

<https://helda.helsinki.fi>

Discursive barriers to voluntary biodiversity conservation: The case of Finnish forest owners

Takala, Tuomo

2022-01

Takala , T , Brockhaus , M , Hujala , T , Tanskanen , M , Lehtinen , A , Tikkanen , J & Toppinen , A 2022 , ' Discursive barriers to voluntary biodiversity conservation: The case of Finnish forest owners ' , Forest Policy and Economics , vol. 136 , 102681 . <https://doi.org/10.1016/j.forpol.2021.102681>

<http://hdl.handle.net/10138/343214>

<https://doi.org/10.1016/j.forpol.2021.102681>

cc_by

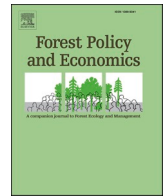
publishedVersion

Downloaded from Helda, University of Helsinki institutional repository.

This is an electronic reprint of the original article.

This reprint may differ from the original in pagination and typographic detail.

Please cite the original version.



Discursive barriers to voluntary biodiversity conservation: The case of Finnish forest owners

Tuomo Takala^{a,*}, Maria Brockhaus^b, Teppo Hujala^c, Minna Tanskanen^d, Ari Lehtinen^d, Jukka Tikkanen^c, Anne Toppinen^a

^a University of Helsinki, Department of Forest Sciences, Latokartanonkaari 7, 00014 Helsingin yliopisto, Finland

^b University of Helsinki, Department of Forest Sciences and Helsinki Institute of Sustainability Science (HELSUS), Latokartanonkaari 7, 00014 Helsingin yliopisto, Finland

^c University of Eastern Finland, Faculty of Science and Forestry, School of Forest Sciences, P.O. Box 111, FI-80101 Joensuu, Finland

^d University of Eastern Finland, Faculty of Social Sciences and Business Studies, Department of Geographical and Historical Studies, P.O. Box 111, FI-80101 Joensuu, Finland

ARTICLE INFO

Keywords:

Discourse analysis
Cognitive dissonance
Biodiversity loss
Social conservation sciences
Non-metric multi-dimensional scaling

ABSTRACT

In many parts of the world, the success of biodiversity conservation strongly depends on the decisions of private landowners. These decisions are guided by the shared perceptions of the biodiversity problem. In this study, we applied a mixed method critical discourse analysis and examined how alternative discourses of biodiversity guide Finnish forest owners to maintain, or not maintain, biodiversity on their lands. Data collection combined a preliminary interview ($n = 24$) with a forest owner survey ($n = 452$).

We identified four discourses of biodiversity. The *concerned discourse* acknowledges the biodiversity problems in forests caused by current forestry. The *sceptical discourse* denies the existence of all biodiversity problems and defends contemporary forestry against the accusations of environmentalists. The *harmonising discourse* emphasises the harmony of all forest uses in the spirit of multi-objective forestry. The *uninvolved discourse* distances itself from the biodiversity issue. Overall, only 21% of the survey respondents worried about biodiversity loss in Finnish forests.

The discourses illustrate three different ways in which Finnish forest owners moderate the cognitive dissonance caused by 'unpleasant' information on biodiversity loss by either excluding or rejecting it, or assimilating it into multi-objective harmony. Overcoming these kinds of discursive barriers – the mechanisms that help decision-makers ignore alarming realities – is a major challenge for all those who aim to halt biodiversity loss.

1. Introduction

Voluntary policy instruments, such as subsidies for temporary or permanent conservation, forest certification and raising awareness for biodiversity-enhancing management decisions, have become popular in the implementation of biodiversity goals in Western forest policy (Hysing and Olsson, 2005; Ma et al., 2012; Koskela and Karppinen, 2021). This means that private forest owners, as a major landowner group, have an increased responsibility to maintain biodiversity in many parts of Europe and the USA (UNECE and FAO, 2020). In Finland – the case country of this study – nearly two thirds of forestland is owned by private persons and families (Natural Resources Institute Finland,

2016). Finnish forest owners are obliged by the Forest Act (1093/1996 as amended by 567/2014) to preserve some rare key biotopes, such as springs, rich fens and luxurious herb-rich forests when their area is small, and by the Nature Conservation Act (1096/1996) to preserve some threatened species and biotopes. Yet, biodiversity conservation depends on voluntary measures in vast majority of private forests. For example, protection of private forests takes place through the voluntary biodiversity programme METSO that offers options for both temporary and permanent protection (Ministry of Agriculture and Forestry, 2021) or through forest owners' own unofficial protection decisions. In this paper, we apply a mixed method critical discourse analysis and examine how alternative discourses of biodiversity guide Finnish forest owners to

* Corresponding author.

E-mail addresses: takala.tuomo.o@gmail.com (T. Takala), maria.brockhaus@helsinki.fi (M. Brockhaus), teppo.hujala@uef.fi (T. Hujala), minna.tanskanen@uef.fi (M. Tanskanen), ari.lehtinen@uef.fi (A. Lehtinen), jukka.tikkanen@uef.fi (J. Tikkanen), anne.toppinen@helsinki.fi (A. Toppinen).

<https://doi.org/10.1016/j.forpol.2021.102681>

Received 24 May 2021; Received in revised form 8 October 2021; Accepted 21 December 2021

Available online 11 January 2022

1389-9341/© 2022 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

either consider or not consider biodiversity in their forest use. These discourses also affect how forest owners perceive the need and appropriateness of different types of policy instruments.

Nature and biodiversity typically mean something positive for a North-European forest owner, and many report having let parcels of forest unmanaged or made some minor deeds, such as leaving deadwood, to maintain biodiversity (Horne et al., 2004; Hysing and Olsson, 2005; Paloniemi and Tikka, 2008; Hallikainen et al., 2010; Brukas et al., 2018; Koskela and Karppinen, 2021). However, it has also been found that initial appreciation of nature and biodiversity is a long – often unattainably long – way from biodiversity-sound forest use, and in this context, the ecological effectiveness of voluntary policy instruments has often been questioned (Uliczka, 2003; Hysing and Olsson, 2005; Sawatzky, 2013). The continuous loss of species and ecosystem diversity in Finnish forests (Kouki et al., 2018; Hyvärinen et al., 2019) underlines the limitations of the prevailing mix of policy instruments and the need to understand the mechanisms underlying these limitations (Bouma et al., 2019; Sironen et al., 2020). Currently, over 2100 red-listed species – 32% of all red-listed species in Finland – live primarily in forest biotopes (Hyvärinen et al., 2019, pp. 38–39, 41–49). In comparison with the previous red-list assessment in 2010, climate change has been beneficial for some southern species living in their northern limits, but the distress of species dependent on old-growth forests has become worse (Hyvärinen et al., 2019, pp. 111–112).

Unlike in many temperate, subtropical and tropical regions, the challenge that Finland faces in sustainable forest use is not the reduction of forest area, but the continuously intensive industrial use of boreal forests that severely harms many ecologically essential forest structures and processes (Kouki et al., 2018; Hyvärinen et al., 2019). In particular, changes in tree species composition and the lack of old-growth forests, old trees and deadwood have affected many species adversely (Hyvärinen et al., 2019, pp. 41–49). The national importance of industrial forestry has been highlighted in public and policy discourses in Finland from the 19th century to the present (Kotilainen and Rytteri, 2011), and the prevailing aim to replace fossil resources with bio-based ones extends this historical continuum (Kröger and Raitio, 2017). Of course, the less dominant environmental critique that blames current forest management and forest policy for biodiversity loss also has deep roots (Takala et al., 2019a). The EU biodiversity strategy for 2030 (European Commission, 2020) is possibly the latest call for an adjustment of the forest policy mix.

Critical discourse analysis provides us with a valuable tool for examining the implementation problems of current forest policy instruments for biodiversity conservation. Different discourses of biodiversity provide people with alternative views of the state of biodiversity and of the need to consider biodiversity in forest management. Each discourse aims to make its own truth the normal and natural truth in society (Fairclough, 2010, pp. 69–83, 126–145). We can think discourses as a collective way to create and sustain realities in which we live together with the similar-minded. Discourses thus provide people, including forest owners, ingredients to build a coherent worldview. Through this process of worldview building, discourses – albeit being inherently social entities – have potential to affect many personal-level traits that are known to be related with forest owners' participation in voluntary biodiversity conservation, such as forest owners' environmental and economic attitudes, knowledge and sense of autonomy (Langpap, 2004; Mitani and Lindhjem, 2015; Miljand et al., 2021). For biodiversity conservation, competing discourses are an essential part of the social context.

