CSA 3 (Austria) in RL Rellstal for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 53, number of operations = 53.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m^3]	20.00	20.00	20.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	25.00	25.00	25.00	0.00

Table 2.128: Frequency analysis in CSA 3 (Austria) in RL Rellstal for regeneration fellings in uneven-aged FM. Number of RST = 53, number of operations = 53.

Regeneration - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Sledge winch	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	0.60 %
	Fagus sylvatica	3.00 %
	Other broadleaves	32.10 %
	Abies alba	9.10 %
	Picea abies	32.10 %
	Other conifers	23.10 %

2.3.2 Representative Landscape Silbertal

Included RSTs:

- Uneven-aged FM: RST 60 to RST 77

Table 2.129: Descriptive statistics harvesting in CSA 3 (Austria) in RL Rellstal for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 18, number of operations = 18.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m^3]	20.00	20.00	20.00	0.00
Extraction distance [m]	100.00	500.00	477.78	92.49
Productivity extraction [m^3/PSH15]	6.00	8.00	7.89	0.46
Cost extraction [€/m^3]	15.00	25.00	24.44	2.31

Table 2.130: Frequency analysis in CSA 3 (Austria) in RL Rellstal for regeneration fellings in uneven-aged FM. Number of RST = 18, number of operations = 18.

Regeneration - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Sledge winch	94.40 %
	Tractor	5.60 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	Other broadleaves	33.33 %
	Picea abies	33.33 %
	Other conifers	33.33 %

2.3.3 RST 1 to RST 38

The figures in Table 2.13194 and Table 2.13295 are valid for RST 1 to RST 38 because of similar parameters and number of operations.

Table 2.131: Descriptive statistics harvesting in CSA 3 (Austria) in RST 1 to RST 38 (similar for indicated RSTs) for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m^3]	20.00	20.00	20.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	25.00	25.00	25.00	0.00

Table 2.132: Frequency analysis in CSA 3 (Austria) in RST 1 to RST 38 (similar for indicated RSTs) for regeneration fellings in uneven-aged FM. Number of operations = 1.

Regeneration - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Sledge winch	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	Other broadleaves	33.33 %
	Picea abies	33.33 %
	Other conifers	33.33 %

2.3.4 RST 39 to RST 41

The figures in Table 2.13396 and Table 2.13497 are valid for RST 39 to RST 41 because of similar parameters and number of operations.

Table 2.133: Descriptive statistics harvesting in CSA 3 (Austria) in RST 39 to RST 41 (similar for indicated RSTs) for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m^3]	20.00	20.00	20.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	25.00	25.00	25.00	0.00

Table 2.134: Frequency analysis in CSA 3 (Austria) in RST 1 to RST 38 (similar for indicated RSTs) for regeneration fellings in uneven-aged FM. Number of operations = 1.

Regeneration - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Sledge winch	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	25.00 %
	Other broadleaves	25.00 %
	Abies alba	25.00 %
	Picea abies	25.00 %

2.3.5 RST 42

Table 2.135: Descriptive statistics harvesting in CSA 3 (Austria) in RST 42 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m^3]	20.00	20.00	20.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	25.00	25.00	25.00	0.00

Table 2.136: Frequency analysis in CSA 3 (Austria) in RST 42 for regeneration fellings in uneven-aged FM. Number of operations = 1.

Regeneration - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Sledge winch	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	25.00 %
	Other broadleaves	25.00 %
	Abies alba	25.00 %
	Picea abies	25.00 %

2.3.6 RST 43 to RST 51

The figures in Table 2.137100 and Table 2.138101Table 2.134 are valid for RST 43 to RST 51 because of similar parameters and number of operations.

Table 2.137: Descriptive statistics harvesting in CSA 3 (Austria) in RST 43 to RST 51 (similar for indicated RSTs) for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m^3]	20.00	20.00	20.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00

Cost extraction [€/m³]	25.00	25.00	25.00	0.00

Table 2.138: Frequency analysis in CSA 3 (Austria) in RST 43 to RST 51 (similar for indicated RSTs) for regeneration fellings in uneven-aged FM. Number of operations = 1.

Regeneration - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Sledge winch	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	Other broadleaves	33.33 %
	Abies alba	33.33 %
	Picea abies	33.33 %

2.3.7 RST 52 to RST 53

The figures in Table 2.139102 and

Table 2.140103Table 2.134 are valid for RST 52 to RST 53 because of similar parameters and number of operations.

Table 2.139: Descriptive statistics harvesting in CSA 3 (Austria) in RST 52 to RST 53 (similar for indicated RSTs) for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m³]				
Productivity harvesting [m³/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m³]	20.00	20.00	20.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m³/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m³]	25.00	25.00	25.00	0.00

Table 2.140: Frequency analysis in CSA 3 (Austria) in RST 52 to RST 53 (similar for indicated RSTs) for regeneration fellings in uneven-aged FM. Number of operations = 1.

Regeneration - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Sledge winch	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %

Species (frequency)	*Fagus sylvatica*	25.00 %
	Other broadleaves	25.00 %
	Abies alba	25.00 %
	Picea abies	25.00 %

2.3.8 RST 60 to RST 67

The figures in Table 2.141104 and Table 2.142105Table 2.134 are valid for RST 60 to RST 67 because of similar parameters and number of operations.

Table 2.141: Descriptive statistics harvesting in CSA 3 (Austria) in RST 60 to RST 67 (similar for indicated RSTs) for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m^3]	20.00	20.00	20.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m^3]	25.00	25.00	25.00	0.00

Table 2.142: Frequency analysis in CSA 3 (Austria) in RST 60 to RST 67 (similar for indicated RSTs) for regeneration fellings in uneven-aged FM. Number of operations = 1.

Regeneration - Uneven-aged		*Frequency*
Phase	Uneven-aged stand	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Sledge winch	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	Other broadleaves	33.33 %
	Picea abies	33.33 %
	Other conifers	33.33 %

2.3.9 RST 68

Table 2.143: Descriptive statistics harvesting in CSA 3 (Austria) in RST 68 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00

Cost harvesting [€/m³]	20.00	20.00	20.00	0.00
Extraction distance [m]	100.00	100.00	100.00	0.00
Productivity extraction [m³/PSH15]	6.00	6.00	6.00	0.00
Cost extraction [€/m³]	15.00	15.00	15.00	0.00

Table 2.144: Frequency analysis in CSA 3 (Austria) in RST 68 for regeneration fellings in uneven-aged FM. Number of operations = 1.

Regeneration - Uneven-aged		***Frequency***
Phase	Uneven-aged stand	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Sledge winch	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	Other broadleaves	33.33 %
	Picea abies	33.33 %
	Other conifers	33.33 %

2.3.10 RST 69 to RST 77

The figures in Table 2.145108 and Table 2.146109Table 2.134 are valid for RST 69 to RST 77 because of similar parameters and number of operations.

Table 2.145: Descriptive statistics harvesting in CSA 3 (Austria) in RST 69 to RST 77 (similar for indicated RSTs) for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]				
H_{dom} [m]				
Volume [m³]				
Productivity harvesting [m³/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m³]	20.00	20.00	20.00	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m³/PSH15]	8.00	8.00	8.00	0.00
Cost extraction [€/m³]	25.00	25.00	25.00	0.00

Table 2.146: Frequency analysis in CSA 3 (Austria) in RST 69 to RST 77 (similar for indicated RSTs) for regeneration fellings in uneven-aged FM. Number of operations = 1.

Regeneration - Uneven-aged		***Frequency***
Phase	Uneven-aged stand	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Sledge winch	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %

Bucking	Chain saw	100.00 %
Species (frequency)	Other broadleaves	33.33 %
	Picea abies	33.33 %
	Other conifers	33.33 %

2.4 CSA4 – Sneznik, Dinaric Mountains, Slovenia

2.4.1 Representative Landscape 1

Included RSTs:

- Even-aged FM: RST 2
- Uneven-aged FM: RST 12, RST 22, RST 23

Table 2.147: Descriptive statistics harvesting in CSA 4 (Slovenia) in RL 1 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 1, number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	25.00	13.00	16.97
Productivity harvesting [m^3/PSH15]	5.00	5.00	5.00	0.00
Cost harvesting [€/m^3]	31.29	31.29	31.29	0.00
Extraction distance [m]	350.00	350.00	350.00	0.00
Productivity extraction [m^3/PSH15]	15.00	15.00	15.00	0.00
Cost extraction [€/m^3]	18.06	18.06	18.06	0.00

Table 2.148: Frequency analysis in CSA 4 (Slovenia) in RL 1 for thinning operations in even-aged FM. Number of RST = 1, number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No bucking	100.00 %
Species (frequency)	*Fagus sylvatica*	50.00 %
	Picea abies	50.00 %

Table 2.149: Descriptive statistics harvesting in CSA 4 (Slovenia) in RL 1 for thinning operations in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 3, number of operations = 12.

Thinning - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	40.00	11.82	8.61
Productivity harvesting [m^3/PSH15]	5.00	15.00	11.69	4.54
Cost harvesting [€/m^3]	10.43	31.30	17.02	9.65
Extraction distance [m]	400.00	500.00	433.33	47.76

Productivity extraction [m^3/PSH15]	15.00	35.00	27.69	8.80
Cost extraction [€/m^3]	13.88	18.06	15.70	1.84

Table 2.150: Frequency analysis in CSA 4 (Slovenia) in RL 1 for thinning operations in uneven-aged FM. Number of RST = 3, number of operations = 12.

Thinning - Uneven-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	30.80 %
	Older pole phase (20-30 cm DBH)	23.10 %
	Mature phase (30-50 cm DBH)	46.20 %
Harvesting method	Cut to length	46.20 %
	Tree length	53.80 %
Extraction method	Skidder	69.20 %
	Tractor	30.80 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	46.20 %
	No bucking	53.80 %
Species (frequency)	*Acer pseudoplatanus*	5.10 %
	Fagus sylvatica	30.70 %
	Other broadleaves	2.60 %
	Abies alba	30.80 %
	Picea abies	30.80 %

Table 2.151: Descriptive statistics harvesting in CSA 4 (Slovenia) in RL 1 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 1, number of operations = 3.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	3.00	180.00	54.38	71.63
Productivity harvesting [m^3/PSH15]	16.00	16.00	16.00	0.00
Cost harvesting [€/m^3]	9.78	9.78	9.78	0.00
Extraction distance [m]	350.00	350.00	350.00	0.00
Productivity extraction [m^3/PSH15]	38.00	38.00	38.00	0.00
Cost extraction [€/m^3]	12.78	12.78	12.78	0.00

Table 2.152: Frequency analysis in CSA 4 (Slovenia) in RL 1 for regeneration fellings in even-aged FM. Number of RST = 1, number of operations = 3.

Regeneration - Even-aged		***Frequency***
Phase	Mature phase (30-50 cm DBH)	37.50 %
	Over mature (>50 cm DBH)	50.00 %
	Rejuvenation phase	12.50 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %

Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	12.50 %
	Fagus sylvatica	25.00 %
	Abies alba	25.00 %
	Picea abies	25.00 %
	Miscellaneous	12.50 %

Table 2.153: Descriptive statistics harvesting in CSA 4 (Slovenia) in RL 1 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 3, number of operations = 9.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	270.00	44.93	77.83
Productivity harvesting [m^3/PSH15]	15.00	16.00	15.50	0.51
Cost harvesting [€/m^3]	9.78	10.43	10.11	0.33
Extraction distance [m]	400.00	500.00	433.33	47.95
Productivity extraction [m^3/PSH15]	35.00	38.00	36.50	1.53
Cost extraction [€/m^3]	12.78	13.88	13.33	0.56

Table 2.154: Frequency analysis in CSA 4 (Slovenia) in RL 1 for regeneration fellings in uneven-aged FM. Number of RST = 3, number of operations = 9.

Regeneration - Uneven-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	40.00 %
	Rejuvenation phase	10.00 %
	Uneven-aged stand	50.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.00 %
	Fagus sylvatica	20.00 %
	Other broadleaves	20.00 %
	Abies alba	10.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.4.2 Representative Landscape 2

In RL 2, all RSTs are represented so descriptive statistics and frequency analyses for RL 2 are the same as for the CSA 4 (Slovenia).

