REPORTS OF THE MINISTRY OF THE ENVIRONMENT 2en | 2012

Remediation of Significant Environmental Damage

Manual on Procedures

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FOREWORD

Finland's national legislation on environmental damage was revised in 2009, when the Act and Government Decree on the Remediation of Certain Environmental Damages were passed and amendments were made to certain existing statutes. These legislative changes were introduced in order to implement the European Union Directive on environmental liability with regard to the prevention and remedying of environmental damage. Already at the preparatory stage, it was stated that to ensure effective implementation of the statutes, an expert network should be established in environmental administration. This network was to issue practical guidelines for procedures related to the assessment and remediation of damage, while providing expert assistance to competent authorities as required.

On 1 October 2011, the Ministry of the Environment set up a monitoring group responsible for guiding and supporting the implementation of environmental liability legislation, by establishing the related guidelines and training materials and planning the monitoring of implementation. The monitoring group was chaired by Tuire Taina, Senior Adviser for Legislative Affairs, with Pekka Salminen, Nature Conservation Adviser, as Vice Chairman, both from the Ministry of the Environment. Other members of the monitoring group were Tia Laine-Ylijoki-Laakso, Senior Officer for Legal Affairs (on leave as of 1 February 2011), and Satu Sundberg, Senior Government Adviser, from the Ministry of the Environment, Leena Simpanen, Senior Environmental Adviser, from the Regional State Administrative Agency for Southern Finland, Ilpo Huolman, Senior Officer, from the Centre for Economic Development, Transport and the Environment for Uusimaa and Harri Tukia, Senior Researcher, from the Finnish Environment Institute. Milla Mäenpää, Planning Officer, from the Finnish Environment Institute served as the group secretary.

As part of its activities, the monitoring group consulted experts and stakeholders outside the group. Experts from the Finnish Environment Institute and the Board for Gene Technology took part in the writing of the manual on procedures for remediation of significant environmental damage. Moreover, the draft version of this manual was reviewed in early autumn 2011 and feedback was taken into consideration during the finalisation stage. This publication, on the remediation of significant environmental damage and the related procedures, is designed primarily as a guide for authorities, particularly for Regional State Administrative Agencies, Centres for Economic Development, Transport and the Environment, and local environmental protection authorities. The publication also provides information on legislative obligations and practices, related to the remediation of environmental damage, for other operators interested in the subject, and citizens.

CONTENT

1 Introduction

This publication is designed as a manual on procedures for the remediation of significant environmental damage. It provides guidance for assessing the significance of such damage, the selection of remedial actions and official procedures related to remediation. The primary aim of the manual is to clarify and harmonise actions taken by the authorities for the remediation of environmental damage. For other operators, it also provides information on legislative obligations and practices related to the remediation of environmental damage.

1.1 Purpose of the Publication

This publication examines the remediation of certain types of significant environmental damage, especially the assessment of the significance of the damage, the selection of remedial actions and official procedures related to remediation. The manual focuses on significant environmental damage falling within the scope of application of the Act on the Remediation of Certain Environmental Damages (383/2009). It is therefore not a general description of all situations in which environmental damage has occurred. However, where applicable, it can also be used in the prevention and remediation of less significant cases of environmental damage.

The primary goal is prevention and control of environmental damage. However, in spite of such efforts, damage does occur, at which point the means of remedying the damage must be considered.

This publication is primarily designed as a guide for competent authorities responsible for the remediation of environmental damage.

The manual aims to clarify and harmonise actions taken by authorities for the remediation of environmental damage, including cooperation with other authorities, such as municipalities and various expert organisations. It also provides information on legislative obligations and practices related to the remediation of environmental damage, for operators engaged in activities posing potential environmental risks, and for citizens.

1.2

Environmental Damage in Finland

Traditionally, *environmental damage* has been specified as damage caused by a sudden event that leads, or may lead, to harmful substances or energy being emitted into the environment. The Finnish Environment Institute has studied incidents of environmental damage in Finland over five-year periods, assessing their number, quality, causes, impacts and costs. The latest report covers 2000 to 2005[1]. These reports classify incidents of environmental damage as follows: incidents with serious, great, minor or no consequences. The significant environmental damage discussed in this manual mainly corresponds to incidents with serious and great consequences.

Based on the reports, transport, industry and municipal engineering are high-risk sectors in terms of environmental damage. The highest number of incidents occurs in transport, but they rarely have significant consequences. The highest total number of incidents of significant damage is reported by industry, while the chemical industry and forestry report the highest number of incidents. In municipal engineering, the total number of incidents is lower than in the above-mentioned sectors, but a fair number have had significant consequences. Typical incidents include overflow of sewage or broken sewage pipes.

The reports indicate that most incidents of damage have affected land. However, in the case of damage to land, preventive measures are of high importance and, for the most part, damage has been entirely prevented. On the other hand, land damage with significant consequences typically involves long-term groundwater contamination. The second highest total number of incidents involved damage to air, but significant damage has been rare. Damage to surface water has involved the highest number of incidents with significant consequences. Such incidents involve large-scale fish kills and hinder recreational use. Incidents of damage to groundwater have been rare, but have had significant consequences. The highest costs were caused by damage to surface water and land.

Reports compiled in Finland have covered the impacts of environmental damage on ecosystems, health and society, but have not paid particular attention to damage to protected species or natural habitats. According to the report published by the European Environment Agency (EEA 13/2010), incidents with significant adverse effects on the ecosystem have occurred in transport and industry in particular, in cases where oil or other harmful substances have been released into the environment.[2] The number of incidents involving significant environmental damage seems to be declining slightly, although large annual fluctuations make it difficult to identify a clear downward trend in the total number of incidents.

Finnish environmental protection legislation has largely focused on the prevention of pollution. However, remediation of damage is also addressed. Finland has very limited practical experience in the recovery of damaged or impaired ecological values, or possibilities for remediation of such damage in alternative areas, or otherwise compensating for temporary losses. For this reason, such issues require a special emphasis with respect to the remediation of significant environmental damage. Despite preventive measures, significant environmental damage does occur, due to various unforeseen causes and human factors. It is important that different operators are aware of responsibilities and procedures related to the remediation of damage.

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1 SYKE ra1/2007 Ympäristövahingot ja niiden kustannukset Suomessa vuosina 2000–2005. Tuuli Alaja, 2007. Suomen ympäristökeskuksen raportteja 1/2007, 84 s., Suomen ympäristökeskus (SYKE). URN:ISBN:978-952-11-2549-2, ISBN 978-952-11-2549-2 (PDF). Also available in printed format ISBN 978-952-11-2548-5 (nid.) http://www.environment.fi/default.asp?contentid=232093&lan=fi

2 http://www.eea.europa.eu/publications/mapping-the-impacts-of-natural

1.3

Legislation

Directive 2004/35/EC of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage, i.e. the *Environmental Liability Directive*, requires that Member States enact legislation on measures to prevent and remedy significant environmental damage to protected species and natural habitats and biodiversity. In this directive, 'environmental damage' means damage to protected species and natural habitats, as well as water and land damage with significant adverse effects. Use of the term 'liability' in the directive does not refer to traditional economic compensation for damage. Instead, the directive aims to prevent and remedy significant environmental damage according to the 'polluter pays' principle. To this end, the directive contains provisions on measures necessary for the remediation of damage.

In Finland, the Environmental Liability Directive has been implemented by the Act on the Remediation of Certain Environmental Damages (383/2009) that entered into force on 1 July 2009, i.e. the *Environmental Liability Act*, and the related changes introduced into the Nature Conservation Act (1096/1996), the Environmental Protection Act (86/2000), the Water Act (587/2011), the Gene Technology Act (377/1995) and the Act on Transport of Dangerous Goods (719/1994). Based on the Environmental Liability Act, the government has also issued a Decree on the Remediation of Certain Environmental Damages (713/2009), or the *Environmental Liability Decree*.

The Environmental Liability Act includes provisions on necessary measures related to the remediation of significant damage to protected species, natural habitats and waters, and on liability to pay the costs of such measures. The principal aim of remediation is to restore the environment to the state in which it would be if no environmental damage had occurred. If this is impossible, other complementary and compensatory measures should be taken as needed outside the affected area, in order to remedy damage to natural resources. The implementation and costs of these measures are mainly borne by the operator responsible for the environmental damage.

The Environmental Protection Act, the Water Act and the Gene Technology Act contain provisions on how, in accordance with the Environmental Liability Act, au-

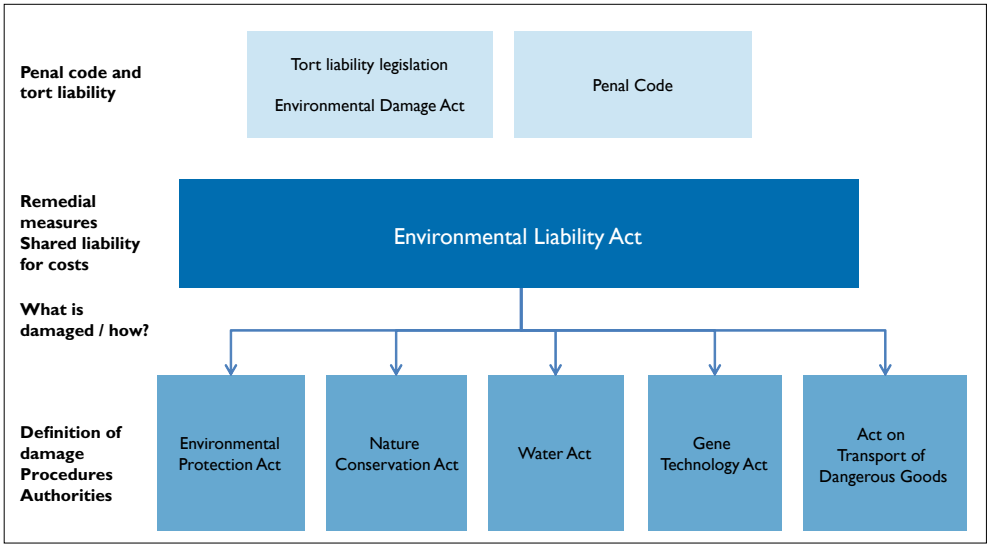


Figure 1. Many acts may apply to an incident of environmental damage; specific statutes are in place for tort liability and possible penal liability, whereas the Environmental Liability Act contains provisions on the remediation of damage. Other environmental legislation may also apply, depending on what has been damaged and what kind of operation caused the damage.

thorities may issue orders to remedy significant environmental damage caused by activities falling within the scope of application of these acts. Provisions to be applied in such cases are those on administrative enforcement proceedings set out in the act concerned. Under the reference provision, the Environmental Protection Act applies to the remediation of damage caused by the transport of dangerous goods.

1.4

Competent Authorities

Regional Centres for Economic Development, Transport and the Environment (the ELY Centres) can issue orders in accordance with the Nature Conservation Act and the Environmental Protection Act, *Regional State Administrative Agencies* can issue orders based on the Water Act and the *Board for Gene Technology* can issue orders in accordance with the Gene Technology Act. In ELY Centres, activities related to the remediation of environmental damage are part of the area of responsibility for the environment and natural resources, which is addressed at 13 regional ELY Centres. Other ELY Centres also have expertise in environmental damage in their fields of activity. In addition to the ELY Centres, *local environmental protection authorities* of the municipalities act as a supervisory authority based on the Environmental Protection Act and the Water Act, and can thus in some circumstances be involved in assessing the significance of the damage and the need to initiate administrative enforcement proceedings. This being the case, municipalities should prepare in advance by identifying situations and phases of environmental damage that require them to contact the regional ELY Centre.

If there is justified cause to suspect that significant environmental damage has occurred, primary contacts include the regional ELY Centre, and in urgent cases, the local rescue authorities.

The ELY Centre or the local environmental protection authority acting as a supervisory authority must also inform the police about environmental damage in potentially criminal cases. The police should be contacted as early as possible. They can then assess the need for a preliminary investigation and launch such an investigation if required.

The Finnish Environment Institute (SYKE) provides general expert assistance to the supervisory authorities, in the assessment of damage and the selection of remedial measures. A statement may be requested from the health protection authorities or the *National Institute for Health and Welfare* to assess the health risk to humans. The supervisory and expert authorities specified in the Gene Technology Act have expertise related to damage caused by genetically modified organisms (GMOs). Such authorities include the Finnish Environment Institute, *the National Supervisory Authority for Welfare and Health (Valvira)* and *the Finnish Food Safety Authority (Evira)*. An appendix to this manual lists the names and contact details of the main authorities related to the prevention and remediation of environmental damage (available only in the Finnish-language version).

If environmental damage might have an impact outside Finland's borders, prevention and remediation typically require international cooperation between the authorities. Several international conventions regulate international cooperation between rescue authorities, and more specifically, international cooperation related to environmental damage, such as damage at sea and damage affecting transboundary waters. In these situations, the national authorities to be contacted must be identified on a case-by-case basis.

1.5

Relation to Other Legislation

Several acts have been enacted for the prevention and remediation of environmental damage in Finland; these may apply simultaneously to those discussed in this manual (see Figure 1). However, no other legislation sets forth provisions on the remediation of environmental damage in the broad sense intended under the Environmental Liability Act. Generally, restoration of environmental damage mainly refers to restoration of the damaged site to its baseline condition. Thus, restoration does not cover the remediation of environmental damage apart from actions carried out at the damaged site, or remediation of interim losses.

1.5.1

Prevention of Environmental Damage

The Chemicals Act (744/1989) aims to prevent and avert harm to health and the environment caused by chemicals. Pursuant to Section 15, sufficient care and caution are to be exercised in the manufacture, import and other handling of chemicals. If careless or incautious handling of a chemical contaminates the environment, the party causing the contamination must clean up the environment. The Chemicals Act also contains provisions on, for example, the approval procedure for biocidal products and prohibitions and restrictions related to chemicals. The Act on Plant Protection Products (1259/2007) contains similar provisions on plant protection products.

The Act on the Safety of Handling Dangerous Chemicals and Explosives (390/2005) aims to prevent and avert, for example, damage to the environment caused by the manufacture, use and handling of dangerous chemicals and explosives. The Act contains provisions on issues such as general safety requirements, permits for and notification of the handling and storage of dangerous chemicals, prohibitions and restrictions, and enforcement measures.

Section 9 of the *Waste Act* (646/2011) contains provisions on the general duties of care related to waste. Pursuant to this, the manufacturer, producer or distributor must ensure, for example, that waste does not cause a hazard or harm to health or the environment. The Act also stipulates that the waste holder must be sufficiently aware of the amount and type of waste held, as well as qualities relevant to waste management and health and environmental effects.

The Health Protection Act (763/1994) sets forth provisions on preventing, decreasing and removing factors from the living environment that may cause harm to health. Activities affecting the living environment must be conducted in a manner that, as far as possible, prevents harm to health. Under the Health Protection Act, competent authorities may issue prohibitions or regulations necessary to remove harm to health, or prevent the emergence of it, as stipulated in the Act.

The Rescue Act (379/2011) contains provisions on the prevention of environmental damage, *the Act on Combating Oil Pollution* (1673/2009) on the prevention of oil spills on land and *the Act on Environmental Protection in Maritime Transport* (1672/2009) on the prevention of environmental damage caused by ships. These Acts contain stipulations on, for example, prevention authorities, performance of prevention activities and the rights and obligations related to prevention. Prevention of oil spills and other environmental damage is the responsibility of local rescue authorities, except for oil spills at sea, where the Finnish Environment Institute has responsibility for prevention.

1.5.2

Compensation for Environmental Damage

The Act on Compensation for Environmental Damage (737/1994), i.e. the Environmental Damage Act, contains general provisions on compensation for environmental damage. This applies to compensation for losses caused by environmental damage, or other similar disturbances to the environment. Pursuant to the Environmental Damage Act, the operator whose activity has caused the environmental damage is liable for compensation, and this is strict liability, i.e. it applies even when the loss has not been caused deliberately or negligently. Pursuant to the Act, the liability applies to bodily injury and material loss and financial loss unconnected with bodily injury or material loss, if the loss is not minor. In addition to traditional compensation, compensation is also paid for the costs of measures needed to prevent environmental damage, restoration costs and the costs of investigations that prove unavoidable to carrying out preventive measures or restoration.

The damaged party may claim damages directly from the operator whose activity caused the damage or, when necessary, by bringing it before a District Court. However, the provisions of the Environmental Damage Act on liability for compensation and on the grounds for compensation also apply if, in a procedure under the Act on the Redemption (Expropriation) of Immoveable Property and Special Rights (603/1977, *Redemption Act*) or another similar act, *the Act on Public Roads* (503/2005), the Act on Private Roads (358/1962), *the Railways Act* (110/2007) or *the Mining Act* (621/2011), compensation is to be set for environmental damage as referred to in the Environmental Damage Act.

Chapter 10 of *the Maritime Act* contains provisions on liability for damages for oil spills caused by maritime traffic. These provisions are based on the ship owner's strict liability and guarantee the right to receive compensation for reasonable restoration costs related to the environment. Oil tankers must hold statutory liability insurance. Chapter 10a of the Maritime Act in turn contains provisions on the ship owner's strict liability for pollution damage caused by fuel from the vessel. The provisions of the Maritime Act (Chapters 10 and 10a) apply to Finnish inland waters, sea areas and Finland's exclusive economic zone.

Environmental damage caused by road traffic, and prevention costs thereof, is compensated in accordance with the *Motor Vehicle Insurance Act* (279/1959). Pursuant to *the Rail Traffic Liability Act* (113/1999), the rail carrier's liability for compensation applies to damage caused to rail traffic by the use of a rail vehicle. Pursuant to *the Railway Act* (555/2006), the rail carrier must hold liability insurance.

The polluter's primary liability to provide compensation according to the above-mentioned acts is supplemented by *the Environmental Damage Insurance Act* (81/1998) and *the Act on the Oil Pollution Compensation Fund* (1406/2004). Pursuant to these acts, compensation for damage and costs of prevention and restoration are covered in certain cases if it is not possible to collect compensation from the liable party or the party's liability insurance, or when it is not possible to identify the liable party.

1.6

Secondary Financing Systems

According to the polluter pays principle, the polluter holds the primary responsibility for the restoration of and compensation for environmental damage. In practice, some polluters are unable to pay the costs for the damage they have caused. The reasons may be that the responsible party is insolvent or unknown, or some other

reason may prevent the establishment of the polluter's liability for compensation for environmental damage. Secondary financing systems are required in such cases.

Pursuant to the Environmental Liability Directive (Article 14), Member States must take measures to encourage the development of financial security instruments and markets, with the aim of enabling operators to use financial guarantees to cover their responsibilities. Financial mechanisms in cases of insolvency, or secondary responsibility, are also to be considered as financial guarantees.

Finland does not have a wide-reaching environmental fund. Instead, compensation or financing is sought from various sources. Possible sources include statutory environmental damage insurance, voluntary insurance, the oil pollution compensation fund and various funding from the state budget.

Statutory environmental damage insurance is used for compensation for environmental damage to an orphan site. This insurance is used to cover the compensation, rather than restoration of the environment. However, in practice, the actions for which compensation is due also promote remediation of damage as described in this publication. Insurance is required to guarantee that compensation is paid according to the Environmental Damage Act, and that the compensation covers the costs of prevention and restoration when the primary responsible party is insolvent or unknown. The Environmental Damage Insurance Act only applies to environmental damage that has occurred on 1 January 1999 or after. Damages for which compensation is paid include bodily injury, material loss, pure financial loss and other environmental damage, such as noise, to a reasonable level. Statutory environmental damage insurance is not used to provide compensation for damage caused to ecological values or the implementation of everyman's right or damage caused by transportation of chemicals, polluted areas, neglect of waste management, or damage caused by a company that is still in business. Moreover, upper and lower limits apply to the compensation to be paid by the insurance. A typical situation where the insurance applies would be a chemical spill caused by a company that has gone bankrupt.

Voluntary insurance purchased by companies and private individuals plays a more important role than statutory insurance. With voluntary insurance, it is possible to insure the company's operations or responsibility. While there is specific environmental insurance, environmental responsibility is usually covered by some other type of insurance. The terms of the insurance policy are important in determining the compensation received from insurance claims. However, a significant amount of damages are not covered by insurance, i.e. damages to biodiversity and restrictions on everyman's right, as well as old soil contamination cases and criminal liability.

Other possible systems that allow secondary financing include the oil pollution compensation fund system and the State's budgeted waste management resources. The State may participate in waste management activities pursuant to Section 35 of the Waste Act. Such participation can occur if waste or other discarded goods or substances in the environment cause hazard, harm or other consequences referred to in the Waste Management Act (Section 19) or Environmental Protection Act (Section 7) and work or activities required to prevent or remove the waste, object or substance causes or may cause costs that can be deemed unreasonable with respect to the municipal waste management authority's ability to bear them. After agreement with the relevant municipality, the ELY Centre may perform or commission waste management activities within the limits of the State budget, or may otherwise contribute to the above-mentioned costs.

2 Damage Assessment

'Significant environmental damage' means damage that has significant adverse effects on protected species and natural habitats and on water and land.

2.1
Definition of Damage

In the legislation discussed in this manual, 'significant environmental damage' means damage that has significant adverse effects on protected species and natural habitats and on water and land. Damage is divided into the following four groups, according to what is damaged and partially according to the cause of the damage:

1. damage to water bodies and groundwater;
2. damage to protected species and natural habitats;
3. damage to land; and
4. damage caused by genetically modified organisms (GMOs).

This division is partially affected by the historical division of responsibilities between different acts and authorities.

Damage to water bodies is further divided into substantial pollution of water bodies and other significant harmful changes in water bodies, and damage to groundwater similarly into substantial pollution of groundwater and other significant harmful changes in groundwater. The Environmental Protection Act contains provisions on the pollution of water bodies and groundwater, and the Water Act on significant harmful changes in water bodies and groundwater. In turn, *damage to protected species and natural habitats* refers to significant harmful effects on those protected species and natural habitats specified in the Nature Conservation Act. Section 12 of the Environmental Protection Act contains provisions on the assessment and treatment of *contaminated soil*. Damage caused by *GMOs* is always damage to water bodies, nature or soil (see p. 28), but because the assessment and selection of remedial measures follows the procedure specified in the Gene Technology Act, they are discussed separately as a type of damage in this document. The assessment and significance of damage is discussed in more detail in the subsections of this section, each of which is dedicated to a specific type of damage.

