Nordisk Miljörättslig Tidskrift

Nordic Environmental Law Journal

2018:1

www.nordiskmiljoratt.se

Nordisk Miljörättslig Tidskrift/Nordic Environmental Law Journal 2018:1
ISSN: 2000-4273
Redaktör och ansvarig utgivare/Editor and publisher: Gabriel Michanek
Webpage http://www.nordiskmiljoratt.se/omtidskriften.asp (which also includes writing instructions).

Forestry and no net loss principle. The possibilities and need to implement NNL in forest management in Finland

*Minna Pappila**

Abstract

Biodiversity is declining all over the world, although there are numerous conventions, policies, and strategies for tackling the problem. One way to approach the imminent problem is to use the no net loss (NNL) of biodiversity principle to help to prevent harm to biodiversity. The NNL principle urges the prevention of biodiversity losses during and after the completion of a development project or other land-use. According to mitigation hierarchy, losses should be first avoided and then minimized, and if possible, restored on the spot. If biodiversity loss occurs despite preventive measures, it must be fully compensated to create a no net loss situation. In this article, Finnish legislation and soft law regulation concerning forest management is scrutinized within the framework of the NNL principle. The analysis shows that there are many shortcomings in Finnish forest and nature protection regulation at all levels of mitigation hierarchy. Overall, the NNL principle proves to be useful for evaluating the ecological sustainability of ongoing land use such as forest management.

Keywords: biodiversity, no net loss, regulation, forest management, legislation, mitigation hierarchy

* Post-doctoral researcher, Faculty of Law, University of Turku.

1. Introduction[1]

1.1 No net loss

Biodiversity is declining worldwide, and the EU and Finland are not exceptions. There are various and complex reasons behind biodiversity decline, but land-use change and climate change are among the most ubiquitous and influential reasons for the decrease. Unsustainable economic and population growth are in turn the main indirect drivers causing the abovementioned changes.[2] Eventually the decline of biodiversity will also decrease human wellbeing by reducing ecosystem services.[3]

The earlier target of halting biodiversity loss by 2010 has not been achieved in the EU, while many species and habitats continue to decline in Finland as well.[4] Traditional nature protection regulation and governance do not seem to be enough. The current aim of the EU Biodiversity Strategy is to halt the loss of biodiversity and the degradation of ecosystem services by 2020. Global Aichi Biodiversity Targets include similar aims. One of the suggested and adopted means to achieve these goals is to operationalize the No Net Loss (NNL) principle more widely throughout the EU.[5] The same principle has also

[1] The author wants to thank the anonymous reviewer for useful comments and the Academy of Finland (project no. 298056) for financial support.

[2] UNEP 2011.

[3] Millennium Ecosystem Assessment, 2005.

[4] Rassi et al. 2010.

[5] European Commission 2011.

emerged in international conservation policy in relation to e.g. project finance.

NNL means that there should be no net loss of biodiversity during and after completing a development project or other land-use. If biodiversity loss occurs despite preventive measures, it must be compensated by e.g. restoring or re-creating a similar habitat elsewhere and thus gaining a no net loss situation or possibly even a net gain of biodiversity.

A so-called mitigation hierarchy determines preferred actions: first, the biodiversity loss should be *avoided* altogether by e.g. locating the project in a way that does not harm biodiversity. If that is not possible, the harm or losses should be *minimized*, for instance, by using certain kinds of technology or construction that decreases losses. Third, if there are losses after these precautions, those damages should be *restored in situ*. As this is not usually possible, finally, damages should be *compensated* somewhere else.[6] Compensation (also called offsetting) in this instance does not mean financial compensation but rather concrete restoration measures at a selected site. Compensations are probably the most debated part of mitigation hierarchy, because there are many uncertainties related to them.[7]

The EU has incorporated NNL thinking into its legislation to some extent. Currently, the NNL principle is only fully applied on the EU level with regards to the protection of Natura 2000 areas. It has, however, been widely acknowledged that there is, among other tasks, a need to incorporate a wider no net loss approach into EU policies and legislation as a means to achieve the aims of the EU Biodiversity Strategy. The European Commission was planning to propose an initiative on NNL by 2015, however, the plan has not even been initiated.[8]

The private sector has also introduced the NNL principle into their private regulation. The International Finance Corporation and many other international financial institutions have included NNL in their performance standards.[9] There is also, for example, a Standard on Biodiversity Offsets created by the Business and Biodiversity Offsets Programme.[10] The significance of NNL is undoubtedly increasing on various levels of regulation.

1.2 Need for reform?

The NNL principle is most commonly related to projects that change previous land use: e.g. from forest or pasture into an industrial area. Implementing this principle to ongoing land use such as forestry seems be very rare, even though forest management activities are the most pressing cause of threat of threatened species in Finland.[11] Ongoing land use such as agriculture and forestry typically have a small spatial footprint locally, although cumulative impacts may be large. Compared to projects such as mining and industrial plants, ongoing land use typically involves several actors, usually landowners, and therefore the coordination of avoidance and minimization can be more difficult than in other projects.[12]

There is also another topical reason for the need to scrutinize biodiversity conservation in Finnish forest regulation: in 2015, the Finnish Government adopted a plan named the National Forest Strategy 2025, which aims at increasing annual logging rates from 65 million m^3 to 80 million m^3.[13] This increase in output places

[6] European Commission 2008, p. 17, BBOP 2009, p. 1.
[7] Curran et al. 2014, Burgin 2008.
[8] The European Commission 2014.
[9] International Finance Corporation 2012.
[10] BBOP 2012.
[11] Rassi et al. 2010, p. 50.
[12] Aiama et al. 2015, p. 24.
[13] Ministry of Agriculture and Forestry 2015, p. 19.

immense pressure on biodiversity. At the same time, the National Forest Strategy emphasizes more effective biodiversity protection: "as most of the conservation areas are found in Northern Finland, more extensive protection of biodiversity than today is required, especially in Southern parts of the country".[14]

There are two ways to do this, both of which should be utilized. One way to protect biodiversity is to improve forest management so that biodiversity will be conserved more efficiently in production forests. Another solution is to increase forest protection areas by establishing nature protection areas, including voluntary – and sometimes temporary – protection financed by the forest protection programme METSO. Unfortunately, the METSO programme has been compromised at the same time as the strategy has been accepted: the state budget for the METSO programme is being reduced from 38 million euros in 2015, to 8 million euros in 2019.[15] It seems that emphasis is unavoidably on forest management. This requires improvements in current forest management practices because business-as-usual forestry will not lead to the achievement of the aims laid out in the National Forest Strategy 2025.[16] Over recent years, the quality of nature protection in forestry operations has even decreased slightly.[17]

Even if there is plenty of discourse and information in Finland suggesting that "everything is well in Finnish forest management", the Finnish forest sector has at least partly acknowledged the existing problem of biodiversity protection in production forests. The sector is continuously trying to improve biodiversity protection and water protection in forest management. A recent project lead by the Forestry Development Centre Tapio (Tapio hereafter), has searched for solutions to existing problems in nature management among the forest-sector actors themselves. Project results have shown that the minimum protection level of the Forest Act and forest certification schemes – i.e. PEFC as it covers 85 % of Finnish forests – have become the standard for forest management and there is not much space for improving contemporary practices of nature management in forestry. There is a standard way to interpret the recommendations and certification criteria and there is no room or freedom to implement them on a case by case basis according to the natural conditions, as the intention has originally been. In particular, it should be noted that economic aspirations restrict better nature management.[18]

1.3 The importance of forests in Finland

Finland is the most forested country in the EU. Nearly 78 % of its territory is covered by forests. In practice, this means that there are four hectares of forest per inhabitant. Further, most of Finland's forests are privately owned: one in five citizens owns forest land and the size of an average forest estate is 30 ha. The state owns approximately one third of the forests, located mainly in Northern Finland.[19] All told, about 80 % of Finnish forests are production forests, which means non-protected forests where logging is not generally restricted. In Southern Finland, only 2–4,8 % of forests have been protected.[20]

Finns have varying opinions on forest management. Some forest owners want to maximize their profits, some primarily value other issues,

[14] Ministry of Agriculture and Forestry 2015, p. 27.
[15] Ministry of Environment 2015.
[16] Saaristo et al. 2017, p. 12.
[17] Saaristo et al. 2017, p. 9.
[18] Saaristo et al. 2017, p. 40.
[19] Luke 2014.
[20] Luke 2016, WWF 2016. Different actors have different views on what counts as a forest. WWF does not count the most unproductive forests as forests, which is the main reason for different protection figures.

such as nature protection.[21] In general, forest owners are more approving of current forestry operations than other citizens. In terms of other issues, clearcutting is the most negatively evaluated forestry operation; 76 % of non-owners and 56 % of forest owners disapprove of this method.[22] Half of the Finnish population also believe that forest logging and management present a threat to biodiversity.[23]

2. Aim of the article

2.1 Selecting criteria for analysis

There are some questions that should be answered before the analysis of regulation. First, what kind of biodiversity is considered within NNL thinking? After all, nature and biodiversity are more or less everywhere, however, not everything can be protected.

Biodiversity is still today often valued via species and habitats even if ecosystem services approaches are slowly becoming more common.[24] Rare and endangered species are considered important, while other species are not usually thought to be as important. Importance, in this sense, is being calculated through the level of protection: only the habitats of most valuable species are protected. At the same time, less valuable species may be protected only from killing or capturing while their habitats are not protected.

Neither the Finnish Forest Act, nor any other act, prevents or restricts forestry land from being utilized for development purposes, for e.g. building or agriculture. This implies that "common" biodiversity is not protected in Finland unless it serves some special functions. In these cases, forest areas can be marked as recreation or other special areas in land use plans.

