
Environmental Liability Regulations

Guidance Document



Environmental Protection Agency

The Environmental Protection Agency (EPA) is a statutory body responsible for protecting the environment in Ireland. We regulate and police activities that might otherwise cause pollution. We ensure there is solid information on environmental trends so that necessary actions are taken. Our priorities are protecting the Irish environment and ensuring that development is sustainable.

The EPA is an independent public body established in July 1993 under the Environmental Protection Agency Act, 1992. Its sponsor in Government is the Department of the Environment, Heritage and Local Government.

OUR RESPONSIBILITIES

LICENSING

We license the following to ensure that their emissions do not endanger human health or harm the environment:

- waste facilities (e.g., landfills, incinerators, waste transfer stations);
- large scale industrial activities (e.g., pharmaceutical manufacturing, cement manufacturing, power plants);
- intensive agriculture;
- the contained use and controlled release of Genetically Modified Organisms (GMOs);
- large petrol storage facilities.
- Waste water discharges

NATIONAL ENVIRONMENTAL ENFORCEMENT

- Conducting over 2,000 audits and inspections of EPA licensed facilities every year.
- Overseeing local authorities' environmental protection responsibilities in the areas of - air, noise, waste, waste-water and water quality.
- Working with local authorities and the Gardaí to stamp out illegal waste activity by co-ordinating a national enforcement network, targeting offenders, conducting investigations and overseeing remediation.
- Prosecuting those who flout environmental law and damage the environment as a result of their actions.

MONITORING, ANALYSING AND REPORTING ON THE ENVIRONMENT

- Monitoring air quality and the quality of rivers, lakes, tidal waters and ground waters; measuring water levels and river flows.
- Independent reporting to inform decision making by national and local government.

REGULATING IRELAND'S GREENHOUSE GAS EMISSIONS

- Quantifying Ireland's emissions of greenhouse gases in the context of our Kyoto commitments.
- Implementing the Emissions Trading Directive, involving over 100 companies who are major generators of carbon dioxide in Ireland.

ENVIRONMENTAL RESEARCH AND DEVELOPMENT

- Co-ordinating research on environmental issues (including air and water quality, climate change, biodiversity, environmental technologies).

STRATEGIC ENVIRONMENTAL ASSESSMENT

- Assessing the impact of plans and programmes on the Irish environment (such as waste management and development plans).

ENVIRONMENTAL PLANNING, EDUCATION AND GUIDANCE

- Providing guidance to the public and to industry on various environmental topics (including licence applications, waste prevention and environmental regulations).
- Generating greater environmental awareness (through environmental television programmes and primary and secondary schools' resource packs).

PROACTIVE WASTE MANAGEMENT

- Promoting waste prevention and minimisation projects through the co-ordination of the National Waste Prevention Programme, including input into the implementation of Producer Responsibility Initiatives.
- Enforcing Regulations such as Waste Electrical and Electronic Equipment (WEEE) and Restriction of Hazardous Substances (RoHS) and substances that deplete the ozone layer.
- Developing a National Hazardous Waste Management Plan to prevent and manage hazardous waste.

MANAGEMENT AND STRUCTURE OF THE EPA

The organisation is managed by a full time Board, consisting of a Director General and four Directors.

The work of the EPA is carried out across four offices:

- Office of Climate, Licensing and Resource Use
- Office of Environmental Enforcement
- Office of Environmental Assessment
- Office of Communications and Corporate Services

The EPA is assisted by an Advisory Committee of twelve members who meet several times a year to discuss issues of concern and offer advice to the Board.



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Environmental Protection Agency

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Environmental Liability Regulations

Guidance Document

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Version 1

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EXECUTIVE SUMMARY

About this Guidance

This document is intended to provide guidance for operators, regulatory authorities and the public in relation to the Environmental Liability Directive and the European Communities (Environmental Liability) Regulations 2008, (Statutory Instrument 547 of 2008) and Act. Further information can be obtained from the EPA's website www.epa.ie and from the Department of Environment, Heritage and Local Government's website www.environ.ie. This is the first version of the guidance and it may be amended once the proposed Environmental Liability Bill is passed.

Environmental Liability Directive - Purpose & Objectives

The Environmental Liability Directive (2004/35/EC) has been partially transposed into Irish law through the European Communities (Environmental Liability) Regulations (2008) and the Environmental Liability Act (tbc). The principal aims of the Regulations are to prevent and remedy water damage, land damage and damage to natural habitats and protected species¹ as defined in the Regulations. It reinforces the 'polluter pays' principle making an operator that causes environmental damage legally and financially liable for the damage caused and subsequent remediation through the liability regimes of the Regulations.

The fundamental objective of the Directive and the Regulations is to prevent and remedy environmental damage, therefore, there is an incentive for operators to proactively assess their environmental risks and manage them in order to prevent environmental damage occurring in the first place. Furthermore, the Regulations require operators to initiate preventive measures where there is an imminent threat of environmental damage occurring (as defined under the Directive). Proactive risk management involves the systematic review of business, operational and development activities that could pose a hazard coupled with an assessment of the sensitivities of the environment that could be impacted.

What is Environmental Damage?

The Environmental Liability Regulations 2008 define environmental damage under three categories:

- Damage to natural habitats and protected species - any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of European designated habitats or species (i.e. those covered by the Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC).

¹ "protected species and natural habitats" means—

- (a) the species mentioned in Article 4(2) of the Birds Directive or listed in Annex I thereto or listed in Annexes II and IV to the Habitats Directive, and
- (b) the habitats of species mentioned in Article 4(2) of the Birds Directive or listed in Annex I thereto or listed in Annex II to the Habitats Directive, and the natural habitats listed in Annex I to the Habitats Directive and the breeding sites or resting places of the species listed in Annex IV to the Habitats Directive.

- Water damage - damage which significantly adversely affects the ecological, chemical and/or quantitative status and/or ecological potential of waters covered in the Water Framework Directive (2000/60/EC).
- Land damage - any contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction in or under the land of substances, preparations, organisms or micro-organisms.

Who do the Regulations apply to?

Under the legislation an 'operator' is defined as any natural or legal, private or public person who operates or controls the occupational activity. Or, where this is provided for in national legislation, a person to whom decisive economic power over the technical functioning of such an activity has been delegated, including the holder of a permit or authorisation for such an activity or the person registering or notifying such an activity. An operator may be an individual, a company, a local authority, a state authority or any entity which causes damage, as defined in the Regulations.

There are two liability regimes that apply to operators within the Regulations:

- Strict liability applies to a wide range of operations that are listed in Schedule 3 of the Regulations. The operators of these activities are held strictly liable for water damage, land damage and damage to natural habitats and protected species as defined in the Regulations.

For example: Facilities include, amongst others, industrial and agricultural activities requiring permits under the 1996 Integrated Pollution Prevention and Control Directive, waste management operations including the transboundary shipment of waste, authorised discharges into surface and groundwater, water abstraction, the manufacture, storage and use of various substances, the transportation of dangerous goods, operations that cause air pollution, the contained use and transport of genetically modified micro-organisms and the deliberate release of genetically modified organisms as well as the management of mining and other extractive waste..

- Fault-based liability applies to all occupational activities that are not listed in Schedule 3 of the Regulations. Operators of occupational activities other than those listed in Schedule 3 are liable for damage to natural habitats and protected species, if the operator was at fault or negligent.

For example: Non-Schedule 3 activities include: agriculture, forestry, construction, tourism developments, transportation and freight hubs, coastal works, etc. Please note that this list is not exhaustive.

Remediation of Damage

The Environmental Liability Regulations set out a framework for the remediation of environmental damage which varies for water, habitats and species and land damage.

Water, Protected Species and Natural Habitats

Primary Remediation - Any remediation measure which returns a damaged natural resource or service to, or towards, its baseline condition. Examples include clean up of a contaminated river or restoration of a damaged habitat.

Complementary Remediation - Any remediation employed to compensate for the fact that primary remediation does not result in fully restoring the damaged natural resources or services. An example would be habitat enhancement at an adjoining site that has not been damaged by a hazard/incident to provide additional habitat for a protected species of bird.

Compensatory Remediation - Compensatory remediation is necessary to compensate for the lost level of natural resources or services caused by the time lag between when the damage occurred and when they are restored to baseline condition (known as interim losses).

Who is the Regulator?

The Environmental Protection Agency (EPA) is the designated competent authority within Ireland for the enforcement of the Regulations. Under the legislation the EPA has a range of powers and responsibilities, including:

- The power to direct an operator to carry out immediate measures where there is imminent threat of environmental damage or where damage has occurred.
- The power to decide on the necessary prevention/remediation measures required and direct an operator to carry out these measures once damage (or threat of damage) under the Regulations has been established.
- The power to recover any costs incurred in the assessment of damage and remediation from the operator who is liable.
- The responsibility to cooperate with competent authorities of other Member States and the European Commission where environmental damage in Ireland may affect another Member State.
- The power to prosecute an operator for failing to comply with a direction of the EPA.
- The responsibility to establish and maintain a Register (the 'Article 18 Register') containing the details presented in Schedule 6 of the Regulations such as the nature of the damage, dates of damage occurrence and subsequent enforcement actions, activity classification code of the operator, details of any appeal, remediation outcomes, etc.
- The power to request information from a public authority on performance of that authority's functions in respect of the prevention or remediation of environmental damage.

How will the Regulations affect operators and the public?

Operators have several responsibilities under the Regulations, namely:

- Prevention of environmental damage including taking measures to prevent damage occurring when there is an imminent threat of damage;
- Informing the EPA of the imminent threat of environmental damage where the preventive measures have not been successful in dispelling the threat;
- Informing the EPA when environmental damage has occurred;

- Complying with the EPA's direction in relation to imminent threat of damage or when damage has occurred; and
- Where damage has occurred the operator shall take steps to control, contain, remove or manage the contaminants.

Persons who are affected or likely to be affected by an instance of environmental damage or those who have sufficient interest in the environment, may submit to the EPA a request for action to assess and act where there is an imminent threat of environmental damage or where damage has occurred by way of submitting a report of such a circumstance. The EPA will review any submission and decide whether an imminent threat of environmental damage or actual environmental damage has occurred and take the necessary action under its powers.

1 INTRODUCTION

1.1 ABOUT THIS GUIDANCE

This guidance document has been prepared to provide a better understanding of the requirements and application of the European Community (Environmental Liability) Regulations 2008. The document describes the main provisions of the legislation, in particular, when the **Regulations** apply, who they apply to and the requirements for those concerned.

A glossary of the key terms (highlighted in bold text throughout this guidance) is provided in Appendix A. Where key aspects of the legislation are addressed, the particular section of the legislation is highlighted in a text box in the margin.

The guidance is aimed at **operators**, persons whose activities have the potential to cause either an **imminent threat of environmental damage** or actual **environmental damage**, authorities in the field of environmental protection and any person with a wider interest in environmental liability and the legislation. This detailed guidance is supplemented by a quick reference guide, which is available on the Environmental Protection Agency's website (contact details below).

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Website: <http://www.epa.ie/whatwedo/enforce/liab/>

1.2 BACKGROUND AND OBJECTIVES

The Environmental Liability Directive is based on the '**polluter pays**' principle. It requires those operators whose activities pose an imminent threat of environmental damage to take preventive actions, and where such damage has occurred, to remediate it and cover the **costs** of these measures and any costs incurred by the competent authority (EPA).

In Ireland, like many other EU Member States, there is a civil liability regime that covers damage to persons and property but does not necessarily cover damage to the environment. Environmental protection is enforced through a range of instruments but these sometimes place no obligation on a person who causes environmental damage to pay for or carry out the remediation operation.

1.3 THE ENVIRONMENTAL LIABILITY DIRECTIVE

In 2004, the European Parliament published Directive 2004/35/EC on environmental liability with regard to the prevention and remedying of environmental damage (known as the Environmental Liability Directive). The Environmental Liability Directive entered into force on

30 April 2004 and Member States had three years to transpose the **Directive** into domestic law.

The Environmental Liability Directive was adopted with the objective of establishing a common framework across the EU for the prevention and remedying of environmental damage or the imminent threat of damage. The inclusion of imminent threat in the legislation is an attempt to prevent damage from occurring by identifying and preventing actual damage occurring. Furthermore, the Directive also encourages operators to pro-actively manage risks in order to prevent damage occurring due to the considerable financial costs of **remediation**.

1.4 THE ENVIRONMENTAL LIABILITY REGULATIONS

The European Communities (Environmental Liability) Regulations 2008 (Statutory Instrument 547 of 2008), entered into force in Ireland on 1st April 2009. It is expected that the Environmental Liability Bill will be enacted in 2011. Together, these instruments transpose EU Directive 2004/35/EC into Irish law.

The principal aims of the Regulations are to prevent and remedy **water damage, land damage and damage to protected habitats and species**. They reinforce the 'polluter pays' principle making an operator that causes environmental damage legally and financially liable for the damage caused and subsequent remediation through the **liability regimes**.

1.5 COMPETENT AUTHORITY

The EPA is the sole competent authority in the State for the purposes of the Environmental Liability Regulations.

Reg. 6

1.6 WHAT IS ENVIRONMENTAL DAMAGE

There are three different types of environmental damage covered in the Regulations:

Reg. 2(1)

- damage to natural habitats and protected species – any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of European designated protected habitats and species (i.e. those covered by the **Habitats Directive** (92/43/EEC) and **Birds Directive** (79/409/EEC)).
- water damage – any damage which adversely affects the ecological chemical, and/or quantitative status and/or ecological potential of water bodies as defined by the **Water Framework Directive** (2000/60/EC) - including inland, transitional and coastal surface waters and groundwaters.
- land damage - any contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction in or under the land of substances, preparations, organisms or micro-organisms.

Note: Where environmental damage is referenced it means only damage as defined in the Regulations, otherwise it is referred to as damage to the environment.

The Regulations contain two distinct liability regimes applicable to the environmental damage listed above:

Reg. 3(1)

- **strict liability** applies to a wide range of occupational activities that are listed in Schedule 3 of the Regulations. The operators of these activities are held strictly liable for water damage, land damage and damage to natural habitats and protected species. For example, an industrial facility operating under an **IPPC** licence.
- **fault-based liability** applies to all occupational activities that are not listed in Schedule 3 of the Regulations. The operators of non-Schedule 3 activities are liable for damage to protected species and natural habitats protected at EU level under the Birds and Habitats Directives only if the operator has been at fault or negligent. For example, a developer who causes damage to a natural habitat during the construction of a project by failing to implement the mitigation measures specified in the EIS.

1.7 CONCEPTS AND TERMINOLOGY

A complete glossary of the terminology employed in this document is included in Appendix A and all terms included in the glossary are highlighted in bold once introduced in the main document. Where reference is made to key aspects of the Regulations, the relevant Regulation is noted on the right hand side of the page throughout the guidance document.

2 THE ENVIRONMENTAL LIABILITY REGULATIONS

2.1 SCOPE OF THE REGULATIONS

The Environmental Liability Regulations were introduced to ensure that where environmental damage has occurred, the operator is held responsible for the full costs of remediation of that damage. The main objective of the Regulations is to prevent damage from occurring and to remedy this damage when and where it occurs.

Environmental damage is defined in the Regulations as damage to protected species and habitats, water damage and land damage.

2.2 ENVIRONMENTAL DAMAGE

The legislation covers only the most significant cases of environmental damage and definitions of what constitutes significant environmental damage are presented below. Further details of the criteria for environmental damage assessment are presented in Section 6 of this guidance.

Reg. 2(1)

- damage to natural habitats and protected species means any damage that has significant adverse effects on reaching or maintaining the **favourable conservation status** of those habitats or species. The species and habitats covered are those listed in the Birds Directive (79/409/EEC) and the Habitats Directive (92/43/EEC). An example of damage to a natural habitat would include a discharge of a chemical spill by an operator which damages an SAC (Special Area of Conservation) wetland habitat to such an extent that it affects the conservation status of that habitat.
- water damage means damage which significantly adversely affects the ecological, chemical and/or quantitative status and/or ecological potential of a water body, as defined in the Water Framework Directive (2000/60/EC). This applies to all surface waters (including inland rivers and lakes), transitional waters, coastal waters as well as groundwaters. An example would include a pump failure at a waste water treatment plant leading to a significant discharge of raw sewage to a lake which reduces the biological water quality status of that lake from 'good' to 'moderate'.
- land damage is defined as any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction in or under the land of substances, preparations, organisms or micro-organisms. For example, release and migration of diesel from an underground storage tank on an industrial site which has an effect on neighbouring properties.

It is important to note that the Regulations not only cover environmental damage but also the imminent threat of environmental damage. The following example demonstrates the difference between an imminent threat of damage and damage that has occurred.

Imminent Threat of Damage - Example

An above ground storage tank containing a solvent (toluene) is situated above a sand and gravel subsoil with a shallow water table and vulnerable aquifer. The tank has ruptured following an incident and the bunding is compromised providing inadequate containment. In this case the toluene is likely to leak to the aquifer without any further intervention, such as appropriate secondary containment.

Actual Damage - Example

During a routine refilling operation, a fuel tanker overturns on an industrial site and the tanker starts to release fuel to the surrounding area. This fuel release is not contained and it flows towards an adjoining river, where it discharges, causing a deterioration in the status of the water body as defined in the Water Framework Directive.

2.3 ACTIVITIES AND OPERATIONS COVERED

The Regulations contain two different liability regimes that apply to operators, namely:

Reg. 3(1)

- Strict liability applies to a wide range of occupational activities that are listed in Schedule 3 of the Regulations. The operators of these activities are held strictly liable for water damage, land damage and damage to natural habitats and protected species as defined in the Regulations. These activities operate subject to one of the following:
 - (a) a licence,
 - (b) a permit,
 - (c) an authorisation,
 - (d) a consent, or
 - (e) other like instrument,

An example would include a landfill operating under a Waste Licence from the EPA, which is known to have caused damage to water from the discharge of leachate to a groundwater body, lowering the status of that water body.

- Fault-based liability applies to all occupational activities that are not listed in Schedule 3 of the Regulations. The operators of such activities are liable for damage to natural habitats and protected species through fault or negligence.

An example would be a farmer starting a fire to clear gorse bushes from his land, where the fire becomes out of control and destroys an adjoining EU designated habitat (listed in Annex 1 of the Habitats Directive (92/43/EEC)). In this case the farmer is negligent and damage to habitats is known to have occurred.

A summary of the occupational activities covered by each liability regime and the environmental damage included under each regime is provided in Table 2.1.