In practice, a damage incident may cause several types of damage simultaneously. For example, spillage of a hazardous chemical into a water body may cause not only damage to the water body, but also damage to protected species and natural habitats. Similarly, soil contamination may cause not only damage to soil but also damage to groundwater. In such cases, it is necessary to assess each type of damage separately,

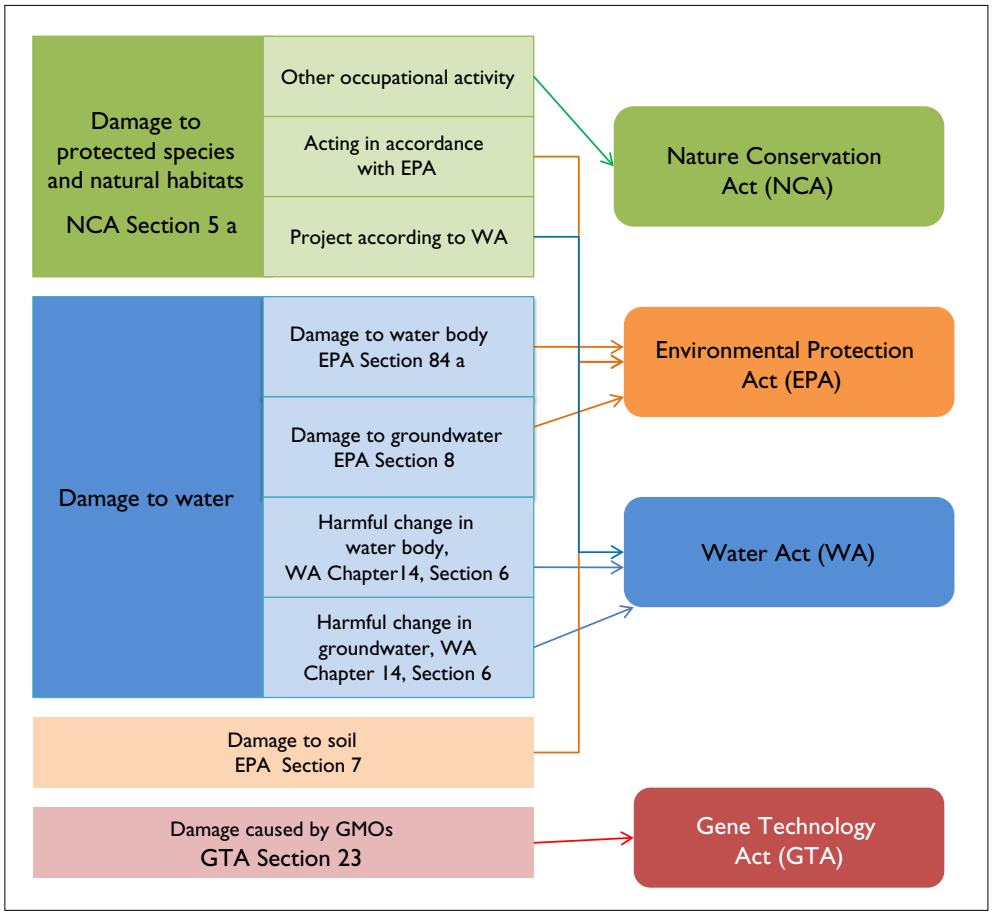


Figure 2. Types of damage and applicable legislation

to determine whether it constitutes significant environmental damage as specified in environmental liability legislation. In practice, this may also mean that several competent authorities participate in the assessment of damage. For example, groundwater abstraction subject to a permit under the Water Act may cause a significant harmful change in groundwater resources. Such a case will be handled by a Regional State Administrative Agency (AVI). If the abstraction project causes harmful changes in a nearby protected area by lowering the groundwater level, constituting damage to protected species or natural habitats, these are assessed in the same procedure pursuant to the Water Act; however, pursuant to the Nature Conservation Act, the ELY Centre participates in the assessment as the supervisory authority. Experts from other authorities, such as the Finnish Environment Institute, may also take part in assessing the significance of the damage.

The specification and assessment of damage may be independently initiated by the authority, or by means of administrative enforcement proceedings initiated by another body. If the specification and assessment give grounds for considering the damage to be significant environmental damage under environmental liability legislation, assessment of the need to remedy the damage follows, and suitable remedial measures are selected. This phase of the process is described in more detail in Section 5 of this document.

If, based on the assessment, the damage cannot be considered significant environmental damage as specified in this document, appropriate measures must still be taken to remove the harmful consequences of the damage, but the provisions on remedial measures in environmental liability legislation do not apply.

The conclusions of the assessment should be documented with sufficient detail by the competent authority; depending on the type of damage, this may be an ELY Centre, a Regional State Administrative Agency or the Board for Gene Technology. If administrative enforcement proceedings have commenced, the matter will be resolved once a decision is issued in a case of administrative enforcement. However, if the authority has independently launched the assessment and it concludes that the damage does not constitute significant environmental damage, administrative enforcement proceedings will not be initiated. In such a case, the conclusions of the assessment may be recorded in a supervisory report.

2.2

Damage to Water Bodies and Groundwater

2.2.1

Damage to Water Bodies under the Finnish Environmental Liability Legislation

The Environmental Liability Act, Chapter 1, applies to substantial pollution of a water body referred to in the Environmental Protection Act (Section 84a) and to significant harmful changes in the water bodies or groundwater referred to in the Water Act (Chapter 14, Section 6). In the case of groundwater pollution, the provisions in Chapter 12 of the Environmental Protection Act on soil contamination apply to the restoration of groundwater. However, since substantial pollution of groundwater is included in the definition of environmental damage in the Environmental Liability Directive, implementation of Chapter 12 of the Environmental Protection Act for these types of damage also entails implementation of the directive.

As regards assessment of groundwater pollution and liability for restoration, it makes no difference whether the pollution is determined to be substantial pollution as specified in the Environmental Liability Directive or groundwater pollution that exceeds the national pollution threshold.

2.2.2

Substantial Pollution of a Water Body

Pursuant to the Environmental Protection Act, authorities may order the operator to undertake measures to remedy pollution and damage to protected species and natural habitats (Section 84a). The Environmental Protection Act contains provisions on assessing the significance of pollution of a water body, by reference to water resources management plans and the Environmental Liability Decree (Section 84b and Section 50(2)). When assessing the significance of environmental pollution, account must be taken of what is set forth in a water resources management plan or marine environment management plan, in accordance with the provisions of the Act on Water Resources Management (1299/2004, hereinafter the *Water Resources Management Act*) on aspects related to the state and use of waters and the marine environment in the area of impact of activities. Because the Environmental Liability Directive specifies water damage as any damage with a significant adverse effect on the ecological, chemical and/or quantitative status and/or ecological potential of the waters concerned, as defined in the Water Framework Directive, assessment of such significance can be based on the ecological status classification system referred to in the Water Framework Directive. A lower classification of the waters concerned typically means substantial pollution, which must be remedied. However, depending on the case, deterioration

of a value within a class may also indicate substantial pollution. Assessment is always case-specific and assessment of the significance of pollution always covers issues such as the extent, duration and scope of the effect, as described later in Section 2.2.5.

2.2.3 Substantial Pollution of Groundwater

National legislation does not separately specify substantial pollution of groundwater. The groundwater pollution prohibition specified in Section 8 of the Environmental Protection Act bans activities that may pose a threat of pollution, without the banned action having to lead to actual pollution. This is why the pollution prohibition is deemed to cover deterioration of groundwater quality with broader scope than required by the Environmental Liability Directive. However, the pollution prohibition is also deemed to include action separately prescribed by decree and any discharge into groundwater of substances hazardous to the environment and health as prohibited by decree (Environmental Protection Act, Section 8.2).

Limit values for maximum permissible emissions and prohibitions on emissions of substances dangerous to the aquatic environment can be found, for example, in the Government Decree on Water Resources Management (1040/2006, hereinafter the *Water Resources Management Decree*) and the Government Decree on Substances Dangerous and Harmful to the Aquatic Environment (1022/2006, hereinafter the *Dangerous Substances Decree*). Substance lists and environmental quality standards are based on Directive 2000/60/EC of the European Parliament and of the Council, establishing a framework for Community action in the field of water policy (hereinafter the *Water Framework Directive*) and Directive 2006/118/EC on the protection of groundwater against pollution and deterioration (hereinafter the *Groundwater Directive*). On 12 November 2010, the Ministry of the Environment issued guidelines on some issues related to the implementation of water resources management legislation and groundwater protection (YM3/401/2010; in Finnish only); these also discuss the relevance and use of environmental quality standards and the determination of groundwater chemical status.

The Water Resources Management Decree (Appendix 7 A) lists groundwater pollutants that, under the Water Framework Directive, may have a negative impact on groundwater chemical status. In cases where the groundwater chemical status deteriorates, consideration must be taken of the quality norms of the Water Resources Management Decree. However, introduction of a substance listed in the decree may be enough to trigger the groundwater pollution threshold, without exceeding the maximum permissible emission value.

The Dangerous Substances Decree prohibits the direct or indirect discharge of substances dangerous to the aquatic environment as referred to in its Annex 1 E, or substances that are part of a substance group mentioned in the Annex into groundwater (Section 4 a). However, the prohibition does not apply to a discharge that contains a minimal amount of a substance dangerous to the aquatic environment such that its discharge could not pose an immediate or future danger of groundwater pollution. At the supervisory authority's request, the operator must be able to prove that the discharge could not cause groundwater pollution or pose a danger thereof. Thus, concentrations of the dangerous substances listed in the Annex of the groundwater decree are relevant when assessing the significance of groundwater pollution.

Under the groundwater pollution prohibition of the Environmental Protection Act (Section 8), groundwater quality must be safeguarded, particularly in areas important to household water supply in communities or sparsely populated areas. Groundwater areas have been divided into three classes based on the need for protection and suitability for water abstraction. In practice, additional research is required to establish

the suitability for use of groundwater areas of the third class, i.e. areas other than areas important to water supply or otherwise suitable for use as such. The classification of a groundwater area can be used when evaluating the significance of pollution, but such an assessment must consider the basis of the classification. The pollution prohibition also covers areas other than classified groundwater areas; assessment of the significance of the damage must also consider effects such as those on soil or surface water ecosystems, as described later in Section 2.2.5.

2.2.4 Substantially Harmful Change in Water Bodies or Groundwater

The Water Act contains provisions on liability for environmental damage for activities that fall under its scope (Chapter 14, Section 6). It covers all such damage to water not specified as pollution damage in the Environmental Protection Act. The Water Act applies to situations where, through failure to observe provisions and regulations or through negligence of obligations related to damming or water abstraction projects, damming or water abstraction activity causes a substantially harmful change in water bodies or groundwater, or the imminence thereof, or damage to protected species and natural habitats as specified in the Nature Conservation Act. The Act contains provisions on issuing an order to prevent an imminent substantially harmful change in water bodies, groundwater or the natural environment, to minimise the effects thereof, or to remedy the damage caused.

The Water Act contains provisions on assessing the significance of the harmful change, by providing similar reference to water resources management plans to that provided by the Environmental Protection Act (Water Act, Chapter 14, Section 6(3)). Assessing the significance of the damage is thus connected to aspects related to the state and use of waters in the area of impact of activities, as specified in the water resources management plan. The Water Act contains similar reference to water resources management plans in relation to the balancing of interests during the permit consideration process (Water Act, Chapter 3, Section 6). Thus, the classification system of water status can be used in assessing the significance of the harmful effects, in a similar manner to assessing the significance of pollution in accordance with the Environmental Protection Act.

2.2.5 Assessment of the Significance of the Damage Caused to Waters

Section 3 of the Environmental Liability Decree contains general provisions on assessing the significance of damage caused to waters. In addition to what is provided by the Act, the following must be considered when assessing the degree of pollution and other harmful change in the water body and the degree of harmful change in groundwater:

1) *concentration of the dangerous or harmful substance* in the water body referred to in the Dangerous Substances Decree (Section 3);
2) considerable decrease in the factor that depicts the *ecological status of surface water*, referred to in the Water Resources Management Decree (Section 9);

3) *concentration of the polluting substance* in the ground water, mentioned in the Water Resources Management Decree (Appendix 7, point A), *concentration of the substance harmful* to groundwater, referred to in the Government Decree on Substances Dangerous and Harmful to the Aquatic Environment (Section 3), *salinification* of groundwater or considerable reduction in the groundwater *surface level*, and their effects on the ground- or surface water ecosystems or the current or future use of groundwater;

4) effects on the *natural resource services* referred to in the Environmental Liability Act (Section 4, paragraph 2).

The water resources management plans referred to in the Water Resources Management Act contain the ecological, chemical and quantitative status of waters in each water resources management area, as assessed using the criteria on the status of waters. These plans divide significant water bodies and groundwaters into five classes based on their ecological, chemical and quantitative status. The aim is to achieve good status of water quality by 2015. When assessing significance, special consideration may be given to the effects of environmental damage in achieving this goal.

1) Concentration of a dangerous or harmful substance in the water body

An assessment must take into account the concentration of a dangerous or harmful substance in a water body, referred to in the Dangerous Substances Decree (Section 3, paragraphs 1 and 2). The Dangerous Substances Decree determines environmental quality standards for certain dangerous and harmful substances, indicating the highest allowed concentrations in surface water. Depending on the case in question, exceeding the environmental quality standard may be deemed significant damage as referred to in the Water Framework Directive. However, an additional requirement is that such damage has been assessed as significant based on the additional criteria suggested in subsection 2 of the section (Environmental Liability Decree, Section 3, paragraph 1). Point 5 below discusses these additional criteria.

2) Considerable decrease in the factor depicting the ecological status of surface water

An assessment must take account of any considerable decrease in the factor depicting the ecological status of surface water, as referred to in the Water Resources Management Decree (Section 9). Factors used in the classification of ecological status include biological, hydrological–morphological and physiochemical factors. Water resources management plans classify the main Finnish rivers, lakes and coastal waters according to their ecological status as high, good, moderate, poor or bad. For these rivers, lakes and coastal waters, any deterioration in the classification of the ecological status of a surface water body can generally be interpreted as significant damage in that water body. Account is taken of the magnitude of the change, such as a decline in the classification of ecological status from borderline satisfactory prior to the damage, to passable status just below the threshold. In such a case, other possible changes caused by the damage would be the decisive factor in assessing the significance of the damage (Environmental Liability Decree, Section 3, paragraph 2).

3) Effects on groundwater

An assessment of damage to groundwater must take account of the concentration of the polluting substance in the groundwater mentioned in Appendix 7, point A, of the Water Resources Management Decree, the concentration of the substance harmful to groundwater referred to in the Government Decree on Substances Dangerous and Harmful to the Aquatic Environment (Section 3), salinification of groundwater, or any considerable reduction in the groundwater surface level, and the effects on the ground- or surface water ecosystems or on the current or future use of groundwater (Environmental Liability Act, Section 4, paragraph 2, and Environmental Liability Decree, Section 3, paragraph 3).

4) Effects on natural resource services

An assessment must also take account of effects on natural resources services. The term 'natural resource services' is discussed in more detail in Section 5.2.3.

5) Extent, duration and scope of the effect

An assessment must take account of the extent, duration and scope of any change in or effect on a water body or groundwater. Account is taken of additional criteria such that, for example, short-term exceedance of the environmental quality standard of a dangerous or harmful substance in a small part of the water body is not considered significant pollution. A short-term reduction in the groundwater surface level would not be considered a substantially harmful change in groundwater, even if this constituted a considerable one-off or temporary incident (Environmental Liability Decree, Section 3(2)).

2.2.6

Damage to Water under the Environmental Liability Directive

Pursuant to Article 2(b) of the Environmental Liability Directive, 'water damage' means any damage that significantly adversely affects the ecological, chemical and/or quantitative status and/or ecological potential of the waters concerned. This specification is based on the Water Framework Directive, which aims to have all Community waters achieve good water quality status by 2015.

Ecological status of surface water is an expression of the quality of the structure and functioning of aquatic ecosystems associated with surface waters in five classes. Classification of ecological status is based on biological, hydromorphological and physiochemical factors. The classes are high, good, moderate, poor and bad. *Good chemical status of surface water* refers to chemical status, where concentrations of substances do not exceed the environmental quality standards defined in legislation. *Groundwater quantitative status* is the degree to which direct and indirect withdrawal of water affects the formation of groundwater. *Groundwater chemical status* is affected by environmental quality norms and changes in status based on conductivity. *Surface water ecological potential* is the status of a heavily modified or artificial body of water.

Pursuant to Article 2(5) of the Environmental Liability Directive, 'waters' mean all waters covered by the Water Framework Directive. The Water Framework Directive applies to surface waters, including inland surface waters, transitional waters and coastal waters. In relation to the chemical status of water, the Directive also applies to territorial waters. In addition, the Directive applies to groundwater.

The definition of damage to water in the Environmental Liability Directive also refers to Article 4(7) of the Water Framework Directive, which contains provisions

on new activities that are of overriding public interest. In the case of such activities, the Member States are not in breach of the Water Framework Directive, even if their activities result in failure to achieve the set water status objectives. Deviations from status objectives are possible only under the conditions specified in the Water Framework Directive.

For the most part, the Water Framework Directive has been implemented in Finland by the previously mentioned Water Resources Management Act and Decree, and the Government Decree on Water Resources Management Regions (1303/2004). Moreover, the above-mentioned Dangerous Substances Decree and its provisions on surface water quality standards have been issued pursuant to the Environmental Protection Act. In amendments to the Environmental Protection Act and the Water Act, provisions were included on how water resources management plans are to be taken into account in the permit procedure.

2.3

Damage to Protected Species and Natural Habitats

2.3.1

Definition of Damage to Protected Species and Natural Habitats in Finnish Legislation

Provisions on damage to protected species and natural habitats can be found in Section 5 a (384/2009) of the Nature Conservation Act (1096/1996). The Nature Conservation Act (Section 5 a(1), paragraphs 1–4) specifies those protected species and natural habitats that fall under the scope of the Environmental Liability Directive to prevent or remedy adverse effects, in order to attain and maintain the favourable conservation status of the species and habitats in question.

1) Ecological Values of the Natura 2000 Network

As regards the Natura 2000 network, an adverse effect that is deemed to cause damage to protected species and natural habitats may affect the ecological values of the areas selected for inclusion in the Natura 2000 network (Section 5 a(1), paragraph 1). The Natura 2000 network consists of Sites of Community Importance (SCIs), for which the Member State must designate Special Areas of Conservation (SACs), as specified in the Habitats Directive (92/43/EEC), as well as Special Protection Areas (SPAs) specified in the Birds Directive (2009/147/EC codified version). Pursuant to the Habitats Directive (Article 3(1)), the Natura 2000 network may include sites hosting the natural habitat types listed in Annex I and habitats of animal or plant species listed in Annex II. Pursuant to the Birds Directive (Article 4), Member States must classify the most suitable territories in number and size as special protection areas for the conservation of species mentioned in Annex I and the regularly occurring migratory species referred to in Article 4(2).

The species and natural habitats based on which each site has been selected for the Natura 2000 network are listed in area-specific fact sheets. The fact sheets contain summaries of the specific areas and they are available in Finnish on the environmental administration's website (www.ymparisto.fi > luonnonsuojelu > suojeluohjelmat ja -alueet > Natura 2000 -verkosto). When assessing the baseline condition prior to damage, up-to-date information on these areas, such as results of inventories performed by Metsähallitus, must be used in addition to the information on the fact sheets.

2) Species in the Birds and Habitats Directives

In addition to the damage mentioned above, damage to protected species and natural habitats may (Section 5 a(1), paragraph 2) occur with respect to the species listed in Annex I of the Birds Directive or species referred to in Article 4(2) of the Birds Directive. Such damage may also occur with respect to an individual animal or plant representing the species listed in Annex II of the Habitats Directive. The Habitats and Bird Directives are available at EUR-Lex, the electronic database providing access to European Union law.

The Finnish Environment Institute and the ELY Centres have information on the occurrence of species. Information is available, for example, in the information system Hertta, where the environmental administration stores its environmental information. The Museum of Natural History and Metsähallitus also store information on species in their information systems. In cases of damage, the Environment Institute's experts on species protection must be contacted in order to identify species information.

3) Habitats of Species

Damage to protected species and natural habitats (Section 5 a(1), paragraph 3) may also occur with respect to the sites providing habitats for species referred to in point 2 above that are protected against deterioration and destruction in accordance with Section 47 of the Nature Conservation Act. Subsection 5 was added to Section 47 of the Nature Conservation Act when the Environmental Liability Directive was implemented. Pursuant to this provision, the deterioration and destruction of habitats significant to reaching or maintaining the favourable conservation status of a species referred to in Section 5 a(1), paragraph 2, is prohibited. This prohibition applies once the ELY Centre has set the boundaries of a site according to the provisions of Section 47(3) and (4). If the species in question has been placed under a strict protection order in accordance with Section 47(1), damage to protected species and natural habitats may occur at the site for which boundaries have been set pursuant to Section 47(3), prior to the entry into effect of the liability provisions on 1 July 2009.

4) Species Listed in Annex IV of the Habitats Directive and Breeding Sites and Resting Places of Animal Species

Damage to protected species and natural habitats may occur with respect to the species listed in Annex IV of the Habitats Directive or the breeding sites and resting places of individual animal species referred to in Annex IV(a) of the Habitats Directive (Section 5a(1), paragraph 4).

As mentioned above, the Finnish Environment Institute should be contacted for information on individual species. As regards breeding sites and resting places, the regional ELY Centres have the most comprehensive information on their respective regions.

Adverse effect on favourable conservation status

Under Section 5 a(1) of the Nature Conservation Act, damage to protected species and natural habitats refers to a significant, measurable, direct or indirect adverse effect on achieving or maintaining a favourable conservation status. The definition of damage is directly connected to the favourable conservation status of the protected species or natural habitat. The term 'favourable conservation status ' used in the Environmental Liability Directive originates in the Habitats Directive. The threshold of the adverse effect is similar to the adverse impact on the Natura 2000 network in accordance

with Section 66(1) of the Nature Conservation Act. But while Section 66 refers to the adverse effect of a project and its impact on the Natura site in question, in the case of damage to protected species and natural habitats, the impact of the adverse effect is assessed in relation to the favourable conservation status of the damaged species or natural habitat.

The conservation status of a natural habitat refers to the sum of the influences acting on a natural habitat, and its typical species, that may affect its long-term natural range, structure and functions, as well as the long-term survival of the typical species within, as the case may be, the European territory of the Member States to which the Treaty on European Union applies, or the territory of a Member State or the natural range of that habitat.

The conservation status of a natural habitat is deemed favourable when:
- its natural range and areas it covers are stable or increasing; and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- the conservation status of its typical species is favourable as defined below.

The conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within, as the case may be, the European territory of the Member States to which the Treaty on European Union applies, or the territory of a Member State or the natural range of that species.

The conservation status of a species is deemed favourable when:
- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Favourable conservation status is assessed area by area. Depending on the case, such an assessment may take place at the European Union level, the Member State level or with respect to the natural range of a species or natural habitat.

Scope of Application

An adverse effect, for which an exception has been granted as specified in the Habitats or Birds Directive, or under national legislation, will not be regarded as damage to protected species and natural habitats. This may constitute a derogation granted in accordance with Section 48(2), Section 49(3) or Section 66 of the Nature Conservation Act.

Moreover, an adverse effect will not be regarded as damage to protected species and natural habitats, if the management of the area is in accordance with the nature conservation objectives (Decree on the Remediation of Certain Environmental Damages Section 2(2)). This may include management activities based on the management and utilisation plan of the area, or another detailed plan. However, in connection with such management activity, an unforeseen change caused in an object other than the object being managed may need to be assessed as damage to protected species or natural habitats. For example, such an unforeseen consequence may occur during

prescribed burning, performed as part of forest management, where fire spreads to other areas and thus causes damage to protected species and natural habitats.

2.3.2

Assessment of the Significance of Damage to Protected Species and Natural Habitats

Liability to prevent and remedy environmental damage referred to in the Environmental Liability Directive applies only to damage assessed as significant. Pursuant to Section 5a(3) of the Nature Conservation Act, the significance of the adverse effect must be assessed in relation to the conservation status of the natural habitat or species in question at the time of the damage, and to the services they provide and their natural ability to recover. The service provided by a species or natural habitat refers to the useful effect of a natural resource on another natural resource or on humans.

Section 2 of the Environmental Liability Decree lists criteria for assessing the significance of damage. The Decree thus implements Annex I of the Environmental Liability Directive.

Criteria for assessing the significance of damage to protected species and natural habitats (Environmental Liability Decree):

1. The number of individuals of a species, their frequency or locality.
2. The significance of the damaged individuals or damaged area to the level of the conservation status of the species or the natural habitat, taking into consideration the viability of the species or the inherent range of the natural habitat and the customary natural variance.
3. The dispersal capacity of the species and the regenerative capacity of the natural habitat.
4. The capacity of the species or natural habitat to recover naturally, at a minimum, to the condition that prevailed when the damage occurred.
5. The effects on human health.