The amount of annual forest loss in Finland is small, yet not insignificant, compared to total forest area. About 10 000 ha out of 21 900 000 ha of forest area is lost annually, mainly to make room for construction.[25] Therefore, it is understandable why "common biodiversity" is not as such, under special area protection in Finland. There is more need for quality, than quantity of forests in Finland: more protected old-growth forests and better quality "production forests".[26] This does not mean that annual forest loss would be insignificant but rather not a high priority concern.

Due to the above-mentioned facts, "normal biodiversity" is left unscrutinised here. Outside of nature protection areas, biodiversity is protected either via species or via habitat protection rules. Certain habitats are protected by the Forest Act, the Nature Conservation Act and the Water Act. For its part, species protection is overseen via a complicated set of rules in various acts, principally in the NCA.

There is not enough space in this article to include all species protection categories in Finland. Therefore, in this article, I consider only the protection of breeding sites or resting places of the Habitat Directive annex IV(a) species, as it is the most debated protection requirement in Finland as well as of interest for international readers.

Further, I chose not to include all protected and endangered habitats here. All natural habitat types and traditional rural biotopes habitats were inventoried in Finland for the first time in 2008. According to the inventory, 70 % of forest habitat types are endangered.[27] Endangered habitats are not listed as such in legislation. In this article, only habitats protected according to the Forest Act are considered because those habitats

[21] Takala et al. 2017.
[22] Valkeapää and Karppinen 2013, p. 56.
[23] Metsäyhdistys 2012.
[24] Primmer and Furman 2012.
[25] Haakana et al. 2015.
[26] On conservation areas see Hanski 2005 and 2006.
[27] Raunio et al. 2008.

have come in contention with forest management most often.[28]

Limiting my research to those habitats and species would, however, be problematic as many of the reasons for the decline of biodiversity in Finnish forests are connected to the structure of the forests. According to the 2010 Red List of Finnish species, "changes in the forest environment are the primary cause of threat in the case of 693 species (30.8 % of endangered species). For more than half of these species, the cause of threat lies in decreasing amounts of decaying wood or forest management activities. Changes in the tree species composition of forests, as well as the reduction of old-growth forests and the decreasing number of large trees, constitute threats which are almost as significant".[29] Therefore, I will also pay attention to the regulation of decaying wood, tree species composition, old-growth forests and large trees.

However, I will not cover the protection of Natura 2000 sites because those areas are typically not managed as production forests and the Forest Act does not normally apply to nature protection areas. Nevertheless, it should be mentioned that the legislation concerning Natura 2000 network, i.e. Chapter 10 of the Nature Conservation Act, is the only piece of legislation in Finland that includes the complete mitigation hierarchy.

2.2 Research questions and method

In this article, I examine how Finnish forest legislation and other regulation correspond with the no net loss of biodiversity principle, especially mitigation hierarchy. I will look at the Forest Act (1093/1996) and the Nature Conservation Act (1096/1996) and analyse how well these acts direct the forest-user to follow the mitigation hierarchy. The aim is not only to find possible gaps in legislation and other regulation but also to evaluate whether NNL principle is in any way a suitable framework for on-going land-use such as forest management. As soft law plays an important role in Finnish forest governance, both forest certifications standards, PEFC and FSC will be scrutinized as well, and to some extent, other soft law such as best practice guidelines will also be examined.

According to the categorization offered by Kokko, forestry affects biodiversity in two ways: directly by destroying or deteriorating valuable habitats or old growth forests (*direct effect)* and by changing the structure of forests in general (*structural effect*).[30] Both aspects should be evaluated from the point of view of the NNL principle. Therefore, when I analyse the two abovementioned acts and soft law from the point of view of mitigation hierarchy, I will, in particular, look at the measures required when the habitats of a flying squirrel or brook or a spring is located in a logging area. The flying squirrel is a species protected by the EU Habitats Directive (art. 12) as an annex IV (a) species and by the 49 § of the Finnish Nature Conservation Act. Brooks, and springs that are in its natural state, or near it, are protected by the Water Act (channel protected) and the Forest Act (surroundings protected).

In addition, I will consider how structural issues, i.e. decaying wood, tree species composition and large trees, have been taken into account in regulation. The compliance of Finnish forest regulation with the EU nature protection legislation i.e. the Habitats Directive and the Birds Directive, is considered whenever relevant.

This research includes both analysis of the existing state of regulation (*de lege lata*) and critical analysis of how well regulation enhances the

[28] The borders of the habitats protected by the NCA are clearly delineated by authorities (NCA 30 §).

[29] Rassi et al. 2010, p. 49.

[30] Kokko 2009, p. 57.

ecological aims of the EU[31] and Finnish government[32] as well as what should be changed (*de lege ferenda*). Therefore, while studying the effectiveness of Finnish regulation on forest biodiversity, this research is part of the regulatory research tradition. Research material consists of legislation and other regulation, case law, research literature, policy papers and various reports on the state of biodiversity in Finland.

3. Regulating forestry in Finland

3.1 Hard law

The Forest Act is the main act regulating forestry in Finland. The freedom of forest owners to manage their forests as they see fit, was increased when the Forest Act was amended in 2013.[33] A forest owner may now decide when she wants to cut down trees in her own forest, regardless of the age and size of the trees. The owner can also select the form of logging; earlier, even-aged forest management (including clear cut harvesting and thinning from below) was practically the only form of forest management, whereas now, the owner may also practice continuous cover forestry, such as the selection cutting of individual trees or small groups of trees. In addition, the owner is obliged to take care of regeneration after felling and to protect the habitats of special importance. These regulations are also binding for professional forest harvesters, who usually carry out cutting instead of forest owners. Although no cutting licence is required, control is based on forest declarations, which must be sent to the Forest Centre at least ten days before felling or other operations.[34]

In addition to the Forest Act and other forest regulation, the Nature Conservation Act and the Water Act also regulate forestry to some extent. The Nature Conservation Act includes stipulations on the protection of species and habitats that must be complied with during forest management if certain species or habitats are present in the area. The Water Act, in turn, protects the channels of rivulets and springs, and regulates ditching and ditch network management.[35]

The Land Use and Building Act (132/1999) regulates forestry instead of the Forest Act if a forest is located in an area covered by a local detailed plan or a master plan and the forest area concerned is not designated for agriculture and forestry. As the clear majority of forests are located on areas covered by the Forest Act, and not the Land Use and Building Act, this article does not discuss the Land Use and Building Act further.

3.2 Soft law

The National Forest Strategy aims at increasing annual harvesting volumes from 65 m^3 to 80 m^3. It also mentions certain measures that should be taken to halt biodiversity decline, to increase the volume of dead wood and to decrease sedimentation discharges from ditch network maintenance – but it does not mention how to get there.[36]

There are regional forest programmes that cover all 14 regions of Finland. They are of a very general nature and are non-legally binding. Thus, these programmes do not imply legally binding obligations on private forest owners and

[31] European Commission 2011.
[32] Ministry of Agriculture and Forestry 2015.
[33] The Act on changing the Forest Act 1085/2013.
[34] The time was shortened from previous 14 days to ten days by amendments to Forest Act in 2013. The rationale was to increase the flexibility of loggings and logistics. According to preparatory materials IT technology has made the surveillance of declarations so efficient that nature protection is not compromised. HE 75/2013 vp, p. 36. Ministry of Environment and environmental NGOs opposed this change. Ibid. p. 13.
[35] On the regulation of forest ditching, see Pappila and Halonen 2015.
[36] Ministry of Agriculture and Forestry 2015.

they mainly steer the funding policy of the Forestry Centre.[37]

Finnish forestry is very much regulated through soft law. Legislation only provides the framework, while the best practice guidelines of Tapio and the Finnish PEFC and FSC forest certification standards give more detailed recommendations about how to practice forest management. For example, Finnish forest legislation does not direct one to leave decaying trees on a logging site, but the voluntary PEFC and FSC standards order forest managers to leave retention and decaying trees on logging sites.[38]

The best practice guidelines of Tapio have a long history and they are well regarded among forest professionals. The guidelines included environmental recommendations much before legislation, however, it took some time before they were implemented into practice. Attitudes within the forest sector have become more biodiversity friendly due to changes in forest law, the education of professionals and forest owners as well as changes in general opinion. These modifications were at least partly the results of NGO campaigns raising awareness of biodiversity issues and Finland joining the EU in 1995.[39]

The most detailed soft law forest management rules are currently included in the Finnish PEFC and FSC forest certification schemes. The forest management standards of the both schemes are taken into consideration as a part of the analysis of forest regulation.

About 85 % of Finnish forests – i.e. 17 660 520 ha – are certified by PEFC.[40] The Finnish forest certification scheme was put in operation in 1999 and endorsed in PEFC in 2000 and the first FSC standard was approved in Finland a bit later. Currently, there are 1 357 000 ha of FSC certified forests in Finland.[41]

4. Analysis of Forest law and regulation

4.1 General information about biodiversity protection

There is no *general* obligation in Finnish environmental legislation to assess or to avoid the negative biodiversity effects of forest management activities; nor does the EIA process apply to normal forest management projects (The EIA process is required only in the case of large (more than 200 ha) projects of permanent alteration of natural forest, peatland or wetland). There is a general obligation to be aware of the environmental impacts in the Act on EIA (31 §), but so far, it has not been interpreted so that it would have any special implications for forest owners and harvesters. There is also no binding requirement to avoid or minimize the degradation of biodiversity during forest management. The Forest Act does state that "forests shall be managed and used in such a manner that the general conditions for the preservation of habitats important for the biological diversity of forests are safeguarded" (10 §) but this does not set any concrete and legally binding requirements for forest users.

