



EUROPEAN FOREST  
INSTITUTE

# Factors influencing forest management objectives and activities

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# STUDY BACKGROUND

## CLIMATE AND BIODIVERSITY SMART FORESTRY

- Forest management decisions impact forest-based ecosystem services (e.g., see: Malovrh et al., 2022; Eggers et al., 2014)
- Management decisions made within a set of policy and socioeconomic factors (Sotirov et al., 2019)
- Projects aim to improve knowledge about the factors and processes influencing forest' management decisions.

Note: presentation represents preliminary findings based on ForestPaths Deliverable 1.2



# RESEARCH QUESTIONS

1. What *objectives* do forest practitioners have?
2. What *management practices* do forest practitioners implement?
3. Which *factors* influence forest management practices and objectives?

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## DATA COLLECTION

### 1.1 CREATING THE INTERVIEW PROTOCOL

- Defining target group “forest practitioner”
- Questionnaire inquiring about the practitioner’s *forest; management objectives; management practices; “CBS” practices, and influential factors*

### 1.2 CONDUCTING INTERVIEWS

- Demo Leads contacted forest practitioners
- Interviews conducted from May – August 2023
- Interviews held across eight European countries

### 1.3 DRAFTING INTERVIEW NOTES

- Transcriptions and first analysis of interview notes drafted into English (n=19)

2

## DATA ANALYSIS – SCHREIER’S QCA

### 2.1 DEVELOPING CODING FRAMEWORK

- Search for reoccurring topics in notes (n=8) →
- Categorize topics; informed by lit. review →
- Subsume categories under major categories →
- Pilot test coding framework →
- Finalize the coding framework.

### 2.2 APPLYING CODING FRAMEWORK

- Segment interviews (n=19) into units of code →
- Label units with framework categories

*“set aside commercial forest are chosen with NGOs.”*

Codes assigned to text: [set aside areas] [public pressure]

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## INTERPRETATION

### 3.1 TABULATING RESULTS

- Count category occurrence across cases
- Cross-tabulate factors and practices
- Cross-tabulate factors and objectives



# THE INTERVIEW GUIDE

## CONDUCTING THE INTERVIEWS

### Forest characteristics

1. Describe your forest.

### Forest management activities

2. Do you actively manage your forests? How?
3. Do you set aside parts of the forest from active forest management?

### Management objectives

4. Is your forest certified?
5. What objectives do you have from your forest?

### Influencing factors

6. Why do you have these objectives?
7. Which factors are most important when deciding how to manage forests?
8. Have you received or applied for public grants for forest management?

### Climate and biodiversity in forest management

9. What in your management supports biodiversity / climate change mitigation?
10. Something you're willing to implement to support biodiversity / climate change?
11. Under which circumstances would you be willing to implement these practices?



# THE DATASET

## CONDUCTING THE INTERVIEWS

Interviews conducted May – August 2023

19 interviews – 6 European countries in local languages

11 private family forest owners

- 2 large industrial commercial forests
- 1 medium commercial forest
- 2 non-commercial small private forest owners
- 4 medium commercial cork forests
- 1 absentee owner

7 public forest managers

- 4 municipal forest
- 1 national forests
- 2 forest cooperatives (public-private ownership)

1 private foundation owned forest

Interviews represented a broad mix of forest practitioners

	Interviewee	Tenure	Ownership	Forest size (ha)
Italy	Owner	Private	Family	15
Italy	Owner	Private	Family	60
Italy	Owner	Private	Family	40
Italy	Owner	Private	Family	60
Italy	Manager	Both	Cooperative	2,000
Italy	Manager	Both	Cooperative	2,000
Finland	Manager	Public	National	249,000
Finland	Owner	Private	Family	20
Latvia	Owner	Private	Family	450
Latvia	Owner	Private	Family	2
Netherlands	Manager	Public	Municipality	380
Netherlands	Manager	Public	Municipality	1,400
Netherlands	Manager	Private	Foundation	3,000
Romania	Manager	Private	Family	7,000
Romania	Manager	Public	Municipality	15,000
Romania	Manager	Public	Municipality	10,000
Portugal	Owner	Private	Family	10
Portugal	Owner	Private	Family	40
Portugal	Owner	Private	Family	1.5



# CODING FRAMEWORK

## FOREST MANAGEMENT OBJECTIVES

**Based on ecosystem services concept. Helps differentiate rationales for objectives – e.g., income is treated as a reason for an objective, it is not the final objective! This framework help reveal why income of provisioning services and not regulatory services).**

1. Cultural ES objectives
2. Provisioning ES objectives
3. Regulating/Maintenance ES objectives





# FOREST MANAGEMENT OBJECTIVES

## DISCUSSIONS FROM RESPONDENTS



### Cultural Services

Typically, the preservation of forest for societal activities or historical purpose.