Because of the inconsistency between Finnish forest owners' initially positive attitude to biodiversity and the low success of biodiversity conservation, we hypothesise that powerful discourses of biodiversity exist that help Finnish forest owners ignore the alarming messages from the ecological sciences (Takala et al., 2019b). Currently, the effects of competing discourses on forest owners' voluntary biodiversity conservation are mostly unexplored (see Miljand et al., 2021). We know that

narration on nature and biodiversity plays an important role in some forest owners' discourses of forest (Takala et al., 2019b), but we do not understand yet how those forest owners and discourses that show less interest in biodiversity conservation deal with alarming messages about biodiversity loss.

Our aim in this study is, first, to reveal 1) what kinds of discourses of biodiversity Finnish forest owners produce and circulate. We also assess 2) how common these discourses are among Finnish forest owners. Because of our critical social science orientation (Fairclough, 2010, pp. 230–254), we aim to point out the discursive barriers to biodiversity conservation on private lands. Knowing these kinds of barriers is essential for policymakers who seek a mix of policy instruments that would effectively counteract biodiversity loss (Bugter et al., 2018). In particular, our analysis enables the assessment of forest owners' propensity to comply with voluntary policy instruments as regards their collective ways of thinking. We are, specifically, interested in how forest owners think, not who they are when measured in e.g. gender, age or estate size.

2. Theoretical framework

Our analysis is based on the theory of Critical Discourse Analysis (CDA) by Norman Fairclough (2010). We understand discourses as linguistic entities of intersubjective origin, each of which present what is right, true and normal in their own characteristic style. Discourses thus comprise both content and style. They are understood as a social practice that affects and is affected by other social, cognitive and material dimensions of reality (Fairclough, 2010, pp. 230–254). For example, we assume that discourses affect actors' personal views about appropriate forest use and their actual, material forest use. And *vice versa*, the way in which an actor thinks and the way in which forests are actually used affect the discourses that are circulated in social interaction. We expect these connections to exist, even though our analysis concentrates on the discursive dimension.

Discourses are always intersubjective, (re)produced in social interaction and shared by many individual actors. Thus, an individual forest owner cannot produce a discourse alone, he or she can only participate in its reproduction or, typically slow transformation. Discourses are always open for transformation and contextual fine-tuning, even if their core content and characteristic styles of narration are considerably resistant to change. Actors are typically not conscious of discourses – they only express their views in a way that sounds right (Fairclough, 2010, pp. 69–83, 126–145). Obviously, most of us have some idea of alternative shared ways of thinking and speaking, i.e. some idea of discourses, but a careful discourse analysis is needed to explicitly bring out their whole content and style. From the perspective of an individual actor, discourses should be understood as the ingredients of one's worldview, not as alternative ways of speaking that one can consciously choose for different speaking situations.

Discourses aim for hegemony, a state in which one's own truth is taken for granted and, thus, opaque in society (Fairclough, 2010, pp. 69–83, 126–145). When all truths cannot be taken for granted simultaneously, there is competition between discourses. This competition can be seen in the discourses' ways of expression. Hegemonic discourses need not justify their own truths or even refer to alternative, potentially conflicting truths. Subordinate discourses – those that lack hegemony – need to raise the problems related to the hegemonic truths and explain why their own truth is a better choice. Like discourses themselves, the power balance between them (the order of the discourses) is considerably, although not totally, resistant to change.

In this study, we also apply the theory of cognitive dissonance (Festinger, 1957) from the field of social psychology. This theory seems a very promising tool for studying the social dimension of environmental problems (Sullivan, 2018). At its very core is the idea that people try to avoid inconsistency between pieces of knowledge, and have different strategies, such as selective reading and re-interpretation, to sustain

coherence and avoid a state of cognitive dissonance. While we do not aim at a full theoretical discussion of cognitive dissonance, an ambition beyond the scope of this paper, we integrate the core idea in our analysis, as it provides us with an additional argument for why discourses always strive for hegemony. It is not only a competition for the right and the normal, but also a way to sustain cognitive coherence. Discourses provide a social means to select and exclude information that does not match one's ideas, activities and the overall worldview.

Finally, a few words about our critical orientation. Critical social sciences have traditionally aimed to reveal the conditions of social injustice (Fairclough, 2010, pp. 230–254, Barnett, 2016). Considering the major environmental problems we face today, and how these are shaped by and are shaping injustice and inequalities, we suggest that the critical social sciences should increasingly aim for – and inform – the assessment and continuous redefinition of overall sustainability (Alhojärvi and Sirviö, 2018), with forests, biodiversity and related policymaking being part of this effort. For this task, the UN goals for sustainable development presented in Agenda 2030 can provide a useful framework (United Nations, 2015). This framework contains 17 goals and 169 sub-goals. In our paper, we operate within Goal 15 – 'Life on land' – and its sub-goals of ensuring the sustainable use of forests (15.1, 15.2) and halting the loss of biodiversity (15.5). This means that we regard biodiversity conservation and the sustainable use of forests as important goals for Finnish society. We only briefly comment on social inequality issues (Goal 10). Critical research is a moral project (Fairclough, 2010, pp. 230–254) and thus it is useful to be explicit in one's normative settings.

3. Material and methods

Our data are based on interviews and a national survey (Fig. 1). In the semi-structured interviews, we asked 12 forest professionals and 12 forest owners ten questions related to biodiversity (Table 1). The aim of the interview stage was to build – based on full narratives – a rich core collection of views to inform the development of the forest owner survey. To achieve this goal, we contacted forest professionals from different Finnish institutions (industrial companies, forest owners'

Table 1
Interview guide.

ID	Question
1	Define the term <i>forest biodiversity</i> .
2	What is the status of biodiversity in Finnish forests?
3	How do you see the future development of biodiversity in Finnish forests?
4	What are the most important measures that sustain or are needed to improve biodiversity?
5	Whose responsibility it is to sustain biodiversity?
6	Are you familiar with the Red List of Finnish Species and biotopes?
7	Are you interested in forest species?
8	Do you take individual species, biotopes or biodiversity into account in your forest-related activity? Do you think that forest owners usually take these into account?
9	What is your relationship with protected species living in the forest? How do you think that forest owners usually react if they hear that protected species are living in their forests?
10	Are you responsive to information on biodiversity conservation? Who is and is not allowed to advise you in biodiversity issues?

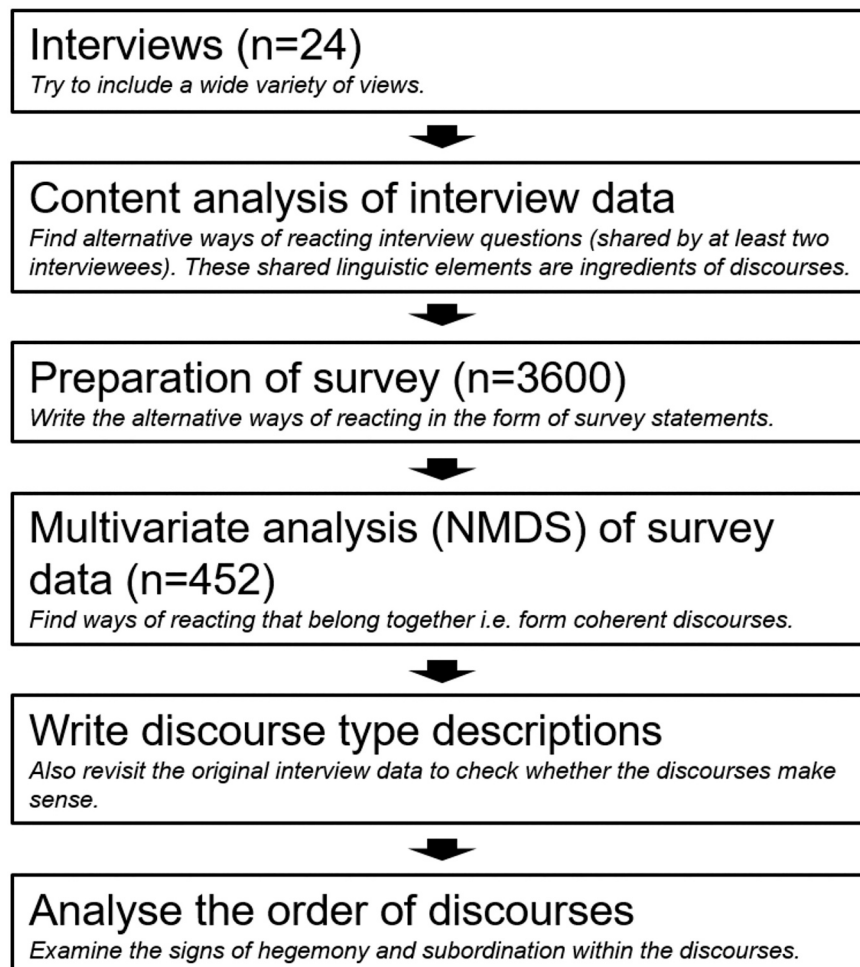


Fig. 1. Analysis stages (Takala et al., 2021).

associations, environmental administration, forestry administration) and different forest-related services (wood trade services, forestry advisory services, forest management planning and forest conservation). Each of them invited one forest owner to the study. Even if this is a forest owner study, the forest professionals' views were also included to add expert views – probably shared by many Finnish forest owners – to our data. Including forest professionals and forest owners from forest conservation services enabled us to reach also critical views about current forestry. The interviews took place between June and November 2019.