Protection of the *habitats of special importance* is the only legally binding requirement that forest owners and forest harvesters have in terms of biodiversity protection according to forest legislation (Forest Act 10, 10a, 10b and 11 §). If a habitat is in its natural or semi-natural state and can be clearly distinguished from the surrounding forest nature, it is protected automatically. To enhance protection, the Finnish Forest Centre and Tapio mapped privately-owned forests to find the protected forest habitats that existed after the Forest Act came into force in 1997. In these inventories, about 4/5 of existing habitats were

[37] Pappila and Pölönen 2012, p. 179.
[38] PEFC 2014, FSC 2011.
[39] Keto-Tokoi 2006, p. 106.
[40] PEFC 2017.
[41] FSC 2017.

found.[42] Mean size of habitats is 0,6 ha[43] and "an upper size limit of 1 ha has been generally used in the Finnish WKH definitions and inventory projects".[44]

All other biodiversity requirements concerning forest management, such as the preservation of old holdover trees and dead and decaying trees, are based on soft law: forest certification schemes and the best practice guidelines.

4.2 Avoid

The Finnish Forest Act determines certain habitat types, called habitats of special importance (10 §), which are protected. The Forest Act, however, does not require that habitats remain untouched. *Cautious management and utilisation operations are allowed*, but the *characteristic features* of the habitats must be preserved or reinforced (10b §). Also, during operations, the special water economy, stand structure, old holdover trees and dead and decaying trees shall be preserved and the vegetation, variability of the terrain and the soil type shall be *taken into account*. This is the only case when the forest owner/logger has an obligation to save old, dead and decaying trees. If those trees are not located on a habitat of special importance, they do not have to be saved.

Some of the habitats of special importance are also habitats mentioned in the Habitats Directive. In Finland e.g. springs and alkaline fens (letto in Finnish) are protected by the Forest Act. Currently the conservation status of both springs and alkaline fens is unfavourable and the habitat types are endangered.[45] 4 % of springs have been protected in Natura 2000 sites in Southern Finland. Other springs are protected according to the Forest Act and Water Act.[46]

The forest act aims at avoiding the deterioration of the habitats of special importance. There are, however, a few features that reduce the effectiveness of habitat protection and avoidance (see below) into minimizing the effects.

The act does not, in any way, regulate logging in other parts of the forest. There is no requirement, for example, to protect areas of old-growth forests, or to leave old holdover trees or dead and decaying trees in the forest.

Despite the absence of obligation in legislation, the amount of deadwood started to increase in Finnish forests at the end of 1990's due to best practice recommendations of Tapio and later due to the forest certification schemes. PEFC certification requires that a minimum of 10 dead and retention trees per hectare are left.[47] The less used FSC certification obliges one to permanently leave a minimum 20 dead trees per hectare (when they exist)[48] and an average minimum of 10 large trees per hectare[49] and e.g. the following valuable living trees: very large old trees (min 60 cm diameter), big aspens (min 40 cm), fire-cracked pines and hardwood trees (min 10 cm).[50]

In the clear-cutting sites of private forests, the amount of deadwood increased from 0,6 m^3/ha in 1996 to 1,4 m^3/ha in 2007. Lately, however, the amount has again decreased back to the numbers of the late 1990s.[51] Therefore, it is clear that soft law and educational efforts has been inadequate for permanently and sufficiently increasing the amount of deadwood in Finnish forests.

---

[42] Kotiaho and Selonen (2006) studied the quality of mapping and found out that 1/5 of the habitats were not found.

[43] HE 75/2013 vp, p. 11.

[44] Timonen et al. 2010, p. 313. WHK is short for woodland key habitats.

[45] Raunio et al., 2013, p. 81, Raunio et al. 2008, p. 68, 85. In Finland 80 % of the habitats protected by the Habitats Directive are in unfavorable conservation status. Ibid, p. 9.

[46] Water Act does not protect the surroundings i.e. forest around the spring or rivulet.

[47] PEFC 2014, criterion 14.

[48] FSC 2011 indicator 6.3.1. S.B.

[49] FSC 2011 indicator 6.3.2.1 S.

[50] FSC 2011 indicator 6.3.2.2. S.

[51] Luonnontila 2015.

4.3 Minimize

Cautious management and the utilisation of habitats of special importance dilutes the avoidance obligation to a minimization requirement. According to the Forest Act, "cautious fellings by picking individual trees may be undertaken which preserve the stand in its natural or semi-natural state in a way that the natural or semi-natural water economy of the habitat does not change".

Moreover, as habitats should be "small in area or have little significance for forestry purposes", selective logging further deteriorates the already small forest plots.[52] The "small in area" criteria were added to the Forest Act in 2013. It was not meant to change previous practices or interpretation of the Forest Act, however, in one region (North Ostrobothnia) at least, it has changed the selection of habitats so that too large habitats have been left out of the protection.[53]

The immediate surroundings of springs, brooks and rivulets is a good example of this "smallness", even if they are the largest of the protected habitats (Forest Act 10.2 §). In practice, the protection zone i.e. the immediate surroundings of springs, brooks and rivulets is 13–14 metres wide.[54] Ecologists say that the protection zone should be a minimum of 30 metres, to really protect the characteristic features of those habitats as e.g. the micro climate of those habitats changes dramatically after cutting surrounding forests.[55] The FSC standard requires a minimum 20 metres of a protection zone along springs, brooks, rivulets, which although closer to ecological requirements, is not enough; whereas PEFC does not add anything to the protection of springs, brooks and rivulets.[56]

Even if according to surveys, the actual width of the protection zones is approximately 14 metres, this does not mean that it would be the minimum accepted width. There are no statistics on what the Forestry Centre considers a wide enough protection zone along rivulets and around springs, and what amounts a violation of habitat protection, which supposedly varies on a case by case basis. The boundaries of the habitat depend on the characteristics of the habitat, as it must be "clearly distinguished from the surrounding forest nature" (Forest Act 10.2 §).

The Forest Act was also amended in 2013 in other ways that do not support the aim of avoiding and minimizing biodiversity loss. A new 10 a § states that "when exercising special caution timber may be transported in habitats of special importance and a channel of a brook may be crossed if this does not endanger the preservation of the characteristic features". This is clearly a risk for small-sized habitats and brooks, because the regulations of the Forest Act tend to be interpreted in favour of forest management.[57] There is no obligation or even recommendation to use e.g. temporary bridges to protect the brook. In their project report, Saaristo et al. mention bridges and spruce twigs as a possible means to protect brooks and rivulets.[58]

The Forestry Centre follows the quality of forest management annually through random and selected samples. In 2016, the Forestry Centre inspected 343 logging areas (1 103 ha in total) and there were 118 habitats of special importance in these 343 logging areas.[59] According to statistics, 92 % of the area of the habitats has been

[52] Timonen et al. 2010.
[53] Koistinen et al. 2017, p. 4.
[54] Saari, Finér, Laurén 2009, p. 22.
[55] Saari, Finér, Laurén 2009, p. 8.
[56] FSC 2011 indicator 6.4.1.2.S.
[57] The habitats are already very small and especially brooks tend to be altered during loggings i.e. there are violations against the protection regime. See more about this below. See also Raunio et al. 2008, p. 68.
[58] Saaristo et al. 2017, p. 14.
[59] Metsäkeskus 2016.

preserved in loggings, 4 % almost preserved, 3 % partly and 1 % totally changed i.e. deteriorated.

It is unfortunate, yet not surprising, that those habitats where there is the most wood per hectare have also suffered the most from loggings. In 2016, 65 % of the acreage of luxurious herb-rich forest patches (207 m^3/ha) have remained untouched, while 33 % have been completely deteriorated. 86 % of the immediate surroundings of rivulets and brooks (184 m^3/ha) have been preserved completely, whereas the habitats with less wood mass (38–46 m^3/ha) such as fens, sandy soils, exposed bedrock and boulder fields have been 100 % preserved.[60] Logging of those areas of low productivity is not very profitable.

Many of those Forest Act habitats that are typically preserved only partially or are partially destroyed, are also threatened habitats. For example, all types of rivulets and springs are threatened in Southern Finland.[61] About 7 % of the area of brooks is not preserved completely during loggings i.e. a portion of them either deteriorate or are destroyed every year. Yet only 2 % of brooks are currently in a natural state in Southern Finland. When the deterioration cumulates year after year, the conservation status of brooks in Finland is not favourable and forest management here clearly does not follow the no net loss of biodiversity principle.

As mentioned earlier, there is no general obligation to minimize harms to biodiversity. There is the general principle in 10.1 § (see above), but it does not really have concrete effects on forest management and it seems that it has not affected the interpretation of the Forest Act, either. This stipulation has not, for example, lead to a biodiversity positive interpretation of 11 § on derogation. Kokko calls 11 § ”a classic example of deficient legislation in Finland”.[62]

There is a possibility of derogation from the protection of habitats of special importance. The Forestry Centre shall – i.e. there is no discretion, should the landowner send an application – grant the landowner a derogation allowing the execution of management operations in a way that the loss to the party concerned remains minimal (11 §). The loss means financial loss that habitat protection would cause to the owner. The threshold for the loss is either 3000 euros or 4 % of the forest property concerned. The threshold corresponds to the current interpretation of the Constitution; there is, on the one hand, the protection of property rights and on the other hand, everyone’s responsibility for biodiversity protection. The derogation does not give the right to destroy the habitat completely. The harvester is only allowed to do loggings to the extent that the habitat protection causes only minimal loss or harm to the landowner.