1) The number of individuals of a species, their frequency or locality

In cases of damage to individuals of a species, the assessment must focus on the number of individuals or percentage of the species as a whole that has been destroyed or cannot reproduce. To assess whether the change causes substantial harm, the baseline condition, or the condition before the damage, should be known. In practice, this requires an estimate of how many individuals of the species lived in the damaged area in question before the damage. For some organisms, frequency may be the only available parameter for measuring the population. The change will become more substantially harmful if the damaged species is threatened or there are few individuals of the species.

Natural fluctuations or high mobility of the species may make assessing the significance of damage to an individual more difficult. This applies to species such as large mammals and birds. The locality of migrating species, such as birds, may change as often as yearly, especially as regards the edges of their natural range. On the other hand, consideration must be taken of the fact that individuals within a species may live in different areas during different stages of their life cycle. The dragonfly is an example of such a species. While it mainly develops in aquatic habitats, mature individuals actively fly around close to water bodies. For some invertebrates, the population fluctuates heavily from one year to another, whereas the populations of some long-lived species, such as mammals, gastropods and bivalves, have more stable populations.

2) The significance of the damaged individuals or damaged area to the level of conservation status of the species or the natural habitat, taking into consideration the viability of the species or the inherent range of the natural habitat and the customary natural variance

The effects of the damage on the level of the conservation status of the species or the natural habitat will be more significant depending on how threatened the species or habitat is. In the Natura 2000 network, the area in question and the natural habitat or habitat of a species that served as its selection criteria, must, as a rule, be considered significant to its favourable conservation status. The significance of the damage is higher if, pursuant to the reviews required by the Habitats Directive, the damaged species or natural habitat is assessed as being impaired.

Outside the Natura 2000 network, the overall distributions of large and well-known species are known. Moreover, distributions of locally rare species are relatively well known in Finland. As regards habitats of species outside the Natura 2000 network that fall within the scope of the directive, assessment of their significance is conducted when the boundaries of the site hosting the species are set according to Section 47 of the Nature Conservation Act.

A species is considered viable when the population is large and stable or increasing. The impact on the conservation status is typically greater if the damage occurs at the edge of the range. The dispersal capacity of the species is particularly affected if an individual edge population is entirely destroyed, thus affecting the range of the species. One example of such a species is *Boros schneideri*, an insect living under the bark of newly dead large pines. Another example is *Lucaena helle*, a butterfly found in wet grasslands or marshlands along creeks, rivers and lakes. The destruction of the few known localities of such a species could have a significant impact on its range and favourable conservation status.

Assessment of the significance of damage to an individual of a species can take account of natural fluctuations regarded as normal for the species in question. Natural fluctuations must be assessed on a case-by-case basis for each species. Long-term differences occur in the distribution and numbers of species due to factors such as climate change. It is also possible to identify trends, i.e. actively spreading and cyclical fluctuations. There is variation in natural fluctuations between groups of organisms, and even between species within the same group. It is more likely for a rare species to die out locally in a boreal region due to a natural disturbance, such as a forest fire or flood. An example of natural fluctuation is *Xestia spp*., a moth with an alternate-year population. If the negative change remains smaller than the natural fluctuation that is regarded as normal for the species, damage will typically not be classified as significant.

In the Natura 2000 network, assessment of the significance of damage to natural habitats can evaluate whether the damage occurs in an area large enough to constitute a significant reduction in the area of the natural habitat in question, with an impact on its conservation status. Typically, the impact on the conservation status will be greater if the damage occurs at the edge of the range of the natural habitat. The damage is also deemed more significant if it causes permanent changes in the structure and functioning of the natural habitat, or changes which are difficult to reverse.

Natural variations in natural habitats must also be assessed on a case-by-case basis. For example, annual vegetation of drift lines or changes in flooded forests and seasonal wetlands may be regular, depending on prevailing weather conditions and rainfalls. However, fully forested habitat types can be considered as stable, as regards their general characteristics. As a general rule, if the negative change remains smaller than the natural variation regarded as normal for the habitat, damage will not typically be classified as significant. In such a case, the change must not be permanent.

3) The dispersal capacity of the species and the regenerative capacity of the natural habitat

The dispersal ability of each species and the regenerative capacity of the natural habitat vary depending on the species and habitat in question. Matters pertaining to the dispersal and regenerative capacities are discussed above in point 2 and below in point 4.

4) The capacity of the species or natural habitat to recover naturally, at a minimum, to the condition that prevailed when the damage occurred

The capacity for natural recovery of the species or natural habitat in question may be considered a mitigating factor when assessing the significance of the damage. If natural recovery is possible within a short time, to a condition equivalent to the baseline condition, the damage should not typically be classified as significant.

The period of natural recovery varies on a case-by-case basis. As a general rule, a species can recover more quickly if the distance is short to the nearest locality in good condition where it can reproduce or to the nearest population with good status and reproductive capacity.

The closer to its natural state the damaged habitat is, the longer it will probably need to recover naturally to a condition equivalent or superior to its baseline condition. On the other hand, restoration and active management and remediation may speed up processes and promote the recovery of species. Environments modified by man usually recover more quickly and restoration activities can often be taken to promote this. Recovery of species in seas and streams may be quick, in particular if the activity causing the damage is short lived. Natural recovery in lakes may be less certain and tends to take longer.

5) The effects on human health

In practice, damage to species or habitats rarely affects human health. Damage to a water body may hinder the use of ecosystem services, such as use of the water body as a raw water source or for purposes such as general recreation or fishing.

2.3.3

Definition of Damage to Protected Species and Natural Habitats in the Environmental Liability Directive

The Environmental Liability Directive (Article 2(1a)) defines the meaning of damage to protected species and natural habitats (national references use the term *'luontovahinko'*, which can be directly translated as *'damage to nature'*). In the context of the Finnish legislation, this is the same as damage to protected species and natural habitats, i.e. any damage that has significant adverse effects on achieving or maintaining the favourable conservation status of such habitats or species.

Article 2(3) of the Directive adds detail to the definition of protected species and natural habitats by referring to the species and habitats mentioned in the annexes of the Habitats Directive and Birds Directive. Moreover, where a Member State so determines, the Directive allows for the definition of protected species and natural habitats to mean any habitat or species, not listed in those annexes, which the Member State so designates for equivalent purposes to those laid down in these two directives. Annex I of the Environmental Liability Directive lists the criteria for assessing the significance of any damage with adverse effects on achieving or maintaining the favourable conservation status of habitats or species.

According to the Environmental Liability Directive, damage to protected species and natural habitats does not include some previously identified adverse effects.

According to the Directive, the following are not considered to be damage to protected species and natural habitats — the result of an action by an operator where the action was expressly authorised by the relevant authorities in accordance with provisions implementing Article 6(3) and (4) or Article 16 of the Habitats Directive or Article 9 of the Birds Directive or, in the case of habitats and species not covered by Community law, in accordance with equivalent provisions of national law on nature conservation.

2.4

Damage to Soil

2.4.1

Damage to Soil under the Finnish Environmental Liability Legislation

The Environmental Liability Act and Decree do not include provisions on the significance of damage or its adverse effects with respect to land. Assessment of the significance of damage to soil takes into account the criteria specified in the Environmental Protection Act and the Government Decree on the Assessment of Soil Contamination and Remediation Needs (214/2007). Pursuant to the Decree, an assessment must be based on a risk assessment, and not solely based on background concentrations, for example. Including organisms and micro-organisms in the specification of contamination (Environmental Protection Act, Section 7) does not significantly change the scope of application.

The requirements of the Environmental Protection Act apply to any actions causing soil contamination. There is strict liability for restoration, i.e. it applies even when the contamination has not been caused deliberately or negligently. In addition, such liability is not based on a violation of provisions or regulations laid down in or under an Act, or permit conditions.

This means that the environmental liability legislation does not apply to soil contamination. Instead, the general provisions of the Environmental Protection Act on soil contamination and groundwater pollution apply. Soil contamination is often linked to a risk of groundwater pollution. In this case, assessment of the significance of the damage must also take account of the damage or risk posed to groundwater.

As regards remediation, the objectives must be based on the results of the risk assessment as specified in the Government Decree on the Assessment of Soil Contamination and Remediation Needs. In such a case, the final remediation objective may differ from the baseline condition, i.e. the situation prior to the damage (for more details, see Section 5).

2.4.2

Assessment of the Significance of the Damage Caused to Soil

The assessment of soil contamination and need for remediation is done in line with the Government Decree 214/2007. According to the Decree, the assessment of soil contamination and need for remediation is based on the prohibition on soil contamination under the Environmental Protection Act and is a case-specific assessment of the hazard or harm to health or the environment represented by the harmful substances in the soil. The following must be taken into account in the assessment (Government Decree on the Assessment of Soil Contamination and Remediation Needs, Section 2):

- the concentration, overall amounts, properties, location and background concentration of the hazardous substances in the soil;
- the soil and groundwater conditions of an area suspected to be contaminated and factors that have an impact on the spread of harmful substances inside and outside the area;
- the current and planned purpose of use of the area suspected to be contaminated, and its environment or groundwater;
- the possibility of exposure to harmful substances in the short or long term;
- the severity and likelihood of hazard to health and the environment from exposure and the possible combined effects of harmful substances;
- elements of uncertainty in the research data and other source information and assessment methods used.

The guideline values in the appendix of the Decree must be used as a tool in the assessment. Soil is regarded as contaminated if the guideline values are exceeded, unless the assessment procedure deems the risks acceptable despite higher concentration levels (Section 4). The upper guideline value applies to areas used as an industrial, storage or transport area or as another corresponding area, and the lower guideline value applies to other areas, such as inhabited and recreational areas.

The general assessment principles of the Government Decree on the Assessment of Soil Contamination and Remediation Needs are complemented in more detailed guidelines issued by the Ministry of the Environment (Ympäristöhallinnon ohjeita [Environmental Administration Guidelines] 2/2007; available in Finnish only). These guidelines provide more detailed instructions on general assessment principles, interpretation of the soil contamination prohibition of the Environmental Protection Act and the use of threshold and guideline values. The specification principles of the threshold and guideline values are described in the publication 'Suomen ympäristö' 23/2007[3].

2.4.3 Definition of Land Damage in the Environmental Liability Directive

In the Environmental Liability Directive (2004/35/CE), 'land damage' means any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction, in, on or under land, of substances, preparations, organisms or micro-organisms (Article 2(1)(c)).

Pursuant to this definition in the Directive, soil may be contaminated as a result of introducing organisms or micro-organisms in, on or under land. Section 7 of the Environmental Protection Act on the soil contamination prohibition did not previously mention organisms or micro-organisms. In order to implement the Environmental Liability Directive, organisms or micro-organisms were added to the section to prohibit dumping or discharging thereof on the ground or in the soil.

3 http://www.ymparisto.fi/default.asp?node=23665&lan=fi

2.5

Damage Caused by Genetically Modified Organisms (GMOs)

2.5.1

Damage Caused by GMOs under the Finnish Environmental Liability Legislation

The Gene Technology Act (377/1995) contains provisions on the use and deliberate release into the environment of genetically modified organisms (GMOs). Pursuant to the Act, the supervisory authority or the Board for Gene Technology (Gene Technology Act, Section 24a) must undertake measures to prevent the placing on the market of a genetically modified product for which no authorisation has been granted. At the same time, remedial action to prevent damage must be initiated. The operator must take measures necessary to protect human or animal health or the environment, if the release of a GMO is altered or if it changes unintentionally in a way that may have consequences with regard to risks to human or animal health or the environment, or if new information becomes available on these risks (Section 19a). The operator must notify the Board for Gene Technology without delay of any accident or hazardous situation which has or could have resulted in the release of a genetically modified organism from the contained use and which has or could have constituted a risk to human or animal health or the environment (Section 16c).

During the implementation of the Environmental Liability Directive, an order was added to the Gene Technology Act for the prevention, limitation to a minimum and remediation of significant pollution of a water body or significant damage to protected species and natural habitats (Section 23). Chapter 7 of the Act contains provisions on prohibitions, restrictions and orders related to the obligation to prevent and take remedial action. As in the Environmental Protection and Water Act, the obligation to take remedial actions under the Gene Technology Act is connected to violations of the law. Section 23 of the Act refers to the remedial measures under the Act on the Remediation of Certain Environmental Damages.

Section 7 of the Environmental Protection Act has been complemented with a provision that prohibits the dumping or discharge of organisms and micro-organisms on the ground or in the soil, resulting in a deterioration of soil quality or the risk thereof. On the national level, organisms and micro-organisms were already considered to be included in the category 'other substances', but the section was nevertheless amended to specify them.

2.5.2

Assessment of the Significance of the Damage Caused by GMOs

Environmental damage caused by genetically modified organisms (GMOs) always constitutes damage to water bodies, protected species and natural habitats or soil, and the assessment thereof has been discussed in previous sections of this document. Environmental damage caused by GMOs may be caused by the GMO itself (e.g. effects of toxin-producing cultivated plants on protected insects) or the effect may be indirect (e.g. eradication of an insect pest due to the toxin, causing the eradication of a protected species feeding on the pest). The damage may be immediate (e.g. death of protected insects immediately during the cultivation of the insect-resistant plants) or delayed (invasive behaviour of a genetically modified plant or hybrid thereof after several generations, causing damage to a protected ecosystem).

The economic damage caused by GMOs may concern individuals, populations, species or ecosystems. In accordance with the Commission Decision (2002/623/EC), potential adverse (environmental) effects of GMOs may include disease to animals and plants including toxic, and where appropriate, allergenic effects; effects on the dynamics of populations of species in the receiving environment and the genetic diversity of each of these populations; altered susceptibility to pathogens facilitating the dissemination of infectious diseases and/or creating new reservoirs or vectors; effects on biogeochemistry (biogeochemical cycles), particularly carbon and nitrogen recycling through changes in soil decomposition of organic material.

Moreover, the Commission Decision specifies some illustrative and qualitative examples of the potential adverse effects stated above. Effects might include significant changes in the numbers of one or more species of other organisms, including endangered and beneficial species, in the short or long term. Such changes may include a reduction in or complete eradication of a species leading to a negative effect on the functioning of the ecosystem and/or other connected ecosystems.

In some cases, the environmental damage caused by GMOs may involve a protected species, where the number of individuals may be significantly reduced or all individuals may be eradicated. Changes caused by the damage may also have an effect on the dynamics of populations of species in the receiving environment and the genetic diversity of each of these populations, endangering their fitness within the ecosystem. Changes in fitness are often not identified immediately. Eradication of an entire species or population thereof, or changes in their genetic diversity, is often irreversible; even if the ecosystem is able to recover, recovery is likely to be slow. The criteria presented in Section 2.3.2 apply to assessment of the significance of damage caused by GMOs.

2.5.3
Definition of Damage Caused by GMOs in the Environmental Liability Directive

Annex III of the Environmental Liability Directive mentions both European Community directives that apply to the use and deliberate release into the environment of GMOs: European Parliament and Council Directive 2009/41/EC (previously 90/219/EEC) on the contained use of genetically modified micro-organisms and European Parliament and Council Directive 2001/18/EC (previously 90/220/EEC) on the deliberate release into the environment, transport and placing on the market of genetically modified organisms. Pursuant to Article 3(1a) of the Environmental Liability Directive, strict liability applies to environmental damage caused by any of the activities referred to in Annex III, including transportation. Environmental damage caused by GMOs may damage protected species or natural habitats, water bodies or land, i.e. damage caused by GMOs is not specified as a separate type of damage in the Directive. However, since damage caused by GMOs is treated differently in national legislation and is handled under different administrative procedures, it is discussed as a separate type of damage in this document.

3 Scope of Application

There are several restrictions on the scope of application of the Environmental Liability Act. These concern the time of damage and the type of action causing it. The Act only applies to certain types of occupational activity. The operator may be completely released from financial liability, or the costs may be brought to a more reasonable level.

3.1

Time-Limited Restrictions on the Scope of the Environmental Liability Act

Pursuant to its entry into force and transitional provisions, the Environmental Liability Act will not apply to remediation of damage caused by activities that were concluded before the Act became effective, i.e. prior to 1 July 2009. Additionally, the Act will not apply if the damage becomes apparent after the Act took effect and the damage was caused by activities that were already concluded before the Act took effect.

Pursuant to Section 17, the Environmental Liability Directive will not apply to damage caused by an event that occurred before its entry into force. Under the Directive, the absolute limit for the scope of application is 30 years after the emission, event or incident occurred that resulted in the damage. Finnish legislators have not considered it necessary to specify a time limit for the scope of application of the Environmental Liability Act. Thus, at least in principle, it is possible to apply the Environmental Liability Act to damage occurring after the entry into force of the Act, even if the consequences emerge over a very long period of time.

3.2

Scope of Occupational Activities

3.2.1

Environmental Damage Caused by Certain Occupational Activities

Under the *Environmental Protection Act*, the obligation to take remedial measures is not connected to specified regulated activities. Instead, it covers all activities that fall within the scope of the Act and that pose a threat of environmental pollution. Likewise, the obligation to undertake remediation specified in the *Gene Technology Act* applies to the action specified in the Act, i.e. the use and deliberate release into the environment of genetically modified organisms. The obligation to take remedial measures specified in the *Act on Transport of Dangerous Goods* also applies to all

damage caused by transport. However, the *Water Act* restricts liability for harmful changes in water bodies or groundwater to activities related to damming or water abstraction only.

The application of the Environmental Liability Directive has generally been linked to occupational activities which pose a risk to human health or the environment. Article 3(1a) of the Directive refers to Annex III, which contains a lists of occupational activities in whose case the resulting damage is subject to strict liability. This means that the provisions on liability do not require that the operator has caused the damage deliberately or negligently. Most of the activities listed in Annex III require a permit in Finland, in accordance with the Environmental Protection Act or the Water Act. However, some activities fall under the scope of the Gene Technology Act or the Act on Transport of Dangerous Goods. References to the Environmental Liability Act have thus been added to these acts.

3.2.2 Damage to Protected Species and Natural Habitats Caused by Other Occupational Activities

Pursuant to Article 3(1)(b) of the Environmental Liability Directive, the Directive also applies to damage to protected species and natural habitats caused by any occupational activities other than those listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities, whenever the operator has been at fault or negligent. Similarly, the Nature Conservation Act links damage to protected species and natural habitats to occupational activity and deliberate or negligent causes of damage (Section 57 a). The Criminal Code considers intent and negligence as prerequisites for criminal liability. Pursuant to the Criminal Code, negligent conduct (negligence) refers to a person violating the obligation to observe due care under the circumstances, where the person was capable of such compliance.

'Occupational activity' means any activity carried out in the course of an economic activity, or by a business or undertaking, irrespective of its private or public, profit or non-profit character. Occupational activities other than those listed in Annex III are relevant only as regards damage to protected species and natural habitats. The scope of application may include operators in sectors such as agriculture and forestry or construction, where damage to protected species and natural habitats is caused while they are engaged in their professional activities. However, activities not deemed occupational activities include activities such as household gardening or fishing, felling of trees for household use referred to in the Forest Act (1093/1996, Section 14), or the extraction of resources for ordinary household needs referred to in the Land Extraction Act (555/1981, Section 4), or other recreational activity, such as hunting or fishing. The Penal Code applies to activities punishable under it, such as hunting without authorisation.

The legislation does not contain specific provisions on the liability of the party responsible for the occupational activity versus the liability of the party providing the hazardous substance. The Product Liability Act (694/1990) does not generally apply to such situations, because it only applies to compensation for injury or damage caused by a product to a person or property intended for private use or consumption, and primarily used for such purposes by the injured party. The competent authority must issue orders pursuant to the Environmental Liability Act on remediation measures to the operator responsible for the occupational activity that caused the damage. In some situations, the operator may have the right to receive compensation from the manufacturer or importer of the product used. Acts such as the Fertiliser Product Act (539/2006) and the Seed Trade Act (728/2000) contain special provisions on operator liability relevant to farmers.

3.3

Other Restrictions on the Scope of Application

The Environmental Liability Directive only applies to environmental damage or to an imminent threat of such damage caused by pollution of a *diffuse character*, where it is possible to establish a *causal link* between the damage and the activities of individual operators. The above-mentioned restriction on the scope is included in the national implementation model, based on administrative enforcement. To be able to issue administrative enforcement orders for remedial measures, the authorities must establish who the operator is that has caused the damage and show that there is a causal link between the damage and the operator's activity subject to administrative enforcement.

The Environmental Liability Act does not apply where the damage has been caused by:

1) an exceptional natural phenomenon;

This chiefly refers to extreme situations (force majeure). However, the Act applies to damage that has been caused by thunder, normal storms or heavy rain.

2) a measure whose sole purpose is to protect against natural disasters;

Such measures include, for example, those measures referred to in Chapter 18, Section 4, of the Water Act to prevent hazards or restrict damage caused by anomalous natural conditions.

3) a measure whose primary purpose is national defence or international security;

Pursuant to the Act, this exception also applies to operations of the Defence Forces, which have the primary purpose of securing national defence under normal conditions.

4) an occurrence to which Chapters 10 and 10 a of the Maritime Act (674/1994) apply.

Chapter 10 of the Maritime Act contains provisions on liability for damage due to oil spills caused by maritime traffic. The ship owner has strict liability for damage due to oil spills caused by maritime traffic. Chapter 10 a of the Maritime Act in turn contains provisions on the ship owner's strict liability for pollution damage caused by the vessel's fuel. The provisions of Chapters 10 and 10 a of the Maritime Act apply to maritime traffic in Finnish inland waters, sea areas and Finland's exclusive economic zone.

5) an activity regulated under the Nuclear Liability Act (484/1972).

The Nuclear Liability Act contains provisions on the liability of an operator of a nuclear power plant for nuclear damage in Finland. Nuclear damage means damage that arises from ionising radiation emitted by any source of radiation inside a nuclear installation, or emitted from nuclear fuel or radioactive products or waste in a nuclear installation, or from nuclear substances coming from, originating in, or sent to such an installation. Thus, environmental damage caused by such nuclear damage falls outside the scope of the Act. However, environmental effects from radioactive substances used outside nuclear power plant operations, such as in mining operations, fall outside the scope of the Nuclear Liability Act. Such effects may thus fall under the scope of the Environmental Liability Act.

3.4

Limitations on Liability

The operator is not liable for the *costs caused by the damage* if the operator can prove that the damage was caused by a third party and was incurred despite appropriate safety measures taken by the operator (Environmental Liability Act, Section 11). Appropriate safety measures include prevention of access by means of fencing and adequate locking mechanisms. Similarly, the operator is not liable for costs if the damage was caused as a result of complying with a stipulation or instruction issued by the authority, unless the stipulation or instruction was issued on account of an emission or other occurrence resulting from the operator's own activity.

The Environmental Liability Act has also made use of the possibility, provided by the Directive, of restricting liability when the damage is related to an authorisation conferred by or given under applicable national laws and regulations. The costs of the operator may be made equitable if the damage is due to an emission or an occurrence that complies with the conditions of the permit granted for the operation or other decision of the authority, or the obligations prescribed in the legislation concerning the operation were complied with in carrying out the operation (Environmental Liability Act, Sections 5 and 12). Moreover, the operator must be able to prove that the damage was not caused deliberately or negligently.

Costs can be *made equitable* under some circumstances, if the damage is due to operations that were in compliance with the relevant obligations prescribed under legislation. In accordance with the Act, the latter restriction mainly applies to accidents occurring during the transport of dangerous goods. The Act on Transport of Dangerous Goods also contains provisions on different authorisation and inspection procedures, but a more general reference to obligations prescribed under legislation is deemed necessary as regards the transport of dangerous goods. This limitation on liability is recorded in the national legislation under a wider scope than is set down in the Environmental Liability Directive. Thus, the application of the provision must consider the authorisation and inspection procedures referred to in the Act on Transport of Dangerous Goods.

4 Administrative Procedures

Administrative procedures on the remediation of significant environmental damage and decision-making on remedial measures are regulated under several acts: the Nature Conservation Act, the Environmental Protection Act, the Water Act and the Gene Technology Act. The decision-making authority for remedial measures and administrative procedures are specified in the applicable act.