2.4.3 RST 1

Table 2.155: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 1 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	43.00	12.00	15.47
Productivity harvesting [m^3/PSH15]	4.00	15.00	10.91	5.49
Cost harvesting [€/m^3]	10.43	34.77	19.35	12.23
Extraction distance [m]	450.00	500.00	477.27	26.11
Productivity extraction [m^3/PSH15]	15.00	35.00	27.27	9.84
Cost extraction [€/m^3]	9.03	18.01	14.94	2.82

Table 2.156: Frequency analysis in CSA 4 (Slovenia) in RST 1 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	36.40 %
	Older pole phase (20-30 cm DBH)	9.10 %
	Mature phase (30-50cm DBH)	54,50 %
Harvesting method	Cut to length	54.50 %
	Tree length	45.50 %
Extraction method	Tractor	45.50 %
	Skidder	54.50 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	54.50 %
	No bucking	45.50 %
Species (frequency)	*Fagus sylvatica*	27.30 %
	Other broadleaves	18.20 %
	Abies alba	27.30 %
	Picea abies	27.30 %

Table 2.157: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 1 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	4.00	270.00	62.80	88.45
Productivity harvesting [m^3/PSH15]	16.00	16.00	16.00	0.00
Cost harvesting [€/m^3]	9.78	9.78	9.78	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	38.00	38.00	38.00	0.00
Cost extraction [€/m^3]	12.78	12.78	12.78	0.00

Table 2.158: Frequency analysis in CSA 4 (Slovenia) in RST 1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	90.00 %
	Rejuvenation phase	10.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	10.00 %
	Fagus sylvatica	20.00 %
	Other broadleaves	20.00 %
	Abies alba	20.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.4.4 RST 2

Table 2.159: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 2 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	25.00	13.00	16.97
Productivity harvesting [m^3/PSH15]	5.00	5.00	5.00	0.00
Cost harvesting [€/m^3]	31.29	31.29	31.29	0.00
Extraction distance [m]	350.00	350.00	350.00	0.00
Productivity extraction [m^3/PSH15]	15.00	15.00	15.00	0.00
Cost extraction [€/m^3]	18.06	18.06	18.06	0.00

Table 2.160: Frequency analysis in CSA 4 (Slovenia) in RST 2 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No bucking	100.00 %
Species (frequency)	*Fagus sylvatica*	50.00 %
	Picea abies	50.00 %

Table 2.161: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 2 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	3.00	180.00	54.38	71.63
Productivity harvesting [m^3/PSH15]	16.00	16.00	16.00	0.00
Cost harvesting [€/m^3]	9.78	9.78	9.78	0.00
Extraction distance [m]	350.00	350.00	350.00	0.00
Productivity extraction [m^3/PSH15]	38.00	38.00	38.00	0.00
Cost extraction [€/m^3]	12.78	12.78	12.78	0.00

Table 2.162: Frequency analysis in CSA 4 (Slovenia) in RST 2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Phase	Mature phase (30-50 cm DBH)	37.50 %
	Over mature (>50 cm DBH)	50.00 %
	Rejuvenation phase	12.50 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	12.50 %
	Fagus sylvatica	25.00 %
	Abies alba	25.00 %
	Picea abies	25.00 %
	Miscellaneous	12.50 %

2.4.5 RST 4

Table 2.163: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 4 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	24.00	7.50	11.09
Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m^3]	34.77	34.77	34.77	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	15.00	15.00	15.00	0.00
Cost extraction [€/m^3]	18.01	18.01	18.01	0.00

Table 2.164: Frequency analysis in CSA 4 (Slovenia) in RST 4 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No bucking	100.00 %
Species (frequency)	*Fagus sylvatica*	25.00 %
	Other broadleaves	25.00 %
	Abies alba	25.00 %
	Picea abies	25.00 %

Table 2.165: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 4 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	5.00	290.00	76.11	95.47
Productivity harvesting [m^3/PSH15]	16.00	16.00	16.00	0.00
Cost harvesting [€/m^3]	9.78	9.78	9.78	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	38.00	38.00	38.00	0.00
Cost extraction [€/m^3]	12.78	12.78	12.78	0.00

Table 2.166: Frequency analysis in CSA 4 (Slovenia) in RST 4 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		***Frequency***
Phase	Over mature (>50 cm DBH)	88.90 %
	Rejuvenation phase	11.10 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	22.20 %
	Other broadleaves	22.20 %
	Abies alba	22.20 %
	Picea abies	22.20 %
	Miscellaneous	11.20 %

2.4.6 RST 5

Table 2.167: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 5 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	17.00	7.50	7.90
Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m^3]	34.77	34.77	34.77	0.00
Extraction distance [m]	650.00	650.00	650.00	0.00
Productivity extraction [m^3/PSH15]	15.00	15.00	15.00	0.00
Cost extraction [€/m^3]	18.01	18.01	18.01	0.00

Table 2.168: Frequency analysis in CSA 4 (Slovenia) in RST 5 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No bucking	100.00 %
Species (frequency)	*Acer pseudoplatanus*	25.00 %
	Fagus sylvatica	25.00 %
	Abies alba	25.00 %
	Picea abies	25.00 %

Table 2.169: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 5 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	4.00	270.00	71.00	85.18
Productivity harvesting [m^3/PSH15]	16.00	16.00	16.00	0.00
Cost harvesting [€/m^3]	9.78	9.78	9.78	0.00
Extraction distance [m]	650.00	650.00	650.00	0.00
Productivity extraction [m^3/PSH15]	38.00	38.00	38.00	0.00
Cost extraction [€/m^3]	12.78	12.78	12.78	0.00

Table 2.170: Frequency analysis in CSA 4 (Slovenia) in RST 5 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	88.90 %
	Rejuvenation phase	11.10 %

Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	22.20 %
	Other broadleaves	22.20 %
	Abies alba	22.20 %
	Picea abies	22.20 %
	Miscellaneous	11.20 %

2.4.7 RST 6

Table 2.171: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 6 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	2.00	24.00	8.75	10.31
Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m^3]	34.77	34.77	34.77	0.00
Extraction distance [m]	530.00	530.00	530.00	0.00
Productivity extraction [m^3/PSH15]	15.00	15.00	15.00	0.00
Cost extraction [€/m^3]	18.01	18.01	18.01	0.00

Table 2.172: Frequency analysis in CSA 4 (Slovenia) in RST 6 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No bucking	100.00 %
Species (frequency)	*Acer pseudoplatanus*	25.00 %
	Fagus sylvatica	25.00 %
	Abies alba	25.00 %
	Picea abies	25.00 %

Table 2.173: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 6 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				

Volume [m^3]	5.00	290.00	68.60	92.40
Productivity harvesting [m^3/PSH15]	16.00	16.00	16.00	0.00
Cost harvesting [€/m^3]	9.78	9.78	9.78	0.00
Extraction distance [m]	530.00	530.00	530.00	0.00
Productivity extraction [m^3/PSH15]	38.00	38.00	38.00	0.00
Cost extraction [€/m^3]	12.78	12.78	12.78	0.00

Table 2.174: Frequency analysis in CSA 4 (Slovenia) in RST 6 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		***Frequency***
Phase	Over mature (>50 cm DBH)	90.00 %
	Rejuvenation phase	10.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.00 %
	Fagus sylvatica	20.00 %
	Other broadleaves	10.00 %
	Abies alba	20.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.4.8 RST 7

Table 2.175: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 7 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	2.00	21.00	9.00	8.37
Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m^3]	34.77	34.77	34.77	0.00
Extraction distance [m]	440.00	440.00	440.00	0.00
Productivity extraction [m^3/PSH15]	15.00	15.00	15.00	0.00
Cost extraction [€/m^3]	18.01	18.01	18.01	0.00

Table 2.176: Frequency analysis in CSA 4 (Slovenia) in RST 7 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %

Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No bucking	100.00 %
Species (frequency)	*Acer pseudoplatanus*	25.00 %
	Fagus sylvatica	25.00 %
	Abies alba	25.00 %
	Picea abies	25.00 %

Table 2.177: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 7 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	5.00	290.00	76.67	90.27
Productivity harvesting [m^3/PSH15]	16.00	16.00	16.00	0.00
Cost harvesting [€/m^3]	9.78	9.78	9.78	0.00
Extraction distance [m]	440.00	440.00	440.00	0.00
Productivity extraction [m^3/PSH15]	38.00	38.00	38.00	0.00
Cost extraction [€/m^3]	12.78	12.78	12.78	0.00

Table 2.178: Frequency analysis in CSA 4 (Slovenia) in RST 7 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	88.90 %
	Rejuvenation phase	11.10 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	22.20 %
	Fagus sylvatica	22.20 %
	Abies alba	22.20 %
	Picea abies	22.20 %
	Miscellaneous	11.20 %

2.4.9 RST 8

Table 2.179: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 8 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	2.00	24.00	8.75	10.31

Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m^3]	34.77	34.77	34.77	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	15.00	15.00	15.00	0.00
Cost extraction [€/m^3]	18.01	18.01	18.01	0.00

Table 2.180: Frequency analysis in CSA 4 (Slovenia) in RST 8 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No bucking	100.00 %
Species (frequency)	*Acer pseudoplatanus*	25.00 %
	Fagus sylvatica	25.00 %
	Abies alba	25.00 %
	Picea abies	25.00 %

Table 2.181: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 8 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	7.00	290.00	68.90	91.83
Productivity harvesting [m^3/PSH15]	16.00	16.00	16.00	0.00
Cost harvesting [€/m^3]	9.78	9.78	9.78	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	38.00	38.00	38.00	0.00
Cost extraction [€/m^3]	12.78	12.78	12.78	0.00

Table 2.182: Frequency analysis in CSA 4 (Slovenia) in RST 8 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		***Frequency***
Phase	Over mature (>50 cm DBH)	90.00 %
	Rejuvenation phase	10.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.0 0%
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.00 %
	Fagus sylvatica	20.00 %
	Other broadleaves	10.00 %

	Abies alba	20.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.4.10 RST 9

The indicated productivities for harvesting and extraction are not reliable, but these are the only data which the CSR got.

Table 2.183: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 9 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	2.00	45.00	12.75	21.50
Productivity harvesting [m^3/PSH15]	100.00	100.00	100.00	0.00
Cost harvesting [€/m^3]	10.73	10.73	10.73	0.00
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	100.00	100.00	100.00	0.00
Cost extraction [€/m^3]	10.73	10.73	10.73	0.00

Table 2.184: Frequency analysis in CSA 4 (Slovenia) in RST 9 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No bucking	100.00 %
Species (frequency)	*Fagus sylvatica*	25.00 %
	Other broadleaves	25.00 %
	Abies alba	25.00 %
	Picea abies	25.00 %

Table 2.185: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 9 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 2.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	6.00	400.00	128.00	168.77
Productivity harvesting [m^3/PSH15]	100.00	100.00	100.00	0.00
Cost harvesting [€/m^3]	10.73	10.73	10.73	0.00

Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	100.00	100.00	100.00	0.00
Cost extraction [€/m^3]	10.73	10.73	10.73	0.00

Table 2.186: Frequency analysis in CSA 4 (Slovenia) in RST 6 for regeneration fellings in even-aged FM. Number of operations = 2.

Regeneration - Even-aged		***Frequency***
Phase	Over mature (>50 cm DBH)	80.00 %
	Rejuvenation phase	20.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	20.00 %
	Other broadleaves	20.00 %
	Abies alba	20.00 %
	Picea abies	20.00 %
	Miscellaneous	20.00 %

2.4.11 RST 10

The indicated productivities for harvesting and extraction are not reliable, but these are the only data which the CSR got.

Table 2.187: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 10 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	2.00	52.00	18.67	28.87
Productivity harvesting [m^3/PSH15]	100.00	100.00	100.00	0.00
Cost harvesting [€/m^3]	10.73	10.73	10.73	0.00
Extraction distance [m]	450.00	450.00	450.00	0.00
Productivity extraction [m^3/PSH15]	100.00	100.00	100.00	0.00
Cost extraction [€/m^3]	10.73	10.73	10.73	0.00

Table 2.188: Frequency analysis in CSA 4 (Slovenia) in RST 10 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %

Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	No bucking	100.00 %
Species (frequency)	*Fagus sylvatica*	33.33 %
	Abies alba	33.33 %
	Picea abies	33.33 %

Table 2.189: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 10 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 2.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	6.00	440.00	140.00	190.43
Productivity harvesting [m^3/PSH15]	100.00	100.00	100.00	0.00
Cost harvesting [€/m^3]	10.73	10.73	10.73	0.00
Extraction distance [m]	450.00	450.00	450.00	0.00
Productivity extraction [m^3/PSH15]	100.00	100.00	100.00	0.00
Cost extraction [€/m^3]	10.73	10.73	10.73	0.00

Table 2.190: Frequency analysis in CSA 4 (Slovenia) in RST 6 for regeneration fellings in even-aged FM. Number of operations = 2.

