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## Content

# Introduction

*Gabriel Michanek, editor*

The twelfth issue of Nordic Environmental Law Journal includes three articles. In the first paper, *Assessing Governance Structures for Green Infrastructure*, Suvi Borgström and Jukka Similä regards green infrastructure as an emerging policy response to the continuous degradation of natural capital. The paper presents a framework that can be used for assessment of feasibility of current governance system for the purpose of green infrastructure policy.

The second article by Henrik Josefsson is titled *Assessing Aquatic Spaces of Regulation: Key Issues and Promising Solution*. It is assumed in the Water Framework Directive that the objective "good ecological status" necessitates an implementation of measures on a large geographical scale. Nevertheless, the legal instruments in the directive focus on each "body of water", which constitutes one of several parts of e.g. a river stretch or a lake. After comparing this fragmented methodology with the wider geographical approach used in e.g. the Habitats Directive and the Liability Directive, the article proposes a differentiation of spaces of regulation that facilitates management of large-scale environmental problems.

Finally, in the article *Transboundary EIA in the Barents Region*, Timo Koivurova, Vladimir Masloboev, Anna Petrétei, Vigdis Nygaard and Kamrul Hossain examines how a transboundary environmental impact assessment (TEIA) is organised in an area where international borders are close to each other, using North Calotte/ Kola Peninsula as a case. The paper examines how TEIA can be conducted in an ideal manner in the region via the available best practise documents, such as the Guidelines for Environmental Impact Assessment in the Arctic Environmental Protection Strategy.

# Assessing Governance Structures for Green Infrastructure[1]

*Borgström, Suvi* and Similä, Jukka***

**Abstract**

Green infrastructure is an emerging policy response to the continuous degradation of natural capital. In this paper we develop a framework that can be used for assessment of feasibility of current governance system for the purposes of green infrastructure policy. The key issues we found relevant for the analysis include: coverage of the regulation, its capacity to enhance landscape level management, flexibility in local implementation and mechanisms for accommodating diverging interests, adaptation of decision-making and robust monitoring. The paper also presents the key findings of our analysis on the feasibility of current governance system for green infrastructure policy in Finland.

Key words: Green infrastructure, ecosystem services, governance, regulation, assessment

## 1. Introduction

Ecosystems are under a great pressure from the intensive use of natural resources and land use changes. As a result biodiversity is on a decline, and many of the ecosystem services are degraded with negative impacts on human well-being.[2] Instead of focusing on protecting, improving and utilizing natural processes to gain economic and social benefits, we continue to use natural resources in an unsustainable manner and building expensive technical systems to provide same services that natural processes provide us for free leading to further degradation of the natural capital. Green infrastructure is an emerging policy response aiming to change this harmful pattern.[3]

The core of GI approach is to recognize that environmental recourses hold a tremendous potential for providing a wide range of ecosystem services and those recourses should be managed in a way that enables the various ecosystem uses and secures the provision of ecosystem services vital for human well-being.[4] As environmental resources are only partially non-rival, meaning

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[1] The preparation of this paper was funded from three projects: (1) EU 7th framework project, Securing The Conservation of biodiversity across Administrative Levels, and spatial, temporal, and Ecological Scales (SCALES), Grant Agreement 226852, (2) EU 7th framework project, Assessment of economic instruments to enhance the conservation and sustainable use of biodiversity (PolicyMix) Grant Agreement 244065. (2) Finnish Environment Ministry funded project, Green Infrastructure (Decision YM107/481/2012).

[2] The Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-Being: Synthesis. Island Press Washington DC.

[3] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Green Infrastructure (GI) – Enhancing Europe's Natural Capital COM(2013) 249 final

[4] Id.

that after some point the consumption of resource by one user potentially diminishes the resource's capacity to support other users or uses, securing the provision of wide variety of goods and services derived from environmental resources requires managing the trade-offs among potentially competing rival uses.[5]

As EU commission points out, investing in natural capital has potential to contribute towards numerous policy objectives, such as improving human health and well-being, climate change adaptation and mitigation, environmental risk management, regional coherence etc. (COM 249/2013). In order to maximize the benefits that green infrastructure has potential to provide, systematic green infrastructure policies that cross ecosystem and sectoral boundaries and integrate GI approach into decision-making affecting the use of land and water is needed. Some countries have started the preparation of GI policies, while most countries do not have yet any systematic policies for GI. In order evaluate current governance system and to provide understanding how it should be developed, analytical tools for the assessment are needed. By governance system we mean legal and other institutional arrangements in which the implementation of green infrastructure policy will take place. The main focus is on relevant laws, although we are not limiting ourselves solely to the sphere of laws.

In this paper we aim to develop such a framework that can be used for assessment of feasibility of current governance system for the purposes of green infrastructure policy and apply the framework developed to assess the Finnish governance system. In our minds, green infrastructure is rather a policy regime than a single policy instrument. Natural elements and land-use pressures shaping these elements, which should be addressed by green infrastructure policy, vary greatly in any given area. Hence, we believe that only a mix of instruments could adequately serve the goals of green infrastructure policy. We start the building of our framework by exploring the infrastructure theory proposed by Frischmann and identifying the main issues that need to be considered in developing regulation for green infrastructure according to his theory. However, there are some issues relevant for green infrastructure governance that infrastructure theory fails to take into account, so we continue to develop the framework further on.

The infrastructure theory is rooted in economic theories of law related to the issue, which regime of resources management, private property regime or an open access regime, best fits to the societal needs. Frischmann argues that for some classes of resources there are strong economic arguments for managing and sustaining resources in openly accessible way[6] and we tend to agree with this general position. Another theoretical tradition relevant to us, is policy evaluation[7]. One stream among evaluation research, is evaluation of legislation.[8] While evaluation of legislation can be seen as part of the general policy evaluation research, it is often seen as a part of the theory of legislation. Although this paper pays particular attention on laws, it differs from

[5] *B. Frischmann*, Infrastructure. The Social Value of Shared Recourses, 2012, p. 227.

[6] B. Frischmann, An Economic Theory of Infrastructure and Commons Management. Minnesota Law Review, Vol. 89, pp. 917–1030, April 2005. Available at SSRN: http://ssrn.com/abstract=588424, p. 918–919.

[7] See e.g. P. Rossi, H.Free,am, M.Lipsey, Evalaution – A systematic approach. Sage Publication. Thousands Oaks, 1979, E.Vedung Public Policy and Programme Evaluation. New Brunswick, Transaction Publishers, 1997.

[8] J. Tala, Lakien vaikutukset, Lakiuudistusten tavoitteet ja niiden toteutuminen lainsäädäntöteoreettisessa tarkastelussa, Oikeuspoliittinen tutkimuslaitos, Helsinki 2001. J. Verschuuren (eds.) The Impact of Legislation, A Critical Analysis of *Ex Ante* Evaluation, Martinus Nijhoff Publishers2009.,

traditional type of evaluation of legislation research in the sense that it focus at a regime level instead of the level of an individual law.

The paper is structured as follows: the section two gives a short introduction to the concept of green infrastructure and discusses existing and emerging policies and legal instruments for sustaining and enhancing green infrastructure. The third section takes the infrastructure theory developed by Frischmann as a starting point and explores what does it mean to consider environment as an infrastructure, and what kind of insights does such an approach provide for policy analysis. We then continue to develop a framework for assessment by identifying those issues and challenges relevant for green infrastructure governance that infrastructure theory does not cover. In section four we apply the framework and assess the feasibility of current governance system in Finland to manage green infrastructure resources. Hence, the section four is an illustration how the framework could be used and what kinds of results it could provide. Last section provides concluding remarks and discusses possible ways forward through changes in regulatory system.

## 2. What is green infrastructure and why do we need green infrastructure policy?

Green infrastructure is an emerging policy response to the continuous loss of biodiversity and associated ecosystem services. The term is relatively new and flexible, with no official definition.[9] In this work we lean on definition used by European Commission. According to EU's Green Infrastructure Strategy GI is "a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. It incorporates green spaces (or blue if aquatic ecosystems are concerned) and other physical features in terrestrial (including coastal) and marine areas. On land, GI is present in rural and urban settings."[10]

The concept is appearing more and more frequently in policy documents all over the world and some countries have taken steps towards systematic green infrastructure policies.[11] Though GI has been interpreted slightly differently depending on the context,[12] and no official definition exists as of yet, there seem to be consensus on key characteristics of what constitutes green infrastructure. The central idea behind the concept is the understanding of the natural environment as infrastructure, capable of delivering wide variety of essential ecosystem services. In addition, the term green infrastructure emphasizes the need for connecting natural areas and other open space to help the species to migrate into suitable habitats and to increase ecosystem resilience.[13]

There are only few examples on systematic policies for green infrastructure, but the legal and political framework for GI can be conceived from existing legal instruments and policies relevant for biodiversity and connectivity at international, regional and national level. At the international level the Convention on Biologi-

[9] *L. Mazza* et al. Green Infrastructure Implementation and Efficiency. Final report for the European Commission, DG Environment on Contract ENV.B.2/SER/2010/0059, p. 7.

[10] *European Commission, supra* note 3.

[11] For instance in France the Trame verte et bleue (TVB) is an example of a nationwide green infrastructure policy initiative. Barthod, C ja Deshayes M. (2009) Trame verte et bleue, the French green and blue infrastructure, European Commission workshop of Europe 25 – 6 March 2009 Bryssel. Available in http://green infrastructureeurope.org/download/8%209%20C%20Barthold%20M%20Deshayes%20The%20French%20Ecological 20Network.pdf

[12] *L. Mazza* et al. *Supra* note 6.

[13] *M. Benedict & E. McMahon*, Green infrastructure: Smart Conservation for the 21st Century. Renewable Resources, 2002(20), pp. 12–17.

cal Diversity (CBD),[14] Convention on Migratory Species[15] (CMS) Convention on Wetlands of International Importance Especially as Waterfowl Habitat[16] (Ramsar Convention), and United Nations Framework Convention on Climate Change[17] (UNFCCC) are amongst the relevant treaties that form the framework for GI policies at the international level. Especially target 11 of the Aichi targets developed under the CBD is of relevance: it states that by 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.[18] At the European level the European Landscape Convention,[19] and the Convention on Conservation of European Wildlife and Natural Habitats[20] (the Bern Convention), are essential building blocks of the framework for green infrastructure.

At the EU level green infrastructure is an integral part of the biodiversity policy. The target two of the EU Biodiversity Strategy to 2020 explicitly mentions the concept of green infrastructure and states that "by 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15 % of degraded ecosystems".[21] In addition to Biodiversity Strategy, there are several other policy documents including the EU Strategy on Adaptation to Climate Change[22], Roadmap to Resource Efficient Europe[23], and Blueprint to Safeguard Europe's Water Resources[24] that call for the development of green infrastructure. As a response to these documents commission adopted a Green Infrastructure Strategy in spring 2013. In the strategy commission highlights the potentiality of green infrastructure to contribute towards numerous EU policy objectives, ranging from increased human health and well-being, climate change adaptation and mitigation to improving resource efficiency. However, while acknowledging the need for systematic and comprehensive GI policies, the commission states that at this point the strategy is to be implemented within existing legislation and policy instruments.[25]

At the EU level the Birds[26] and Habitats directives[27] are naturally important legal instru-

[14] Convention on Biological Diversity (Rio de Janeiro, 1992),
[15] Convention on Migratory Species (Bonn, 1979)
[16] Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar 1971)
[17] United Nations Framework Convention on Climate Change (New York 1992)
[18] Convention on Biological Diversity COP decision X/2 on The Strategic Plan for Biodiversity 2011–2020 and the Aichi Biodiversity Targets.
[19] European Landscape Convention, (Firenze 2000)
[20] Convention on Conservation of European Wildlife and Natural Habitats (Bern 1979)

[21] COM(2011)244 final. Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions. Our life insurance, our natural capital: an EU biodiversity strategy to 2020.
[22] COM(2012)673) final Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. An EU Strategy on adaptation to climate change
[23] COM(2013)216 final. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Roadmap to a Resource Efficient Europe.
[24] COM(2011)571 final. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions A Blueprint to Safeguard Europe's Water
[25] European Commission, *supra* note 3.
[26] Council Directive 79/409/EEC on the conservation of wild birds, OJ. 1979 L 103.
[27] Council Directive 92/43/EC on the Conservation of the Natural Habitats of Wild Fauna and Flora, OJ. 1992 L 206.

ments contributing towards protection of biodiversity and ecosystem services in the Europe. The backbone of these directives is the protection and management of the protected areas network (Natura 2000), but the directives also require the conservation of species and habitats of Community importance (as well as other migratory birds). However, these directives are not adequate, as green infrastructure requires measures in the wider landscape.[28] In addition to these nature conservation "backbone" directives, there are numerous other instruments relevant for supporting GI within EU. These include, among others the Water framework directive[29] and the Marine strategy framework directive[30], which provide a framework for sustaining and enhancing the quality of Europe's "blue infrastructure", by establishing a legal obligation to protect and restore the quality of waters and marine environment. Further the regulations of the Common Agricultural Policy (CAP), legislation on groundwater protection and flood risk management, are among the key substantive laws relevant for GI. At the procedural level the Environmental impact assessment directive[31] (EIA) and Strategic environmental assessment directive[32] (SEA) provide a basis for the integration of GI in the sectoral decision-making systems. Effective implementation of these instruments is in the core of sustaining green infrastructure in Europe.[33]

The Commission promotes member states to develop national GI strategies and to enhance policy integration to support GI.[34] There are already few examples on systematic, integrative GI policies at the Member State level. One of the initiatives includes the green and blue infrastructure called Trame verte et bleue (TVB) in France.[35] France has established legal rules on how to define and implement its green and blue infrastructure. France officially established the TVB -ecological network with the publication of a decree at the end of 2012.[36] As its core element, the decree foresees the elaboration of national guidance on the French ecological network. All planning documents and national projects such as the major linear infrastructures must be compatible with this guideline. Implementation is mainly the task of the regions, which have to work out regional ecological networks including maps and action plans (regional coherence schemes) as their main elements. The regional ecological networks have to be taken into account by all spatial planning tools.[37] While spatial planning is seen as a key instrument to implement the network, also other instruments such as agricultural subsidies and establishment of protected areas are used.[38]

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[28] European Commission, supra note 3.

[29] Directive of the European Parliament and of the Council 60/2000/EC Establishing a framework for community action in the field of water policy. OJ. 2000 L 327.

[30] Directive 2008/56/EC Of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy. OJ 2008 L 164/19

[31] Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment OJ 2012 L 26/1

[32] Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment OJ 2001 L 197

[33] European Commission, *supra* note 3.

[34] European Commission, supra note 3.

[35] *C. Barthod & M. Deshayes*, Trame verte et bleue, the French green and blue infrastructure, European Commission workshop of Europe 25 – 6 March 2009 Brysel. Available in http://green-infrastructureeurope.org/download/8%209%20C%20Barthold%20M%20Deshayes%20The%20French%20Ecological%20Network.pdf

[36] Décret n° 2012-1492 du 27 décembre 2012 relatif à la trame verte et bleue

[37] Décret n° 2012-1492 du 27 décembre 2012 relatif à la trame verte et bleue

[38] Id.

In order to assess whether existing regulatory regimes are consistent with the ideas of green infrastructure and sufficient to protect, sustain and create green infrastructure analytical tools for assessment are needed. Next chapter discusses the issues that should be considered in assessment and development of regulations for green infrastructure.

## 3. Developing an approach for the assessment of current governance system

Brett Frischmann has developed a theoretical account of infrastructure recourses and applied it to non-traditional infrastructure, including environmental recourses and intellectual infrastructure. According to Frischmann, natural environment plays similar functional role as traditional infrastructure in society: "*it functions instrumentally as an essential input for wide range of human and natural goods and services including agricultural output, human health and more amorphous goods such as quality of life, as well as purification of water and air, regulation of climate and maintenance of biodiversity*".[39]

According to Frischmann infrastructure resources satisfy the following criteria:

- The resource may be consumed nonrivalrously for some appreciable range of demand,
- Social demand for the recourse is driven primarily by downstream productive activity that requires the recourse as an input, and
- The recourse may be used as an input into wide range of goods and services, which may include private goods, public goods, and social goods.[40]

As Frischmann argues, these criteria are satisfied when we take a look at environmental resources. In contrast to some non-renewable natural resources, environmental infrastructures are not purely rivalrous in consumption, but they are potentially (non)rival, meaning that those recourses have finite, potentially renewable, and potentially sharable capacity. The second and third criteria focus the attention on the manner which infrastructure generates value for society, and the diversity of the outputs (private, public, social goods). The social value and demand for environmental infrastructure derives from those benefits and goods that contribute towards human well-being, which require the ecosystems as an input. These ecosystem goods and services are both private goods, public goods and social goods. Private goods include provisioning services like food and raw material, while many of the supporting and regulating services like water purification and nutrient climate regulation are public goods in nature. The cultural ecosystem services like recreation can be regarded as social goods.[41]

The key findings of Frischmann's studies on infrastructure can be summarized as follows: 1) infrastructure resources generates value as inputs into variety of productive processes, 2) these processes often generate positive externalities to the benefit of the society as a whole, and that 3) managing such recourses as commons is often socially desirable because doing so supports these downstream activities.[42]

In his theory Frischmann defines commons management as a situation in which a resource is accessible to all members of a community on nondiscriminatory terms.[43] From this perspective Frischmann criticizes the development of

[39] *Frischmann, supra* note 5 at p. 227.
[40] Id.
[41] Id at pp. 234–240.
[42] Id at p. 228.
[43] Id at p. 7.

marked-based instruments that build on property regimes, for conservation and its financing. The problem with market-based approaches, as Frischmann argues, is that they lean on property regimes which may lead to exclusion of potential users resulting in loss of positive externalities provided by different activities.[44]

Rather than relying on instruments based on property regimes and leaning on economic valuation of ecosystem services, the infrastructure theory proposes that in order to support the varied, heterogeneous uses of ecosystems, managing them as commons may be more desirable.[45] Frischmann argues that sustaining the fundamental structures in an open manner is critical to realizing the potential of positive externalities because doing so enables the public to participate productively in a wide range of socially valuable activities.[46]

There are, however important differences between traditional and environmental infrastructure. One of the key differences is that human beings do not produce green infrastructure in a sense as other infrastructure recourses. Due to the partially non-rival nature and difficulties in producing new environmental resources, environmental infrastructure faces complex congestion and degradation problems in a different manner than other infrastructure recourses. The congestion and degradation problems lead to the conclusion that pure open access in absence of regulation is not feasible for environmental infrastructures.[47] Nevertheless, the management should, according to Frichmann, aim at enabling open access to the extent feasible. This can be done through regulating those ecosystem uses that drive rivalry.[48] How to manage the rivalry is highly dependent on number of economic, social, and physical attributes as the rate and degree of rivalry varies across space and time. In this regard the nature of user groups, (current and future generations and non-humans) and the relevant recourse characteristics such as the renewal rate of the recourse affect the decision-making. Thus sustaining environmental infrastructure depends on institutions that allow consideration and accommodation of wide variety of interests and leave flexibility in local level implementation to take into account relevant resource characteristics and other attributes that affect the decision-making on how to best manage rivalry.[49]

While providing some interesting insights for green infrastructure governance, the infrastructure theory fails, however, to consider some aspects that are relevant for managing environmental resources. For instance, it treats environmental infrastructure as separated assets, like lakes, forests and wetlands, and fails to address the issue of landscape scale management. Many of the ecosystem services are dependent on measures at broader landscape level. Thus, GI policy instruments should function across sectors and ecosystems and support landscape level management. In this regard, the coordination between different instruments is essential.

Further, depending on circumstances, management of green infrastructure requires different concrete measures: in some cases directing land use to specific areas or regulating activities to minimize the negative impacts on ecosystems are adequate, but in other cases conservation or restoration measures may be needed. In our opinion, any legal system supporting effectively green infrastructure should include legal mechanisms for all these functions.