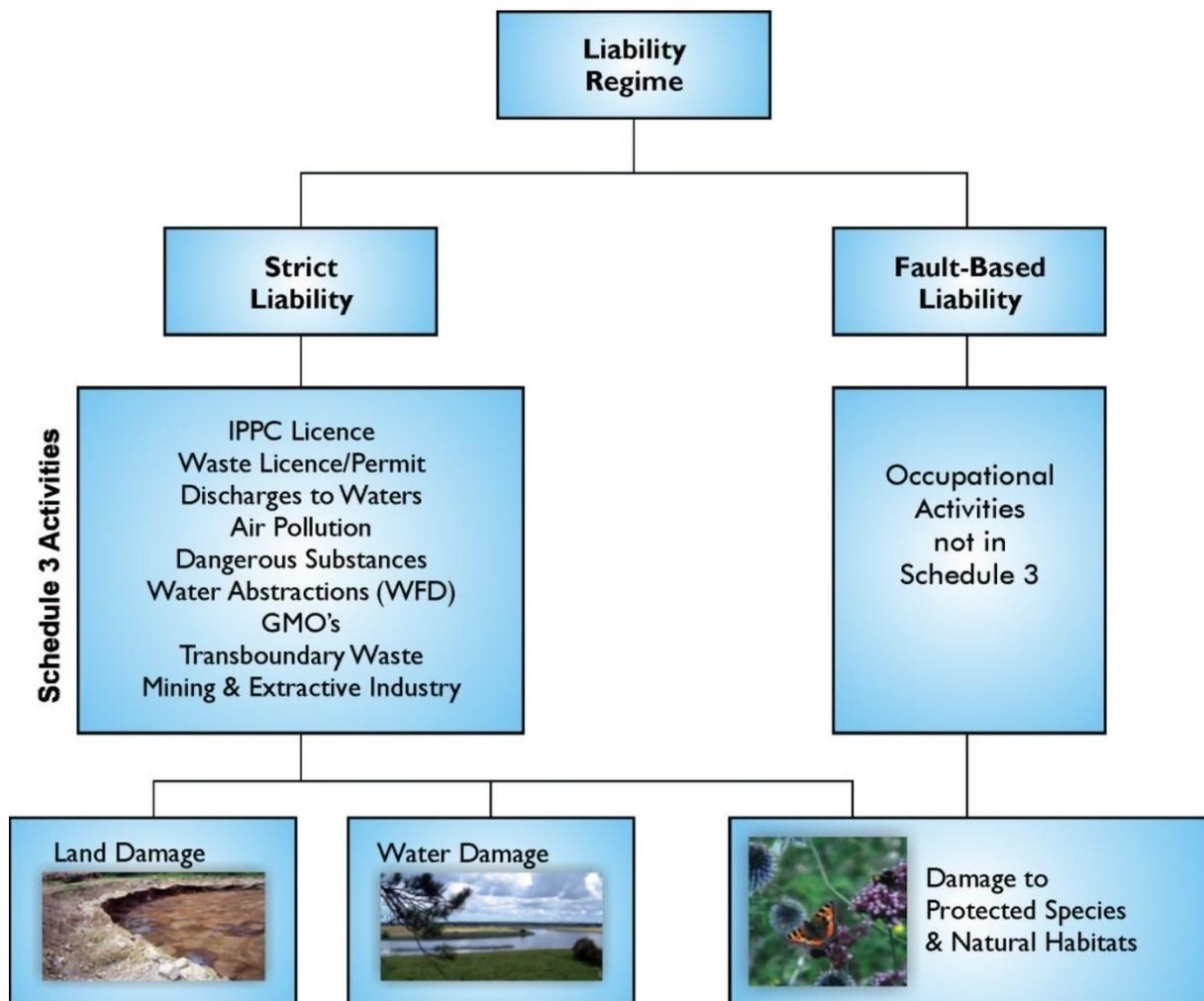
Table 2.1: Occupational activities and liability regimes

Liability Regimes	Occupational Activities	Damage to Habitats & Species	Water Damage	Land Damage
Strict All Schedule 3 Activities	IPPC licensed facilities Waste management operations (licence and permit) Discharges to surface and groundwater (discharge licence) Water abstractions under licence (WFD) Manufacture & Use of Dangerous Substances Transport of Dangerous Goods Air Pollution Licences Contained Use of GMO Deliberate release of GMO Transboundary Shipment of Waste Mining & Extractive Industry Waste	√	√	√
Fault – Based Activities not included within Schedule 3	Any activity not listed above ⁽¹⁾ .	√	X	X

Note: 1. For example agriculture, forestry, construction, tourism developments, transportation and freight hubs, etc. where these operators do not have a licence or permit, as listed in Schedule 3 of the Regulations.

Figure 2.1 presents an outline of the two liability regimes and the activities covered.

Figure 2.1: Environmental liability regimes



2.4 EXCEPTIONS

There are a number of exceptions to the Regulations that relate either to the dates that the damage occurred or to the operations that caused the damage. The temporal exceptions set out the restrictions on the dates within which damage is covered by the Regulations. The operational exceptions are a list of activities for which environmental damage or imminent damage resulting from these activities are excluded from the scope of the Regulations.

The temporal application means that the Regulations do not apply to the following:

Reg. 5

- damage caused by an emission, event or incident which took place before 1st April 2009, i.e. the Regulations are not retrospective.
- damage caused by an emission, event or incident which takes place after the 1st April 2009, when it derives from a specific activity that took place and finished before this date.
- damage, where more than 30 years have passed since the emission, event or incident resulting in the damage occurred, i.e. where the event occurs after the date of transposition but the consequences do not become apparent after 30 years.

The following text box provides an example of the temporal limit.

Temporal Limit - Example

An IPPC licensed operator has caused significant groundwater contamination in an underlying aquifer. The contamination was caused by historic activities on the site in the 1980's and has been the subject of extensive investigation. The contamination is currently being remediated under the supervision of the EPA through the IPPC Licence. Although the plume has impacted groundwater to a significant effect that it has impacted the chemical status of the underlying groundwater body, it does not constitute water damage because it was caused by events that occurred prior to the implementation date of the Regulations (1st April 2009).

There are a number of operational exceptions where the Regulations do not apply:

- damage caused by pollution of a diffuse character, where it is not possible to establish a causal link between the damage and the operator. For example, a river in a rural area is being affected by agricultural/forestry activities in the catchment leading to a reduction in water quality status. However, as there are a large number of farms, commercial forests and other pollution sources within the catchment, a causal link can not be identified between the source of the pollution and the damage. Reg. 4(5)
- a natural phenomenon of exceptional, inevitable and irresistible character (e.g. earthquake, tsunami, volcanic eruption, etc.). Reg. 4(1)(b)
- an incident in respect of which liability or compensation falls within the scope of any of the International Conventions listed in Schedule 4 of the Regulations, which includes: Reg. 4(2)

 - Oil Pollution of the Sea (Civil Liability and Compensation)(Amendment) Act 1998;
 - Sea Pollution (Miscellaneous Provisions) Act 2006;
 - Sea Pollution (Hazardous Substances)(Compensation) Act 2005; and
 - Convention of 10 October 1989 on Civil Liability for Damage Caused during Carriage of Dangerous Goods by Road, Rail and Inland Navigation Vessels.
- an incident where an operator can limit his/her liability in accordance with the Merchant Shipping (Liability of Shipowners and Others) Act 1996. Reg. 4(3)
- activities of national defence or international security and activities to protect from natural disasters. Reg. 4(6)
- nuclear risks or environmental damage or imminent threat of damage caused by the activities to which the treaty establishing the European Atomic Energy Community applies. Reg. 4(4)(a)
- an incident or activity in respect of which compensation fails to be determined within any of the International Instruments listed in Schedule 5. Reg. 4(4)(b)

- an act of armed conflict, hostilities, civil war or insurrection.

Reg. 4(1)(a)

2.5 DEFENCES

The Directive outlines the following provisions in relation to the matter of defences against the costs of remediation:

Article 8(4). The Member States may allow the operator not to bear the cost of remedial actions taken pursuant to this Directive where he demonstrates that he was not at fault or negligent and that the environmental damage was caused by:

(a) an emission or event expressly authorised by, and fully in accordance with the conditions of, an authorisation conferred by or given under applicable national laws and regulations which implement those legislative measures adopted by the Community specified in Annex III, as applied at the date of the emission or event;

(b) an emission or activity or any manner of using a product in the course of an activity which the operator demonstrates was not considered likely to cause environmental damage according to the state of scientific and technical knowledge at the time when the emission was released or the activity took place.

It is a matter for Member States to choose whether or not to adopt the two discretions contained in Article 8(4) (a) and (b) of the Directive, normally referred to as the '**permit defence**' and the '**state-of-the-art defence**'. In the Irish context, adoption of these discretions is a matter for primary legislation. Accordingly, these discretions could not be dealt with in the Environmental Liability Regulations and consequently are outside the remit of this guidance document.

3 ROLES AND RESPONSIBILITIES

3.1 ROLES AND RESPONSIBILITIES OF OPERATOR AND EPA

The Regulations set out the responsibilities of the operator and the roles of the EPA when assessing whether there is an imminent threat of damage, when damage has occurred and in remedying that damage. A fundamental principle throughout the Regulations is that operators take a proactive stance to deal with imminent threats of damage and actual damage and inform the EPA and other relevant stakeholders as soon as possible so that threats and actual damage can be dealt with expeditiously in order to reduce the severity and magnitude of impact.

The Regulations clearly set out the responsibility of the operator and the requirement to notify the EPA of imminent threat of damage and when damage has occurred. The Regulations also clearly set out the powers and responsibilities of the EPA to prevent imminent threat of damage and remediate damage that has occurred. A summary of the roles and responsibilities of the operator and the EPA are presented in Table 3.1.

Table 3.1 is presented on a stage-by-stage basis to represent the key responsibilities at each phase of the process.

Table 3.1: Roles and responsibilities of the operator and the EPA

Stage	Operator Responsibility	EPA Powers
<p>Imminent Threat of Environmental Damage</p>	<p>When an operator becomes aware of an imminent threat of environmental damage, the operator must take all necessary preventive measures without delay.</p> <p>If these preventive measures do not remove the threat of environmental damage, the operator must notify the EPA of the imminent threat and actions taken to date.</p> <p>The operator must comply with any direction from the EPA in relation to the imminent threat of environmental damage.</p>	<p>Once the EPA becomes aware of an imminent threat of damage, the EPA must issue a direction to an operator to provide specified information and to take necessary preventive measures or to identify preventive measures to be taken and gives instruction as to how such measures should be implemented.</p> <p>Where an operator fails to take the necessary measures, cannot be identified or has a defence under the Regulations, the EPA <u>may</u> take the necessary preventive measures itself to remove the threat where it considers it appropriate. If an operator can be identified and has failed to take the necessary measures, the EPA can seek to recover full costs from the operator.</p>
<p>Environmental Damage</p>	<p>Where the operator becomes aware that environmental damage has occurred the operator must inform the EPA immediately.</p> <p>The operator must take all necessary steps to immediately control the pollution in order to prevent further environmental damage.</p> <p>The operator must comply with any direction from the EPA in relation to environmental damage.</p>	<p>Once the EPA is aware of damage, the EPA will issue a direction to provide information and to take specified remedial measures.</p> <p>Where an operator fails to take the measures, the EPA may, as a last resort, take the necessary remedial measures where damage has occurred and seek to recover full costs from the operator.</p>
<p>Remediation</p>	<p>The operator must identify and choose what he/she considers to be the remedial measures required and submit same to the EPA. When the EPA has decided what remedial measures are to be undertaken, the EPA will issue a direction to the operator notifying him/her of the remedial measures that are to be undertaken. The operator must then comply with the EPA's direction to carry out all necessary remedial measures within the time period specified in the direction.</p>	<p>The EPA will decide the remedial measures required to ensure the remedying of environmental damage.</p> <p>The EPA will direct the operator who caused the damage to identify and choose remedial measures.</p> <p>The EPA will invite observations from qualifying third parties to assist in the decision-making for remedial measures.</p> <p>The EPA will invite observations from landowners, if entry onto these lands is required, to assist in the decision-making for remedial measures.</p> <p>The EPA will direct the operator who has caused the damage to carry out the remedial action measures required and identify the proposed level of monitoring and inspection required to ensure that the measures are effective.</p>

Reg. 7 and 8

Reg. 9 and 10

Reg. 11

3.2 ADDITIONAL EPA FUNCTIONS

In addition to the functions outlined in Table 3.1 the EPA has a number of additional administrative functions under the Regulations as outlined below:

- in the event of environmental damage (or the threat of damage), the EPA may request information from a public authority on performance of that authority's statutory functions in respect of the prevention or remediation of environmental damage. Reg. 14(1)
- the EPA must cooperate with competent authorities of other Member States and the EU Commission where environmental damage originating in Ireland may affect another Member State. Reg. 20
- the EPA must establish and maintain a register containing the details presented in Schedule 6 of the Regulations in relation to damage, remediation and costs of each case. Reg. 21
- the EPA may appoint authorised officers to ensure compliance with the Regulations. Reg. 23
- the EPA may prosecute an operator for offences under the Regulations. Reg. 24

The EPA also has a central role in the third party request for action and this role is outlined in Section 11 of this guidance.

4 RISK MANAGEMENT

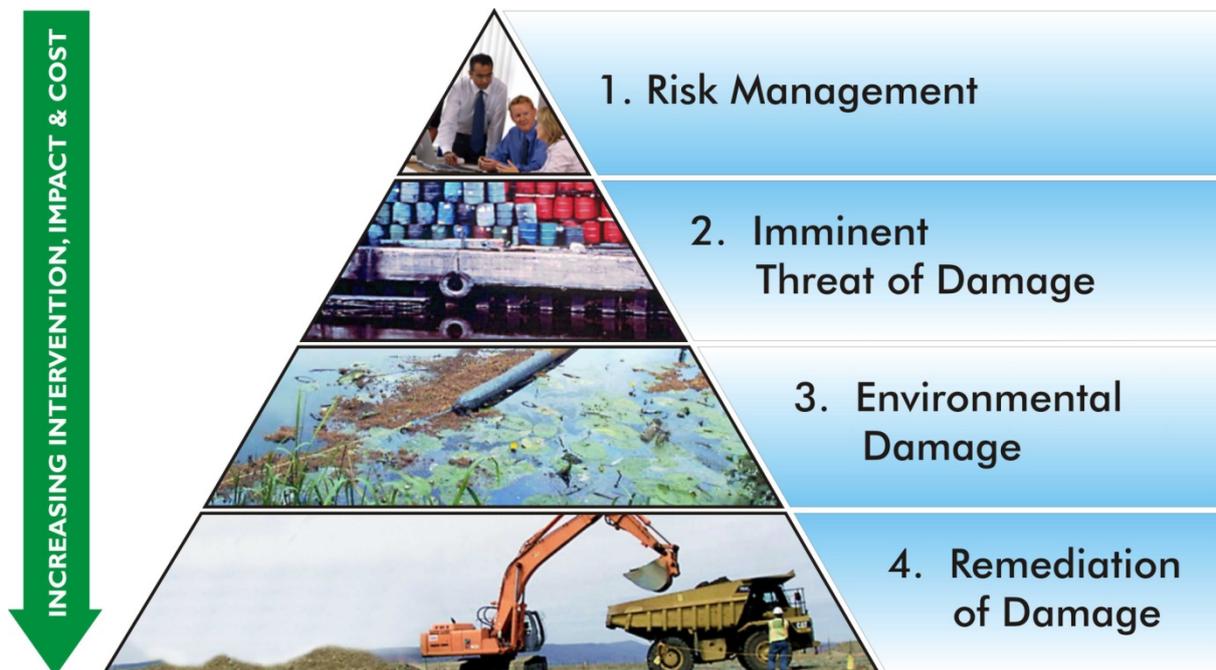
Sections 1 to 3 of this guidance outlined the key concepts and terminology of the Environmental Liability Regulations. The following sections present procedures and processes to assist in the application of the Regulations.

4.1 RISK HIERARCHY

Proactive environmental risk management can significantly reduce an operator's potential exposure under the Regulations and other environmental legislation. It stands to reason that the rate of incident occurrence and magnitude of impact will be lower for organisations that proactively manage his/her environmental risk than for those of a similar scope that do not.

The fundamental objectives of the Directive and the Regulations are to prevent and remedy environmental damage, therefore, there is an incentive for operators to assess his/her environmental risks and manage them in order to prevent environmental damage occurring in the first instance. The environmental risk hierarchy presented in Figure 4.1 illustrates the hierarchy of risk management for operators by not only reducing the potential to cause environmental damage but also reducing the ultimate cost to the operator.

Figure 4.1: Environmental risk hierarchy



This guidance sets out the principles and likely manner in which the Regulations may be implemented by the EPA.

1. **Proactive risk management.** Proactive risk management involves the systematic review of business, operational and development activities that could pose a hazard coupled with an assessment of the sensitivities of the environment that could be impacted upon. The preventive costs of mitigation can be significantly less than the costs that would arise if an incident were to occur. Furthermore, operators that have strong risk management systems can expect to have the added benefit of lower financial provision and insurance premiums.
2. **Imminent Threat of Environmental Damage** (Section 5). Determining an imminent threat may also be proactive and would include ongoing assessment of an activity to ensure that imminent threats are promptly identified. Dealing with an imminent threat will involve management time in addition to external costs from other sources depending on the nature of the threat. These may include some or all of the following: consultants, emergency response contractors and the capital costs associated with repairing and/or replacing damaged plant and equipment. There is also the potential that the operator will have to reimburse costs incurred by the EPA if they become involved in responding and issuing directions to the operator.
3. **Environmental Damage** (Section 6). Dealing with environmental damage will involve significant management time in addition to external costs from other sources depending on the nature of the damage. These may include some or all of the following: consultants, emergency response contractors and the capital costs associated with repairing and/or replacing damaged plant and equipment. There may also be costs incurred by the EPA as they become involved in evaluating the damage, liaising with other State bodies and issuing directions to the operator.
4. **Remediation** (Section 7). Remediation is the final step in the process and will be the most costly. Remediating environmental damage will involve significant management time in addition to external costs from several other sources depending on the nature of the remediation and subsequent monitoring of its effectiveness. These may include some or all of the following: consultants, emergency response contractors and the costs associated with **primary, complementary and compensatory remediation** that could also include the purchase of land to provide for the additional remediation measures. There may also be costs incurred by the EPA in overseeing and directing the remediation process, which the operator will be required to reimburse.

Figure 4.2 presents an operator responsibility and notification summary. The key inputs and outputs from the operator and the EPA and other parties are also summarised.