The landowner also has the possibility to apply for monetary compensation for their losses, however, at the same time, the owner can also choose to destroy the habitat to the extent it causes more than minimal loss. Here, the Forest Act clearly functions against mitigation hierarchy, while the current regulation on derogations is against the obligation to avoid and minimize. In practice, this might not be a huge problem, as in 2016 when only 9 derogations were granted. In previous years, however, the figures have been higher. For example, 131 derogations were granted in 2010, 129 in 2012 and 86 in 2014. The lower number of derogations in 2016 might be due to changes in law: there is no more need for derogations in the case of damage caused by a storm nor for the transportation of timber in habitats

[60] Metsäkeskus 2016.
[61] Raunio et al. 2008, p. 70.
[62] Kokko 2009, p. 62.

or the crossing of a brook or a rivulet (which was forbidden earlier).[63] Nevertheless, the number of derogations is small compared to the amount of forest declarations that the Forestry Centre receives annually: about 100 000 declarations. Unintentional or negligent deteriorations of the habitats cause more harm to biodiversity.

4.4 Restore

The Forest Act requires that one who treats a forest contrary to certain sections of the Forest Act (e.g. protection of the habitats of special importance), "is obliged to remove the effects of the illegal operations or to restore the original conditions to an extent that is possible at reasonable cost" (20 §). Thus, there is a very clear obligation to restore an illegally deteriorated forest area whenever it is possible and reasonable.

As mentioned earlier, a share of habitats becomes deteriorated every year. Thus, there is clearly a need for remedial measures in many of the protected habitats. Typically, the remedial measures are, however, unfeasible, because it is not possible to bring the cut trees back any faster than would occur anyway through natural regeneration. The most common reasons for the deterioration of protected habitats, are that there has been either a total or a partial clear cutting on the habitat, or that local climatic or shadowing circumstances have changed. Yet, it would be possible to restore – at least partially – a rivulet, brook or a spring that has been deteriorated by machine tracks.

It is not possible to ascertain how often the forest owner or harvester has been obliged to restore a habitat of special importance, as there are no specific statistics about that issue.[64] According to an official from the Forestry Centre, most of the restoring cases concern regeneration obligation. According to 2016 statistics, there were only three cases when the party concerned has been obliged to carry out the necessary restoring measures. These cases unlikely concerned deteriorated habitats but rather neglected regeneration tasks even if there are quite a few habitats that every year loose part or all of their characteristics.

In addition to the restoration obligation, destroying a habitat can also lead to criminal sanctions. In 2016, the Forestry Centre reported two habitat-related forest offences or forest infringements for prosecution. Between 2009 and 2015, there have been only 6 cases of forest offence. Similä et al. state that the figure is very low in comparison to the thousands of forestry operations conducted in private forests in Finland annually and therefore claim that compliance with the Forest Act is very high.[65] Laakso et al., however, have shown ten years earlier, that most violations were not reported to the police at all and when they were, charges were dropped much more often in forest-related crimes (68 %) than in other crimes (26–32 %).[66] One of the reasons for this is that infringements and offences go unnoticed within the period of limitation (2 and 5 years respectively) and the prosecutors might have too high a threshold for accusing the suspect of a forest offence, instead of an infringement.[67]

The Forestry Centre inspects sample areas every year and about 3 % of the area of the habitats have been, partly, and 1 %, totally, changed i.e. deteriorated. The reports suggest that there are 1–2 severe violations among the sample logging areas every year. As there are 110 000 forest declarations annually, there must be more severe

[63] Koistinen et al. 2017, p. 30.
[64] E-mail, 2017 April 6, from Partanen J, Head of Finance and Surveillance, Finnish Forestry Centre.
[65] Similä et al. 2014, p. 84.
[66] Laakso et al. 2003.
[67] Leppänen 2003.

violations of habitat protection than the 1–2 cases prosecuted annually.

Criminal law is not the best means to improve the quality of forest management and habitat protection but the continuously steady level of infringements (habitat deterioration) and overly lenient treatment of forest infringements gives the wrong signal to forest harvesters, who are chiefly professionals.

Restoration could also mean creating deadwood by killing some trees deliberately. No regulation requires this to be done even if it would be vital to create much more deadwood in Finnish forests. There could perhaps be a rule introduced requiring a certain amount of deadwood in every hectare. If there is not enough, it could be made by girdling some trees of sufficient mass, or by buying a share from a "habitat bank" or similar.

4.5 Compensatory measures

There is no obligation to compensate for violations off-site if restoration is unfeasible on-site or would be too expensive. Nevertheless, ecological compensations as the last step of the NNL principle concerns only planned, preferably pre-planned, completed compensatory measures. Therefore, the remedial measures of the Forest Act, or for example, the Environmental Liability Directive, are of no help in assessing the possibilities of ecological compensation related to NNL principle as those obligations to compensate only concern illegal actions.

Pre-planned ecological compensations do not seem to fit the habitat protection system described in the Finnish Forest Act. According to the Forest Act, intentional forest habitat destruction is allowed to the extent that habitat protection causes more than minimal reduction in forest yield or other financial loss or harm (11 §). A possible, new obligation to compensate would not be compatible with the current underlying idea that habitat protection should not create too large of an economic burden for forest owners, and that therefore it is currently allowed – after acquiring a derogation – to destroy part of the "too big" habitat.

Nevertheless, there is the problem of deteriorating or destroying habitats. In many cases, this doubtlessly happens unintentionally, yet economic interests also prevail.[68] Could compensations somehow help to compensate for these habitat losses? Financial habitat protection funding already exists: it is possible to receive "environmental aid" to protect habitats more than the Forest Act requires or to conduct restoration measures within a habitat. There is also the METSO programme that finances voluntary forest protection measures. Yet, there is no systematic programme of forest habitat restoration outside protection areas; something that would compensate for the annual deterioration or destruction of forest habitats. The systematic restoration of deteriorated habitats off-site would have to be a collective action, paid for by the forest offenders, or by the forest sector as a whole, according to the "polluter pays" principle.[69]

5. Analysis of Nature Conservation Act and related soft law

5.1 The scope of analysis

There are several rules in the Nature Conservation Act (NCA) that require the avoidance of destroying habitats or harming species, and are relevant to both forest management and utilization:

1) The protection of *protected* species is regulated in 38 §. According to which, all (except for species regulated by the Hunting Act[70]: game

[68] Leppänen 2003, p. 211.

[69] The polluter pays principle is nowadays often stretched from mere pollution to other kinds of unwanted environmental changes. See e.g. Werde et al. 2018, p. v.

[70] Hunting Act 615/1993.

and unprotected species[71]) birds and mammals are protected, and other species can be protected by adding them to the list of the Nature Conservation Decree (NCC). There are currently 62 animals, 131 vascular plants and 13 species of moss that are protected by the decree. For example, the deliberate killing and capture, and deliberate disturbance of animals, particularly during mating season, in important resting places during migration, or on any other sites of significance to their life cycles, is prohibited. The state has no duty to pay compensation for these protection measures.

2) *Endangered* species have been listed according to the NCA 46 § in annex 4 of the NCC: there are altogether 2,124 species. The Ministry of Environment is responsible for monitoring the status of endangered species, but there is no special protection regime that would obligate landowners to protect these species during forest operations. Further, there is no stipulation on receiving monetary compensation, if the owner wants to protect a habitat of an endangered species. (The owner can try to obtain money from the voluntary forest protection programme METSO. Also, an administrative procedure has been developed to enhance the voluntary protection of endangered species.[72])

3) A portion of endangered species are *specially protected* species according to NCA 47 § (680 animal and plant species). Their habitats are protected if the regional environmental authority, ELY-centre (The Centre for Economic Development, Transport and the Environment) has delineated them. By 2016, ELY-centres had made 225 such decisions.[73] These decisions forbid forest management within these habitats and landowners are entitled to full compensation if significant inconvenience occurs (NCA 53 §).

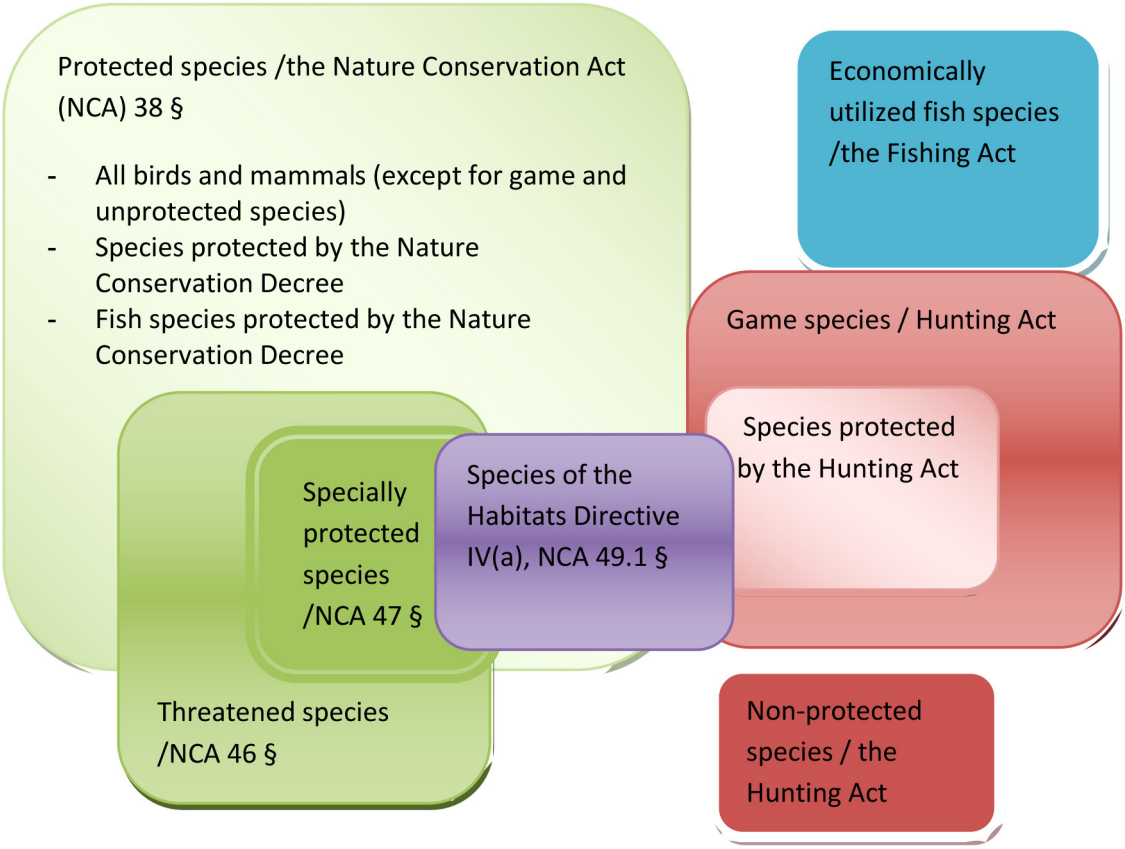
4) Part of the endangered species are "*directive species*" protected according the NCA 49 § (and the Habitats Directive art. 12(1)(d)and annex IV(a)). In Finland there are 43 such species. All breeding and resting places are protected automatically – also those of the game species that are otherwise regulated by the Hunting act – according to the NCA, while the landowner is entitled to monetary compensation (NCA 53 §).