The content analysis of the interview data listed the different verbal reactions elicited by each interview question (Table 1, Fig. 1). These reactions included direct answers to the questions, but also other combinations of content and style that the questions evoked and that existed in several interviews. The reactions were written in the form of statements and the list of statements was supplemented after each interview. After the 24 interviews we decided to stop this analysis stage, as the data seemed to be saturated. The list of statements was then used as a template for the survey tool. Importantly, the interviewees were not examined further in this study. The interview questions that informed this analysis (Table 1) were part of a wider interview. Data from this wider interview will be analysed in a separate study that concentrates on forestry service development.

Guided by the interview stage, we created a questionnaire including 55 statements (Fig. 1., Appendix A). Because the different orientations to the interview questions were already included in these statements, the survey respondents could only either agree or disagree with them (Appendix A). Furthermore, three open questions were added to cover the issues that elicited multiple variable responses in the interviews. This variable information would have been lost if the questions had been condensed to agree/disagree statements. These issues concerned the definition of biodiversity and the most important ways in which a forest owner and the state can sustain biodiversity in private forests (Appendix A). In addition to this, the survey collected information on the forest owners' objectives for forest use and on their actual forest use (Appendix B). We hypothesised that these quite subjective and value-bound owner characteristics could be related with forest owners' views about biodiversity conservation. Demographic or estate characteristics were not included in this study.

The paper questionnaire was sent to 3600 randomly selected Finnish forest owners between 18 and 75 years who owned more than two hectares forest. The survey took place in late spring 2020. The response rate was 13.8%, as we got 495 responses. We did not use all 495 responses in the research, but only those 452 that included all necessary parts. The missing ranking of objectives (see Table B1 in Appendix B) was the most common reason for abandonment.

When compared to the national survey of Finnish forest owners published in 2020 (Karppinen et al., 2020), our sample of respondents was slightly higher educated, was more often male and owned more often an inherited forest than forest owners on average (Table B3 in Appendix B). The duration of ownership was also slightly beyond the average. The perceived differences in the age class structure can be explained by our upper limit of 75 years. All in all, our sample of 495 forest owners seems to represent quite well the Finnish forest owners. We think that the essential bias is not related to the demographic factors, but to the involvement of the forest owners. In our sample, many forest owners used to visit their forests quite often (Table B3) and most of them reported forest-related activities (Table B2). A majority of them did practical forestry work and used forest for recreation. Thus, we assume that our sample is biased towards forest owners who were interested in their forests and the forests in general. Furthermore, the sample may be biased towards forest owners who are interested in filling questionnaires. Our questionnaire was long and the issues were not at all easy – it demanded full dedication from the respondents. We assume that this is one possible explanation for the relatively low response rate (14%, no reminders sent). However, the magnitude of this possible bias cannot be easily estimated with the loss analysis approach applied in this study.

In the content analysis of the survey data, we created a binary matrix with the statements as rows and the forest owners as columns, to be used in non-metric multi-dimensional scaling (NMDS) (Fig. 1; McCune and Grace, 2002). If a forest owner agreed with a statement, we marked the cell value as one. If a forest owner disagreed or did not answer, we added a cell value of zero. Alternative answers to the open questions were first analysed using the content analysis technique similar to the interview stage, and added then into the binary data matrix. Furthermore, information about the forest owners' objectives and actual forest use was added. From here on, we refer to the statements, answers, objectives and forest uses included in the matrix as codes.

By definition, discourses are composed of shared ideas and ways of speaking. The open survey questions produced 95 codes that were expressed by only one respondent (not reported). These codes were not included in our analysis, as we could not be sure about their wider relevance. In addition to this, we had to exclude codes that occurred 2 to 16 times in our data, because these rare variables prevented an acceptable NMDS solution (no convergence was reached). Appendix C shows these codes, which include many innovative measures for biodiversity conservation.

The aim of the NMDS was to reveal the multi-dimensional structure of the data – to determine which codes belong together and form the forest owners' discourses of biodiversity. In the NMDS, the codes were arranged in an n-dimensional ordination space so that the codes that were typically expressed by the same forest owners were situated near each other (McCune and Grace, 2002). The forest owners were positioned in this same ordination space according to the codes they expressed. We applied a three-dimensional NMDS and used the Bray–Curtis (dis)similarity index to measure the distances between the objects. We used the Vegan package (Oksanen et al., 2017) in R (R Core Team, 2017) to conduct the analysis. The final stress value of our three-dimensional NMDS solution was 0.16. Stress value is a measure of the data variation that remains unexplained in the analysis, and values below 0.2 are completely acceptable (McCune and Grace, 2002). In addition to the stress value, the number of NMDS dimensions was decided based on the interpretability of results.

NMDS dimensions represent the main gradients in the multivariate data and, thus, the main differences between the discourses. When interpreting the three NMDS dimensions, it was useful to examine how codes related to a same original interview question were dispersed in the NMDS space. After the examination of the NMDS dimensions, we started to identify discourses on the basis of the code positions. Codes positioned close to each other were interpreted as belonging to the same discourse. Discourse type descriptions were then written based on these groups of codes (Fig. 1). The main gradients along the NMDS dimensions were emphasised in the search for coherent discourses, but the NMDS results were still subordinate to qualitative interpretation. We used NMDS here to find coherent discourses – codes that depict the world in a characteristic way – and the codes that were most strongly related with particular NMDS dimensions were not necessarily the most important ones in the final discourse type descriptions.

Finally, we assessed the order and prevalence of the discourses. The former means that we identified the signs of subordination, such as critique, anxiety and worries, within each discourse. The lack of these signs indicated hegemony (Fairclough, 2010, pp. 69–83, 126–145). Analysing the order of discourses meant thus analysing the content and style of the discourses. The prevalence of the discourses was assessed by analysing the prevalence of key codes – the codes that were particularly characteristic of each discourse. We did not specifically classify forest owners into particular discourses, i.e. we did not analyse why each forest owner was exactly oriented towards a particular discourse. Each forest owner had an individual code profile, and thus, a personal way of producing one or several discourses in their narration. The selected way of prevalence estimation represented this personal variation better than an exact classification.

4. Results

4.1. Results of NMDS

Based on the code positions, NMDS dimension one (NMDS 1) depicted variation from a weak to a strong relationship with biodiversity issues (Fig. 2; Appendix C). Most definitions of the term biodiversity and most measures for the maintenance of biodiversity were positioned in the positive values of NMDS 1. The NMDS dimension two (NMDS 2) revealed a gradient from the denial of biodiversity loss (B and C in Fig. 2) to a perceived potentiality (D) or existence (A) of this problem. The gradient from the critique of biodiversity conservation to the critique of current forestry - combined with concern over biodiversity – was separated by both NMDS dimensions (running from B to A in Fig. 2). Based on these main gradients, we identified four discourses of biodiversity (Fig. 2). The *concerned discourse* worried about biodiversity loss, the *sceptical discourse* defended modern forestry, the *harmonising discourse* believed in the harmony of all forest functions, and the *uninvolved discourse* distanced itself from the whole issue.

NMDS 3 separated concrete activities in the forest from other activities. The concrete forest owners' biodiversity maintenance measures, such as increasing deadwood (C40) and leaving parts of the forest unmanaged (C38), were positioned at the negative end of this gradient. The other forest owners' biodiversity maintenance measures, such as reading (C47) or contacting experts (C49), and all society's measures for biodiversity maintenance were located at the positive end of the gradient. Regarding forest use, NMDS 3 separated planning (C99) and observation (C100) from the other, more physical, forest uses. We can thus conclude that our respondents and each of the four discourses were divided in their orientation towards either concrete forest uses or managerial-type planning and observation. This is an interesting result as such, but did not give us reason to split the discourses. Hence, NMDS 3 was excluded from further examination.