The process outlined above is presented in the following sections of this guidance. Additional technical information is provided in the following appendices to this guidance:

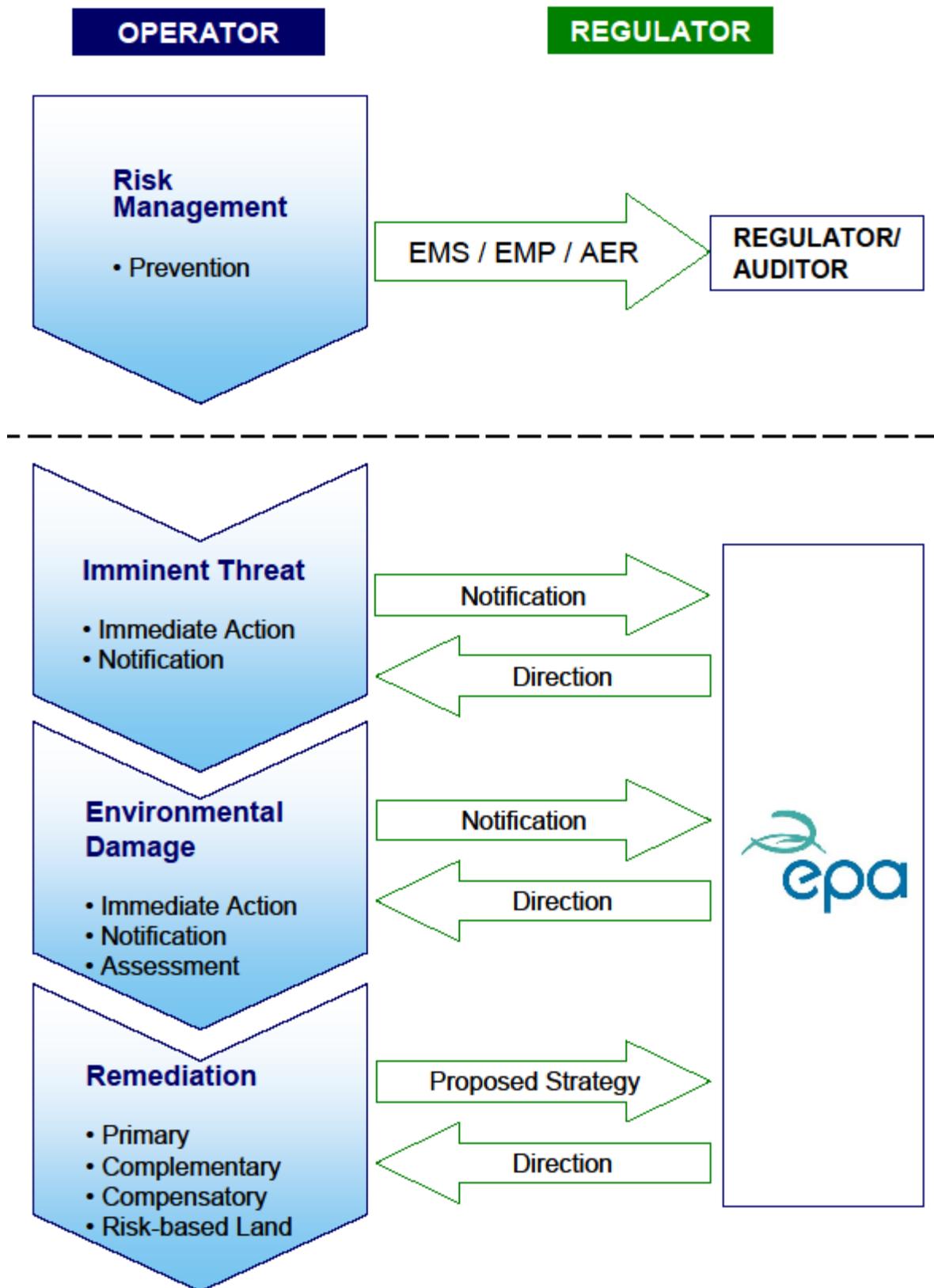
Appendix C – Further information on **Damage to Protected Species and Natural Habitats**

Appendix D – Further information on **Water Damage**

Appendix E – Remediation of **Damage to Protected Species and Natural Habitats**

Appendix F – Further information on **Land Damage** and Remediation

Figure 4.2: Operator responsibilities and notifications



4.2 GENERAL PRINCIPLES OF RISK MANAGEMENT

While the Regulations set out a common framework to be followed for assessment of imminent threat of damage, actual damage and subsequent remediation in line with the 'polluter pays' principle, these measures are also intended to generate an incentive for operators to manage his/her risks effectively. By proactively managing environmental risk, an operator can reduce both the potential for damage to the environment as well as any liability incurred under the Regulations and under other legislation.

In line with the environmental risk hierarchy presented in Figure 4.1, the costs associated with proactive risk management will be a fraction of the potential costs of remediation in the event of damage occurring. As such, while not a statutory obligation under the Regulations, it is advisable for all operators to implement environmental risk management for his/her operation.

The following section summarises the basic principles of environmental risk management and the process for continual improvement to reduce risk.

4.3 OPERATIONAL RISK MANAGEMENT

The basic steps for environmental risk management follow the general approach for all environmental management procedures as prescribed by **ISO14001** (Environmental Management Systems – requirements with guidance for use), known as the Plan-Do-Check-Act (PDCA) management model. PDCA is an ongoing, iterative process that enables an operator to manage environmental risks. Detailed information can be found in ISO14001 and an outline of the basic principles are presented below:

Plan – The operator should review all activities and operations under his/her control to assess the potential for damage or an imminent threat of damage occurring. This should include a review of both the operations (e.g. fuel storage on site, materials handling, containment, transport, etc.) and the sensitivity of the environment (e.g. proximity to the nearest water body, protected habitat, etc. as well as the existing status of these resources).

Do - Where the plan identifies areas of potential risk of damage, the operator should execute the necessary measures to mitigate this risk. These measures may be management based (e.g. training of staff in environmental awareness, documentation control, emergency response, etc.) or physical (e.g. installation of local containment, moving high risk contaminant sources such as tanks, etc.)

Check – The operator should carry out routine checking of operations to ensure that the mitigation measures put in place are adequate and that any new risks are addressed as above.

Act – The operator should also carry out ongoing review to identify areas for improvement to ensure that there is continual reduction in the overall risk at the site.

This is the recommended approach for any operator who wishes to actively manage and record his/her environmental risk and reduce his/her potential liability under the Regulations.

Any operator who maintains an environmental management system (EMS) will be familiar with this continuous improvement process. This includes all operators with an IPPC or Waste licence from the EPA who are obliged to maintain an EMS under the conditions of his/her licence.

Other operators may have developed an EMS for a range of purposes including corporate social responsibility, stakeholder engagement, conditions of planning (e.g. large construction projects), etc.

Environmental Liability Risk Assessment (ELRA) conducted by IPPC and Waste licensed operators provides a good example of a methodology for environmental risk management. The EPA guidance (*Guidance on Environmental Liability Risk Assessment, Residual Management Plans and Financial Provision, 2006*) on the subject provides a useful starting point for operators who may be unfamiliar with this approach. A critical aspect of this methodology is in ranking the risks and mitigating unacceptably high risks by raising awareness, changing operational practices, training, auditing, upgrading control systems and replacing old equipment, which will ultimately reduce the probability of an incident occurring.

4.4 FINANCIAL PROVISION

The Regulations do not make environmental liability insurance, or other financial security, mandatory for operators. However, the Directive does require Member States to take measures to encourage the development of appropriate financial security instruments, in order to allow operators to use financial guarantees to cover any potential liability.

Separately, through IPPC and Waste licensing, operators will have financial provision conditions and these should be reviewed by operators to ensure that the financial provision covers imminent threat, damage and remediation, including complementary and compensatory remediation as defined in the Regulations. The amount of financial provision should be reviewed to ensure that it is of sufficient value to pay for the full costs of liabilities under the Regulations.

There is a range of options available for financial provision for operators who wish to cover liabilities under the Regulations. These range from specialist environmental insurance, bonds and parent company guarantees. The appropriateness of the financial provision amount and the scope of cover should be verified by qualified persons to ensure that, in the event of an incident that creates an imminent threat or causes damage, the financial provision will apply (e.g. check exclusions in the operator's policy) and that the amount of cover is sufficient to pay for the necessary remedial measures, including any **compensatory** and **complementary remediation**.

Further information on the types of financial provision that may be suitable for operators is contained within the Unknown Liability Financial Provision section of the EPA *Guidance on Environmental Liability Risk Assessment, Residual Management Plans and Financial Provision, 2006*.

A thorough understanding of these risks is essential to ensuring that adequate financial provision is made for any imminent threats or potential damage and remediation.

5 IMMINENT THREAT OF DAMAGE

5.1 RESPONDING TO AN IMMINENT THREAT

This section sets out what should be done by an operator where he/she suspects that there is an imminent threat of environmental damage.

One of the main objectives of the Environmental Liability Regulations is to encourage operators, where a circumstance of imminent threat arises, to take preventive measures to eliminate the imminent threat in order to prevent actual damage occurring. The inclusion of imminent threat in the Regulations should result in a higher degree of environmental protection as damage will be prevented wherever possible.

Where an operator becomes aware of an imminent threat of damage, or ought to reasonably be expected to form the opinion that there is an imminent threat, the operator must take the necessary preventive measures to prevent the damage occurring. Failure to do so may result in prosecution.

Reg. 7(1)

An imminent threat of environmental damage means that there is a likelihood that environmental damage will occur in the near future if preventive action is not taken. It may be an incident that has not yet caused any damage but is sufficiently likely to cause damage in the future if action is not taken. Also it could be an event that has already occurred and that will cause environmental damage if immediate action is not taken.

Imminent Threat of Damage – Example

An IPPC licensed facility has significant solvent and chemical usage and storage on site and the facility is situated above a locally important fractured bedrock aquifer with moderate groundwater vulnerability which is used as a local water supply.

During a routine refilling of solvent from a road tanker to the tank farm via an underground pipeline, level meters on the tanks indicate a large volume of solvent is unaccounted for and has possibly leaked to the ground from a rupture in the underground pipeline.

In this case, while the ground has been contaminated after the incident, the aquifer has not yet been contaminated as the solvent has not migrated to the underlying aquifer. However, if the ground contamination is not addressed, contamination of the aquifer is likely to occur causing a significant risk to human health (land damage) and affecting the chemical status of the groundwater (water damage). In this case there is an imminent threat of damage, requiring emergency preventive action to be taken.

The two key requirements for an operator, once he/she becomes aware (or should be aware) of an imminent threat of damage are to:

- take the necessary preventive measures as a priority; and
- where the operator is of the opinion that the preventive measures do not dispel the threat of environmental damage, he/she must inform the EPA of the imminent threat and the preventive measures he/she has already taken.

5.2 IMMEDIATE ACTION

Where an operator is aware of an imminent threat of environmental damage, he/she is legally obliged to take the necessary preventive measures without delay. Failure to comply with these requirements is an offence under the Regulations.

Reg. 7(1)

In addition to the legal obligation to take early action to prevent environmental damage, the operator may significantly reduce his/her liability for remediation costs if early and effective preventive measures are undertaken.

An example of effective early action in the event of imminent threat of environmental damage is presented below.

Immediate Action – Example

A tank containing dangerous substances has started to leak and the substances have entered the permeable soil and are migrating to a nearby river. The early action in this case may be to empty the tank, remove the tank and excavate the contaminated soil for treatment prior to the substances reaching the river.

The above example indicates the types of immediate action that should be undertaken in such cases. All incidents will vary in terms of nature and extent and actions will be site and incident specific. An operator should examine all options for immediate action as part of a risk management plan for an activity.

5.3 NOTIFYING THE EPA

Where the operator is of the opinion that the preventive measures do not dispel the threat of environmental damage, he/she must inform the EPA of the imminent threat and the preventive measures he/she has already taken. Failure to do so may result in prosecution.

Reg. 7(2)

The notification to the EPA should specify the nature of damage, i.e. if it is a case of damage or an imminent threat of damage. Operators should report as much detail as possible and the information presented in the text box overleaf should be provided as a minimum.

A form that gives summary instruction and a list of relevant information required for notification under the Environmental Liability Regulations is available to download from the EPA website (<http://www.epa.ie/whatwedo/enforce/liab/>).

1. Operator's name, address of the activity and nature of the activity.
2. Name, position in the company and contact details.
3. The nature of the imminent threat or environmental damage (including dates and if the damage is ongoing).
4. Any licence or permit, including Register number that the facility operates under.
5. The name of the relevant local authority.
6. Fulllest possible account of the facts giving rise to the notification. The description should be as specific as possible and concentrate on the facts surrounding the threat of damage. Include details of the imminent threat, the preventive measures taken, preventive measures proposed or ongoing and the outcome of preventive measures taken to date along with an outline of specific dates and times and duration of any incidents/emissions and when the operator first became aware of the incident.
7. Details of any approaches that the operator has already made to other relevant public authorities (e.g. Local Authority, Department of Environment, Heritage and Local Government, Inland Fisheries, European Commission) and copies of this correspondence.
8. Details of any court or other legal actions or insurance claims in relation to the environmental damage.

Once the EPA becomes aware of the imminent threat of damage, the EPA has the power to direct an operator to carry out specific works to remedy the threat of damage.

Reg. 8(1)

5.4 NOTIFYING OTHER PARTIES

Under certain circumstances, other public bodies may require notification of an imminent threat of damage and the preventive measures that have been undertaken. Such bodies may include the local authorities or public authorities as may be required under separate legislation.

It may also be a policy requirement of the operator's financial provision, such as environmental insurance, to notify the provider immediately once an imminent threat of damage is notified to the EPA. The operator should be aware of his/her obligations in this regard.

6 DETERMINATION OF ENVIRONMENTAL DAMAGE

This section presents the responsibilities of operators where environmental damage has occurred and in addition, provides greater detail on screening assessment and establishment of **baseline conditions**. A more comprehensive description of what constitutes damage under the Regulations is also provided.

Environmental Damage - Example

This example follows on from that presented for the large pharmaceutical facility presented in Section 5.1 (imminent threat of damage). The facility is situated above a locally important fractured bedrock aquifer with moderate groundwater vulnerability that is used as a local water supply.

During the routine refilling of solvent from a road tanker to a tank farm via an underground pipeline on the facility, level meters on the tanks indicate a large volume of solvent is unaccounted for and has possibly leaked to the ground from a rupture in the underground pipeline.

In this case, both the ground and the underlying bedrock aquifer have been contaminated by the incident. Given that the aquifer is a local water supply and the solvent has mutagenic properties, there is a significant risk to human health from the damage. In this case, environmental damage under the Regulations has occurred.

6.1 IMMEDIATE ACTION

Where environmental damage has occurred the operator is legally obliged to take all necessary measures to immediately control the damage in order to prevent:

Reg. 9(2)

- further environmental damage;
- damage to human health; or
- further impairment of **services**.

Failure to comply with these requirements is an offence.

Reg. 9(3)

In the above example, immediate action in this instance would be to empty the tanks and pipeline, isolate the area, deploy booms (to prevent/limit movement of solvent from hard surfaced areas) and clean-up equipment, excavate the contaminated soil, and arrange for a temporary alternative drinking water supply for local residents. These actions would limit the extent of the damage and would prevent further damage.

It should be noted that the circumstances of all incidents will differ and the nature and type of immediate action to be undertaken will be site and incident specific. Operators should plan for a range of possible immediate action responses using the risk management procedures presented in Section 5.

6.2 NOTIFICATION

Once the operator becomes aware of environmental damage, he/she is required to inform the EPA of the damage without delay. Failure to notify the EPA is an offence under the Regulations.

Reg. 9(1)

The notification to the EPA should specify the nature of the damage and should report, as a minimum, as much detail as possible using the headings presented in Section 5.3 of this guidance (summarised below).

1. Operator's Name, address of the activity and nature of the activity.
2. Name, position in the company and contact details.
3. The nature of the imminent threat or actual environmental damage (including dates and if the damage is ongoing).
4. Any licence or permit, including Register number the facility operates under.
5. The name of the relevant local authority.
6. Fullest possible account of the damage and preventive/remedial measures taken up to the time of notifying the EPA.
7. Details of any approaches that the operator has already made to other relevant public authorities
8. Details of any court or other legal actions or insurance claims in relation to the environmental damage.

6.3 SCREENING

Once the EPA is notified of a potential case of environmental damage, an assessment may be undertaken to determine if the Environmental Liability Regulations apply or if other legislation applies. The following section outlines the process for this screening assessment.

The screening assessment takes a precautionary approach to assess whether or not the damage constitutes environmental damage. Where there is doubt, it is considered that the damage may be covered by the Regulations and further investigation may be required.

The step-by-step methodology presented in Table 6.1 is used to screen cases of damage and is illustrated in the flow chart presented in Figure 6.1.

In the event that environmental damage has occurred and it is considered that there is the potential for this damage to be significant, then the investigation will proceed to the next stage. If damage is not covered by the Regulations, this will be recorded and, where relevant, the details will be passed on to the relevant enforcement authority where the incident may be dealt with under other domestic legislation.

Figure 6.1: Screening assessment for damage under the Regulations

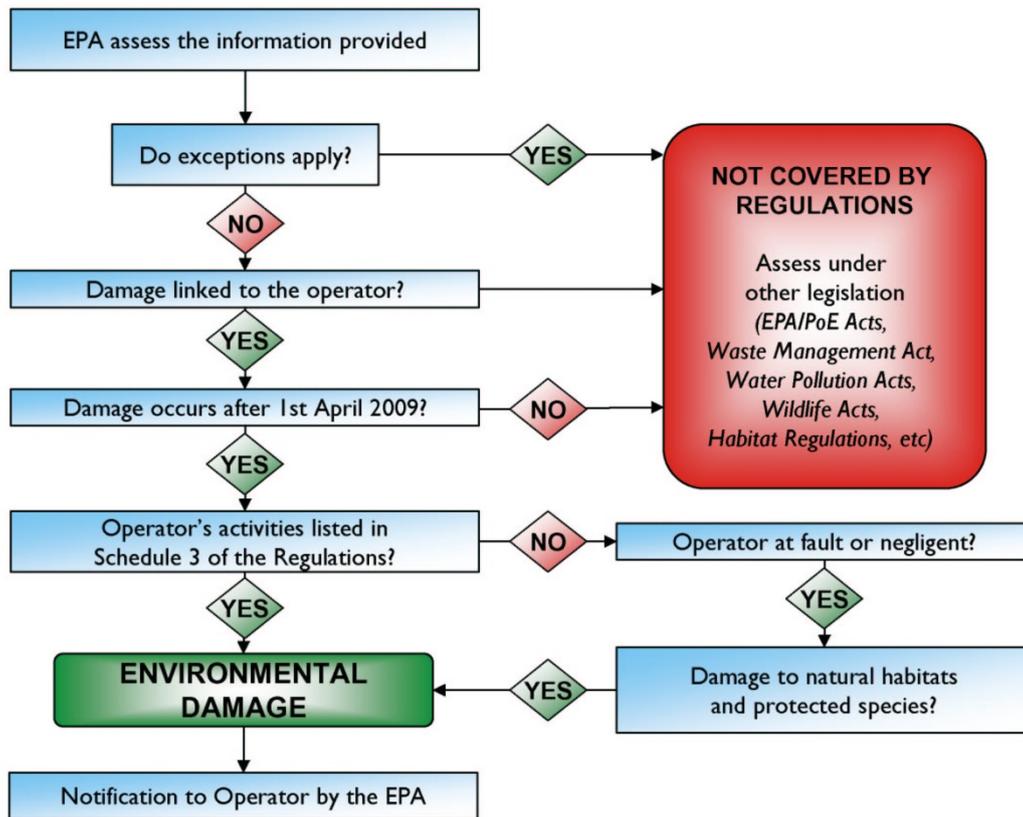


Table 6.1: Environmental Damage Screening

1. Identify if the damage can be linked to an operator(s) as defined in the Regulations. For example, if there is a spill into a river, is there evidence that the spill originated from the operator's facility or as a result of the operator's activities.
2. Assess if this damage or imminent threat of damage occurred within the timeframe of the Regulations. Only incidents which occur after the 1st April 2009 are covered. If the damage is caused after the 1st April 2009, from an incident which occurred before this date, then the Regulations do not cover the damage. If more than 30 years have passed since an incident occurred, then the Regulations do not apply.
3. Is the activity of the operator listed as an exception to the Regulations?
4. Is the operator's activity listed in Schedule 3 of the Regulations? If 'Yes', then the operator is strictly liable for any significant environmental damage caused to water, land and/or EU protected species and natural habitats. If 'No', then the operator is liable for significant damage to protected species and natural habitats only if the operator has been at fault or negligent.
5. For Schedule 3 operators, is there the potential for the damage to be significant? Where the answer is 'Yes', the investigation will proceed to the next stage and the case will be treated as environmental damage under the Regulations until proved otherwise. If the answer is 'No' then the investigation under the Regulations ceases pending further information but other legislation may apply to the damage. The criteria for environmental damage are outlined below: <ul style="list-style-type: none"> a. Damage to protected species and natural habitats means any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of habitats and/or species. b. Water damage is damage which significantly adversely affects the ecological, chemical and/or quantitative status and/or ecological potential of a water body, as defined in the Water Framework Directive. c. Land damage is defined as any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction in or under the land of substances, preparations, organisms or micro-organisms.
6. For non-Schedule 3 operators, is there the potential for the damage to EU designated species and natural habitats to be significant? If the answer is 'Yes', then the investigation will proceed to the next stage and the case will be treated as environmental damage under the Regulations until proved otherwise. If the answer is 'No', then the investigation under the Regulations ceases pending further information, however, other legislation may apply to the damage.