All these species groups have a different status and a species may belong to 1-4 of these categories. In addition, there are species protected under CITES convention (Nature Conservation Act 44 §), species protected mainly or only by the Hunting Act (e.g. wolves, bears, lynx) and non-protected species listed in the Hunting Act (e.g. rats). Fish species are regulated in the Fishing Act, except for those species protected by the Nature Conservation Act (37 fish species are protected, one declared endangered at the moment). Therefore, the actions required of the forest owner – or more likely of the forest harvester, depend on the species.

As the protection regulation of species is too complex to be covered in one article, I have chosen to analyse what is internationally, the most interesting case: the protection of breeding sites or resting places of the Habitat Directive annex IV(a) species from deterioration or destruction (Nature Conservation Act 49 §).

Picture 1. This is an indicative chart of different species categories. It includes only animal species. It does not include e.g. the category of CITES-species, which would overlap several of the categories.

[71] Unprotected species include species such as brown rat and house mouse (Hunting Act 5 §).
[72] Saaristo et al. 2010.
[73] Ikonen 2016.



5.2 Avoid and minimize: species of the Habitat Directive

Protection of the habitats of "directive species" (Habitats Directive art. 12(1)(d)) is based on 49 § of the Nature Conservation Act. It repeats the wording of the Habitats Directive: "The destruction and deterioration of breeding sites and resting places used by specimens of animal species referred to in Annex IV(a) of the Habitats Directive is prohibited".

The number of directive species in Finland is 43. The species most often in conflict with forest management is the flying squirrel and, therefore, I use it here as an example. Due to very strict – at least in theory – habitat protection, the flying squirrel has become one of the most debated and hated animals in Finland. Flying squirrel are quite numerous in Finland. There are approximately 143 000 female animals in Finland, although the number has diminished 23 % over the last ten years (from 2006 to 2015) and their conservation status is thus not favourable.[74]

Until 2016, ELY Centres delineated the boundaries of the habitat when the Forestry Centre informed the ELY Centre about a forest declaration concerning the habitat of a flying squirrel.

The areas delineated as breeding sites and resting places were usually less than 0,5 hectares.[75] That size of a delineated area was still larger than what the directions of the Ministry of Agriculture and Forestry and the Ministry of Environment suggested: 0,03–0,07 ha.[76] The latter guide from 2016 does not provide clear instructions.[77]

[74] Jokinen 2012.
[75] Jokinen 2012.
[76] Ministry of Agriculture and Forestry and Ministry of Environment 2003.
[77] Ministry of Agriculture and Forestry and Ministry of the Environment 2016.

The delineation procedure has not helped to stop the degradation of the conservation status of the species. According to a recent field study, only 21–36 % of breeding sites and resting places are habited one year after loggings. Half of the examined (after delineation and loggings) breeding sites and resting places (n 100) were less than 0,3 ha. The size of the breeding site or resting place is not the only decisive element. The quality of the surrounding forests outside the logging area also defines the suitability of the breeding site and resting place for the flying squirrel.[78] According to the study, within 150 metres from a breeding site or a resting place, at least 35–60 % of the forest should be suitable for the flying squirrel.[79] This means that there should be 2,4–4,2 hectares of suitable forest surrounding the habitat.

The problem was also that ELY Centres used most of the human resources that were reserved for species protection to delineating the sites of flying squirrels and thus there was no longer enough time available for the protection of more rare and endangered species. Since 2016, ELY Centres have not delineated habitats, although forest owners may still ask for advice from an ELY Centre.[80] After this amendment of the NCA in 2016, the Ministry of Agriculture and Forestry and the Ministry of the Environment published a recommendation for the protection of flying squirrel in forestry operations.[81] The new recommendation does not mention a minimum area for the protection of the habitats. Rather, it merely states that all nesting trees should be left standing and trees in the immediate vicinity of nesting trees, including feeding trees (aspens, birches, alders), spruces suitable for food storage and indispensable shelter trees. Further, the amendment maintains the risk of wind damage should be taken into account.[82] All in all, the immediate vicinity does not sound like 2–4 ha but appears to be closer to 0,5 ha.

The Supreme Administrative Court of Finland (KHO abbreviated from Finnish), has made decisions on the appropriate interpretation of the 49 § of the NCA. First, there is case KHO 2014:13 in which the court decided that 3,7 hectares is an excessive area for the protection of the breeding sites and resting places of flying squirrels. The ELY Centre, which had delineated the site, referred to research that has shown that flying squirrels need 3–4 hectares of suitable forest around the site.[83] The court in turn emphasized that the Habitats Directive does not demand the protection of the whole habitat and that when NCA 49 § was enacted, it was not meant to protect such large areas. The KHO states that the recommendation of the two ministries[84] – even if not binding – reflects the idea behind the provision i.e. that the site is of small size. The KHO also states that flying squirrels are protected in Natura 2000 sites and in other nature conservations areas, too. The court did not base its reasoning on scientific research but on legal interpretation and context.[85] There is no reference to the conservation status of the flying squirrel, even if the favourable conservation status of species is the general aim of the Habitats Directive, and the NCA as well (5 §). Additionally, the implementation "(m)easures taken pursuant to this Directive shall be designed to maintain or restore, at favourable conservation status, natural habitats

[78] Jokinen 2012, p. 53–54.
[79] Jokinen 2012, p. 56.
[80] NCA 72 § that stipulated the delineation process, was annulled in 2016.
[81] Ministry of Agriculture and Forestry and Ministry of the Environment 2016.
[82] Ministry of Agriculture and Forestry and Ministry of the Environment 2016.
[83] Jokinen 2016.
[84] Ministry of Agriculture and Forestry and Ministry of the Environment 2003.
[85] Halonen 2014.

and species of wild fauna and flora of Community interest".[86] Finally, the KHO did not determine what the correct size of the site should be but returned the case to the ELY Centre.

In another decision (KHO 2015:269), the KHO found that the delineated area was too small and would have caused deterioration of the breeding site and resting place. There were two breeding sites (two nesting trees) and between them there was a 10-m wide and 200-m long corridor. Around the other tree there would have been an area of 0,18 ha remaining (a circle with a radius of 24 m). In total, the protected area would have been less than 0,5 ha. The surrounding area would consist of clear cuts and young stands. Again, the KHO did not determine the right size of the site but once again returned the case to the ELY Centre.

These decisions do not help to define what the correct area is; something between 0,18 and 3,7 hectares. Unlike the Forest Act on habitats, the Nature Conservation Act does not as such require that the sites are delineated as very small areas. However, the interpretation of the KHO, the highest legal authority within the field of Finnish environmental law, is that the site is not very large. The current interpretation and practice has led to flying squirrels frequently abandoning the "protected" yet inhabitable sites. The breeding sites and resting places are thus protected in the NCA, but are they protected well enough in practice, taking the Habitats Directive into consideration?

There are no cases of the ECJ concerning forestry and the protection of breeding sites. The guidance of the Commission admits that forestry is a special case in species protection[87], and suggests that there is no need to protect the whole habitat, e.g. feeding areas, but a smaller breeding or resting place suffices.[88] Nevertheless, the commission states that the emphasis should be on the ecological functionality of the sites and that the sites should "continue to provide all that is required for a specific animal to rest or to breed successfully".[89] Yet, the Commission also points out that a holistic approach, i.e. a wider definition of a site, "seems more feasible for species with relatively small home ranges", and that for wide-ranging species, "it may be advisable to restrict the definition of a breeding and resting site to a locality that can be clearly delimited: e.g. the roosts for bats or the holt of an otter".[90] However, if article 12(1)(d) should "be understood as aiming to safeguard the continued ecological functionality of such sites and places, ensuring that they continue to provide all the elements needed by a specific animal to rest or to breed successfully", current Finnish legislation does not include requisite measures needed under Article 12 to "establish and implement an effective system of strict protection".[91]

If this is the case, then we can maintain that Finnish forest management practices do not meet these criteria as more than half of the breeding sites and resting places have been deserted within one year after loggings and the current management and protection measures have not been able to improve, or even maintain the conservation status of the flying squirrel.[92]

The result of case KHO 2014:13 has been interpreted so, that the Nature Conservation Act should be changed in order to be able to protect the sites properly.[93] Yet, the indirect effect of EU law – the Habitats Directive – could lead to such an interpretation of 49 § on the premise that the

[86] European Commission 2007, p. 27.
[87] European Commission 2007, p. 32.
[88] European Commission 2007, p. 44.
[89] European Commission 2007, p. 41.
[90] European Commission 2007, p. 45.
[91] European Commission 2007, p. 33.
[92] Jokinen 2014.
[93] Halonen 2014, p. 611.

protected site should be large enough to sustain the species in the area after loggings in the surrounding forests as well, and to reach favourable conservation status, regardless of the intention of a Finnish legislature.