- Areas for recreation
- Areas for tourism
- Areas for hunting societies
- Areas for family enjoyment (e.g., Christmas trees)
- Preserving land for historical reasons
- Preserving traditions associated with the forest



### Provisioning Services

A wide variety of tangible outputs from the forest are discussed; fishing and game meat as food sources unmentioned!

- Timber
- Berries, Mushrooms
- Fuelwood
- Cork
- Husbandry (agroforestry)



### Regulatory Services

Typically associated with the *improvement* of regulatory services or ensuring continued regulatory functions in the future.

- Halting biodiversity loss
- Enhancing carbon sinks through wood stock
- Enhancing carbon sinks through wood products
- Enhancing forest resilience and adaptation

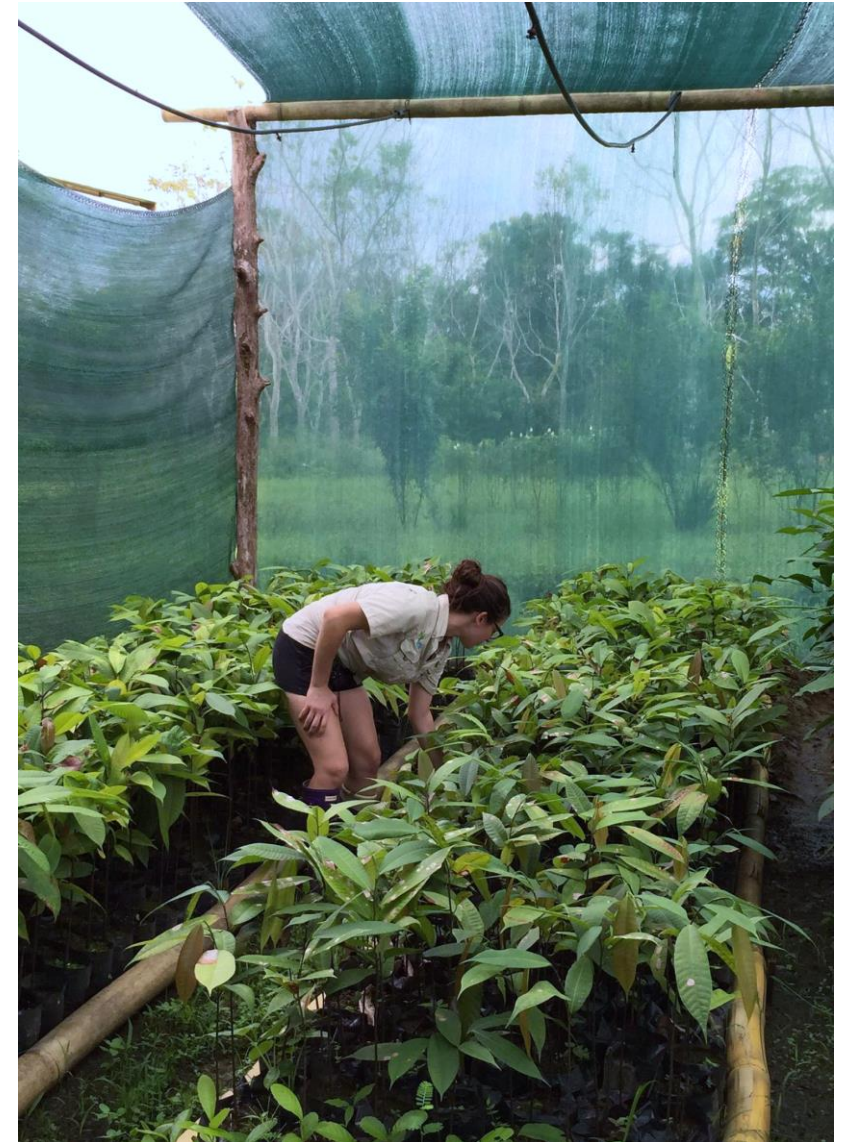


# CODING FRAMEWORK

## FOREST MANAGEMENT ACTIVITIES

**29 subcategories built deductively from the data subsumed into 7 broader categories.**

- 1. Regeneration activities:** number of species, types of species material used, regeneration techniques
- 2. Harvesting activities:** approaches for harvesting timber or non-timber forest products
- 3. Conservation activities:** silvicultural practices that attempt to preserve the natural environment
- 4. Stand treatments:** practices that change stand structure or condition
- 5. Ecological controls:** altering behaviors or population composition of wildlife or pest
- 6. Land-use changes:** converting forestland or developing infrastructure
- 7. Agroforestry:** coproduction of agriculture and forestry





# CODING FRAMEWORK

## FACTORS INFLUENCING ACTIVITIES AND OBJECTIVES

**21 subcategories built deductively from the data subsumed into 8 major categories.**

1. **Values:** tradition, economic, environmental, utilitarian
2. **Organizational structure:** how choices or processes made in the organization impact behavior (managers only!)
3. **Resources:** time, money, knowledge
4. **Governance mechanisms:** voluntary instruments, information agreements, regulations, market-based instruments, public processes
5. **Market pressures:** timber markets, NTFP markets, and other markets
6. **Normative pressure:** public pressure, forestry networks, neighbors, and public goods
7. **Disturbance regimes:** pests, fire, dieback, drought
8. **Biophysical:** geographic features and biotic features



# RESULT

## CROSSTABULATION TABLE

### How to read the table:

Cell indicate that a unit of code was labelled with both the respective management objective (row) and the respective influential factor (column). The values in the cells indicates the number of interview cases where occurrence is visible (highest number is N=19).