4.1

Overview of Administrative Procedures

The provisions of the Environmental Liability Act on remedial measures and the selection of such measures are mainly substantive in nature, and are applied in accordance with the administrative enforcement procedures set out in the acts concerned. Thus, a single authority does not decide on the remedial measures, but the authority and administrative procedures are regulated under the applicable act (Environmental Liability Act, Section 3).

The act applicable to administrative procedures is primarily that which regulates the operation that has caused the damage (Environmental Liability Act, Section 2). For example, remediation of damage caused by dredging is handled according to the administrative procedures specified in the Water Act. The administrative enforcement procedures specified in the Nature Conservation Act only apply to remediation of damage to protected species and natural habitats caused by an occupational activity that falls outside the scope of the Environmental Protection Act, the Water Act or the Gene Technology Act. Moreover, remediation of significant environmental damage caused by the transport of dangerous goods is always handled by the administrative enforcement procedures specified in the Environmental Protection Act (Environmental Protection Act, Chapter 12, and Act on Transport of Dangerous Goods, Section 4).

Sections 4.3 to 4.6 below discuss the administrative enforcement procedures specified in the Water Act, the Nature Conservation Act, the Environmental Protection Act and the Gene Technology Act.

Although the provisions on administrative enforcement procedures are based on the above-mentioned acts, the Environmental Liability Act also contains provisions on remediation of environmental damage that will have an influence on the selection of remedial measures and administrative enforcement. Certain other laws may apply alongside the Environmental Liability Act. These are the acts listed in Section 1.5. of this manual, i.e. the Rescue Act, the Act on Combating Oil Pollution, the Act on Environmental Protection in Maritime Transport and the Environmental Damage Act.

The process chart in Appendix 4 of this document depicts the process phases for remediation of significant environmental damage, from damage identification to the conclusion of remedial measures. The main features of the process are similar, regardless of the applicable legislation.

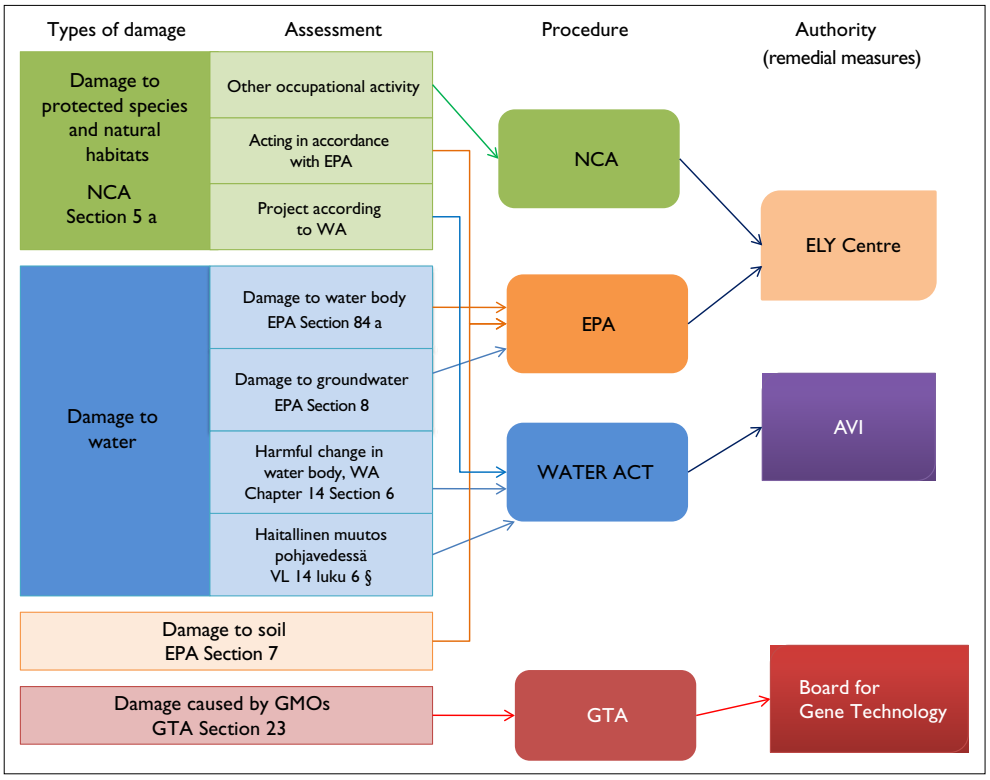


Figure 3. Types of environmental damage and applicable procedures.

4.2

Provisions on Procedures under the Environmental Liability Act

4.2.1

Selection of Remedial Measures

Once the proceedings related to significant environmental damage have been initiated with the authority, the authority must consider what types of measures are to be undertaken with respect to remediation. However, the operator who caused the damage holds principal responsibility for assessing the scope and significance of the damage and identifying remedial measures. This being the case, the selection of remedial measures requires a great deal of communication and negotiation between the authority and the operator. Section 5 of this document discusses matters to be considered in the selection of measures and the related need for assessment.

In selecting the measures to be undertaken, the proposal by the operator who caused the damage must be taken into consideration (Environmental Liability Act, Section 6(2)). The authority should agree with the operator on drafting such a proposal, or prompt the operator to draft the proposal within a specified time frame. If the operator does not prepare a proposal on remedial measures, the authority must otherwise assess the damage in order to select suitable remedial measures. However, the operator is liable for any costs that the authority incurs in doing so (Environmental Liability Act, Section 10).

In addition to the operator's proposal, the authority must take account of any comments made by the parties entitled to initiate proceedings on administrative enforcement procedures under the applicable act. Certain types of remedial measures may also require the permission of another authority, such as a landscape work permit granted by municipal building inspection authorities, which must be taken

into consideration during the selection of remedial measures. Before the measures are decided upon, the authority must give the operator and other affected parties and authorities the opportunity to be heard on the matter.

4.2.2

Authority's Right to Undertake Measures

At the government's expense, the *Centre for Economic Development, Transport and the Environment* can take the necessary measures relating to the prevention or limitation of damage. However, this only applies to measures in the damaged area.

The ELY Centre has the right to undertake measures provided that the matter is urgent; for example, immediately after the rescue authority has taken action (Environmental Liability Act, Section 9(1)(1)). However, this only applies to measures in the damaged area. The right to undertake measures in an urgent matter requires that the procedure cannot be delayed without substantially exacerbating the damage. The state will collect the costs incurred from the operator who caused the damage.

Moreover, the ELY Centre has the right to undertake measures if the operator who caused the damage cannot be determined without difficulty. The state must also collect these costs from the operator who caused the damage, if the operator is later identified.

After performing any urgent measures, or having identified the operator who caused the damage, the ELY Centre must initiate *administrative enforcement proceedings*. According to the administrative enforcement referred to in the Nature Conservation Act and the Environmental Protection Act, the ELY Centre is also the decision-making authority with respect to remedial measures and can commence the administrative enforcement proceedings independently. When the action that caused the damage falls under the scope of the Water Act, the ELY Centre must initiate the proceedings at the Regional State Administrative Agency. If the ELY Centre considers the damage to be clearly insignificant, after carrying out the urgent measures, and it does not initiate administrative enforcement proceedings, it may be sufficient to record the assessment of the damage in a separate memo. However, to be able to recover costs from the operator that caused the damage, the authority must make a decision on the matter (Environmental Liability Act, Section 14).

In matters falling under the scope of the Gene Technology Act (Section 23), the ELY Centre does not have the right to initiate proceedings, but must inform the Board for Gene Technology by other means about possible damage caused by GMOs.

4.2.3

Deciding on Liability

Matters concerning the allocation of and limitations on liability and with respect to rendering the costs equitable are decided upon by means of a procedure regulated under the same act as the requirement to undertake remedial measures (Environmental Liability Act, Section 13). The operator's liability for costs is implemented through *a provision on administrative enforcement*, obligating the operator to perform the required measures. Such a decision will also include the costs incurred by the authority in assessing the damage and the immediate threat posed by it, and deciding upon remedial measures and supervising them (Environmental Protection Act, Section 10).

The operator that caused the damage is liable for any costs arising from the remedial measures and for costs incurred by the authority in assessing the damage and the immediate threat posed by it, and in deciding upon remedial measures and supervising them (Environmental Protection Act, Section 10(1)). Assessment of the costs incurred by the authority may take into account the costs of clarifications nec-

essary to determine the damage and its immediate threat, clarifications necessary to assess alternative remedial measures, and clarifications necessary to select remedial measures and monitor the implemented remedial measures (Decree on Environmental Liability, Section 7).

If the damage has been caused by more than one activity, responsibility for the costs will be divided among the operators, according to their portion of the full damage. This is equivalent to established case law on the division of responsibility among several operators for the treatment of contaminated soil, referred to in Chapter 12 of the Environmental Protection Act. It may be difficult to assess the share of responsibility of each individual operator who has contributed to the damage. If this share cannot be assessed, responsibility will be divided per capita (Environmental Liability Act, Section 10.2).

Section 3.4 of this document discusses limitations on liability and the possibility of making the costs equitable. If the operator is not responsible for the costs for a reason pursuant to limitations on liability, or the liability of the operator who caused the damage has been made more equitable, the ELY Centre may carry out the remedial measures, or have them performed as work benefiting the environment (Environmental Liability Act, Section 15). The state has no obligation to contribute to these costs, but under certain circumstances, it could be possible to allocate certain funds budgeted to the Ministry of the Environment to carry out remedial measures. In urgent cases referred to in Section 4.2.2 above, the measures are funded by the state before recovery of costs from the operator.

4.2.4

Ending Remediation

In certain situations, the authority processing the matter pertaining to remediation of significant environmental damage can decide to end remediation. Typically, a decision can be made when the operator has already carried out remedial measures, but there is no reason to continue them. A decision on ending remediation can be made when the costs of continuing remediation would be disproportionate to the environmental benefits gained and the remedial measures implemented guarantee the elimination of the risk to human health and natural resources (Environmental Liability Act, Section 8). The decision on ending remediation is made by means of the same procedure related to determination of remedial measures.

4.2.5

Appeal

Appeals against the authority's decision concerning the imposition of remedial measures and liability for costs is prescribed in the act whose administrative enforcement procedures have been followed (Environmental Liability Act, Section 17). An appeal related to matters falling under the scope of the Water Act and the Environmental Protection Act is made to the Administrative Court of Vaasa. In matters falling under the scope of the Nature Conservation Act, such appeals are made in a regional Administrative Court. A decision made by the Board for Gene Technology pursuant to the Gene Technology Act is also open to appeal before the Administrative Court, as referred to in the Administrative Judicial Procedure Act (586/1996).

As regards the enforceability of the decision on remedial measures, the general provisions on the enforceability of decisions apply. Pursuant to Section 31 of the Administrative Judicial Procedure Act, the decision may be enforced before it has become final if there is a provision to this effect in an act or a decree, if the decision is of a nature requiring immediate enforcement, or if its enforcement cannot be delayed

for reasons of public interest. The Environmental Protection Act (Section 101(3)), the Water Act (Chapter 15, Section 8) and the Nature Conservation Act (Section 57(1)) contain separate provisions on the enforcement of decisions regardless of appeal. The authority's decision on a matter pertaining to administrative enforcement may include an order that, regardless of the appeal, the decision must be followed.

4.3

Procedure according to the Water Act

4.3.1

Application of Administrative Enforcement

No special procedure has been established for remediation of damage referred to in the Environmental Liability Directive. The procedure followed is that referred to in Chapter 14, Section 6, of the Water Act.

Chapter 14, Section 6, of the Water Act covers all such damage to water not specified as pollution damage in the Environmental Protection Act. It applies to situations where *damming* or *a water abstraction* activity, through failure to observe provisions and regulations or through negligence of obligations related to a damming or water abstraction project, causes a substantially harmful change in water bodies or groundwater, or the imminence thereof, or damage to protected species and natural habitats as specified in the Nature Conservation Act. *Damming* can be taken as referring to any kind of act that prevents water flow, and *water abstraction* refers to the abstraction of groundwater and surface water.

The provision also applies to direct or indirect environmental damage linked to damage to water referred to in Section 5 a of the Nature Conservation Act. The Nature Conservation Act contains provisions on damage to protected species and natural habitats, but for activities falling under the scope of the Water Act, the remedial measures follow the procedure referred to in the Water Act.

4.3.2

Matters Subject to Administrative Enforcement

Administrative orders to prevent, limit or remedy damage are only possible in cases where the Water Act is violated. In other words, either when *an application for a permit required under the Water Act* has not been submitted for the activity or a permit has not been granted, or when the activity *violates the permit*. In practice, damage referred to in the Environmental Liability Directive cannot be caused by an activity that falls under the scope of the Water Act but that does not require a permit under the Act. The Act does not allow granting a permit for an activity that may cause the damage referred to in the Directive.

However, situations may occur where, through failure to observe provisions and regulations or through negligence of obligations related to a damming or water abstraction project, damming or a water abstraction activity causes a substantially harmful change in water bodies or groundwater, or the imminence thereof, or damage to protected species and natural habitats as specified in the Nature Conservation Act, which could not be foreseen at the time the permit was granted.

An order to remedy damage to protected species and natural habitats caused by an activity related to damming or water abstraction will be given regardless of whether the damage was caused by negligence. If damage to protected species and natural habitats has been caused by a project that falls under the scope of the Water Act but involves activities other than damming or water abstraction, the order can only be issued

in cases where the activity violates the Act and the responsible operator has caused the damage deliberately or through negligence (Water Act, Chapter 14, Section 6(2)).

4.3.3

Initiation of Administrative Enforcement Proceedings

The Regional State Administrative Agency is the competent authority in administrative enforcement proceedings related to the Water Act.

An operator who has caused damage or harm or the imminent threat thereof must immediately notify the state supervisory authority and take appropriate measures to prevent or minimise the damage or harm (Water Act, Chapter 14, Section 7).

Pursuant to the Water Act, the following parties have *the right to initiate proceedings*, when the supervisory authority has not done so (Water Act, Chapter 14, Section 14):

1) parties whose rights or interests may be affected by the matter (affected party);
2) registered associations or foundations whose purpose is to promote protection of the environment or health or nature conservation, or the general amenity of the environment, and whose area of activity is subject to the environmental impact in question;
3) the municipality where the water resources management project takes place and other municipalities subjected to its environmental impact;
4) other supervisory authorities acting in the public interest in the matter, such as the Finnish Transport Agency, Metsähallitus or the National Board of Antiquities.

A matter of this nature is initiated in writing at the appropriate Regional State Administrative Agency through an application for administrative enforcement. If the ELY Centre acting as the supervisory authority does not initiate proceedings at the Regional State Administrative Agency, because the damage is not considered sufficient to warrant such action, it may be sufficient to record the assessment of the damage in a separate memo.

4.3.4

Orders on Preventive and Remedial Measures

Before issuing a prohibition or an order, the Regional State Administrative Agency must give those subject to the prohibition or order the opportunity to be heard. If necessary, other parties concerned, other supervisory authorities and authorities acting in the public interest must also be heard, such as the Finnish Transport Agency, Metsähallitus or the National Board of Antiquities.

The enforcement proceedings follow the procedures for issuing water permits with appropriate changes as applicable. The authorities may carry out activities such as inspections or provide special clarifications.

During administrative enforcement proceedings, the Regional State Administrative Agency must also assess whether the activity or neglect that violates the Water Act causes or threatens to cause a significant adverse effect on the water body or groundwater, or damage to protected species and natural habitats referred to in the Nature Conservation Act (Section 5 a). If this is the case, the Regional State Administrative Agency must order the party causing the harm to take action necessary for preventing or minimising the adverse effects or remedying the harm. Provisions on remedial measures can be found in the Act on the Remediation of Certain Environmental Damages.

An application for administrative enforcement may be rejected when the violation has been removed, for example, by issuing a permit for the activity. However, if

significant adverse change (Water Act, Chapter 14, Section 6) or damage to protected species and natural habitats has already occurred, the Regional State Administrative Agency must issue an order for remedial measures to be taken.

The order given under the administrative enforcement proceedings must be reinforced, unless such a course of action is apparently unnecessary, under notice of a conditional fine or a requirement that the neglected measure be carried out at the expense of the negligent party, or the suspension or prohibition of the operations in question. The supervisory authority may be granted the right to carry out necessary measures. Related proceedings follow the provisions of the Act on Conditional Fines.

The party subject to the prohibition or order must be notified of the decision as provided in the Administrative Procedure Act. The appeal period begins from when this notification is given.

The costs incurred by an affected party during the administrative enforcement proceedings are compensated as provided in the relevant provisions of the Administrative Judicial Procedure Act. In urgent cases, or for another special reason, the Regional State Administrative Agency may order that, regardless of the appeal, the decision issued in the administrative enforcement proceedings must be followed (Water Act, Chapter 15, Section 8). Appeals are lodged before the Administrative Court of Vaasa.

4.4

Procedure according to the Nature Conservation Act

4.4.1

Application of Administrative Enforcement

No specific procedure has been established for the prevention, limitation and remedying of damage to protected species and natural habitats referred to in the Environmental Liability Directive. The handling of a matter follows the administrative enforcement proceedings referred to in Section 57 of the Nature Conservation Act ('Coercive measures'). During the implementation of the Environmental Liability Directive, a new Section 57 a was added to the Nature Conservation Act to complement the administrative enforcement proceedings as required by the Directive.

Under administrative enforcement proceedings, a party violating the provisions or regulations laid down in or under the Nature Conservation Act may be forbidden from continuing the activity, or said party may be ordered to rectify the unlawful situation. Section 57 a of the Nature Conservation Act applies in cases of damage to protected species or natural habitats (defined *in the Nature Conservation Act, Section 5 a*) caused by a natural or legal person engaged in a professional activity or who de facto controls said activity. Moreover, the Act requires that the activity has not been caused in connection with an operation falling under the scope of the Environmental Protection Act, the Water Act or the Gene Technology Act.

The proceedings referred to in the Nature Conservation Act are not followed if the damage incident causes damage to a water body, groundwater or soil. Depending on the type of damage, the proceedings referred to in the Water Act or the Environmental Protection Act apply.

4.4.2

Matters Subject to Administrative Enforcement

Under the Nature Conservation Act, administrative enforcement proceedings may apply to a person who engages in a professional activity or who de facto controls said

activity (Section 57 a). The person may be a natural person, or a private or public legal person. The key issue is whether the damage to protected species or natural habitats is caused by a professional activity. The provisions do not apply to damage caused by a private person, but apply, for example, to agricultural or forestry activities practiced professionally. However, if the damage was caused by an activity other than an occupational activity, such as felling for household use, referred to in the Forest Act (1093/1996, Section 14), or the extraction of resources for ordinary household needs, referred to in the Land Extraction Act (555/1981, Section 4), there is no liability to remedy the damage.

Remediation proceedings are applied when the operator causes damage, or is likely to cause damage, deliberately or through negligence. The Criminal Code considers intent and negligence as prerequisites for criminal liability. Pursuant to the Criminal Code, negligent conduct (negligence) refers to a person's violation of the duty to exercise due care under the circumstances and as required of said person, where the person would have been capable of exercising such care. To be liable for legal remedy, the operator's actions or neglect causing the damage must be contrary to the provisions and regulations laid down in, or pursuant to, the Nature Conservation Act. For example, the activity may be contrary to a prohibition of a protection provision for protected areas, or constitute neglect of an obligation laid down under law. Liability may arise, for example, if an operator fails to fulfil the obligation to conduct an assessment referred to in Section 65 of the Nature Conservation Act. Because the liability may arise from activity contrary to the Act or by neglect thereof, it can be deemed that the obligation of the party engaged in a professional activity to exercise due care and to investigate existing provisions or regulations exceeds the similar duty of private persons, for example.

If the operator causing the damage has been granted a derogation in accordance with the Nature Conservation Act for the activity that caused the damage (e.g. protection of a species, protection of a habitat of a species or pursuant to Section 66 of the Nature Conservation Act, protection of the Natura 2000 network), the operator is not liable for the damage.

4.4.3
Initiation of Administrative Enforcement Proceedings

The *ELY Centre* is the competent authority in administrative enforcement proceedings related to the Nature Conservation Act.

The *operator* who has caused the damage or harm or the imminent threat of it must immediately notify the ELY Centre acting as the supervisory authority and take appropriate measures to prevent or minimise said damage or harm. The supervisory authority may also independently initiate proceedings to remedy the damage.

If the operator does not initiate proceedings to remedy the damage, or the ELY Centre does not do so, the following parties have *the right to institute proceedings* pursuant to the Nature Conservation Act (Section 57(2)):

- anyone suffering inconvenience;
- any registered local or regional association whose purpose is to promote nature conservation or environmental protection; and
- a municipality.

Prior to initiating the administrative enforcement proceedings, the ELY Centre must assess whether the damage constitutes damage to protected species and natural habitats as referred to in Section 5 a of the Nature Conservation Act. The decision on the administrative enforcement must include the details of this assessment, because the right to appeal also applies to assessing the significance of the damage. If the ELY

Centre determines that the damage does not constitute damage to protected species or natural habitats, and thus no grounds exist for administrative enforcement proceedings under Section 57 a, the Centre must, in most cases, issue an *administrative decision*. In cases that clearly do not constitute significant damage and in which the ELY Centre has not initiated administrative enforcement proceedings, it may be sufficient to record the assessment of the damage in a separate memo.

4.4.4

Orders on Preventive and Remedial Measures

After receiving notification of damage to protected species and natural habitats, or the imminent threat of it, the ELY Centre must order the operator to take the measures necessary to prevent or minimise the adverse effects. After such urgent preventive measures, the ELY Centre must order the operator to take the remedial measures referred to the Act on the Remediation of Certain Environmental Damages.

The matter is handled according to the procedure specified in Section 57 of the Nature Conservation Act. Before the order is issued, those subject to the order must be given the opportunity to be heard. Pursuant to the Environmental Liability Act, the operator who caused the damage must be provided with the opportunity to submit a proposal (Environmental Liability Act, Section 6(2)). The ELY Centre must take this proposal and the comments of parties entitled to initiate proceedings under the Act into consideration when issuing the order on remedial measures. The order given under the administrative enforcement proceedings may be reinforced with notice of a conditional fine or a requirement that the neglected measure be carried out at the expense of the negligent party, or suspension of the operations in question (Nature Conservation Act, Section 57 a(2)).

The decision of the ELY Centre must be adhered to regardless of appeal, unless the appeal authority decides otherwise (Nature Conservation Act, Section 57(1)). Appeal is made in the competent Administrative Court. The relevant provisions on compensation for costs incurred by an affected party during administrative enforcement proceedings are given in the Administrative Judicial Procedure Act.

4.5

Procedure according to the Environmental Protection Act

4.5.1

Application of Administrative Enforcement

No specific procedure has been established for remediation of damage referred to in the Environmental Liability Act. The handling of a matter follows the general administrative enforcement proceedings referred to in Section 84 of the Environmental Protection Act.

Chapter 13 of the Environmental Protection Act contains provisions on the supervision of compliance and initiation of administrative enforcement. Under administrative enforcement proceedings a party that violates the Environmental Protection Act, or a decree or regulation based on it, may be ordered to fulfil its duty in some other way. The authority may also order a party to restore the environment to its previous state or to eliminate the harm to the environment caused by the violation.

Pursuant to the Environmental Protection Act, the authority may order the operator to undertake measures to remedy pollution and damage to protected species and natural habitats (Section 84 a). These orders are usually issued under the same

administrative enforcement proceedings as the other orders referred to in Section 84. However, the provision may also be applied independently, if other orders are not necessary. If an operator causes significant environmental damage, this is typically caused by violation of the permit granted for the activity, or the operator has failed to apply for a permit required by law. However, significant damage to a water body or protected species and natural habitats can occur without violation of a law; for example, due to an accident in a production facility, or as a result of some other type of sudden and serious disturbance. An accident may also occur during operations that do not require permits, such as using or processing dangerous or harmful substances. In such situations, the authority must order the operator to undertake remedial measures referred to in the Environmental Liability Act (Section 84 a(2)).