6.4 DAMAGE TO HABITATS AND SPECIES

In any assessment of damage to natural habitats and protected species, the EPA must take into account the habitats and species covered by the Regulations, the favourable conservation status of each the habitats and species and the baseline condition. This section outlines the scope of the Regulations in terms of the habitats and species that are covered, the key criteria that constitute favourable conservation status and options for determining the baseline condition. Supplementary information is provided in Appendix C.

6.4.1 Habitats and Species covered by the Regulations

The protected species and natural habitats covered by the Regulations are summarised in Table 6.2. A more detailed list of the habitats and species covered by the Regulations is presented in Appendix C. There are some exceptions to damage to protected species and natural habitats under the Regulations and these are also outlined in Appendix C. A strategic ranking of the habitats and species protected under European and Irish legislation, including the Environmental Liability Regulations is presented in Appendix C, Section C4.

Reg. 2(1)

Table 6.2: Overview of the habitats and species covered by the Regulations

Resource	EU Directive
Species of birds	Birds Directive, 79/409/EEC (listed in Annex I of that Directive and referred to in Article 4(2) of that Directive)
Species of plants and animals	Habitats Directive, 92/43/EEC (listed in Annex II and Annex IV)
Habitats of birds	Birds Directive, 79/409/EEC (listed in Annex I of that Directive and referred to in Article 4(2) of that Directive)
Habitats of plants and animals	Habitats Directive, 92/43/EEC (listed in Annex II of that Directive)
Natural habitats	Habitats Directive, 92/43/EEC (listed in Annex I of that Directive)
Breeding sites or resting places	Habitats Directive, 92/43/EEC (listed in Annex IV)

It should be noted that the species of birds, animals and plants listed in the Habitats and Birds Directives are protected to varying degrees under Irish legislation. Some species are protected only in designated areas while others are protected wherever they occur in Ireland. The Environmental Liability Regulations apply protection against damage to all species of birds, plant and animals listed in the relevant legislation (Table 6.2 above) wherever they occur in Ireland regardless of whether they are within or outside a designated land area, including built structures (e.g. bat roosts).

There is a network of European designated sites in Ireland, known as Natura 2000 sites. These are the natural habitats listed in Annex I of the Habitats Directive. These sites include:

- Special Areas of Conservation (**SACs**) - these are selected for conservation of habitats and species as listed under the Habitats Directive.
- Special Protection Areas (**SPAs**) – these are selected for the conservation of habitats of birds listed under the Birds Directive.

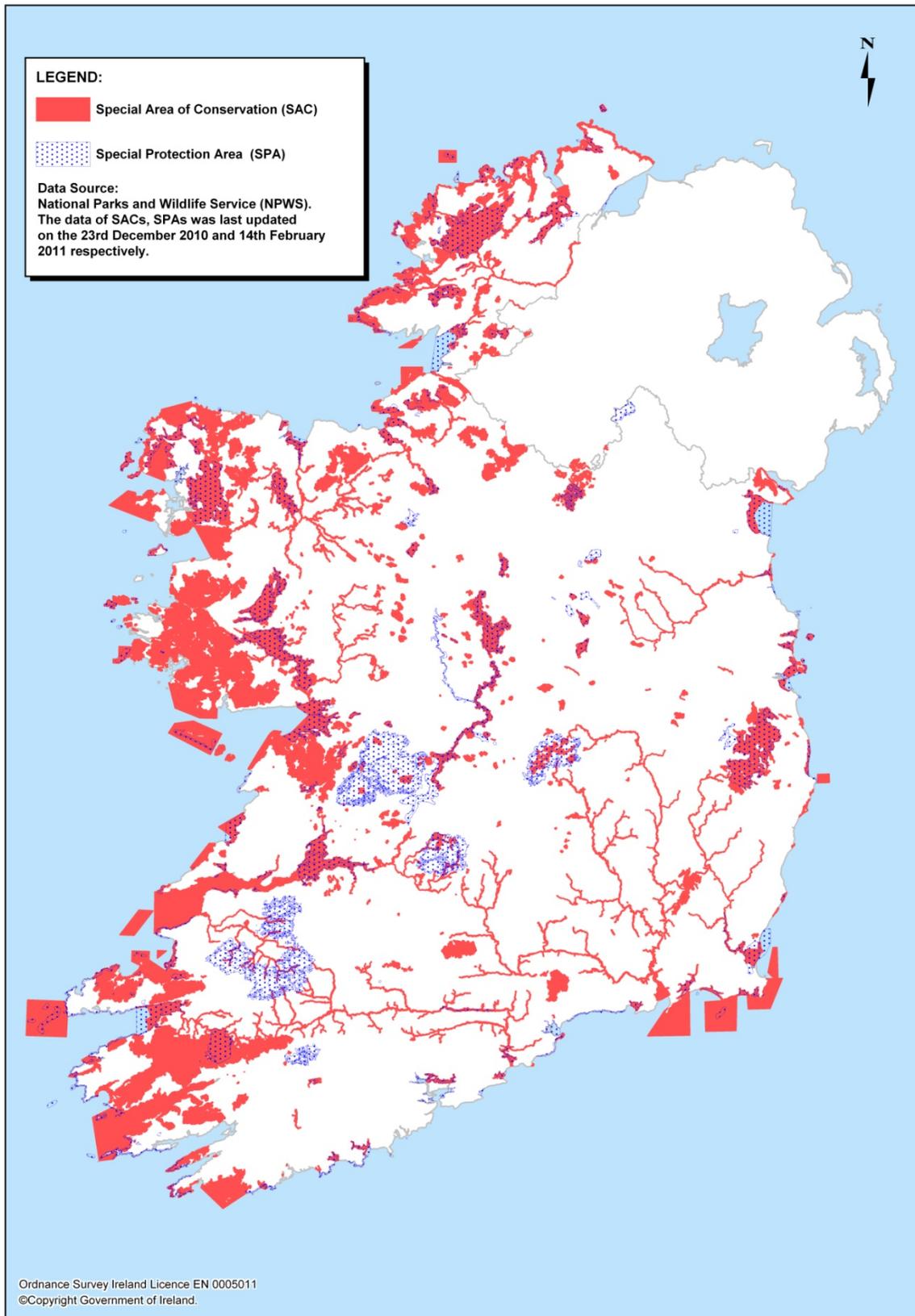
Figure 6.2 presents the national coverage and distribution of SACs and SPAs in the country as of September 2010. It should be noted that these designations are subject to change and the

reader is referred to the relevant websites for the most recent designations. Further information on sourcing this information is provided in Appendix C.

Ireland has applied the Habitats Directive to areas outside the 12 nautical mile limit with the proposal of offshore SACs around the Porcupine Basin. As a result, the species and habitats protected under the Environmental Liability Regulations include those in the area inclusive of the 200 mile exclusive fishery limit. It should be noted that protected species and natural habitats that are only designated under national legislation and are not designated under European legislation are not covered by the Environmental Liability Regulations. As such, Natural Heritage Areas (**NHAs**) are not covered by the Environmental Liability Regulations unless they are also designated as an SAC or SPA.

Further information on the habitats and species covered by the Regulations is presented in Appendix C of this guidance.

Figure 6.2: Map of European designated sites in Ireland (SAC & SPA data as of February 2011)



6.4.2 Favourable Conservation Status

The favourable conservation status of species and habitats has been defined in the Regulations. Conservation status of a species can be considered favourable if:

Reg. 2(1)

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

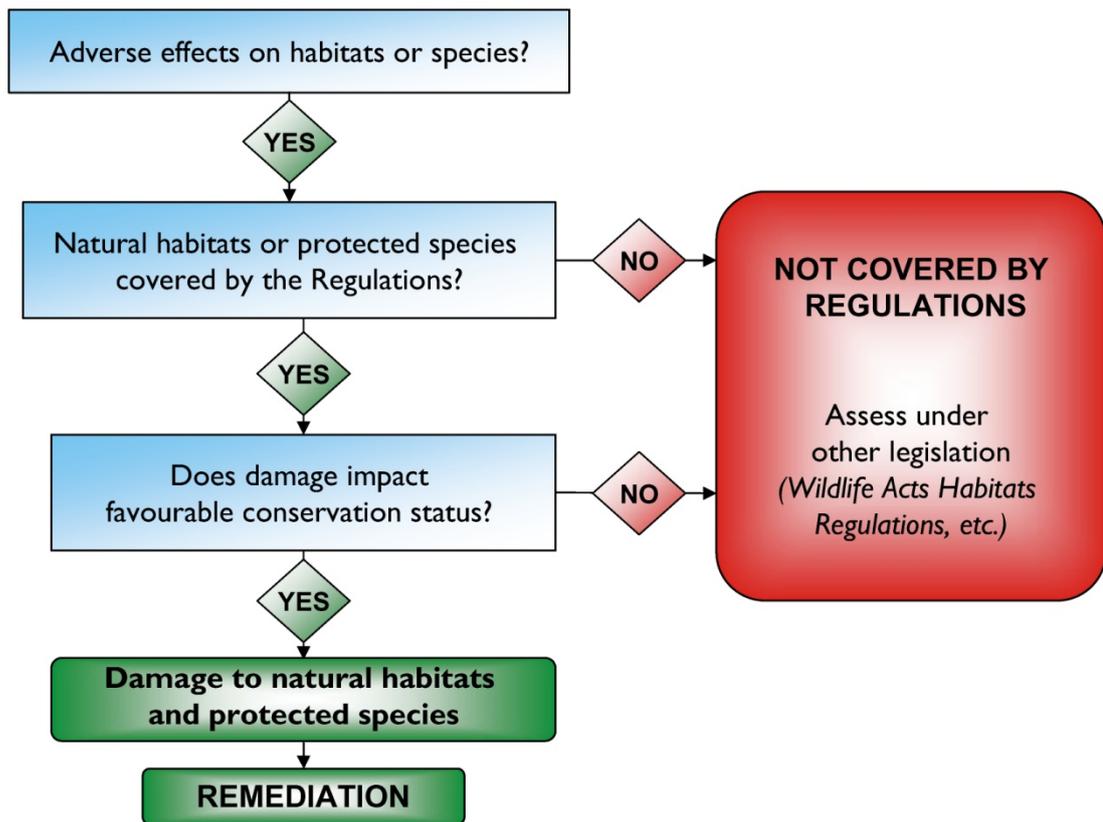
The conservation status of a habitat can equally be considered favourable if:

- its natural range, and the area it covers within that range, is stable or increasing;
- the structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist; and
- the conservation status of its typical species is favourable, as defined above.

These definitions can be used at a site level to enable an assessment to be made of the significance of the impact from a perceived damaging incident. Each of these criteria should be assessed by a suitably qualified person. The criteria to be addressed in a damage assessment are presented in Table 6.3. This data has been referenced from the 2006 EU Commission publication, '*Assessment, Monitoring and Reporting under Article 17 of the Habitats Directive: Explanatory Notes and Guidelines*'.

Table 6.3: Criteria which may be used for establishing favourable conservation status (source: EU Commission, 2006)

Aspect	Definition	Evaluation Criteria
Range of species or habitat	Range within which all significant ecological variations of the habitat/species are included for a given biogeographical region and which is sufficiently large to allow the long term survival of the habitat/species.	In making an assessment of a species or habitat range the appropriately qualified person needs to consider the following criteria in making a judgement: <ul style="list-style-type: none"> • Determine the current range of the species/habitat; • Determine the potential extent of a species/habitats range taking into account physical and ecological conditions (such as climate, geology, soil or altitude); • Determine the historic range of a species/habitat and causes of change; and • Determine the area required for viability of a species/habitat, including consideration of connectivity and migration issues. Where the range of a species or habitat is poorly documented, it will require expert judgement and detailed knowledge of that species or habitat.
Area of Habitat Range	Total surface area in a given biogeographical region considered the minimum necessary to ensure the long-term viability of the habitat type; this should include necessary areas for restoration or development of those habitat types for which the present coverage is not sufficient to ensure long-term viability.	In making an assessment of a habitat's range, the appropriately qualified person needs to consider the following criteria in making a judgement: <ul style="list-style-type: none"> • Historic distribution and causes of change; • Potential natural vegetation; • Actual distribution and actual variation; • Dynamics of the habitat type; • Natural variation (subtypes, syntaxa, ecological variants, etc.); and • Distribution pattern should allow exchange/gene flow in typical species.
Populations of Species	Population in a given biogeographical region considered the minimum necessary to ensure the long-term viability of the species.	In making an assessment of a habitats population the appropriately qualified person needs to consider the following criteria in making a judgement: <ul style="list-style-type: none"> • Historic distribution and abundances and causes of change; • Potential range; • Biological and ecological conditions; • Migration routes and dispersal ways; • Gene flow or genetic variation including clines; and • Population should be sufficiently large to accommodate natural fluctuations and allow a healthy population structure.
Suitable Habitat for a Species	No definition.	A favourable or suitable habitat required for the favourable conservation status of a protected species should ensure the following: <ul style="list-style-type: none"> • The area of habitat(s) of the species should be sufficiently large, stable and/or increasing; and • The habitat quality must be suitable for the long term survival of the species in question.
Structure and Function of a Habitat	No definition.	The structure and function of a habitat can vary hugely between different types of habitats but essentially the various ecological processes essential for a habitat have to be present and functioning for the habitat to be considered to be at a favourable conservation status. <p>A typical practical application of structure and function has been set out by the EU Commission as follows: <i>'for a woodland habitat function would include regeneration and nutrient cycling and structure would include elements such as the age class structure and presence of dead wood. It may not be necessary for all elements to be present on all sites. Similarly for mires the eco-hydrological regime can be essential, so that disruptions to it by e.g. drainage can be unfavourable. Although fragmentation is not mentioned in the directive it is clear that fragmentation can disrupt habitat function and is a factor that should be taken into account when assessing structure and function'</i>.</p>
Future prospects of the species or habitat	No definition.	If the main pressures and threats identified for a species or habitat are deemed not significant, then that species will remain viable in the long-term. The following rationale can be applied in order to determine the outcome of this stage of assessment: <ul style="list-style-type: none"> • Good prospects – species expected to survive and prosper; • No moderate prospects – species likely to struggle unless conditions change, and • Poor prospects – long-term viability at risk; species likely to become extinct. A practical example in application of this step is set out by the EU Commission - <i>'For example if the population(s) are all non reproducing mature individuals with no young or reproducing adults (as is the case for Margaritifera margaritifera (Natura code 1029) in many countries) the 'future prospects' will be poor or bad.'</i>

Figure 6.3: Determination of damage to habitats and species

6.4.3 Baseline Conservation Status

The EPA is required to determine whether there have been significant adverse changes to the baseline condition in order to assess if environmental damage to protected species and natural habitats has occurred. The specific habitats and species data necessary to determine baseline conditions are listed below:

Schedule 1

- the number of individuals, their density or the area covered;
- the role that particular individuals or the damaged area plays in relation to the species or to habitat conservation and the rarity of the species or habitat;
- the species' capacity for propagation, its viability or the habitat's capacity for natural regeneration; and
- the species' or habitat's capacity to recover within a short time to a condition which returns to the baseline condition.

It is important to note that there are circumstances where alterations to the baseline condition are not considered as damage under the Regulations and these should be factored into the baseline assessment, namely:

- negative variations smaller than natural fluctuations regarded as normal for the species or habitat in question;
- negative variations due to natural causes; and,
- damage to protected species and natural habitats from which it is established that they will recover, within a short timeframe and without intervention.

Schedule 1

The amount of baseline information available on protected species and natural habitats in Ireland varies. Baseline information is available from a wide range of sources as detailed in Appendix C.

6.4.4 Establishing Significance

It is considered that each incident of damage to protected species and natural habitats should be examined and assessed by the EPA on a case-by-case basis to determine whether or not such damage comes within the scope of the Regulations.

Once it has been established that damage to protected species or natural habitats has occurred, the significance of such damage needs to be assessed. The Regulations set out the criteria which should be applied in order to determine the extent of damage in relation to the baseline condition. Significant adverse changes to the baseline condition and the potential for impact on favourable conservation status should be determined by means of the criteria listed in Table 6.3.

Schedule 1

The EPA is required to carry out a damage assessment to establish the significance of the damage under the Regulations. The EPA may consult with other public authorities or private organisations to assist in the damage assessment. Where the local authority is the regulatory authority for an operator not licensed by the EPA, then the EPA will consult with the local authority on the damage assessment. The damage assessment will be based on professional, qualitative judgement on a number of issues and as such, should be carried out by suitably qualified experts with experience in the assessment of the damaged habitat or species. The EPA may also request the operator to carry out an assessment of damage.

One key point to note is that any damage to protected species and natural habitats that has a proven effect on human health must be classified as significant damage under the Regulations, regardless of the criteria outlined in Table 6.3.

6.5 WATER DAMAGE

Existing legislation in Ireland for the protection of waters is aimed at preventing polluting matter from entering the water and causing harmful effects to fish life, human health, domestic, commercial, industrial, agricultural or recreational uses. However, any person who causes such pollution may not be liable to carry out the necessary works to remediate the polluting matter under existing legislation. The Environmental Liability Regulations have introduced a specific requirement for an operator who causes water damage to take the necessary remedial measures. In order to assess if water damage is covered by the Regulations, the EPA needs to establish the water quality status baseline condition as well as the water quality status at the locations affected after an incident. The following sections outline the key criteria for the assessment of water damage and supplementary information is provided in Appendix D.