### Coarse overview allows scanning for saliency.

Hotspots signal that topic is relevant across several interviews. No directionality, however.

	Organizational factors	Resource availability	Traditional values	Economic values	Utilitarian values	Climate values	Conservation values	Information instrument	Voluntary agreement	Market-based instruments	Public administration	Regulations	Timber markets	NTPF market	Other markets	Forestry networks	Public goods	Public pressure	Neighbours	Biophysical	Disturbances
<b>Regeneration activities</b>																					
Monospecies regeneration	2	4	2	1	2	3	4	1	2	3	3	4	2	1	0	3	2	3	1	3	3
Natural regeneration	4	8	4	6	4	4	5	4	4	8	5	8	6	2	2	7	5	7	2	6	6
Artificial regeneration	4	8	4	6	1	3	4	7	4	7	7	6	7	1	2	6	6	8	2	7	7
Native species regeneration	2	6	5	5	4	2	4	3	4	6	4	6	4	3	2	5	3	6	1	5	5
Adapted species regeneration	3	7	4	5	6	7	7	2	0	6	4	6	5	2	2	7	3	4	3	7	5
<b>Harvesting activities</b>																					
Salvage Logging	2	5	4	3	4	4	5	2	0	4	4	4	3	2	3	5	2	3	2	5	5
Shelterwood	2	3	2	2	1	1	2	0	3	3	2	3	1	1	0	2	2	3	0	2	2
Selection Cutting	4	7	4	7	4	4	5	3	2	7	4	6	5	1	3	7	3	5	1	6	5
Clearcutting	6	12	7	9	7	8	10	4	4	10	8	10	7	3	3	10	6	9	2	11	8
Coppicing	4	8	5	7	5	3	5	4	4	8	6	8	6	4	4	7	5	7	4	6	7
NTPF Cultivation	3	12	10	12	7	6	8	8	6	12	7	10	10	5	7	12	5	10	6	9	11
<b>Conservation activities</b>																					
Forest edges	1	3	1	3	2	3	3	1	1	3	1	3	3	0	0	3	1	2	0	3	1
Set-aside areas	5	11	7	10	6	6	9	3	5	10	6	9	7	3	4	9	5	9	2	9	7
Retention trees	3	5	1	4	3	3	4	1	2	4	3	4	3	1	0	3	3	4	0	4	1
Terrain preservation	6	9	5	7	4	5	7	4	3	8	7	7	5	2	2	7	5	8	0	8	6
Buffer zones	3	6	3	5	2	3	4	2	4	5	3	5	3	1	0	4	3	5	0	5	3
Deadwood	5	9	4	6	4	6	7	3	4	7	6	8	5	1	0	7	5	7	1	8	5
Continuous cover forestry	4	7	4	6	2	3	4	3	5	6	5	5	4	2	0	5	5	7	1	6	4
<b>Stand treatments</b>																					
Stand rotation	3	4	2	3	1	1	2	1	3	3	3	3	1	1	0	2	3	4	0	3	2
Tending / Clearing	4	13	10	11	7	7	9	9	5	12	9	11	11	4	7	13	6	10	7	11	13
Fertilization / Liming	4	6	3	5	3	5	5	4	0	5	4	4	4	1	1	5	3	5	1	6	4
Thinning	2	5	3	5	3	4	4	3	0	4	2	3	3	1	1	4	1	3	1	5	3
<b>Land use change</b>																					
Deforestation	0	5	4	4	3	4	5	1	1	4	3	5	4	1	2	5	1	3	3	4	4
Afforestation	2	6	4	4	2	4	5	2	3	5	4	6	4	0	0	5	2	4	1	6	5
Development	5	10	6	9	4	2	5	6	6	10	9	9	9	2	5	9	7	9	4	8	9
<b>Ecological control</b>																					
Wildlife management	4	7	4	4	3	4	5	2	3	6	5	5	4	1	1	6	4	4	2	7	6
Pest control	3	4	3	4	2	1	2	2	1	4	3	3	2	1	3	4	2	3	1	3	4
<b>Agroforestry</b>																					
Agroforestry	3	7	4	6	3	2	3	7	3	7	7	6	7	2	4	7	5	6	3	6	7