Infrastructure theory also provides little information on the specific challenges for man-

[44] Id at p. 228.
[45] Id.
[46] *Frischmann supra* note 5 at p. 227.
[47] Id.
[48] Id at p. 235.
[49] Id at pp. 246–247.

aging environmental infrastructure due to its nature as complex socio-ecological system. Constant changes and uncertainties in socio-ecological systems make it difficult to manage GI. As changes are natural in ecosystems, it has become apparent that their protection and securing provisioning of ecosystem services cannot be achieved through eliminating changes. Instead, the focus of ecosystem management should be in enhancing and supporting ecosystem resilience.[50]

Resilience is the capacity of a system to withstand internal and/or external change yet remain with the same regime.[51] When resilience is exceeded, a system will reorganize around a different set of processes, producing different goods and services for humankind. Green infrastructure differs from traditional infrastructure especially in this regard. While man made infrastructures can be re-produced, repaired and restored, changing ecosystem back to the desired state may be difficult, or functionally impossible.[52]

Conservation institutions that apply adaptive governance and adaptive management techniques have been viewed important for achieving ecosystem resilience.[53] Adaptive governance enhances an institution's capability to deal flexibly with new situations, thus preparing managers for uncertainty and surprise.[54] In order to enhance adaptive governance, environmental laws need to be flexible enough to allow consideration of local conditions, experimenting and learning. However, while some scholars have delineated the benefits of a regulatory system with flexible norms, decentralized and redundant regulatory authority, also various weaknesses have been identified. These include the failure to address the broadly dispersed resource issues such as global climate change, and potential incentives for regulatory inattention as well as problems with legal security and enforceability.[55] As Buzbee explains, "especially where the causes of an ill cross jurisdictional borders, the harms themselves cross borders, and there is vertical or horizontal fragmentation of potential regulatory turfs, incentives for regulatory inattention are strong".[56] Thus, regulatory flexibility and fragmentation of decision-making needs to be balanced with adequate coordination of decision-making, robust monitoring and feedback systems.[57] To summarize the key findings of this section, we have identified the following criteria and questions relevant for the assessment of GI governance systems:

- **Coverage:** Does the current governance system include mechanisms which aim to serve the four functions (1) placement of activities affecting the environment; (2) protection of places of special importance; (3) regulation of activities and projects; and (4) restoration of habitats. Do these mechanisms cover all

[50] *C. Hollings,* Resilience and stability of ecological systems. Annual Review of Ecology and Systematics 1973 4:1-24. *C. Folke* et al., Adaptive Governance of Social-Ecological Systems, 30 Ann. Rev. Env't & Resources 2005 at p. 441, 447.

[51] *Folke* et al. *supra* note 46.

[52] *C. Folke* et al., Regime Shifts, Resilience, and Biodiversity in Ecosystem Management, in L. Gunderson et al. (eds.) Foundations of Ecological Resilience 2009, at p.119, 142.

[53] See *C. Arnold & L. Gunderson, L* (2013) Adaptive Law and Resilience. Environmental Law Reporter, 2013 Vol. 43.

[54] Ibid.

[55] *A. Camacho,* Adapting governance to climate change: managing uncertainty through learning infrastructure. Emory Law Journal 2009 (59).

[56] *W. Buzbee,* The Regulatory Fragmentation Continuum, Westway and the Challenges of Regional Growth, J.L. & POL. 2005 (21) at p. 356.

[57] *B. Cosens*, Transboundary river governance in the face of uncertainty: resilience theory and the Columbia River Treaty. Journal of Land Resources and Environmental Law 2010 30(2). *O. Green* et al. EU Water Governance: Striking the Right Balance between Regulatory Flexibility and Enforcement? Research, part of a Special Feature on Law and Social-Ecological Resilience, Part I. 2011.

sectors and activities relevant for green infrastructure?

- **Capacity to enhance landscape level management and coordination of decision-making**: Does the governance system provide strategic planning framework to support individual decision-making processes?
- **Flexibility in local decision making and capacity to enhance multiple ecosystem uses**: Do the regulation allow taking into account local conditions in a relevant way? Do the laws include adequate mechanisms for accommodating diverging interest?
- **Robust monitoring and adaptation of decision making**: Does the governance system include adequate monitoring system and mechanisms to accommodate decision-making according the monitoring results and new information?

We have used these criteria to assess the feasibility of the Finnish governance system for the purposes of the green infrastructure policy. The focus of our assessment is on the legal and institutional frames relevant for the maintenance and improvement of green infrastructure. Hence, we do not aim to assess how legal and other mechanisms work, but only whether there is any legal and other institutional frames which could make possible to carry out long term green infrastructure policy. The basic rationale behind this is that public authorities may not make any decision affecting the rights and duties of private actors without legal basis and hence would this basis be lacking, there would not be green infrastructure policy.

There is no explicit green infrastructure policy in use in Finland. To focus our assessment on the right laws, we decided to explore laws which are relevant for functions we consider necessary to protect, sustain and (re)create green infrastructure: (1) placement of activities affecting the environment; (2) protection of places of special importance; (3) regulation of activities and projects; and (4) restoration of habitats. In our opinion, any legal system supporting effectively green infrastructure should include legal mechanisms for all these functions. So we used this categorization for the identification of the relevant instruments, and thereafter we assessed this group of instruments using the above mentioned evaluation criteria.

The focus of our assessment directs also material gathering. The key source of information is the legal system itself: what kinds of legal mechanisms existing and what are their merits and flaws from the green infrastructure policy point of view. The public authorities need to base their work on law and hence their possibilities to make decisions are framed by law. Furthermore, an analysis of public policy documents informs us about the policy strategies and other non-legal means possible used for purposes relevant for green infrastructure policy. Hence, we have gone through a huge number of laws and public policy documents.

## 4. Results

This section presents the key results of our analysis. First we'll summarize our findings concerning which instruments we found relevant for green infrastructure policy. The detailed description of the instruments would require much of space and hence we are not able to do it in this paper.[58] After short description of the relevant instruments, our main observations will be described criterion by criterion.

[58] In a longer report – written in Finnish – the instruments have been descried in detail. *J. Similä* et al. Vihreä infra – ekosysteemipalveluiden ja luonnon monimuotoisuuden riippuvuus vihreästä infrastruktuurista ja sääntelyjärjestelmän muutostarpeet. (Fortcoming in SYKE report series 2014).

The Finnish regulatory system directing placement of activities and regulating activities and projects relevant for green infrastructure consists of set of sector specific and few integrative instruments. Forestry, mining, land extraction and utilization of water resources are examples of sectors with specific direct regulation and administrative procedures (permits and notification systems). Agriculture is also regulated through the set of sector specific instruments, which are naturally largely affected by the Common Agricultural Policy (CAP). The key integrative instrument, which at least in principle, covers all sectors and activities, is planning law and its implementation mechanism (Land use and Building Act 132/1999). Planning law is mainly used for directing the placement of activities, but to some extent also to regulate the use of natural resources. Another key integrative instrument is the environmental impact assessment (Act on Environmental Impact Assessment Procedure 468/1994, Act on the Assessment of the Effects of Certain Plans and Programmes on the Environment 200/2005), which covers a wide range of activities, and does not exclude any projects or plans from the scope of assessment. The Environmental Protection Act (86/2000, currently under revision) with its direct regulations and permit procedure also covers all those activities that lead or may lead to environmental pollution. Its main function is to minimize and prevent environmental pollution through standard setting, but it also includes norms for directing the placement of activities within the project area. Also the Act on Water and Marine Resources Management 1299/2004 can be described as an integrative instrument based on principles of ecosystem management.

The key instruments for protection of places of special importance, including the Natura -2000 network and habitat's protection, can be found in Nature Conservation Act (1096/1996). In addition, the Water Act (587/2011), Act on Wilderness Areas (62/1991), Forest Act (1093/1996), and Rapids Conservation Act (35/1987) are used to protect certain habitat types in Finland. Some of the habitat types are directly protected through law, while others require separate administrative decision in order to have legal effects. In addition to these "traditional" nature conservation instruments, the voluntary protection of certain forest habitats is possible under the Forest Biodiversity Protection Programme for Southern Finland (METSO). Funding from this METSO programme is also used to incentivize restoration measures. In some cases the restoration measures are also obligated by the law. For instance, permits granted for utilization of natural resources often include obligations for landscaping or restoration measures after the project is finished. Also, if the degradation of ecosystem is due to illegal activities or activities that are against the permit granted, the obligation to conduct restoration measures can be placed according the Act on the Remediation of Certain Environmental Damages (383/2009).

In addition to these key legal instruments (and few others that were not described here due to the limited space), there are numerous soft law instruments such as National guidelines for land use, plans for biodiversity protection in agricultural lands, Recommendations for sustainable forestry, Water protection targets, and numerous plans and programmes for natural resources use that are of relevance and were included in the analysis. The key findings of our analysis are presented criterion by criterion below.

**Coverage**. We found that there is a rich web of instruments (regulatory, economic, and planning) in place, which are relevant for green infrastructure policy. The Finnish regulatory machinery provides opportunities, in principle, to conserve whatever habitats type authorities consider

worth of protecting and most of activities potentially changing the environment are regulated in some or another way. If we look at the four groups of instruments, the main institutional deficiency relates to **restoration**. In the Finnish legislation, there are only few explicit requirements for ecosystem restoration. However, as restoration measures are essential for reaching the targets of the EU's nature conservation and water protection legislation, ecological restoration is a commonly used, but largely unregulated nature conservation practice. The responsibility for ecosystem restoration in Finland is largely left to public bodies and is highly dependent on the availability of public finance. The Finnish law does not allow the setting of obligations on landowners to take active measures to restore habitats except when this obligation is a permit condition of natural resources use. There are only few legal obligations, which require restoration of changed habitats (e.g. after extraction of soil or mineral resources), but their scope is limited and they do not necessarily cover all old activities. There is no general mechanism able to cover situations where the need to restore habits is based on the cumulative effects of various kinds of possible small activities. Thus the restoration measures are focused on publicly owned protected areas. Outside those areas, restoration in requires either voluntary action based on negotiation or economic instruments compensating the economic loss that activities done for the public good may cause. The key instrument to finance biodiversity conservation measures in Finland is the METSO programme. However, it covers only forest areas and provides limited possibilities to fund restoration projects. With regard to the **placement of activities and regulation of them**, the regulatory web seems to cover all major activities and hence provide some kinds of tools for direction of detrimental activities from places which is important for green infrastructure. However, some small activities, like falling outside the permitting procedure, such as pulling cords can be carried out without any environmental control. The control of extraction of peat covers pollution effects, but do not cover negative effects on nature conservation values. The Nature Conservation and the Forest Act, as well as Water Act and Rapids conservation Act include tools to **protect some places of special importance,** although these mechanisms have been criticized for covering too small areas and only a part of habitats in need of protection.[59]

**Capacity to enhance landscape level management and coordination of decision-making.** The main and almost only mechanism for landscape level management is planning instruments, at regional and local levels. The planning law, however, is not sufficient to ensure that the ecosystem services of green infrastructure are maintained. The planning law has quite powerful means for drawing the main lines for **the placement of various activities**, although the final location may be different from the one indicated in the plan. In addition, the detailed regulation – and defining the crucial permit conditions – is done under other laws, which do not always require that planning decisions are taken into account. Planning law has dual role for **the protection of places of special importance**. The role of planning is mainly informative with regard to those places already strictly protected under the Nature Conservation Act, Forests Act, Water Act and Rapids Conservation Act. The implementation of these laws is a responsibility of state authorities, whereas local government has the responsibility for planning. Strict protection under

[59] *J. Similä*, et al. Luonnonsuojelulainsäädännön arviointi – Lain toimivuus ja kehittämistarpeet. Suomen Ympäristö 27/2010. *A. Raunio*, et al. Luontotyyppisuojelun nykytilanne ja kehittämistarpeet – lakisääteiset turvaamiskeinot. Suomen ympäristö 5/2013.

the planning law is possible, but limited spatially and temporary. The instruments available under the planning law are, however, used to complement the strict protection by, for example, creating buffer zones, where some sort of land uses are restricted or to enhance connectivity between protected areas. The **restoration of habitats** is excluded from the scope of the planning law. With regard to other laws, none of them provide effective tools for landscape management and coordination. There are some rules concerning the order in which permits should be granted and rules aiming to ensure that decisions are not overlapping. However, while these rules are important as such, they do not provide mechanisms which aim to landscape level management and coordination. In practice, landscape level planning is utilized in state owned land and water areas. The planning methods used by Metsähallitus (The Finnish Forest Park Service), which is responsible the administration and management of more than 12 million hectares of state owned land and water areas, is based on a a multi-stage planning system covering regional decisions on natural resources management, nature conservation and other forms of land use as well as detailed local plans for a particular operations. The decisions made in regional level on land use are implemented by means of detailed operational planning. Operational planning includes amongst others, silviculture and felling plans, forest and mire restoration and route plans.[60]

**Robust monitoring and adaptation of decision-making**. It is not surprising to find that monitoring and feedback mechanisms are built to support sectoral decision-making, not the changes of overall green infrastructure. In particular, there is no sufficient data concerning ecosystem services and mechanism affecting the provision of those services. After saying this, it need to be stressed that there is a huge number monitoring programmes and data banks, which are in some way or another relevant for the understanding of the state and changes of green infrastructure. For example, biodiversity monitoring programmes provide relevant information, although green infrastructure policies call for new kinds of information. Nevertheless, a new combination of existing sources of information provide opportunities to develop the information basis for green infrastructure policy as show by our colleagues, who have buildt up maps on ecosystem services based on a method what they called green frame[61] using existing data.

What comes to the mechanisms to respond to the new knowledge gained through monitoring or other vice, we concluded that there are various approaches in use aiming to increase adaptive capacity of the governance-system relevant for green infrastructure. To begin with, in a small country like Finland, even environmental laws are revised often, two thirds of environmental laws and regulation is less than 10 years old and one third less than 5 years old.[62] Regulatory impact assessment is obligatory for all new laws and either strategic impacts assessment or environmental impact assessment for all major policy and administrative decisions. Undoubtedly, this system includes a number of elements which increase adaptive capacity of public decision-making.

With regard to the **placement of activities** the plans under the planning laws are frequently

[60] http://www.metsa.fi/sivustot/metsa/en/NaturalResources/Sivut/NaturalResources.aspx

[61] *L. Kopperoinen, et al.* Using expert knowledge in combining green infrastructure and ecosystem services in land use planning: an insight into a new place-based methodology, Landscape Ecology 2014 (DOI 10.1007/s10980-014-0014-2).

[62] *J. Similä*, Regulating Industrial Pollution – The Case of Finland. Forum Iuris 2007.

updated. Further, permit decisions **regulating activities** need to be renewed after a period of time, and conditions for subsidies are regularly revised. Modern laws governing the regulation of activities and projects, make even it possible to open a process aiming to change permit conditions before the regular revision, if something unforeseeable happen. Having said this, one exception, relevant for green infrastructure was identified among the regulations on permit procedures. According the Water Act (2011/587) section 14 the party responsible for the project shall be obliged to take measures to prevent or reduce the damage to fish stocks or fishing, (fisheries obligation) or be ordered to pay a fee to the fisheries authorities. The regulations on fisheries obligations may be amended by the permit authority if the conditions have fundamentally changed. The problem, however, is that there are old water permits granted for hydro power plants without such an obligation at the first place. As stated in the Finnish Supreme Court decision 27.3.2006/676, despite the changed conditions, the fisheries obligation cannot be placed once the permit is revised, if there was no such an obligation in original permit. This has been proven to be problematic in terms of **restoring** the migratory fish stocks, which have significantly decreased due to hydro power plants.[63]

Further, the problem lies on the fact that the adaptive capacity of regulation is not harnessed for the maintenance and improvement of green infrastructure. The legal requirements for renewal of permits or changing them before regular revision do not make any special reference to landscape level changes and need to coordinate activities with other ones. **The same applies to the protection of places of special importance**; they do not improve the capacity of governance system to react to changes beyond the narrow focus of the regulation.

**Flexibility in local implementation and accommodation of diverging interests.** The benefit of planning law from the perspective of green infrastructure policy is that it offers flexible and democratic means to accommodate diverging interests through **placement of activities**. The planning law requires consideration of economic, ecological and social interests in land use plans. Compared to the planning law, the **regulation of activities** through sector specific regulation and permit procedures leave less room for flexibility in local level implementation and accommodating diverging interest in decision-making. This is because often, according the law or its interpretation permits are to be granted if the certain preconditions set by the law are met. In this regard, the permit procedure under the Water Act differs from other permitting systems as it is based on a principle of interest weighing, seemingly allowing all kinds of interests to be taken into consideration. Having said this, in practice the difference between these two systems has been less significant.[64]

In terms of **protecting places of special importance**, the legal mechanism protecting certain habitat's directly by law, such as habitats for species considered in a need for strict protection under the Habitat's Directive, can be regarded as too static, inflexible, and incapable of accommodating diverging interest and taking into account local conditions. Thus, protecting areas through separate administrative decision-making procedure and drawing management plans for protected areas provides, at least in principle, more

[63] Government Decision in Principle 8.3.2012. National strategy on Fish Paths.

[64] *A Ekroos & M. Warsta,* Luontoarvot ympäristölupamenettelyssä. Selvitys ympäristönsuojelulain ja muun lainsäädännön kehittämismahdollisuuksista. 2012.

flexible means to accommodate diverging interests. However, at least what comes to the areas included in Natura 2000 -network, the flexibility in local implementation seems to be hindered by the use of rather static ecology criteria (conservation objectives) under the Habitat's Directive, easily opposing natural interests to social and economic interests. The assessment of the projects and plans according the article 6 of the Habitat's Directive, starts with the crucial question whether a plan or project has significant effects on the Natura 2000-site's conservation objectives. This assessment based on strictly ecological criteria might easily lead to a blocking away of socio-economic interests.[65]

In addition, the strict application of the provisions for the habitat's and species protection may even paradoxically unincentivize **restoration** measures. As pointed out by Schoukens, strict application of the Habitat's directive may, for instance, take away chances for the establishment of "temporary nature" on those lands that lay vacant waiting for the future developments. The landowner is rather incentivized to prevent protected species and habitat's to settle in order to avoid strict land use restrictions in the future.[66]

## 5. Discussion and conclusion

In this paper we have developed an approach for the assessment of current governance system to understand to what extent it could serve the purposes of green infrastructure policy and how current governance system could be developed. By governance system we mean legal and other institutional arrangements in which the implementation of green infrastructure policy will take place. Our main focus is on legal system, although we are not limiting ourselves solely to the legal sphere.

We found that Brett Frischmann's infrastructure theory gives a sound starting point for the building of assessment framework. Originally Frischmann has developed his theory for other than environmental field and his theory, as interesting it is, fails to take into account all nuances of environmental resources. Particularly it fails to consider the landscape level management needed to secure the provisioning of certain ecosystem services, such as pollination, and the special nature of green infrastructure as a complex socio-economic system in a need of adaptive management.

We applied the framework in the governance system of green infrastructure resources in Finland and found it useful. Based on our analysis the greatest weakness of the current governance system in Finland for green infrastructure is the lack of mechanisms for landscape level management and weak coordination between instruments. The current governance system for green infrastructure in Finland consists of broad, but fragmented set of instruments. While regulatory fragmentation as such cannot be regarded as negative phenomena it becomes problematic, if the coordination between instruments and information sharing between authorities is not adequate. The sector specific governance systems and single decision-making procedures often restrict the consideration only to the particular activity and the area in question. They fail to provide means to plan conservation of wider landscapes and to consider joint effects. Further, as Camacho explains the regulatory fragmentation runs the risk of regulatory inattention.[67]

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[65] See more in *S. Borgström & F. Kistenkas*, Green Infrastructure and Ecosystem services: re-assessment of the Habitat's Directive (EELR 23/2014).

[66] *H. Schoukens* 'Temporary Nature: A new way forward for ecological restoration in highly urbanized areas?' The Nordic Environmental Social Science Conference, 11–13 June 2013 Abstracts. available in http://ness2013.ku.dk/documents/NESS_2013-Volume_of_abstracts.pdf/

[67] *Camacho supra* note 53.

The main and almost only mechanism for landscape level management in Finland is planning instruments governed by the planning law, at regional and local levels. The planning law provides soft means to support landscape level management and coordination between instruments, but these means are insufficient. Although these instruments are used in the planning practice, their influence on the actual land uses is limited partly because of the legal nature of the instruments and partly because unsatisfactory coordination between policies of local governments and state authorities. Further, the link between instruments regulating various activities and planning law is either fully lacking or weak.

There are several options to find ways forward towards more integrative, coordinated governance system for green infrastructure. The situation could be improved also without changes in legislation. This could be done through educating planners and making use of new methods developed to provide spatial information on ecosystem services. In addition, strengthening the cooperation and information sharing between authorities would be beneficial. The weakness of this approach, however, is that without changes in legislation the link between instruments regulating various activities and planning law would continue to be blurred. In addition, spatial planning cannot be used to obligate or incentives active management measures, such as restoration, which is one of the core objectives of EU's green infrastructure policy.[68] As the current governance system does not include instruments to provide a sound basis for restoration of various habitats types, new instruments or changes in current once are likely needed, if the restoration target of 15 % of degraded ecosystems by 2020 is to be reached.