Pursuant to Chapter 13 of the Environmental Protection Act, the authority must also issue an order to remedy damage caused by the transport of dangerous goods in case of damage to a water body or protected species and natural habitats. The ELY Centre issues the order on remedial measures, irrespective of whether the activity is subject to a permit or which authority has granted such a permit. However, in every case the special provisions of Chapter 12 apply to the treatment of contaminated soil and groundwater.

4.5.2

Matters Subject to Administrative Enforcement

The provisions on the remediation of environmental damage may apply to all activities that may pose a danger of pollution, irrespective of whether the activity is subject to a permit under the Environmental Protection Act. Unlike the Nature Conservation Act, the Environmental Protection Act does not restrict the use of administrative enforcement with respect to professional activities. All activities under the scope of the Act can be subject to administrative enforcement.

Moreover, Chapter 12 of the Environmental Protection Act does not restrict the liability to treat contaminated soil and groundwater with respect to specified activities. The party whose activities have caused contamination is generally required to restore the soil or groundwater, and the holder of the contaminated area and the municipality have secondary responsibility.

4.5.3

Initiation of Administrative Enforcement Proceedings

The *ELY Centre* is the competent authority in administrative enforcement proceedings related to the Environmental Protection Act.

The operator must notify the ELY Centre without delay of any substantial damage and the imminent threat thereof (Section 84 c). The supervisory authority may also independently initiate proceedings to remedy such damage.

If legal action is not taken on the initiative of the supervisory authority, action may be initiated in writing by parties who have *the right to initiate proceedings* (Section 92). These include the following:

- whoever may have a right or interest in the matter;
- registered associations or foundations, whose purpose is to promote the protection of the environment or health, or nature conservation or the pleasantness of the living environment, and in whose operating area the environmental impacts in question arise;
- the municipality in which the activity is located, or another municipality in whose area the adverse impacts appear;
- other authorities protecting the public interest in the matter.

Pursuant to the Environmental Protection Act (Section 84), administrative proceedings may commence even though the damage does not constitute significant damage to a water body or protected species and natural habitats as discussed in this document. Since the right to appeal against the administrative enforcement also applies to assessing the significance of the damage, the decision must contain details of the result of this assessment. In cases of less than significant damage, where the ELY Centre has not initiated administrative enforcement proceedings, it may be sufficient to record the assessment of the damage in a separate memo.

4.5.4

Orders on Preventive and Remedial Measures

The ELY Centre may issue orders on remedial measures against damage which has occurred (Section 84 a). The authority may issue orders in order to prevent or minimise significant damage (Section 84), if the operator fails to observe the obligation to prevent pollution (Environmental Protection Act, Section 5(2)).

After the damage has occurred, the operator issues a proposal on remedial measures (Environmental Liability Act, Section 6(2)). The ELY Centre must take this proposal and the comments of parties entitled to initiate proceedings under the Act into consideration when issuing the order on remedial measures. Before the measures are decided upon, the authority must reserve an opportunity for other affected parties and authorities to be heard on the matter.

If an environmental permit has been granted for the activity, significant damage caused by the activity may provide grounds for amending the permit, to prevent the occurrence of similar consequences in the future (Environmental Protection Act, Section 58). In such a case, the ELY Centre must begin proceedings with the Regional State Administrative Authority to amend the permit.

The matter must be processed similarly to the procedure referred to in Chapter 13 of the Environmental Protection Act. Before the order is issued, those subject to the order must be given the opportunity to be heard. An order given under the administrative enforcement proceedings must be reinforced with notice of a conditional fine, or a requirement that the neglected measure be carried out at the expense of the negligent party, or suspension of the operations in question (Environmental Protection Act, Section 88). The supervisory authority or other affected party may be granted the right to perform the required measure.

An application for administrative enforcement under the Environmental Protection Act may end without action being taken by the authorities when the violation has been removed, for example, by a permit being issued for the activity. However, if significant damage to a water body or protected species and natural habitats referred to in Section 84 a of the Environmental Protection Act has occurred, the ELY Centre must issue an order for remedial measures to be taken.

The ELY Centre may order that the decision made concerning administrative enforcement must be complied with regardless of any appeal filed (Environmental Protection Act, Section 101(3)). The same applies to orders to take remedial measures (Environmental Protection Act, Section 84 a). The relevant provisions on compensation for costs incurred by an affected party during the administrative enforcement proceedings are given in the Administrative Judicial Procedure Act. The decision of the administrative enforcement case is subject to appeal to the Vaasa Administrative Court.

4.6

Procedure according to the Gene Technology Act

Section 23 of the Gene Technology Act (377/995) contains provisions on the prevention and remediation of significant environmental damage. It applies to activities that violate the Gene Technology Act and cause or are at risk of causing significant pollution of a water body referred to in Section 84a of the Environmental Protection Act, or significant damage to protected species and natural habitats referred to in Section 5a of the Nature Conservation Act. In such a case, the *Board for Gene Technology* must order the operator causing the damage or risk thereof to take measures necessary to preventing the damage or limiting it to a minimum, or must take remedial measures referred to in the Act on the Remediation of Certain Environmental Damages.

As regards contained use of GMOs, the operator must notify the Board for Gene Technology without delay of any accident or hazardous situation which has or could have resulted in the release of a genetically modified organism from contained use and which has or could have constituted a risk to human or animal health or the environment.

Although liability for remedying environmental activities as regards the activities referred to in the Gene Technology Act is linked to violation of the law, the protection clause under Section 24 requires special attention. Pursuant to this Section, the supervisory authority referred to in the Gene Technology Act or the Board for Gene Technology may suspend the placing on the market of an already approved product if it emerges that the product may constitute a serious hazard to human or animal health or the environment. The authority must inform the public of the suspension. The suspension must proceed as follows: the supervisory authority informs the Board for Gene Technology about the suspension decision. The Board informs the Ministry of Social Affairs and Health, which brings the matter to a plenary session of the Government for consideration. The Government may provisionally restrict the use or sale of a product, or prohibit its use or sale, if, after consent is granted, new information is obtained of significance with regard to the risk assessment, indicating that the product or a genetically modified organism in the product may constitute a serious hazard to human or animal health or the environment. The Board for Gene Technology must immediately inform the European Commission of the suspension decision, while giving its reasons for the decision, as well as providing the European Commission with its re-evaluation of the risk assessment.

As stated above, the primary authority for environmental damage caused by GMOs is the Board for Gene Technology, or the supervisory authority referred to in the Gene Technology Act. In its safety guidelines for field trials, the Board for Gene Technology has emphasised that in the case of accidents and malicious tampering, the operator must directly inform the appropriate rescue authorities, the Board for Gene Technology and the supervisory authority.

The requirement to inform several parties simultaneously is in place to ensure that the authorities referred to in the Gene Technology Act can decide, as soon as possible, on whether the incident warrants urgent remedial measures. This operational procedure is ideal for field trials, but may not lend itself to other types of incident that may cause environmental damage (e.g. accidents during transport). It is essential to ensure that regional authorities (rescue authorities, Regional State Administrative Agencies and ELY Centres) are aware that the Board for Gene Technology must be immediately informed of any suspected environmental damage involving the release of GMOs. To assess the situation, it is important that the regional authorities can provide the gene technology authority with sufficient information on what type of damage has occurred and what kinds of measures have been taken on site.

5 Remedial Measures

Remediation of environmental damage means that by taking measures, damaged natural resources will recover quantitatively and qualitatively to the condition that would have existed had the damage not occurred (baseline condition). The environmental legislation introduces new terms related to the selection of actions and specification of the goal of the remedial measures, such as *baseline condition, natural resource services, and primary, complementary and compensatory remedial measures.*

5.1

Assessment of Remedial Measures

The aim of the environmental liability legislation is to remedy significant environmental damage to the fullest extent possible. The provisions of the Environmental Liability Act focus on the selection of measures for remediation, in particular, of damage to water bodies and protected species and natural habitats. The legislation introduces new terms related to the selection of actions and specification of the goal of the remedial measures, such as baseline condition, natural resource services, and primary, complementary and compensatory remedial measures.

Remediation of environmental damage means that by taking measures, damaged natural resources will recover quantitatively and qualitatively to the condition that would have existed had the damage not occurred (*baseline condition*) (Environmental Liability Act, Section 4(3)).

Given the wide array of remedial measures available, the selection should take account of the qualities of the damaged area in question and those remedial measures best suited for it. The objective of the remedial measures should be realistically attainable and in line with the local environmental management plans. However, the costs of the measures should remain at a reasonable level.

There are three phases in the assessment process of remedial measures (Figure 4). In practice, these three phases overlap, and the activity proceeds depending on case-specific factors. Incidents of environmental damage discussed in this document are highly exceptional and often very complex, and no two incidents are alike.

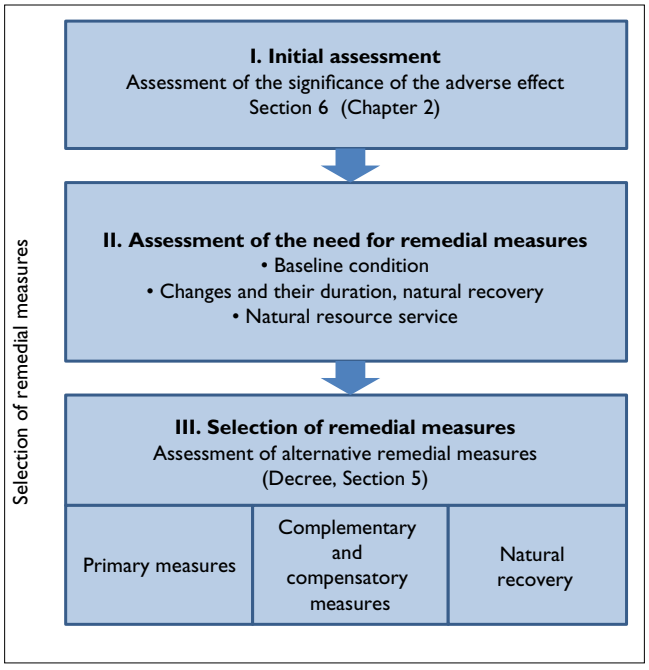


Figure 4. Assessment and selection of remedial measures for significant environmental damage.

PHASE I: Assessment of the significance of damage to natural resources and services

Once the authority receives notification of environmental damage, it assesses the primary response measures necessary for preventing the spread of environmental damage and minimising its adverse effects.

To assess other necessary remedial measures, the authorities first assess whether the damage constitutes significant damage to the environment or a risk thereof, as referred to in the environmental liability legislation, to see whether the process needs to follow the Environmental Liability Act and Decree. The significance of the environmental damage or harmful effect is determined by the location of the damaged site and time of damage. At this stage, the assessment should largely be based on existing and/or easily available information. The aim is to carry out an expert assessment of whether the damage is significant enough to warrant further remedial measures under the process.

Significance is always assessed on a case-by-case basis. The assessment should take into consideration the vulnerability of the environment in the damaged area, the extent and time of the damage, and the irreversibility, persistence and multidimensional aspects of any changes. A strong indication of significant pollution and/or significance of adverse changes include a high score for adverse effects, an extensive affected area, effects on more than one status indicator of a natural resource or natural resource service, the persistence of effects, and the likelihood of full recovery of the affected area.

The authorities also conduct a preliminary evaluation of the information available for assessing the damage and determining the remediation objective. Expert authorities should be contacted at this stage and existing information systems utilised.

The assessment criteria for different types of damage were discussed in more detail in Section 2.

PHASE II: Assessment of the Need for Remedial Measures

If the assessment shows that significant damage has occurred, or a risk thereof exists, the damage and need for remedial measures are assessed more thoroughly. At this stage, the objective is to conduct any necessary additional investigations and establish a more detailed assessment of incidents of damage and their consequences, and what changes have occurred in the environment and where. The authorities will assess the state of the environment prior to the incident, or the state that would have existed had the damage not occurred (baseline condition). Natural recovery also affects the need for and selection of remedial measures.

The objective is to assess whether remedial measures are required, or whether possible response measures and natural recovery will suffice to return the environment to its baseline condition within a reasonable time.

This issue is discussed in more detail in Section 5.2.

PHASE III: Selection of Remedial Measures

If the recovery of the environment to the baseline condition cannot occur through natural recovery within a reasonable time, the competent authority must impose remedial measures. During the selection of remedial measures, different remediation options are considered and compared, and the most suitable and cost-effective measure or combination of measures is selected. Possible primary remediation measures and the benefits and drawbacks of these are assessed first. These typically include measures taken to remedy environmental damage that falls outside the scope of

the Environmental Liability Act. Next, the authorities assesses whether the primary measures need to be complemented in the damaged area or elsewhere (complementary remediation). Irrespective of whether the recovery of the environment to the baseline condition occurs through natural recovery or because of remedial measures, the competent authority must assess whether compensation for interim losses of natural resources is required until the resources recover to their baseline condition (compensatory remediation).

This is discussed in more detail in Section 5.3.

5.2

Assessment of the Need for Remedial Measures

As a rule, the operator who has caused the environmental damage is liable for taking remedial measures to remove the contamination. If, while assessing the significance of environmental damage, the authority deems that the significant environmental damage or risk thereof falls under the scope of the Environmental Liability Act, the authority can begin the process of assessing the need for remedial measures. First, the damage that occurred and its consequences are evaluated more thoroughly as required. When assessing the need for remedial measures, the authority must take factors into account such as the condition before the damage, the possibility of natural recovery and damage to natural resource services. Other essential factors must also be considered, such as other possible damage that may affect the baseline condition of the damaged area.

Factors taken into account in the assessment include:

- baseline condition
- damage incident and its consequences
- extent, duration and effect of changes in the environment
- natural recovery
- natural resource services affected by the damage

The aim is to establish whether active remedial measures are required or whether the natural resources can return to the baseline condition through natural recovery within a reasonable time. In this case, it may be necessary to organise temporary services (see Section, 5.3.4, Compensatory Remediation).

The authority may also decide to end the remediation process when the preventive measures or other actions that have been carried out are sufficient in ensuring the following:

- the risk to human health and natural resources has been eliminated; and
- the costs of continuing remediation would be disproportionate compared to the environmental benefits gained (Environmental Liability Act, Section 8).

The following section discusses the terminology related to assessing the need for remedial measures and assessment of remedial measures.

5.2.1

Specification of and Changes to the Baseline Condition

Baseline condition means the status prior to damage to natural resources and natural resource services. (Environmental Liability Act, Section 4, paragraph 3)

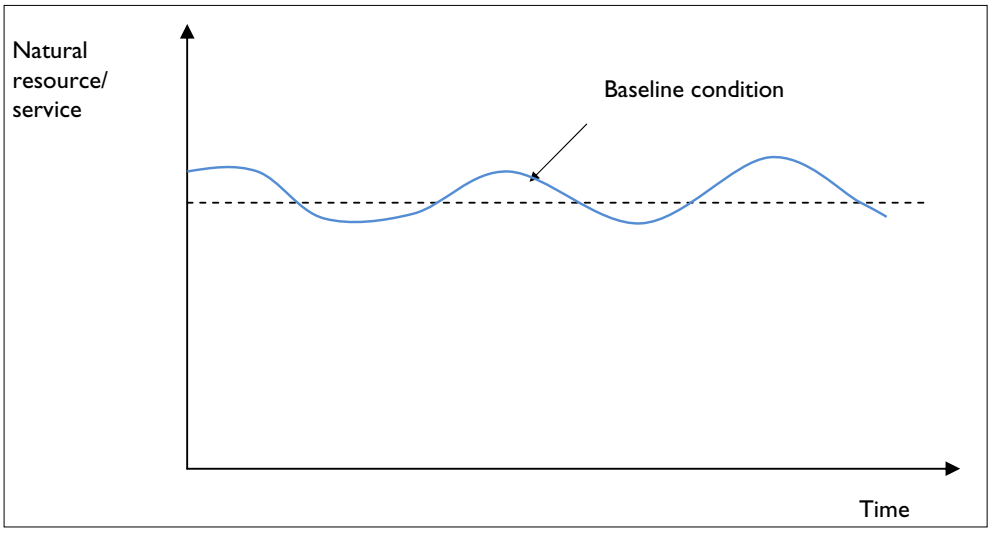


Figure 5. Quantitative changes in natural resources and natural resource services over time.

Remediation of a damaged area, where natural resources and natural resource services have been damaged and are in a qualitatively or quantitatively depleted state, means to return the area to the condition that existed prior to the damage, in other words to the baseline condition. The baseline condition refers to the condition that would have existed had the damage not occurred. The baseline condition will be assessed according to the best-quality information available.

It is important to note that baseline condition does not necessarily equal untouched nature. Comprehensive monitoring of the state of the environment in an area facilitates the assessment of its baseline condition. But even in this case, assessing the state of the affected area prior to the damage is not easy. The state of the environment is dynamic and changes in natural resources can occur very quickly (Figure 5).

The assessment of the baseline condition must also take account of other factors that may have an adverse effect on the state of the environment in the damaged area. For example, changes caused by factors other than the damage incident and their possible impacts can also have an effect on the baseline condition. When assessing the baseline condition, the aim should be to assess the conditions that would have existed had the damage not occurred. In particular, this affects any reasonable objectives set for remedial measures.

If monitoring information is unavailable, the baseline condition can be assessed using a reference area or modelling based on historical data. If a reference area is used, it should resemble the damaged area as closely as possible. As necessary, selection of the reference area should take account of geographical location, soil and geology, hydromorphology, types of land use, habitation and other factors affecting the biodiversity and biological communities of the area. To the extent possible, the assessment should utilise existing information and information systems. Hertta, the information system of the environmental administration, contains a great deal of environmental information (water bodies, nature, loading), as well as information on land use.

5.2.2 Natural Recovery

Natural recovery means the return of damaged natural resources and impaired services to the baseline condition (Article 2 of the Environmental Liability Directive). In many of the incidents causing environmental damage, nature can recover through its own processes.

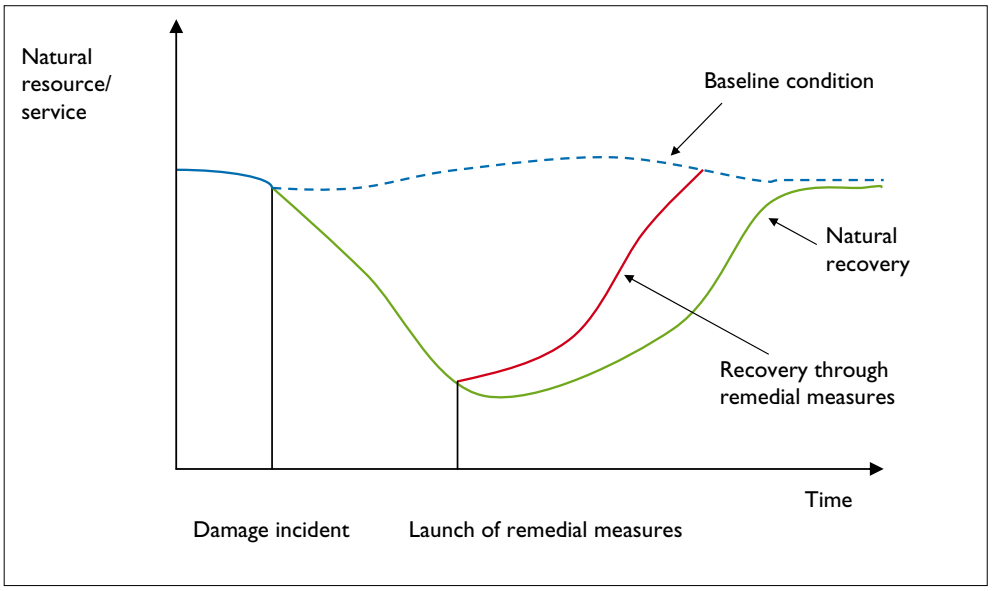


Figure 6. Active remedial measures speed up the return of the damaged area to its baseline condition.

In the case of damage to water, for example, natural recovery is often the best option because it is difficult to speed up such recovery through human activities. However, natural recovery is slow and thus requires the operator to provide compensation for the interim loss of natural resources and services pending recovery (see Figure 6).

Since natural recovery reduces the need for human action in relation to natural processes, and is also cheaper than measures requiring human action, the competent authority must consider natural recovery among other primary remedial measures. The authority should also assess the need for complementary and compensatory remediation.

When assessing natural recovery, it should be noted that natural processes do not always result in recovery to the same or even a similar condition to that prior to the damage. In the assessment of the baseline condition resulting from natural recovery, effects independent of the damage can be taken into consideration, in a similar fashion to the assessment of the baseline condition as discussed in the previous section. Such effects may include that of climate, even if the baseline condition is not equivalent to the condition prior to the damage.

5.2.3

Natural Resource Services

Natural resource service means the useful effect of a natural resource on another natural resource or on humans (Environmental Liability Act, Section 4, paragraph 2).

In this context, *natural resource* means the following (Environmental Liability Act, Section 4):

- the natural habitats and habitats of the species referred to in the Nature Conservation Act, as well as the species and their localities, breeding sites and resting places (Section 5 a(1));
- the water bodies referred to in the Water Act (Chapter 1, Section 3(1)(3)), and groundwater (Chapter 1, Section 3(1)(7));
- the territorial waters referred to in the Act on the Delimitation of the Territorial Waters of Finland (463/1956);
- the economic zone referred to in the Finnish Act on the Exclusive Economic Zone (1058/2004).

Natural resource service means the beneficial effect of a natural resource on another natural resource or on humans. This term has not been previously used in Finnish legislation. The beneficial effect of a natural resource on another natural resource or on humans refers, for example, to soil formation, nutrient recycling, extraction of raw materials, or the effect of nature on the mental or physical well-being of humans, through recreational use, for instance. Natural resource service may also refer to the role of natural resources in the regulation of climate and in hydrological or biochemical cycles, such as runoff and flood control in water bodies, carbon and nitrogen sequestration, reduction in the amount of nutrients, destruction of pollutants and control of pest populations. However, it should be noted that the legislation links the term 'natural resource services' to surface and groundwater and only to certain protected species and natural habitats, i.e. it does not include all services provided by natural resources.

Definition of natural resource service

Natural resource service has the same meaning, benefit, position in the system or status as does the natural resource itself for the entire ecosystem or for humans. Impairment of a natural resource service is included in the definition of 'damage', but it must be measurable.

Natural resource service is a term used particularly in the environmental administration and legislation of the United States. In the European Union, the term has mainly been used in connection with the Environmental Liability Directive. In the United States, natural resource service is defined as 'habitat, food and other needs of biological resources, recreation, other products or services used by humans, flood control, ground water recharge, waste assimilation and other such functions that may be provided by natural resources'.

The concept of natural resource service is based on an understanding of the structure and functions of ecosystems. An *ecosystem* is a biological system that includes all living organisms (biotic factors) in an area, and its physical environment (abiotic factors), that function together as a unit. In an ecosystem, it is possible to determine the structure, composition (of species) and processes which are based on the functions that take place in the ecosystem.

In the context of natural resource services, *service* means that a certain part of the ecosystem is part of the service chain and, through its existence, offers services to other parts of the ecosystem. Thus, service refers to the ecologic meaning (location) of a natural resource in relation to the functional environment as a whole. A natural resource might, for example, be a specific part of a food chain, offering a service by feeding on other organisms and providing food for others.

Thus, natural resource service primarily means *the location or ecological process of the natural resource within the system*. In the case of environmental damage, the entire system is damaged because damage has occurred to one part of the chain. The Environmental Liability Directive aims to remedy this in its entirety. Its premise is that, although the damaged part of the chain cannot be returned to its previous condition, it can be restored so that the chain can function as before. From this point of view, nature resource service has the same meaning as the damaged natural resource for the system as a whole.