# Latvia Case 1

## A small-scale private forest owner

2 ha of land obtained through restitution. Forest as a home that fulfills cultural objectives. Efforts made to afforest property over 30 years.

- **Monospecies afforestation** of abandoned farmland due to Latvian soil classification system and poor soil quality despite belief mixed-species regeneration better for nature (regulation, biophysical).
- **Wildlife management** with help from local hunting association to prevent overgrazing (regulating objective, forestry network).
- **Salvage logs** to reduce bark beetle outbreaks (regulating objectives, biophysical driver).
- **Tends the stands** collecting firewood or NTFP for family (provisioning objective - utility value);
- **Opposes deadwood** due to bark-beetle and in conflict with neighbouring public forest.
- **Opposes clearcutting** due to personal values although legislation also prevents harvesting of the young pine forest.
- **Not a passive forest owner – values primarily drive decisions!**

	Resources	Conservation values	Utility values	Tradition values	Public administration	Regulations	Forestry networks	Neighbours	Bio-physical	Disturbances
<b>Cultural objectives</b>			✓	✓						
<b>Provisioning objectives</b>			✓			✗	✓			
<b>Regulating objectives</b>			✓						✓	
<b>Monospecies regeneration</b>						✓			✓	
<b>Mixed species regeneration</b>		✓				✗			✗	
<b>Afforestation</b>		✓								
<b>Wildlife management</b>			✓				✓		✓	
<b>Salvage Logging</b>									✓	
<b>Clearcutting (opposed)</b>		✗								
<b>Deadwood (opposed)</b>				✗	✗			✗		✗
<b>Tending / Clearing</b>	✓	✓	✓				✓			

X: represents hindering factor. ✓: represents enabling factor  
Table adapted from ForestPaths Deliverable 1.2 (Franzini et al. 2024)

# Latvia Case 2

## A large-scale private forest owner

450 ha of land obtained through 20 purchases since 2002. Forest property primarily for provisioning timber, with select areas meeting cultural objectives.