6.5.1 Water bodies covered by the Regulations

The water bodies covered by the Regulations include all waters covered by the Water Framework Directive (WFD) and as such include the water bodies listed in Table 6.4.

Reg. 2(1)

Table 6.4: Types of water bodies covered in the WFD

Water body	Description as per WFD
Rivers	A body of inland water flowing for the most part on the surface of the land but which may flow underground for part of its course.
Lakes	A body of standing inland surface water.
Transitional Waters	A body of surface water in the vicinity of river mouths, which is partly saline in character as a result of its proximity to coastal waters but which is substantially influenced by freshwater flows.
Coastal Waters	Surface waters which extend from the outer limit of transitional waters out to the 12 nautical mile limit.
Artificial Water Bodies	A body of surface water created by human activity, for example a canal.
Heavily Modified Water Bodies	A body of surface water which, as a result of physical alterations by human activity, is substantially changed in character, for example a reservoir or a dam.
Groundwaters	All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

Water damage, as defined under the Regulations, covers all water bodies out to the 12 nautical mile limit (including the territorial seas).

One important point to note in relation to water damage is that the exemption under Article 4(7) of the WFD also applies under the Regulations. Damage is not covered where the reduction in status is the result of development activities which have an overriding benefit to human health.

Detailed mapping of the water bodies covered by the WFD, their quality status, objectives and pressures are available through the work carried out under the WFD. Sources of this information are provided in Appendix D.

6.5.2 Water Quality Status

Water damage occurs where adverse effects are significant enough to cause a reduction in water body status to a lower status, as defined under the WFD. Water quality status under the WFD is based on a combination of ecological, chemical and physical parameters that are monitored and assessed to generate an overall 'status' for each water body.

Each water body in Ireland is categorised as having a quality status based on a five point scale (high, good, moderate, poor and bad). Under the WFD, water monitoring and status assessment is carried out on an ongoing basis. As a general rule, Ireland must aim to achieve at least 'good' status for all water bodies by 2015. This section provides a summary of the key criteria that are used to determine the status of a water body under the WFD and therefore damage under Regulations.

While the WFD includes a wide range of ecological, chemical and physical parameters in the assessment of status, not all of these are applicable to the assessment of damage under the Regulations. Effects will be regarded as environmental damage under the Regulations if they result in a change in status to a lower status in respect of:

- the ecological status of surface waters (except artificial or heavily modified water bodies, e.g. canals);
- the ecological potential of surface waters designated as artificial or heavily modified water bodies, e.g. canals;
- the chemical status of a body of surface water;
- the chemical status of a body of groundwater; and
- the quantitative status of a body of groundwater.

Table 6.5 presents a summary of the water quality classification system as described in the WFD. A detailed description of the classification tool is presented in the EPA 2006 publication, *Water Framework Directive Monitoring Programme*. Sources of additional information and links to the Water Framework Directive website are presented in Appendix D of this guidance.

Table 6.5: Summary mechanism for assessing water quality status

Water Body	Status	Description	Scores	Context
Surface Water	Ecological Status (except artificial or heavily modified water bodies)	Ecological status of a surface water body is established through three key areas: 1. Biological status describes the structure and functioning of aquatic ecosystems by considering aquatic algae, plants, invertebrates and fish. 2. General conditions are assessed by measuring oxygen, nutrients, transparency, (water clarity), temperature, acid status and salinity; together, these describe the general physico-chemical status of surface waters. 3. The levels of specific pollutants, chemical pollutants including metals, pesticides and hydrocarbon compounds of local relevance in Ireland.	High	High ecological status means that there are no or only very minor alterations to the different plant and animal groups. Bad ecological status means that there are severe alterations to the plant and animal communities such that large portions of the communities found at high ecological status are absent.
			Good	
			Moderate	
			Poor	
			Bad	
	Ecological Potential (artificial or heavily modified water bodies)	Ecological potential describes the degree to which the potential ecological quality of a water body's aquatic ecosystem has been realised, given the body's artificial or heavily modified characteristics. It only applies to water bodies that have been designated as heavily modified or artificial.	Maximum	If the maximum potential has been realised, the status is described as 'maximum ecological potential'. Good ecological potential describes a condition in which the ecological quality is only slightly less than the maximum.
			Good	
			Moderate	
			Poor	
			Bad	
	Chemical Status	Chemical Status describes whether surface waters contain safe levels of certain chemicals that have been identified as being of particular concern across Europe because of their toxicity, persistence and/or their ability to accumulate in plants and animals. These substances include the 'priority substances' identified in the Water Framework Directive as well as others identified under the Dangerous Substances Directive (76/464/EEC).	Good	The chemical classification system is straightforward: waters which breach one or more of the European standards fails to achieve good chemical status.
			Failing to achieve good	
Groundwater	Chemical Status	Groundwater chemical status includes parameters such as conductivity and concentrations of various pollutants as described under Annex V of the Water Framework Directive within the threshold limits as specified in Annex I of the Groundwater Directive (2006/118/EC).	Good	The parameters for determining groundwater chemical status are concentration of pollutants and conductivity.
			Poor	
	Quantitative Status	Groundwater quantitative status is principally a measure of the impact of groundwater abstraction on associated surface waters and on terrestrial ecosystems directly dependent on groundwater.	Good	The parameter for the classification of groundwater quantitative status is the groundwater level regime.
			Poor	

6.5.3 Baseline Water Quality Status

The EPA has established the national Water Framework Directive monitoring programme. This programme outlines the nature, frequency and extent of monitoring of surface waters and groundwater. As such, it is considered that the ecological, chemical and quantitative parameters of waters are currently established, and with the monitoring programme in place, it will be possible to determine on an ongoing basis if there has been any change to these parameters.

As a result, there is a comprehensive set of baseline data available for water quality. Further information in relation to sourcing this baseline information for water quality is presented in Appendix D of this guidance.

6.5.4 Assessment of Water Damage

Water damage occurs where adverse effects are significant enough to cause a reduction in status to a lower status. Effects will be regarded as significant enough to qualify as damage under the Regulations if they result in:

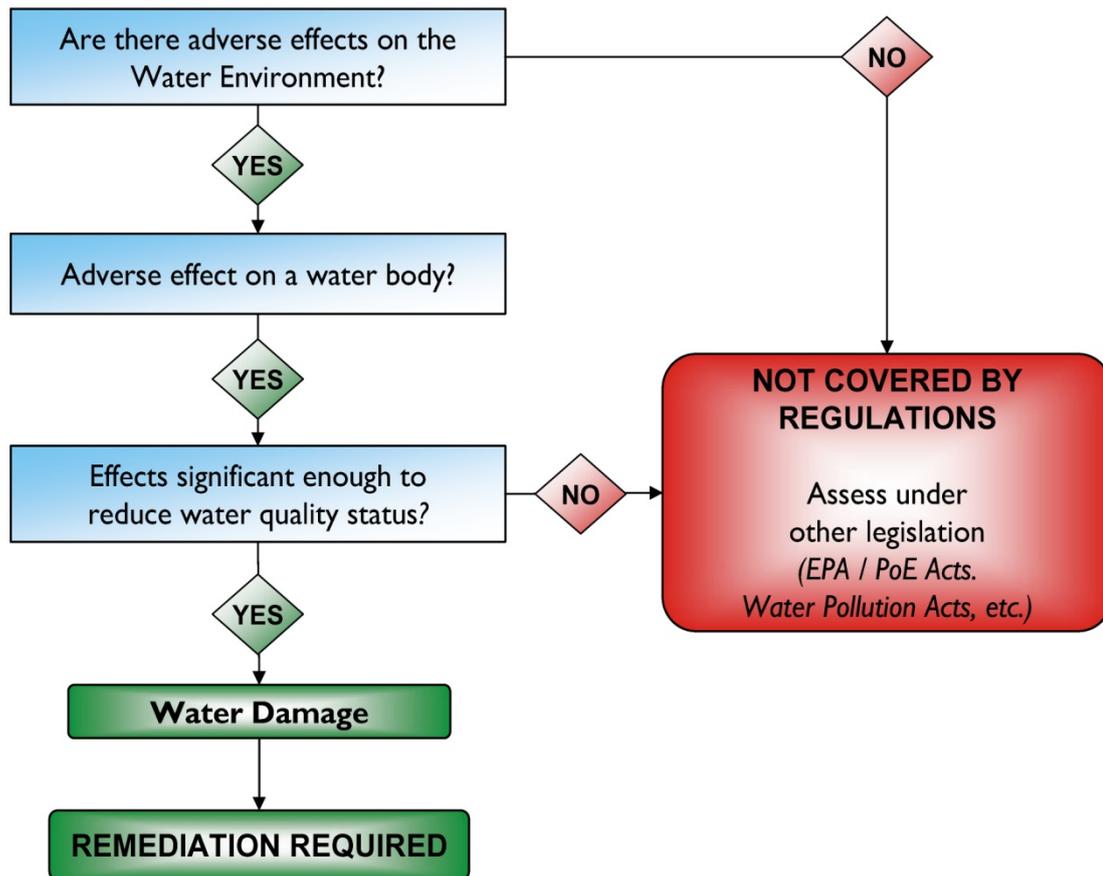
Reg. 2(1)

- change in status to a lower status; or
- change to a lower status of any quality element for the classification of bodies of surface water or any parameter (conductivity, level or concentration) for the classification of bodies of groundwater; or
- change to a lower status for any parameter (conductivity, level or concentration of pollutants) for the classification of bodies of groundwater.

Monitoring of the chemical, ecological or quantitative parameters of a water body may be carried out after an incident to establish the relevant status of a water body. Data analysis will follow the criteria outlined above under WFD reporting standards to establish the status of a water body.

Finally, if an incident of water damage causes water pollution to an extent that it adversely affects human health, then the damage is considered significant under the Regulations. This is regardless of the water quality status before or after the incident.

Figure 6.4 outlines the process for establishing water damage under the Regulations.

Figure 6.4: Determination of water damage

6.6 LAND DAMAGE

Land damage was not explicitly covered by legislation in Ireland prior to the implementation of the Regulations. However, some of the existing regulatory controls, such as the IPPC or waste regimes can to an extent, regulate land damage arising in relation to IPPC and waste activities. However, there are a range of other operations that are regulated by the local authorities and other statutory bodies as well as operators that have previously been unregulated that have the potential to cause land damage. This section outlines the key criteria for assessing land damage under the Regulations and the principles of human health **risk assessment**.

Reg. 2(1)

The Regulations define land damage as any land damage that creates a significant risk of human health being adversely affected. This is a risk-based definition which takes account of the characteristic and function of the soil, the type and concentration of polluting material, associated risks and the possibility of dispersion.

In terms of assessing whether land damage has occurred, the following points should be noted in relation to what is and is not defined as damage under the Regulations:

- risks to human health may result not only from the toxicological properties of contaminants but also from other hazardous properties such as flammability, explosiveness or propensity to asphyxiate. As such, each of these properties is considered as land damage under the Regulations where human health is at risk.

- exposure to airborne material from a source other than the land itself is not included. For example, a spill of a toxic chemical on a site leading to dispersion of airborne pollutants to a nearby residential area. This is not land damage. It is only damage if the land becomes contaminated and this leads to dispersion of airborne pollutants to the residences.
- contaminants have the potential to migrate over long distances from where they were originally introduced. However, the damage would still be covered if the contaminants pose a significant risk of human health being adversely affected. For example, a spill of a toxic chemical may have been on an industrial site (where it is not posing a risk to health) but may migrate down gradient towards nearby residential areas over several years, where it does pose a risk to human health.

The presence of 'significant risk' will be determined based on a structured risk assessment process as outlined in the following sections. The assessment of risk is presented as a two-tier system including screening risk assessment followed by site specific risk assessment where screening indicates a potential risk to health. These procedures are outlined in the following sections with additional information provided in Appendix F.

6.6.1 Risk Assessment Principles

Human health risk assessment methodologies have been employed in a number of countries and these were developed with an objective to provide protection to human health from release of contaminants to soil and groundwater. Acceptable risk is generally taken to mean risk that is required for everyday life. Unacceptable risk is something that no one should be exposed to and tolerable risk is taken as something less than acceptable but which can be tolerated based on consideration of other factors.

The risk assessment process used in the determination of land damage under the Regulations is based on the source-pathway-receptor (**SPR**) concept, whereby all three elements must be present in order for a risk to be present. This principle is illustrated in Figure 6.5. The decision-making process involved in the determination of land damage using a risk based approach is outlined in Figure 6.6.

Figure 6.5: Source-pathway-receptor concept in risk assessment

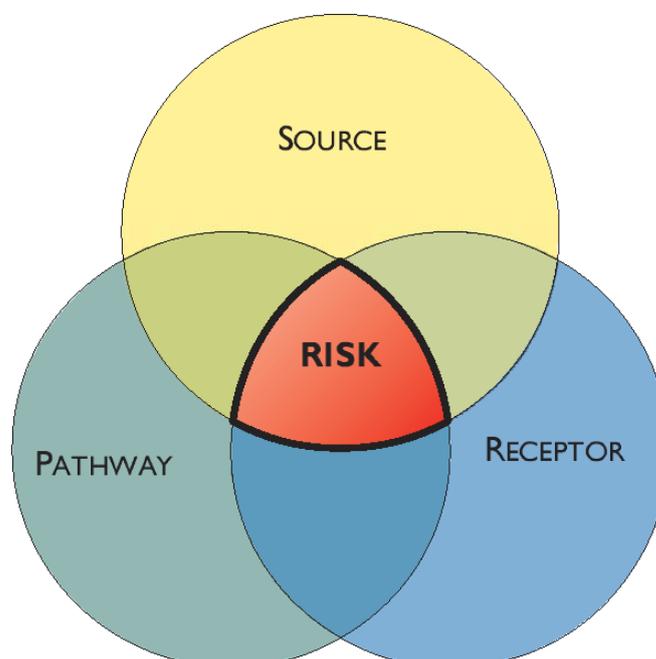
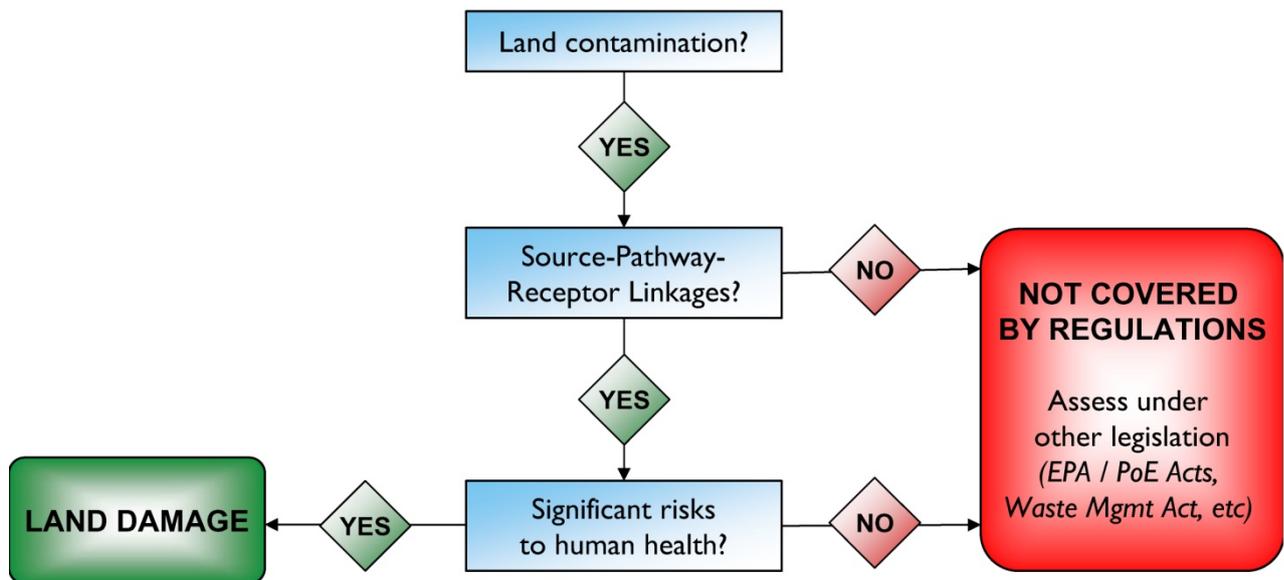


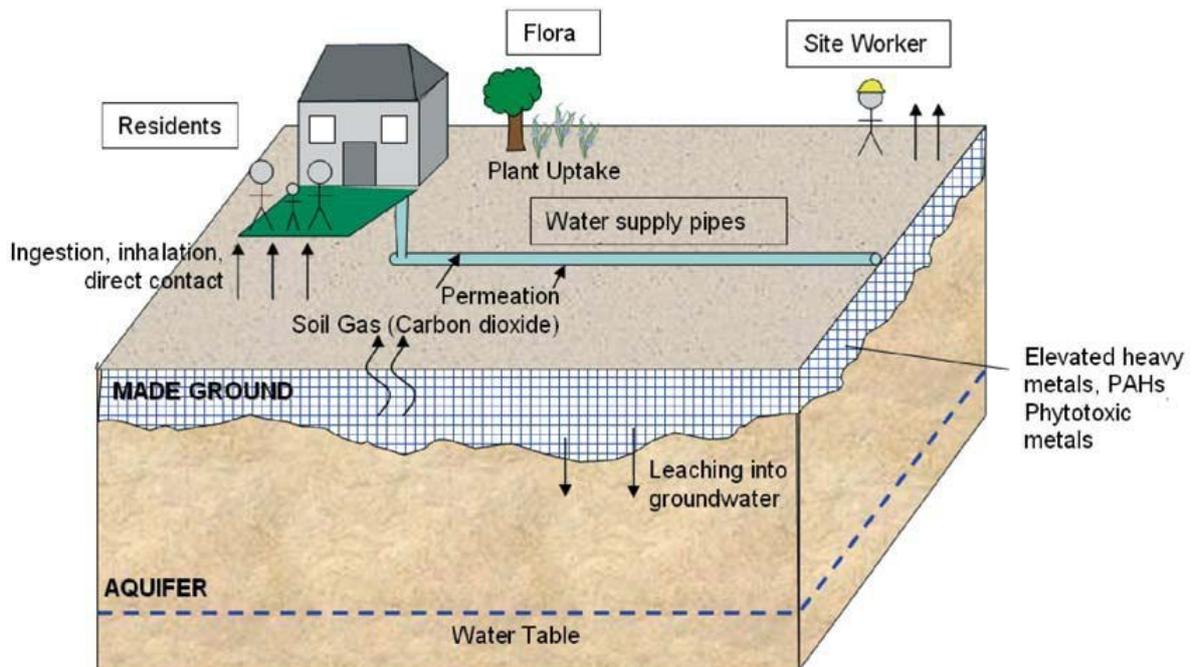
Figure 6.6: Determination of land damage

6.6.2 Land Damage - Screening Assessment

The screening assessment is intended to be a qualitative assessment of potential risks. The screening assessment will be based on the development of a conceptual site model (CSM), which will be used to identify potentially significant source-pathway-receptor (SPR) linkages. An example of a CSM is provided in Figure 6.7. As a minimum, the screening level assessment will include the components listed in Table 6.6.