4.2. Discourse type descriptions

4.2.1. Concerned discourse (A)

As the name suggests, the concerned discourse underlines the current biodiversity problem in Finnish forests (C16 in Appendix C) caused by modern forestry (C31). It believes we should urgently and drastically change our forest use if we hope to stop continuous biodiversity loss (C29). At present, few forest owners actually pay attention to biodiversity issues (C74), and forest professionals give inadequate advice for the maintenance of biodiversity (C90). According to this discourse, Finnish forestry generally pays too little attention to the sustenance of threatened species (C82). In this discourse, the future of the biodiversity of Finnish forests looks dark (C20).

The concerned discourse has a clear idea about the measures needed to stop biodiversity loss. Because most forest owners and forest professionals are not really interested in biodiversity, it sees a need for more stringent regulation regarding cuttings and soil preparation (C57). At the same time, it believes that the forest owners who take more than superficial measures to sustain biodiversity should be compensated with, for example, tax relief (C52). It also considers that society should raise forest owners' and other citizens' awareness of biodiversity and biodiversity loss. For forest owners who wish to take care of biodiversity, the concerned discourse proposes leaving at least some parts of the forest unmanaged (C38). In the forests under economic use, the silvicultural and cutting operations should be planned and conducted in a way that supports biodiversity (C42). This discourse proposes mixed forests (C39), the sustenance of deadwood (C40), decreasing clearcutting (C46) and applying continuous cover management (C48) as practical measures. Furthermore, it encourages forest owners to read and learn about biodiversity and put these lessons into practice (C47).

In this discourse, the term biodiversity is understood as the variety of species and biotopes (C2–C4). The variety of tree species (C1), the abundance of deadwood (C9) and the variability of different kinds of forests (C7) are also discussed when defining biodiversity. Furthermore, biodiversity and the well-being of nature are strongly linked (C6).

Quite unsurprisingly, the concerned discourse emphasises non-

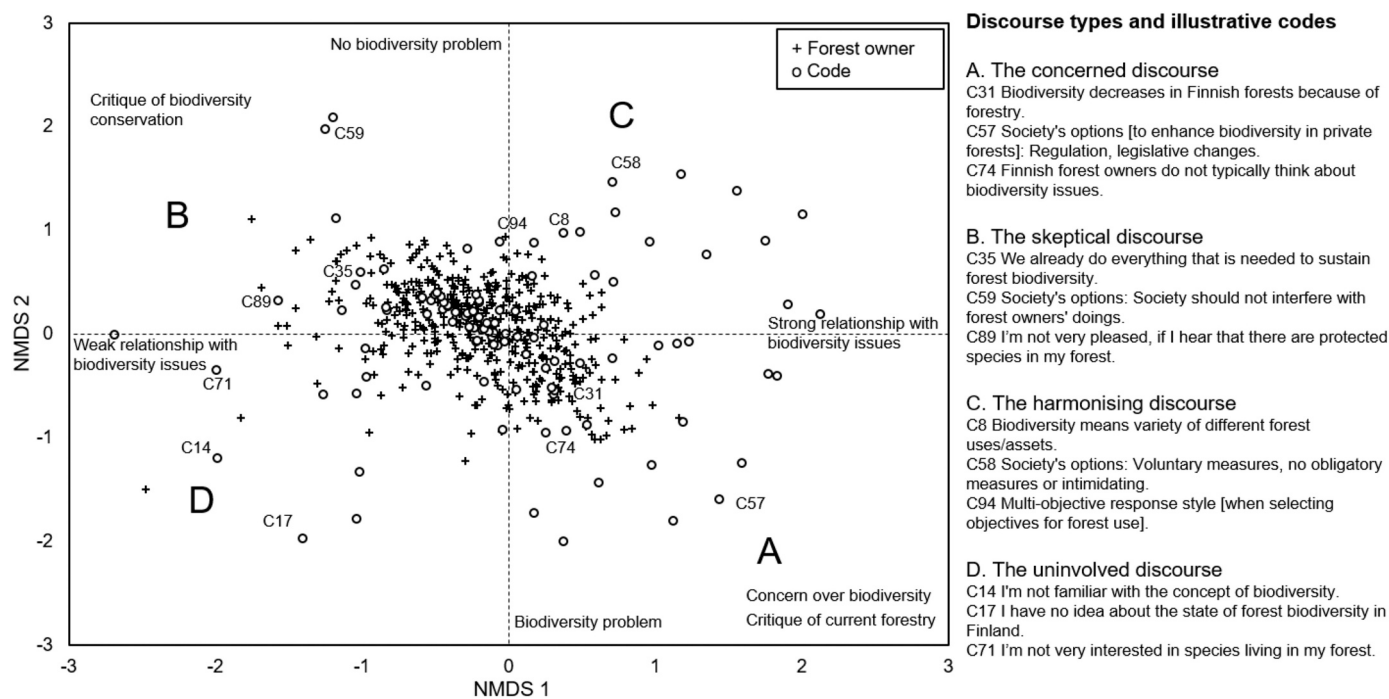


Fig. 2. NMDS 1 and NMDS 2. The main gradients along these NMDS dimensions are indicated with text. Appendix C provides a full list of codes and code positions. The approximate orientations of the four discourses are indicated by uppercase letters. The gridlines are to help locate the origin. Importantly, they do not divide the NMDS space between the discourses.

timber and non-tangible objectives (C97; the category of non-tangible objectives includes also non-timber forest products in this paper, see Appendix B). In its view, recreation and relaxation of all kinds, such as walking, hiking, skiing, walking a dog, or photography are all essential forest uses (C101). Enjoying nature plays an important role in these activities (C104).

4.2.2. *Sceptical discourse (B)*

The sceptical discourse does not recognise any biodiversity problem in Finnish forests (C15). It sees the future development of biodiversity as bright (C18–C19). The biodiversity of one's own forest is also perceived to be beyond average (C23). In the view of this discourse, Finnish forest owners typically take biodiversity into account in their forest use (C73), and this trend is becoming stronger (C77, C33). Contemporary modern forestry and high-quality silviculture sustain biodiversity, and thus according to this discourse, everything that is needed is already being done (C32, C35).

Although this discourse is pleased with the status of biodiversity, it is bothered by opposing voices. It claims that the media discussion on biodiversity pays too little attention to all the positive changes that have been made in Finnish forestry during recent decades (C27), and that those who see a biodiversity problem should compare the Finnish case with those of other countries (C26) and forests with other biotopes (C28). Furthermore, it sees conservation statistics as biased, because forest owners typically conserve parts of their forests without an official contract (C78). According to the sceptical discourse, if one still sees a problem, it is important not to blame anyone (C30). Thus it is not surprising that this discourse does not favour advice from conservationists in biodiversity issues (C86). Instead, it considers forest(ry) professionals experts in biodiversity maintenance (C93). Their advice is typically trusted (C88), even if they sometimes propose exaggerated measures (C89).

Because modern forestry sustains biodiversity, the sceptical discourse proposes mainstream silviculture and forestry to a forest owner who wishes to care for biodiversity (C37). Another piece of good advice is to listen to forestry experts (C49). Society should not interfere with forest owners' doings (C59). The sceptical discourse avoids defining the term biodiversity and merely reminds us that high-quality silviculture and forestry ensures that all is well (C13).

The sceptical discourse also takes a stand on threatened and protected species: too much attention is paid to threatened species in the Finnish forestry (C83). Forest owners are typically not very pleased if they hear a protected species is living in their forests (C79, C84), as the conservation status of some threatened species, such as the flying squirrel (*Pteromys volans*), is exaggerated (C81). The fear of mandatory protection can even cause anticipatory cuttings and thus decrease biodiversity (C85).

This discourse emphasises economic objectives for forest use (C96). Silvicultural work, planning and follow-up observation of cuttings, as well as observation of forests' condition and growth, are typical ways of using the forest in the sceptical discourse (C98–C100).