Thus, we propose, that Finland would follow the example of other countries, which have already adopted or plan to adopt a new special planning mechanism for green infrastructure. What is common to those new mechanisms is that they aim to provide means to conceive the big picture spatially, to provide common understanding of the measures needed across-sectors at national and regional level, and to enhance coordination and cooperation between different actors.

Green infrastructure policy is needed as a response to the continuous loss of biodiversity and degradation of ecosystems and ecosystem services. The current environmental and other sectoral policies and legislation to support them are inadequate, as they fail to integrate the consideration of services that nature provides us for free into all decision-making that affects the use of land and water resources. Thus, changes in current governance systems are needed to provide sound basis for green infrastructure policy.

[68] *European Commission supra* note 3.

# Assessing Aquatic Spaces of Regulation: Key Issues and Promising Solutions

*Henrik Josefsson**

**Abstract**

Implementing measures on a large scale, including multiple bodies of water and activities, is emphasized as a prerequisite for achieving the Water Framework Directive's objective of 'good ecological status'. This article asks what kind of space of regulation is suitable for the ecological and hydrological systems and large-scale environmental problems of a river basin area. The conclusion is that the obligation of 'good ecological status' is coupled to each body of water, not multiple ones, and not designed for large-scale environmental problems that include multiple bodies of water. A larger-scale and management-adapted aquatic space of regulation is found in the Habitats Directive and the Liability Directive, since their space of regulation is more site-specific and adapted to environmental characteristics and problems of the legal space. A differentiation of spaces of regulation that facilitates management of large-scale environmental problems of a sub-basin or river stretch is proposed.

*Consult the genius of the place in all; That tells the waters to rise and fall …*
Alexander Pope[1]

## 1. Introduction

This article analyses the establishment of spaces of regulation of areas where the expanse of freshwater ecosystem is a dominant feature. Under EU law the assessment and management of freshwater ecosystems are dominated by the Water Framework Directive[2], however, other legal frameworks, such as the Habitats Directive,[3] and the Liability Directive[4] also provide freshwater spaces of regulation.[5] The purpose is to, first, examine if regulation of large-scale environmental problems, integrating multiple bodies of water, is compatible with the Water Framework Directive's space of regulation that 'body of wa-

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[1] Alexander Pope, *Epistle to Burlington,* lines 57–58.

[2] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (Water Framework Directive).

[3] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive).

[4] Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage (Liability Directive).

[5] 'Space of regulation' is used as an overarching concept to converge the different legal schemes of geographical differentiation of both social places and ecosystems. The differentiation is a mean to operationalize the different environmental objectives of each directive geographically.

ter' and the objective of 'good ecological status' actualizes. Secondly, the purpose is to examine if there exists alternative spaces of regulation or ecological spaces suitable for the management of large-scale environmental problems. Still, as the Water Framework Directive is the main legislative act as regards water management, this essay orients itself towards the Directive throughout and analyses how well the different directives correlate when they overlap.

This essay first discusses the possibility of the Water Framework Directive's unit of 'body of water', and objective of 'good ecological status' to include or interrelate multiple bodies of water and activities. Second, it exemplifies how the ecological space of a stream adjacent to a Natura 2000 area is perceived legally in the issuing of a hydropower permit. The third and fourth section provides an analysis and discusses different spaces of regulation, such as the Liability Directive's, the large-scale legal spaces of the Marine Strategy Directive[6] and the Landscape Convention[7]. An expanse of freshwater ecosystem may, ecologically, be differentiation through the use of units such as: community, population, ecosystem, lake, or river, for example. Section five introduces ecological reasoning discussing different ecological spaces for the assessment of river basin environmental problems, both with and without regard to the Water Framework Directive. The final section discusses how an expanse of freshwater ecosystem may be differentiated, to facilitate spaces of regulation that incorporates large-scale environmental problems.

## 2. Aquatic Spaces of Regulation

Legal objectives such as the Water Framework Directive's 'good ecological status' or the Habitats Directive's 'favourable conservation status' are connected to the units of their respective Directives. A 'body of water' is the unit to which 'good ecological status' applies (e.g. Art 2 (22), 4 (a)(ii)), and a 'Natura 2000 area' or a 'species population' within the European territory is the unit to which 'favourable conservation status' applies (e.g. Art. 3 and 1 (i)). When assessing the 'favourable conservation status' of a Natura 2000 area or a species population, the obligation may expand beyond of the unit to activities outside of geographical area or follow the species requirements for self-maintaining, if an activity significantly affects the 'favourable conservation status' of the of the Habitats Directives spaces of regulation (Art. 1 (e)(i), Art. 6 (2)(3)).

The spatial expansion of the obligation of 'favourable conservation status' is not possible, in relation to the Water Framework Directive's unit 'body of water', as the entire river basin is differentiated into different types of bodies of water or management units, each having a type-specific objective with a type-specific reference point associated with it (see Art. 4 (a)(ii), Annex V (1.2.) and Annex II (1.1.)(1.3.)). Another difference is that a Natura 2000 area may include waters that are not identified as 'bodies of water', since the Water Framework Directive applies to rivers, lakes, transitional waters, or coastal waters. Waters that cannot be clearly classified, as any of these categories (e.g. the narrow neck between two lake types), is not directly integrated into the provisions of the Water Framework Directive (see Annex II). Thus, the space of regulation of a body of water is not the same, ecologically or legally, as the legal space of a Natura 2000 area, and generates different obligations for the Member States.

[6] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for Community action in the field of marine environmental policy (The Marine Strategy).

[7] Council of Europe, 'European Landscape Convention, Florence. CETS No. 176 (Strasbourg: Council of Europe)'.

The difference between the spaces of regulation is due to the variables that direct the differentiation of the legal units. In the Habitats Directive, geographic, abiotic, and biotic features distinguish aquatic areas, a differentiation of units that seems to follow the Convention on Biological Diversity[8] and its definition of 'ecosystem' as a 'dynamic complex of plant, animal and micro-organisms communities and their non-living environment interacting as a functional unit' (Art. 2). In the Water Framework Directive, only abiotic parameters, in much more detail, are specified, to differentiate bodies of water from one another (see Annex II 1.2).

The following section discusses the suitability of the body of water as the space of regulations of 'good ecological status' when assessing and managing the ecological, and hydrological systems of an aquatic area, with regard to large-scale environmental problems.

### 2.1 The Water Framework Directive

In a recent Swedish official governmental report, the interconnectedness of a river basin was discussed from the perspective of implementing measures for multiple bodies of water and activities within a sub-basin or river section.[9] The report suggested that it should be possible for the government or competent authorities to issue general administrative provisions that implement general measures with regard to substantial, well documented, and similar environmental problems within a part of a river basin. Issuing this kind of provision is intended to breach permit rights and change the circumstances of multiple, permitted activities within a sub-basin or river section, for example. It has been argued that this kind of provision is a prerequisite for achieving the Water Framework Directive's objective of 'good ecological status'.[10] The space of regulation would then be on a large scale (e.g. multiple bodies of water or sub-basin), potentially incorporating ecological, hydrological, and hydrogeological systems. However, such large-scale regulation highlights many complex legal and ecological questions, which the report leaves to the administrative authorities to sort out. One question not discussed in the report is fundamental: is this kind of large-scale regulation compatible with the Water Framework Directive's space of regulation that 'body of water' and the objective of 'good ecological status' actualizes?

#### *2.1.1 From River Basin to Body of Water*

The obligation of 'good ecological status' is notable for both its ecological and legal complexity.[11] Part of the complexity is that the Water Framework Directive establishes an a priori typological system that differentiates the river basins into bodies of water (found primarily in Annex II). The primary focus of the differentiation is to allow for the assessment of biological and physico-chemical quality elements, and the way in which these are affected by human activity.

[8] Convention on Biological Diversity, United Nations 1992.

[9] SOU 2013:69. Vattenverksamhetsutredningen, *Ny Tid Ny Prövning: Förslag till Ändrade Vattenrättsliga Regler* 305–312.

[10] Daniel Hering and others, 'Assessment and Recovery of European Water Bodies: Key Messages from the WISER Project' (2013) 704 Hydrobiologia 1.

[11] See for example Brian Moss, 'The Water Framework Directive: Total Environment or Political Compromise?' (2008) 400 Science of the Total Environment 32; Daniel Hering and others, 'The European Water Framework Directive at the Age of 10: A Critical Review of the Achievements with Recommendations for the Future' (2010) 408 Science of the Total Environment 4007; Henrik Josefsson and Lasse Baaner, 'The Water Framework Directive – a Directive for the Twenty-First Century?' (2011) 23 Journal of Environmental Law 463; Henrik Josefsson, 'Achieving Ecological Objectives' (2012) 1 Laws 39.

Throughout the EU, more than 127,000 bodies of surface water have been identified, approximately 82 % being rivers, 15 % lakes, and the remaining 3 %, coastal and transitional waters.[12] The differentiation of bodies of water is a crucial step for obtaining a robust assessment and classification systems under the Water Framework Directive.[13] Establishing the body of water as the space of regulation for 'good ecological status', the Water Framework Directive specifies that the river basin should be differentiated into different types of bodies of water (system A). If a lake has a depth <3 m, 3 to 15 m, and >15 m, each area is designated as one of three types, and each type is compared to a type-specific 'high ecological status' lake reference point (Annex II 1.2.2.), for example. An alternative differentiation system (system B) complement the main differentiation method, but must achieve at least the same degree of differentiation as would be achieved using system A, that is, ensure that type-specific biological reference conditions may be reliably derived (see Annex II 1.1. (iv), 1.2.). For rivers, as one example, the defining features for this differentiation include altitude, latitude, longitude, geology, and size. For heavily modified and artificial bodies of water with the objective of 'good ecological potential', the lines drawn among types of bodies of water are based primarily on the changes in hydromorphological characteristics resulting from physical alternations caused by human activity, preventing the attainment of 'good ecological status' characteristics (see Art. 4 (3 (a)) Annex II 1.1. (v) and Annex V 1.2.5.).[14] For example, a dam affects the hydromorphological characteristics of a body of water, owing to its physical alteration of the flow of the heavily modified body of water.

Even if the Water Framework Directive leaves the way in which its provisions are achieved to the discretion of Member States, the differentiation process is not optional, but a material, procedural part of the Directive. The differentiation constructs the body of water as the unit to which the Water Framework Directive's objectives apply, and therefore the differentiation of bodies of water is an important procedural element for achieving 'good ecological status'. Each body of water is to be assessed and managed individually, as obligations such as non-deterioration and restoration are coupled to each body of water, and not multiple ones (e.g. see Art. 4 (1)(a)).[15] This highlights that the achievement of a good status for the ecological organization of aquatic ecosystems, communities, populations, and organisms is on the scale of a body of water, creating an impression that the river basin is a collection of separate bodies of water. In order to improve and maintain ecological status, this is how lawyers, governmental agencies, and the public are to frame the aquatic assemblage of different types of organisms and their abiotic environments.

The ecological assumption behind this differentiation of river basins is that biological communities in a type of body of water will deviate only slightly from the reference body of water and its biological communities, when they at-

[12] European Commission, 'Commission Staff Working Document European Overview (1/2) Accompanying the Document Report From the Commission to the Europea Parliament and the Council on the Implementation of the Water Framework Directive (2000/60/EC) River Basin Management Plans' 70.

[13] Ibid 58.

[14] See also 'Common Implementation Strategy For The Water Framework Directive (2000/60/EC) Guidance Document No 2 Identification of Water Bodies'.

[15] See also Lasse Baaner, 'The Programme of Measures of the Water Framework Directive-More than Just a Formal Compliance Tool' (2011) 8 Journal for European Environmental and Planning Law.

tain 'good ecological status' (see Annex V 1.2.). This means that you compare and assess sites by assuming that one site has certain desired attributes/elements/conditions, which are then compared to those of another site with undesirable elements or conditions. This reasoning is used experimentally, for example, when two similar sites exist, and one is experimented on, to understand and predict how ecosystems may respond to the induced stressors. In management under the Water Framework Directive, the reasoning may be practical: if human stressors impact a stretch of a river, one compare this stretch to a similar reference stretch, and through management measures, try to alter the impacted stretch, to make it similar to the reference stretch.[16] This may be of practical value, since a number of comparable bodies of water may be similarly assessed and managed.[17]

It should be kept in mind that the conditions for the previously mentioned practical management are the results of treating the river basin as consisting of multiple numbers of predefined elements, assessed and managed based on their similarities and differences, rather than site-specific characteristics. The ecological status of a body of water depends on how it resembles the units of the differentiation system of the Water Framework Directive, and not the site-specific structure of the ecological organization; instead, that status is assumed to follow from the structural factors that direct their differentiation. Thus, Annex II provides a grammar that, by a priori variables, determines how ecological spaces in EU river basins are alike, without assessing their individual attributes.[18]

As many biotic and abiotic site-specific interactions are fundaments to the ecosystem status of a stream or a lake framing the ecological organization of the river basin in this way, assessment and management under the Water Framework Directive differs from an assessment and management focused on the status of ecosystems.[19] The following sections attempt to address this divergence between the ecological space of an ecosystem and the space of regulation that the body of water actualize.

### *2.1.2 Managing Multiple Bodies of Water Under the Water Framework Directive – General Administrative Provisions*

The idea behind a general administrative provision is quite simple: if multiple permitted activities considerably affect the ecological status of a river section and deteriorate the river section in a similar manner, then instead of reviewing each permit, a general measure could be implemented that allows for the ecological status of the river section to increase. The legal and ecological actuality of the river section is not necessarily so simple. Within a larger area with multiple activities, the bodies of water may be of different types, and each unit may carry different type-specific obligations that must be taken into account. Furthermore, the obligation of 'good ecological status' does not allow interim ecological losses within one body of water to be compensated by restoration or enhancement measures at another

[16] Nikolai Friberg and others, 'Biomonitoring of Human Impacts in Freshwater Ecosystems: The Good, the Bad and the Ugly' (2011) Volume 44 Advances in Ecological Research 1.

[17] Piet FM Verdonschot, 'Evaluation of the Use of Water Framework Directive Typology Descriptors, Reference Sites and Spatial Scale in Macroinvertebrate Stream Typology' in Mike T Furse and others (eds), *The Ecological Status of European Rivers: Evaluation and Intercalibration of Assessment Methods* (Springer Netherlands 2006).

[18] This analysis was inspired by Michel Foucault, *The Order of Things : An Archaeology of the Human Sciences* (Pantheon Books 1971) 136–137, 144–145.

[19] Guy Woodward, 'Biodiversity, Ecosystem Functioning and Food Webs in Fresh Waters: Assembling the Jigsaw Puzzle' (2009) 54 Freshwater Biology 2171; Friberg and others (n 16).

body of water, and Member States must prevent deterioration, and protect, enhance, and restore each body of water simultaneously (although the time frame for achieving the objectives may differ)(Art. 4 (1)(a)(i)(ii)(iii) and 4 (4)).

A general administrative provision aimed at changing ecological conditions of multiple bodies of water must ensure that the measure both prevents deterioration and simultaneously improve the ecological status of all bodies of water within a sub-basin, for example. Since the risk of ecological deterioration cannot be circumvented, owing to the site-specific ecological, legal, and technical complexity of each sub-basin or river section, an ecosystem focused administrative provision for multiple bodies of water must also correspond to the deterioration exemptions found in the Water Framework Directive. Consulting the exemptions is necessary as there can be no guarantee that management measures, as new modification of the physical characteristics of bodies of water (such as water flow or temperature), do not result in deterioration within the targeted or adjacent bodies of water.[20] Therefore, any provision affecting multiple bodies of water must clearly demonstrate that it is for the benefit of the environment and society in the absence of significant, better environmental options (it has to be a more suitable regulative instrument than separate reviews of each permitted activity), while all practicable steps are taken to mitigate any risk of adverse impact on any body of water (Art. 4 (7)(a)(c)(d)). This problem has been discussed by some Member States (e.g. the Netherlands and Denmark), and in the Netherlands, deterioration of one specific body of water may be compensated for by improvements to another body of water, or the river basin district as a whole.[21]

Ecologically, implementing general environmental measures as a legal method for the large-scale management of hydrological connectivity between multiple bodies of water, for example, is probably needed, if the status of the ecological organization of river sections, sub-basins, or river basins is to improve. However, a precautionary approach is needed, owing to the lack of knowledge of the large-scale rehabilitation of aquatic ecosystems.[22] Also questionable is whether large-scale measures are compatible with the way in which the Water Framework Directive couples the obligations of the Directive to the 'body of water' unit. Since the consequences for each body of water cannot be envisaged, in the implementation of management measures that change the physical characteristics of bodies of water, it must be clearly demonstrated that there is no better legal option available for the achievement of 'good ecological status' for each body of water affected, corresponding to the Water Framework Directive's exceptions for new modification of bodies of water (Art. 4 (7)(d)).

The more comprehensive management that a general administrative provision is intended to provide is appropriate in intent, but the Water Framework Directive's space of regulation is not differentiated for the purpose of managing bodies of water together, since the obligations of 'good ecological status' and non-deterioration are tied to each body of water, and not to the multiple bodies of water that constitute a sub-basin,

[20] For example, see Christian Feld and others, 'From Natural to Degraded Rivers and Back Again: A Test of Restoration Ecology Theory and Practice' (2011) 44 Advances In Ecological Research 119; Scott A Stranko, Robert H Hilderbrand and Margaret A Palmer, 'Comparing the Fish and Benthic Macroinvertebrate Diversity of Restored Urban Streams to Reference Streams' (2012) 20 Restoration Ecology 747.

[21] See Andrea Keessen and others, 'European River Basin Districts: Are They Swimming in the Same Implementation Pool?' (2010) 22 Journal of Environmental Law 197.

[22] Feld and others (n 20).

for example.[23] As one of the dominant features of aquatic ecosystems is hydrological connectivity among various parts of a sub-basin, this conclusion may be surprising. However, the hydromorphological quality elements are not part of the definition of 'good ecological status', but are defined only for 'high ecological status' bodies of water, and when establishing reference points, or defining a body of water as heavily modified (as a possible reference for hydromorphological characteristics) (see Art. 4 (3) and Annex V 1.1. 1.2.). The bodies of water are differentiated to allow for the assessment of the biological and physico-chemical quality elements, and not hydrological connectivity (see Annex V 1.2.). This means that, just because a differentiated river basin corresponds to the stipulated differentiation, and may facilitate the assessment of the quality elements, the space of regulation may still fail to provide a basis for appropriate management measures (as a general administrative provision) and assessment of hydrological or food web connectivity. Therefore, the space of regulation that a body of water provides may not coordinate the ecological, hydrological, and hydrogeological systems of the river basin (recital 33) without side-stepping the material, procedural part of the Water Framework Directive that the differentiation of bodies of water is.

There are alternatives for adapting the general administrative provision to the body of water construct, if there is a similar causality between multiple activities and a corresponding unsatisfactory body of water status. Each activity could be required to be investigated by the operator of the activity and reported to the competent authority, regarding how the activity might be adapted to increase the status of the body of water in question. The authorities could then assess the suggestions, and obligate the operators to realize the necessary measures. With this approach, measures would address a general environmental problem while being coupled to the body of water of each activity, and clearly be a better regulative option, in comparison to separate permit reviews of each activity.

How the differentiations of spaces of regulation may differ will now be demonstrated through a case study, which demonstrates three assessment and management spaces: the Habitats Directive's, the Swedish Environmental Court of Appeal's, and the Water Framework Directive's.

### 2.2 The Swedish Stream, Ljungån

When a court or administrative authority considers the review or issuing of a permit the assessment is often tied to the place of the activity (even if alternative locations and indirect effects need to be considered in accordance with the Environmental Impact Assessment Directive[24] (Annex IV (2) (5))). That the differentiation of the space of regulation is difficult has been demonstrated in Swedish case law regarding Natura 2000 areas on several occasions, and an aquatic example (and not an example of court practise) is that of the hydropower development of Ljungån. Ljungån was an unregulated stream located just outside the Natura 2000 area of Gimån.

[23] It is important to see that there is a difference between the assessment and the management obligation, as monitoring points may be selected based on the magnitude and impact of hydromorphological pressures as a whole, for example, and could include multiple bodies of water, whereas the environmental objectives apply to bodies of waters individually.

[24] Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment Text with EEA relevance.