Table 6.6: Components of screening level risk assessment

- Characterisation of the source (land contamination) with regard to physical and toxicological properties, i.e. carcinogenic, explosive, etc.
- Summary of all available information relating to the physical setting of the site and the source(s) of contamination presented within maps and schematic cross section.
- Identification of potential human receptors by considering current, adjacent and surrounding land use, including potential approved future use.
- Identification and characterisation of mechanisms and pathways by which the receptors could be adversely affected by the source, including migration pathways within the subsurface and exposure mechanisms, e.g. inhalation, dermal contact etc.
- Summary table and diagram of all source-pathway-receptor linkages which may result in a significant risk of adverse effects to human health.
- A clear rationale in table or text format for the exclusion of any SPR linkages not considered to be potentially significant.
- Identification of any data gaps or uncertainties relating to the site which may affect the determination of land damage.
- A clear decision record for the site stating whether further assessment or information gathering is required in order to determine land damage.
- Recommendations for further information gathering, risk assessment and/or remediation.

Figure 6.7: Example Conceptual Site Model (CSM)

*Reference: Environment Agency (2008) R&D Publication 66: 2008 Volume 1- Guidance for the safe development of housing on land affected by contamination.

The complexity of the CSM will depend on the site and the amount of information available. For organisms and micro-organisms (including GMOs) more detailed consideration may need to be given to indirect pathways such as entry into the food chain or disruption to the performance of human or veterinary medicine. Uncertainty within the CSM should be reflected within the conclusions of the assessment.

The CSM and risk assessment should consider the particular conditions on the site including specific activities of site users. However, in identifying and characterising receptors and pathways the CSM and risk assessment should also take account of all potential uses of the land that could occur without a change in land zoning or planning permission.

Any contamination that could potentially cause harm to human health under a reasonable future scenario would also be considered land damage.

Further guidance on the principles of undertaking qualitative risk assessment is presented in Appendix F.

6.6.3 Land Damage - Site Specific Quantitative Risk Assessment

If potentially significant risks are identified at the screening stage two courses of action are available:

- undertake a site specific quantitative risk assessment in order to reduce uncertainty, quantify damage and aid the decision-making process; or
- determine that there is land damage and proceed immediately to appropriate remediation.

For risks associated with toxicological effects, risk is assessed by comparing estimated exposure (i.e. the amount taken into the body) with health criteria values. These values determine the amount of a substance that can be taken into the body without adverse health effects. Quantitative risk assessment may include:

- the use of generic assessment criteria (GAC), where such criteria are:
 - appropriate to the assessment of risks to human health;
 - relevant with respect to the CSM;
 - scientifically based; and
 - from an authoritative source.
- estimation of exposure and health criteria based on chemical and site specific parameters using appropriate, relevant and scientifically based models.

Estimations of exposure must be site specific or based on reasonable worst case assumptions with respect to the generic population and must take account of potential for changes in site use. The Environment Agency (England and Wales) Contaminated Land Exposure Assessment (CLEA) model (EA/Defra, 2008b), presents assumptions and algorithms with respect to exposure to contaminated soils in the UK. It is considered that these assumptions are valid with respect to Ireland. The CLEA model is accompanied by a software tool which can be used to undertake site specific quantitative risk assessment for contaminants in soil. Other commercially available software packages are also available, which may assist in undertaking quantitative site specific risk assessment.

The Environment Agency (England and Wales) has published a comprehensive methodology for the derivation of health criteria values for chemical substances (EA/Defra, 2008a). Further details and sources of information on toxicology are presented in Appendix F.

With respect to organisms and micro-organisms (including GMOs), methods used to assess risks must reflect **best available techniques** in some cases. Quantitative methods may not be available, therefore, land damage may be determined on the basis of uncertainty within the qualitative risk assessment.

Risks associated with the physical properties of a substance, such as flammability and explosive risk, may be assessed by considering the probability of harm occurring and the likely severity of that harm.

A site specific quantitative risk assessment will include, as a minimum, the components listed in Table 6.7.

Table 6.7: Components of site specific quantitative risk assessment

- Components of Screening level assessment (Table 6.6) plus:
- Revised conceptual model based on any additional information collected.
- Description and justification of approach used, including selection of any software used.
- Table providing all Generic Assessment Criteria or input parameters used and detailed justification for use.
- Risk estimation using selected method.
- Discussion of estimated risk and potential significance within context of conceptual site model.
- Discussion and assessment of uncertainties in chosen method and implication on risk evaluation.
- Decision record with respect to further assessment.
- Recommendations for further data gathering, risk assessment and/or remediation.

Further information on principles of site specific quantitative risk assessment is provided in Appendix F.

7 REMEDIATION MEASURES

The fundamental aims of the Regulations are to ensure that damage to land, water and EU protected species and natural habitats is either prevented by taking appropriate measures or remediated by restoring towards baseline condition and to make operators liable for the costs of preventing damage and the remediation of damage that has occurred. The requirement for an operator to remediate damaged resources under Regulations stems from the 'polluter pays' principle.

The purpose of remedial measures is to restore the **natural resource** (i.e. protected species and natural habitats and water) to its baseline condition where possible and also compensate for any interim or permanent losses where return to baseline is either slow or not possible. In the case of land damage, the objective is to remove the significant risk to human health.

The previous sections of this guidance outlined the key criteria for action and damage assessment. This section presents the process for developing strategies to remediate the damage.

7.1 OVERVIEW OF REMEDIATION PROCESS

The EPA has the responsibility under the Regulations for deciding what measures are required to ensure the remediation of environmental damage. The EPA may consult other public bodies or specialists as required in deciding on the required remediation measures.

Reg. 11(1)

- The EPA will issue a direction to the operator who caused the damage, to identify the measures that he/she considers are required to prevent or remedy the damage.
- The operator must respond to the EPA with a report specifying the proposed remediation measures within a specified time period. The remediation measures must comply with the criteria set out in Schedule 2 of the Regulations.
- The EPA will invite observations from third parties (i.e. someone who is affected by the damage or has sufficient interest in decisions relating to the environment) to assist in the decision-making process on the remediation options.
- If entry onto lands is required to assist decision-making, the EPA will invite observations from the landowner or occupier of the lands in question.
- The EPA will review all available data including the operator's report, third party observations and landowner observations as well as any data gathered by the EPA.
- If more than one type of environmental damage has occurred, the EPA will consider all aspects of the damage and make a decision on what remediation to proceed with and in what order.
- In formulating the remediation strategy, the EPA must give consideration to the framework as set out in Schedule 2 of the Regulations, the nature and extent of all damage, **natural recovery** options and risks to human health.
- The EPA will issue a direction to the operator to carry out the specified remedial measures as decided by the above process. The direction will specify the damage, the remedial measures, the order in which remedial measures should be taken and the proposed monitoring and inspection programme to be undertaken by the operator until the EPA is satisfied that the remedial measures are complete.

Reg. 11(3)

Reg. 11(4)

Reg. 11(5)

Reg. 11(6)

Reg. 11(7)

Reg. 11(8)

Reg. 11(9)

Reg. 12(1)

The operator may appeal the EPA direction. The criteria and procedures for such an appeal are outlined in Section 8 of this guidance.

Reg. 13(1)

7.2 REMEDIATION OF DAMAGE TO HABITATS, SPECIES AND WATER DAMAGE

Where damage has occurred to either waters, protected species or natural habitats there may be a range of remediation options available to restore the resource to its baseline condition. The following section outlines the types of remediation options available and how these options may be integrated to develop a remediation strategy. The remediation of land damage requires a different approach and this is outlined in Section 7.3 of this guidance.

7.2.1 Types of Remediation

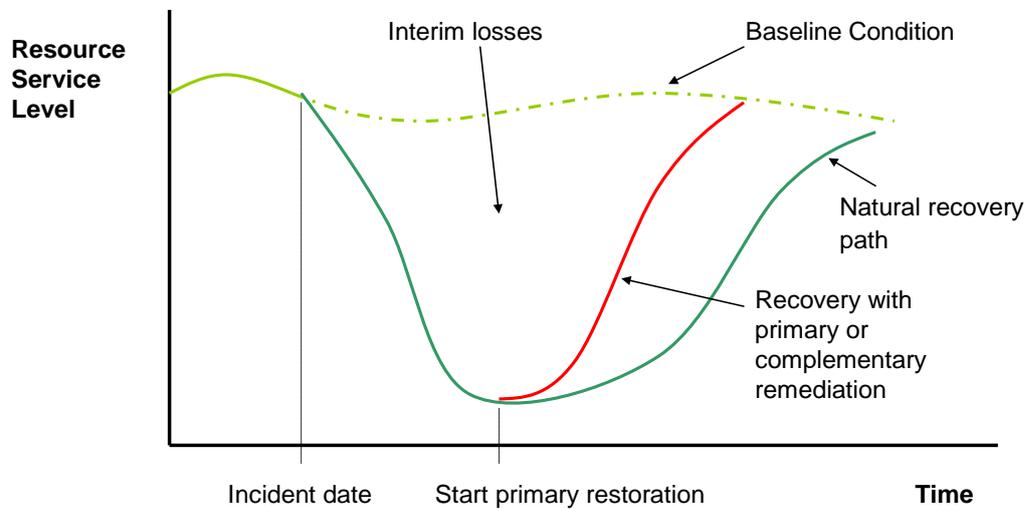
The Regulations define the types of remediation that are applicable for remediation of damage to natural habitats, protected species and water. Remediation is to be achieved by the use of primary, complementary and compensatory remediation measures. Each of these is described below:

Schedule 2

- **primary remediation** is any remedial measure which returns the damaged natural resource or impaired service towards baseline condition. For example, the re-vegetation of a natural habitat damaged by unauthorised development.
- complementary remediation is any remedial measure taken to compensate for the fact that primary remediation will not result in fully restoring the damaged natural resources to its baseline condition. For example, the restoration and conservation of an adjacent cut-over peat land to compensate for the loss of habitat.
- compensatory remediation is any action taken to compensate for **interim losses** of natural resources that occur from the date of damage occurring until primary and complementary remediation has achieved their full effect.

Interim losses are losses which result from the fact that the damaged natural resources are not able to perform their ecological functions or provide services to other natural resources or to the public until the primary and complementary measures have taken effect.

In short, where primary remediation does not result in the restoration of the environment to its baseline condition, complementary remediation will be undertaken. In addition, compensatory remediation will be undertaken to compensate for interim losses occurring while these measures take effect to restore a resource to its baseline condition. Figure 7.1 presents the concepts of baseline status, remediation, natural recovery and interim losses.

Figure 7.1: Overview of remediation concepts

The following sections outline in greater detail each of the above remediation options and provide illustrative examples. Further information on remediation options for damage to natural habitats, protected species and water is presented in Appendix E.

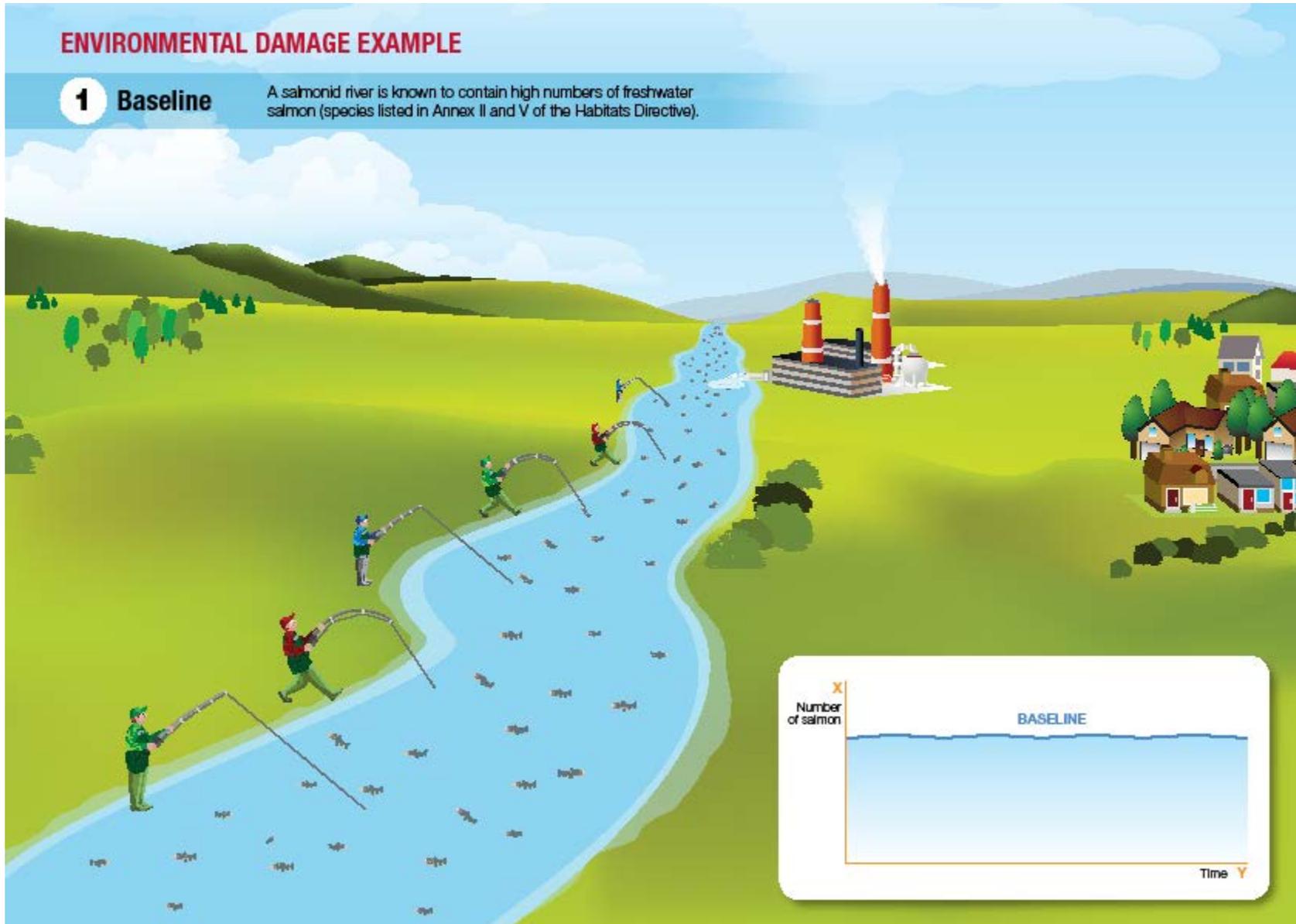
The following graphics present a simple example of environmental damage and the roles of the remediation measures employed. The figures are presented sequentially as follows:

- Graphic 1 Baseline
- Graphic 2 Incident
- Graphic 3 Primary Remediation
- Graphic 4 Complementary and Compensatory Remediation

ENVIRONMENTAL DAMAGE EXAMPLE

1 Baseline

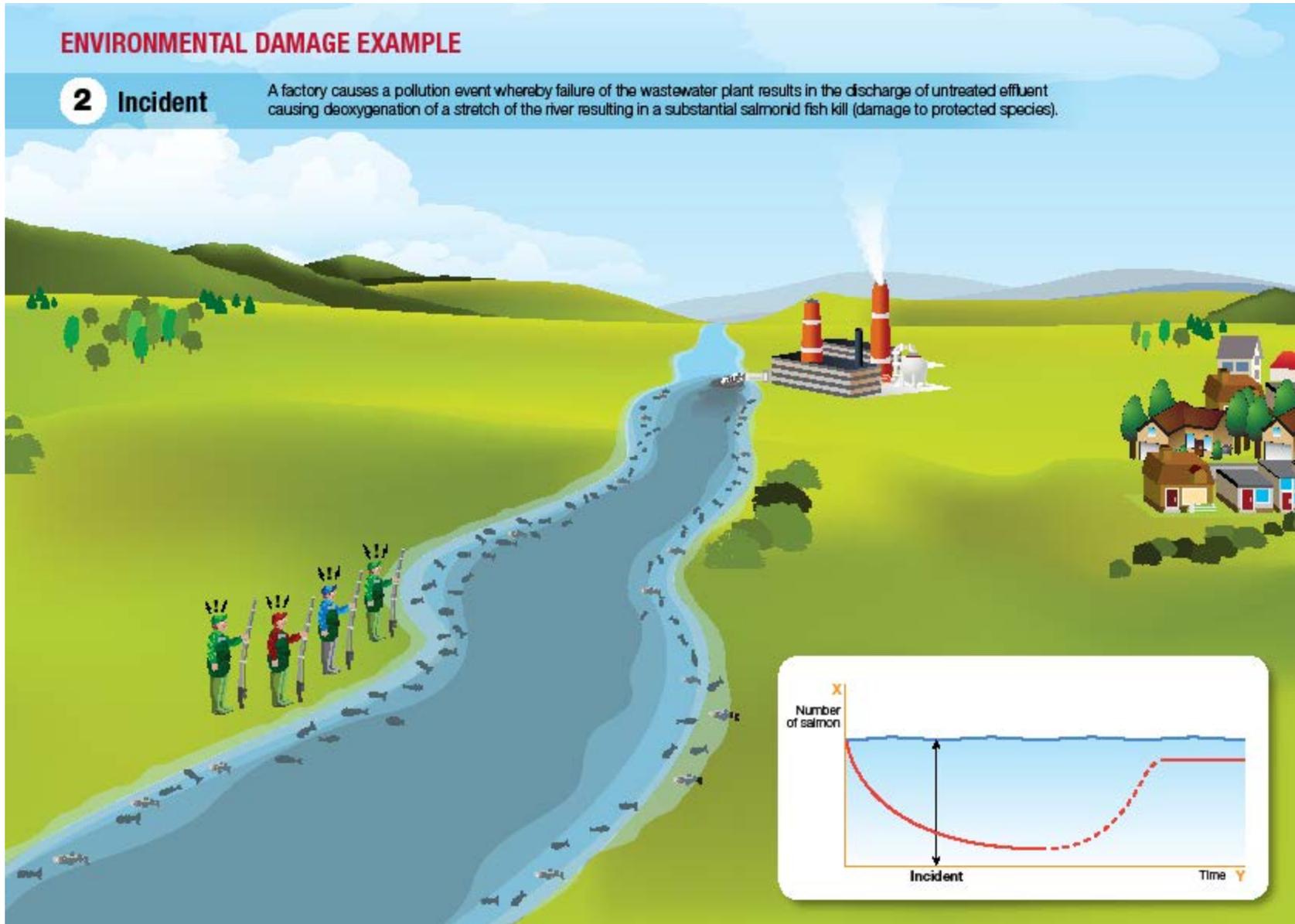
A salmonid river is known to contain high numbers of freshwater salmon (species listed in Annex II and V of the Habitats Directive).