4.2.3. *Harmonising discourse (C)*

The harmonising discourse combines interest in biodiversity issues with low concern over biodiversity loss. The Red List of Finnish Species and biotopes are known in this discourse, illustrating an interest in biodiversity issues (C66–C67). When defining the term biodiversity, this discourse underlines the special biotopes, such as wetlands, springs, brooks or other biotopes mentioned in the [Forest Act \(1093/1996\)](#); amendments 1085/2013) that should be maintained (C12). Importantly, it also draws attention to the multiple assets that the forest offers (C8). It often mentions berries and mushrooms, landscape, and game stocks (C5, C10, C11). The key message is that all forest uses – biodiversity maintenance included – can and should be combined. Thus, we should not be overly concerned about biodiversity loss, even if management practices could be improved. The harmonising discourse sees modern(ised)

forestry as also promising a bright future for the biodiversity of Finnish forests (C19, C27).

For a forest owner who wishes to maintain biodiversity, the harmonising discourse proposes leaving special biotopes unmanaged, leaving bushes for game, and leaving retention trees and made-up snags in cutting areas (C43, C50, C41). Of course, voluntary conservation is also an alternative (C44). A forest owner can also ask for advice from forest(ry) professionals who are typically experts in biodiversity maintenance (C88, C93). It is possible to plan one's forest use in a nature-friendly way (C42). From society's perspective, the harmonising discourse approves voluntary measures only, such as guidance of all kind and (already existing) programmes for voluntary conservation (C54, C55, C58). Economic incentives and compensations for biodiversity conservation are welcomed (C53).

The harmonising discourse tries to balance between environmental and productivist objectives (C95), even if productivist objectives are typically the most important (C96). The multi-objective response style – the tendency to select all possible objectives when asked – is also typical of this discourse (C94). Silvicultural work, planning of forestry operations, berry and mushroom picking, hunting, game stock management, and other recreation are typical forest uses mentioned in this discourse (C98–C99, C101, C102, C105).

4.2.4. *Uninvolved discourse (D)*

The uninvolved discourse distances itself from the biodiversity issue. It frankly admits that the term biodiversity is unfamiliar (C14) and has no idea about the state of biodiversity in Finnish forests (C17). It sees future development as similarly impossible to assess (C22). According to this discourse, if one had to guess, we might be heading towards decreasing biodiversity (C21), as Finnish forest owners do not typically think about biodiversity very much (C74). The biodiversity of one's own forest is also assessed to be average or below in this discourse (C24–C25). Similarly, the uninvolved discourse has no measures to offer forest owners or society (C51, C60). Forest species are distant or uninteresting in this discourse (C69, C71). Overall, biodiversity is not a personally important issue (C62). Rather, it is an issue best avoided (C92), even when talking with forest professionals (C87). Regarding the objectives of forest use, this discourse's objectives are closer to timber-related than non-tangible objectives (C96–C97).

4.3. *Common ground*

Some of the codes and code groups belonged to all or most discourses. At first, the common opinion seemed to be that biodiversity is something that should be sustained (C91, 96% of respondents). Interest in forest species and species identification was also shared by most forest owners and discourses (C68, 90%; C70, 80%; C72, 83%). Indifferent attitudes were rare and related to the sceptical and uninvolved discourses (C69, 11%; C71, 9%). Many forest owners in all four discourses also expressed their interest in still lacking forest advisory services that would concentrate on the species and biodiversity of their own forests (C91, 62%). Positive orientation towards the protected species in one's own forest (C80, 78%) was also common to most discourses and more common than the negative orientation within the sceptical discourse.

The discourses were not divided on their idea about who has the responsibility for biodiversity maintenance. The forest owners, the advising forestry experts and the state were all seen as responsible (C63, 85%; C64, 83%; C65, 70%). Similarly, the ideas that forest owners' estrangement from their forests threatens biodiversity conservation or that the new generations have more motivation to maintain forest biodiversity were dispersed over the discourses (C34, 60%; C36, 58%).

4.4. *Order and prevalence of discourses*

The concerned discourse and the sceptical discourse appeared subordinate in our analysis. Both expressed concern and anxiety of their

own kind and recognised conflicts between the forest users and uses. It is noteworthy that even though the sceptical discourse could (in a hegemonic manner) deny any biodiversity problem, it could not exclude the opposing voices. The concerned discourse did not even have these small traces of hegemonic narration.

The harmonising discourse and the uninvolved discourse were hegemonic. The harmonising discourse was not worried about biodiversity loss or those who raise this issue. Even if things still needed improvement, a harmony between all forest users and uses was possible and well within reach in this discourse. The uninvolved discourse did not need to deny the biodiversity problem, because the whole issue was regarded as distant and thus, irrelevant.

Based on the prevalence of the key codes, the harmonising discourse and the sceptical discourse were the most common, followed by the concerned discourse and the uninvolved discourse. About one third of the respondents regarded protected species as a nuisance (34%, C84 in Appendix X) and thought that Finnish forestry emphasises threatened species too much (31%, C83). These codes were typical of the sceptical discourse. One fifth of the respondents recognised a biodiversity problem (21%, C16) and were thus advocates of the concerned discourse. About three quarters of the respondents denied the existence of any biodiversity problems (71%, C15) and assessed modern forestry as supporting biodiversity (75%, C32). Few respondents reported unfamiliarity with the concept of biodiversity (6%, C17), the state of biodiversity (4%, C17) or forest owners' options for biodiversity maintenance (16%, C51), indicating the rarity of the uninvolved discourse. Balancing between timber-related and non-tangible objectives was typical of more than half of the respondents (57%, C95). No other codes were exclusively characteristic of the harmonising discourse, but this discourse seemed to be the most common one in our sample.

5. Discussion

5.1. The disturbing noise of biodiversity loss

Our analysis revealed three different ways in which Finnish forest owners moderated the dissonance caused by the disconfirming evidence of biodiversity loss. This information was either excluded, as in the uninvolved discourse; rejected, as in the sceptical discourse; or assimilated into the harmony of multi-objective forestry, as in the harmonising discourse. The majority of Finnish forest owners seem to use some of these discursive tools, as only 21% of the respondents recognised the well-documented biodiversity problem (Kouki et al., 2018; Hyvärinen et al., 2019) in Finnish forests. Based on the prevalence of the discourses, about one third of the forest owners rejected the disturbing information and still more reinterpreted it through the lenses of multi-objective forestry. Exclusion, in turn, was used by few forest owners.

The sceptical discourse sustained its coherence by judging the information on biodiversity loss as erroneous and those who spread this information as enemies. It took the wood production position in the eternal conflict between the productivist and environmentalist discourses documented in numerous forest policy studies (e.g. Arvai and Mascarenhas, 2001; Sandberg et al., 2004; Vainio and Paloniemi, 2013; Blicharska and Van Herzele, 2015; Riedl et al., 2018), also regarding Finnish forest policy (Paloniemi and Tikka, 2008). The idea that forestry is best biodiversity conservation (Vainio and Paloniemi, 2013) was also typical in the sceptical discourse. However, the uninvolved discourse was the only one that could completely exclude information on biodiversity loss. When this and other biodiversity issues were distant enough, the uninvolved discourse did not need to take a side in any question. The forest owners who produced these two discourses were not likely to take any voluntary biodiversity conservation measures. New regulatory policy instruments were also strongly opposed, especially by the advocates of the sceptical discourse. Within these discourses, biodiversity conservation was apparently seen as a threat for forest owner's autonomy (Miljand et al., 2021).

The harmonising discourse did not need to counteract information on biodiversity loss, even if it did not really support the idea. Modern multi-objective forestry was the solution that precluded the possibility of a biodiversity problem. This discourse thrives under the paradigm of multi-objective forestry, which has been typical of at least Finnish, Swedish and Canadian forest policy since the 1990s (Arvai and Mascarenhas, 2001; Lindahl et al., 2017; Takala et al., 2019a). The suggested measures for the maintenance of biodiversity, such as retention trees, made-up snags and saving the key biotopes, effectively illustrate the toolbox of multi-objective forestry. In contrast to the concerned discourse, the harmonising discourse pondered biodiversity maintenance from the perspective of forestry, not biodiversity itself. Paloniemi and Tikka (2008) also found that forest owners can take either a human- or nature-driven perspective to biodiversity maintenance. Even if multi-objective forestry is definitely a better option for biodiversity than single-objective wood production forestry, there is a risk that the consideration of biodiversity will remain superficial from the ecological perspective.