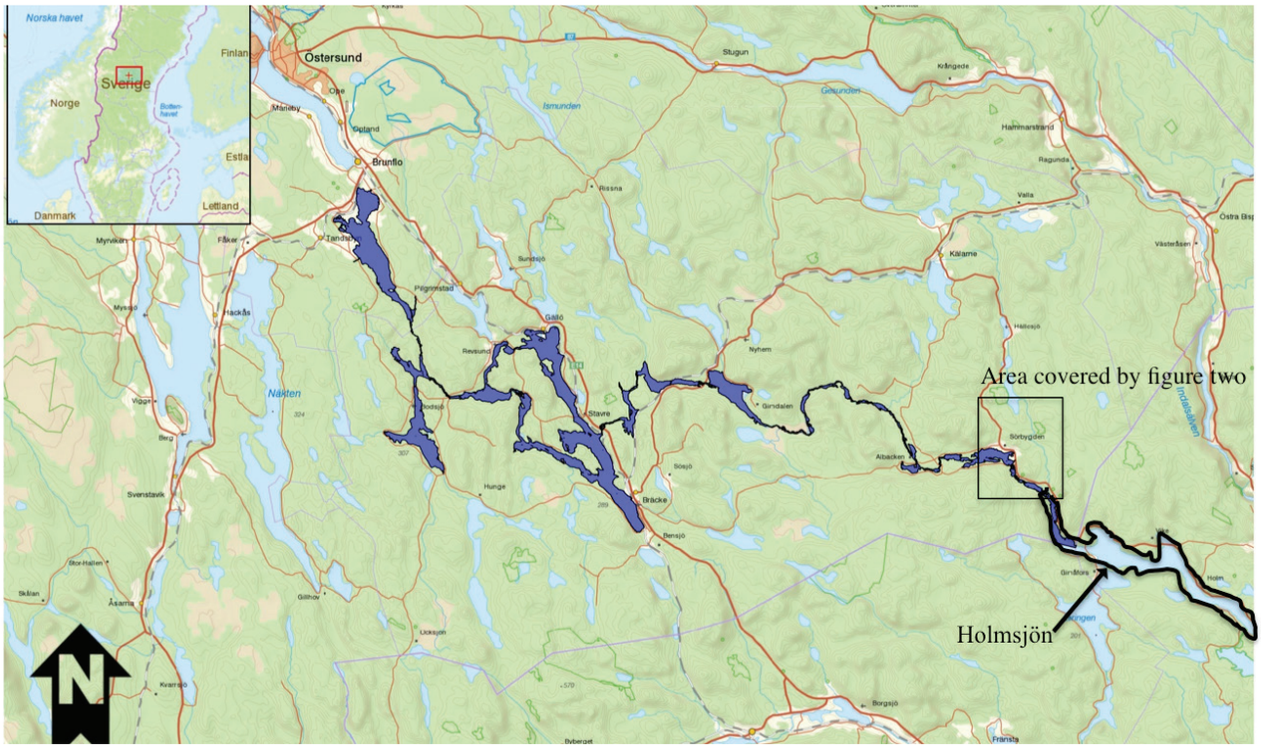


*Figure 1. The Natura 2000 area of Gimån; the highlighted area is the Natura 2000 area.*[25]

Gimån is a Natura 2000 area with several species and habitats of EU conservation value, such as Fennoscandian natural rivers (3210), oligotrophic to mesotrophic standing waters (3130), hard oligo-mesotrophic waters with benthic vegetation (3140), water courses of plain to montane levels (3260), *Cottus gobio* (European bullhead), and *Lutra lutra* (European otter). Ljungån is a tributary of the Natura 2000 area, and connects to the Gimån area through the regulated lake Holmsjön, which is part of the Natura 2000 area.[26] The Holmsjö area is characterized by dead riparian zones that make it difficult for organisms to find food in the lake, and tributaries, such as Ljungån, is an important part of the food web of the lake and the Natura 2000 area.[27] In the conservation plan for the Natura 2000 area, Ljungån is described as an important link in maintaining the conservation status of the Natura 2000 areas, and has many indicators of ecological value, such as bottom fauna of national conservation interest, and food web interaction from species such as *Salmo trutta* (salmon), *Lutra lutra* (otter), and *Thymallus thymallus* (grayling), which connect the food web of the Natura 2000 area to Ljungån. The otter is found in the Habitats Directive Annex IV, and specified as in need of strict protection. For the otter population of the Natura 2000 area, Ljungån appear to provide a space that supports the population's capacity to maintain itself (one of three criteria's for 'favourable conservation status', see Art. 1 (i)) with regard to the Natura 2000 area, especially with respect to the regulated lake section of the area. Both the Natura 2000 area and the otter had excellent status in the conservation plan, before exploitation. However, it is emphasized in the conservation plan that

[25] Map extracted from VISS database, http://www.viss.lansstyrelsen.se, 2014-06-23.
[26] Länsstyrelsen Jämtlands Län, 'Bevarandeplan För Natura 2000-Område Gimån SE0720294'.
[27] Ibid.

this status depends on the current hydrological-ecological network of tributaries that function ecologically.[28] That is, even if Ljungån is outside the protected area, the conservation values of the Natura 2000 area depend on the ecosystem functions of tributaries outside of the Natura 2000 area, of which Ljungån is indicated as the most important.

In 2004, the Swedish Environmental Court of Appeal permitted a new hydropower station and dam in the lower part of Ljungån, disrupting the hydrological and food web connection between the Natura 2000 area and the upstream section of Ljungån. Different administrative organizations, such as the National Conservation Agency and the County board considered that a new hydropower station and dam would significantly impact the conservation values of the Natura 2000 area, regardless of measures, such as the construction of a small artificial tributary. The court disagreed, and considered the measure sufficient to permit the hydropower station and dam, as habitats of EU conservation value are not directly affected by the exploitation, and only some species, principally the otter, are perceived as affected by the exploitation.[29] Since the exploitation affects the hydrological-ecological network that supports the otter's ability to maintain itself, and thereby affects its favourable conservation status by disturbing the species (Art. 12 (1)(b)), the decision may be criticized for a questionable assessment of the ecosystem interrelations and dependencies between Gimån and Ljungån, foremost with regard to the otter.[30] In other court decisions it has been emphasized that it is the comprehensiveness of habitat types and species that together should be assessed when determine if an activity will provide a deterioration of a Natura 2000 area.[31] But primarily, the differentiation of the Natura 2000 area may be criticized, as the space of regulation differs from the ecological space of Gimån. Because even if Article 4 specifies that, for aquatic species that range over wide areas, sites should be proposed that represent the physical and biological factors essential to the species' life cycle, Ljungån is not included in the Natura 2000 area. It would seem that in differentiating the Natura 2000 area, the specified habitat types were considered, and not the otter.

Above, the differences between the space of regulation of a Natura 2000 area and a body of water were discussed. In the implementation of the Water Framework Directive, the stream, Ljungån, was differentiated into two bodies of water, and each of its four watercourse tributaries was differentiated from Ljungån into uniform, isolated bodies of water (classification presented in figure two). The lake downstream from Ljungån, is differentiated into two bodies of water: upstream (Drogsjön), the body of water is classified as being of 'moderate ecological status', and downstream (Holmsjön), 'with moderate ecological potential'. The entire Natura 2000 area of Gimån is differentiated into 47 bodies of water, tributaries not included.[32]

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[28] Ibid.

[29] In Swedish: "Den särskilt utpekade art inom Natura 2000-området som oavsett områdets utbredning skulle kunna påverkas av en utbyggnad av Ljungån är utter. Vidare kan vissa angivna skyddsvärda livsmiljöer, där karaktärsarter utgörs av öring och harr, påverkas. Med de skyddsåtgärder som enligt nedan bör föreskrivas för verksamheten finner Miljööverdomstolen att det föreligger förutsättningar att bevilja tillstånd till verksamheten enligt 7 kap. 28 b § miljöbalken." See Mark- och Miljööverdomstolen, 'Ljungån M 6581-05'.

[30] See also Henrik Josefsson, *Natura 2000: en rättsfallsanalys* (2008), D Master thesis.

[31] MÖD 2004:68 'Hägerums Kvarn II'.

[32] Information extracted from http://www.viss.lansstyrelsen.se, 2014-06-23.

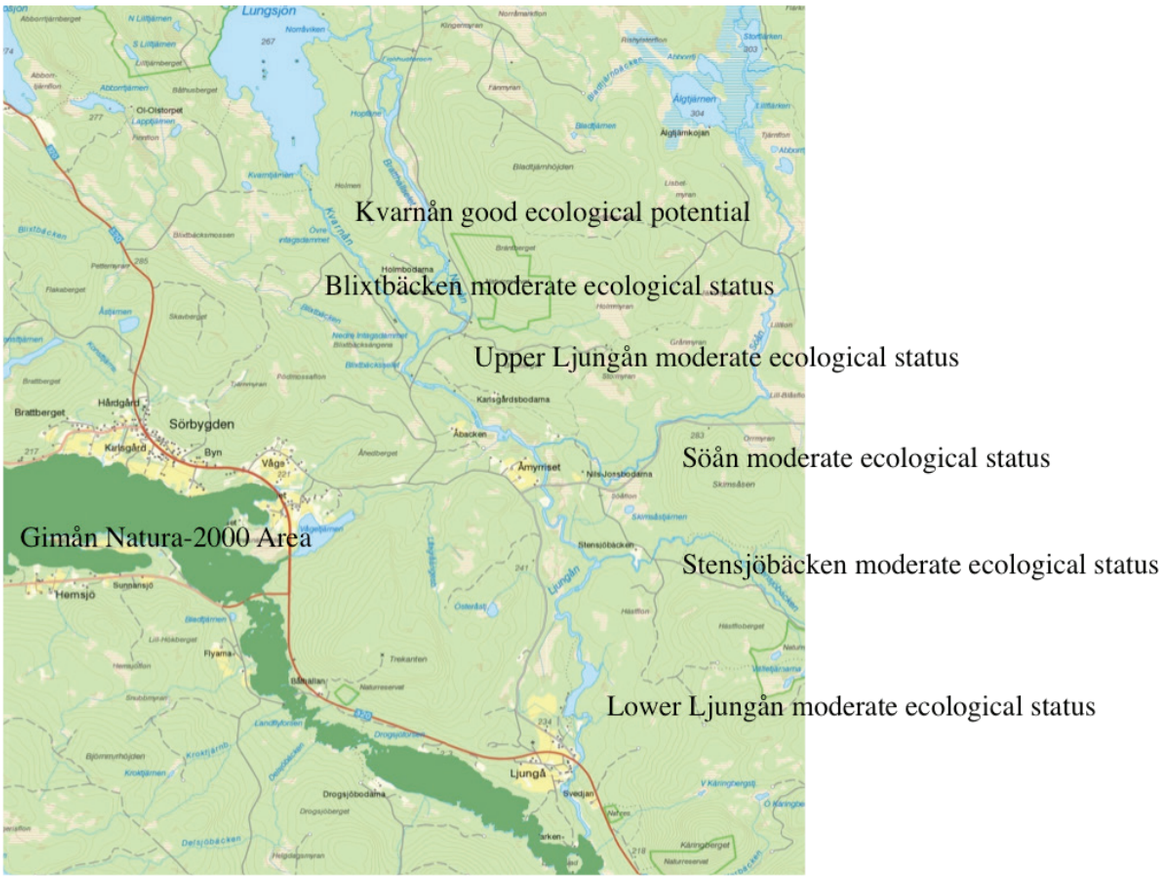


*Figure 2. Ljungån, the Natura 2000 area; Gimån is highlighted.*[33]

As discussed above, the Water Framework Directive is not constructed to assess and manage the site-specific hydrological-ecological interconnectedness between a stream and a lake, since the obligation of 'good ecological status' is coupled to the type-specific body of water. On the other hand, the Habitats Directive can provide an aquatic differentiation that may include hydrological-ecological interconnectedness, if this is part of the requirements of protected species, for example, even if this was not the case with Gimån.

Here, we have two different ecological perspectives that, based on habitat types, and species requirements or water quality, give rise to two different differentiation approaches with different spaces of regulation, as a consequence. If a conflict occurs between the objectives of 'good ecological status' and 'favourable conservation status', the Commission in general favours 'good ecological status', and the body of water as the space of regulation.[34] This interpretation is based on Article 4 (2) of the Water Framework Directive, which stipulates that the more stringent objective applies.[35] Whether the Commission is

[33] Map extracted from VISS database, http://www.viss.lansstyrelsen.se, 2014-06-23.

[34] European Commission, Links between the Water Framework Directive (WFD 2000/60/EC) and Nature Directives (Birds Directive 2009/147/EC and Habitats Directive 92/43/EEC).

[35] Another provision of the Directive, with regard to the Habitats Directive, is to create a register of protected areas within the river basin district, and include measures required by the Habitats Directive in the plans of measure (see Art. 6 and Annex VI (Part A)).

correct, and 'good ecological status' is in general more stringent for every site with overlapping spaces of regulation remains to be seen, and may become a question for the Court of Justice to consider, as the Commission behaviour creates a legitimate expectation that this is the interpretation that the Commission will apply in its assessment of Member State implementation.[36] As there are significant differences between the spaces of regulation the Commissions position can be controversial, as the small-scale space of a body of water seems contradictory to elements found in the Habitats Directive.

However, the Water Framework Directive and the Habitats Directive are not alone in regulating aquatic ecological elements; through its conceptualization of water degradation, the Liability Directive also provide a aquatic space of regulation. We next consider the similarities and differences between the Water Framework Directive and the Liability Directive's units.

### 2.3 The Liability Directive – Water Degradation

The main objective of the Liability Directive is to prevent and remedy damage to the environment. Here, 'environment' indicates protected species and natural habitats, in keeping with the Habitats Directive ('nature'), water (defined in accordance with the Water Framework Directive), and land (soil) (Art. 2 (12)). 'Damage to the environment' means a measurable, adverse change in a natural resource (means protected species and natural habitats, water and land (Art. 2 (12)), or measurable impairment of a natural resource service that may occur directly or indirectly (Art. 2 (2)). 'Services and natural resource services' refer to the functions performed by a natural resource for the benefit of another natural resource or the public (Art. 2 (13)). 'Water damage' refer to significant adverse effects on the ecological, chemical, and/or quantitative status and/or ecological potential of body of water (Art. 2 (1)(b) and Water Framework Directive Art. 2 (21), Annex V (1.1.) (1.2.)). 'Damage' means a measurable adverse status change in the ecological status, for example, of a body/bodies of water, which also can be assessed through measurable impairments of a natural resource service (Art. 2 (2)(12)). Service, here, refer to the activity of organisms or communities that result in functions that are beneficial for other natural resources or the public (Art. 2 (13)).

In principle, the liable party is the 'operator' who carries out an 'occupational activity'. There is a strict liability (without fault) for environmental damage for certain dangerous activities, which are listed in Annex III, and include water abstraction and impoundment of water subject to prior authorization, in pursuance of the Water Framework Directive's objectives (Annex III (6)). Operators carrying out other occupational activities are liable for any fault-based damage they cause to protected species and habitats. Operators are under an obligation to remedy environmental damage once it has occurred, and to bear the costs of the 'polluter'. If the operator fails to do so, or is not identifiable, the competent authority may step in and carry out the necessary preventative or remedial measures (Art. 6 (2)(3)).

For damage affecting water, protected species, and natural habitats (land will not be discussed here), the aim is to restore the environment to its undamaged/pre-damage state (Art. 2 (14), Annex II (1.1.1)) when damage from a listed (Annex III) activity have occurred or if other occupational activities damage protected species or habitats (Art. 3 (1(a)(b)). Damage remediation is achieved through measures intended to restore the baseline conditions by means of primary,

[36] See C-181/91 and C-248/91 *Parliament v Council / Parliament v Commission* [1993] ECR I-3713 para 12–14; C-137/92 *Commission v BASF* [1994] ECR I-2629 para 50.

complementary, and compensatory remediation (Art. 2 (11), (15) and Annex II). The damaged natural resource or impaired services must achieve baseline conditions or be replaced by identical, similar, or equivalent natural resources or services at the site of the incident, or at an alternative site (Annex II 1.1.2).

The Liability Directive's system for achieving baseline conditions complements the Water Framework Directive, not only by specifying that all practicable measures should be used to recover a damaged body of water to its status prior to the damage (see Water Framework Directive Art. 4 (6)(d)), but also has a system for how this should be done, and specifies how remediation should be conducted when recovery is not possible, or will take a substantial amount of time. The Liability Directive is unique in that it specifies techniques for remediating an area not achieving baseline conditions, termed 'habitat equivalency analysis' (HEA) and 'resource equivalency analysis' (REA) (see Annex II). If natural recovery is not possible, remedial measures should be employed to rehabilitate or replace damaged natural resources and/or impaired services, or provide an equivalent alternative to those resources or services (Art. 2 (10)). When determining the scale of complementary and compensatory remedial measures, the use of resource-to-resource or service-to-service equivalence approaches are considered first. With these approaches, actions that provide natural resources and/or services of the same type, quality, and quantity as those damaged are considered first. Where this is not possible, alternative natural resources and/or services must be provided. For example, a reduction in quality might be offset by an increase in the quantity of remedial measures (Annex II 1.2.2.). Complementary and compensatory remedial measures should be so designed that they provide for additional natural resources and/or services, to reflect the time required for measures to take effect; for example, the longer the period of time before the baseline condition is reached, the greater the number of compensatory remedial measures that will be undertaken (see Annex II 1.2.3.). The Liability Directive is intended to create a space of regulation that is site-specific, with the main objective of preventing and remedying damage where it has occurred, or if necessary, at an alternative site. This offers a flexible unit, where measures may be implemented outside the damaged area, if necessary.

If one or more bodies of water are damaged, and neither primary nor complementary measures can remediate them, or compensate for the damage during recovery, compensatory remediation at another site than the damaged area would be implemented, to compensate for the damage. This may be compared to the Water Framework Directive, where water degradation results in the obligation to prevent further deterioration, and take all practicable measures to remediate the effects to the body of water, and not an alternative body of water (see e.g. Art. 4 (6)(a)(c)(d)).

Even if the baseline for damage/temporary deterioration of bodies of water is the same, according to the Water Framework Directive and the Liability Directive, regarding restoration of the environment to its undamaged state, they differ in the remediation measures and the designated space of regulation. According to the Water Framework Directive, the body of water must be restored; for the Liability Directive, the space of regulation is the damaged area, and if interim losses occur, complementary and/or compensatory remedial measures must be implemented even if this falls outside the damaged body of water. This creates a larger and more flexible space of regulation than the Water Framework Directive's body of water. This enlargement of the space of regulation by the compensatory obligation is not possible under the ordinary man-

agement of the Water Framework Directive, or if only the Directive is invoked in the remediation damage/temporary deterioration.

The Liability Directive provides the option of implementing measures where needed, if water degradation occurs. Remediation of water degradation may be transferred throughout the river basin and not be bound to the damaged body/bodies of water, through the obligations stated in the Liability Directive. However, such practice does not correspond to the Water Framework Directive's differentiation system, which places obligations within the boundaries of each body of water. Thus, the space for remediating water degradation, and also damage to habitats and species protected by the Habitats Directive, is different than the space of regulation that is intended to provide for 'good ecological status'. The obligations may conflict, as interim ecological losses in one body of water cannot be compensated at another body of water during recovery, according to the Water Framework Directive. For compensatory remediation to be compatible with the Water Framework Directive, exceptions to the Directive must be considered as it provide a new modification of a body/bodies of water, such as no significantly better environmental option being available (see Art. 4 (7)(a)(c)(d)).

### 2.4 Alternative Legal and Ecological Perspectives

The Water Framework Directive has a rather small-scale space of regulation, and in comparison, the Habitats Directive may offer a larger space, although the scale depends on the habitats and species designated as protected, and the Liability Directive's space depends on the damage and the possibilities for remediating the damage. None of the Directives is explicitly large-scale, however there are other spaces of regulation that are large-scale, without being explicitly focused on freshwater ecosystems. Two such units are the Marine Strategies' 'marine regions' and 'sub-regions', and the Landscape Conventions' 'landscapes'. To compare the legal perspectives that specify the scale on which ecosystems should be managed, this section also exemplifies how different ecological views on effective differentiation of river basin ecosystems is discussed from an ecological perspective.

#### *2.4.1 The Marine Strategy Directive*

Both the Marine Strategy and the Maritime Spatial Planning Directive[37] use marine regions or sub-regions as the units to which their objectives apply. Although the Maritime Spatial Planning Directive appears to be the main focus, with its spatial attention, it bases its initial differentiation of units on the Marine Strategies' construct of 'marine region', and does not have a scheme of differentiation that complement or diverges from the Marine Strategy (see Art. 3). Therefore, we analyse only the Marine Strategies' spatial constructs of 'marine region' and 'sub-region'.