- **Provisioning objectives (timber provisioning)** especially cutting regime, motivated by economic values. Adequate forest machinery and labor force key to cutting activities, alongside knowledge acquired through forestry professionals (resources, forestry networks). Unwilling to implement costly cutting activities.
- **Commercial thinning** regimes implemented according to own expertise as trained forest professional (resources)
- **Set-asides areas** primarily due to challenges accessing sites (biophysical) or scenic beauty for family recreation (tradition, utility)
- **Multiple conservation activities** cited as implemented due to regulation rather than inherent values and believes insufficient market instruments result in less uptake of conservation across sector.
- **Knowledge, economic values, and resource availability stated to guide the owner's decision-making process, although regulations plays a strong role in multiple activities**

	Regulations	Economic values	Utilitarian values	Market instruments	Resources	Bio-physical
Cultural services			✓			
Provisioning services		✓	✗		✓/✗	✗
Regulating services	✓			✗	✓/✗	✓
Natural regeneration	✓					
Afforestation	✓				✓	
Deforestation	✓				✓	
Set-aside areas	✓			✗		✓
Retention trees	✓					
Buffer zones	✓					
Deadwood	✓					✓
Thinning					✓	
Tending / Clearing					✗	
Wildlife management						✓
Clearcutting					✓/✗	
Selection logging					✗	

X: represents hindering factor. ✓: represents enabling factor  
Table adapted from ForestPaths Deliverable 1.2 (Franzini et al. 2024)



# COMPARING INTERVIEWS

## SIMILARITIES AND DIVERGENCES

### LATVIA CASE 1 VERSUS LATVIA CASE 2

- Differing values drive different objectives: tradition versus economic
- Differing harvesting regimes due to differing values
- Role of regulation key for conservation activities in both cases
- Biophysical features impact activities significantly in both cases
- Forestry networks help guide decision-making in both cases although Case 1 also encounters conflicts with neighbor.
- Values drive objectives but structural factors constrain value-based choices!

### LATVIA VERSUS OTHER INTERVIEWS

- No mention of continuous cover forestry as an activity (cf. Finland Case 2 private forest owner holding 20 ha). What might limit this?



# KEY TAKEAWAYS

- The coding framework tool for identifying forest management objectives, activities, and influential factors
- Key salient factors include:
  - Resource availability
  - Market-based instruments (dimension of governance)
  - Regulations (dimension of governance)
  - Forestry networks
  - Biophysical qualities
- Several types of forest practitioner with diverse range of profiles; can these be consolidated somehow?
- Managers (private and public alike) describe aspects of their organizational structures impacting choices – an area of future study!
- **Values drive objectives but structural factors constrain value-based decisions – but to what extent? Preliminary research from ForestPaths / Forwards projects shows this effect may be large!**

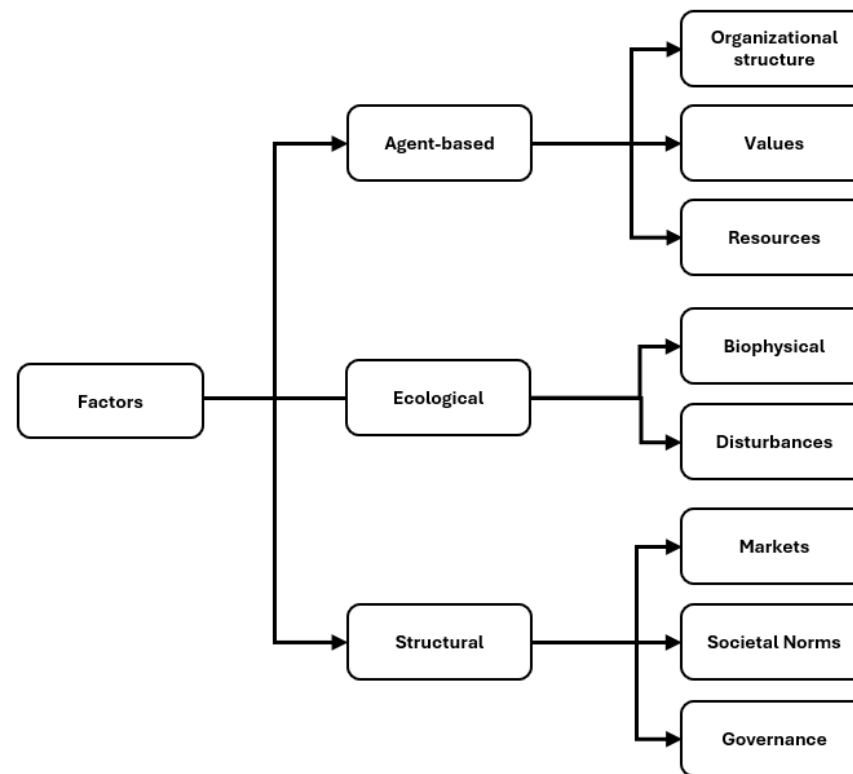


Image from ForestPaths Deliverable 1.2 (Franzini et al. 2024)





# EUROPEAN FOREST PRACTITIONER SURVEY

## THE SURVEYING PROCESS

We survey forest practitioners in thirteen European countries: Croatia, Czechia, Finland, France, Germany, Italy, Netherlands, Spain, United Kingdom, Latvia, Romania, Sweden, and Switzerland.