On the other hand, natural resource service means *the benefit that the natural resource or ecological phenomenon provides to the system* of which it is part. However, the term benefit does not mean financial benefit to humans. Each natural resource contributes to and provides benefits to the system. When the resource is damaged, some of these benefits are lost. The Environmental Liability Directive refers to this as impairment of a natural resource service.

Definition of ecosystem service

The term natural resource service is closely connected to the widely-used term, 'ecosystem service'. For this reason, when discussing the Environmental Liability Directive, the similarities and differences between these concepts should be noted.

Ecosystem service is generally understood as referring to functions that occur at different levels of the ecosystem and produce direct or indirect benefits to humans[4]. These benefits include production of different resources (such as production of food plants, game, wood and natural products), as well as other natural processes that support the well-being of humans and the functioning of society, such as nutrient recycling, purification of air and water, storage and sequestration of carbon, and flood mitigation. Ecosystem services also include various cultural and recreational uses of natural areas. Ecosystem services are typically divided into four categories in the literature: supporting services, provisioning services, regulating services and cultural services (see Figure 7). These services can be further divided, but the classification is often slightly different depending on the different uses of the term.

As a term, ecosystem service is in many ways comparable to the term 'nature resource service'. Both terms cover effects that are a benefit to humans, including the resources produced by the ecosystem and the processes that support the functioning and production of ecosystems. Both terms also take into account the value of the recreational use of the environment. However, there is one notable difference between the two terms: ecosystem service only produces benefits to humans, whereas natural resource service also includes benefits to other natural resources, such as natural habitats, and habitats of species (see the definitions of natural resource and natural resource services above). This means that, as regards natural resource services, the scope of liability under the Environmental Liability Act is slightly wider than what is included in the definition of ecosystem services.

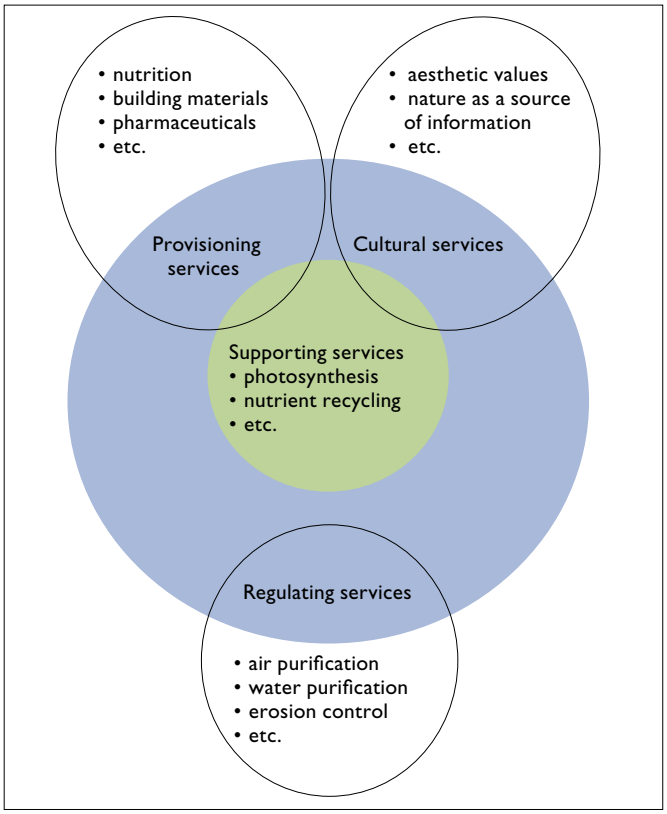


Figure 7. Ecosystem services are divided into four categories: supporting, regulating, provisioning and cultural services. (Source: Environmental Administration's website 18 May 2011/Kopperoinen Leena)[5]

4 Millennium Ecosystem Assessment (2005): http://www.millenniumassessment.org/en/index.html

5 More information on ecosystem services: http://www.ymparisto.fi/default.asp?contentid=301105&lan=fi&clan=fi

5.3

Selection and Scale of Remedial Measures

Remediation of environmental damage means implementing measures that help damaged natural resources recover quantitatively and qualitatively to a condition similar to their baseline condition. Improving the condition of natural resources also enhances the quantity of natural resource services provided. Remedial measures are divided into primary, complementary and *compensatory* measures. This section discusses these in more detail.

5.3.1

Principles for Selecting Remedial Measures

Remedial measures restore, rehabilitate or replace damaged natural resources and impaired services. Remediation of environmental damage means activities that return the species, natural habitat, water body or groundwater to the condition before the damage, i.e. the baseline condition. The authorities select the remedial measure on a case-by-case basis. Depending on the type of damage, the authority makes a decision pursuant to the procedure specified in the Nature Conservation Act, the Environmental Protection Act, the Water Act or the Gene Technology Act. Under the decision, the operator is obliged to take the remedial measures in accordance with the Environmental Liability Act.

The authority must take the following into account when considering the measures to be undertaken (Environmental Liability Act, Section 6):

1) the nature, scope and severity of the damage;
2) the possibility of natural restoration;
3) risks posed to human health;
4) expenses incurred in remedying the damage;
5) other damage that may have occurred in the area.

The list provided in the Act is not exclusive. The authority must consider other factors that may affect the implementation of the measures. These include permits required for the activity, such as a permit for restoring a water body pursuant to the Water Act, a permit for the treatment of contaminated soil pursuant to the Environmental Protection Act, or a landscape work permit pursuant to the Land Use and Building Act. The assessment should also consider other plans and their objectives, such as zoning status and water resources management plans.

Additionally, a more detailed assessment of the damage that has occurred must evaluate the possibility of natural recovery. Possible risks to human health must be separately assessed, because they affect the prioritisation of measures. The objective should be to remove risks to human health as quickly as possible, even if natural recovery was otherwise possible.

Although the primary objective is to return the environment to its baseline condition, an exception can be made if the costs of the measures would be disproportionate to the benefits gained, in relation to the value of natural resource services, for example.

Consideration must also be taken of other possible damage incidents. When necessary, the authority must decide which incident of environmental damage must be remedied first. Other damage may also affect the baseline condition (see Section 5.2.1).

The assessment should also consider the following principles (Environmental Liability Decree, Section 5):

1) effects on public health and safety;
2) costs arising from implementation;
3) probability of success;
4) opportunity to prevent future damage and avoid causing damage to other sites;
5) benefits to damaged natural resources and natural resource services;
6) social and economic considerations, cultural aspects and particular factors concerning location;
7) implementation schedule for remediation of damage;
8) probability of restoration to pre-damage status; and
9) geographical connection to the damaged area, if measures are carried out elsewhere.

In selecting the measures, the authority must consider the proposal by the operator that caused the damage, and the views of the affected parties (parties who have the right to initiate proceedings).

Possible measures include primary, complementary and compensatory remediation of natural resources and natural resource services (Environmental Liability Act, Section 5). The first step is primary remediation, but under some circumstances, it is also possible to select complementary and compensatory remediation. The following sections discuss these in more detail.

5.3.2 Primary Remediation

Natural resources and natural resource services must be restored to baseline condition by eliminating the harmful change caused by the damage (*primary remediation*).

The primary aim of remediation is always restoration to the baseline condition by eliminating the harmful change caused by the damage (Environmental Liability Act, Section 5(1)). Primary remediation includes measures such as removing the substance causing pollution or the structure causing damage from the environment. In addition to restoration, primary remediation may include other measures, such as plantings and stocking (e.g. fish), construction of fish passes, restrictions on the use of an area or monitoring of the state of the environment.

Natural recovery can be considered equal to primary remediation. However, natural recovery does not typically mean that no measures are taken. It often includes other administrative measures, such as monitoring or limiting the use of the area in question.

In cases of damage to protected species and natural habitats, primary remediation refers to measures that restore the damaged habitat of a protected species or a damaged natural habitat, the most important of which include supporting natural recovery by means such as management of forests, soil preparation and planting of trees. [6]

In cases of water pollution, remedial measures may include measures to prevent chemical damage, or methods to restore a water body, such as oxygenation and dredging.[7]

Treatment of soil contamination does not fall within the scope of the Environmental Liability Act. Instead, assessing soil contamination and the need for remediation follows the Government Decree 214/2007 on soil contamination. Pursuant to the

6 More information on restoration of natural areas: http://www.ymparisto.fi/default.asp?contentid=54000&lan=fi

7 More information on restoring water bodies: http://www.ymparisto.fi/default.asp?contentid=1654&lan=fi

Decree, the assessment of soil contamination and the need for remediation must be based on a case-specific assessment of the hazard or harm to health or the environment represented by the harmful substances in the soil, based on the prohibition of soil contamination under the Environmental Protection Act.[8]

Selection of primary remedial measures

> From among the primary remedial measures, a measure can be selected that does not fully restore the damaged natural resource or natural resource service to the baseline condition or that restores it more slowly, if additional complementary and compensatory measures are selected which restore the natural resources and natural resource services to a level equivalent to the baseline condition. The selection of complementary and compensatory measures is regulated under sections 4 and 5. (Environmental Liability Decree, Section 6)

The primary remedial measure, which brings the natural resource or natural resource service closest to the baseline condition in the shortest possible time, is not always the best or most cost-effective option. In such a case, the legislation allows the authorities to select alternative measures.

Such alternative measures can be selected provided that complementary and compensatory remedial measures are also selected. This is possible, for example, if a similar level of natural resources and natural resource services can be established outside the affected area, at a lower cost.

5.3.3

Complementary Remediation

> If the baseline condition cannot be fully restored, the impairment the damage has caused to the natural resource and natural resource service should be remedied by measures undertaken on the damaged site or elsewhere (*complementary remediation*). (Environmental Liability Act, Section 5)

Primary remediation does not always result in a return to the baseline condition, or a return to the baseline condition by means of primary remediation alone may be ineffective and expensive. In such a case, it is possible to use complementary methods. The aim of complementary remediation is to provide a similar level of natural resources or services to that which would have been provided if the damaged site had been returned to its baseline condition.

Complementary remediation is not aimed at restoring the baseline condition. The idea is to provide a similar level of natural resources and natural resource services to those provided by the baseline condition before the damage. This is why complementary remediation can take place at an alternative site outside the damaged area.

For an ecosystem, the purpose of complementary remediation is to provide it with a similar level of natural resources and natural resource services as would have been provided if the damaged site had been returned to its baseline condition. At the ecosystem level, complementary remedial measures aim to restore natural resources and natural resources services to a level that would have been available had the primary remediation resulted in full restoration to the baseline condition of the damaged area (Figure 8).

8 More information on the treatment of soil contamination: http://www.ymparisto.fi/default.asp?node=23663&lan=fi

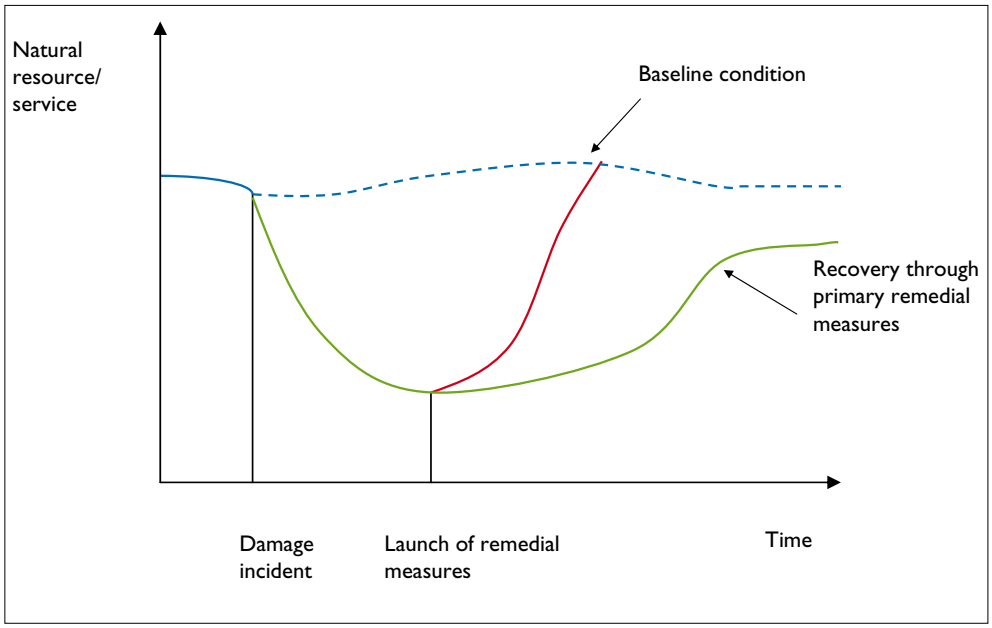


Figure 8. Complementary remediation means taking additional measures to provide a similar level of natural resources and natural resource services as before the damage. Natural recovery is included in primary remediation.

Selection of complementary remedial measures

Complementary (and compensatory) remedial measures should be selected in such a way that they provide for additional national resources and services. Selection of measures takes into account their order of priority and the time taken to implement them.

The additional natural resources and services resulting from the complementary remedial measures should be of the same type, quality and quantity as those that were damaged. If this is not possible on the damaged site, then alternative natural resources or services must be provided elsewhere in the ecosystem. If this is not possible either, complementary remedial measures can be taken to provide an alternative natural resource or service. In such a case, the extent of the necessary compensatory remedial measures may be determined through monetary valuation.

Complementary remedial measures at the damaged area → another natural resource or service

Complementary (and compensatory) remedial measures outside the damaged area → the same or an alternative natural resource or service

Complementary remediation occurs at the damaged site, but unlike primary remediation, the remedial measures provide a different natural resource or service to the damaged one. Outside the damaged site, complementary remediation may include measures that provide a natural resource or service of the same type as the damaged one, or an alternative natural resource or service. If compensatory measures are performed outside the damaged site, the area should, whenever possible, be geographically connected to the damaged one.

As a general rule, complementary and compensatory remediation is focused primarily on the natural resource or natural resource service, which in type, quality and quantity matches the damaged natural resource or natural resource service to the highest possible degree. If this is not possible, remediation must provide alternative

natural resources or natural resource services. For example, a reduction in quality could be offset by an increase in the quantity of remedial measures.

In practice, measures taken to provide alternative natural resources or services should be considered when remedial measures cannot provide natural resources or services of the same type, quality and quantity as those damaged; for example, if the damaged natural resources or services are extremely rare, or the scope of the damage is so wide that direct compensation is impossible.

In such a case, determining the scope of the necessary remedial measures is based on the monetary value of the change brought about in the natural resource or service by the damage. Compensatory and complementary remedial measures should be determined in such a way that they provide for additional natural resources and services whose total value equals the value lost due to the damage caused to the natural resource and service. This is discussed in more detail later (Section 5.3.6).

5.3.4

Compensatory Remediation

> The interim loss of a natural resource or natural resource service shall be compensated for by taking measures at the damaged site or elsewhere until primary and complementary remediation have taken full effect (*compensatory remediation*). (Environmental Liability Act, Section 5)

The aim of primary and complementary remedial measures is to return natural resources and natural resource services to their baseline condition at the damaged site. Compensatory remedial measures in turn compensate for the interim loss of natural resources and services, i.e. losses from the time the damage occurred to the time they have been remedied (see Figure 9).

Compensatory remedial measures are undertaken to compensate for the interim loss of natural resources and services, pending recovery to the baseline condition for the duration of primary and complementary remediation. This is achieved through additional measures taken to immediately improve the quality of the damaged natural resource or service.

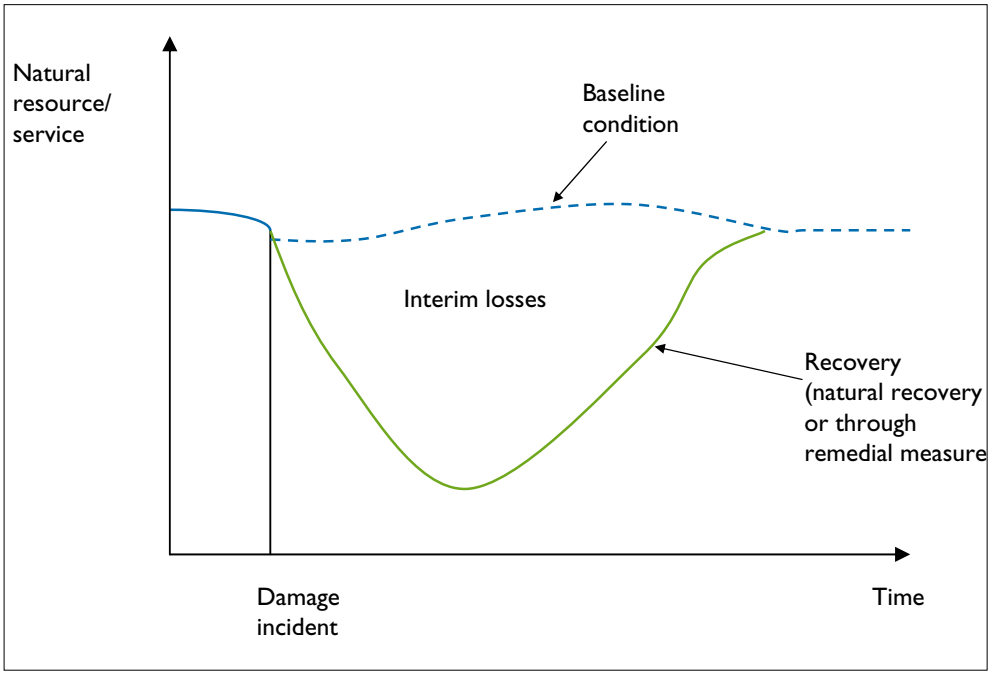


Figure 9. Extent of interim losses.

The scale of the necessary additional measures can be estimated based on the extent of the damaged site and the duration and significance of the damage. The longer the period of time before the baseline condition is reached, the greater the amount of compensatory remedial measures that are required.

Compensatory remedial measures should provide natural resources and services of the same type, quality and quantity to compensate for interim losses. If remedial measures cannot be taken to provide natural resources equivalent to those damaged, alternative natural resources should be considered, such as an equivalent type of natural resource outside the damaged area. If this, too, is not possible, the monetary value of remedial measures is determined by means of monetary evaluation. In practise, remedial measures undertaken must include additional environmental protection measures to improve or protect the state of the damaged part of the ecosystem, or the ecosystem as a whole.

Remedial measures must not cause an inconvenience that could be avoided (Environmental Liability Act, Section 7). If carrying out the remedial measures causes considerable inconvenience to the owner of the real estate or to a special right holder, he or she has the right to full compensation for any damage. The authority must provide the owner of the real estate or the special right holder the right to be heard, and determine the amount of any compensation to be paid.

Compensatory remedial measures do not consist of financial compensation to members of the public. Instead, this is handled under different provisions on compensation (see Section 1.3).

5.3.5

Remedial Measures Outside the Damaged Area

> The authority may grant the operator who caused the damage the right to perform the measures referred to in section 5, subsections 2 and 3, outside the damaged area. Remedial measures must not cause any inconvenience that could be avoided. The authority shall, before the measures are decided upon, give the owner of the real estate or a special right holder the right to be heard.
>
> If carrying out the remedial measures causes considerable inconvenience to the owner of the real estate or the special right holder, he or she has the right to receive full compensation for damage. When granting the right referred to in subsection 1, the authority shall, at the same time, order compensation to be paid for the inconveniences incurred in undertaking the measures. If an agreement on compensation cannot be reached, the provisions of the Act on the Redemption of Immoveable Property and Special Rights (603/1977) shall apply, as appropriate, in determining the amount of compensation.
>
> If the party entitled to receive compensation is unable to collect compensation from the operator who caused the damage, the state shall pay damages.
>
> (Environmental Liability Act, Section 7)

The underlying principle governing the use of complementary and compensatory measures, in addition to primary remediation, is that, to the fullest extent possible, the operator is liable for any damage caused.

If complementary remedial measures cannot be carried out on the damaged site, they can be taken outside it (Environmental Liability Act, Section 7). If the most suitable area is not controlled by the operator who caused the damage, the authority may grant the operator the right to carry out measures in that area. The prerequisite is

that the measures must not cause any inconvenience that could be avoided. In such a case, the owner of the real estate or the special right holder has the right to be heard.

This may include, for example, developing a certain area by creating favourable conditions for the protection and expansion of the natural habitat or species population, if it is not possible to restore the damaged natural resource services at the damaged site.

In addition, if the measures cause considerable inconvenience to the owner of the real estate or the special right holder, he or she has the right to full compensation for damages. The authority must order the compensation when granting the right to carry out the measures. If the parties are unable to agree on the compensation, pursuant to the Act on the Redemption of Immoveable Property and Special Rights (603/1977), the competent authority will determine the compensation when granting the right to carry out the measures. The Act's provisions on compensation for damages related to the establishment of right of use apply. This means that the compensation cannot be processed in a separate redemption or other procedure. Instead, the authority deciding on the remedial measures, i.e. the ELY Centre or the Regional State Administrative Agency, will determine the compensation.

If the operator who caused the damage does not pay the compensation, the state is obligated to do so. An application for compensation is filed with the ELY Centre. Similarly, within five years, the state must collect any compensation it paid from the operator (Environmental Liability Act, Section 14).

5.3.6

Scale and Economic Value of Compensatory and Complementary Remediation

If complementary or compensatory remediation aims to provide alternative natural resources or services, the scale is determined by taking into account the economic value of the lost natural resource and service (Environmental Liability Decree, Section 4(2)).

If the aim of complementary or compensatory remediation is to provide alternative natural resources or services, the scale must be determined by taking into account the economic value of the lost natural resource and service.

Determination of the scale of the necessary remedial measures must be based on the economic value of the change caused to the natural resource or service by the damage. Complementary and compensatory remedial measures should be determined so as to provide for additional natural resources and services, whose total value equals the value lost due to the damage caused to the natural resource and service.

If the scale of the complementary or compensatory measures cannot be specifically determined within a reasonable amount of time or at a reasonable cost, discretion can be used to determine the scale of the measures. Even then, the costs arising from remedial measures should correspond to the value of the lost natural resource or natural resource service. In selecting compensatory and complementary remedial measures, the aim should be to select those that provide additional national resources and services.

Since determining the economic value of natural resources services is challenging, several methods are used. Instead of calculating precise figures, the determination should primarily focus on the selection of complementary and compensatory measures that provide improvements in natural resource services of the same type, quality and quantity as those lost. The selection of remedial measures is not intended as a punishment for the operator that caused the damage. Instead, the aim is to achieve

a natural resource service similar to that before the damage, as cost-effectively as possible.

Determining the economic value of natural resources and services (equivalency methods)

The REMEDE project[9] (Resource Equivalency Methods for Assessing Environmental Damage in the EU), which is funded through the Sixth Framework Programme of the European Commission, is aimed at developing guidelines for authorities and operators in the Member States to determine the scale of remedial measures. The project focuses on equivalency methods. These are considered to be similar to the approach specified in the Environmental Liability Directive (resource-to-resource or service-to-service equivalence approaches).

Equivalency methods are based on a case-specific assessment of adverse environmental effects and environmental benefits, and they use a specific ecological indicator. However, the shortcomings of the approach must be considered when assessing ecological diversity or social effects.