Regeneration - Even-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	80.00 %
	Rejuvenation phase	20.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00%
Felling	Harvester	100.00%
Delimbing	Harvester	100.00%
Bucking	Harvester	100.00 %
Species (frequency)	*Fagus sylvatica*	20.00 %
	Other broadleaves	20.00 %
	Abies alba	20.00 %
	Picea abies	20.00 %
	Miscellaneous	20.00 %

2.4.12 RST 11

Table 2.191: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 11 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	3.00	11.00	7.75	3.95
Productivity harvesting [m^3/PSH15]	4.00	4.00	4.00	0.00
Cost harvesting [€/m^3]	34.77	34.77	34.77	0.00

Extraction distance [m]	470.00	470.00	470.00	0.00
Productivity extraction [m^3/PSH15]	15.00	15.00	15.00	0.00
Cost extraction [€/m^3]	18.01	18.01	18.01	0.00

Table 2.192: Frequency analysis in CSA 4 (Slovenia) in RST 11 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	No bucking	100.00 %
Species (frequency)	*Acer pseudoplatanus*	25.00 %
	Fagus sylvatica	25.00 %
	Abies alba	25.00 %
	Picea abies	25.00 %

Table 2.193: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 11 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	4.00	270.00	58.09	74.94
Productivity harvesting [m^3/PSH15]	16.00	16.00	16.00	0.00
Cost harvesting [€/m^3]	9.78	9.78	9.78	0.00
Extraction distance [m]	470.00	470.00	470.00	0.00
Productivity extraction [m^3/PSH15]	38.00	38.00	38.00	0.00
Cost extraction [€/m^3]	12.78	12.78	12.78	0.00

Table 2.194: Frequency analysis in CSA 4 (Slovenia) in RST 11 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		***Frequency***
Phase	Over mature (>50 cm DBH)	90.90 %
	Rejuvenation phase	10.10 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	18.20 %
	Fagus sylvatica	18.20 %
	Other broadleaves	18.20 %
	Abies alba	18.20 %
	Picea abies	18.20 %

	Miscellaneous	9.00 %

2.4.13 RST 12

Table 2.195: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 12 for thinning operations in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	40.00	11.77	13.52
Productivity harvesting [m^3/PSH15]	5.00	15.00	11.69	4.66
Cost harvesting [€/m^3]	10.43	31.30	17.02	9.91
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	15.00	35.00	27.69	9.04
Cost extraction [€/m^3]	13.88	18.06	15.70	1.89

Table 2.196: Frequency analysis in CSA 4 (Slovenia) in RST 12 for thinning operations in uneven-aged FM. Number of operations = 4.

Thinning - Uneven-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	30.80 %
	Older pole phase (20-30 cm DBH)	23.10 %
	Mature phase (30-50 cm DBH)	46.20 %
Harvesting method	Cut to length	46.20 %
	Tree length	53.80 %
Extraction method	Skidder	69.20 %
	Tractor	30.80 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	46.20 %
	No bucking	53.80 %
Species (frequency)	*Fagus sylvatica*	30.80 %
	Other broadleaves	7.70 %
	Abies alba	30.80 %
	Picea abies	30.80 %

Table 2.197: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 12 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. number of operations = 3.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	4.00	250.00	47.00	78.73
Productivity harvesting [m^3/PSH15]	15.00	16.00	15.50	0.53

Cost harvesting [€/m^3]	9.78	10.43	10.11	0.34
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	35.00	38.00	36.50	1.58
Cost extraction [€/m^3]	12.78	13.88	13.33	0.58

Table 2.198: Frequency analysis in CSA 4 (Slovenia) in RST 12 for regeneration fellings in uneven-aged FM. Number of operations = 3.

Regeneration - Uneven-aged		***Frequency***
Phase	Over mature (>50 cm DBH)	40.00 %
	Rejuvenation phase	10.00 %
	Uneven-aged stand	50.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.00 %
	Fagus sylvatica	20.00 %
	Other broadleaves	20.00 %
	Abies alba	10.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.4.14 RST 14

Table 2.199: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 14 for thinning operations in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	39.00	12.27	13.63
Productivity harvesting [m^3/PSH15]	5.00	15.00	12.80	4.06
Cost harvesting [€/m^3]	10.43	31.30	14.75	8.57
Extraction distance [m]	350.00	350.00	350.00	0.00
Productivity extraction [m^3/PSH15]	15.00	35.00	30.00	8.02
Cost extraction [€/m^3]	13.88	18.06	15.18	1.76

Table 2.200: Frequency analysis in CSA 4 (Slovenia) in RST 14 for thinning operations in uneven-aged FM. Number of operations = 4.

Thinning - Uneven-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	20.00 %
	Older pole phase (20-30 cm DBH)	20.00 %
	Mature phase (30-50 cm DBH)	60.00 %
Harvesting method	Cut to length	60.00 %
	Tree length	40.00 %
Extraction method	Skidder	80.00 %

	Tractor	20.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	60.00 %
	No bucking	40.00 %
Species (frequency)	*Acer pseudoplatanus*	6.60 %
	Fagus sylvatica	26.70 %
	Other broadleaves	13.30 %
	Abies alba	26.70 %
	Picea abies	26.70 %

Table 2.201: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 14 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. number of operations = 3.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	340.00	45.80	104.83
Productivity harvesting [m^3/PSH15]	15.00	16.00	15.50	0.53
Cost harvesting [€/m^3]	9.78	10.43	10.11	0.34
Extraction distance [m]	350.00	350.00	350.00	0.00
Productivity extraction [m^3/PSH15]	35.00	38.00	36.50	1.58
Cost extraction [€/m^3]	12.78	13.88	13.33	0.58

Table 2.202: Frequency analysis in CSA 4 (Slovenia) in RST 14 for regeneration fellings in uneven-aged FM. Number of operations = 3.

Regeneration - Uneven-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	40.00 %
	Rejuvenation phase	10.00 %
	Uneven-aged stand	50.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.00 %
	Fagus sylvatica	20.00 %
	Other broadleaves	20.00 %
	Abies alba	10.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.4.15 RST 15

Table 2.203: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 15 for thinning operations in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	2.00	30.00	11.40	9.35
Productivity harvesting [m^3/PSH15]	5.00	15.00	12.80	4.06
Cost harvesting [€/m^3]	10.43	31.30	14.75	8.57
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	15.00	35.00	30.00	8.02
Cost extraction [€/m^3]	13.88	18.06	15.18	1.76

Table 2.204: Frequency analysis in CSA 4 (Slovenia) in RST 15 for thinning operations in uneven-aged FM. Number of operations = 4.

Thinning - Uneven-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	20.00 %
	Older pole phase (20-30 cm DBH)	20.00 %
	Mature phase (30-50 cm DBH)	60.00 %
Harvesting method	Cut to length	60.00 %
	Tree length	40.00 %
Extraction method	Skidder	80.00 %
	Tractor	20.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	60.00 %
	No bucking	40.00 %
Species (frequency)	*Acer pseudoplatanus*	6.60 %
	Fagus sylvatica	26.70 %
	Other broadleaves	13.30 %
	Abies alba	26.70 %
	Picea abies	26.70 %

Table 2.205: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 15 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. number of operations = 3.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	270.00	41.20	82.69
Productivity harvesting [m^3/PSH15]	15.00	16.00	15.50	0.53
Cost harvesting [€/m^3]	9.78	10.43	10.11	0.34
Extraction distance [m]	500.00	500.00	500.00	0.00
Productivity extraction [m^3/PSH15]	35.00	38.00	36.50	1.58
Cost extraction [€/m^3]	12.78	13.88	13.33	0.58

Table 2.206: Frequency analysis in CSA 4 (Slovenia) in RST 15 for regeneration fellings in uneven-aged FM. Number of operations = 3.

Regeneration - Uneven-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	40.00 %
	Rejuvenation phase	10.00 %
	Uneven-aged stand	50.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.00 %
	Fagus sylvatica	20.00 %
	Other broadleaves	20.00 %
	Abies alba	10.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.4.16 RST 16

Table 2.207: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 16 for thinning operations in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	3.00	33.00	11.53	11.04
Productivity harvesting [m^3/PSH15]	5.00	15.00	12.80	4.06
Cost harvesting [€/m^3]	10.43	31.30	14.75	8.57
Extraction distance [m]	350.00	350.00	350.00	0.00
Productivity extraction [m^3/PSH15]	15.00	35.00	30.00	8.02
Cost extraction [€/m^3]	13.88	18.06	15.18	1.76

Table 2.208: Frequency analysis in CSA 4 (Slovenia) in RST 16 for thinning operations in uneven-aged FM. Number of operations = 4.

Thinning - Uneven-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	20.00 %
	Older pole phase (20-30 cm DBH)	20.00 %
	Mature phase (30-50 cm DBH)	60.00 %
Harvesting method	Cut to length	60.00 %
	Tree length	40.00 %
Extraction method	Skidder	80.00 %
	Tractor	20.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %

Bucking	Chain saw	60.00 %
	No bucking	40.00 %
Species (frequency)	*Acer pseudoplatanus*	6.60 %
	Fagus sylvatica	26.70 %
	Other broadleaves	13.30 %
	Abies alba	26.70 %
	Picea abies	26.70 %

Table 2.209: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 16 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. number of operations = 3.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	290.00	41.80	88.46
Productivity harvesting [m^3/PSH15]	15.00	16.00	15.50	0.53
Cost harvesting [€/m^3]	9.78	10.43	10.11	0.34
Extraction distance [m]	350.00	350.00	350.00	0.00
Productivity extraction [m^3/PSH15]	35.00	38.00	36.50	1.58
Cost extraction [€/m^3]	12.78	13.88	13.33	0.58

Table 2.210: Frequency analysis in CSA 4 (Slovenia) in RST 16 for regeneration fellings in uneven-aged FM. Number of operations = 3.

Regeneration - Uneven-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	40.00 %
	Rejuvenation phase	10.00 %
	Uneven-aged stand	50.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.00 %
	Fagus sylvatica	20.00 %
	Other broadleaves	20.00 %
	Abies alba	10.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.4.17 RST 17

Table 2.211: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 17 for thinning operations in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				

Volume [m^3]	2.00	30.00	11.40	9.35
Productivity harvesting [m^3/PSH15]	5.00	15.00	12.80	4.06
Cost harvesting [€/m^3]	10.43	31.30	14.75	8.57
Extraction distance [m]	350.00	350.00	350.00	0.00
Productivity extraction [m^3/PSH15]	15.00	35.00	30.00	8.02
Cost extraction [€/m^3]	13.88	18.06	15.18	1.76

Table 2.212: Frequency analysis in CSA 4 (Slovenia) in RST 17 for thinning operations in uneven-aged FM. Number of operations = 4.

Thinning - Uneven-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	20.00 %
	Older pole phase (20-30 cm DBH)	20.00 %
	Mature phase (30-50 cm DBH)	60.00 %
Harvesting method	Cut to length	60.00 %
	Tree length	40.00 %
Extraction method	Skidder	80.00 %
	Tractor	20.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	60.00 %
	No bucking	40.00 %
Species (frequency)	*Acer pseudoplatanus*	6.60 %
	Fagus sylvatica	26.70 %
	Other broadleaves	13.30 %
	Abies alba	26.70 %
	Picea abies	26.70 %

Table 2.213: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 17 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. number of operations = 3.

Regeneration - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	270.00	41.20	82.69
Productivity harvesting [m^3/PSH15]	15.00	16.00	15.50	0.53
Cost harvesting [€/m^3]	9.78	10.43	10.11	0.34
Extraction distance [m]	350.00	350.00	350.00	0.00
Productivity extraction [m^3/PSH15]	35.00	38.00	36.50	1.58
Cost extraction [€/m^3]	12.78	13.88	13.33	0.58

Table 2.214: Frequency analysis in CSA 4 (Slovenia) in RST 17 for regeneration fellings in uneven-aged FM. Number of operations = 3.

Regeneration - Uneven-aged		***Frequency***
Phase	Over mature (>50 cm DBH)	40.00 %
	Rejuvenation phase	10.00 %
	Uneven-aged stand	50.00 %

Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.00 %
	Fagus sylvatica	20.00 %
	Other broadleaves	20.00 %
	Abies alba	10.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.4.18 RST 18

Table 2.215: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 18 for thinning operations in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	4.00	33.00	11.53	10.01
Productivity harvesting [m^3/PSH15]	5.00	15.00	12.80	4.06
Cost harvesting [€/m^3]	10.43	31.30	14.75	8.57
Extraction distance [m]	390.00	390.00	390.00	0.00
Productivity extraction [m^3/PSH15]	15.00	35.00	30.00	8.02
Cost extraction [€/m^3]	13.88	18.06	15.18	1.76

Table 2.216: Frequency analysis in CSA 4 (Slovenia) in RST 18 for thinning operations in uneven-aged FM. Number of operations = 4.

Thinning - Uneven-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	20.00 %
	Older pole phase (20-30 cm DBH)	20.00 %
	Mature phase (30-50 cm DBH)	60.00 %
Harvesting method	Cut to length	60.00 %
	Tree length	40.00 %
Extraction method	Skidder	80.00 %
	Tractor	20.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	60.00 %
	No bucking	40.00 %
Species (frequency)	*Acer pseudoplatanus*	6.60 %
	Fagus sylvatica	26.70 %
	Other broadleaves	13.30 %
	Abies alba	26.70 %
	Picea abies	26.70 %

Table 2.217: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 18 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. number of operations = 3.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	290.00	42.30	88.19
Productivity harvesting [m^3/PSH15]	15.00	16.00	15.50	0.53
Cost harvesting [€/m^3]	9.78	10.43	10.11	0.34
Extraction distance [m]	390.00	390.00	390.00	0.00
Productivity extraction [m^3/PSH15]	35.00	38.00	36.50	1.58
Cost extraction [€/m^3]	12.78	13.88	13.33	0.58

Table 2.218: Frequency analysis in CSA 4 (Slovenia) in RST 18 for regeneration fellings in uneven-aged FM. Number of operations = 3.