ENVIRONMENTAL DAMAGE EXAMPLE

2 Incident

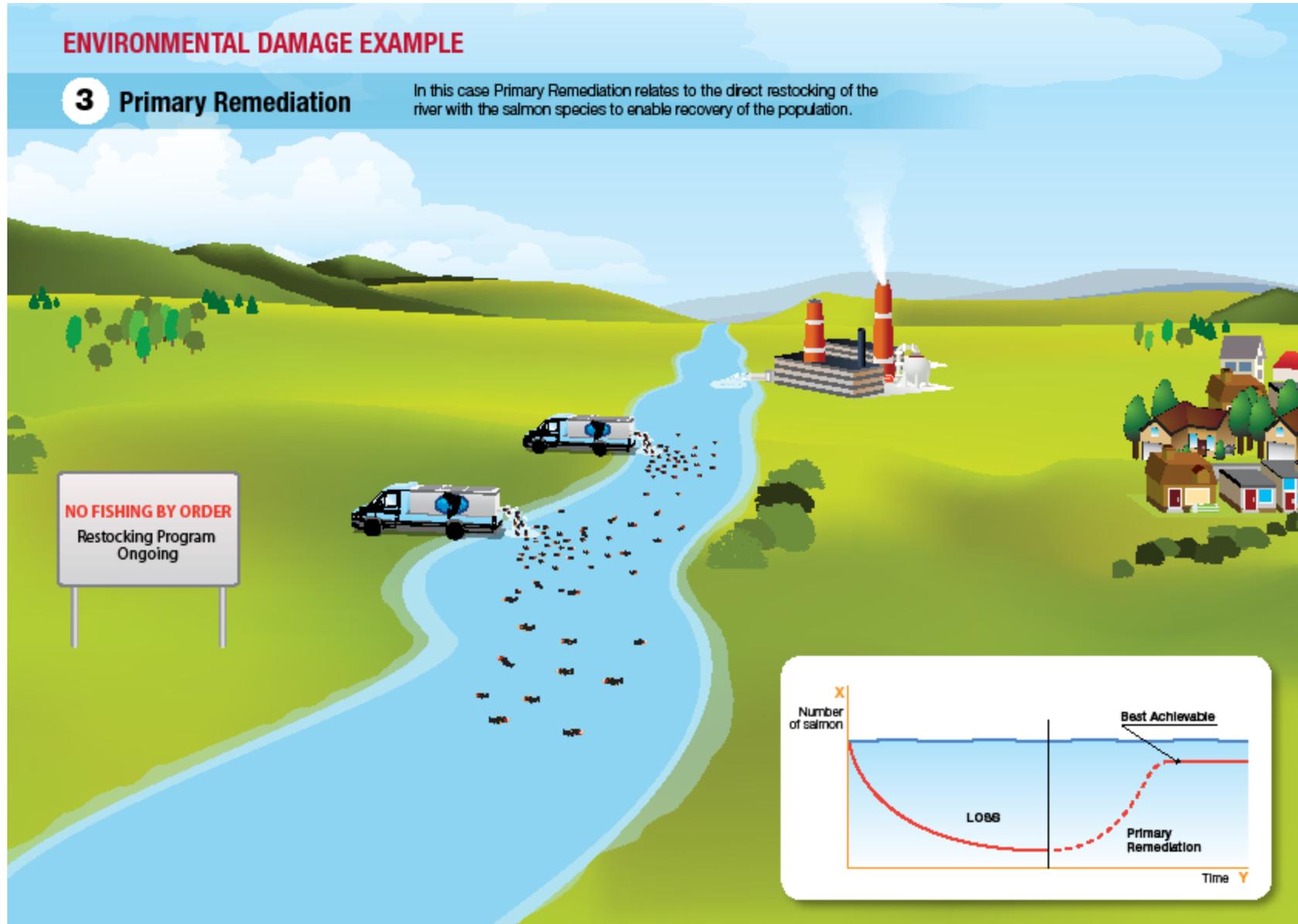
A factory causes a pollution event whereby failure of the wastewater plant results in the discharge of untreated effluent causing deoxygenation of a stretch of the river resulting in a substantial salmonid fish kill (damage to protected species).



ENVIRONMENTAL DAMAGE EXAMPLE

3 Primary Remediation

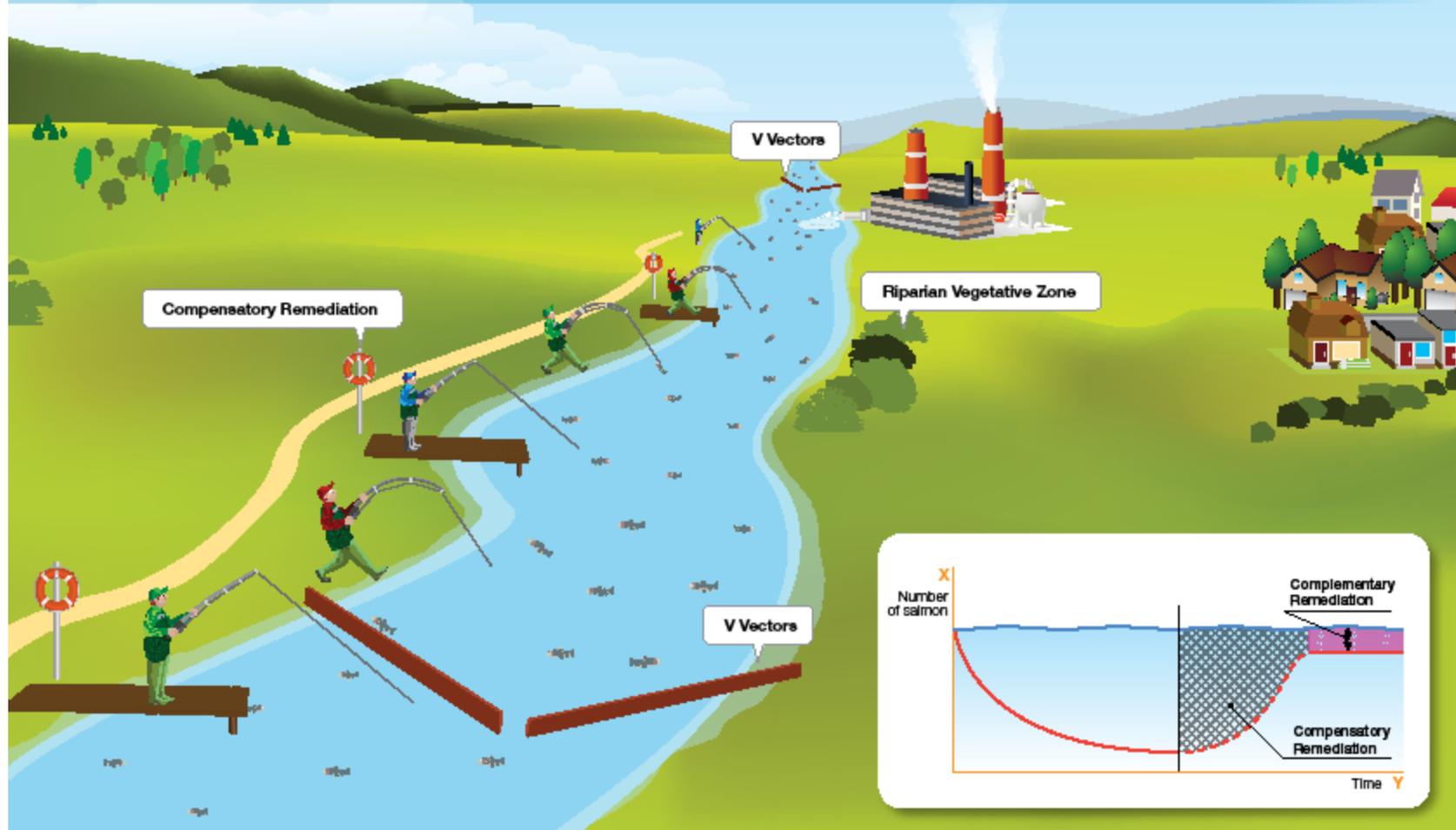
In this case Primary Remediation relates to the direct restocking of the river with the salmon species to enable recovery of the population.



ENVIRONMENTAL DAMAGE EXAMPLE

4 Complementary & Compensatory Remediation

Complementary and Compensatory Remediation is carried out through the development of the salmon habitat in two ways. The introduction of V vectors along the river increases the flows along set channels which can create pooling at the base of these vectors to develop salmon spawning habitat in the river. In addition, the development of a riparian vegetative zone beside the river using native trees/shrubs will provide shelter and shade for immature salmon.



7.2.2 Primary Remediation

There are a wide range of primary remediation options available and these will be dependent on the resource damaged and the nature of this damage. The types of primary remediation applicable and the extent of intervention required will vary on a case-by-case basis and should be assessed by suitably qualified experts. For all cases of water damage and damage to natural habitats and protected species, the first priority should be to achieve primary remediation. Options for primary remediation are presented below.

Non-intervention (including natural recovery) - Where possible, remediation should seek to assist natural processes in order to repair the damage caused to waters, habitats or species populations. This is sometimes referred to as natural recovery. In some cases it may be that non-intervention is the best long-term restoration option, especially where sites are inaccessible, sensitive to machinery or susceptible to further physical damage.

Non-intervention Primary Remediation – Example

A groundwater body close to an industrial plant becomes contaminated with a solvent which has leaked from the plant. The solvent degrades naturally and relatively quickly over time. The best option may be to carry out ongoing monitoring of groundwater quality to assess the extent of the groundwater impact and natural recovery (using monitored natural attenuation) provided the contamination does not pose a risk to human health.

Limited Intervention - A limited level of intervention may be the most preferable option to restore resources in some instances. For example, this may involve the planting of grasses, trees or shrubs that provide an improved structure to allow for the natural re-colonisation of other elements of a habitat that have been lost. The intervention in these circumstances would provide sufficient ecological amelioration to allow natural processes to restore the ecosystem. The planting is therefore intended to provide an ecological framework within which natural processes can re-establish themselves and operate in the future.

Limited Intervention Primary Remediation – Example

A designated habitat of coastal sand dunes has been damaged by a construction operator working in an area. In order to achieve a level of ecological stability to prevent future wind-erosion of the dunes, planting of marram grass (*Ammophila arenaria*) is carried out and the effectiveness of the remedial measures are monitored over time.

Full Intervention - Full intervention is likely to be of long duration and expensive. The resultant resource may never fully recover although much of its function can be restored. Conservation of genetic diversity is considered fundamental to natural resource conservation. As many Natura 2000 sites support habitats and ecosystems that have evolved over many thousands of years, the genetic integrity of these sites is of vital importance. Where full intervention is needed, great care is required to conserve the genetic integrity of the damaged site. This might require the development of specific plant and animal propagation projects in preparation for re-introduction.

Full Intervention Primary Remediation – Example

A section of protected woodland is damaged by illegal tree felling. The best option may be to opt for full intervention to replace the woodland and habitat. This may include propagation of appropriate trees, shrubs, grasses and other plants from indigenous genetic stock, growth of these plants in a suitable nursery environment and replanting. This may need to be combined with appropriate soil restoration, restoration of hydrology and water quality and, in certain circumstances, may require the re-formation of geomorphological features, such as riverine structures (e.g. meanders, pools, etc.).

7.2.3 Complementary Remediation

Complementary remediation applies when it is not possible to restore the original resource to its baseline condition using primary remediation alone. The purpose of complementary remediation is to provide a similar level of natural resources as would have been provided if the damaged site had been returned to its baseline condition.

A similar resource is restored to the extent that the damaged resource cannot be restored. For example, if the damaged resource can only be remediated to 80% using primary remediation, then, the 20% shortfall may be undertaken elsewhere as complementary remediation. Where possible and appropriate, the alternative site should be geographically linked to the damaged site, taking into account the interests of the affected species / habitats / humans.

Complementary Remediation – Example

A crayfish habitat in a river is damaged by agricultural/forestry activity. Primary remediation can only restore the habitat to support two thirds of the freshwater crayfish population that existed in the baseline condition. Complementary remediation is undertaken by means of developing a suitable habitat in a separate downstream location in the river to generate equivalent habitat to that which could not be restored by primary remediation.

7.2.4 Compensatory Remediation

Compensatory remediation is needed to offset losses from the time that damage occurred until recovery to baseline conditions is achieved. Such losses are called 'interim losses'. During the interim loss period, natural resources and the services they provide are diminished or lost. This loss can be offset through remediation of a type and amount of natural resources equivalent to the type and amount lost during the interim period.

In such cases, the amount of resources or services lost is calculated in terms of both the quantity of resource loss (e.g., hectares of habitat, fish population reduction, etc.) and the duration of the loss. It does not consist of financial compensation to members of the public.

For example, compensatory remediation could include additional improvements at the damaged site or an alternative site or, in lieu of this, financial and/or other types of compensation for lost or damaged natural resources and services could be considered when in-kind approaches are not feasible.

Compensatory Remediation – Example

One hectare of protected wetland is damaged following a chemical spill from a tanker. The entire wetland is damaged and primary restoration can only restore 50% of the wetland (0.5 hectares) to the baseline condition. Complementary remediation is being undertaken to develop 0.5 hectares of similar wetland habitat in a nearby location but this will take approximately 5 years to complete. To compensate for the losses in this period, an additional 0.3 hectares of wetland will be developed as well as the 0.5 hectares from primary remediation and 0.5 hectares from complementary remediation.

7.2.5 Complementary and Compensatory Remediation

The examples presented in the previous section outline the nature of complementary and compensatory remediation. In order to fully determine to what extent each of these remediation options is required, quantification using equivalence analysis must be carried out. This section outlines the key principles of equivalence analysis with further information provided in Appendix E.

The Regulations primarily recommend the use of resource-to-resource or service-to-service equivalent approaches for quantifying complementary and compensatory remediation. This means that actions providing natural resources and/or services of the same type, quality and quantity as those damaged should be considered in the first instance.

Schedule 2

The method used to determine the type and amount of complementary and compensatory remediation needed to make up for losses related to an incident is known as equivalency analysis. Equivalency analysis takes into account the chemical, physical, biological and, sometimes, social and economic, nature of an environmental impact and remediation options. This approach is being developed in the EU through the REMEDE project (Resource Equivalency Methods for Assessing Environmental Damage in the EU <http://www.envliability.eu>) and other initiatives.

Complementary and compensatory remedial measures should be designed so that additional natural resources and/or services are provided to reflect time preferences and the time profile of the remedial measures. For example, the longer the period of time before the baseline condition is reached, the greater the amount of compensatory remedial measures that will be needed to account for the interim losses.

7.2.6 Quantifying Complementary and Compensatory Remediation

Conducting an equivalency analysis involves three main steps:

- Quantify the effects of environmental damage in terms of the extent and degree of lost resources or services. This step is carried out as damage assessment under the Regulations.
- Identify and evaluate remediation options in terms of the quantity and quality of service or resource replacement anticipated to be provided. This step is carried out to determine the preferred remediation option under the Regulations.
- Scale the remediation to compensate for the lost resources or services over time. Essentially this step involves varying the degree of remediation to account for the time lost in implementation (i.e. the interim losses).

Basic Equivalency Analysis - Example

A simple example would be where water damage leads to a fish kill involving the death of 1,000 fish. To remediate the damage the river is restocked with 1,000 new fish. In this case no scaling has been undertaken to take into account the time lost in restocking the fish.

To develop the above example, an operator may decide to restock the river with 1,500 fish. The additional 500 fish are based on a scale-up of the initial 1,000 fish to compensate for the interim losses during the time taken to restock the river. In this instance scaling has been applied but with no scientific basis for calculating the compensatory remediation. It should be noted that scientific approaches to the scaling up factors have been developed by the REMEDE project.

The Regulations impose the following hierarchy for resource equivalency approaches to assessing complementary and compensatory remediation:

Schedule 2

- Resource-to-resource (e.g. Resource Equivalency Analysis (**REA**)) in which losses are expressed in terms of resource units, such as numbers of fish or birds;
- Service-to-service (e.g. Habitats Equivalency Analysis (**HEA**)) in which losses are expressed in terms of habitat and are offset by remediation of similar habitat; and
- Two variations of Value Equivalency Analysis (**VEA**)
 - Value-to-Value, where both damage and benefit of remediation are measured in terms of their economic value, (i.e. in money units); and
 - Value-to-Cost, where damage is measured in terms of the economic value lost.

In many cases, the remediation actions provide the same resources or services as those lost and HEA or REA are appropriate for use as scaling tools. In other cases, where the same resources or services cannot be remediated, similar resources can be remediated and VEA is appropriate to scaling remediation as it focuses on human services.

When it is not possible to provide natural resources and/or services of the same type, quality and quantity as those damaged, then the EPA may prescribe the method, for example of monetary valuation, to determine the extent of the necessary complementary and compensatory remedial measures. If valuation of the lost resources and/or services is practicable, but valuation of the replacement natural resources and/or services cannot be performed within a reasonable timeframe or at a reasonable cost, then the EPA may choose remedial measures whose cost is equivalent to the estimated monetary value of the lost natural resources and/or services.

Further information and links to the REMEDE Project are presented in Appendix E.

7.2.7 Assessing Remediation Options

The EPA is responsible for assessing all information gathered (from operators, other public bodies, third parties, etc.) before making a decision on the preferred remediation option. The Regulations require that all data is evaluated based on the following criteria:

Reg. 11(1)

- the effect of each option on public health and safety;

Schedule 2

- the cost of implementing the option;
- the likelihood of success of each option;
- the extent to which each option will prevent future damage and avoid collateral damage, as a result of implementing the option;
- the extent to which each option benefits the natural resource or service;
- the extent to which each option takes account of relevant social, economic and cultural concerns and other relevant factors specific to the locality;
- the length of time it will take for the restoration of the environmental damage to be effective;
- the extent to which each option achieves the restoration of the site of environmental damage at the site; and
- the geographical linkage to the damaged site.

Evaluating options may, for example, include deciding between improving different natural resources or services, between improving similar resources at different sites or between restoring the damaged resources and services to different levels or at different speeds.

The EPA must be satisfied that the measures chosen are sufficient to restore the natural resources to the baseline condition through a combination of primary, complementary and compensatory remediation. The EPA will exercise judgement on how to balance the criteria listed above in any particular case and will record the basis on which the decision is made.

A decision can be made to take no further remedial measures if the remedial measures already taken ensure that there is no longer any significant risk to human health or if the cost of the measures required to reach baseline conditions is disproportionate to the environmental benefits to be obtained.

7.3 REMEDIATION OF LAND DAMAGE

The remediation of land damage is subject to a different set of criteria than the remediation approaches outlined above for water damage and damage to habitats and species. This section outlines the main criteria for remediating land damage as specified in the Regulations.

Schedule 2

Remediation measures are required to ensure that the relevant contaminants are removed, controlled, contained or diminished so that the land damage, taking account of its current use or approved future use at the time of the damage, no longer presents a significant risk to human health.