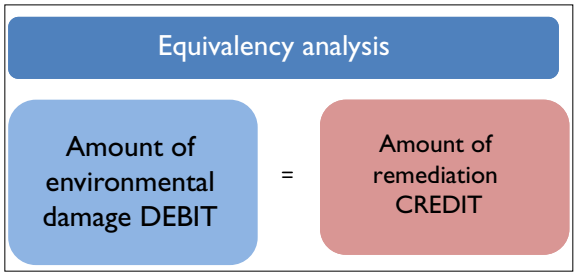


Figure 10. The REMEDE toolkit helps in assessing the losses caused by damage and the benefits of the remedial measures. (http://www.envliability.eu)

Assessing the economic value of natural resource services

If the lost natural resources or services cannot be restored by any measures taken within or outside the damaged area, an economic valuation may be the only possible approach. This may be necessary, for example, if the environmental incident has destroyed an ecological value that cannot be completely restored or returned at a reasonable cost. In such a case, the competent authority may specify that an alternative method, such as assessing the economic value, be used to determine the scale of complementary and compensatory remediation. The aim is to apply the polluter pays principle and provide compensation for the value of the lost ecological values by some other means. Furthermore, the extent of such compensation is determined by the economic value of what has been damaged. Economic assessment is a means of determining the scale of the measures required.

Two methods of value equivalency analysis have been developed (the REMEDE project) to support assessment of the scale of complementary and compensatory remedial measures pursuant to the Environmental Liability Directive. Both methods require that the value of the damaged natural resource and natural resource service be determined. When possible, priority should be given to the *value-to-value* equivalence approach (Annex II of the Directive), with the aim of returning the economic value of the damaged natural resource or service to the level prior to the damage, by means of environmental management and/or protection (returning the value "at any cost").

9 Resource Equivalency Methods for Assessing Environmental Damage in the EU 2006–2008. http://www.envliability.eu

The *value-to-cost* method also calculates the value of the damaged natural resource or service at its baseline condition, but the aim is not a return to this earlier value. Instead, a corresponding sum is invested in the management, protection or research of the damaged natural resource or service. In such a case, the cost of remedial measures equals that of restoration to the baseline condition, but the measures may not necessarily result in a return to the baseline condition. The value-to-cost method is necessary if the value of the replacement natural resources and/or services cannot be performed within a reasonable time-frame or at a reasonable cost. It should be noted that only the value-to-value method requires the assessment of the economic benefit provided by remedial measures.

Economic valuation is based on the assumption that it is possible to estimate a cost for the damaged natural resource or service. Such estimates can be done by using objective and subjective measurement methods. Objective methods include the travel cost method and the hedonic price method. Subjective methods include the contingent valuation method (CVM), choice experiment (CE) and the contingent ranking method.

The *travel cost method* measures peoples' willingness to pay for a pleasant environment and recreational use, by calculating the sum they are prepared to pay (travel and entrance costs) to visit a natural area. In turn, the *hedonic pricing* method is mainly suited to the pricing of urban surroundings, since it is a statistical analysis method that studies the dependencies between sale prices of property or plots of land and environmental qualities.

The *choice experiment and contingent ranking* methods are similar to the hedonic pricing method. These are based on the principle that it is possible to calculate the total cost of the environment through a summation of its various qualities. Thus, the contingent ranking method may be used to measure the value of a water body by identifying how willing people are to pay for some qualities of the aquatic ecosystem, such as water clarity and the amount of seaweed and fish. With the value-to-value method, the economic value accorded to the environment by people can be studied through a direct survey which first describes the ecosystem (e.g. a water body). It does this by stating facts about the state of the ecosystem and factors affecting it, and then it asks how willing people are to pay to maintain or improve each factor.

Economic valuation methods like these have rarely been used in Finland, but some international valuations are available that use such terms. In Finland, economic valuation (using the contingent valuation method) has been applied, for example, in regulating inland waters (e.g. Lake Pielinen).

6 Summary

6.1

Obligations of the Operator

Where environmental damage has occurred, the operator must, without delay, inform the competent authority. The operator must describe the environmental damage in as much detail as possible, in order to help differentiate the effects of the damage from other environmental factors. In particular, causal relationships associated with the damage should be specified and carefully separated from other factors.

Moreover, the operator must take any action required for the prevention of pollution without delay (Environmental Protection Act, Section 5(2)), must keep the pollution to a minimum and, at the authority's request, provide a list of suitable remedial measures pursuant to Section 5 of the Environmental Liability Act. In accordance with the Environmental Liability Act and Decree, the competent authority will decide which of the measures proposed by the operator must be carried out.

In addition to the planning and implementation of remedial measures, the operator who is responsible for the damage must also monitor the effects and supervise any remedial measures. The authority can decide to end remedial measures when the risk posed by the damage to human health and natural resources has been eliminated, or when the costs of continuing remediation would be disproportionate to the environmental benefits gained.

6.2

Duties of the Authorities

Pursuant to the Environmental Liability Act, competent authorities that can issue orders on remediation of significant environmental damage under the Nature Conservation Act, the Environmental Protection Act, the Water Act and the Gene Technology Act include the Centres for Economic Development, Transport and the Environment, the Regional State Administrative Agencies and the Board for Gene Technology. Upon being informed of possible significant environmental damage, the ELY Centre must immediately take all action necessary to limiting and preventing damage if the operator that caused the damage has not done so. Other authorities, such as the local environmental protection authorities, may also be informed of significant environmental damage and should contact the regional ELY Centre.

The authority will assess the scope and extent of the damage and, when necessary, initiate administrative enforcement proceedings. Competent authorities may use the help of other expert authorities in assessing the significance of the damage. If the assessment shows that the damage does not constitute significant environmental

damage pursuant to the Environmental Liability Act, the authorities must continue remedying the damage according to the relevant procedure specified in the Environmental Protection Act, Water Act or Gene Technology Act.

Once administrative enforcement proceedings have commenced, the authority must ensure that the operator that caused the damage makes a proposal for remedial measures. Before selecting the remedial measures to be applied, other affected parties and authorities must be heard. After hearing the relevant parties, the competent authority must issue an order on remedial measures and, when necessary, on the distribution of liability between parties and on rendering the costs equitable. This decision is reinforced with a warning that the measures will be carried out at the operator's expense.

After issuing the order on remedial measures, the competent authority will monitor the implementation thereof and, when necessary, issue a notice of enforced compliance. The operator will be heard before enforcement actions are initiated. The competent authority must monitor the implementation and effects of remedial measures. Remediation ends when the imposed remedial measures have been carried out and a return to the baseline condition has been achieved. Under certain conditions, the authority may decide to end remediation, even if the baseline condition has not been achieved.

Appendix 3 contains a process chart depicting significant environmental damage from the point of view of the competent authority.

6.3

Standing of Other Affected Parties

Anyone who observes environmental damage may inform the supervisory authority, which is usually the nearest regional ELY Centre or the Board for Gene Technology. Pursuant to the provisions of administrative enforcement proceedings, other authorities can also initiate administrative enforcement proceedings related to environmental damage, if the supervisory authority has not yet done so. Administrative enforcement proceedings are initiated in writing. The authority where the administrative enforcement proceedings are commenced is typically the same authority that must be informed of the damage. However, administrative enforcement proceedings falling under the scope of the Water Act are initiated by the Regional State Administrative Agency.

When assessing the significance of environmental damage and the necessary remedial measures, the authority must hear other affected parties, such as landowners and inhabitants. According to the administrative enforcement proceedings, the affected parties have the right to be heard before the authority decides on remedial measures. Typically, the hearing focuses on the proposal for remedial measures that was prepared by the operator causing the damage. The affected parties may often be better informed about the state of the environment prior to the damage (establishment of the baseline condition) and how the damage has affected the possibility to use the environment (impairment of natural resource services). Examples of loss of use, which should be taken into account when assessing remedial measures, include impaired recreational use, such as the possibility to swim or fish.

In most cases, compensation for personal injury or damage to private property inflicted on an affected party does not fall under remediation of damage in administrative enforcement proceedings. The affected party may issue a claim for such damages pursuant to the Environmental Liability Act or the Tort Liability Act, by bringing it before a District Court. Some types of damage to water form an exception to this rule. Chapter 13 of the Water Act contains special provisions on such damage, and the

Regional State Administrative Agency may handle the related compensation during the administrative enforcement proceedings. As regards compensation for damage to a water body caused by activities specified in the Environmental Protection Act, the provisions of Chapter 11 of the Act apply. A claim for compensation for unexpected damage caused by such activities may be submitted separately to the Regional State Administrative Agency for processing.

APPENDICES[10]

Appendix 1. Key terms

Natural resource

Natural resource means the natural habitats and habitats of the species referred to in the Nature Conservation Act, Section 5 a(1), as well as the species and their localities, breeding sites and resting places, the water bodies referred to in the Water Act, Chapter 1, Section 3(1)(3), and ground water referred to in paragraph 7, the territorial waters referred to in the Act on the Delimitation of the Territorial Waters of Finland (463/1956), and the economic zone referred to in the Finnish Act on the Exclusive Economic Zone (1058/2004). (See p. 53)

Natural resource service

Natural resource service means the functions performed by a natural resource for the benefit of another natural resource or the public, such as soil formation, nutrient recycling, extraction of raw materials or the effect of nature on the mental or physical well-being of humans, through recreational use, for example. Natural resource service may also refer to the role of natural resources in the regulation of climate and in hydrological or biochemical cycles, such as runoff and flood control in water bodies, carbon and nitrogen sequestration, reduction in the amount of nutrients, destruction of pollutants and control of pest populations. It does not mean financial benefit to humans. (See p. 54)

Ecosystem service

Ecosystem service is generally understood as referring to functions that occur at different levels of the ecosystem and produce direct or indirect benefits to humans. These benefits include production of different resources (such as production of food plants, game, wood and natural products), as well as other natural processes that support the well-being of humans and the functioning of society, such as nutrient recycling, purification of air and water, storage and sequestration of carbon, and flood mitigation. Ecosystem services also include various cultural and recreational uses of natural areas. The difference between a natural resource service and an ecosystem service is that the latter only produces benefits to humans. (See p. 55)

Baseline condition

Baseline condition means the status prior to damage to natural resources and natural resource services (Environmental Liability Act, Section 4, paragraph 3), or the condition of the natural resources or services had the damage not occurred. (See p. 51)

10 Appendix 2. Species and Natural Habitats of the Habitats and Bird Directives and Appendix 3. Contact Details for Expert Organisations are available only in the Finnish-language version of the manual.

Primary remediation

Natural resources and natural resource services must be restored to the baseline condition by eliminating the harmful change caused by the damage (Environmental Liability Act, Section 5(1)). Primary remediation includes measures such as removing the substance causing pollution or the structure causing damage from the environment. In addition to restoration, primary remediation may include other measures, such as plantings and stocking (e.g. fish), construction of fish passes, restrictions on the use of an area, or monitoring of the state of the environment. Natural recovery can be considered equal to primary remediation. (See p. 57)

Natural recovery

Natural recovery means the return of damaged natural resources and impaired services to the baseline condition (Article 2 of the Environmental Liability Directive). In many of the incidents causing environmental damage, nature can recover through its own processes. Natural recovery can be considered primary remediation. (See p. 52)

Complementary remediation

If the baseline condition cannot be fully restored, the impairment the damage has caused to the natural resource and natural resource service should be remedied by measures undertaken on the damaged site or elsewhere (Environmental Liability Act, Section 5). The aim of complementary remediation is to provide a similar level of natural resources or services to those that would have been provided if the damaged site had been returned to its baseline condition. (See p. 58)

Compensatory remediation

The interim loss of a natural resource or natural resource service must be compensated for by taking measures on the damaged site or elsewhere until primary and complementary remediation have taken full effect (Environmental Liability Act, Section 5). Compensatory remedial measures should provide natural resources and services of the same type, quality and quantity to compensate for interim losses. Compensatory remedial measures do not include economic compensation for parties suffering damage. (See p. 60)

Occupational activity

Occupational activity means any activity carried out in the course of an economic activity, or by a business or undertaking. In the application of environmental liability legislation, it makes no difference whether the activity is of a private or public, profit or non-profit character. Application of the Environmental Liability Directive has generally been linked to occupational activities which present a risk to human health or the environment. (See p. 33)

Types of damage

Damage to water bodies

The Environmental Liability Act, Chapter 1, applies to substantial pollution of a water body referred to in the Environmental Protection Act (Section 84 a) and to substantial harmful change in the water bodies or groundwater referred to in the Water Act (Chapter 14, Section 6). Surface water pollution refers to damage that has significant adverse effects on the ecological, chemical or quantitative status of the water as referred to in the Act on Water Resources Management (1299/2004). When assessing the significance of pollution, account must be taken of what is set forth in a water resources management plan on aspects related to the state and use of waters in the area of impact of activities. (See p. 18)

Damage to protected species and natural habitats

The definition of damage to protected species and natural habitats is directly connected to the favourable conservation status of the protected species or natural habitat. According to Section 5 a(1) of the Nature Conservation Act, damage to protected species and natural habitats means a significant, measurable, direct or indirect adverse effect on achieving or maintaining a favourable conservation status. (See p. 23)

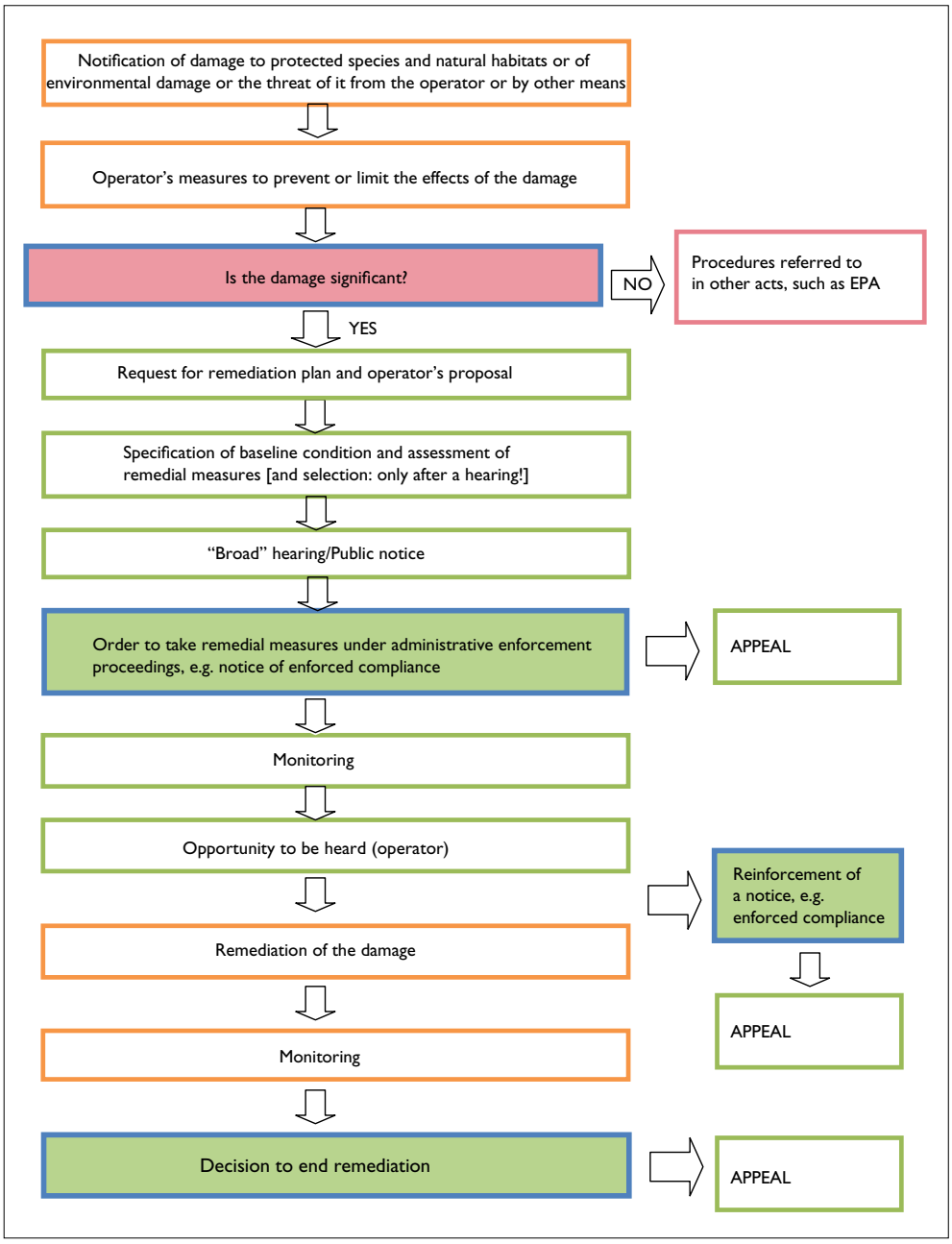
Damage to soil

Land damage means any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction, in, on or under land, of substances, preparations, organisms or micro-organisms (Environmental Liability Directive (2004/35/CE). Damage to soil is specified based on a case-specific risk assessment. (See p. 29)

Damage caused by GMOs

In every case, environmental damage caused by genetically modified organisms (GMOs) constitutes damage to water bodies, protected species or natural habitats or soil. Such damage may be caused either by the GMO itself, or the effect may be indirect. Damage caused by GMOs may concern individuals, populations, species or ecosystems. (See p. 31)

Appendix 4. Process Chart for Incidents of Significant Environmental Damage



Appendix 5. Example of Possible Incidents

Introduction

The following parts discuss some examples of incidents of environmental damage. They are mostly fictional, but have some factual basis. However, all of the actual incidents used as background information occurred before the entry into force of the EU's Environmental Liability Directive and Finland's Environmental Liability Act.

The examples are presented to express and show certain viewpoints related to assessing the significance of damage and the selection of remedial measures discussed in this manual. These examples are intended to provide food for thought rather than predict the kind of remedial measures applicable to real-life incidents of environmental damage.

1. Damage related to the transport of dangerous substances

Description

A national park constitutes the largest uninterrupted protected mire area in Southern Finland. Threatened bird species are regularly encountered in the area, and the diversity and representativeness of the natural habitats of the mire are good. The mire area and its surrounding fields are an important resting area for birds during spring and autumn, and it is also used by non-breeding cranes. Most of the raised bog area is protected under the Natura programme. Tens of thousands of people use the boardwalks and bird towers in the area every year. Large highways cut across the mire area, and trucks carrying heavy loads of hazardous and other substances that require permits are transported daily along the roads. The sides of the road and the edges of the mire area typically have large, deep ditches, through which any spilled substances can easily spread to the surrounding area, including nearby water bodies and agricultural areas, even outside the protected area.

A truck carrying a heavy load of fuel oil is speeding along the highway early one morning and overturns. All of the containers in the truck and its trailer are damaged, leaking oil into the ditches and polluting them over a distance of hundreds of metres. Some of the oil is absorbed by the peat layers of the mire, while some spreads to the fields of nearby farms, contaminating about a dozen wells mainly used to supply cows with water.

Baseline condition

The Natura 2000 area covers over 2,900 hectares. Metsähallitus has recently drafted a management and utilisation plan, according to which the area has a total of 10 habitat types referred to in Annex I of the Habitats Directive. Of the whole area, 83 per cent is of the prioritised type, active raised bogs (7110), and the second most abundant type is transition mires and quaking bogs (7410). Representativeness of types is assessed as good (B). Many bog habitats that are classified as threatened are encountered near the damaged area.

In conservation terms, the area is the most valuable mire complex in Southern Finland. The area is well known, and its bird fauna are diverse. Finland has national responsibility for eight species of bird that reproduce in the area (15 per cent of the European population nest in Finland). Locally, the plant species of the wide mire area is highly representative. This is of particular importance to many butterflies feeding on mire vegetation.

According to the latest estimates, the area is visited by some 20,000 people every year. The bird tower in the immediate vicinity of the damaged area is one of the main attractions of the protected area. Because of the incomparable scenery of the mire, the tower and nearby nature trails receive the largest number of visitors in the summer.

The water bodies in the area are small and the ditches along the edges of the area flow through the surrounding cultivated fields into larger water bodies. Drainage has occurred in 13 per cent of the area. Most of these drained areas will be restored to their natural state in the near future.

Adverse effects of the damage

The oil spilled in the accident has polluted local small water bodies and groundwater. The authorities need to quickly assess the extent of the damage. The operator that caused the damage has to evaluate the effects on agriculture, animal husbandry and local inhabitants outside the protected area.

At the Natura site, a review must be done, and it must involve at least a representative of the operator that caused the damage, Metsähallitus and the local Centre for Economic Development, Transport and the Environment (ELY Centre). Damage to protected species and natural habitats will be assessed during the review. When assessing the significance of damage to protected species and natural habitats, aspects to be considered include which species and natural habitats have been damaged and whether they can recover to their natural state in a reasonable time. At the same time, a proposal will be made on remedial measures to return the area to its baseline condition.

Moreover, impairment of local natural resource services needs to be assessed, and also the loss of such services to any target and user groups. In the sample case, these could include farmers, tourists, berry pickers and hunters.

Assessment of significance and operator's liability

To be considered significant, environmental damage must involve protected species or natural habitats referred to in Section 5 a of the Nature Conservation Act, and have a significant, measurable, direct or indirect adverse effect on reaching or maintaining a favourable conservation status. In this sample case, limited and local damage to a wide protected area would probably not exceed the threshold of significant environmental damage with respect to individual species or natural habitats. The significant adverse impact on the particular ecological value, for whose protection the site has been included in the Natura 2000 network, would meet the threshold referred in to Section 66(1) of the Nature Conservation Act. The provisions of the Environmental Protection Act on administrative enforcement proceedings apply to the remediation of damage to a water body or damage to protected species and natural habitats caused by the transport of dangerous substances. Thus, the ELY Centre will issue the required orders on the remediation of the damage to a water body and damage to protected species and natural habitats.

Remediation of the damage

The oil must be removed mechanically, along with the surface peat layer. The resulting holes can be filled using peat from a near-by peat extraction site. If the contaminated and oily peat cannot be removed, the area must be covered so that birds resting in the area do not become exposed to it. Sphagnum mosses growing in the raised bog will cover smaller oil-contaminated areas over the coming years. According to Section 5.3.5 of this manual, remedial measures outside the damaged area should be considered part of compensatory remediation.

2. Damage to a water body caused by wastewater discharge

Description

Pulp and paper mills and related industrial plants operate by Lake Saimaa. In June, there was a lengthy stoppage in these operations, after which the mills experienced problems in recommencing production. During the start up of the pulp mill, the entire contents of the secondary basin at the evaporation plant, a mixture of soap and water, were discharged into the wastewater treatment plant. The load from the main drainage sewer to the water treatment plant was five times the usual daily amount, causing problems at the treatment plant.

Because of the problems at the evaporation plant, water containing soap and black liquor escaped into clean water pipelines and directly into the lake. Some 400 tonnes of soap were discharged into the water body. After the soap discharge, the wastewater treatment plant also discharged 7,475 m^3 of neutralised black liquor into Lake Saimaa. Dispersion of soap in the water significantly reduced oxygen levels, killing fish at the same time that the black liquor spill occurred.

After the black liquor spill, the strain of microbes used for biological treatment at the wastewater treatment plant sustained partial damage, causing the plant to discharge wastewater treated less thoroughly than usual into the lake. As a result of the wastewater discharge, the mills exceeded the daily discharge allowances specified in their environmental permits every day for a week. In June, they exceeded the discharge allowances specified in their environmental permits for Chemical Oxygen Demand (COD), phosphorus and Biological Oxygen Demand (BOD). The most significant of these was total phosphorus, because the amount released also exceeded the permitted annual level.

The discharge had a significant impact in the nearby load area, but milder impacts were evident on the entire eastern side of Lake Pien-Saimaa, and for a short period, on its western side. Because Lake Pien-Saimaa has a maze-like morphology, the impact emerged in two waves: the first wave occurred immediately after the wastewater discharge and the second, two to three weeks later when currents moved wastewater further from the bays and bights.

Baseline condition

The water of the eastern side of Lake Pien-Saimaa has been nutrient-rich (eutrophic) and has contained a lot of organic matter for as long as the Kaukaa mills have been discharging treated wastewater into it. According to the classification specified in the Water Framework Directive, the status of Lake Pien-Saimaa is satisfactory, and the wastewater discharge occurring in the summer of 2003 did not affect this classification.