The survey analysis is carried out by expert researchers within the project partner institutes.

Upon request, we can provide forthcoming project reports and publications based on the survey.

## THE SURVEY

**The European Forest Practitioner Survey is a tool for learning about stewardship of European forest.**

The survey asks for information on the different forest management practices ongoing across Europe, and willingness to engage in new practices in the future.

In addition, the survey asks forest practitioners to share their most important forest management objectives and the expected outcomes of their activities.

Apart from practical matters, the survey is also an opportunity for forest practitioners to provide their insights into the most important resources for implementing forest management.



## EXPECTED SURVEY OUTCOMES

**Improve understanding of forest practitioners' decision making process.** It is not enough to know how stewardship occurs, we also explore the reasons why different activities are taken up.

**Develop forest management recommendations that support forest practitioners of the future.** As forests change due to climate change, we evaluate how management practices could look in the future and what is needed to enact these change.



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# Thank you! Questions?

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Read the ForestPaths Deliverable 1.2: [Online Library](#)

# References

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Activities / Objectives	Drivers	Barriers
<b>Cultural services</b> Aesthetics; Recreation; Hunting; Family traditions	<ul style="list-style-type: none"> <li>• <b>Utilitarianism</b>: enjoy making personal use of forest for recreation and other activities (e.g., hunting)</li> <li>• <b>Forestry network</b>: give local hunting association rent-free access to the forest – linked to <i>wildlife management</i></li> <li>• <b>Tradition</b>: family values important, e.g., logging own Christmas tree</li> </ul>	---
<b>Provisioning services</b> Fuelwood Wild forest products	<ul style="list-style-type: none"> <li>• <b>Utilitarianism</b>: owner uses fuelwood from clearing stands – linked to <i>tending/clearing</i></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Regulations</b>: cannot consider timber production since forest law prohibits stand felling for another 60 years (fixed rotation management)</li> </ul>
<b>Regulating services</b> Forest resilience Forest biodiversity	<ul style="list-style-type: none"> <li>• <b>Utilitarianism</b>: maintain and regenerate the forest to use it -- linked to <i>tending/clearing; afforestation</i></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Regulations</b>: forest law limits regenerate to soil type classification, limiting opportunities for mixed-species forest and forest resilience</li> <li>• <b>Biophysical</b>: grazing pressure from wildlife damages stand</li> </ul>
<b>Monospecies regeneration</b>	<ul style="list-style-type: none"> <li>• <b>Regulations</b>: legally obliged to plant a stand only with pine – linked to <i>afforestation</i></li> <li>• <b>Biophysical</b>: poor soil only suitable for pine forest ecosystem – linked to <i>afforestation</i></li> </ul>	---
<b>Mixed species regeneration</b>	<ul style="list-style-type: none"> <li>• <b>Conservationist</b> : believe mixed species forest are more resilient</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Regulations</b>: legally obliged to regenerate some stands only with pine</li> <li>• <b>Biophysical</b>: poor soil suitable only for pine forest ecosystem – linked to <i>afforestation, monospecies regeneration</i></li> </ul>
<b>Adapted species</b>	---	---
<b>Afforestation</b>	<ul style="list-style-type: none"> <li>• <b>Conservationist</b> : forests regeneration is positive for nature</li> </ul>	---
<b>Wildlife management</b>	<ul style="list-style-type: none"> <li>• <b>Utilitarianism</b>: sometimes family participates in hunting</li> <li>• <b>Biophysical</b>: hunting is necessary to control population and prevent stand from damage</li> <li>• <b>Forest network</b>: local hunting association provides the service; hunting is rent-free on their property</li> </ul>	---
<b>Salvage logging</b>	<ul style="list-style-type: none"> <li>• <b>Biophysical</b>: they see this as an unavoidable activity for forest health otherwise they would not do it</li> </ul>	---
<b>Clearcutting (opposed)</b>	<ul style="list-style-type: none"> <li>• <b>Environmental values</b>: believes in non-intensive forest management with minimum management activities; clearcutting is out of the question</li> </ul>	---
<b>Deadwood (opposed)</b>	---	<ul style="list-style-type: none"> <li>• <b>Disturbances</b>: oppose deadwood due to bark beetle outbreak</li> <li>• <b>Neighbours (norms)</b>: deadwood retention in neighbouring state park perceived as the culprit to bark beetle outbreaks in their forest</li> <li>• <b>Public administration</b>: perceive local authorities in neighbouring forest should have better communication and regulatory process to discuss and manage bark beetle outbreaks</li> </ul>
<b>Tending / clearing</b>	<ul style="list-style-type: none"> <li>• <b>Conservation value</b>: seen as important to ensure unnecessary tree competition and promote forest resilience</li> <li>• <b>Utility</b>: makes forest more accessible recreational uses</li> <li>• <b>Forestry networks</b>: State Forest Services provides helpful advice for managing the stand; seen as very supportive</li> <li>• <b>Resources</b>: family carries out tending work since forest is small and they live on property so they can access it easily</li> </ul>	---