In line with the concern-free biodiversity maintenance in the harmonising discourse, some previous studies have illustrated how biodiversity conservation is integrated so tightly with modern Finnish forestry that it practically disappears (Primmer, 2011; Hyvärinen, 2020). When this has been typical of Finnish forest professionals and forestry organisations (Primmer, 2011), their advice – well appreciated within the harmonising discourse – has not necessarily guided the advocates of the harmonising discourse to any deeper ecological thinking. Ultimately, these problems related to the harmonising discourse and multi-objective forestry illustrate how difficult it has been to introduce new responsibilities to the Finnish forest sector, which has had such a clear focus on wood production for so long (Kotilainen and Rytteri, 2011).

As regards other major environmental problems of our time, climate change denial has also been discussed in the media, and its ideological origin has been studied to a great extent (e.g. Häkkinen and Akrami, 2014; Stanley et al., 2021). Obviously, we should also further discuss the similarly ideological biodiversity loss denial that seems to be so common among Finnish forest owners. As with the climate change issue (Stanley et al., 2021), the question is more about how to get people – decision-makers from the local to the global policy level in particular – to really listen and accept the problem, than about how to make them better informed (Delabre et al., 2020; Lau et al., 2021).

Regarding the issue of social equality, the advocates of the harmonising and the uninvolved discourse seem to fare well in Finnish society. This was indicated by the absence of worries and anxiety in these discourses. In contrast, the advocates of the concerned discourse and the sceptical discourse have unfavourable positions. The former worried about biodiversity loss and the latter suffered from irritating environmentalist information. Most likely, the advocates of the concerned discourse also encounter unpleasant messages that deny or exclude biodiversity loss. A morally interesting question is: to what extent should we sympathise with the advocates of the sceptical discourse who do not really care about biodiversity conservation? The sceptical discourse took the traditional wood production orientation, which has been privileged in the national Finnish policy for more than a century (Kotilainen and Rytteri, 2011). The critique aimed at environmentalists and the public media is probably a symptom of losing hegemony (Takala et al., 2020). It is important to notice that it is also a source of anxiety for some forest owners, even if it collides with the maintenance of biodiversity that is raised beyond other goals in our normative framework. However, despite the first signals of changing power relationships, the productivist discourses of the forest are still closer to hegemony than the environmentalist discourses in Finnish society (Takala et al., 2017; Takala et al., 2020). Biodiversity conservation is a topic that many productivist forest owners tend to skip in their narration of the forest, if it is not specifically elicited (Takala et al., 2019b).

5.2. Towards a more influential forest policy

Despite the poor recognition of biodiversity loss, our results also showed some positive signals. At first, still many – one fifth – of Finnish forest owners produced the concerned discourse. In this discourse, the definition of the term biodiversity, the perception of the state of biodiversity and the measures proposed for biodiversity maintenance repeated those presented by the ecological sciences. The lack of old-growth forests, old trees and deadwood are the main reasons for the loss of species diversity in Finnish forests (Hyvärinen et al., 2019), for which the concerned discourse proposed leaving (parts of) the forest untouched and increasing deadwood. These measures were obviously pondered on the basis of the biodiversity problem itself, not that of forestry operations. This illustrates the genuine nature-oriented motive of biodiversity maintenance, which should be made more prominent in the national discussion on Finnish forest ownership (Paloniemi and Tikka, 2008). Environmental orientation and knowledge of biodiversity issues peaked in the concerned discourse, both of which are known to facilitate biodiversity conservation activity (Langpap, 2004; Mitani and Lindhjem, 2015; Miljand et al., 2021).

It is noteworthy that the concerned discourse was the only one that shared the idea of biodiversity and the state of biodiversity with the ecological sciences. The uninvolved discourse excluded this information, the sceptical discourse protested it and the harmonising discourse adapted it to the idea of multi-objective forestry. This means that the uninterrupted communication of ecological facts reaches only one fifth of forest owners who already know a great deal and who also circulate this same information themselves. This discursive resistance is one obvious reason for the low effectiveness of informative policy instruments (Hysing and Olsson, 2005). Ecological information is essential, but it only makes a difference after people listen and apply it (Salomaa et al., 2016; Bugter et al., 2018) without selective hearing, and reinterpretation, which enables the oppression of any dissonance. Obviously, an evidence-informed policy for biodiversity conservation can mean quite different things depending on the discourse from which it stems. Certainly, the advocates of different discourses also use different information channels, and this could be an interesting topic for further research. Our results also illustrate how emotionally forest owners – equipped with different kinds of discursive lenses – react to all kinds of seemingly neutral information on biodiversity (Bujs and Lawrence, 2013).

However, the harmonising discourse was sensitive to biodiversity issues. Continuous, variable, multi-channel information (Tinch et al., 2018) about the state of biodiversity may slowly move some advocates of this discourse towards the concerned discourse. The harmonising discourse was the most common of our discourses, indicating that many Finnish forest owners could actually be influenced if the discursive barrier produced by the multi-objective forestry paradigm could be gradually broken. On a personal level, the change occurs when a forest owner replaces the idea of multi-objective harmony with concern over biodiversity loss. A trusted relationship with someone who recognises biodiversity loss may be an important change factor here. Change in the order of discourses occurs in turn when the concern over the biodiversity loss has become a normal and accepted feature among forest owners and the people around them, including also forest professionals.

Besides informative policy instruments, other voluntary instruments such as subsidies for temporary or permanent conservation or for nature-friendly forestry were primarily discussed in the harmonising discourse. This discourse combined a carefree interest and appreciation of nature (i.e. a kind of environmental orientation) with interest in economic incentives, both of which are documented to facilitate participation in biodiversity conservation programmes (Langpap, 2004; Mitani and Lindhjem, 2015; Miljand et al., 2021). Accordingly, the advocates of the harmonising discourse obviously form the primary target group for these kinds of voluntary instruments, which are popular and widely applied in Europe and the USA (e.g. Ma et al., 2012; Koskela and

Karppinen, 2021). These instruments also fit well into the toolbox of multi-objective forestry in their aim to create and ensure multiple benefits, at least financial and environmental advantages. Undoubtedly, these and other voluntary instruments such as forest certification and payments for ecosystem services add, or can add, an essential component to the forest policy mix in many societies (Bugter et al., 2018; Bouma et al., 2019; Sironen et al., 2020). However, the association with the harmonising discourse indicates that Finnish forest owners typically apply these measures to create further environmental benefits in addition to the privileged economic benefits, but not to stop an alarming biodiversity loss. The environmental orientation of the harmonising discourse lacked the concern over biodiversity loss typical of the concerned discourse, indicating that there are different types or levels of environmental orientation among Finnish forest owners (see also Häyrinen et al., 2015; Pynnönen et al., 2018). The advocates of the concerned discourse may also support many subsidy-based policy instruments, but some of them – those who lack the interest in economic incentives (Miljand et al., 2021) – may find the idea of demanding compensation for biodiversity conservation strange or even unpleasant (Primmer et al., 2014). This feeling is possible even without a deeper critique of the neoliberal commercialisation of nature.

Overall, our results show that we should not rely too much on the effectiveness of voluntary policy instruments in biodiversity conservation in Finland. Too few forest owners take biodiversity maintenance measures that stem from concern for biodiversity loss. More stringent regulation was strongly opposed by all discourses except the concerned discourse that raised the needs of nature beyond a forest owner's autonomy. However, it is possible that regulatory instruments will ultimately determine the future course of biodiversity in Finnish forests. Recent decades have seen a European-wide deregulation trend in forest policy, but it is specifically the major environmental issues such as biodiversity loss and climate change that create pressure for regulation (Nichiforel et al., 2020). Importantly, the demand for stronger regulation and the recognition of biodiversity loss were combined in the concerned discourse. This obviously indicates that the more forest owners we have who recognise biodiversity loss and become worried about it, the more compliance with increased regulation we may expect.

Although non-tangible objectives were emphasised in the concerned discourse, we do not know exactly how the producers of this discourse actually use their forest and its different parts. Taking care of nature and biodiversity does not have to mean uniform practices among all forest owners or in every forest or forest part. A forest owner's personal financial situation, for example, may also force them to sell more wood than they would like to. This study did not examine this kind of dissonance between objectives and realised forest use. Thus, we cannot conclude that 21% of Finnish forest owners prioritise biodiversity in their forest use. However, these forest owners have a clear idea of the biodiversity problem and conservation needs, which is a good starting point for influential biodiversity conservation. Previous studies have documented the connection between environmental sensitivity and pro-environmental land use practices (Drescher et al., 2017; Paloniemi and Tikka, 2008). We do not either know how the advocates of the harmonising discourse might actually use their forests or the existing biodiversity maintenance measures, even if this discourse reflects many traits that are related with active participation in biodiversity conservation programmes (Miljand et al., 2021). Many of these forest owners and the assistant forest professionals can already be happy with the standard forestry, when it is perceived to follow the national forestry guidelines (Äijälä et al., 2019) written in the spirit of multi-objective forestry. The advocates of the sceptical discourse and the uninvolved discourse most likely follow the minimum legal requirements for biodiversity conservation.