Adverse effects of the damage

Biological effects

In the area where the loads occurred, plant plankton had the longest lasting biological effects and fish fauna, the most visible biological effects. The eastern side of Lake Pien-Saimaa and, in particular, the area nearby the mills where loading occurred, was eutrophic before the discharge, but the discharge boosted the growth of plant plankton in the area, causing massive algal blooms. The greater amount of surface algae caused fish-traps and some lakeshores to become slimy, while the higher levels of plankton algae reduced water clarity. Greater plant plankton production enhanced the biological oxygen demand of the water. Because of the accelerated rise in the chemical and biological oxygen demand, the water in the areas of loading surround-

ing the plants became oxygen depleted, which in turn caused fish kills and fish to move to areas further away.

Fish kills were reported for a period of one week (from 30 June to 6 July 2003) after the discharge, mainly within two to three kilometres from the place of discharge. The fish kills that occurred farthest away were five kilometres from the mills. Most of the dead fish were small species, such as common roach, perch and ruffe, which are normally dominant in the area. Pike-perch and pike, with smaller populations in the area, seemed to have moved to parts away from the oxygen-depleted zone, because only one pike was found among the dead fish.

The structure, biomass and density of the fish stock were studied through samples caught by net fishing. Differences were identified only in the Kanavansuu area, 2 kilometres from the mills: high-value fish (pike-perch and pike) had returned to the area, but the common roach, perch and ruffe showed a decrease in biomass and smaller densities. The quality of the fish was also studied. No foreign substances were found in the fish, but foul odours were identified in uncooked pike-perch caught in the area of loading nearby the mill. The appearance, odour and taste of cooked pike-perch were inferior to pike-perch caught in the control area of Lake Suur-Saimaa.

Partly because of inadequate comparison material, the impact of the incident on bottom fauna could not be studied on a large scale. Previous bottom fauna studies had mainly been conducted in the immediate vicinity of the area where treated wastewater is discharged, from the mill to Lake Saimaa. The bottom in this area was oxygen depleted before the incident, and the bottom fauna consisted of midge larvae and earthworms that tolerate oxygen-depleted conditions. Bottom fauna is generally used as an indicator in the ecological classification of waters, because it is slow to react to changes in water quality. The biodiversity of the bottom fauna had been weakened over decades due to discharges from the pulp and paper mill. By the time of the incident, it was at such a low level that the additional discharge was unlikely to weaken it significantly.

Physiochemical effects

After the incident, the water quality of the area of loading nearby the mill, within a five-kilometre radius, was temporarily lower. The main effects were evident for some three weeks. Deviations from long-term average physiochemical parameters occurred for some months.

Physiochemical effects mainly have an impact on surface water (0 to 1 m). The most significant effects included an increase in the amount of soluble and insoluble organic matter, which darkened the water, higher chemical oxygen demand, and accumulation of a dark precipitate on the lakeshores. Moreover, the total phosphorus content and the chlorophyll content, which indicate the amount of algae, increased from their long-term averages. As a result, oxygen levels decreased in the water and foam was observed. The discharge had no impact on water acidity. The damage did not involve levels exceeding the concentrations specified in the Government Decree on Substances Dangerous and harmful to the Aquatic Environment (1022/2006).

Effects on natural resource services

The damage to the natural resources impaired the natural resource services, in particular, the use of the water body for recreation. Local inhabitants could not swim and fish or enjoy the natural value of the lake for the duration of the summer, because of the dark precipitate on the lakeshores, the dead fish floating on the surface and the massive algal blooms. Impairment of the natural resource services was evident in that people were less willing to use the damaged area for recreation. Recreational use was also inhibited by an unpleasant odour and lower natural value.

The few commercial fishermen and fishing co-operatives in the area suffered most, because the biomass of the fish stock composition deviated from normal levels for some three weeks after the discharge, in an area ranging up to some five kilometres downstream from the mills. The most significant biological effects were the adverse impacts on fish habitats and breeding environments and the massive fish kills. Moreover, there is reason to suspect that the discharge had an adverse effect on tourism in the area, which normally has many visitors during the summer.

Assessment of the significance of the damage

Impairment of the natural resource caused deterioration in many biological and physiochemical factors and, in addition to this impairment, a natural resource service was also impaired. Considering the life-cycle of the lake (the natural resource), the effects were of short duration, but the curtailment of recreational use (the natural resource service) seemed to last longer. This made a strong case for classifying the incident as significant pollution of a water body.

Damage to the water body was caused by an activity referred to in Annex III of the directive and was a violation of the terms of the environmental permit. The provisions of the Environmental Protection Act apply to damage to a water body and remedial measures should be imposed in accordance with the administrative enforcement proceedings specified in the Act. Furthermore, the pollution could be deemed significant pursuant to Section 84 b of the Environmental Protection Act, Section 3 of the Environmental Liability Act and Section 9 of the Water Resources Management Decree. Pursuant to the Environmental Liability Act, the authority may order the operator to take remedial measures.

Remedial measures

The most cost-effective primary remedial measures include natural recovery of the damaged area and stocking of fish in the damaged or nearby area. Successful primary remediation of the damaged area requires that the beach located in the area be closed, which would necessitate complementary remediation. As a complementary remedial measure, a beach could be opened as close to the damaged area as possible, to serve as a replacement for the damaged one. Primary and complementary remedial measures would help eliminate the changes in the water quality, fish stock and recreational services in the damaged area, i.e. return the ecosystem to its baseline condition.

These primary and complementary remedial measures would be time-consuming, which means that interim losses would occur in natural resources and natural resource services until the remedial measures have taken full effect. Pursuant to the Environmental Liability Act, interim losses of natural resources and services should primarily be replaced by ecologically similar resources and services; this means that remedial measures should focus on fishery and recreational use. To compensate for temporary loss of recreational use, the operator could be ordered to perform minor remedial measures in a part of Lake Saimaa, preferably as close to the damaged area of the eastern side of Lake Pien-Saimaa as possible (perhaps on the western side of Lake Pien-Saimaa).

To compensate for the temporary impairment of fishery, overstocking of fish could be included in primary remediation, i.e. the number of fish would be increased from the baseline condition. When stocking is used to increase the fish stock, the natural functioning of the ecosystem should be taken into consideration to ensure that the structure of the fish stock supports it. By stocking prey fish, it is possible to reduce the numbers of smaller fish in the water body and the benefit of stocking could be maximised by selective fishing of smaller fish. This combination of measures would work as a remedial measure and provide added value compared to the baseline con-

dition. It would also improve other recreational uses of the water body for a period of several years.

3. Damage caused by the construction of waterways

Description

A large city in Southern Finland wishes to make the waterway leading to its marina deeper and to expand the marina. Pursuant to the Water Act, the Regional State Administrative Agency for Southern Finland granted a permit to dredge 30,000 m^3 to deepen the waterway and expand the marina. The Centre for Economic Development, Transport and the Environment for Uusimaa had set the boundaries of a site hosting *Macroplea pubipennis*, a chrysomelid beetle, under strict protection in accordance with Section 47(3) of the Nature Conservation Act, in the immediate vicinity of the marina. In addition, the deterioration and destruction of the habitat is prohibited by virtue of Section 47(2) of the Act. To protect the habitat of the beetle, the terms of the permit require that the dredged material be disposed of on land, and a time limit be set for the dredging, so that the work is done only from 1 November to 31 March.

Dredging of the marina and waterway occurs only in winter. After the marina is free of ice in the spring, the owner of a neighbouring property contacts the Uusimaa ELY Centre and informs the authorities that dredging seems to have taken place within the boundaries of the site hosting the beetle.

Baseline condition

The beetle is known to live only in Finnish waters. It lives in brackish water, in the sheltered bays of the Baltic Sea. Individual sightings have occurred from the Gulf of Finland up to the Oulu region, but the only known, viable population lives in the bay in question.

The beetle was first identified in the mid-1960s. Its distribution was studied in more detail in 1995 and from 2001 to 2004. According to the results, a total of 260 individuals were found in eight different shoreline areas of the bay. The latest study in 2004 observed a total of 132 individuals in the bay. Pursuant to Section 47(3) of the Nature Conservation Act, boundaries have been set for four known sites hosting the species, which are considered important to its survival.

The suspected damage occurred on a site that hosted 20 individuals, according to the latest study. This site has a great deal of fennel pondweed, the main plant on which the beetle feeds.

Adverse effects of the damage

The beetle lives underwater throughout its life cycle, from egg to adult beetle. The species depends on its food plants. In the bay, the beetle mainly feeds on fennel pondweed (*Potamogeton pectinatus*). It also feeds on water milfoils (*Myriophyllum* species) and possibly on other pondweeds (*Zannichellia* species).

Dredging poses a direct threat to individual beetles and also destroys their food plants. Deeper and murkier water may also change the conditions, so that they are no longer favourable to these plants.

Assessment of the significance of the damage

Pursuant to Section 47(3) of the Nature Conservation Act, the damage is occurring on a site hosting a species under strict protection, the deterioration of which will have a significant adverse effect on maintaining a favourable conservation status. In the sample case, a habitat important to the survival of the beetle has been destroyed by dredging.

Remediation of the damage

Pursuant to the Water Act, the Centre for Economic Development, Transport and the Environment initiates administrative enforcement proceedings at the Regional State Administrative Agency for Southern Finland. The Agency requests the operator to propose remedial measures. The operator states that remedial measures are not required because the plants will soon recover in the area and the beetle can naturally recover there.

The Agency asks the ELY Centre to comment on the operator's proposal. According to the ELY Centre, natural recovery of plant life to its baseline condition is uncertain and slow, because of factors such as the change of depth in the dredged area. To maintain the favourable conservation status of the beetle, a compensatory habitat is required quickly to replace the lost one. This means that remedial measures focussing on the damaged area alone are insufficient to restore the baseline condition. A management and utilisation plan has been created for the beetle habitats in the bay. According to the plan, some shores where the beetle is not currently found could be modified and rendered suitable for the species by mowing reed stands. The condition of current sites can also be improved and maintained by mowing. The ELY Centre proposes that the Regional State Administrative Agency order the operator to take the measures described in the management and utilisation plan as complementary remediation and to create a new, suitable site for the species by mowing reed stands in an area outside the damaged area. Pursuant to Section 7 of the Environmental Liability Act, the Agency can issue an order for remedial measures outside the damaged area; this would not be possible under the provisions of the Water Act.

4. Damage to protected species and natural habitats from forestry

Description

Regeneration felling is undertaken in a forest nearby a Natura 2000 site in Southern Finland, covering some 35 hectares. According to the notification on the use of the forest, the regeneration felling was planned to take place along the border of a Natura 2000 site, covering a distance of some 800 metres. Because of this, the Häme-Uusimaa Forestry Centre asked the Centre for Economic Development, Transport and the Environment for an opinion on whether a Natura assessment was necessary.

The ELY Centre considered that the felling was unlikely to significantly weaken the natural habitats based on which the area had been selected for the Natura 2000 network. An assessment as specified in Section 65 of the Nature Conservation Act would therefore not be necessary, as long as the area was protected by leaving a 20-metre zone of untouched forest between the Natura area and the felling area.

Once felling began, the forest company contacted the Uusimaa ELY Centre. Owing to a technical GPS error and incorrect reading of the map, the contractor doing the felling had cut all of the trees in the 20-metre protection zone required by the ELY Centre, and had also cut trees on the Natura site, in an area some 600 metres long and extending 10 to 40 metres into the protected area. Once the contractor noticed the error, felling was stopped immediately.

Baseline condition

The Natura 2000 site covers some 40 hectares in total. According to the official fact sheet, the natural habitats based on which the area was selected for the Natura 2000 network include *Forests of Boreal Europe* (9010), *Fennoscandian herb-rich forests* (9050) and *bog woodland* (91D0) specified in Annex I of the Habitats Directive. Representativeness of the types in the area is assessed as excellent (A). Of the Natura area, 50

per cent has been classified as forests of boreal Europe, 25 per cent as Fennoscandian herb-rich forests and 8 per cent as bog woodland. Metsähallitus has prepared a restoration plan. According to the recent inventory of habitat types, the forests of boreal Europe cover 23 hectares, Fennoscandian herb-rich forests cover 8 hectares, and bog woodland, 3 hectares. Based on the plan, 15 hectares of forests and bogs in the area require restoration. Suggested measures in the plan include girdling of trees, gap felling and ditch blocking.

Adverse effects of the damage

To determine the damage to the Natura site, representatives from the forest company and the Forestry Centre perform a review onsite. The report states that trees have been felled on 1.5 hectares of the Natura site. Based on the inventory of habitat types by Metsähallitus, the felling has destroyed 1.2 hectares of forest of Boreal Europe and 0.3 hectares of natural spruce mires included in bog woodland. In addition to the damage to trees, the deep wheel tracks of the forest machinery threaten the hydrology of the natural spruce mire.

Assessment of the significance of the damage

The felling has destroyed 6 per cent of the *Forests of Boreal Europe* in the Natura area and 10 per cent of the *bog woodland*. The damaged habitats were the most representative and natural in the Natura area. Both *Forests of Boreal Europe* and *bog woodland* are prioritised habitats. The damaged area is significant, considering the total area of the Natura site. Natural recovery of such habitats to their baseline condition is very slow.

Pursuant to Section 57 a of the Nature Conservation Act, the felling constitutes occupational activity, and the operator has caused damage through negligence. Pursuant to the Environmental Liability Act, the ELY Centre can order the operator to take remedial measures by initiating administrative enforcement proceedings specified in the Nature Conservation Act.

Remediation of the damage

The ELY Centre requests the operator that caused the damage to propose remedial measures. The operator proposes replacing the felled trees in the area by planting trees, leaving the felled trees in the area to decompose and filling in the wheel tracks left by the forest machinery.

Under the assessment these measures are not considered sufficient to return the damaged area to its baseline condition within a reasonable time. Since it would take at least 100 to 150 years for the planted trees to mature enough to equal the baseline condition, complementary measures are required.

The ELY Centre orders the operator to take the primary remedial measures suggested, i.e. plant new trees, leave the felled trees on the ground and fill in the wheel tracks left by the forest machinery. As complementary remediation, the ELY Centre orders the operator to take all of the measures proposed in the restoration plan of the Natura site.

DOCUMENTATION PAGE

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<tr><td>Publication series and number</td><td colspan="4">Reports of the Ministry of the Environment 2en/2012</td></tr>
<tr><td>Abstract</td><td colspan="4">Finland's national legislation on environmental damage was revised in 2009, when the Act (383/2009) and Government Decree on the Remediation of Certain Environmental Damages were passed and amendments were made to certain existing statutes. These legislative changes were introduced in order to implement the EU Directive on environmental liability with regard to the prevention and remedying of environmental damage.

This publication, on the remediation of significant environmental damage and the related procedures, is designed primarily as a guide for authorities, particularly for Regional State Administrative Agencies, Centres for Economic Development, Transport and the Environment, and local environmental protection authorities. The publication also provides information to operators engaged in activities posing potential environmental risks, other operators interested in the subject, as well as citizens. Such information concerns legislative obligations and practices related to the remediation of environmental damage.

The primary goal is the prevention and control of environmental damage. However, in spite of these, damage does occur, at which point the means of remedying the damage must be considered. This publication examines the remediation of certain types of significant environmental damage, especially the assessment of the significance of the damage, the selection of remedial measures and official procedures related to remediation.

The manual focuses on significant environmental damage falling within the scope of application of the Act on the Remediation of Certain Environmental Damages (i.e. Environmental Liability Act). It is therefore not a general description of all situations in which environmental damage has occurred. However, where applicable, it can also be used in the prevention and remediation of less significant incidents of environmental damage. The manual aims to clarify and harmonise actions taken by authorities for the remediation of environmental damage, including cooperation with other authorities, such as municipalities and various expert organisations.

The Environmental Liability Act provides for necessary measures related to the remediation of significant damage to protected species, natural habitats and waters, as well as for liability to pay the costs of such measures. The principal aim of remedial measures is to restore the environment to the state in which it would be if no environmental damage had occurred. If this is impossible, other complementary and compensatory measures should be taken as needed outside the affected area, in order to remedy the damage to natural resources. The costs of these measures are mainly borne by the operator responsible for the environmental damage.

The Environmental Protection Act, the Water Act, the Nature Conservation Act and the Gene Technology Act contain provisions on how, in accordance with the Environmental Liability Act, orders may be issued to remedy significant environmental damage caused by activities falling within the scope of application of these acts. The provisions to be applied in such cases are those on administrative enforcement set out in the act concerned.</td></tr>
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<tr><td>Tiivistelmä</td><td colspan="3">Ympäristövahinkoihin liittyvää lainsäädäntöä uudistettiin vuonna 2009, kun säädettiin laki (383/2009) ja valtioneuvoston asetus eräiden ympäristölle aiheutuneiden vahinkojen korjaamisesta sekä tehtiin muutoksia eräisiin olemassa oleviin säädöksiin. Lainsäädännön muutoksilla pantiin täytäntöön EU:n direktiivi ympäristövastuusta ympäristövahinkojen ehkäisemisen ja korjaamisen osalta.

Tämän julkaisu merkittävien ympäristövahinkojen korjaamisesta ja siihen liittyvästä menettelystä on tarkoitettu ensisijaisesti oppaaksi viranomaisille eli erityisesti aluehallintovirastoille, elinkeino-, liikenne- ja ympäristökeskuksille ja kuntien ympäristönsuojeluviranomaisille. Julkaisu antaa kuitenkin myös ympäristöriskejä sisältävää toimintaa harjoittaville tahoille ja muille aiheesta kiinnostuneille toimijoille sekä kansalaisille tietoa lainsäädännön velvoitteista ja ympäristövahinkojen korjaamiseen liittyvistä käytännöistä.

Ympäristövahinkojen ehkäisy ja torjuminen ovat ensisijaisia toimenpiteitä, mutta niistä huolimatta vahinkoja tapahtuu ja silloin joudutaan tarkastelemaan keinoja vahinkojen korjaamiseksi. Tässä julkaisussa tarkastellaan eräiden merkittävien ympäristövahinkojen korjaamista ja erityisesti vahinkojen merkittävyyden arviointia, korjaavien toimien valintaa sekä korjaamiseen liittyviä viranomaismenettelyitä.

Oppaassa on keskitytty sellaisiin merkittäviin ympäristövahinkoihin, jotka kuuluvat eräiden ympäristölle aiheutuneiden vahinkojen korjaamisesta annetun lain soveltamisalaan. Opas ei siten ole yleisesitys kaikista ympäristövahinkotilanteista, mutta oppaassa esitettyä voidaan soveltuvin osin hyödyntää myös muiden, vähäisempien ympäristövahinkojen torjumisessa ja korjaamisessa.

Oppaan tavoitteena on selkiyttää ja yhdenmukaistaa ympäristövahinkojen korjaamiseen liittyvää viranomaisten toimintaa, mikä kattaa myös yhteistyön muiden viranomaisten kuten kuntien ja erilaisten asiantuntijalaitosten kanssa.

Ympäristövastuulaissa säädetään suojelluille lajeille ja luontotyypeille sekä vesille aiheutuvien merkittävien vahinkojen korjaamiseksi tarvittavista toimenpiteistä ja toimenpiteiden kustannusvastuusta. Korjaamistoimenpiteiden tavoitteena on ensisijaisesti palauttaa ympäristö tilaan, jossa se olisi, jos vahinkotapahtumaa ei olisi sattunut. Jollei tämä ole mahdollista, tulee luonnonvaroille aiheutuneen haitan korjaamiseksi tehdä muita täydentäviä ja korvaavia toimenpiteitä tarvittaessa myös muualla kuin vahingon tapahtumapaikalla. Toimenpiteiden kustannuksista vastaa pääsääntöisesti vahingon aiheuttanut toiminnanharjoittaja.

Ympäristönsuojelulaissa, vesilaissa, luonnonsuojelulaissa ja geenitekniikkalaissa säädetään siitä, miten lakien soveltamisalaan kuuluvassa toiminnassa aiheutunut merkittävä ympäristövahinko voidaan määrätä korjattavaksi ympäristövastuulain mukaisesti. Sovellettavaksi tulevat tällöin kunkin lain hallintopakkomenettelyä koskevat säännökset.</td></tr>
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PRESENTATIONSBLAD

Utgivare	Miljöministeriet Naturmiljöavdelningen			*Datum* Juli 2012
Författare	En arbetsgrupp tillsatt av miljöministeriet			
Publikationens titel	**Remediation of Significant Environmental Damage • Manual on Procedures** (Avhjälpande av betydande miljöskador • En handbok om förfaringssätt)			
Publikationsserie och nummer	Miljöministeriets rapporter 2en/2012			
Sammandrag	Lagstiftningen i anslutning till miljöskador reviderades år 2009 i och med att det stiftades en lag (383/2009) och utfärdades en statsrådsförordning om avhjälpande av vissa miljöskador och gjordes ändringar i några gällande författningar. Genom ändringarna i lagstiftningen genomfördes EU:s direktiv om miljöansvar för att förebygga och avhjälpa miljöskador. Denna publikation om avhjälpande av betydande miljöskador och förfarandet i anslutning till det är i första hand avsedd som handbok för myndigheterna, dvs. i synnerhet regionförvaltningsverken, närings-, trafik- och miljöcentralerna och de kommunala miljövårdsmyndigheterna. Publikationen ger dock också aktörer som bedriver verksamhet som inbegriper miljörisker samt medborgare och andra som är intresserade av ärendet information om förpliktelserna i lagstiftningen och förfarandena för att avhjälpa miljöskador. De primära åtgärderna är att förebygga och avvärja miljöskador, men oavsett detta inträffar det skador och då måste man undersöka med vilka metoder skadorna kan avhjälpas. Publikationen behandlar avhjälpande av vissa betydande miljöskador, i synnerhet bedömning av hur betydande skadorna är, val av avhjälpande åtgärder och myndighetsförfaranden i anslutning till avhjälpandet. Fokus ligger på betydande miljöskador som hör till tillämpningsområdet för lagen om avhjälpande av vissa miljöskador. Handboken ger därmed ingen allmän presentation av samtliga fall av miljöskada, men det som förs fram i handboken kan i tillämpliga delar också utnyttjas när andra, mindre omfattande miljöskador ska avvärjas och avhjälpas. Målet med handboken är att förtydliga och förenhetliga myndigheternas verksamhet vid avhjälpandet av miljöskador, vilket också inbegriper samarbete med andra myndigheter såsom kommuner och olika sakkunniginrättningar. I lagen om avhjälpande av vissa miljöskador föreskrivs det om de åtgärder som behövs för att avhjälpa betydande skador som föranletts skyddade arter och naturtyper och vattendrag samt om kostnadsansvaret för åtgärderna. Det primära målet med de avhjälpande åtgärderna är att återställa miljön i det tillstånd som skulle ha gällt om skadan inte inträffat. Om detta inte är möjligt bör det vidtas andra kompletterande och kompenserande åtgärder för att avhjälpa den skada som orsakats naturresurserna, vid behov även på en annan plats än den där skadan inträffade. För kostnaderna för åtgärderna svarar i regel den verksamhetsutövare som orsakat skadan. I miljöskyddslagen, vattenlagen, naturvårdslagen och gentekniklagen finns bestämmelser om hur en betydande miljöskada som uppstått i verksamhet som omfattas av dessa lagar kan avhjälpas i enlighet med lagen om avhjälpande av vissa miljöskador. I dessa fall ska respektive lags bestämmelser om förvaltningstvångsförfarande tillämpas.			
Nyckelord	ekosystemtjänster, återställande, GMO, lagstiftning, habitatdirektivet, förorenade markområden, inverkan på vattendrag, miljökatastrofer, miljöansvar, miljöskador			
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REMEDIATION OF SIGNIFICANT ENVIRONMENTAL DAMAGE

MINISTRY OF THE ENVIRONMENT