The Nature Conservation Act entitles the landowner to monetary compensation, if the damages or losses are too high ("significant inconvenience") (NCA 53 §). Therefore, the stricter interpretation of the protection of breeding sites and resting places would not violate the property rights of the forest owners, but would still cost Finland money.

It could be claimed that Finland has failed to take the requisite measures to establish and implement an effective system of strict protection for the flying squirrel and to avoid activities that may deteriorate or destroy its breeding sites. The implementation "measures must contribute to the aim of maintaining the species in the long term or restoring its population in its habitat and must be effectively enforced". "The full and effective application of Article 12 requires, on the one hand, the establishment of a legal framework of coherent and coordinated measures and, on the other, the application of concrete, coherent and coordinated measures to enforce these provisions on the ground effectively".[94]

Even the recommendations of Tapio do not provide further advice on protecting the breeding sites and resting places. For its part, Tapio only refers to the old recommendations of the ministries and only mentions that uneven-structured (i.e. continuous cover) forestry helps to protect species such as the flying squirrel.[95] Further, the recommendation of ministries recommends that uneven-structured forestry should be applied on these sites when appropriate.[96] Despite this, there are no special efforts or incentives, let alone binding rules, to increase the use of uneven-structured forestry near sensitive sites. As mentioned earlier, it is still a very marginal form of forest management. However, this is evidently a cost-effective protection measure – or rather, a cost-effective measure of sustainable forest management – that Finland has not yet utilized to its full potential. Uneven-structured forestry could also be used for widening the protection zones along brooks and rivulets.

Another means of sustainable forest management is landscape-level forest management planning. Although, there is such planning in state-owned forests, it has not been considered viable in private-owned forests. Forest ownership is scattered and the forests of one owner are scattered over several smaller parcels. The average size of clear cuts is about 2 ha. Forest management plans are done – if the owner wants a plan – for one owner at a time. As for regional forest programmes, they are of a very general nature. They have very little practical meaning for private forest owners and are of no use in concrete habitat protection.[97] Because there is currently no suitable planning instrument, it is very difficult or impossible to plan loggings in such a way that 150 m around a breeding site or resting place of the flying squirrel would be 35–60 % of good quality forests.[98]

As stated above, a number of forest owners dislike flying squirrels and the hindrances that the occurrence of the species brings with it.[99] Some forest owners already cut all deciduous trees, especially aspens – an important tree species for the flying squirrels – during the thinning of a young forest stand to prevent the forest from developing into a suitable habitat for flying

[94] European Commission 2007, p. 27.
[95] Saaristo and Vanhatalo 2015, p. 62, 65.
[96] Ministry of Agriculture and Forestry and Ministry of the Environment 2016, p. 9.
[97] Pappila and Pölönen 2012, p. 179.
[98] Jokinen 2012, p. 56.
[99] Valkeapää and Karppinen 2013, p. 56.

squirrels: ”However, there are many true stories about cases where the favourite trees of flying squirrel are felled before all others. This ensures that the squirrel will not find appropriate nesting trees and the forest owner need not worry about protection measures when logging the forest”.[100]

The Forest Act has no regulation about the need to leave deciduous trees in forests. Earlier, in the 1960s and 70s, the official forest management doctrine included the removal of birches as they were considered of no value (”the white lie of the forests”). Nowadays, soft law, i.e. forest certification schemes and best practice guidelines, recommends also leaving deciduous trees in forests.

5.3 Minimize

The principle of minimizing the negative effects on the environment is incorporated into Finnish environmental regulation. The Environmental Protection Act and the Water Act always require the minimization of the effects on the environment. The Nature Conservation Act, however, is first and foremost regulating ”avoidance”, and only in some rare cases, it also emphasizes minimization. Only stipulations concerning Natura 2000 sites and the derogation clause on Habitats Directive species (annex IV(a)) include a clear stipulation to minimize. Nevertheless, as Suvantola writes, the inner coherence of Finnish environmental regulation requires that the principle of minimization applies to nature protection law, too, even if it is not explicitly mentioned as a general principle or obligation.[101] Also, the general goal of achieving the favourable conservation status of species of the Habitats Directive and NCA, and the general obligation of the Habitats Directive to implement a strict protection regime for species, all imply the need to minimize harms. Currently the ”minimize harm principle” should be – and most likely is – applied when authorities grant derogations from species and habitats protection. Yet, it should be applied to all decision-making that affects negatively on biodiversity, such as development projects and forestry.

5.4 Restore

The Biodiversity Strategy of the EU aims at maintaining and restoring ecosystems and their services. The aim of the strategy is to restore at least 15 % of degraded ecosystems.[102] There is ecosystem restoration going on all the time in Finland, but it is not based on any regulatory requirement, but rather on governmental projects and programmes and the voluntary projects of NGOs etc.[103]

In Finland compulsory restoration is connected to illegal effects. The Nature Conservation Act stipulates that the ELY Centre can require one to correct the unlawful situation or redress the negligence (57 §). Further, if someone deliberately or through negligence causes damage, or the imminence of damage, to protected species and natural habitats, the ELY Centre may require that the operator takes remedial measures referred to in the Act on the Remediation of Certain Environmental Damages (383/2009).

As it is not always possible to restore a destroyed or deteriorated habitat as ordered in 57 §, it would be useful to include into law, the possibility of making the violator of the law pay for *ex situ* restoration instead.

5.5 Compensate

Even if chapter 10 of the Nature Conservation Act on the Natura 2000 network includes the steps of mitigation hierarchy, it does not completely fulfil

[100] Kauppi 2015.
[101] Suvantola 2005, p. 46.
[102] European Commission 2011, p. 2.
[103] Kotiaho et al. 2015, p. 93.

the idea of NNL. This is because chapter 10 of the Nature Conservation Act, as well as the Habitats Directive, aim at insuring the integrity of the Natura 2000 network only and not the biodiversity in Finland or in the EU in general. Natura 2000 regulation emphasizes certain habitat types or species that the area has been protected for. Neither are there criteria in the Nature Conservation Act that would additionally require, i.e. creating a new habitat or restoring an old one but that would be solved by interpreting the compensation obligation in line with EUCJ case law and Commission guidance that chiefly require restoration or new areas to be created.

In addition to areas belonging to the Natura 2000 network, there is no regulation concerning ecological compensation. Nevertheless, sometimes ecological compensation is required beforehand if the project is acquiring a derogation from e.g. Nature Conservation Act 49 § (habitat protection of the annex IV(a) species of the Habitats Directive) even if there is no regulation about it.[104] For example, in Tampere, the city was passed an ordinance to create (plant) a new corridor for flying squirrels to move about, and to put nesting boxes in some areas to replace the habitats and flying corridors.[105] In another case on derogation of habitat protection (49 §) of the moor frog, the project leader had proposed a number of compensatory measures.[106]

The timing of the compensatory measures is not always mentioned in derogation decisions even if that is considered an important part of offsetting.[107] All in all, the use of compensatory measures is not yet coherent, and the practices probably vary from one ELY Centre to another, as there is no legislation or governmental guidance on ecological compensations. A law amendment or a general guidance would be helpful to enhance the use of ecological compensations and also to ensure equal treatment of the petitioners of derogations. Legislative amendments would be required if the project leader would be required to take compensatory measures on someone else's land. Overall, ecological compensations should be considered more widely in Finland, as compensations are missing e.g. from the Finnish EIA legislation even if the EIA directive would require it (article 5.1 c).[108]

Yet, the above mentioned is not relevant to forestry as it is not possible to obtain a derogation of 49 § for forest logging due to the derogation conditions, such as overriding public interest. There is also no permit process or anything similar in which the authorities could require compensatory measures in connection to forest logging.

6. Conclusions

The no net loss principle requires that projects or ongoing land use does not lead to a decrease of biodiversity. The analysis presented in this article has shown that there are many shortcomings in Finnish forest and nature protection legislation at all levels of mitigation hierarchy: avoidance, minimizing, restoring and compensating. Avoidance works only to a certain extent and avoidance is often diluted into minimizing harms. Restoring is required only if there are biodiversity losses due to illegal activities. The Nature Protection Act stipulates compensations related to Natura 2000 areas. Otherwise, ecological offsite compensations are sometimes required by environmental authorities in derogation permits concerning species or habitat protection in the Nature Protection Act.

[104] Leino 2015, Pappila 2017.
[105] Pappila 2017, p. 33.
[106] Pappila 2017, p. 34–35.
[107] Pappila 2017, p. 36.
[108] Pappila 2017, p. 36.

The no net loss principle seems to be better included into nature protection legislation than into forest legislation, even if some of the elements are included only implicitly, not explicitly (e.g. minimizing and ecological compensations in derogations). Yet there are still defects in the Nature Conservation Act regarding taking endangered species and flying squirrels into account in forest operations. Further, there is need for regulation on ex situ restoration and ecological compensations. The implementation of the Forest Act is not at a satisfactory level when it comes to the protection of biodiversity. There are deficiencies in the protection of water related habitats in particular, and the current derogation system of the Forest Act works against the NNL principle. The lack of *ex situ* restoring obligations is a defect as well. Also, there is no requirement in law to save, let alone create, more deadwood. Legislation has also no rules on enhancing the tree species diversity. Only soft law contains stipulations on deadwood, however, this has not lead to permanent improvements in forestry. In addition, only FSC certification, which is not yet widely used, stipulates on leaving large trees and certain types of old-growth forests untouched. Implementation of EU nature protection law is questionable as the protection of flying squirrels in forest management is not effective. Due to lacking case law, there is no certainty how the article 12 of the Habitats Directive would be implemented as regards to forestry as an ongoing land-use combined with a flying squirrel as a wide-ranging species.