Regeneration - Uneven-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	40.00 %
	Rejuvenation phase	10.00 %
	Uneven-aged stand	50.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.00 %
	Fagus sylvatica	20.00 %
	Other broadleaves	20.00 %
	Abies alba	10.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.4.19 RST 19

Table 2.219: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 19 for thinning operations in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	4.00	33.00	11.53	10.01
Productivity harvesting [m^3/PSH15]	5.00	15.00	12.80	4.06
Cost harvesting [€/m^3]	10.43	31.30	14.75	8.57
Extraction distance [m]	410.00	410.00	410.00	0.00
Productivity extraction [m^3/PSH15]	15.00	35.00	30.00	8.02
Cost extraction [€/m^3]	13.88	18.06	15.18	1.76

Table 2.220: Frequency analysis in CSA 4 (Slovenia) in RST 19 for thinning operations in uneven-aged FM. Number of operations = 4.

Thinning - Uneven-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	20.00 %
	Older pole phase (20-30 cm DBH)	20.00 %
	Mature phase (30-50 cm DBH)	60.00 %
Harvesting method	Cut to length	60.00 %
	Tree length	40.00 %
Extraction method	Skidder	80.00 %
	Tractor	20.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	60.00 %
	No bucking	40.00 %
Species (frequency)	*Acer pseudoplatanus*	6.60 %
	Fagus sylvatica	26.70 %
	Other broadleaves	13.30 %
	Abies alba	26.70 %
	Picea abies	26.70 %

Table 2.221: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 19 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. number of operations = 3.

Regeneration - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	290.00	42.10	88.24
Productivity harvesting [m^3/PSH15]	15.00	16.00	15.50	0.53
Cost harvesting [€/m^3]	9.78	10.43	10.11	0.34
Extraction distance [m]	410.00	410.00	410.00	0.00
Productivity extraction [m^3/PSH15]	35.00	38.00	36.50	1.58
Cost extraction [€/m^3]	12.78	13.88	13.33	0.58

Table 2.222: Frequency analysis in CSA 4 (Slovenia) in RST 19 for regeneration fellings in uneven-aged FM. Number of operations = 3.

Regeneration - Uneven-aged		***Frequency***
Phase	Over mature (>50 cm DBH)	40.00 %
	Rejuvenation phase	10.00 %
	Uneven-aged stand	50.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.00 %
	Fagus sylvatica	20.00 %

	Other broadleaves	20.00 %
	Abies alba	10.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.4.20 RST 20

Table 2.223: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 20 for thinning operations in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	2.00	27.00	11.67	8.70
Productivity harvesting [m^3/PSH15]	5.00	15.00	12.13	4.47
Cost harvesting [€/m^3]	10.43	31.30	16.15	9.46
Extraction distance [m]	460.00	460.00	460.00	0.00
Productivity extraction [m^3/PSH15]	15.00	35.00	28.67	8.76
Cost extraction [€/m^3]	13.88	18.06	15.46	1.86

Table 2.224: Frequency analysis in CSA 4 (Slovenia) in RST 20 for thinning operations in uneven-aged FM. Number of operations = 4.

Thinning - Uneven-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	26.70 %
	Older pole phase (20-30 cm DBH)	20.00 %
	Mature phase (30-50 cm DBH)	53.30 %
Harvesting method	Cut to length	53,30 %
	Tree length	46.70 %
Extraction method	Skidder	73.30 %
	Tractor	26.70 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	53.30 %
	No bucking	46.70 %
Species (frequency)	*Fagus sylvatica*	26.70 %
	Other broadleaves	20.00 %
	Abies alba	26.70 %
	Picea abies	26.60 %

Table 2.225: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 20 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. number of operations = 3.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				

Volume [m^3]	1.00	290.00	43.30	87.86
Productivity harvesting [m^3/PSH15]	15.00	16.00	15.50	0.53
Cost harvesting [€/m^3]	9.78	10.43	10.11	0.34
Extraction distance [m]	460.00	460.00	460.00	0.00
Productivity extraction [m^3/PSH15]	35.00	38.00	36.50	1.58
Cost extraction [€/m^3]	12.78	13.88	13.33	0.58

Table 2.226: Frequency analysis in CSA 4 (Slovenia) in RST 20 for regeneration fellings in uneven-aged FM. Number of operations = 3.

Regeneration - Uneven-aged		***Frequency***
Phase	Over mature (>50 cm DBH)	40.00 %
	Rejuvenation phase	10.00 %
	Uneven-aged stand	50.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.00 %
	Fagus sylvatica	20.00 %
	Other broadleaves	20.00 %
	Abies alba	10.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.4.21 RST 21

Table 2.227: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 21 for thinning operations in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	24.00	12.00	6.03
Productivity harvesting [m^3/PSH15]	5.00	15.00	11.69	4.66
Cost harvesting [€/m^3]	10.43	31.30	17.02	9.91
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	15.00	35.00	27.69	9.04
Cost extraction [€/m^3]	13.88	18.06	15.70	1.89

Table 2.228: Frequency analysis in CSA 4 (Slovenia) in RST 21 for thinning operations in uneven-aged FM. Number of operations = 4.

Thinning - Uneven-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	30.80 %
	Older pole phase (20-30 cm DBH)	23.00 %
	Mature phase (30-50 cm DBH)	46.20 %
Harvesting method	Cut to length	46.20 %
	Tree length	53.80 %
Extraction method	Skidder	69.20 %
	Tractor	30.80 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	46.20 %
	No bucking	53.80 %
Species (frequency)	*Acer pseudoplatanus*	7.60 %
	Fagus sylvatica	30.80 %
	Abies alba	30.80 %
	Picea abies	30.80 %

Table 2.229: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 21 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. number of operations = 3.

Regeneration - Uneven-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	2.00	270.00	54.00	89.05
Productivity harvesting [m^3/PSH15]	15.00	16.00	15.50	0.54
Cost harvesting [€/m^3]	9.78	10.43	10.11	0.35
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	35.00	38.00	36.50	1.60
Cost extraction [€/m^3]	12.78	13.88	13.33	0.59

Table 2.230: Frequency analysis in CSA 4 (Slovenia) in RST 21 for regeneration fellings in uneven-aged FM. Number of operations = 3.

Regeneration - Uneven-aged		***Frequency***
Phase	Over mature (>50 cm DBH)	37.50 %
	Rejuvenation phase	12.50 %
	Uneven-aged stand	50.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	25.00 %
	Fagus sylvatica	25.00 %
	Abies alba	12.50 %

	Picea abies	25.00 %
	Miscellaneous	12.50 %

2.4.22 RST 22

Table 2.231: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 22 for thinning operations in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	24.00	12.00	5.76
Productivity harvesting [m^3/PSH15]	5.00	15.00	11.69	4.66
Cost harvesting [€/m^3]	10.43	31.30	17.02	9.91
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	15.00	35.00	27.69	9.04
Cost extraction [€/m^3]	13.88	18.06	15.70	1.89

Table 2.232: Frequency analysis in CSA 4 (Slovenia) in RST 22 for thinning operations in uneven-aged FM. Number of operations = 4.

Thinning - Uneven-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	30.80 %
	Older pole phase (20-30 cm DBH)	23.00 %
	Mature phase (30-50 cm DBH)	46.20 %
Harvesting method	Cut to length	46.20 %
	Tree length	53.80 %
Extraction method	Skidder	69.20 %
	Tractor	30.80 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	46.20 %
	No bucking	53.80 %
Species (frequency)	*Acer pseudoplatanus*	7.60 %
	Fagus sylvatica	30.80 %
	Abies alba	30.80 %
	Picea abies	30.80 %

Table 2.233: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 22 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. number of operations = 3.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	270.00	43.20	81.74
Productivity harvesting [m^3/PSH15]	15.00	16.00	15.50	0.53
Cost harvesting [€/m^3]	9.78	10.43	10.11	0.34

Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	35.00	38.00	36.50	1.58
Cost extraction [€/m^3]	12.78	13.88	13.33	0.58

Table 2.234: Frequency analysis in CSA 4 (Slovenia) in RST 22 for regeneration fellings in uneven-aged FM. Number of operations = 3.

Regeneration - Uneven-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	40.00 %
	Rejuvenation phase	10.00 %
	Uneven-aged stand	50.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.00 %
	Fagus sylvatica	20.00 %
	Other broadleaves	20.00 %
	Abies alba	10.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.4.23 RST 23

Table 2.235: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 23 for thinning operations in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 4.

Thinning - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	19.00	11.69	4.31
Productivity harvesting [m^3/PSH15]	5.00	15.00	11.69	4.66
Cost harvesting [€/m^3]	10.43	31.30	17.02	9.91
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	15.00	35.00	27.69	9.04
Cost extraction [€/m^3]	13.88	18.06	15.70	1.89

Table 2.236: Frequency analysis in CSA 4 (Slovenia) in RST 23 for thinning operations in uneven-aged FM. Number of operations = 4.

Thinning - Uneven-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	30.80 %
	Older pole phase (20-30 cm DBH)	23.00 %
	Mature phase (30-50 cm DBH)	46.20 %
Harvesting method	Cut to length	46.20 %
	Tree length	53.80 %
Extraction method	Skidder	69.20 %
	Tractor	30.80 %

Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	46.20 %
	No bucking	53.80 %
Species (frequency)	*Acer pseudoplatanus*	7.60 %
	Fagus sylvatica	30.80 %
	Abies alba	30.80 %
	Picea abies	30.80 %

Table 2.237: Descriptive statistics harvesting in CSA 4 (Slovenia) in RST 23 for regeneration fellings in uneven-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. number of operations = 3.

Regeneration - Uneven-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]				
H_{dom} [m]				
Volume [m^3]	1.00	270.00	44.60	81.44
Productivity harvesting [m^3/PSH15]	15.00	16.00	15.50	0.53
Cost harvesting [€/m^3]	9.78	10.43	10.11	0.34
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	35.00	38.00	36.50	1.58
Cost extraction [€/m^3]	12.78	13.88	13.33	0.58

Table 2.238: Frequency analysis in CSA 4 (Slovenia) in RST 23 for regeneration fellings in uneven-aged FM. Number of operations = 3.

Regeneration - Uneven-aged		*Frequency*
Phase	Over mature (>50 cm DBH)	40.00 %
	Rejuvenation phase	10.00 %
	Uneven-aged stand	50.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Acer pseudoplatanus*	20.00 %
	Fagus sylvatica	20.00 %
	Other broadleaves	20.00 %
	Abies alba	10.00 %
	Picea abies	20.00 %
	Miscellaneous	10.00 %

2.5 CSA5 – Vilhelmina, Scandinavian Mountains, Sweden

2.5.1 RST 1

Table 2.239: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 1 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	1.00	45.00	18.33	23.44
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.240: Frequency analysis in CSA 5 (Sweden) in RST 1 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Thicket phase (>130 cm DBH)	33.30 %
	Early pole phase (10-20 cm DBH)	66.70 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.241: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 1 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	100.00	100.00	100.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	7.00	226.00	90.00	118.73
Productivity harvesting [m^3/PSH15]	25.00	25.00	25.00	0.00
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	25.00	25.00	25.00	0.00
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.242: Frequency analysis in CSA 5 (Sweden) in RST 1 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		*Frequency*
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.5.2 RST 2

Table 2.243: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 2 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	1.00	44.00	18.67	22.50
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.244: Frequency analysis in CSA 5 (Sweden) in RST 2 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.245: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 2 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	90.00	90.00	90.00	0.00

H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	7.00	264.00	108.00	137.04
Productivity harvesting [m^3/PSH15]	26.00	26.00	26.00	0.00
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	26.00	26.00	26.00	0.00
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.246: Frequency analysis in CSA 5 (Sweden) in RST 2 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		***Frequency***
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.5.3 RST 3

Table 2.247: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 3 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	2.00	45.00	18.00	23.52
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.248: Frequency analysis in CSA 5 (Sweden) in RST 3 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %

Species (frequency)	*Betula pubescens*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.249: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 3 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	110.00	110.00	110.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	6.00	171.00	66.33	91.00
Productivity harvesting [m^3/PSH15]	23.00	23.00	23.00	0.00
Cost harvesting [€/m^3]	6.00	6.00	6.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	23.00	23.00	23.00	0.00
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.250: Frequency analysis in CSA 5 (Sweden) in RST 3 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		*Frequency*
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.5.4 RST 4

Table 2.251: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 4 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	1.00	41.00	19.33	20.21
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.252: Frequency analysis in CSA 5 (Sweden) in RST 4 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.253: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 4 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	90.00	90.00	90.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	7.00	233.00	104.67	116.08
Productivity harvesting [m^3/PSH15]	26.00	26.00	26.00	0.00
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	26.00	26.00	26.00	0.00
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.254: Frequency analysis in CSA 5 (Sweden) in RST 4 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		***Frequency***
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.5.5 RST 5

Table 2.255: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 5 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	1.00	42.00	18.67	21.08
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.256: Frequency analysis in CSA 5 (Sweden) in RST 5 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.257: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 5 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	100.00	100.00	100.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	3.00	213.00	90.00	109.53
Productivity harvesting [m^3/PSH15]	25.00	25.00	25.00	0.00
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	25.00	25.00	25.00	0.00
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.258: Frequency analysis in CSA 5 (Sweden) in RST 5 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		*Frequency*
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %

Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.5.6 RST 6

Table 2.259: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 6 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	1.00	42.00	17.67	21.55
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.260: Frequency analysis in CSA 5 (Sweden) in RST 6 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	Betula pubescens	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.261: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 6 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	110.00	110.00	110.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	6.00	161.00	66.00	83.22
Productivity harvesting [m^3/PSH15]	23.00	23.00	23.00	0.00
Cost harvesting [€/m^3]	6.00	6.00	6.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	23.00	23.00	23.00	0.00

Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.262: Frequency analysis in CSA 5 (Sweden) in RST 6 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		***Frequency***
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.5.7 RST 7

Table 2.263: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 7 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	1.00	44.00	14.25	20.24
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.264: Frequency analysis in CSA 5 (Sweden) in RST 7 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	25.00 %
	Picea abies	25.00 %
	Pinus contorta	25.00 %
	Pinus sylvestris	25.00 %

Table 2.265: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 7 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	90.00	90.00	90.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	6.00	285.00	88.00	132.61
Productivity harvesting [m^3/PSH15]	24.00	24.00	24.00	0.00
Cost harvesting [€/m^3]	6.00	6.00	6.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	24.00	24.00	24.00	0.00
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.266: Frequency analysis in CSA 5 (Sweden) in RST 7 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		*Frequency*
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	25.00 %
	Picea abies	25.00 %
	Pinus contorta	25.00 %
	Pinus sylvestris	25.00 %

2.5.8 RST 8

Table 2.267: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 8 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	1.00	43.00	13.50	19.91
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.268: Frequency analysis in CSA 5 (Sweden) in RST 8 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %

Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	25.00 %
	Picea abies	25.00 %
	Pinus contorta	25.00 %
	Pinus sylvestris	25.00 %

Table 2.269: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 8 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	100.00	100.00	100.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	3.00	404.00	115.50	193.41
Productivity harvesting [m^3/PSH15]	24.00	24.00	24.00	0.00
Cost harvesting [€/m^3]	6.00	6.00	6.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	24.00	24.00	24.00	0.00
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.270: Frequency analysis in CSA 5 (Sweden) in RST 8 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		*Frequency*
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	25.00 %
	Picea abies	25.00 %
	Pinus contorta	25.00 %
	Pinus sylvestris	25.00 %

2.5.9 RST 9

Table 2.271: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 9 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	1.00	43.00	13.25	19.94
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00

Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.235: Frequency analysis in CSA 5 (Sweden) in RST 9 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	25.00 %
	Picea abies	25.00 %
	Pinus contorta	25.00 %
	Pinus sylvestris	25.00 %

Table 2.272: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 9 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	110.00	110.00	110.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	3.00	365.00	98.00	178.14
Productivity harvesting [m^3/PSH15]	21.00	21.00	21.00	0.00
Cost harvesting [€/m^3]	7.00	7.00	7.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	21.00	21.00	21.00	0.00
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.273: Frequency analysis in CSA 5 (Sweden) in RST 9 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		***Frequency***
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	25.00 %
	Picea abies	25.00 %
	Pinus contorta	25.00 %
	Pinus sylvestris	25.00 %

2.5.10 RST 10

Table 2.274: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 10 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	2.00	46.00	18.00	24.33
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.275: Frequency analysis in CSA 5 (Sweden) in RST 10 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.276: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 10 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	100.00	100.00	100.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	13.00	231.00	90.00	122.28
Productivity harvesting [m^3/PSH15]	25.00	25.00	25.00	0.00
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	25.00	25.00	25.00	0.00
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.277: Frequency analysis in CSA 5 (Sweden) in RST 10 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		*Frequency*
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %

Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.5.11 RST 11

Table 2.278: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 11 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	4.00	43.00	17.67	21.96
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.279: Frequency analysis in CSA 5 (Sweden) in RST 11 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.280: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 11 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	110.00	110.00	110.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	13.00	165.00	65.67	86.08
Productivity harvesting [m^3/PSH15]	23.00	23.00	23.00	0.00
Cost harvesting [€/m^3]	6.00	6.00	6.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	23.00	23.00	23.00	0.00

Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.281: Frequency analysis in CSA 5 (Sweden) in RST 11 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		***Frequency***
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.5.12 RST 12

Table 2.282: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 12 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	3.00	46.00	19.00	23.52
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.283: Frequency analysis in CSA 5 (Sweden) in RST 12 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.284: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 12 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	90.00	90.00	90.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	20.00	268.00	108.00	138.80
Productivity harvesting [m^3/PSH15]	26.00	26.00	26.00	0.00
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	26.00	26.00	26.00	0.00
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.285: Frequency analysis in CSA 5 (Sweden) in RST 12 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		*Frequency*
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.5.13 RST 13

Table 2.286: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 13 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	1.00	46.00	18.00	24.43
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.287: Frequency analysis in CSA 5 (Sweden) in RST 13 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %

Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.288: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 13 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	100.00	100.00	100.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	7.00	234.00	90.00	125.19
Productivity harvesting [m^3/PSH15]	25.00	25.00	25.00	0.00
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	25.00	25.00	25.00	0.00
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.289: Frequency analysis in CSA 5 (Sweden) in RST 13 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		*Frequency*
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.5.14 RST 14

Table 2.290: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 14 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	1.00	49.00	18.67	26.39
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00

Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.291: Frequency analysis in CSA 5 (Sweden) in RST 14 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		***Frequency***
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.292: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 14 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	90.00	90.00	90.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	8.00	288.00	108.00	156.21
Productivity harvesting [m^3/PSH15]	26.00	26.00	26.00	0.00
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	26.00	26.00	26.00	0.00
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.293: Frequency analysis in CSA 5 (Sweden) in RST 14 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		***Frequency***
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.5.15 RST 15

Table 2.294: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 15 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	0.00	0.00	0.00	0.00
H_{dom} [m]	13.00	13.00	13.00	0.00
Volume [m^3]	4.00	43.00	17.67	21.96
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	14.00	14.00	14.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	11.00	11.00	11.00	0.00
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.295: Frequency analysis in CSA 5 (Sweden) in RST 15 for thinning operations in even-aged FM. Number of operations = 1.

Thinning - Even-aged		*Frequency*
Phase	Early pole phase (10-20 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %
Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pubescens*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.296: Descriptive statistics harvesting in CSA 5 (Sweden) in RST 15 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 1.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	110.00	110.00	110.00	0.00
H_{dom} [m]	0.00	0.00	0.00	0.00
Volume [m^3]	15.00	165.00	66.00	85.75
Productivity harvesting [m^3/PSH15]	23.00	23.00	23.00	0.00
Cost harvesting [€/m^3]	6.00	6.00	6.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Productivity extraction [m^3/PSH15]	23.00	23.00	23.00	0.00
Cost extraction [€/m^3]	4.00	4.00	4.00	0.00

Table 2.297: Frequency analysis in CSA 5 (Sweden) in RST 15 for regeneration fellings in even-aged FM. Number of operations = 1.

Regeneration - Even-aged		*Frequency*
Phase	Older pole phase (20-30 cm DBH)	100.00 %
Harvesting method	Cut to length	100.00 %
Extraction method	Forwarder	100.00 %

Harvesting system	Fully mechanized	100.00 %
Felling	Harvester	100.00 %
Delimbing	Harvester	100.00 %
Bucking	Harvester	100.00 %
Species (frequency)	*Betula pendula*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.6 CSA6 – Kozie chrbty, Western Carpathians, Slovakia

2.6.1 RST 1

Table 2.298: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	70.00	70.00	70.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.31	14.16	0.22

Table 2.299: Frequency analysis in CSA 6 (Slovakia) in RST 1 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.300: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	35.00	150.00	73.33	66.40
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.31	14.10	0.18

Table 2.301: Frequency analysis in CSA 6 (Slovakia) in RST 1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.2 RST 2.1

Table 2.302: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 2.1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	70.00	70.00	70.00	0.00
Extraction distance [m]	100.00	100.00	100.00	0.00
Cost harvesting and extraction [€/m^3]	13.00	13.00	13.00	0.00

Table 2.303: Frequency analysis in CSA 6 (Slovakia) in RST 2.1 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.304: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 2.1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	35.00	150.00	73.33	66.40
Extraction distance [m]	100.00	100.00	100.00	0.00
Cost harvesting and extraction [€/m^3]	13.00	13.00	13.00	0.00

Table 2.305: Frequency analysis in CSA 6 (Slovakia) in RST 2.1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.3 RST 2.2

Table 2.306: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 2.2 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	70.00	90.00	77.50	9.57
Extraction distance [m]	250.00	250.00	250.00	0.00
Cost harvesting and extraction [€/m^3]	11.55	12.00	11.89	0.23

Table 2.307: Frequency analysis in CSA 6 (Slovakia) in RST 2.1 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.308: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 2.2 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	20.00	100.00	66.67	41.63
Extraction distance [m]	250.00	250.00	250.00	0.00
Cost harvesting and extraction [€/m^3]	11.55	12.00	11.85	0.26

Table 2.309: Frequency analysis in CSA 6 (Slovakia) in RST 2.2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.4 RST 2.3

Table 2.310: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 2.3 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	80.00	100.00	92.50	9.57
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.29	11.07	0.15

Table 2.311: Frequency analysis in CSA 6 (Slovakia) in RST 2.3 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.312: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 2.3 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	20.00	110.00	73.33	47.26
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.29	11.10	0.17

Table 2.313: Frequency analysis in CSA 6 (Slovakia) in RST 2.3 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.5 RST 3.1

Table 2.314: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 3.1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	70.00	70.00	70.00	0.00
Extraction distance [m]	250.00	250.00	250.00	0.00
Cost harvesting and extraction [€/m^3]	11.55	12.00	11.85	0.26

Table 2.315: Frequency analysis in CSA 6 (Slovakia) in RST 3.1 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.316: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 3.1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	20.00	110.00	73.33	47.26
Extraction distance [m]	250.00	250.00	250.00	0.00
Cost harvesting and extraction [€/m^3]	11.55	12.00	11.85	0.26

Table 2.317: Frequency analysis in CSA 6 (Slovakia) in RST 3.1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.6 RST 3.2

Table 2.318: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 3.2 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	70.00	70.00	70.00	0.00
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.29	11.10	0.17

Table 2.319: Frequency analysis in CSA 6 (Slovakia) in RST 3.2 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.320: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 3.2 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	45.00	210.00	100.00	95.26
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.29	11.10	0.17

Table 2.321: Frequency analysis in CSA 6 (Slovakia) in RST 3.2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %

Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.7 RST 4.1

Table 2.322: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 4.1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	70.00	70.00	70.00	0.00
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	13.00	13.00	13.00	0.00

Table 2.323: Frequency analysis in CSA 6 (Slovakia) in RST 4.1 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.324: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 4.1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	45.00	210.00	100.00	95.26
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	13.00	13.00	13.00	0.00

Table 2.325: Frequency analysis in CSA 6 (Slovakia) in RST 4.1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.8 RST 4.2

Table 2.326: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 4.2 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	15.00	70.00	45.25	28.93
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	11.55	12.00	11.89	0.23

Table 2.327: Frequency analysis in CSA 6 (Slovakia) in RST 4.2 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.328: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 4.2 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	45.00	210.00	100.00	95.26
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	11.55	12.00	11.85	0.26

Table 2.329: Frequency analysis in CSA 6 (Slovakia) in RST 4.2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.9 RST 4.3

Table 2.330: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 4.3 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	15.00	26.00	20.50	6.35
Extraction distance [m]	1400.00	1400.00	1400.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.29	11.07	0.15

Table 2.331: Frequency analysis in CSA 6 (Slovakia) in RST 4.3 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.332: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 4.3 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	30.00	150.00	100.00	62.45
Extraction distance [m]	1400.00	1400.00	1400.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.29	11.10	0.17

Table 2.333: Frequency analysis in CSA 6 (Slovakia) in RST 4.3 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.10 RST 5.1

Table 2.334: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 5.1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	45.00	50.00	47.50	3.54
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	13.00	13.00	13.00	0.00

Table 2.335: Frequency analysis in CSA 6 (Slovakia) in RST 5.1 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.336: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 5.1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	30.00	150.00	100.00	62.45
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	13.00	13.00	13.00	0.00

Table 2.337: Frequency analysis in CSA 6 (Slovakia) in RST 5.1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.11 RST 5.2

Table 2.338: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 5.2 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	30.00	45.00	37.50	10.61
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	11.55	12.00	11.78	0.32

Table 2.339: Frequency analysis in CSA 6 (Slovakia) in RST 5.2 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.340: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 5.2 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	30.00	150.00	100.00	62.45
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	11.55	12.00	11.85	0.26

Table 2.341: Frequency analysis in CSA 6 (Slovakia) in RST 5.2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.12 RST 5.3

Table 2.342: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 5.3 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	45.00	50.00	47.50	3.54
Extraction distance [m]	1400.00	1400.00	1400.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.29	11.15	0.21

Table 2.343: Frequency analysis in CSA 6 (Slovakia) in RST 5.3 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.344: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 5.3 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	20.00	170.00	76.67	81.45
Extraction distance [m]	1400.00	1400.00	1400.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.29	11.10	0.17

Table 2.345: Frequency analysis in CSA 6 (Slovakia) in RST 5.3 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %

Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.13 RST 6.1

Table 2.346: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 6.1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	30.00	50.00	42.50	8.66
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	11.55	12.00	11.89	0.23

Table 2.347: Frequency analysis in CSA 6 (Slovakia) in RST 6.1 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.348: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 6.1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	25.00	180.00	80.00	86.75
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	11.55	12.00	11.85	0.26

Table 2.349: Frequency analysis in CSA 6 (Slovakia) in RST 6.1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.14 RST 6.2

Table 2.350: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 6.2 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	4.00	45.00	24.25	17.44
Extraction distance [m]	1400.00	1400.00	1400.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.29	11.07	0.15

Table 2.351: Frequency analysis in CSA 6 (Slovakia) in RST 6.2 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.352: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 6.2 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	25.00	180.00	80.00	86.75
Extraction distance [m]	1400.00	1400.00	1400.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.29	11.10	0.17

Table 2.353: Frequency analysis in CSA 6 (Slovakia) in RST 6.2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

2.6.15 RST 7.1

Table 2.354: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 7.1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	4.00	11.00	7.50	4.95
Extraction distance [m]	300.00	300.00	300.00	0.00

Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.355: Frequency analysis in CSA 6 (Slovakia) in RST 7.1 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.356: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 7.1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	210.00	78.33	81.10
Extraction distance [m]	300.00	300.00	300.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.357: Frequency analysis in CSA 6 (Slovakia) in RST 7.1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.16 RST 7.2

Table 2.358: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 7.2 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	2.00	2.00	2.00	0.00
Extraction distance [m]	300.00	300.00	300.00	0.00
Cost harvesting and extraction [€/m^3]	12.62	13.00	12.81	0.27

Table 2.359: Frequency analysis in CSA 6 (Slovakia) in RST 7.2 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %

Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.360: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 7.2 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	4.00	198.00	100.33	83.45
Extraction distance [m]	300.00	300.00	300.00	0.00
Cost harvesting and extraction [€/m^3]	12.62	13.00	12.75	0.20

Table 2.361: Frequency analysis in CSA 6 (Slovakia) in RST 7.2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.17 RST 8.1

Table 2.362: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 8.1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	2.00	13.00	7.00	5.35
Extraction distance [m]	300.00	300.00	300.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.363: Frequency analysis in CSA 6 (Slovakia) in RST 8.1 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.364: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 8.1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	4.00	198.00	64.33	71.21
Extraction distance [m]	300.00	300.00	300.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.365: Frequency analysis in CSA 6 (Slovakia) in RST 8.1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.18 RST 8.2

Table 2.366: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 8.2 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	6.00	50.00	18.25	21.24
Extraction distance [m]	200.00	200.00	200.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.367: Frequency analysis in CSA 6 (Slovakia) in RST 8.2 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.368: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 8.2 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	8.00	292.00	167.00	129.43
Extraction distance [m]	200.00	200.00	200.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.369: Frequency analysis in CSA 6 (Slovakia) in RST 8.2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.19 RST 8.3

Table 2.370: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 8.3 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	50.00	20.00	20.00
Extraction distance [m]	350.00	350.00	350.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.47	11.12	0.24

Table 2.371: Frequency analysis in CSA 6 (Slovakia) in RST 8.3 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.372: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 8.3 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	8.00	292.00	108.00	127.44
Extraction distance [m]	350.00	350.00	350.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.47	11.31	0.24

Table 2.373: Frequency analysis in CSA 6 (Slovakia) in RST 8.3 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %

Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.20 RST 9.1

Table 2.374: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 9.1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	50.00	23.33	23.09
Extraction distance [m]	300.00	300.00	300.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.375: Frequency analysis in CSA 6 (Slovakia) in RST 9.1 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.376: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 9.1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	240.00	133.33	95.85
Extraction distance [m]	300.00	300.00	300.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.377: Frequency analysis in CSA 6 (Slovakia) in RST 9.1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.21 RST 9.2

Table 2.378: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 9.2 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	50.00	23.33	23.09
Extraction distance [m]	350.00	350.00	350.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.47	11.16	0.27

Table 2.379: Frequency analysis in CSA 6 (Slovakia) in RST 9.2 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.380: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 9.2 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	35.00	240.00	85.00	77.33
Extraction distance [m]	350.00	350.00	350.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.47	11.31	0.24

Table 2.381: Frequency analysis in CSA 6 (Slovakia) in RST 9.2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.22 RST 10.1

Table 2.382: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 10.1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	35.00	20.00	12.25

Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	20.00	20.00	20.00	0.00

Table 2.383: Frequency analysis in CSA 6 (Slovakia) in RST 10.1 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.384: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 10.1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	5.00	270.00	138.33	118.27
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	20.00	20.00	20.00	0.00

Table 2.385: Frequency analysis in CSA 6 (Slovakia) in RST 10.1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.23 RST 10.2

Table 2.386: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 10.2 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	35.00	26.25	11.82
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.387: Frequency analysis in CSA 6 (Slovakia) in RST 10.2 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged	*Frequency*

Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.388: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 10.2 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	5.00	270.00	98.33	104.63
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.389: Frequency analysis in CSA 6 (Slovakia) in RST 10.2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.24 RST 10.3

Table 2.390: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 10.3 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	35.00	23.75	10.31
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	10.00	10.12	10.03	0.06

Table 2.391: Frequency analysis in CSA 6 (Slovakia) in RST 10.3 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.392: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 10.3 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	5.00	295.00	165.00	123.29
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	10.00	10.12	10.08	0.06

Table 2.393: Frequency analysis in CSA 6 (Slovakia) in RST 10.3 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.25 RST 11.1

Table 2.394: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 11.1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	9.00	45.00	27.00	25.46
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	20.00	20.00	20.00	0.00

Table 2.395: Frequency analysis in CSA 6 (Slovakia) in RST 11.1 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.396: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 11.1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	5.00	295.00	107.50	129.26
Extraction distance [m]	600.00	600.00	600.00	0.00

Cost harvesting and extraction [€/m^3]	20.00	20.00	20.00	0.00

Table 2.397: Frequency analysis in CSA 6 (Slovakia) in RST 11.1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.26 RST 11.2

Table 2.398: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 11.2 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	4.00	55.00	29.50	36.06
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.399: Frequency analysis in CSA 6 (Slovakia) in RST 11.2 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.400: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 11.2 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	260.00	148.33	118.22
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.401: Frequency analysis in CSA 6 (Slovakia) in RST 11.2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %

Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.27 RST 11.3

Table 2.402: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 11.3 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	3.00	10.00	6.50	4.95
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.403: Frequency analysis in CSA 6 (Slovakia) in RST 11.3 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.404: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 11.3 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	30.00	260.00	103.33	92.23
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.405: Frequency analysis in CSA 6 (Slovakia) in RST 11.3 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.28 RST 12.1

Table 2.406: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 12.1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	6.00	60.00	26.00	24.17
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	20.00	20.00	20.00	0.00

Table 2.407: Frequency analysis in CSA 6 (Slovakia) in RST 12.1 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.408: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 12.1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	8.00	292.00	153.67	128.07
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	20.00	20.00	20.00	0.00

Table 2.409: Frequency analysis in CSA 6 (Slovakia) in RST 12.1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.29 RST 12.2

Table 2.410: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 12.2 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*

Volume [m^3]	10.00	80.00	32.50	32.02
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.411: Frequency analysis in CSA 6 (Slovakia) in RST 12.2 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.412: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 12.2 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	8.00	292.00	103.00	121.69
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.413: Frequency analysis in CSA 6 (Slovakia) in RST 12.2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.30 RST 12.3

Table 2.414: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 12.3 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	15.00	130.00	49.75	53.85
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	15.00	15.16	15.04	0.08

Table 2.415: Frequency analysis in CSA 6 (Slovakia) in RST 12.3 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.416: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 12.3 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	240.00	125.00	102.32
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	15.00	15.16	15.11	0.08

Table 2.417: Frequency analysis in CSA 6 (Slovakia) in RST 12.3 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	50.00 %
	Picea abies	50.00 %

2.6.31 RST 13.1

Table 2.418: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 13.1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	30.00	240.00	92.22	61.80
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	11.00	11.29	11.23	0.13

Table 2.419: Frequency analysis in CSA 6 (Slovakia) in RST 13.1 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %

Species (frequency)	*Larix decidua*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.420: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 13.1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	65.00	34.17	24.78
Extraction distance [m]	450.00	450.00	450.00	0.00
Cost harvesting and extraction [€/m^3]	12.00	12.00	12.00	0.00

Table 2.421: Frequency analysis in CSA 6 (Slovakia) in RST 13.1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.6.32 RST 13.2

Table 2.422: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 13.2 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	65.00	34.17	24.78
Extraction distance [m]	450.00	450.00	450.00	0.00
Cost harvesting and extraction [€/m^3]	12.00	12.00	12.00	0.00

Table 2.423: Frequency analysis in CSA 6 (Slovakia) in RST 13.2 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.424: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 13.2 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	30.00	270.00	112.78	97.38
Extraction distance [m]	450.00	450.00	450.00	0.00
Cost harvesting and extraction [€/m^3]	12.00	12.00	12.00	0.00

Table 2.425: Frequency analysis in CSA 6 (Slovakia) in RST 13.2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.6.33 RST 14.1

Table 2.426: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 14.1 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	5.00	130.00	42.50	36.65
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	13.00	13.00	13.00	0.00

Table 2.427: Frequency analysis in CSA 6 (Slovakia) in RST 14.1 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.428: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 14.1 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	20.00	270.00	71.11	78.65

Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	13.00	13.00	13.00	0.00

Table 2.429: Frequency analysis in CSA 6 (Slovakia) in RST 14.1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.6.34 RST 14.2

Table 2.430: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 14.2 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	115.00	46.00	30.39
Extraction distance [m]	450.00	450.00	450.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.431: Frequency analysis in CSA 6 (Slovakia) in RST 14.2 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.432: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 14.2 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	4.00	210.00	86.11	75.52
Extraction distance [m]	450.00	450.00	450.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.433: Frequency analysis in CSA 6 (Slovakia) in RST 14.2 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.6.35 RST 15

Table 2.434: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 15 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	5.00	60.00	26.78	20.30
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	15.00	15.00	15.00	0.00

Table 2.435: Frequency analysis in CSA 6 (Slovakia) in RST 15 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

Table 2.436: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 15 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	210.00	95.00	75.50
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	15.00	15.00	15.00	0.00

Table 2.437: Frequency analysis in CSA 6 (Slovakia) in RST 15 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %

Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	33.33 %
	Picea abies	33.33 %
	Pinus sylvestris	33.33 %

2.6.36 RST 16

Table 2.438: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 16 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	20.00	45.00	31.67	12.58
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	12.00	12.00	12.00	0.00

Table 2.439: Frequency analysis in CSA 6 (Slovakia) in RST 16 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	33.33 %
	Picea abies	66.67 %

Table 2.440: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 16 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	35.00	250.00	143.50	88.41
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	12.00	12.00	12.00	0.00

Table 2.441: Frequency analysis in CSA 6 (Slovakia) in RST 16 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %

Species (frequency)	*Fagus sylvatica*	30.00 %
	Larix decidua	40.00 %
	Picea abies	30.00 %

2.6.37 RST 17

Table 2.442: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 17 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	60.00	34.00	21.62
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.443: Frequency analysis in CSA 6 (Slovakia) in RST 17 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	20.00 %
	Picea abies	80.00 %

Table 2.444: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 17 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	35.00	300.00	166.11	112.33
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.445: Frequency analysis in CSA 6 (Slovakia) in RST 17 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	33.33 %
	Larix decidua	33.33 %
	Picea abies	33.33 %

2.6.38 RST 18

Table 2.446: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 18 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	45.00	25.00	14.72
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.447: Frequency analysis in CSA 6 (Slovakia) in RST 18 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	25.00 %
	Picea abies	75.00 %

Table 2.448: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 18 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	20.00	300.00	151.00	115.83
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.449: Frequency analysis in CSA 6 (Slovakia) in RST 18 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	30.00 %
	Larix decidua	40.00 %
	Picea abies	30.00 %

2.6.39 RST 19

Table 2.450: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 19 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*

Volume [m^3]	10.00	35.00	24.00	9.62
Extraction distance [m]	1200.00	1200.00	1200.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.451: Frequency analysis in CSA 6 (Slovakia) in RST 19 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Larix decidua*	20.00 %
	Picea abies	80.00 %

Table 2.452: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 19 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	5.00	300.00	173.33	116.00
Extraction distance [m]	1200.00	1200.00	1200.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.453: Frequency analysis in CSA 6 (Slovakia) in RST 19 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	33.33 %
	Larix decidua	33.33 %
	Picea abies	33.33 %

2.6.40 RST 20

Table 2.454: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 20 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	15.00	65.00	45.00	19.75
Extraction distance [m]	1100.00	1100.00	1100.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.455: Frequency analysis in CSA 6 (Slovakia) in RST 20 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	16.70 %
	Larix decidua	16.70 %
	Picea abies	66.70 %