The common ground between the four discourses (Section 4.3) gives some reason for optimism from the biodiversity perspective. The discourses shared the idea that biodiversity is something valuable. There was also a common interest in forest species and nature, and even in new

forest services related to these. These findings illustrate the positive initial reactions that typical forest owners and, in fact, almost everyone have to nature and biodiversity (Horne et al., 2004; Hallikainen et al., 2010; Brukas et al., 2018; Bugter et al., 2018). This initial positive signal tells us very little about the underlying awareness, worldview, knowledge or behavioural intentions, but it is still a positive signal (Hysing and Olsson, 2005; Sawatzky, 2013) and a potential achievement of the 30 years of biodiversity rhetoric in Finnish society. It is possible that helping forest owners of all kinds to increase their knowledge of nature and species in their forest might promote pro-biodiversity behaviour. Recognising this common ground can also facilitate an interaction between the advocates of different discourses. The biggest and possibly most insurmountable challenge, however, is to find ways in which to present these issues that are not blocked by sceptics or ignored by those who are uninvolved (Bugter et al., 2018).

6. Conclusions

Based on our results, biodiversity conservation is still not a common mission among Finnish forest owners. While policy and policymaking seems to suggest such a direction, it is unrealistic to expect larger or radical changes in the near future due to the discursive resistance we identified in our analysis. There is no single study, policy instrument, argument, piece of art, or any other event of meaning-making that would change the order of discourses alone. Discourses guide forest owners to select messages that keep their worldview coherent – and changing one's worldview is not an easy feat. Slow change triggered by numerous cumulating messages from different sources is possible, but viewed through the lenses of discourse analysis, voluntary biodiversity conservation actually places its greatest hope in the next generations. Even if voluntary instruments make the forest policy mix for biodiversity conservation more acceptable for those involved in forest management, we should not rely too much on them when tackling biodiversity loss. In fact, the policy problem is not in the existing supply of biodiversity conservation measures, but in landowners' recognition of biodiversity loss and their motivation to stop it.

Our study was of Finnish forests and forest owners, but no doubt similar kinds of discursive processes exist in other decision-making and policy contexts throughout the world. The contested nature of most environmental issues suggests that understanding and breaking up discursive barriers – the mechanisms that help decision-makers across all levels (from local forest owners to participants in global forest governance) ignore alarming realities – is likely a major challenge for most environmental policy arenas, even far beyond that of Finnish forests.

Finally, some concluding remarks regarding the applied methodology. Combining a survey tool with a discourse analysis as proposed here is to some extent unconventional and hence deserves a brief reflection about advantages as well as risks and response strategies. First, also to clarify our discourse-theoretic perspective, we argue that it is difficult to conduct a discourse analysis using closed or short open-ended questions alone – unpacking discourses always demands narratives. In our case, the survey respondents were allowed to select only ready-made ingredients of discourses found in the earlier interview stage. Second, this means that a careful planning and implementation of the interviews or other documentation of narratives is crucial for a successful data collection and transparent analysis. Then, and only then as we would argue, the combination of interview and survey tools can be a highly effective response to i) problems of generalisation associated with in-depth qualitative analysis and ii) problems of in-depth interpretations associated with using survey data.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence

the work reported in this paper.

Acknowledgements

We thank all the forest owners and forest professionals who kindly participated in our study. The study was funded by Maj & Tor Nessling Foundation.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.forpol.2021.102681>.

References

- Äijälä, O., Koistinen, A., Sved, J., Vanhatalo, K., Väisänen, P. (Eds.), 2019. Metsänhoidon Suositukset [Forestry Recommendations]. Publications of Tapio, 252 p. (In Finnish).
- Alhojärvi, T., Sirviö, H., 2018. Affirming political ecology: seeds, hatchets and situated entanglements. *Nordia Geogr. Pub.* 47 (5), 1–6.
- Arvai, J.L., Mascarenhas, M.J., 2001. Print media framing of the environmental movement in a Canadian forestry debate. *Environ. Manag.* 27, 705–714.
- Barnett, C., 2016. Towards a geography of injustice. *Alue ja Ympäristö* 43 (1), 111–118.
- Blicharska, Malgorzata, Van Herzele, Ann, 2015. What a forest? Whose forest? Struggles over concepts and meanings in the debate about the conservation of the Białowieża Forest in Poland. *For. Policy Econ.* 57, 22–30.
- Bouma, J.A., Verbraak, M., Dietz, F., Brouwer, R., 2019. Policy mix: mess or merit? *J. Environ. Econ. Policy* 8 (1), 32–47.
- Brukas, V., Stanislovaitytis, A., Kavaliauskas, M., Gaizutis, A., 2018. Protecting or destructing? Local perceptions of environmental consideration in Lithuanian forestry. *Land Use Policy* 79, 1014–1023.
- Bugter, R., Harrison, P., Haslett, J., Tinch, R., 2018. Making a better case for biodiversity conservation: the BESAFE project. *Biodivers. Conserv.* 27, 1549–1560.
- Bujs, A., Lawrence, A., 2013. Emotional conflicts in rational forestry: towards a research agenda for understanding emotions in environmental conflicts. *Forest Policy Econ.* 33, 104–111.
- Delabre, I., Boyd, E., Brockhaus, M., Carton, W., Krause, T., Newell, P., Wong, G.Y., Zelli, F., 2020. Unearthing the myths of global sustainable forest governance. *Glob. Sustain.* 3 (e16), 1–10.
- Drescher, M., Warriner, G.K., Farmer, J.R., Larson, B.M.H., 2017. Private landowners and environmental conservation: a case study of social-psychological determinants of conservation program participation in Ontario. *Ecol. Soc.* 22 (1), 44.
- European Commission, 2020. EU Biodiversity Strategy for 2030. Bringing nature back into our lives. COM/2020/380 final.
- Fairclough, N., 2010. *Critical Discourse Analysis. The Critical Study of Language*, 2nd edn. Pearson Education Limited, Harlow. 608 p.
- Festinger, L., 1957. *A Theory of Cognitive Dissonance*. Stanford University Press, Redwood City, p. 291.
- Forest Act 1093/1996. Amendments up to 567/2014. Available at: <https://www.finlex.fi/fi/laki/kaannokset/1996/en19961093>.
- Häkkinen, K., Akrami, N., 2014. Ideology and climate change denial. *Pers. Individ. Differ.* 70, 62–65.
- Hallikainen, V., Hyppönen, M., Pernu, L., Puoskari, J., 2010. Family forest owners' opinions about forest management in northern Finland. *Silva Fennica* 44 (2), 363–384.
- Häyriäinen, L., Mattila, O., Berghäll, S., Toppinen, A., 2015. Forest ownership profiles as predictors of customer value: evidence from Finland. *Small Scale For.* 14 (1), 19–37.
- Horne, P., Koskela, T., Ovaskainen, V., 2004. Safeguarding forest biodiversity in Finland – citizens' and non-industrial private forest owners' views. In: Horne, P., Koskela, T., Ovaskainen, V. (Eds.), *Metsänomistajien ja kansalaisten näkemykset metsäluonnon monimuotoisuuden turvaamisesta*. Finnish Forest Research Institute (Research Papers 933. 110 p. In Finnish with English abstract).
- Hysing, E., Olsson, J., 2005. Sustainability through good advice? Assessing the governance of Swedish forest biodiversity. *Environ. Polit.* 14 (4), 510–526.
- Hyvärinen, P., 2020. Mushroom-foraging on northern tree plantations: diverse forest economies and the problem of plantationocentrism. *Alue ja Ympäristö* 49 (2), 22–43 (In Finnish with an English abstract.).
- Hyvärinen, E., Juslén, A., Kempainen, E., Uddström, A., Liukko, U.-M. (Eds.), 2019. The 2019 Red List of Finnish Species. Ministry of the Environment & Finnish Environment Institute, Helsinki (704 p. [in Finnish with an English abstract]). <https://www.environment.fi/redlist>.
- Karppinen, H., Hänninen, H., Horne, P., 2020. *Suomalainen metsänomistaja 2020 [The Finnish Forest Owner 2020]*. Luonnonvara- ja biotalouden tutkimus 30/2020. Natural Resources Institute Finland, Helsinki (73 p. [In Finnish.]).
- Koskela, T., Karppinen, H., 2021. Forest owners' willingness to implement measures to safeguard biodiversity: values, attitudes, ecological worldview and forest ownership objectives. *Small-scale For.* 20, 11–37.
- Kotilainen, J., Rytteri, T., 2011. Transformation of forest policy regimes in Finland since the 19th century. *J. Hist. Geogr.* 37, 429–439.
- Kouki, J., Junninen, K., Mäkelä, K., et al., 2018. *Metsät [Forests]*. In: Kontula, T., Raunio, A. (Eds.), *Threatened Habitat Types in Finland 2018, Red list of Habitats, Part I: Results and Basis for Assessment*. The Finnish Environment, pp. 171–201, 5/