The differentiation of region and sub-region facilitates the implementation of the directive, and the differentiation should be considering hydrological, oceanographic, and biogeographic features (Art. 3 (2)). The units of 'marine region' and 'sub-region' are defined as the units to which the objective of 'good environmental status' applies (Art. 3 (5)). However, as Member States share regions and sub-regions, a certain differentiation based on each Member State's zone of sovereignty (e.g. delimited by each Member State's economic zone) adapts the predefined units to Member States' conditions of sovereignty (see Art. 4). The entire Baltic Sea compromises

[37] Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning.

one region, but the obligation of achieving 'good environmental status' for Sweden applies only to the Swedish part of the Baltic Sea. Even if the Member States that share the Baltic Sea Region must take into account the fact that each Member State's segment is part of the region of the Baltic Sea as a whole, and cooperate and coordinate activities, 'good environmental status' applies to each Member State's portion of the larger region (see Art. 3(9), 4, 5, and 6).

Since the ecosystem approach is integrated into 'good environmental status', and the objective is intended to allow marine ecosystems to function fully and maintain their resilience to human induced environmental change, the Marine Strategy establishes a space of regulation that contrasts with the Water Framework Directive's small-scale, body of water construct (see Art. 4 (5)). A potential difficulty in assessing and managing ecosystems within a Member State's part of a region or sub-region is that the unit includes multiple ecosystems and all marine waters within this area, and in achieving 'good environmental status', the objective is intended to represent the diversity of all constituent ecosystems (see e.g. Art. 13 (4)).

*2.4.2 The Landscape Convention*

Another large-scale space of regulation is the 'landscape' construct found in the Landscape Convention. In comparison to both the Water Framework Directive and the Marine Strategy, the Landscape Convention differs fundamentally in its scheme of differentiation of landscapes, as it does not use any predefined elements to construct the landscape unit. The Convention's definition of 'landscape' may include land, inland water, and marine areas (Art. 2)), and is differentiated based on the interaction of natural and human elements, and how these elements are perceived by people (Art. 1 (a)). The differentiation is open to what people perceive as landscape units, a differential process based on landscape democracy.[38]

As the interaction between natural and human elements changes continuously, the landscape as unit is intended to be an evolving entity, where human-created elements in the landscape should be assessed and managed together with more natural elements, and not necessarily separated.[39] For example, by including both heavily modified and natural bodies of water within the same water landscape, the intention is for assessment, management, and planning to address the entire landscape, and avoid dividing it into a number of component elements. The landscape unit should not be composed of its constituent parts, or be the sum of its parts, but be a whole, qualitative, space of regulation.[40]

Ideally, the public concerned differentiates landscapes from one another; in practice, this is probably accomplished by experts in conjunction with local inhabitants, and the actual differentiated landscape may become both a large-scale and a small-scale unit, depending on what the public concerned identifies and recognizes as a landscape. Hypothetically, this could lead to a heterogeneous mass of units that fit neither administrative units nor the biophysical outline of an area particularly well. At the same time, the legitimacy of management authorities could also increase, if the space of regulation somewhat follows what the eye of the observer considers logical or given.[41] Differentiating a lake into three

[38] Council of Europe, 'European Landscape Convention, Florence, Explanatory Report, Strasbourg: Council of Europe. CETS No. 176'.
[39] Ibid.
[40] Council of Europe, 'Recommendation CM/Rec(2008)3 of the Committee of Ministers to Member States on the Guidelines for the Implementation of the European Landscape Convention'.
[41] For example, see Barbara A Cosens, 'Legitimacy, Adaptation, and Resilience in Ecosystem Management' (2013) 18 Ecology & Society.

bodies of water as the lake varies in depth (<3 m, 3 to 15 m and >15 m), in accordance with the Water Framework Directive, may not seem logical to the public concerned. Or, if a lake has a narrow neck somewhere that results in two bodies of water, classifying one as 'heavily modified', but not the other, since the heavily modifying activity is located in one of the bodies of water, although the environmental stress is the same, is not necessarily logical either. The Marine Strategies' marine regions or sub-regions may also seem illogical: for example, traditionally, in Sweden the Baltic Sea has been differentiated into two larger areas, the Gulf of Bothnia and the actual Baltic Sea, differentiated by the Åland islands. As the environmental problems in the two areas also differ – in general, pollution in the north, and organic pollution in the south – including them both in the same space of regulation could seem illogical to the public concerned.

The landscape construct may be criticized as lacking in definition, and, as its differentiation is facilitated by public views, it may result in units that fail to incorporate the biophysical outline or relevant environmental problems. On the other hand, a priori schemes of differentiation are not necessarily better adapted to site-specific environmental problems, such as both the Water Framework Directive and the Marine Strategy suggest.

### *2.4.3 Aquatic Spaces of Regulation – Ecological Perspectives*

Parameters relevant to typology are among the major sources of uncertainty in ecological assessment.[42] A differentiated unit may be a community, population, or ecosystem, if the focus is mostly abiotic or biotic. The differentiation may also be established by using other differentiation variables, such as geographical (e.g. lake, stream or river section) or administrative elements (e.g. county board or municipal), if this better fits the research questions and objectives.[43] The units of an ecosystem may also intersect other units, such as the administrative area of county board to study how the management authorities connect management actions to ecosystems; biotic elements may then be compared to the human-scale management of a landscape, for example.

With regard to the Water Framework Directive, there have been suggestions from the natural sciences for how the differentiation of units could be developed, either towards simplicity, aiming for manageability, or more sophisticated systems that are better adapted to addressing aquatic ecosystems.[44] A recurring, critical view is that a priori typological differentiation, with its broad categories of map-derived variables, fails to recognize the site-specific aspects of a river basin or body of water,[45] or, that typological river basin differentiation is a questionable method for describing how a river basin is affected or unaffected by establishing reference points in different ecological environments.[46] It is argued that instead of a priori judgements, more site-specific ecological aspects, such as the composition of river basin materials on which organisms are dependent, makes more sense, and

[42] See Hering and others (n 11).

[43] Jianguo (Jingle) Wu, 'Landscape Ecology' in Rik Leemans (ed), *Ecological Systems* (Springer New York 2013).

[44] For example, see Brian Moss and others, 'The Determination of Ecological Status in Shallow Lakes – a Tested System (ECOFRAME) for Implementation of the European Water Framework Directive' (2003) 13 Aquatic Conservation: Marine and Freshwater Ecosystems 507; Hering and others (n 11).

[45] Hering and others (n 11).

[46] Thomas R Whittier and others, 'Selecting Reference Sites for Stream Biological Assessments: Best Professional Judgment or Objective Criteria' (2007) 26 Journal of the North American Benthological Society 349; Friberg and others (n 21).

should be used.[47] Another criticism is that the differential process loses some of the benefits of being type-specific, since the Water Framework Directive demands a high degree of differentiation, which has negative consequences for the applicability of the typology system.[48] Others argue that the differentiation of bodies of water should be based on ecological processes, such as water-level regime, or geomorphological patterns, such as physical features of a river basin (artificial or natural).[49] In general, it may be said that these typological factors are more reliable, simply because they apply a differentiation that is based on variables that are ecologically significant in a given region (site-specific), and comply more closely with the character of aquatic ecosystems.[50]

Various concepts, without regard for the Water Framework Directive, have been used to describe, present, and differentiate aquatic ecosystem and the river basin, including 'riverine landscape' or 'riverscape', which focus on the macro-level of aquatic ecosystems. These representational concepts embrace a macro-level approach, focused on the patterns and processes associated with fluvial ecosystems, integrating ecological processes and spatial complexity.[51] Ecological context, such as site-specific interactions between flow-patterns, geomorphology, and temperature heterogeneity, which vary markedly among differing geologic, climatic, and topographic settings, should frame the differentiation of river basins from this perspective.[52] A site-specific, riverine, macro-scale differentiation could be based on the hydrological-ecological network of site-specific flow-patterns, sedimentation, nutrients, and organisms, abiotic and biotic site-specific elements that differentiate one unit from another.[53] Heterogeneity of biophysical habitat conditions, intrinsic connectivity between management units, and temporal fluctuations of variables, such as population abundance and nutrient levels, are potential ecological assessment and management metrics for such macro-units.[54] A riverine differentiation would establish units that are large enough

[47] Moss and others (n 44); John Davy-Bowker and others, 'A Comparison of the European Water Framework Directive Physical Typology and RIVPACS-Type Models as Alternative Methods of Establishing Reference Conditions for Benthic Macroinvertebrates' in Mike T Furse and others (eds), *The Ecological Status of European Rivers: Evaluation and Intercalibration of Assessment Methods* (Springer Netherlands 2006); Verdonschot (n 17); Richard K Johnson and others, 'Ecological Relationships between Stream Communities and Spatial Scale: Implications for Designing Catchment-Level Monitoring Programmes' (2007) 52 Freshwater Biology 939.

[48] Verdonschot (n 17).

[49] Roland Jansson, 'Heavily Modified Waters in Europe: Case Study on the Ume River in Northern Sweden' (2001).

[50] Hering and others (n 11); Davy-Bowker and others (n 47).

[51] James V Ward, 'Riverine Landscapes: Biodiversity Patterns, Disturbance Regimes, and Aquatic Conservation' (1998) 83 Biological Conservation 269; James V Ward, Florian Malard and Klement Tockner, 'Landscape Ecology: A Framework for Integrating Pattern and Process in River Corridors' (2002) 17 Landscape Ecology 35.

[52] James V Ward and JA Stanford, 'Thermal Responses in the Evolutionary Ecology of Aquatic Insects' (1982) 27 Annual review of entomology 97; Brian Moss and others, 'Climate Change and the Future of Freshwater Biodiversity in Europe: A Primer for Policy-Makers' (2009) 2 Freshwater Reviews 103; Julian D Olden and Robert J Naiman, 'Incorporating Thermal Regimes into Environmental Flows Assessments: Modifying Dam Operations to Restore Freshwater Ecosystem Integrity' (2010) 55 Freshwater Biology 86; Gary Brierley and others, 'Reading the Landscape Integrating the Theory and Practice of Geomorphology to Develop Place-Based Understandings of River Systems' (2013) 37 Progress in Physical Geography 601.

[53] Kevin E McCluney and others, 'Riverine Macrosystems Ecology: Sensitivity, Resistance, and Resilience of Whole River Basins with Human Alterations' (2014) 12 Frontiers in Ecology and the Environment 48.

[54] Ibid; James H Thorp, 'Metamorphosis in River Ecology: From Reaches to Macrosystems' (2014) 59 Freshwater Biology 200.

for assessment and management of the variations that produce changes, both downstream and upstream from an impacted area, including the activities that affect the possibility of rehabilitating a river section.[55] For example, in large-scale assessments, units of 50 $km^2$ have been used.[56]

With regard to the Water Framework Directive, ecological research emphasizes that a more site-specific differentiation that focuses on ecological aspects important to each space of regulation should be used, instead of the Water Framework Directive's differentiation system. Without regard to the Water Framework Directive, a more macro-scale differentiation is emphasized where a river basin's hydrological-ecological network should be used to differentiate units, using site-specific flow-patterns, for example. Understanding the river basin based on these ecological elements emphasizes that an obligation intended to enhance and protect the ecological status of a river basin must construct spaces of regulation that allow for assessment and management of both small-scale and large-scale, site-specific ecological properties.[57]

## 3. Discussion

If the spaces of regulation within a river basin are small-scale, the risk is that large-scale ecological properties that also create and enhance the ecological status of an aquatic area are disregarded in the assessment and management. The ecological space of these properties is generally located on larger scales, and may be assessed through site-specific elements, such as hydrological connectivity, migration of aquatic organisms, sediment transport, or the possibility of an (indicator) organism maintaining its population. The differentiation of aquatic Natura 2000 areas and bodies of water indicates an important difference between the ecological variables incorporated into the Habitats Directive and the Water Framework Directive. The aim of the Habitats Directive to protect designated species and habitats can result in large units that can provide species with the physical and biological factors essential to their life-cycles demands, whereas the Water Framework Directive demands a smaller-scale approach. The body of water construct found in the Water Framework Directive is formed for discrete types of bodies of water, and not to incorporate the fact that many aquatic ecosystems tend to be distributed along a gradient of conditions, along increases or decreases of ecological properties of the river basin, such as temperature, or the interconnectedness between upstream and downstream habitat quality. This results in a relatively artificial set of bodies of water that is not always ecologically or legally relevant, in terms of the environmental problems facing a sub-basin or river section. This makes the body of water ill-suited to management of the interactions among multiple ecosystems, populations, and organisms of an aquatic ecological organization, to implement regulative instruments that affect multiple bodies of water and activities, and introduce compensatory remediation measures for water degradation.

Partly, the lack of a large-scale focus in the Water Framework Directive is due to its focus on qualitative, rather than quantitative water management elements. For the Directive to be focused on more quantitative water management elements, the Member States would have had to be in unanimous agreement fifteen years ago, when approving the Directive, and they

[55] James H Thorp and others, 'Linking Ecosystem Services, Rehabilitation, and River Hydrogeomorphology' (2010) 60 BioScience 67.

[56] Richard H Norris and others, 'Very-broad-scale Assessment of Human Impacts on River Condition' (2007) 52 Freshwater Biology 959.

[57] Thorp and others (n 55).

were not (see Article 192(2) TFEU).[58] Therefore, the Water Framework Directive is primarily concerned with the quality of waters (see also recital 19). As hydromorphological pressure is mostly relevant once water quality has been enhanced to a level not severely affecting organisms, a focus on qualitative measures might also be reasonable as a first management step.[59] However, this also makes the quality measures, in the second step, directed at the degradation of features that affect organisms through alteration of habitat composition, flow dynamics, shading, or food web interactions, difficult to establish without side-stepping the coupling of body of water and 'good ecological status'. This means that although the flow regime of a body of water may be significantly altered downstream or upstream from an impoundment or an abstraction, unless the biological quality elements are affected, it could be classified as achieving 'good ecological status'.[60]

In many respects, a small-scale approach corresponds to the way in which ecological restoration has often been framed historically. Today, it is recognized that small-scale restoration is unsuitable for achieving long-term, measurable improvements to the ecological quality of a river basin.[61] Instead, a more holistic approach is required, emphasizing connectivity with adjacent ecological systems, for example.[62] For all water types, it is recognized that stressors acting at larger scales than small-scale bodies of water are more important for achieving results when implementing management measures.[63] It may be necessary to consider upstream conditions, such as naturally woody, riparian vegetation several kilometres upstream from a stretch (of water) for example.[64] Thus, the status of a body of water is coupled to the status of other bodies of water. For example, the part of the Gimån Natura 2000 area to which Ljungån is connected was Holmsjön, which is classified as having moderate ecological potential, and is characterized by dead riparian zones that make it difficult for organisms to find food. Increasing the status of Holmsjön should not be attempted principally within the lake's bodies of water, but within its tributaries, especially as the lake is a heavily modified body of water, and the regulation of the lake may, at most, be more environmentally friendly and, probably not cease.[65] The objective for Holmsjön, good ecological potential, is connected to the body of water of the lake, and therefore, measures to achieve this objective should be directed at the body of water, rather than adjacent bodies of water. Thus, it becomes difficult to adapt the space of regulation of a body of water to the environmental problems of the site.

For an effective space of regulation, a differentiated unit must correspond to both important ecological elements, and the kind of area and activities that are to be regulated, to achieve an improved ecological status at the river basin or sub-basin level. For example, managing multiple hydropower stations that affect both the seasons of water flow and the movement of organisms in a river section or sub-basin through a general

[58] See David Aubin and Frédéric Varone, 'The Evolution of European Water Policy: Towards Integrated Resource Management at EU Level' in Stefan Kuks and Ingrid Kissling-Näf (eds), *The Evolution of National Water Regimes in Europe: Transitions in Water Rights and Water Policies* (1st edn, Kluwer Academic 2005).

[59] Hering and others (n 10); Feld and others (n 20).

[60] For example, see Josefsson and Baaner (n 11).

[61] Feld and others (n 20).

[62] Piet FM Verdonschot and others, 'A Comparative Review of Recovery Processes in Rivers, Lakes, Estuarine and Coastal Waters' (2013) 704 Hydrobiologia 453.

[63] Armin W Lorenz and Christian K Feld, 'Upstream River Morphology and Riparian Land Use Overrule Local Restoration Effects on Ecological Status Assessment' (2013) 704 Hydrobiologia 489; Hering and others (n 10).

[64] Lorenz and Feld (n 63); Hering and others (n 10).

[65] Stranko, Hilderbrand and Palmer (n 20); Lorenz and Feld (n 63).

administrative provision, a larger space of regulation would be preferable to the body of water construct.

A differentiation based on site-specific hydromorphological structures could create a space of regulation that could be more easily used to implement measures relevant to the hydrological-ecological network of a sub-basin; to some extent, the Natura 2000 area of Gimån is an example of such a unit (even if this unit is not fully adapted to the environmental characteristics of the area, as exemplified above). A large-scale space of regulation, like Gimån, allows for more practical rehabilitation measures, as the Habitats Directive's units may refer to both site-specific ecological context and site-specific demands of organisms. The Gimån area provides a basis for assessment and management based on the comprehensiveness of the area, while the 47 bodies of water indicate a reductionist approach incapable of incorporating this comprehensiveness.

Even if a hydrological-ecological fit with the space of regulation is achieved, this does not mean that the unit is suitable for managing the interactions of activities and their pressure on the environment within a river basin. The unit should be differentiated, to allow for assessment that can provide information about the causes of deterioration, and not only that deterioration has occurred, and clearly couple this information to the legal obligation. As the case of Ljungån demonstrates, only providing information is not always enough, if the information cannot be firmly connected to a legal obligation that furnishes the legal system with a cause and effect relationship between the exploitation and the legal obligation that makes exploitation impossible. If there are characteristic elements within a Member State's legal system that affect the ecological status of ecosystems within a river basin, such as a regular, small-scale assessment of hydrological-ecological impact, it may be just as important to adapt the space of regulation to the characteristic legal elements as to the biophysical outline, if improved ecological status is to be achieved.[66] Therefore, site-specific spaces of regulation within a river basin should originate not only from ecological knowledge, but also legal knowledge, adapting the unit to the legal and ecological complexity and environmental problems of the place of regulation. It may be necessary to gain a comprehensive perception of the site-specific environmental problem and a social-ecological contextualization, using the public concerned and experts, as emphasized by the Landscape Conventions landscape construct, while not allowing environmental problems at river basin level to become normative, as such regional units, similarly to the Marine Strategies marine regions, risk becoming too diffuse for classification, objective-setting, and management generally.

If the Water Framework Directive intends to focus on coordination of the ecological, hydrological, and hydrogeological systems (recital 33), a different space of regulation should be created. The ecological status would then be measured on a larger scale then it is today, and the current assessment elements would have to be replaced or complemented by other variables.[67] Certain organism traits could be used to assess and manage the possibility of organisms maintaining themselves (Habitats Directive Art. 1 (i)), and the occurrence and abundance of these traits could be used to indicate an improved ecological status of the aquatic ecosystems of the area. The improved ecological status would then be achieved when management measures are not

[66] Timothy Moss, 'The Governance of Land Use in River Basins: Prospects for Overcoming Problems of Institutional Interplay with the EU Water Framework Directive' (2004) 21 Land Use Policy 85.

[67] For example, see Josefsson and Baaner (n 11).

needed for maintaining (indicator) organisms.[68] This would require spaces of regulation that allow for heterogeneous status perspectives within each unit, and for management measures that aim to improve 'good ecological status' sites towards even higher status. Because 'high status' sites are important for maintaining aquatic biodiversity, providing effective protection of these sites is important, and enhancing 'good status' sites to attain 'high status' could also be considered as important as achieving 'good ecological status' for 'moderate' sites.[69] Other parts of the specific area could then be left in a poorer ecological status, since measures there do not benefit the ecological status of the unit as a whole. From this perspective, it would be possible to prioritize the parts of the unit to be targeted, and if ecological deterioration occurs, over either short or long time spans, the deterioration could then be compensated for by additional measures, besides implementing all practicable steps to mitigate the deterioration at another part of the area, not only at the site of deterioration, and more easily incorporate any upstream or downstream (large-scale) effects of the deterioration.[70]

It is difficult to generalize about how the differentiation of the foregoing kind of space of regulation would be accomplished in practice, as the site-specific environmental characteristics and pressures of the river basin must be considered. However, we can use Ljungån and Gimån as an example, and base the differentiation on the conservation plan of the Natura 2000 area. We assume that for good ecological quality, hydrological and ecological connectedness is needed, and the pressure from the activities in the area are primarily coupled to their impact on hydrological and food web connectivity. Therefore, it is important that the space of regulation is large enough to incorporate the activities' impact on these ecological properties, and large enough to manage these properties without having to consider a multitude of spaces of regulation. A suitable management unit for the Gimån area would include Ljungån, both because it is ecologically important, and hosts an activity that affects the ecological quality of the area. Another method of differentiating site-specific ecological spaces of regulation is to use indicator organisms that demand an interconnected hydrological-ecological network. The differentiated unit should then correspond to both food web and hydrological demands of the organism, to enable it to achieve a state of self-maintenance, and be a viable component of the area (see Habitats Directive Art. 1 (i)). That is, if a population is able to maintain some of the conditions required for their own existence, they also have the capacity to be a viable component of the area. If the organism can contribute to the maintenance of its population and provide for food web connectivity, it also provides for the sustainment of the vigour/maintenance of the ecological organization.[71] Thus, organisms that are indicators of a good hydrological-ecological network, and involved in the large-scale mainte-

[68] Ibid.