Table 2.456: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 20 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	5.00	290.00	149.00	109.39
Extraction distance [m]	1100.00	1100.00	1100.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.457: Frequency analysis in CSA 6 (Slovakia) in RST 20 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	30.00 %
	Larix decidua	40.00 %
	Picea abies	30.00 %

2.6.41 RST 21

Table 2.458: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 21 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	26.00	65.00	47.20	16.48
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	10.00	10.12	10.10	0.05

Table 2.459: Frequency analysis in CSA 6 (Slovakia) in RST 21 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %

Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	20.00 %
	Abies alba	20.00 %
	Larix decidua	20.00 %
	Picea abies	40.00 %

Table 2.460: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 21 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	35.00	220.00	162.50	76.14
Extraction distance [m]	400.00	400.00	400.00	0.00
Cost harvesting and extraction [€/m^3]	10.00	10.12	10.09	0.05

Table 2.461: Frequency analysis in CSA 6 (Slovakia) in RST 21 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	25.00 %
	Abies alba	25.00 %
	Larix decidua	25.00 %
	Picea abies	25.00 %

2.6.42 RST 22

Table 2.462: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 22 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	70.00	36.23	20.69
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	13.00	13.00	13.00	0.00

Table 2.463: Frequency analysis in CSA 6 (Slovakia) in RST 22 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %

Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	23.10 %
	Abies alba	23.10 %
	Larix decidua	23.10 %
	Picea abies	30.80 %

Table 2.464: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 22 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	35.00	300.00	190.83	99.59
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	13.00	13.00	13.00	0.00

Table 2.465: Frequency analysis in CSA 6 (Slovakia) in RST 22 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	25.00 %
	Abies alba	25.00 %
	Larix decidua	25.00 %
	Picea abies	25.00 %

2.6.43 RST 23

Table 2.466: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 23 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	10.00	70.00	35.77	23.17
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.467: Frequency analysis in CSA 6 (Slovakia) in RST 23 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %

Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	23.10 %
	Abies alba	23.10 %
	Larix decidua	23.10 %
	Picea abies	30.80 %

Table 2.468: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 23 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	5.00	300.00	210.83	101.98
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.469: Frequency analysis in CSA 6 (Slovakia) in RST 23 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	25.00 %
	Abies alba	25.00 %
	Larix decidua	25.00 %
	Picea abies	25.00 %

2.6.44 RST 24

Table 2.470: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 24 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 2.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	15.00	70.00	44.80	24.45
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.471: Frequency analysis in CSA 6 (Slovakia) in RST 24 for thinning operations in even-aged FM. Number of operations = 2.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	20.00 %

	Abies alba	20.00 %
	Larix decidua	20.00 %
	Picea abies	40.00 %

Table 2.472: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 24 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	5.00	300.00	183.75	127.17
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.473: Frequency analysis in CSA 6 (Slovakia) in RST 24 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	25.00 %
	Abies alba	25.00 %
	Larix decidua	25.00 %
	Picea abies	25.00 %

2.6.45 RST 25

Table 2.474: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 25 for thinning operations in even-aged FM. Volume = harvested volume. Number of operations = 4.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Volume [m^3]	20.00	70.00	58.08	18.32
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.475: Frequency analysis in CSA 6 (Slovakia) in RST 25 for thinning operations in even-aged FM. Number of operations = 4.

Thinning - Even-aged		*Frequency*
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	23.10 %
	Abies alba	23.10 %
	Larix decidua	23.10 %

	Picea abies	30.80 %

Table 2.476: Descriptive statistics harvesting in CSA 6 (Slovakia) in RST 25 for regeneration fellings in even-aged FM. Volume = harvested volume. Number of operations = 4.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Volume [m^3]	4.00	250.00	126.67	96.25
Extraction distance [m]	600.00	600.00	600.00	0.00
Cost harvesting and extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.477: Frequency analysis in CSA 6 (Slovakia) in RST 25 for regeneration fellings in even-aged FM. Number of operations = 4.

Regeneration - Even-aged		***Frequency***
Harvesting method	Tree length	100.00 %
Extraction method	Tractor	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Fagus sylvatica*	25.00 %
	Abies alba	25.00 %
	Larix decidua	25.00 %
	Picea abies	25.00 %

2.7 CSA7 – Shiroka laka, Rhodope Mountains, Bulgaria

2.7.1 Representative Landscape 1

Included RSTs:

- Even-aged FM: RST 1 to RST 6

Table 2.478: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RL 1 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 5, number of operations = 15.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	70.00	50.00	16.54
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	6.00	7.00	6.95	0.22
Extraction distance [m]	150.00	200.00	157.69	18.28
Productivity extraction [m^3/PSH15]	1.00	2.00	1.23	0.43
Cost extraction [€/m^3]	9.00	9.00	9.00	0.00

Table 2.479: Frequency analysis in CSA 7 (Bulgaria) in RL 1 for thinning operations in even-aged FM. Number of RST = 5, number of operations = 15.

Thinning - Even-aged		*Frequency*
Harvesting method	Cut to length	66.70%
	Tree length	33.30%
Extraction method	Manual	76.90 %
	Animal	17.90 %
	Skidder	5.10 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Fagus sylvatica*	30.80 %
	Abies alba	7.70 %
	Picea abies	30.80 %
	Pinus nigra	23.10 %
	Pinus sylvestris	7.70 %

Table 2.480: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RL 1 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 5, number of operations = 15.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	90.00	120.00	101.76	11.26
H_{dom} [m]				

Volume [m^3]				
Productivity harvesting [m^3/PSH15]	2.00	3.00	2.05	0.23
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00
Extraction distance [m]	150.00	300.00	181.08	55.72
Productivity extraction [m^3/PSH15]	2.00	5.00	3.30	0.88
Cost extraction [€/m^3]	8.00	16.00	9.14	2.65

Table 2.481: Frequency analysis in CSA 7 (Bulgaria) in RL 1 for regeneration fellings in even-aged FM. Number of RST = 5, number of operations = 15.

Regeneration - Even-aged		***Frequency***
Harvesting method	Cut to length	100.00 %
Extraction method	Animal	24.30 %
	Skidder	59.50 %
	Tower yarder	10.80 %
	Tractor&trailer	5.40 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Fagus sylvatica*	32.40 %
	Abies alba	8.10 %
	Picea abies	37.80 %
	Pinus nigra	16.20 %
	Pinus sylvestris	5.40 %

2.7.2 Representative Landscape 2

Included RSTs:

- Even-aged FM: RST 7 and RST 8

Table 2.482: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RL 2 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 2, number of operations = 6.

Thinning - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	30.00	70.00	50.00	17.89
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	1.00	9.00	5.00	4.38
Cost harvesting [€/m^3]	7.00	7.00	7.00	0.00
Extraction distance [m]	300.00	300.00	300.00	0.00
Productivity extraction [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost extraction [€/m^3]	12.00	14.00	13.00	1.10

Table 2.483: Frequency analysis in CSA 7 (Bulgaria) in RL 2 for thinning operations in even-aged FM. Number of RST = 2, number of operations = 6.

Thinning - Even-aged		*Frequency*
Harvesting method	Cut to length	66.70%
	Tree length	33.30%
Extraction method	Manual	100.00 %
Harvesting system	Partly mechanized	100.00 %
Felling	Chain saw	100.00 %
Delimbing	Chain saw	100.00 %
Bucking	Chain saw	100.00 %
Species (frequency)	*Picea abies*	100.00 %

Table 2.295: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RL 2 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of RST = 2, number of operations = 6.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	90.00	120.00	105.00	13.42
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	2.00	3.00	2.17	0.41
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00
Extraction distance [m]	300.00	300.00	300.00	0.00
Productivity extraction [m^3/PSH15]	3.00	5.00	3.83	0.75
Cost extraction [€/m^3]	14.00	16.00	15.00	1.10

Table 2.484: Frequency analysis in CSA 7 (Bulgaria) in RL 2 for regeneration fellings in even-aged FM. Number of RST = 2, number of operations = 6.

Regeneration - Even-aged		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Tower yarder	66.70 %
	Tractor&trailer	33.30 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Picea abies*	100.00 %

2.7.3 RST 1 (RL 1)

Table 2.485: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 1 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30,00	70,00	50,00	20,00
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	1,00	1,00	1,00	0,00

Cost harvesting [€/m^3]	7,00	7,00	7,00	0,00
Extraction distance [m]	150,00	150,00	150,00	0,00
Productivity extraction [m^3/PSH15]	1,00	1,00	1,00	0,00
Cost extraction [€/m^3]	9,00	9,00	9,00	0,00

Table 2.486 Frequency analysis in CSA 7 (Bulgaria) in RST 1 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		***Frequency***
Harvesting method	Cut to length	66.70%
	Tree length	33.30%
Extraction method	Manual	100.00%
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Fagus sylvatica*	100.00%

Table 2.487: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 1 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	90,00	120,00	105,00	15,00
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	2,00	2,00	2,00	0,00
Cost harvesting [€/m^3]	5,00	5,00	5,00	0,00
Extraction distance [m]	150,00	150,00	150,00	0,00
Productivity extraction [m^3/PSH15]	2,00	4,00	3,33	1,16
Cost extraction [€/m^3]	8,00	8,00	8,00	0,00

Table 2.488: Frequency analysis in CSA 7 (Bulgaria) in RST 1 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		***Frequency***
Harvesting method	Cut to length	100.00 %
Extraction method	Animal	33.33 %
	Skidder	66.77 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Fagus sylvatica*	100.00%

2.7.4 RST 3 (RL 1)

Table 2.489: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 3 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	70.00	50.00	17.32
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	7.00	7.00	7.00	0.00
Extraction distance [m]	150.00	150.00	150.00	0.00
Productivity extraction [m^3/PSH15]	1.00	2.00	1.22	0.44
Cost extraction [€/m^3]	9.00	9.00	9.00	0.00

Table 2.490: Frequency analysis in CSA 7 (Bulgaria) in RST 3 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Harvesting method	Cut to length	66.70%
	Tree length	33.30%
Extraction method	Animal	22.20 %
	Manual	77.80 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Fagus sylvatica*	33.33 %
	Picea abies	33.33 %
	Pinus nigra	33.33 %

Table 2.491: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 3 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	90,00	120,00	100,71	11,34
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	2,00	2,00	2,00	0,00
Cost harvesting [€/m^3]	5,00	5,00	5,00	0,00
Extraction distance [m]	150,00	150,00	150,00	0,00
Productivity extraction [m^3/PSH15]	2,00	4,00	2,71	0,76
Cost extraction [€/m^3]	8,00	8,00	8,00	0,00

Table 2.492: Frequency analysis in CSA 7 (Bulgaria) in RST 3 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Animal	42.90 %

	Skidder	57.10 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Fagus sylvatica*	42.90 %
	Picea abies	28.60 %
	Pinus nigra	28.60 %

2.7.5 RST 4 (RL 1)

Table 2.493: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 4 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	70.00	50.00	17.32
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	7.00	7.00	7.00	0.00
Extraction distance [m]	150.00	150.00	150.00	0.00
Productivity extraction [m^3/PSH15]	1.00	2.00	1.22	0.44
Cost extraction [€/m^3]	9.00	9.00	9.00	0.00

Table 2.494: Frequency analysis in CSA 7 (Bulgaria) in RST 4 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Harvesting method	Cut to length	66.70%
	Tree length	33.30%
Extraction method	Animal	22.20 %
	Manual	77.80 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Fagus sylvatica*	33.33 %
	Picea abies	33.33 %
	Pinus nigra	33.33 %

Table 2.495: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 4 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	90.00	120.00	100.71	11.34
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	2.00	2.00	2.00	0.00
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00

Extraction distance [m]	150.00	150.00	150.00	0.00
Productivity extraction [m^3/PSH15]	2.00	4.00	2.71	0.76
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.496: Frequency analysis in CSA 7 (Bulgaria) in RST 4 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		***Frequency***
Harvesting method	Cut to length	100.00 %
Extraction method	Animal	14.30 %
	Skidder	85.70 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Fagus sylvatica*	42.90 %
	Picea abies	28.60 %
	Pinus nigra	28.60 %

2.7.6 RST 5 (RL 1)

Table 2.497: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 5 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	30.00	70.00	50.00	17.06
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	7.00	7.00	7.00	0.00
Extraction distance [m]	150.00	150.00	150.00	0.00
Productivity extraction [m^3/PSH15]	1.00	2.00	1.25	0.45
Cost extraction [€/m^3]	9.00	9.00	9.00	0.00

Table 2.498: Frequency analysis in CSA 7 (Bulgaria) in RST 5 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		***Frequency***
Harvesting method	Cut to length	66.70%
	Tree length	33.30%
Extraction method	Animal	25.00 %
	Manual	75.00 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Fagus sylvatica*	25.00 %
	Picea abies	25.00 %
	Pinus nigra	25.00 %

	Pinus sylvestris	25.00 %

Table 2.499: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 5 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	90.00	120.00	100.00	10.61
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	2.00	2.00	2.00	0.00
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00
Extraction distance [m]	150.00	150.00	150.00	0.00
Productivity extraction [m^3/PSH15]	2.00	4.00	2.67	0.71
Cost extraction [€/m^3]	8.00	8.00	8.00	0.00

Table 2.500: Frequency analysis in CSA 7 (Bulgaria) in RST 5 for regeneration fellings in even-aged FM. Number of operations = 3.