2018. [in Finnish with an English abstract]. https://www.ymparisto.fi/fi-fi/luonto/luontotyypit/luontotyypin_uhanalaisuus/luontotyypin_uhanalaisuus_2018.
- Kröger, M., Raitio, K., 2017. Finnish forest policy in the era of bioeconomy: a pathway to sustainability? *Forest Policy Econ.* 77, 6–15.
- Langpap, C., 2004. Conservation incentives programs for endangered species: an analysis of landowner participation. *Land Econ.* 80 (3), 375–388.
- Lau, J.D., Song, A.M., Morrison, T., Fabinyi, M., Brown, K., Blythe, J., Allison, E.H., Adger, W.N., 2021. Morals and climate decision-making: insights from social and behavioural sciences. *Curr. Opin. Environ. Sustain.* 51 (52), 27–35.
- Lindahl, K.B., Sténs, A., Sandström, C., Johansson, J., Lidskog, R., Ranius, T., Roberge, J.-M., 2017. The Swedish forestry model: more of everything? *Forest Policy Econ.* 77, 44–55.
- Ma, Z., Butler, B.J., Kittredge, D.B., Catanzaro, P., 2012. Factors associated with landowner involvement in forest conservation programs in the U.S.: implications for policy design and outreach. *Land Use Policy* 29, 53–61.
- McCune, B., Grace, J.B., 2002. Analysis of Ecological Communities. MjM Software, Gleneden beach, p. 304.
- Miljand, M., Bjärstig, T., Eckerberg, K., Primmer, E., Sandström, C., 2021. Voluntary agreements to protect private forests – a realist review. *Forest Policy Econ.* 128, 102457.
- Ministry of Agriculture and Forestry, 2021. Forest Biodiversity Programme for Southern Finland (METSO). Available at: <https://mmm.fi/en/forests/biodiversity-and-protection/metsoprogramme> (Accessed 8 Sep 2021).
- Mitani, Y., Lindhjem, H., 2015. Forest owners' participation in voluntary biodiversity conservation: what does it take to forgo forestry for eternity? *Land Econ.* 91 (2), 235–251.
- Natural Resources Institute Finland, 2016. Ownership of Forest Land 2016. <https://stat.luke.fi/en/ownership-forest-land-2016.en>. Accessed 2 Feb 2021.
- Nature Conservation Act 1096/1996. Available at: <https://finlex.fi/en/laki/kaannokset/1996/en19961096> (Accessed 8 Sep 2021).
- Nichiforel, L., Deuffic, P., Jellesmark Thorsen, B., et al., 2020. Two decades of forest-related legislation changes in European countries analysed from a property rights perspective. *Forest Policy Econ.* 115, 102146.
- Oksanen, J., Blanchet, F.G., Friendly, F., Kindt, R., Legendre, P., McGlenn, D., Minchin, P. R., O'Hara, R.B., Simpson, G.L., Solymos, P., Stevens, M.H.H., Szoecs, E., Wagner, H., 2017. Vegan: Community Ecology Package. R package version 2.4-3. <https://CRAN.R-project.org/package=vegan>.
- Paloniemi, R., Tikka, P.M., 2008. Ecological and social aspects of biodiversity conservation on private lands. *Environ. Sci. Pol.* 11, 336–346.
- Primmer, E., 2011. Analysis of institutional adaptation: integration of biodiversity conservation into forestry. *J. Clean. Prod.* 19, 1822–1832.
- Primmer, E., Paloniemi, R., Similä, J., Tainio, A., 2014. Forest owner perceptions of institutions and voluntary contracting for biodiversity conservation: not crowding out but staying out. *Ecol. Econ.* 103, 1–10.
- Pynnönen, S., Paloniemi, R., Hujala, T., 2018. Recognizing the interest of forest owners to combine nature-oriented and economic uses of forests. *Small-Scale For.* 17, 443–470.
- R Core Team, 2017. R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, Vienna, Austria. URL: <https://www.R-project.org/>.
- Riedl, M., Hrib, M., Jarský, V., Jarkovská, M., 2018. Media analysis in a case study of Šumava National Park: a permanent dispute among interest groups. *Forest Policy Econ.* 89, 71–79.
- Salomaa, A., Paloniemi, R., Hujala, T., Rantala, S., Arponen, A., Niemelä, J., 2016. The use of knowledge in evidence-informed voluntary conservation of Finnish forests. *Forest Policy Econ.* 73, 90–98.
- Sandberg, L.A., Houde, N., Lavoie, P., 2004. Beyond L'Erreur boréale: The forest industry, environmentalism and image production in Quebec, Canada. In: Lehtinen, A., Donner-Amnell, J., Saether, B. (Eds.), *Politics of Forests*. Ashgate, Aldershot, pp. 63–83.
- Sawatzky, M., 2013. *Voices in the Woods: A Study of Forest-Use in Eastern Manitoba*, Vol. 55. Publications of the University of Eastern Finland, Joensuu, 193 p.
- Sironen, S., Primmer, E., Leskinen, P., Similä, J., Punttila, P., 2020. Context sensitive policy instruments: a multi-criteria decision analysis for safeguarding forest habitats in southwestern Finland. *Land Use Policy* 92, 104460.
- Stanley, S.K., Wilson, M.S., Milfont, T.L., 2021. Social dominance as an ideological barrier to environmental engagement: qualitative and quantitative insights. *Glob. Environ. Chang.* 67, 102223.
- Sullivan, S., 2018. Dissonant Sustainabilities? Politicising and Psychologising Antagonisms in the Conservation-Development Nexus. *Future Pasts Working Papers* no. 5.
- Takala, T., Hujala, T., Tanskanen, M., Tikkanen, J., 2017. The order of forest owners' discourses: hegemonic and marginalised truths about the forest and forest ownership. *J. Rural. Stud.* 55, 33–44.
- Takala, T., Lehtinen, A., Hujala, T., Tanskanen, M., Tikkanen, J., 2019a. The rise of multiobjective forestry paradigm in the Finnish print media. *For. Policy Econ.* 106, 101973.
- Takala, T., Hujala, T., Tanskanen, M., Tikkanen, J., 2019b. Competing discourses of the forest shape forest owners' ideas about nature and biodiversity conservation. *Biodivers. Conserv.* 28, 3445–3464.
- Takala, T., Lehtinen, A., Hujala, T., Tanskanen, M., Tikkanen, J., 2020. Discursal power and multi-objective forestry in the Finnish print media. *For. Policy Econ.* 111, 102031.
- Takala, T., Lehtinen, A., Hujala, T., Tanskanen, M., Brockhaus, M., Tikkanen, J., Toppinen, A., 2021. Forest owners as political actors. *Environ. Sci. Pol.* 126, 22–30.
- Tinch, R., Bugter, R., Blicharska, M., Harrison, P., Haslett, J., Jokinen, P., Mathieu, L., Primmer, E., 2018. Arguments for biodiversity conservation: factors influencing their observed effectiveness in European case studies. *Biodivers. Conserv.* 27, 1763–1788.
- Uliczka, H., 2003. Nature conservation efforts by forest owners – intentions and practice in a Swedish case study. *Silva Fennica* 37 (4), 459–475.
- UNECE and FAO, 2020. *Who Owns our Forests? Forest Ownership in the ECE Region*. ECE/TIM/SP/43. United Nations Publication, Geneva. <https://unece.org/forests/publications/forest-ownership-ece-region>.
- United Nations, 2015. *Transforming Our World: the 2030 Agenda for Sustainable Development*. A/RES/70/1.
- Vainio, A., Paloniemi, R., 2013. Adapting to the gender order: voluntary conservation by forest owners in Finland. *Land Use Policy* 35, 247–256.