[69] Hering and others (n 11); Kenneth Irvine, 'The Tragedy of the Threshold: Revising Perceptions for Aquatic Conservation' (2012) 22 Aquatic Conservation: Marine and Freshwater Ecosystems 705.

[70] Thorp and others (n 55).

[71] For example, see Cristian Saborido, Matteo Mossio and Alvaro Moreno, 'Biological Organization and Cross-Generation Functions' (2011) 62 The British Journal for the Philosophy of Science 583; Francine MR Hughes and others, 'Monitoring and Evaluating Large-Scale, "open-Ended" Habitat Creation Projects: A Journey rather than a Destination' (2011) 19 Journal for Nature Conservation 245; Francine MR Hughes, William M Adams and Peter A Stroh, 'When Is Open-Endedness Desirable in Restoration Projects?' (2012) 20 Restoration Ecology 291; Matteo Mossio, Leonardo Bich and Alvaro Moreno, 'Emergence, Closure and Inter-Level Causation in Biological Systems' (2013) 78 Erkenntnis 153; Nei Nunes-Neto, Alvaro Moreno and Charbel N El-Hani, 'Function in Ecology: An Organizational Approach' (2014) 29 Biology & Philosophy 123.

nance of the ecological organization, may suggest the spatial scale on which a site-specific ecological space of regulation should be located. In the case of Gimån, the hydrological and food web demands of the otter could be used to differentiate a space of regulation, which, in comparison to the Natura 2000 area, would include Ljungån. Even if the spaces are differentiated from each other, they should still be perceived as related to the whole river basin,[72] assuming that all major components of the ecological organization of a river basin or sub-basin contribute to conditions supporting ecological quality, and that damage to any component is of concern for all intersecting segments of the river basin.[73] This space of regulation could be translated into more detailed planning instruments (such as general administrative provisions), where certain activities are selected as being more important in terms of the environmental problems of the area, whereas other activities are left to future management plans of measures.

## 4. Conclusion

Spaces of regulation designated as units for assessing an ecological obligation should be able to address site-specific environmental problems and support management with legitimacy, if we are to improve river basin ecological status. How we frame the differentiation of units is essential, particularly when they are legally materialized through spaces of regulation.[74]

Even if the Water Framework Directive aims to adapt the administrative structure (river basin districts) to the significant ecological-hydrological elements of the river basin, the body of water as the assessment and management unit is not similarly adapted to significant ecological elements. For organisms that are dependent on hydromorphological elements such as hydrological connectivity, the clear-cut border that a body of water represents is problematic, as it implies that each body of water should be considered individually rather than in conjunction with others. The management of organisms dependent on a connected hydrological-ecological network would be much easier if the Water Framework Directive's space of regulation were differentiated based on the hydrological-ecological elements that such organisms depend on to self-maintain.

Larger spaces of regulation than the Water Framework Directive's 'body of water' may also provide a better space of regulation for implementing general administrative provisions aimed at providing general environmental/ecological measures within a sub-basin or river section, for example. Regulating multiple bodies of water through a general administrative provision is much more difficult, as type-specific obligations such as 'good ecological status' and non-deterioration are coupled to each body of water, and not multiple bodies of water. Therefore, to be an effective space of regulation, the unit should not only be hydrologically-ecologically site-specific, but also be adapted to the procedures of environmental and/or administrative law within each Member State. This demands that the space of

[72] For example, see Arthur Koestler, *The Ghost in the Machine* (Arkana 1989) 341–348; Elinor Ostrom, *Understanding Institutional Diversity* (Princeton University Press 2005) 11–12; Sven Erik Jørgensen and others, *A New Ecology: Systems Perspective* (1st edn, Elsevier 2007) 246–250.

[73] Norris and others (n 56).

[74] David Delaney, 'Beyond the Word: Law as a Thing of This World' in Jane Holder and Carolyn Harrison (eds), *Law and Geography* (Oxford University Press 2003); JB Ruhl, 'Law's Complexity: A Primer' (2007) 24 Ga. St. UL Rev. 885; David Delaney, *The Spatial, the Legal and the Pragmatics of World-Making: Nomospheric Investigations* (Reprint edition, Routledge-Cavendish 2011) 5; JB Ruhl, 'Panarchy and the Law.' (2012) 17 Ecology & Society.

regulation is adapted to national structures such as property and permit rights, and the environmental problems in which they may result.

The kind of aquatic space of regulation proposed here would not result in a pan-European typology, where the units are comparable, owing to the similarities from Member State to Member State, observer to observer, but units would be designed to meet specific legal and environmental needs, as they are adapted to the environmental problems and characteristics of each river basin.[75]

[75] Cf. Bas Pedroli, Teresa Pinto-Correia and Peter Cornish, 'Landscape – What's in It? Trends in European Landscape Science and Priority Themes for Concerted Research' (2006) 21 Landscape Ecology 421.

# Transboundary EIA in the Barents Region

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## Abstract

The article examines how transboundary environmental impact assessment (TEIA) is organised in an area where international borders are close to each other, that is, in North Calotte/Kola Peninsula. It shows that a dense set of international legal obligations requires the region's states to undertake TEIA. The paper examines the important question how TEIA can be done in an ideal manner in the region via the available best practise documents, such as the Guidelines for Environmental Impact Assessment in the Arctic document adopted by the predecessor of the Arctic Council, the Arctic Environmental Protection Strategy. Our argument is that best practises can be used in evaluating how individual cases are undertaken, such as the TEIA over the so-called Kaunisvaara project located in Pajala municipality (northern Sweden), close to the Finnish border (chapter 4). Our conclusion is that TEIA should be undertaken by the region's nation-states by applying the main international TEIA convention, the so-called Espoo Convention, but also by adhering to the best practise documents that give guidance how to perform a TEIA in Arctic conditions.

## Introduction

In this article, we[1] will examine how transboundary environmental impact assessment (EIA) is regulated within the Barents Region[2], more specifically in the North Calotte/Kola Peninsula and how it could ideally be applied and implemented.[3] Since international borders are in close proximity in this region, it is also important to know how to deal with the adverse impacts of mining that are caused in one nation-state, and harm another. The article will try to identify what a transboundary EIA procedure is, which of the region's nation-states are legally bound to undertake it and the situations that prompt such an undertaking, and what are the main legal requirements that international law lays out for such a procedure. An important goal of the

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[2] The core of the research was conducted under the "Sustainable Mining, Local Communities and Environmental Regulation in Kolarctic Area" (SUMILCERE) project. Among other research questions, the project, funded by the Kolarctic ENPI CBC initiative of the European Union and being run within the period of 2013–2014, focuses on mining and transboundary EIA procedures in the Kolarctic region.

[3] The main focus will be on the northernmost parts of Finland, Sweden and Norway and the Kola Peninsula of the Russian Federation.

article is to examine what are the applicable legal instruments for conducting transboundary EIA within the region, and which of the identified legal requirements are most important to the process. In order to illustrate the aforementioned, a case study is conducted.

Given the particular characteristics of this region as a remote Arctic area, it is of importance to study what guidance is available for conducting best practises in transboundary EIA. We will examine in particular the Guidelines for Environmental Impact Assessment in the Arctic[4] – a document that is particularly well-suited to our case study, given that it provides special guidance for Arctic transboundary EIA. The aim is to demonstrate a means by which we can scrutinize a case study on transboundary EIA, and to determine whether it has been conducted on the basis of business-as-usual, in an ideal manner, or to highlight if the ways in which it has been implemented are amenable to criticism.

## 1. Introduction to the transboundary EIA procedure

Many are familiar with the environmental impact assessment (EIA) as a nationally regulated procedure for studying the social and environmental impacts of a proposed activity. EIA is different from strategic environmental assessment (SEA) in the sense that EIA applies to proposed projects (like proposed gas pipelines or windmills), whilst SEA is meant to evaluate the impacts of plans, programmes and policies. When the likely impacts of a proposed activity exceed the international border of a state and endanger the environment of another nation-state, then a transboundary EIA has to be carried out.

Normally, nation-states deal with these situations by concluding international treaties that are legally binding on both the origin state (the state within which the proposed activity is to operate), and the affected state (the state which is concerned about the potential adverse impacts from that activity on the other side of the border). The main international convention that applies in the North Calotte/Kola Peninsula area is the 1991 Espoo Convention on Environmental Impact Assessment in a Transboundary Context, an international convention that was concluded under the auspices of the UN Economic Commission for Europe (ECE). However, there are also other key agreements[5] and applicable conventions.[6] Of the relevant nation-states, Sweden, Finland and Norway are parties to this convention; the Russian Federation has signed the convention but has not yet ratified it. It has however, officially stated at least on one occasion that it is

[4] Guidelines for Environmental Impact Assessment in the Arctic. Available online at: http://www.unece.org/fileadmin/DAM/env/eia/documents/EIAguides/Arctic_EIA_guide.pdf

[5] 2003 Kiev Protocol on Strategic Environmental Assessment, which complemented the Espoo Convention, but has not yet come into force (it has been ratified by only 4 States, whereas 16 are needed), 1992 Helsinki Convention on the Transboundary Effects of Industrial Accidents, 1998 Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.

[6] General conventions: Article 206 of the 1982 United Nations Convention on the Law of the Sea (Article 206), which is reproduced in 21 I.L.M. 1261 (1982), Article 14 of the 1992 Convention on Biological Diversity, reproduced in 31 I.L.M. 818 (1992). All other specific agreements: The Convention between Norway and Sweden on certain questions relating to the law on watercourses signed in 1929 (and still in force); The 1981 Agreement on a Finnish-Norwegian Frontier Water Commission; Agreements between Finland and Russia are the 1964 Agreement Concerning Frontier Watercourses between Finland and Russia, and the 1992 Action Program Between Finland and the Russian Federation with a view to Reduce Pollution and Implement Water Protection in the Baltic Sea Area as well as Other Areas Near the Border of Finland and Russian Federation; The NEPC (Nordic Environmental Protection Convention between Norway, Sweden, Finland and Denmark); the agreement on common Nordic guidelines on communication concerning the siting of nuclear installations in border areas.

prepared to apply the convention to the extent permitted by its national legislation.[7] Moreover, Finland and Sweden as Member States of the European Union, and Norway as a party to the European Economic Area agreement are legally bound under European law to undertake transboundary EIA.

Nordic cooperation has also played an important role in the transboundary EIA procedure, but it has largely been replaced by later United Nations ECE agreements. These ECE agreements have also been of primary importance in developing European Union EIA and SEA legislation, because the European Community (and now the European Union) has been a Party to all these agreements and later implemented them to become part of European Union Law through its directives.

Hence, if a proposed mining activity is likely to cause transboundary impacts between these three nation-states (e.g. in the northernmost parts of Finland, Sweden and Norway), a transboundary EIA procedure must be organized. Yet, if a mining activity e.g. in the Kola Peninsula is likely to cause transboundary impacts for these nation-states, Russia is not legally obligated to organize such a procedure, although it is of course desirable to have such a procedure in place. In a similar vein, if a mining activity in Finland is likely to cause transboundary impacts for the Russian environment, Finland is not legally obligated under the Espoo Convention to organize a transboundary EIA, even if Finland has notified its policy to treat Russia as if it were a party to the Espoo Convention.[8] It is good to keep in mind that even if this paper addresses only the Espoo Convention as the most relevant transboundary EIA procedure, it may well be that in some cases another convention or directive (between the Nordic states)[9] may require states to conduct such a procedure. It is also important to recognize that transboundary EIA is nowadays a legal requirement under customary international law. Customary international law obligates all nation-states of the world (including the nation-states under scrutiny here) to undertake transboundary EIA, as the International Court of Justice (ICJ) confirmed in the 2010 Pulp Mills Case:

> In this sense, the obligation to protect and preserve, under Article 41 (a) of the Statute, has to be interpreted in accordance with a practice, which in recent years has gained so much acceptance among States that it may now be considered a requirement under general international law to undertake

[7] A good example of this is Finland's notification a few years ago to the Russian Federation on the basis of the Espoo Convention, regarding a planned mining project in Sokli – located above the Arctic Circle, 12 kilometers from the Russian border – even though Russia is not a party to the Convention. For more information see also: T Koivurova and I Pölönen, 'Transboundary Environmental Impact Assessment in the Case of the Baltic Sea Gas Pipeline' (September 5, 2013) *The International Journal of Marine and Coastal Law* 25 (2010) pp. 151–181. Available at SSRN: http://ssrn.com/abstract=2320989

[8] It is also good to keep in mind that Russia as a signatory to the Convention is required not to frustrate the object and purpose of the treaty as stipulated in the customary law of treaties, and can be expected to become a party to the Convention at a later stage.

[9] For instance, there is the Directive 96/61/EC concerning integrated pollution prevention and control (the IPPC Directive, which is also part of the EEA Agreement). Article 17 regulates on an inter-state transnational EIA procedure where the main emphasis is explicitly on the exchange of information between States based on the permit application procedure. Annex I of this Directive includes a large number of activities hazardous to the environment, far more than were included in the Espoo Convention and the EIA Directive, and which have concentrated on activities that are considered most detrimental to the environment. The transboundary exchange of information between establishments storing dangerous substances is also briefly regulated in the Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances (the Seveso II Directive, Article 13).

> an environmental impact assessment where there is a risk that the proposed industrial activity may have a significant adverse impact in a transboundary context, in particular, on a shared resource.[10]

Yet, the World Court did leave it for states to determine in what way they will carry out transboundary EIA, since it observed that general international law does not specify the scope and content of an environmental impact assessment.[11]

## 2. How to conduct a transboundary EIA on the basis of the Espoo Convention

As reviewed above, the Espoo Convention is clearly the most important international treaty regulating transboundary EIA, and is also applicable in the North Calotte/Kola Peninsula. According to Appendix I where activities falling under the Espoo Convention are listed, the Convention also applies to mining projects: Appendix I (14) Major quarries, mining, on-site extraction and processing of metal ores or coal.

### 2.1. What is a transboundary EIA procedure?

Transboundary EIA is a procedure to which foreign nation-states and their nationals are integrated as participants in the national EIA procedure of the origin state. For this reason, Article 2 of the Espoo Convention obliges the Contracting Parties to establish national EIA and permit application procedures with respect to the activities listed in Appendix I (see also Article 2, paragraph 4). The Espoo Convention links the actors in the affected Party – the affected Party and its public – with the functioning of the national EIA procedure of the Party of origin. An affected Party and its public should be informed of an EIA procedure at latest when the Party of origin announces the commencement of an EIA procedure to its own public.

### 2.2. Starting the procedure

An especially important aspect of the transboundary EIA procedure is the stage at which the Party of origin decides whether the international agreements, and the Espoo Convention in particular, oblige it to put a transboundary EIA procedure into motion. This may sometimes be a matter that a private company considers unfavourable because obtaining a permit for its proposed project may encounter more difficulties, yet an affected Party (a State in whose territory the environmental impacts of the proposed activity are likely to drift) and its public are often opposed to the project being built, especially when they can expect hardly any financial gain from the project (the project also becomes an international matter, which a company frequently does not wish). Thus, as an international legal obligation the transboundary EIA procedure needs to be handled professionally.

The Espoo Convention stipulates that a Party of origin is to implement an EIA procedure:

> For a proposed activity listed in Appendix I that is likely to cause a significant adverse transboundary impact, the Party of origin shall, for the purposes of ensuring adequate and effective consultations under Article 5, notify any Party which it considers may be

[10] See paragraph 204 of the ICJ judgment. Available at: http://www.icj-cij.org/docket/files/135/15877.pdf There is an increasing body of literature on transboundary EIA; see, e.g., the special issue on transboundary EIA, 26 Impact Assessment and Project Appraisal (IAPR) (2008); Theory and Practice of Transboundary Environmental Impact Assessment (2008) K. Bastmeijer, T. Koivurova (eds.) Leiden: Martinus Nijhoff Publishers; N. Craik, The International Law of Environmental Impact Assessment, Process, Substance and Integration (2008) Cambridge, UK: Cambridge University Press. See in general about the transboundary EIA. There are also some studies that look into EIA in general in the Arctic, e.g. T Koivurova, 'Environmental Impact Assessment in the Arctic: A Study of International Legal Norms' (2002) *Ashgate Publishing*.

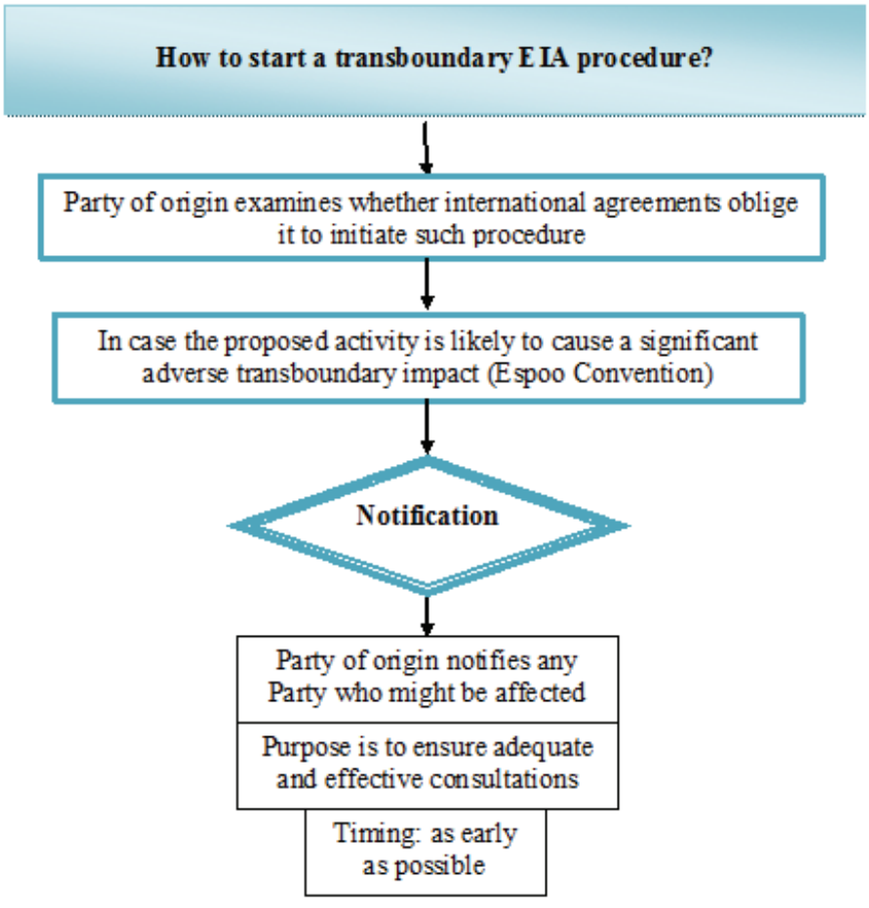
[11] See paragraph 205 of the ICJ judgment. Available at: http://www.icj-cij.org/docket/files/135/15877.pdf

an affected Party as early as possible and no later than when informing its own public about that proposed activity.

The Party of origin is therefore not obliged to implement a transboundary EIA procedure simply on the grounds that the proposed activity is listed in Appendix I; rather, it should also have "likely significant adverse transboundary impacts." The Party of origin therefore has some amount of discretion whether to start the transboundary EIA procedure, especially so because only the terms "transboundary impact" and "impact" are explicitly defined in Article 1 of the Espoo Convention. Moreover, it should be pointed out that the categories of activities listed in Appendix I are, in some aspects open to interpretation. For example, in Finland, mining activities are being planned to an increasing extent in different parts of Lapland, including areas in the proximity of Finland's Norwegian and Swedish borders. Mining activities are one of the categories listed in Appendix I of the Espoo Convention, but this category is comparatively broadly defined: "Major mining, on-site extraction and processing of metal ores or coal" (Appendix 1, item 14). In order to limit this power of discretion, the Espoo Convention includes a so-called Inquiry Commission that investigates whether the Espoo Convention can be applied to a specific proposed activity. In situations where the Party of origin considers that the Convention does not apply, the affected Party can take the Party of origin to Inquiry Commission proceedings, even against its will or in its absence (see Article 3, paragraph 7 and Appendix IV).[12]

To sum up, it can be stated that the Espoo Convention fundamentally applies to the activities listed in Appendix I with the provision that they are likely to cause significant adverse transboundary environmental impacts. If the Parties so agree, the Espoo Convention can also be applied to activities other than those listed in Appendix I which are likely to cause significant adverse transboundary impacts. Moreover, in terms of procedure, a difference lies in whether the proposed activity is listed in Appendix I or not, and the Inquiry Commission is only applicable to activities listed in Appendix I. Good practice would be that states would always informally discuss any proposed activities that may have transboundary impacts, and commence a transboundary EIA if required by the potentially affected state. This communication between states and provinces can take place via the different inter-governmental bodies these nation-states belong to, e.g. the Barents Euro-Arctic Region (with its Council), the Barents Regional Council, or in Nordic co-operation.