Regeneration - Even-aged		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Animal	44.40 %
	Skidder	55.60 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Fagus sylvatica*	33.33 %
	Picea abies	22.22 %
	Pinus nigra	22.22 %
	Pinus sylvestris	22.22 %

2.7.7 RST 6 (RL 1)

Table 2.501: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 6 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	70.00	50.00	17.89
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	6.00	7.00	6.67	0.52
Extraction distance [m]	200.00	200.00	200.00	0.00
Productivity extraction [m^3/PSH15]	1.00	2.00	1.33	0.52
Cost extraction [€/m^3]	9.00	9.00	9.00	0.00

Table 2.502: Frequency analysis in CSA 7 (Bulgaria) in RST 6 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	10.00 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Abies alba*	60.00 %
	Picea abies	40.00 %

Table 2.503: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 6 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	90,00	120,00	102,00	12,55
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	2,00	3,00	2,20	0,45
Cost harvesting [€/m^3]	5,00	5,00	5,00	0,00
Extraction distance [m]	200,00	200,00	200,00	0,00
Productivity extraction [m^3/PSH15]	4,00	4,00	4,00	0,00
Cost extraction [€/m^3]	8,00	8,00	8,00	0,00

Table 2.504: Frequency analysis in CSA 7 (Bulgaria) in RST 6 for regeneration fellings in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Skidder	10.00 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Abies alba*	60.00 %
	Picea abies	40.00 %

2.7.8 RST 7 (RL 2)

Table 2.505: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 7 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	70.00	50.00	20.00
H_{dom} [m]				
Volume [m^3]				

Productivity harvesting [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost harvesting [€/m^3]	7.00	7.00	7.00	0.00
Extraction distance [m]	300.00	300.00	300.00	0.00
Productivity extraction [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost extraction [€/m^3]	12.00	12.00	12.00	0.00

Table 2.506: Frequency analysis in CSA 7 (Bulgaria) in RST 7 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		***Frequency***
Harvesting method	Cut to length	66.70 %
	Tree length	33.30 %
Extraction method	Manual	10.00 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Picea abies*	100.00 %

Table 2.507: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 7 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	***Minimum***	***Maximum***	***Mean***	***Standard deviation***
Stand age [years]	90.00	120.00	105.00	15.00
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	2.00	3.00	2.33	0.58
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00
Extraction distance [m]	300.00	300.00	300.00	0.00
Productivity extraction [m^3/PSH15]	4.00	5.00	4.33	0.58
Cost extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.508: Frequency analysis in CSA 7 (Bulgaria) in RST 7 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		***Frequency***
Harvesting method	Cut to length	100.00 %
Extraction method	Tower yarder	100.00 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Picea abies*	100.00 %

2.7.9 RST 8 (RL 2)

Table 2.509: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 8 for thinning operations in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Thinning - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	30.00	70.00	50.00	20.00
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	9.00	9.00	9.00	0.00
Cost harvesting [€/m^3]	7.00	7.00	7.00	0.00
Extraction distance [m]	300.00	300.00	300.00	0.00
Productivity extraction [m^3/PSH15]	1.00	1.00	1.00	0.00
Cost extraction [€/m^3]	14.00	14.00	14.00	0.00

Table 2.510: Frequency analysis in CSA 7 (Bulgaria) in RST 8 for thinning operations in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Harvesting method	Cut to length	66.70 %
	Tree length	33.30 %
Extraction method	Manual	10.00 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%
Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Picea abies*	100.00 %

Table 2.511: Descriptive statistics harvesting in CSA 7 (Bulgaria) in RST 8 for regeneration fellings in even-aged FM. H_{dom} = dominant height at time of harvesting, volume = harvested volume. Number of operations = 3.

Regeneration - Even-aged	*Minimum*	*Maximum*	*Mean*	*Standard deviation*
Stand age [years]	90.00	120.00	105.00	15.00
H_{dom} [m]				
Volume [m^3]				
Productivity harvesting [m^3/PSH15]	2.00	2.00	2.00	0.00
Cost harvesting [€/m^3]	5.00	5.00	5.00	0.00
Extraction distance [m]	300.00	300.00	300.00	0.00
Productivity extraction [m^3/PSH15]	3.00	4.00	3.33	0.58
Cost extraction [€/m^3]	16.00	16.00	16.00	0.00

Table 2.512: Frequency analysis in CSA 7 (Bulgaria) in RST 8 for regeneration fellings in even-aged FM. Number of operations = 3.

Thinning - Even-aged		*Frequency*
Harvesting method	Cut to length	100.00 %
Extraction method	Tower yarder	33.33 %
	Tractor&trailer	66.77 %
Harvesting system	Partly mechanized	100.00%
Felling	Chain saw	100.00%

Delimbing	Chain saw	100.00%
Bucking	Chain saw	100.00%
Species (frequency)	*Picea abies*	100.00 %

3 Description of the questionnaire and the database

ARANGE Questionnaire

Harvesting technologies Representative Landscape

27-03-2013

Responsible: Thomas Leitner

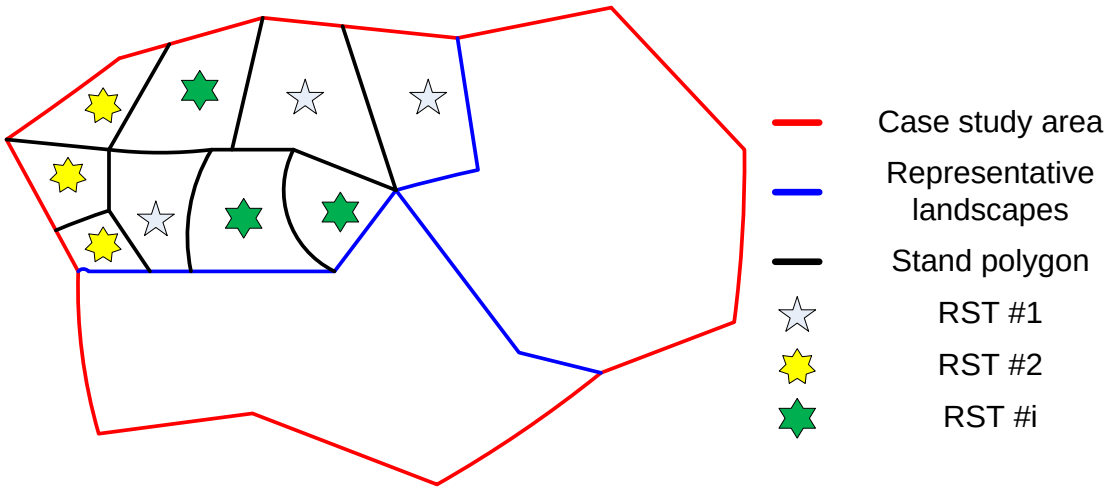
ARANGE - Grant no. 289437- Advanced multifunctional forest management in European mountain ranges

Harvest technologies Table

The »Harvest technologies Table« contains data on harvest technologies and refer to other tables for needed meta data. All information should relate to the **current situation** and should be on the Representative landscape scale.

Table Harvest technologies: Scale Representative landscape	
IDCase study	Unique identifier for the case study (global key defined by ARANGE)
IDRepresentative landscape	Unique ID (Figure)
Area	Area of the Representative landscape[ha]
Road network	Reference to road network
Transportation	Reference to transportation
System input	Reference to system input
Accidents	Reference to accidents

Figure:



Road network	
Main road density	Forest roads, trafficable for truck & trailer [m/ha]
Subsidiary roads	Forest roads, trafficable just for single truck, in relation to main roads [%]
Skidding road density	Roads for skidding [m/ha]
Accessibility	Percentage of accessible area (Forest roads with a 300 m buffer) in relation to total area [%]
Construction method	Catalogue
Construction cost main road	Cost road construction trafficable for truck & trailer [€/m]
Annual construction main road bedrock	Amount of new built main roads per year on bedrock [m/year]
Annual construction main road earth ground	Amount of new built main roads per year on soil ground [m/year]
Construction costs skidding road	Cost for road construction trafficable for skidding [€/m]
Culvert spacing	Recommended standard distance between culverts [m]
Main culvert typ	Catalogue
Culvert diameter	Recommended minimum culvert diameter [cm]
Main road maintenance cost	Cost for regular maintenance of main roads (average of the last 10 years) [€/year]

Construction method	
1	Excavator
2	Bulldozer
3	manual
4	Indicate the method

Culvert Type	
1	Concrete
2	Polyethylene
3	Iron

4	Indicate the method

Transportation	
Transportation method	Transportation method table (transport from forest to e.g.industry)
Check Sum	Please have a look on the check sum, as total sum of frequencies of transportation methods should be 100.
Transportation distance	Timber amount weighted mean distance between harvesting unit and wood or paper industry [km]
Legal regulations	Allowed maximum load for truck&trailer transportation [tons]

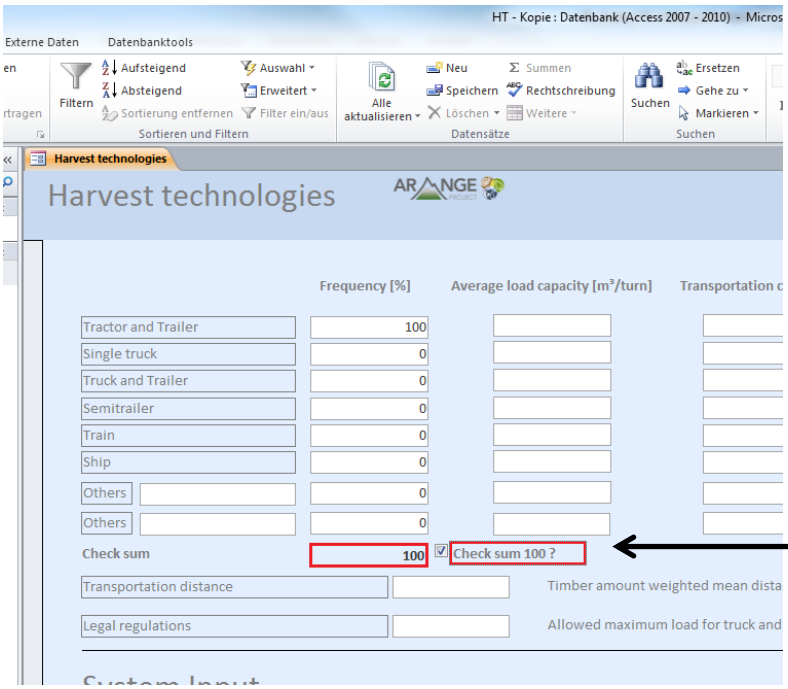
Transportation method table			
	Frequency[%]	**Average load capacity [m^3/turn]**	**Transportation costs [€/m^3]**
Tractor and Trailer			
Single truck			
Truck and Trailer			
Semitrailer			
Train			
Ship			
Others			

System Input	
Labour costs	Costs for a skilled chainsaw operator [€/h] with experiences in forest work (without the costs of the chainsaw)
Fuel costs	Costs for diesel [€/l]

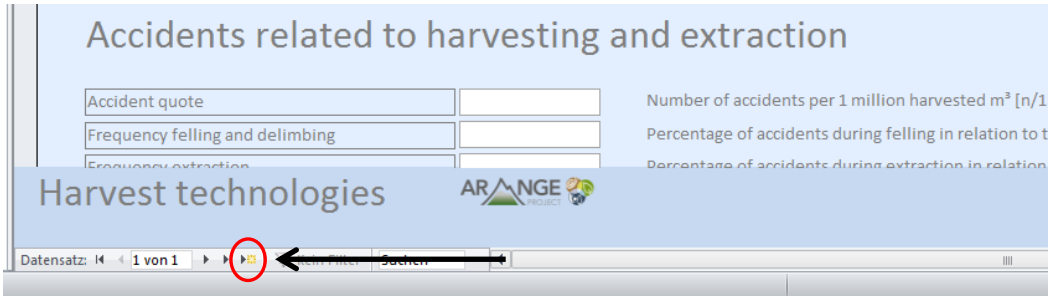
Accidents related to harvesting and extraction	
Accident quote	Number of accidents per 1 million harvested m^3 [n/1 mio m^3]
Frequency felling and delimbing	Percentage of accidents during felling in relation to the total number of accidents [%]
Frequency extraction	Percentage of accidents during extraction in relation to the total number of accidents [%]
Accident quote mechanized operation	Number of accidents per 1 million harvested m^3 [n/1 mio m^3] (e.g. chain saw and skidder, chain saw and tower yarder, …)
Accident quote full mechanized operation	Number of accidents per 1 million harvested m^3 [n/1 mio m^3] (Harvester and Forwarder)

Manual for data input in Microsoft Access

1. Please open the database
2. The form “Harvest technologies” should appear. (if not please open it on the left side).
3. Please put in the data for the first Representative Landscape and tick the “Check sum” off.



4. For a new record (second Representative Landscape e.g.) use the arrow at the end of the form.



5. When data input for all Representative Landscapes is finished please save the database and send it back to Thomas.leitner@boku.ac.at