Despite the interpretation of the Habitats Directive, new, cost-effective measures, such as uneven-structured forest management could be used in species and habitat protection for creating buffer zones outside currently protected smallish habitats and breeding sites and resting places.

As for protection of the habitats of Habitats Directive, Finland could do better, too. Certain amount of the habitats has been protected within the Natura 2000 areas, as the Habitats Directive requires, but to achieve favourable conservation status of habitats, they should be protected outside of these strictly protected areas, too. The Forest Act does not ensure that habitats are protected in an ecologically meaningful way, because, for example, the size of the habitats is often too small.[109] Finland has apparently fulfilled its legal obligations by establishing Natura 2000 areas to protect species and habitats mentioned in the Habitats Directive and the Birds Directive, but this has not been enough to ensure the favourable conservation status of many endangered species and habitats.

7. Discussion

A difficult yet important question is, whether we should use soft law or legislation to improve biodiversity protection in forest management? It is probably true that regulations that are considered legitimate are better followed. What would make new forest management rules more legitimate? Currently the forest management paradigm is not highly legitimate as the majority of Finns disapprove of clear cuts, which are not ecologically legitimate either, as the increasing amount of endangered forest species demonstrates.

Regulatory instruments should be amended if they do not to help to achieve the aims of regulation. In Finland this is thought to be done through soft law. Currently, soft law works to a certain extent but not well enough as the example of soft law and deadwood shows us. Soft law has not been enough to improve the conservation status of the habitats of the Habitats Directive either.[110] If soft law is implemented according to minimum standards, it does not lead to real improvements. Legislation should form a

[109] Raunio et al. 2008, Raunio et al. 2013.
[110] Raunio et al. 2013, p. 169.

more solid basis for biodiversity protection than it does currently. Soft law could then fine tune the rules. There is a pressing ecological need to reconsider the current regulatory mix, and both the National Forest Strategy and the Red List of Finnish Species call for more efficient biodiversity protection in production forests.

Parallel to forest management reform, endangered forest types should be protected as large nature protection areas. Some species benefit from more dead and large trees in production forests, but there are also many endangered species that require non-fragmented old-growth forests. It is not possible to practice forestry and protect old-growth forests on the same spot. Therefore, Finland should invest enough money in protected areas, too.

On the whole, it seems that the NNL principle is useful for evaluating the biodiversity friendliness of ongoing land use. For instance, during forestry it would be possible to avoid certain habitats, minimize certain effects by using alternative logging methods, to restore waterways after crossing them and to compensate biodiversity losses by creating deadwood. Also, instruments used in state-owned forests, such as landscape-level forest management planning, could be implemented in private forests, too.

The no net loss principle offers a framework for assessing the regulation of forest management as a whole, even if every step of the mitigation hierarchy cannot always be implemented on every forestry operation. For ongoing land use, the NNL principle and the mitigation hierarchy should rather cover the entire regulation of forest biodiversity protection to ensure that forest management does not lead to biodiversity losses due to the cumulative effects of numerous small operations. Also, regulation should be put into practice effectively and preferably on case-by-case basis rather than according to minimum acceptable standards.

8. References

Aiama D, Edwards S, Bos G, Ekstrom J, Krueger L, Quétier F, Savy C, Semroc B, Sneary M, Bennun L. 2015. No Net Loss and Net Positive Impact Approaches for Biodiversity: exploring the potential application of these approaches in the commercial agriculture and forestry sectors. Gland, Switzerland, IUCN. [Accessed 2017 Nov 11] http://thebiodiversityconsultancy.com/wp-content/uploads/2015/06/IUCN-Agriculture-and-Forestry-final-report-April-2015.pdf.

BBOP (Business and Biodiversity Offsets Programme). 2012. Resource Paper: No Net Loss and Loss-Gain Calculations in Biodiversity Offsets. [Accessed 2017 Nov 23] http://www.forest-trends.org/documents/files/doc_3103.pdf.

BBOP (Business and Biodiversity Offsets Programme). 2009. BBOP Principles on Biodiversity [accessed 2018 July 6] Offsets. http://bbop.forest-trends.org/documents/files/bbop_principles.pdf

Burgin S. 2008. BioBanking: an environmental scientist's view of the role of biodiversity banking offsets in conservation. Biod Cons, 17, 807–816.

Curran M, Hellweg S, Beck J. 2014. Is there any empirical support for biodiversity offset policy? Ecol Appl, 24, 617–632.

European Commission. 2014. No Net Loss of Biodiversity public consultation Summary overview of the responses. [Accessed 2017 Nov 21] http://ec.europa.eu/environment/nature/biodiversity/nnl/pdf/report.pdf.

European Commission. 2011. Our life insurance, our natural capital: an EU biodiversity strategy to 2020. Brussels, 3.5.2011, COM(2011) 244 final. [Accessed 2018 Jan 24] http://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/EP_resolution_april2012.pdf.

European Commission. 2008. The European Union's Biodiversity Action Plan "Halting the loss of biodiversity by 2010 – and beyond". [Accessed 2018 July 8] http://ec.europa.eu/environment/nature/info/pubs/docs/brochures/bio_brochure_en.pdf.

European Commission. 2007. Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC. [Accessed 2018 Jan 24] http://ec.europa.eu/environment/nature/conservation/species/guidance/pdf/guidance_en.pdf.

FSC (Forest Stewardship Council). 2011. FSC standard for Finland. V1-1 Approved 21.01.2011 FIN. [Accessed 2017 Dec 20] https://fi.fsc.org/fi-fi/sertifiointi/metssertifiointi/suomen-fsc-standardi.

FSC (Forest Stewardship Council). 2017. FSC numeroin (FSC in numbers). Updated 5.8.2017. [Accessed 2017 Nov 21] https://fi.fsc.org/fi-fi/tietoa-fscst/fsc-numeroina.

Haakana M, Ollila P, Regina K, Riihimäki H, Tuomainen T. 2015. Menetelmä maankäytön kehityksen ennustamiseen. Pinta-alojen kehitys ja kasvihuonekaasupäästöt vuoteen 2040 (A method for predicting changes in land use. Trends in surface area and greenhouse gases until 2040). Luonnonvara- ja biotalouden tutkimus 51.

Halonen L. 2014. KHO 2014:13: liito-oravan lisääntymis- ja levähdyspaikka: oikeudellis-ekologisen käsitteen määrittelyä KHO:n ratkaisun valossa. (KHO 2014:13: breeding and resting place of a flying squirrel: defining the legal-ecological concept in the light of the KHO decision). Lakimies, 112(4): 601–611.

Hanski I. 2005. The Shrinking World: Ecological Consequences of Habitat Loss. International Ecological Institute. Olderndorf/Luhe.

Hanski I. 2006. Täsmäsuojelun mahdollisuus – vai mahdottomuus? (The possibility of precision protection – or impossibility) (chapter 5.4). In Jalonen, R, Hanski I, Kuuluvainen T, Nikinmaa E, Pelkonen P, Puttonen P, Raitio K, Tahvonen O, editors. Uusi metsäkirja (The new forest book). Gaudeamus. Tampere, p. 200–205.

HE 75/2013 vp. Hallituksen esitys eduskunnalle laiksi metsälain ja rikoslain 48 a luvun 3 §:n muuttamisesta (A government bill on changing the Forest Act and the Criminal law).

International Finance Corporation. 2012. IFC Performance Standards on Environmental and Social Sustainability. [Accessed 2017 Sep 15] https://www.ifc.org/wps/wcm/connect/c8f524004a-73daeca09afdf998895a12/IFC_Performance_Standards.pdf?MOD=AJPERES.

Ikonen I. 2016. Kiireellisesti ja erityisesti suojeltavat lajit – turvaamistoimia ja rajauspäätökset (Urgently and specially protected species – protection measures and demarcation decisions). Centre for Economic Development, Traffic and Environment. PowerPoint presentation 15.12.2016. [Accessed 2017 Nov 17] https://www.ely-keskus.fi/documents/10191/20407199/Erityissuojelulajit_IiroIkonen_191216.pdf/06415d22-1610-418e-89a4-92a9a8562474.

Kauppi A. 2015. Protection of flying squirrel to be relaxed. Finnish Forest Association / Metsänhoitoyhdistys. News 1.10.2015. [Accessed 2017 Nov 20] https://www.smy.fi/en/artikkeli/protection-of-flying-squirrel-to-be-relaxed/.

Keto-Tokoi P. 2006. Varhaiset luonnonhoitosuositukset eivät toteutuneet käytännön metsätaloudessa (The early recommendations for nature management have not be fulfilled in forest practices). In Jalonen, R, Hanski I, Kuuluvainen T, Nikinmaa E, Pelkonen P, Puttonen P, Raitio K, Tahvonen O, editors. Uusi metsäkirja (New Book on Forests), Gaudeamus, Helsinki, p. 102–106.

Koistinen A, Matila A, Lahti E. 2017. Metsälakiuudistus käytännön metsätalouden kannalta (The Forest Act reform from the point of view of practical forestry). Reports of Tapio, nro 18. [Accessed 2017 Dec 18] http://tapio.fi/wp-content/uploads/2017/10/Metsalaki_analyysi_-raportti_2017.pdf.

Kokko KT. 2009. A Legal Method and Tools for Evaluating the Effectiveness of Regulation: Safeguarding Forest Biodiversity in Finland. Nordic Environmental Law Journal, 57–78.

Kotiaho JS, Kuusela S, Nieminen E, Päivinen J. 2015. Elinympäristöjen tilan edistäminen Suomessa (Improving the status of habitats in Finland – report of the ELITE working group on a prioritisation plan for improving the status of habitats and estimated total costs of the plan). Suomen ympäristö, 8. Ministry of Environment.