[12] What happens when the proposed activity is not listed in Appendix I? In this case, the Espoo Convention can be applied in such instances where: a) it is likely to cause significant adverse transboundary impacts, and b) the Parties are agreed that for this reason, the Espoo Convention should be applied to the activity. Appendix III provides guidelines when deciding whether to apply the Espoo Convention to the proposed activity if it does not appear in Appendix I. Such criteria include the size of the proposed activity, its location and impacts. In such instances, the Inquiry Commission cannot be used. The Espoo Convention therefore leaves much to the discretion of the Party of origin as to whether to implement a transboundary EIA procedure. The decision of the Inquiry Commission is just a recommendation, even if its de facto effect may be far-reaching. It is interesting that all three States – Finland, Sweden and Norway – have made declarations under Article 36, paragraph 2 of the Statute of the UN International Court of Justice, which means that any of these States can institute proceedings against another in this court of law (including such cases where, in the view of the affected Party, the Party of origin does not comply with the Espoo Convention in its refusal to implement a transboundary EIA procedure).



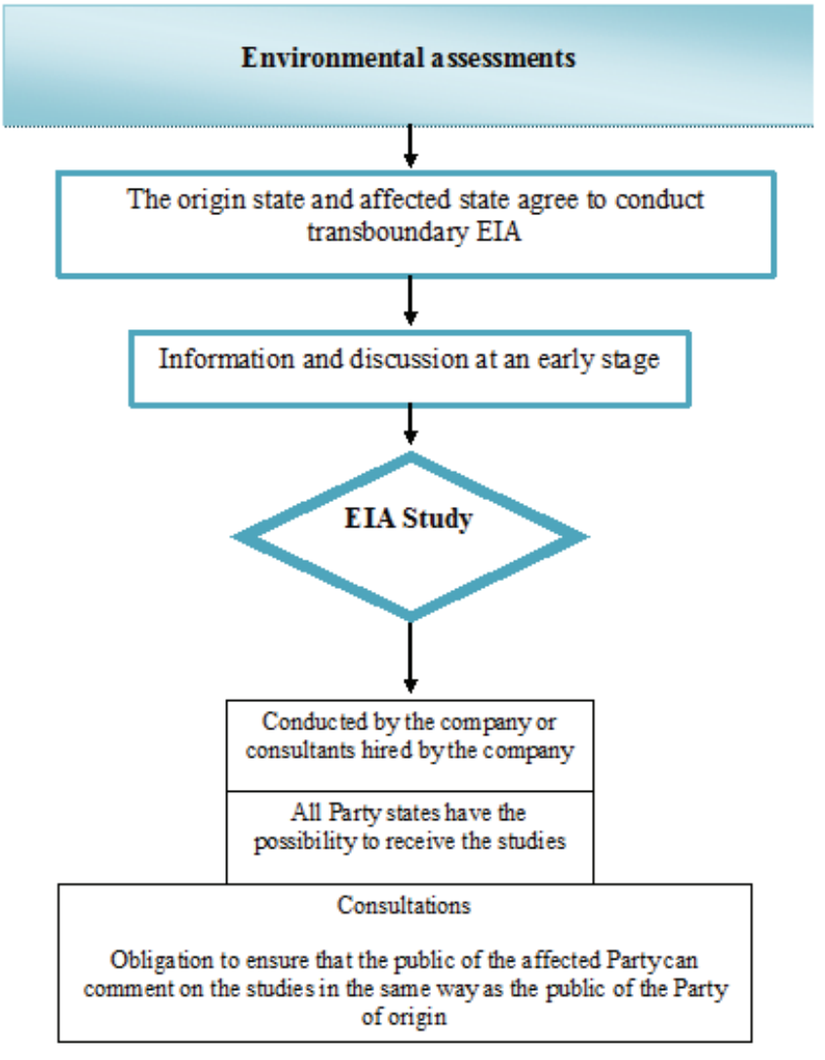

### 2.3. Conducting environmental assessments in a transboundary context

When the origin state and the affected state agree to conduct a transboundary EIA, there will need to be a transmission of information from the origin to the affected state and its public – much in the same way than the origin state's own public receives information about the proposed activity. If the origin state's EIA includes a scoping procedure (a separate stage of an EIA where the decision is made with the assistance of the public and the competent authorities, as to what should be studied in the EIA), then the origin state needs to start the procedure very early on and involve the affected state and its public in discussions on what should be examined.[13] This is normally a very important stage from the viewpoint of the affected state and its public, as they want the mining company and the possible consultants it has hired to examine the impacts the planned activity will have on the other side of the border. Yet, if the origin state's EIA does not include a scoping procedure, then authorities need to make sure that environmental studies take into consideration impacts on the other side of the border. In fact, the Convention requires the Party of origin to request assistance from the affected Party when conducting environmental studies, if further information is necessary. Under normal circumstances, it is difficult to justify why

[13] The Convention calls for the Contracting Parties to arrange the participation of the public of the affected Party in the scoping procedure under the same terms and conditions by which the public of the Party of origin are able to participate (Article 3, paragraph 8). The affected Party may also present its position in the scoping procedure.

the Party of origin should not ask for such assistance from the affected Party, in instances where the environmental impacts have a direct effect on the environment in the affected Party territory. In such instances, the information it provides about its own environment is an important additional assessment of the overall impacts from the proposed activity. The affected Party is also obliged to provide "reasonably obtainable information" if the Party of origin so requests (Article 3, paragraph 6).

After the company or the consultants that it has hired, has finalized the environmental and social impact assessments all parties (including foreign bodies) have the opportunity to receive the studies (the results of which are prepared in a way that is understandable for a lay audience). The public of the affected Party and the affected Party also retain the right to have a say in the environmental studies. The Party of origin and the affected Party are both obliged to ensure that the public of the affected Party are able to comment on the environmental studies in the same way as the public of the Party of origin. The Party of origin is required to arrange consultations with the affected Party based on the environmental studies, and the parties can raise various matters in the consultation, such as those concerning possible alternatives for the proposed activity (Article 5).



### 2.4. Final decision

The Party of origin should "take due account" (Article 6, paragraph 1) of the views of the affected Party and its public in its final decision-making. The Party of origin should also provide the affected Party with the final decision on the permit application. The Convention does not oblige an affected Party to provide the decision to its public,[14] although this should naturally take place in cases where its public has participated in a transboundary EIA procedure. The Espoo Convention also includes the possibility for Contracting Parties to arrange a post-project analysis of the environmental impacts, but there is no legal obligation to do so. If the states are serious about following up on whether any transboundary impacts ensue from the activity however, they should engage in post-project analysis.

## 3. How Transboundary Environmental Impact Assessment should be conducted in the Arctic context

Given that the North Calotte/Kola Peninsula are considered to be Arctic areas, it is of importance that the eight Arctic nation-states (Finland, Sweden, Norway, Iceland, Denmark, the United States, the Russian Federation and Canada) were able to provide guidance on how to conduct EIA in general, and transboundary EIA in particular, in the vulnerable and very unique conditions of the Arctic. In this chapter, we will mostly study what kind of good practises the Guidelines[15] recommend, but we will also study these recommendations in light of what the leading association, the International Association for Impact Assessment (IAIA), has provided in the way of how to improve the way transboundary EIA is undertaken. Based on these two recommendatory documents, we have collated suggestions that would help to carry out transboundary EIA procedures in a more effective and equitable manner.[16]

In the 1997 Alta Declaration, the Arctic states agreed to apply the 1997 EIA Guidelines,[17] which contain a separate chapter on transboundary impacts that specifically mentions the Espoo Convention.[18] At the time, there were great prospects of having the Espoo Convention become a pan-Arctic Convention, which partly inspired the making of these Guidelines, given that the Espoo Convention not only regulates transboundary EIA, but sets out certain minimum requirements for national EIA's. In the introduction, the legal nature of these EIA Guidelines is clarified:

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[14] Here, the EIA Directive goes a step further because it requires that: the comments of the affected State and its public "must be taken into consideration" in final decision-making (Article 8); that the State of origin must send to the affected State a more detailed report of the manner in which these views were taken into consideration in final decision-making; and also, that the public of the affected State is informed of the final decision (Article 9, paragraph 2).

[15] Guidelines for Environmental Impact Assessment in the Arctic. Available online at: http://www.unece.org/fileadmin/DAM/env/eia/documents/EIAguides/Arctic_EIA_guide.pdf

[16] The tips are available online on the webpage of the IAIA: http://www.iaia.org/publications-resources/fastips.aspx

[17] What are Guidelines for Environmental Impact Assessment in the Arctic? The guidelines were adopted by the ministers of the Arctic Countries in their Alta Declaration of 1997. It is an instrument to disseminate information on Arctic EIA activities. The aim is to give practical guidance for environmental assessments to all parties involved in development activities in the northern circumpolar areas, but especially to local authorities, developers and local people. The document raises issues that are unique to Arctic assessments, for example the issue of permafrost. Universal issues that are particularly important in the Arctic are also emphasized, for example public participation and the use of traditional knowledge.

[18] Chapter 11, 'Transboundary impacts' contains the following reference (pp. 40–41): 'The UN ECE Convention on EIA in a Transboundary Context, the Espoo Convention (1991, entered into force in 1997), provides a comprehensive framework for dealing with activities likely to have significant adverse transboundary impacts'.

> These guidelines are not intended to replace existing procedures adopted by international, national or provincial laws, land claim agreements, regulations or guidelines. As they do not recommend any particular procedure for EIA, these guidelines are applicable across jurisdictional boundaries and in different EIA processes. They aim at providing suggestions and examples of good practice to enhance the quality of EIAs and the harmonization of EIA in different parts of the Arctic.[19]

The Guidelines provide important guidance as to how EIA should be conducted to give due consideration of the special conditions in the Arctic, some examples of which will be given here. The drafting of the instrument was prompted by the realisation that the Arctic states share many challenges in applying EIA in their Arctic areas. For example, the participation of the public in EIA is constrained by the region's small population which includes many indigenous peoples. The long distances and limited number of cities and towns also affect how public participation is organised. Moreover, although environmental conditions vary in different parts of the Arctic, environmental assessment must address the similarities in the region's ecosystems and the challenge of integrating indigenous peoples and their traditional knowledge into the decision-making processes.

Chapter 11 of the Guidelines provides useful recommendations for the Arctic states on how to organize their transboundary EIA procedures. As all of the Arctic states are signatories to the Espoo Convention (and five of them as parties), the Guidelines are meant to adjust the requirements of the Convention to the Arctic context. Above all, the Guidelines instrument urges that all activities assessed according to national EIA legislation should also be screened from the viewpoint of whether any transboundary impacts are likely.[20] Thus, all activities to which a national EIA procedure is applied should be screened in view of likely transboundary impacts in the Arctic context. In addition, lower thresholds may be needed for those activities listed in the Espoo Convention if they are proposed to operate in Arctic conditions.[21]

According to the Guidelines, the origin state should initiate the transboundary EIA procedure at a very early phase of its national EIA procedure. The Guidelines document recommends that already in the scoping phase of the national EIA procedure, potential transboundary impacts should be identified and the methods to be used for their assessment should be agreed upon between the concerned states – joint steering groups are recommended to perform these tasks.[22] The Guidelines also urge cooperation in the implementation of transboundary EIA procedures taking place in the Arctic.[23] This is also taken up in the IAIA guidance, which expresses that it is advisable to start thinking of mitigation measures already at an early stage.

The Espoo Convention provides for a basic right for all private legal subjects of the affected state located in the area likely to be affected, to participate in the transboundary EIA procedure, just as the private legal subjects of the origin state may also participate. The Guidelines go further and urges the Arctic states to be as inclusive as possible when organising a transboundary EIA procedure: 'Communities in the area of antici-

[19] See the Guidelines at http://arcticcentre.ulapland.fi/aria/procedures/eiaguide.pdf (2.10.2014).

[20] Paragraph 8 of chapter 11 of the EIA Guidelines.
[21] Ibid.
[22] Ibid., para. 4.
[23] Ibid., paras. 7 and 8.

pated impacts should be given an opportunity to participate, irrespective of their location relative to the border'[24]. According to IAIA Guidance, it is important to ensure that the transboundary EIA report positively contributes not only to the environment, but also to the well-being of local inhabitants. The IAIA Guidance places a lot of emphasis on transparency, participation and the engagement of all relevant stakeholders in the process.

In the Arctic context, these local inhabitants are often indigenous peoples, as referred to in chapter 11 of the Guidelines.[25] This is also emphasized in the IAIA transboundary EIA best practices. According to IAIA, local and indigenous knowledge is relevant and important. Therefore, it is strongly suggested to include it in the transboundary EIA process. Involving traditional knowledge and local cultural practices is not only essential for gaining trust, but can also be beneficial for the transboundary EIA study. The Guidelines document also emphasises that even though activities may be far away from the border, transboundary impacts may anyway occur, especially with respect to large-scale activities such as mining activities.[26]

## 4. Case-study

The function of a case study in this article is to demonstrate one way of analysing whether Arctic transboundary EIA procedures are conducted in a good manner. As stated above, we will examine the case from the viewpoint of those aspects which can be seen as best practises and those that cannot – and whether there are aspects of the transboundary EIA case study that can be criticized.

We have chosen the only case where a mining activity has gone through a full transboundary EIA procedure, involving the Tapuli and Sahavaara mines, the so-called Kaunisvaara project (see below). It is of interest to note that there are also pending mining transboundary EIA's (e.g. the Sydvaranger mine, located in the border town of Kirkenes, with possible transboundary impacts to both Finland and the Russian Federation), and likely forthcoming mining transboundary EIA's (e.g. Sokli, located in Savukoski in Lapland, 12 kilometres from the Russian border) in the region we have examined.

Our case is the overall development of mining operations by the Northland Resources AB (henceforth, Northland Resources) regarding the Tapuli mine and the planned Sahavaara[27] mine (the so-called Kaunisvaara project located in Kaunisvaara, Pajala[28]). The mine area is set approximately 10 km from the Finnish border, partly in a large swamp area. In total, the future Kaunisvaara project mine area including the planned Sahavaara mine will cover an area of 3,000 ha, which is 0.5 % of the area of the Pajala municipality.[29] Initially the company planned to take the iron ore by trucks to the Finnish side for further transportation by railway to the Gulf of Bothnia, but finally relinquished this plan in favour of an alternative route.

Northland Resources mines magnetite ore in an open pit. The company has a budget to pro-

[24] Ibid., para 10.
[25] Ibid. Paragraph 10 reads: 'The Inuit Circumpolar Conference, the Sami Council and the Indigenous Peoples Secretariat are accredited non-governmental organizations on the Arctic Council, and which are active in several arctic countries. They may thus provide useful links to the public on both sides of the border.'
[26] Ibid., para. 9.
[27] Sahavaara means "The sawmill mountain".
[28] Kaunisvaara means "The beautiful mountain".
[29] The Tapuli mine is an operating mine in the area, while the Sahavaara mine is currently in the planning phase.

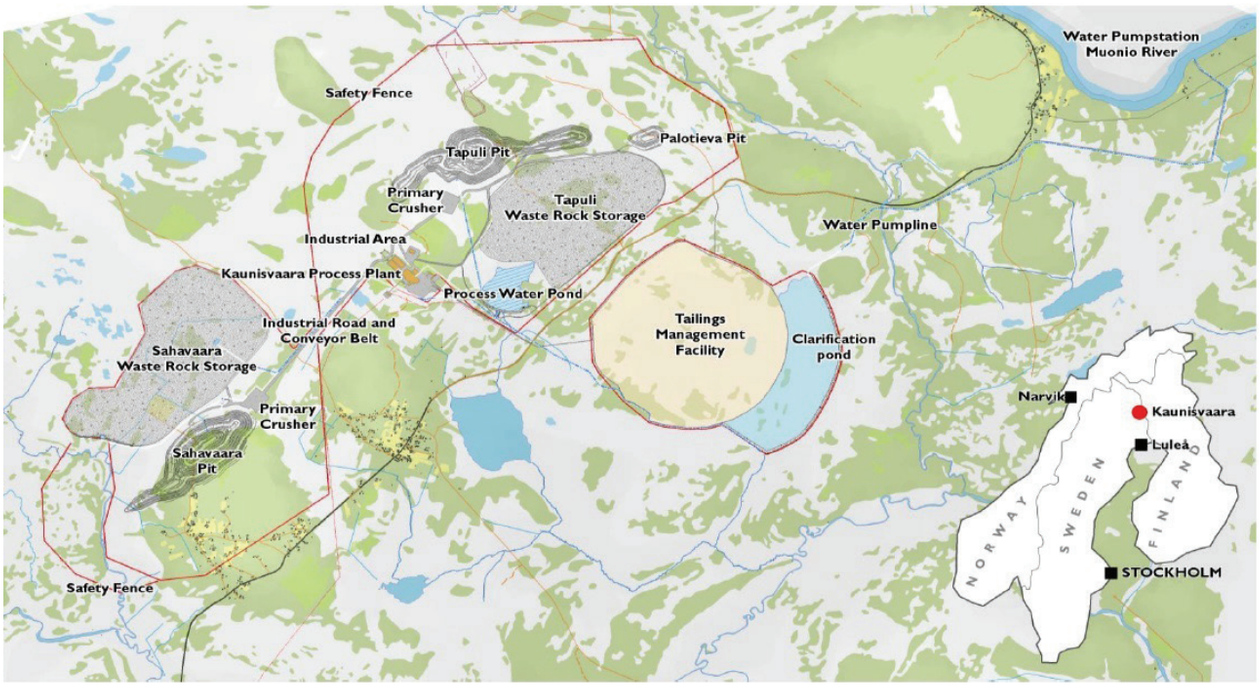
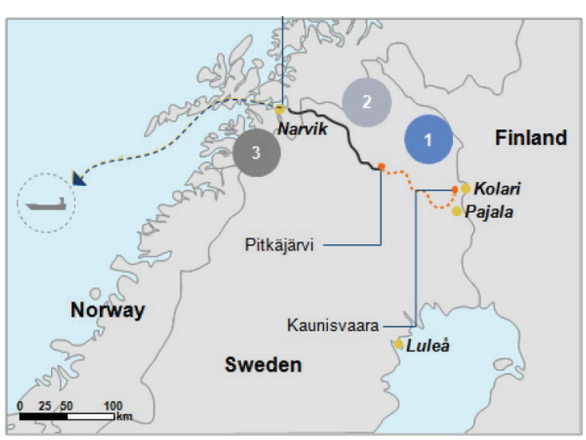



*Illustration of the Kaunisvaara project mine area with the existing Tapuli mine and the future Sahavaara mine, each with waste rock storages, located in Pajala municipality (northern Sweden). The figure also illustrates the tailings management facility, clarification pond, process water pond, industrial area, process plant, water pump and effluent discharge station in the Muonio River etc. Figure courtesy of Northland Resources.*

duce 1.7 million tons of iron concentrate during 2014, while the mill is designed for a capacity of 5 million tons of concentrate per year at full production rate. The concentrate is of high quality, with a 69 % iron content. In the summer of 2014, there were an approximate total of 300 employees in the Kaunisvaara project.

The iron concentrate is transported from the mine to Pitkäjärvi by highway trucks. Each truck transports 63 tons of iron concentrate. From Pitkäjärvi, the iron concentrate is transported to Narvik (Norway) by train. In Narvik, the iron concentrate is shipped out to customers around the world in vessels of cape size.