Management behaviour	Drivers	Barriers
<b>Provisioning services</b> Timber	<b>Economizing:</b> timber is main objective <b>Resources:</b> own knowledge guides provisioning methods – links to <i>Forest Networks</i> : cooperation with researchers to acquire new knowledge and Thinning's --	<b>Biophysical:</b> some stand characteristics inhibit combining conservation and provisioning – links to <i>Wildlife management</i> challenges balancing biodiversity preservation and timber production <b>Utilitarianism:</b> areas set aside from harvesting for family recreation
<b>Regulating services</b> Forest productivity Forest resilience Biodiversity	<b>Regulation:</b> Natura 2000 mandates biotope protection and limits intensive management activities; Buffer zones nearby water is required by national law; 21 hectares designated under Natural 2000; legally required to leave 5-8 retention trees per hectare <b>Resources:</b> own knowledge guides stand protection and resilience approach	<b>Biophysical:</b> stand characteristics can inhibit multifunctional objectives -- links to <i>Wildlife management</i> challenges balancing biodiversity preservation and timber production <b>Market Instruments:</b> believes lack of compensation for NATURA 2000 limits forest conservation in society, generally speaking <b>Resources:</b> won't implement CSF activities for which she lacks technology or workforce
<b>Cultural services</b> Aesthetics Recreation	<b>Utilitarianism:</b> beautiful areas set aside for family recreation	---
<b>Thinning</b>	<b>Resources:</b> forestry degree, professional and technical knowledge; self-motivated to learn; living near property contribute to which thinning practices to use – linked to <i>Forestry Networks</i> : cooperation with researchers to develop and implement management activities	---
<b>Clearcutting</b>	---	---
<b>Selective felling</b>	---	---
<b>Afforestation</b>	<b>Resources:</b> land consolidation allows for easier management, so she afforest to consolidate land <b>Regulations:</b> Forestry law is simpler to navigate when having one consolidated plot rather than multiple smaller plots, so owner afforest to consolidate land	--
<b>Natural regeneration</b>	<b>Regulations:</b> seed trees mandatory by legislation with permissible species according to soil class	--
<b>Set aside areas</b>	<b>Regulations:</b> forestry law and NATURA 2000 restricts silvicultural activities <b>Biophysical:</b> hard to reach areas are left unmanaged <b>Utilitarianism:</b> beautiful areas left aside for personal enjoyment	<b>Market instrument:</b> believes lack of compensation for NATURA 2000 limits forest conservation in society on general level
<b>Buffer Zones</b>	<b>Regulation:</b> Buffer zones nearby water is required by national law	---
<b>Retention Trees</b>	<b>Regulations</b> legally required to leave 5-8 trees per hectare	---
<b>Forest edges (opposed)</b>	---	<b>Resources:</b> from knowledge, believes this does not reduce bark beetle because they can fly to the sites.
<b>Deadwood</b>	<b>Regulations:</b> required by national legislation <b>Biophysical:</b> occurs naturally in forest [perhaps because of large forest size]	---
<b>Wildlife management</b>	<b>Biophysical:</b> grazing damages the commercial stands	---