Kotiaho JS, Selonen VAO. 2006. Metsälain erityisen tärkeiden elinympäristöjen kartoituksen laadun ja luotettavuuden analyysi (Analysis of the quality and reliability of the mapping of the especially important habitats of the Forest Act). Suomen ympäristö, 29. Finnish Environment Institute. Helsinki.

Kuuluvainen T, Tahvonen O, Aakala T. 2012. Even-Aged and Uneven-Aged Forest Management in Boreal Fennoscandia: A Review. Ambio, 41: 720–737.

Laakso T, Leppänen T, Määttä T. 2003. Metsärikollisuus empiirisen oikeustutkimuksen kohteena (Empirical legal research on forestry crimes). Defensor Legis, 4: 647–667.

Leino L. 2015. Korvaavat toimenpiteet pienialaisten luontokohteiden suojelusta poiketaessa (Compensatory measures in derogations from the protection of small-sized habitats). Ympäristöjuridiikka 1: 9–34.

Leppänen T. 2003 Metsien hakkuut, uudistaminen ja metsärikokset (Forest loggings, renewal and forest offences). In Metsäoikeudellisia tutkielmia, University of Joensuu Publications in Law, Joensuu, 117–212.

Luke (The Natural Resources Institute Finland). 2016. Metsäpinta-alasta on suojeltu 12 % (12 % of forest area is protected). News 15.9.2016. [Accessed 2018 Jan 16] https://www.luke.fi/uutiset/metsapinta-alasta-suojeltu-12-prosenttia/.

Luke (The Natural Resources Institute Finland). 2014. Metsänomistus (Forest ownership). [Accessed 2018 Jan 13] http://www.metla.fi/metinfo/kestavyys/c6-forest-holdings.htm.

Luonnontila. 2015. ME6 Lahopuun määrä (The amount of decayed wood). Updated 21.12.2015. [Accessed 2017 Nov 27] https://www.luonnontila.fi/fi/elinymparistot/metsat/me6-lahopuunmaara.

Ministry of Agriculture and Forestry, Ministry of Environment. 2003. Liito-oravan lisääntymis- ja levähdyspaikkojen määrittäminen ja turvaaminen käytännössä. Ohje. (The delineation and protection of the breeding sites and resting places of the flying squirrel. A guide).

Ministry of Agriculture and Forestry, Ministry of Environment. 2016. Liito-oravan huomioon ottaminen metsänkäytön yhteydessä. Neuvontamateriaali (Taking flying squirrel into consideration in forest management. Guidance material). [Accessed 2017 Dec 16]. http://tapio.fi/wp-content/uploads/2016/04/Liito-orava-neuvontamateriaali.pdf.

Ministry of Agriculture and Forestry. 2015. National Forest Strategy 2025. Government Resolution of 12 February 2015. [Accessed 2018 Jan 14] http://mmm.fi/documents/1410837/1504826/National+Forest+Strategy+2025/197e0aa4-2b6c-426c-b0d0-f8b0f277f332.

Metsäkeskus. 2016. Talousmetsien luonnonhoidon laadunseuranta – Raportti (A quality survey of nature management in production forests – a Report). [Accessed 2017 August 5] http://metsakeskus.fi/sites/default/files/luontolaadun-tarkastusraportti-kooste-2015.pdf.

Metsäyhdistys. 2012. Metsä ja puu -kyselyn tulokset 2012. (Results of ”Forest and tree” survey 2012) [Accessed 2018 Jan 16] https://frantic.s3.amazonaws.com/smy/2014/11/metsa_ja_puu_barometri_2012_09b.pdf.

Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-being: Synthesis. Island Press, Washington, DC.

Ministry of Environment. 2015. Ministeri Tiilikainen: Metso-ohjelma jatkuu tavoitteesta tinkimättä – toteutusta tehostettava (Minister Tiilikainen: Metso-progamme will continue without compromises – enforcement should be more efficient). Press release 8.10.2015. [Accessed 2018 Jan 8] http://www.ym.fi/fi-FI/Luonto/Ministeri_Tiilikainen_Metsoohjelma_jatku%2835769%29.

Pappila M, Pölönen I. 2012. Reconsidering the Role of Public Participation in the Finnish Forest Planning System. Scand J For Res 177(27): 180–83.

Pappila M, Halonen L. 2015. The Impact of the Water Framework Directive on Diffuse Pollution Control: The Case of Ditch Network Maintenance in Finnish Forests. Nordic Environmental Law Journal 2: 77–92.

Pappila M. 2017. Ei nettohävikkiä -periaate ja kompensaatiot biodiversiteetin suojelussa (No net loss principle and compensations in biodiversity protection). Ympäristöjuridiikka 3–4: 10-53.

PEFC. 2017. Certified Forest Area by Country. [Accessed 2017 Dec 15] https://www.scribd.com/document/147379606/PEFC-Global-Certificates#fullscreen&from_embed.

PEFC. 2014. PEFC Finland Standard. Criteria for PEFC Forest Certification. PEFC FI 1002:2014. [Accessed 2018 Jan 10] http://pefc.fi/wp-content/uploads/2016/09/PEFC_FI_1002_2014_Criteria_for_Forest_Certification_20141027.pdf.

Primmer E, Furman E. 2012. Operationalising ecosystem service approaches for governance: Do measuring, mapping and valuing integrate sector-specific knowledge systems? Ecosyst Serv 1:85–92.

Pukkala T. 2016. Plenterwald, Dauerwald, or clearcut? For Pol Econ 62: 125–134.

Rassi P, Hyvärinen E, Juslén A, Mannerkoski I, editors. 2010. Suomen lajien uhanalaisuus – Punainen kirja 2010 (The 2010 Red List of Finnish Species). Ministry of Environment and Finnish Environment Institute.

Raunio A, Schulman A, Kontula T, editors. 2008. Suomen luontotyyppien uhanalaisuus – Osa 1: Tulokset ja arvioinnin perusteet (Assessment of threatened habitat types in Finland. Part 1: Results and basis for assessment). Suomen ympäristö, 8. Finnish Environment Institute, Helsinki.

Raunio A, Anttila S, Kokko A, Mäkelä K. 2013. Luontotyyppisuojelun nykytilanne ja kehittämistarpeet – lakisääteiset turvaamiskeinot (Current situation and development needs in the protection of natural habitat types – statutory safeguarding measures. The Finnish Environment 5/2013.

Saari P, Finér L, Laurén A. 2009. Metsätaloudessa vesistöjen ja pienvesien suojavyöhykkeille asetetut tavoitteet ja niiden toteutuminen (The aims and implementation of water protection zones in forestry). METLAn työraportteja 124. (Accessed 2017 Dec 4) http://www.metla.fi/julkaisut/workingpapers/2009/mwp124.htm.

Saaristo L, Mannerkoski I, Kaipiainen-Väre H. 2010. Metsätalous ja uhanalaiset lajit (Forest management and endangered species). Metsätalouden kehittämiskeskus Tapio. [Accessed 2018 May 5] http://tapio.fi/wp-content/uploads/2015/08/Metsatalous_ja_uhanalaiset_lajit.pdf

Saaristo L, Vanhatalo K, editors. 2015. Metsänhoidon suositukset talousmetsien luonnonhoitoon, työopas. (Recommendations for nature management in production forests). Publications of Tapio.

Saaristo L, Seppälä M, Vesanto T, Ruutiainen J. 2017. Talousmetsien luonnonhoidon tehokkaat ratkaisut. Monimetsä-hankkeen selvitys (Effective solutions for nature management in production forests. Report of the Monimetsä project). Publications of Tapio. [Accessed 2018 Jan 17] https://www.metsakeskus.fi/monimetsa-hanke.

Similä J, Fredrikson J, Primmer E, Horne P. 2014. Biodiversity Protection in Private Forests: An Analysis of Compliance. J Env Law, 26(1): 83–103.

Steffen W, Richardson K, Rockström J, Cornell SE, Fetzer I, Bennett EM, Biggs R, Carpenter SR, de Vries W, de Wit CA, et al. 2015. Planetary boundaries: Guiding human development on a changing planet. Science, 347(6223): 736–746.

Suvantola L. 2005. Kun maailma ei riitä – luonnon monimuotoisuudelle aiheutettavien haittojen kompensointi (When the world is not enough – compensating harms caused on biodiversity). Ympäristöjuridiikka, 3–4: 30–80.

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 of Rur Stud, 55: 33–44.

Timonen J, Siitonen J, Gustafsson L, Kotiaho JS, Stokland JN, Sverdrup-Thygeson A, Mönkkönen M. 2010. Woodland key habitats in northern Europe: concepts, inventory and protection, Scan J For Res, 25(4): 309–324.

UNEP (United Nations Environment Programme). 2011. Decoupling natural resource use and environmental impacts from economic growth, A Report of the Working Group on Decoupling to the International Resource Panel. (Fischer-Kowalski, M., et al.) [Accessed 2018 Jan 28] http://wedocs.unep.org/handle/20.500.11822/9816.

Valkeapää A, Karppinen H. 2013. Citizens' view of legitimacy in the context of Finnish forest policy. For Pol Econ. 28: 52–59.

Wende W, Tucker G, Quétier F, Rayment M, Darbi M. 2018. Biodiversity Offsets: European Perspectives on No Net Loss of Biodiversity and Ecosystem Services, Springer.

WWF. 2016. Metsien suojelun edistäminen (Promoting forest protection). Updated 6th Nov. 2016. [Accessed 2017 Jan 14] https://wwf.fi/alueet/suomi/suomen-metsat/metsien-suojelun-edistaminen/.

Court cases (Supreme Administrative Court of Finland)

KHO 2014:13

KHO 2015:269