*The iron concentrate is transported from the Kaunisvaara mine to Pitkäjärvi by truck (1). From Pitkäjärvi the iron concentrate is transported to Narvik harbour by train (2). From Narvik harbour the product is shipped out to costumers (3).*

*Figure courtesy of Northland Resources.*

### 4.1. Transboundary EIA procedure

Northland Resources plans to begin iron ore mining activities at Sahavaara in the Pajala municipality in Northern Sweden. As part of the list of activities in Annex III to the Environmental Ordinance[30] that are likely to have significant environmental impacts, Northland Resources had to undergo an environmental impact assessment of the project.[31] As it was likely that the Sahavaara project would have significant environmental impacts in Finland, Sweden applied the Espoo Convention[32] regime as transposed into Swedish national law.[33] The Convention bases its regime on national EIA procedures, so the process of the Sahavaara mine transboundary EIA took place according to the sections of the Swedish Environmental Code, which governs national and transboundary EIA procedures.[34]

Pursuant to section 4.1 of chapter 6 of the Environmental Code, the developer informs the county administrative board of a project that is likely to have adverse environmental impacts.[35] The country administrative board shall then decide if the activity is likely to have a significant environmental impact, as laid down in section 4.3. However, section 4.4 states that the Government may specify activities and measures that are always likely to have a significant environmental impact. Mining industry has been specified as one of these activities in the EIA Ordinance to the Environmental Code.[36]

Pursuant to the abovementioned sections, Northland Resources was planning to consult the Norrbotten County Board, the Pajala Municipality, the Fiskverket fishing facility and the Muonio Sami village.[37] In addition, the developer planned to have public hearings in Sweden and in Kolari, Finland for landowners, associations, organisations and hunting societies.[38]

Pursuant to section 5 of chapter 6, following the county administrative board's decision that the project is likely to have significant environmental impacts, an environmental impact assessment is to be held. The county administrative board shall also forward the information to the Swedish Environmental Protection Agency (henceforth, SEPA), which is in charge of contacting the authorities in the state likely to be affected, should the project have significant

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[30] Förordning om ändring i förordningen (1998:905) om miljökonsekvensbeskrivningar, 12 May 2006.

[31] Annex III contains a section of 'Utvinningsindustri' (Mining industry). Mining industry is always assumed to have significant environmental impacts according to the Ordinance.

[32] The Convention on Environmental Impact Assessment in a Transboundary Context, 25 February 1991, United Nations Treaty Series, vol. 1989, p. 309.

[33] Section 6, chapter 6 of the Environmental Code states "if an activity or measure is likely to have a significant environmental impact in another country, the responsible authority designated by the Government shall inform the competent authority in that country about the planned activity or measure and give the country concerned and the citizens who are affected the opportunity to take part in a consultation procedure concerning the application and the environmental impact assessment".

[34] Chapter 6 of the Environmental Code governs the EIA procedures. The EIA Ordinance provides for some detailed statutes.

[35] Section 4.1 reads "Persons who intend to pursue an activity or take a measure for which a permit or decision concerning permissibility is required pursuant to this Code or to rules issued in pursuance thereof shall consult the county administrative board at an early stage. They shall also consult private individuals who are likely to be affected and must do so in good time and to an appropriate extent before submitting an application for a permit and preparing the environmental impact statement that is required in accordance with section 1. Prior to consultation, a person who intends to pursue an activity shall submit information about the location, extent and nature of the planned activity and its anticipated environmental impact to the county administrative board and any private individuals affected."

[36] See "Bilaga 3 Förordning om ändring i förordningen (1998:905) om miljökonsekvensbeskrivningar, 12 May 2006".

[37] Northland Resources AB, Alustava asiakirja koskien kaivostoimintaa Sahavaarassa, Pajalan kunnassa. Northland Resources Inc. 11 November 2009, p. 4.

[38] Ibid., p. 4.

transboundary environmental impacts. Pursuant to section 6 and the non-discrimination principle laid down in the Espoo Convention article 2(6)[39], if the project is likely to have significant transboundary environmental impacts, the affected country and its citizens must be granted the opportunity to take part in the consultations and the EIA procedure.

Accordingly, on 4 December 2009, SEPA (the point of contact and focal point for Sweden in transboundary environmental impact issues as decided by the first meeting of the parties to the Convention) contacted the Finnish Ministry of the Environment to notify them of the project.[40] This notification was also in line with article 3(1) of the Espoo Convention.[41] Pursuant to article 3(2) of the Convention, the notification must contain information of the proposed activity and available information of its transboundary impacts, the nature of the possible decision and an indication of the time within which a response is expected.

The notification sent to the Finnish Ministry of the Environment contained information in line with the requirements laid down in article 3(2). SEPA first summarized the project and then explained the Swedish regime regarding EIA. Information was then provided about meetings that had already taken place with the municipalities regarding consultations and the content of the environmental impact assessment. Lastly, SEPA requested the Ministry of the Environment to reply at the latest by 29 January 2010. The reply should entail information of confirmation of the receipt of the notification, a decision as to whether Finland will participate in the environmental impact assessment, comments on what the environmental impact assessment should contain, and comments from the public in Finland. Sweden has a gentlemen's agreement with the Nordic countries that the affected party will handle the responsibility of the public consultations in that country, and therefore SEPA was not involved in the process on the Finnish side.[42]

Following the notification by SEPA, the Finnish Ministry of the Environment sent out a request for statements and comments on the 17 December 2009.[43] These were due by 27 January 2010.

The reply by the Finnish Ministry of the Environment was delayed by a few days, but sent to SEPA on 5 February 2010.[44] This did not pose a problem as there is no legal time frame for a reply in the Swedish EIA regime. Furthermore, in a questionnaire sent out to the parties to the Espoo Convention, the Swedish attitude towards delays in replies was very lenient.[45] The reply contained statements from, inter alia, the National Board

[39] According to the principle, the public of the State that is likely to be affected must be given an opportunity to participate in the studies of the impacts in a similar manner to that of the public of the origin. See Pölönen and Koivurova, 'Rajat ylittävä ympäristövaikutteiden arviointi – vaihtoehtotarkastelun riittävyys ja suhde lupapäätöksentekoon', Lakimies (3) (2009), p. 373.

[40] Ruotsin ympäristöviranomaisen 4.12.2009 päivätty ilmoitus kaivoshankkeesta Sahavaaraan Pajalan kuntaan, Ympäristövaikutusten arviointimenettely, Ympäristöministeriö available at: http://www.ym.fi/fi-FI/Kansainvalinen_yhteistyo/Ymparistovaikutusten_arviointi/Sahavaaran_kaivoshanke_Pajalassa%283622%29 (15. 09. 2014)

[41] According to article 3(1) of the Espoo Convention, the country of origin must notify the affected party of the proposed activity (listed in Annex I of the Convention) that might cause adverse transboundary impacts.

[42] Information given by Egon Enocksson from SEPA by e-mail.

[43] Ympäristöministeriön lausuntopyyntö Sahavaaraan suunnitteilla olevasta rautakaivoshankkeesta, Ympäristövaikutusten arviointimenettely, Ympäristöministeriö. Available at: http://www.ym.fi/fi-FI/Kansainvalinen_yhteistyo/Ymparistovaikutusten_arviointi/Sahavaaran_kaivoshanke_Pajalassa%283622%29, (15. 09. 2014)

[44] Ympäristöministeriön vastaus Ruotsin ympäristöviranomaiselle Sahavaaraan Pajalan kuntaan suunnitteilla olevasta kaivoshankkeesta, available at: file:///C:/Users/u1401489/Downloads/Sahavaara_svar_FINAL_100205.pdf (06. 10. 2014)

[45] See S Jerdenius, 'Report of Sweden on the Implementation of the Convention on Environmental Impact Assess-

of Antiquities, the Provincial Office of Lapland, and the cities of Kemi and Tornio.[46] The Finnish Ministry of the Environment stated that based on the statements and opinions received from the parties and its own views, Finland would participate in the EIA process. Furthermore, the Ministry stated that Finland perceives the project likely to have significant transboundary environmental impacts on watercourses.

In their reply, the Ministry of the Environment pointed out several topics for the EIA. The Ministry indicated, for example, that in the materials to be assessed an alternative route for how the materials would be transported from the mine was not presented. The Ministry considered that the EIA should entail a section detailing alternative transport routes[47] in Sweden compared with those in Finnish territory.[48] Furthermore, the Ministry of the Environment stated that the significant adverse environmental impacts of the project could also include effects on fishing and reindeer herding.

Following the Ministry's views on the EIA procedure, a summary of the statements collected from the different entities was provided. These statements included, inter alia, the National Board of Antiquities' concerns over the effects of the project on Finland's archaeological heritage, and the Regional Council of Lapland's wishes that the EIA statement include a separate section for the impacts on Finland.[49] Some calls were made in the statements to study the environmental impacts of the mine projects jointly and not separately.[50]

After public opinions and statements were collected from the Finnish entities, they were sent back to SEPA in Sweden. Pursuant to section 7 of the Swedish Environmental Code, after the statements and comments were collected from necessary entities, the developer began to conduct the EIA. Following the requirements set out in section 7 of the Environmental Code, the developer had to include, inter alia, a description and details of the activity, and information needed to assess the effect on the environment.

### 4.2. Joint EIA statement on the Tapuli and Sahavaara mines

The EIS document was published in June 2011 by Northlands Resources.[51] Northland Resources made a joint EIS for the effects of the Tapuli and Sahavaara mines (and the concentrator). The joint EIS was made to provide a full picture of the environmental effects of the Pajala mine. The joint EIS is also supposed to form the groundwork for one comprehensive permit for the overall Kaunisvaara mining development. The document was translated into Finnish as well, although the Espoo Convention does not set requirements for translations. However, the Swedish authorities usually discuss documents to translate with the developer. According to

ment in a Transboundary Context' (2010) *United Nations Economic Commission for Europe*, p. 5 (Question 11).

[46] For a completele list, please see: Ympäristöministeriön vastaus Ruotsin ympäristöviranomaiselle Sahavaaraan Pajalan kuntaan suunnitteilla olevasta kaivoshankkeesta, Ympäristövaikutusten arviointimenettely, Ympäristöministeriö. Available at: http://www.ym.fi/fi-FI/Kansainvalinen_yhteistyo/Ymparistovaikutusten_arviointi/Sahavaaran_kaivoshanke_Pajalassa%283622%29 (15. 09. 2014) p. 1. (Available in Swedish)

[47] According to the plans, the transportation of iron ore concentrate was destined to Äkäsjokisuu Kolari in Finland for further transportation by rail to Ajos harbour in Kemi, from where it would have been transported overseas.

[48] See ibid., p. 2.

[49] See Ibid., p. 7.

[50] See for example, the statement of the Regional Council of Lapland.

[51] Northland, 'Ympäristövaikutusten arviointi: Kaunisvaaran kaivostoiminta, Sahavaaran ja Tapulin kaivokset sekä Kaunisvaaran rikastamo'. Lupinus, Luulaja 2011. Available at: http://www.ym.fi/fi-FI/Kansainvalinen_yhteistyo/Ymparistovaikutusten_arviointi/Sahavaaran_kaivoshanke_Pajalassa%283622%29 (17. 09. 2014).

Sweden, it is up to the developer to translate sufficient parts of the notification and the EIA.[52]

Northlands Resources discussed the environmental impacts from multiple aspects.[53] These included, for example, the effects on the view and scenery (a change will occur during the mining activities, but the permanent impact will be minor); the water system (although a swamp will be drained, the assessment was that there would be no impact on the environmental quality standards regarding the waters); and disturbances such as noise and air pressure waves (Northlands Resources concluded that some estates would have to be redeemed due to their location within the security perimeter of the Sahavaara mine, and that for the villagers of Kaunisvaara the project would entail an increased noise level). In addition, Northlands Resources compared the negative impacts on the environment with the positive impacts of the project (such as increased employment rate, improved infrastructure and municipal tax revenue) and concluded that the positive impacts outweighed the negative ones.[54]

After the EIS is concluded, notification thereof shall be published pursuant to section 8 of the Swedish Environmental Code, chapter 6. This statement has to be made available to the public, which shall be given an opportunity to comment on the statement before permits are granted.

This notification was performed by Sweden (SEPA) as regards the Kaunisvaara project mining activities, and received by the Finnish Ministry of the Environment on the 15 November 2012.[55] The deadline for comments was set for 10 January 2013. Some changes had been made to the plans of the mining complex. For example, the transportation of mining extract would no longer take place on the Finnish side of the border, but would be taken from Kaunisvaara by railroad to Svappavaara, and onward to Narvik harbour in Norway.

On 26 November 2012, the Ministry of the Environment submitted a request for comments on the environmental impact statement.[56] The Ministry specified that the previous Sahavaara application had been supplemented with further requests for concentrator facilities and the alternate route for exportation of the mining extract.

On 17 January 2013, the Ministry of the Environment sent a response to SEPA regarding the EIA statement.[57] The Ministry underlined the importance that the project's environmental impacts be assessed as a whole, which would provide the best means to minimise and mitigate the adverse impacts of the project. In addition, the response included the comments received from; inter alia, the Lappish ELY Centre[58] and

[52] See, Sten Jerdenius, Report of Sweden on the Implementation of the Convention on Environmental Impact Assessment in a Transboundary Context, United Nations Economic Commission for Europe, 2013, p. 10.

[53] Northland, 'Ympäristövaikutusten arviointi: Kaunisvaaran kaivostoiminta, Sahavaaran ja Tapulin kaivokset sekä Kaunisvaaran rikastamo'. Lupinus, Luulaja 2011. Available at: http://www.ym.fi/fi-FI/Kansainvalinen_yhteistyo/Ymparistovaikutusten_arviointi/Sahavaaran_kaivoshanke_Pajalassa%283622%29 (17. 09. 2014), pp. 8–14.

[54] Ibid., p. 15.

[55] Ruotsin ympäristöviranomaisen 15.11.2012 päivätty ilmoitus kaivoshankkeesta Kaunisvaaraan Pajalan kuntaan, available at: file:///C:/Users/u1401489/Downloads/Ruotsin%20ymp%C3%A4rist%C3%B6viranomaisen%2015.11.2012%20p%C3%A4iv%C3%A4tty%20ilmoitus%20(2).pdf (06. 10. 2014)

[56] Ympäristöministeriön lausuntopyyntö Kaunisvaara-Sahavaaran kaivoshankkeen YVA-menettelyn arviointiselostuksesta, available at: file:///C:/Users/u1401489/Downloads/lausuntopyynt%C3%B6%20Kaunisvaara-Sahavaara%20YVA%20(2).pdf (06. 10. 2014)

[57] Ympäristöministeriön vastaus Kaunisvaara-Sahavaaran kaivoshankkeen ympäristövaikutusten arviointiselostuksesta, available at: file:///C:/Users/u1401489/Downloads/Ymp%C3%A4rist%C3%B6ministeri%C3%B6n%20vastaus%20Kaunisvaara-Sahavaaran%20kaivoshankkeen%20ymp%C3%A4rist%C3%B6vaikutusten%20arviointiselostuksesta%20(1).pdf (06. 10. 2014)

[58] Centre for Economic Development, Transport and the Environment (Elinkeino-, liikenne- ja ympäristökeskus)

the Reindeer Herding Association.[59] The ELY Centre raised concerns that the amount of drainage water would be more significant than was assessed in the EIA statement of 2011. Therefore the ELY Centre raised issues and requirements that should be considered in the licensing process regarding the waste water. These included, inter alia, extensively investigating the properties of the sulphur tailings arising from flotation and production-related variations, and controlling the effects of the mining activities on the fish stock and fisheries in a way approved by both the Swedish fish authorities and the ELY Centre.

The Reindeer Herding Association on the other hand, stated that the project caused a loss of pasture for the Muonio Sami village. The Association continued that other indirect losses may occur as the reindeer move to pasture in other areas as a result of the disturbances. The Association further stated that eventually an enclosure would have to be built to prevent the mixing of Finnish and Swedish reindeer caused by the mining activities.

### 4.3. Analysis

It seems first of all obvious that in most aspects, the two states, Finland and Sweden, have conducted themselves on the basis of the applicable international convention, the Espoo Convention. This is also the Convention on which the Guidelines for EIA in the Arctic are founded, in its chapter 11.

There are several examples of best practices. The Guidelines document prescribes that "[o]pen dialogue and information exchange should be established between the country of origin and the affected country or countries", which is clearly the case here.

Perhaps more importantly, chapter 11 of the Guidelines provides:

> In the EIA process, possible transboundary impacts should be considered, when appropriate. Assessments of transboundary impacts require project developers and authorities to make allowances for different legal systems, to provide translations when necessary, and to make special arrangements for public participation across jurisdictional borders.[60]

As studied above, when Sweden made a joint EIS over the Kaunisvaara mining project developments, and the document was translated into Finnish, even though the Espoo Convention does not set requirements for such translations. Additionally, the Guidelines document urges special arrangements for public participation across jurisdictional borders. Sweden has a gentlemen's agreement with the Nordic countries that the affected party will handle the responsibility of the public consultations in that country, and therefore SEPA was not involved in the process on the Finnish side. This type of gentlemen's agreement clarifies responsibilities in transboundary EIA and is clearly a good practice. Overall, the public participation on both sides of the border was handled well, and also involved indigenous reindeer herders.

One particular best practice is the way that Sweden, upon request of Finland, carried out a joint environmental impact statement concerning the Kaunisvaara mining developments. As provided in the Guidelines document:

> It is important to describe and analyze the accumulation of change to the environment due to project related impacts, even though the projects may be small and their impacts minor … Cumulative impact assessment at the project level, along with an understand-

[59] See ibid. pp. 2–3.

[60] See page 39 of the Guidelines, at http://arcticcentre.ulapland.fi/aria/procedures/eiaguide.pdf

> ing of environmental impacts at the resource and land use planning level, helps set that project and its impacts in a broader ecological and development context.[61]

The provision by Sweden of a joint EIS of the Kaunisvaara mining developments also provided a full picture of the environmental effects of the Pajala mine to Finland. In this way, Finland was able to provide comments on the overall environmental pressures from the Finnish perspective.

As the case study involved neighbours with good relations and long-standing experiences of conducting transboundary EIA's, there are only some issues that might be discussed in a critical vein, given that the procedure was clearly handled in accordance with the Espoo Convention. One issue on which the two states could have placed more emphasis is how to better involve indigenous peoples organizations, as is encouraged in the Guidelines document:

> Communities in the area of anticipated impacts should be given an opportunity to participate, irrespective of their location relative to the border. The Inuit Circumpolar Conference, the Sami Council and the Indigenous Peoples Secretariat are accredited non-governmental organisations on the Arctic Council, and which are active in several arctic countries. They may thus provide useful links to the public on both sides of the border.[62]

In the case-study, some reindeer herding associations were involved, but perhaps the Saami Council could also have had a role in conveying the overall views of Sami in general and reindeer herding Sami in particular, also taking into account that the same company is planning mining activities (the Hannukainen mine) also on the Finnish side of the border.

## 5. Conclusions

The Barents region in general and the North Calotte/Kola Peninsula are in the process of deep transformation. Climate change and especially economic globalization have opened up the region's plentiful resources for global consumption. The mining industry has migrated northwards, and even if the current global market prices of many minerals cause problems for the mining industry, it seems clear that in the long-run the demand for mineral resources from the Arctic regions will stay at a high level. With a projected 12 billion people on our planet by the end of the century, and most of the population growth stems from Asia where people want to raise their living standards very quickly, it seems obvious that mining industry will progress in the Barents region.

In order to sustain this development, we need to have strong environmental protection machinery, which includes EIA over planned mining developments. Since the international boundaries of the North Calotte/Kola Peninsula are very close to each other, it is important to know the international legal requirements for these very complex EIA's. Moreover, as has also been studied in this article, it is important to take into account the particular characteristics of the Barents and Arctic regions. The Guidelines for Environmental Impact Assessment in the Arctic, and the more general IAIA Guidance, provide important recommendations how to conduct more effective and equitable transboundary EIA in this region. Additionally, this case study demonstrates ways of conducting transboundary EIA in the North Calotte/Kola Peninsula region.

[61] See the special chapter on cumulative impacts in the Guidelines document at 5.2., at http://arcticcentre.ulapland.fi/aria/procedures/eiaguide.pdf

[62] Ibid, p. 41.

Because Norway, Sweden and Finland are Contracting Parties to the Espoo Convention and because the Espoo Convention provides more detailed regulations on transboundary EIA, it provides the best foundation for conducting a transboundary EIA in the North Calotte/Kola Peninsula area. Moreover, the Russian Federation has indicated that it is willing to observe the Convention to the extent permitted by its own national legislation, even if it is not yet a party to the Convention.[63] Hence, the Espoo Convention should be used as the backbone of the transboundary EIA system in the North Calotte/Kola Peninsula as regards proposed mining activities, and additionally, the IAIA and the Arctic EIA Guidelines also provide important recommendations for conducting a transboundary EIA in the region.

[63] It may well be that the Espoo Convention will soon be ratified by the Russian Federation, given that in recent years it has been reported that this may happen soon.