Remediation of significant adverse effects will be achieved by breaking the relevant source-pathway-receptor (SPR) linkages through removing one or more of the source, pathway or receptor.

The most suitable method of remediation will be determined by reference to the conceptual site model and/or risk assessment. More than one method of remediation may be required in order to address all relevant SPR linkages.

If the contamination creates a significant risk of adverse human health effects, then the land damage must be remediated.

The natural recovery option allows for contaminants in the ground to attenuate over time, and would apply to the degradation of organic contaminants and the lifecycles of organisms or microorganisms, such that physical removal or treatment of a source may not be necessary. With respect to risks to human health and land damage, the natural recovery option will only be considered a suitable remediation technique in the event that:

- a) all other remedial options have been considered and eliminated and it can be demonstrated that natural recovery will occur at a sufficient rate such that adverse effects to human health will not occur; or
- b) natural recovery is used in conjunction with exposure control methods to remove either the pathway or receptor from the SPR linkage.

Further information sources and data on the remediation of land damage are provided in Appendix F.

8 APPEALS PROCEDURE

The Regulations allow an operator to appeal any of the three types of direction issued by the EPA and these are summarised in Table 8.1. The direction may be appealed by an operator within 7 days of the direction being served. This appeal is made to a District Court. The stage at which an appeal may be made is also presented.

Reg. 13(1)

Table 8.1: Direction which may be appealed

Stage /Regulation	Direction
Imminent Threat of Damage <i>Regulation 8(1)</i>	Where the operator notifies the EPA of an imminent threat of environmental damage, the EPA shall issue a direction to the operator to provide information and take the necessary preventive and remedial measures.
Environmental Damage has occurred <i>Regulation 10(1)</i>	Where the operator notifies the EPA of environmental damage, the EPA shall issue a direction to the operator to provide information and take the necessary remedial measures.
Determination of Remedial Measures <i>Regulation 12(1)</i>	Following consideration of all information, the EPA will issue a direction to the operator to carry out all necessary remediation measures.

The process for appealing any of the above directions is identical and outlined in summary form below.

- 1 A direction issued by the EPA will take effect on the day it is received by the operator. Reg. 13(1)(a)
- 2 It should be noted that the bringing of an appeal against a direction will not automatically result in the suspension of that direction. However, the operator may apply to the courts for the direction to be suspended until the appeal is disposed of. Reg. 13(2)
- 3 The direction may be appealed by an operator within 7 days of the direction having been served. This appeal is made to a District Court. Reg. 13(3)
- 4 The judge will assess the details and can confirm, vary or cancel the direction. Reg. 13(3)
- 5 If the direction is confirmed then the direction takes effect starting the following day. Reg. 13(1)(b)
- 6 In confirming an EPA direction, the judge may decide to suspend the operation of the direction for a period that the judge considers appropriate. Reg. 13(4)
- 7 If the operator appeals a direction, he/she must notify the EPA of the appeal application and the grounds for the appeal. Reg. 13(5)

9 COST RECOVERY

9.1 COST RECOVERY PROCEDURE

The operator who causes the damage is liable for the costs incurred in carrying out the preventive or remedial measures that are required. In addition, the EPA may recover any costs incurred in relation to the preventive or remedial measures carried out as well as any costs incurred in studies or investigations carried out on behalf of the EPA in relation to the environmental damage. These costs may be recovered by means of a simple contract debt in a court of competent jurisdiction.

Reg. 17(1)

The EPA, in the recovery of costs from an operator, must do so within 5 years of the completion of the remedial measures or on the date on which the EPA became aware of the identity of the operator responsible.

Reg. 19

However, an operator may have a defence against cost recovery where the operator demonstrates that he/she was not at fault or negligent and that the environmental damage was caused by either:

Reg. 17(4)

(a) the act or omission of a third party and that the operator has appropriate safety measures in place in relation to the occupational activity, or

(b) the operator or a third party complying with an order or instruction of a public authority duly issued by that body in the performance of its statutory functions, where the order or instruction did not relate to an emission or incident arising from the occupational activity of the operator.

If an operator proves one of the defences as outlined above, he/she may recover the costs incurred in relation to the preventive or remedial measures from the third party or public authority as the case may be under the Regulations. These costs may be recovered by means of a simple contract debt in a court of competent jurisdiction.

Reg. 17(5)

9.2 MULTI-PARTY CAUSATION

Where significant environmental damage has occurred and a causal link between that damage and the activities of any one or a number of particular operators is established, then the costs are to be allocated on the basis of joint and several liability. In other words, where several operators are liable for costs of remediation, then each operator may be held responsible for the whole amount, irrespective of his/her actual net contribution to the damage.

Reg. 18(1)

10 OFFENCES AND PENALTIES

10.1 OFFENCES

The following is a list of offences under the Regulations. It should be noted that there are a number of offences applicable to the operator as well as one offence applicable to 'any person'.

Regulation 7 (3) It is an offence if an operator is aware of an imminent threat of environmental damage but does not take necessary preventive measures without delay. Similarly, it is an offence if the operator forms the opinion that these preventive measures do not dispel the imminent threat of environmental damage but he/she does not inform the EPA.

Regulation 8 (2) It is an offence if the operator refuses to comply with any direction from the EPA in terms of provision of information, taking preventive measures and instructions to be followed in the carrying out of remedial measures.

Regulation 9 (3) It is an offence if an operator is aware of environmental damage but does not notify the EPA of the damage. It is also an offence if the operator does not take all necessary practicable steps to immediately control, contain, remove or manage contaminants in order to prevent further environmental damage.

Regulation 10 (2) It is an offence for an operator not to comply with any direction from the EPA in terms of provision of information, taking practicable steps and remediation measures and instructions to carry out these measures.

Regulation 12 (2) Failure of an operator to comply with a direction from the EPA to carry out all necessary remediation measures within the timeframe referred to in the direction is an offence.

Regulation 23 (8, 10) Any person who obstructs or interferes with an authorised officer or a member of An Garda Síochána, impedes the exercise of a power by the officer or member or fails or refuses to comply with a request or requirement of the officer or member is guilty of an offence. In addition, any person who falsely represents themselves to be an authorised officer is guilty of an offence.

10.2 PENALTIES

A person found guilty of an offence under Regulation 7, 8, 9, 10, or 12 above shall be liable to either:

Reg. 24(1)

- on summary conviction to a fine not exceeding €5,000 or imprisonment for a term not exceeding 6 months or both; or
- on conviction on indictment, to a fine not exceeding €500,000 or to imprisonment for a term not exceeding 3 years or both.

It shall be a defence in proceedings for a person charged with the offence under Regulation 7, 8, 9, 10 or 12 to prove that the person took all reasonable steps to avoid the commission of the offence.

Reg. 24(2)

Any person guilty of an offence under Regulations 23(8) or (10) is liable on summary conviction to a fine not exceeding €5,000 or imprisonment for a term not exceeding 6 months or both.

Reg. 24(3)

11 REQUESTS FOR ACTION BY THIRD PARTIES

There is provision in the Regulations for a person to submit observations to the EPA and request the EPA to perform its functions in relation to instances of environmental damage or imminent threat of environmental damage. A person who may be affected by an instance of an imminent threat or actual environmental damage or has sufficient interest in the decisions relating to the environment made by the EPA or any other person, may notify the EPA, subject to the procedures outlined below, and request that action be taken against the operator who may be liable. This section outlines the procedures for submission of a third party request.

Reg. 15(1)

It is important to note that the Regulations set out certain criteria which must be satisfied in order to allow a person to submit a request to the EPA. A person who may submit a request to the EPA is a person who is defined as someone who:

Reg. 15(2)

- is affected or likely to be affected by the instance of environmental damage (**'affected person'**); or
- has a sufficient interest in the decisions relating to the environment (**'persons of sufficient interest in decisions relating to the environment'**). The term 'sufficient interest' means that a person can satisfy the EPA that he or she is a member of an organisation that promotes protection of the environment, and has acted to promote protection of the environment during the period of 12 months before the person submits a request to the EPA.

Reg. 15(3)

Where a person submits observations and requests the EPA to carry out its functions under the Regulations, he/she must also furnish a report to the EPA as part of any request and containing all data and information relevant to the damage, in question

Reg. 15(4)

As a minimum it is recommended that the following details are provided:

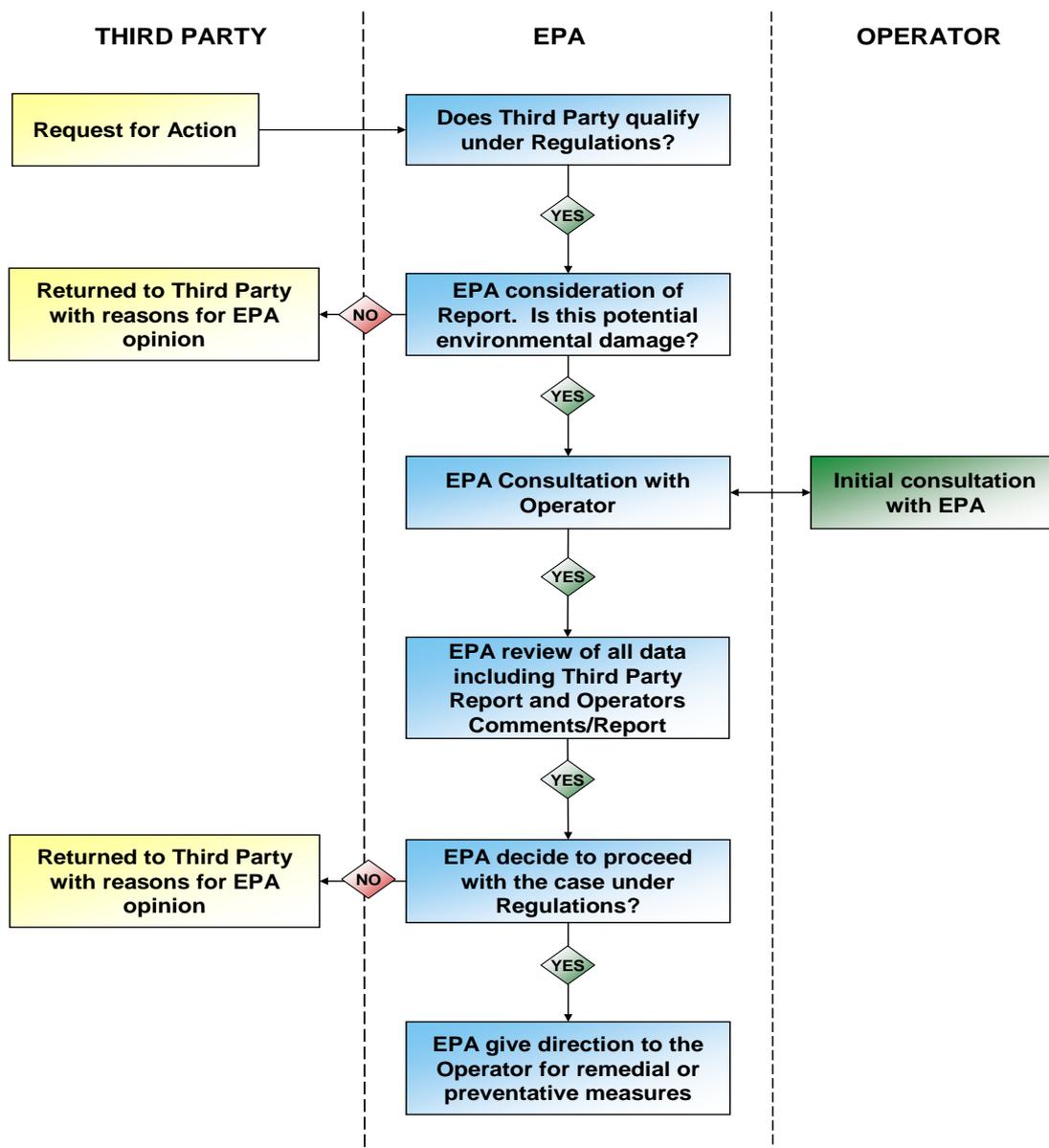
- name, organisation and contact details;
- operator's name, contact details, address of the activity and nature of the activity;
- state clearly if it is a case of imminent threat of damage or actual damage that has occurred;
- licence or permit, number under which the facility operates, if relevant;
- the name of the relevant local authority;
- a report outlining all relevant data relating to the environmental damage/imminent threat, including the location and nature of the incident;
- details of how the person has been or will be affected by the damage/imminent threat of damage; or
- details to demonstrate that the person is a member of an organisation that promotes the protection of the environment and has acted to promote the protection of the environment during the 12 months previous to submitting the request for action to the EPA;

- details of any approaches that have been made by the person to other local or public authorities; and,
- details of any legal actions or insurance claims in relation to the environmental damage that the person is aware of.

On receipt of the report the EPA will read the report and assess in terms of the applicability of the Regulations. Following the review of the report, the EPA will notify the person of the decision and the EPA reasons for reaching this decision. All requests will be dealt with in a timely manner by the EPA.

Reg. 15(6)

Figure 11.1: Process for third party request



APPENDIX A

Glossary

The following glossary outlines the meaning and definitions of the principal terminology employed in this guidance document.

AER	Annual Environmental Report as required under IPPC or Waste Licence requirements.
Affected Person	A person who is affected or likely to be affected by an instance of environmental damage.
Baseline condition*	The condition at the time of the damage of the natural resources and services that would have existed had the environmental damage not occurred, which is estimated on the basis of the best information available. (Article 2(14) ELD)
Best Available Techniques	Most effective and advanced stage in the development of an activity and its methods of operation, which indicate the practical suitability of particular techniques for providing, in principle, the basis for emission values designed to prevent or eliminate or where that is not practicable, generally to reduce an emission and its impacts on the environment as whole.
Birds Directive	Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds.
Complementary remediation*	Any remedial measure taken in relation to natural resources or services to compensate for the fact that primary remediation does not result in fully restoring the damaged natural resources and/or services. (Annex II ELD)
Compensatory remediation*	Any action taken to compensate for interim losses of natural resources and/or services that occur from the date of damage occurring until primary remediation has achieved its full effect. (Annex II ELD)
Conservation status*	Means: (a) in respect of a natural habitat, the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species. (b) in respect of a species, the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations. (Article 2(4) ELD)
Costs*	Means costs which are justified by the need to ensure the proper and effective implementation of these Regulations including the costs of assessing environmental damage, an imminent threat of such damage, alternatives for action as well as the administrative, legal, and enforcement costs, the costs of data collection and other general costs, monitoring and supervision costs. (Art 2(16) ELD)
CSM	Conceptual Site Model
Damage*	Means a measurable adverse change in a natural resource or measurable impairment of a natural resource/service which may occur directly or indirectly. (Art 2(2) ELD)

Damage to protected species and natural habitats	Any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of such habitats or species; the significance of such effects is to be assessed with reference to the baseline condition, taking into account the criteria set out in Schedule 1 to the Regulations. (Art 2(1) ELD).
Directive	Environmental Liability Directive – Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage.
ELU	Environmental Liability Unit of the EPA
Emission*	Means the release in the environment, as a result of human activities, of substances, preparations, organisms or micro-organisms. (Art 2(8) ELD)
EMP	Environmental Management Plan
EMS	Environmental Management System
Environmental Damage	Includes any of the following: damage to protected species and natural habitats, protected at EU level; water damage, or land damage; Note: Where environmental damage is referenced it means only damage as defined in the Regulations, otherwise it is referred to damage to the environment.
EPA	Environmental Protection Agency
Fault based liability	Means an instance where the operator has been at fault or negligent in causing the environmental damage.
Favourable conservation status*	Favourable conservation status is defined in the Regulations as: (a) The conservation status of a natural habitat will be taken as 'favourable' when: its natural range and areas it covers within that range are stable or increasing, 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 in (b); (b) The conservation status of a species will be taken as '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, 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. (Art 2(4)ELD)

GMO	Genetically Modified Organisms
Habitats Directive	Council Directive (92/43/EEC) of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.
HEA	Habitat Equivalency Analysis is used to scale damages (debits) and the benefits of remediation (credits) using units of habitat. The principal concept underlying the method is that the public can be compensated for losses of habitat resources through habitat replacement projects providing additional resources of the same type. For example, the impacts of a given incident are calculated in terms of discounted-hectare-years that describe the aerial extent of harm over time. Remediation credits also are calculated in terms of discounted-hectare-years that describe the ecological services that will accrue during and following remediation. Recent advances in HEA enable treatment of partial service losses, impacts from multiple stressors, and inclusion of scalars that reflect differential productivity or scarcity of different habitat types. (source REMEDE)
Imminent threat of damage*	Means a sufficient likelihood that environmental damage will occur in the near future. (Art 2(9) ELD)
Interim losses*	Losses which result from the fact that the damaged natural resources or services are not able to perform their ecological functions or provide services to other natural resources or to the public until the primary or complementary measures have taken effect. (Annex II ELD)
IPPC	Integrated Pollution Prevention Control
ISO14001	International guidance for developing environmental management systems. (EMS)
Land damage*	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. (Art 2(1)(c) ELD)
Liability regimes	Refers to the strict-based and fault-based liability regimes provided under the Regulations.
Natural Habitats Regulations	European Communities (Natural Habitats) Regulations 1997 (S.I. No. 94 of 1997), the European Communities (Natural Habitats) (Amendment) Regulations 1998 (S.I. No. 233 of 1998), the European Communities (Natural Habitats) (Amendment) Regulations 2005 (S.I. No. 378 of 2005).
Natural resource*	Means protected species and natural habitats, water and land. (Art 2(12) ELD)
NHA	Natural Heritage Area established under the Wildlife Amendment Act 2000 but protected under the Wildlife Acts 1976-2000.
NPWS	The National Parks & Wildlife Service (NPWS) is part of the Department of Environment, Heritage and Local Government and is charged with the conservation of a range of sites, habitats and species in Ireland.

Occupational Activity	Means any activity carried out in the course of an economic activity, a business or an undertaking, irrespective of its private or public, profit or non-profit character. (Art 2(7) ELD)
Operator*	Means any natural or legal, private or public person who operates or controls the occupational activity or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of such an activity has been delegated, including the holder of a permit or authorisation for such an activity or the person registering or notifying such an activity. (Art 2(6) ELD)
Person with sufficient interest in the environment	'A sufficient interest' means that a person can satisfy the Agency that he/she is a member of an organisation that — (a) promotes protection of the environment, and (b) has acted to promote protection of the environment during the period of 12 months before the person submits the request.
Polluter Pays Principle (PPP)	The principle according to which the polluter should bear the cost of measures to reduce pollution according to the extent of either the damage done to society or the exceeding of an acceptable level (standard) of pollution.
Precautionary principle*	In environmental matters, the theory that if the effects of an action are unknown, then the action should not be taken.
Preventive measures*	Means any measures taken in response to an event, act or omission that has created an imminent threat of environmental damage, with a view to preventing or minimising that damage. (Art 2(10) ELD))
Primary Remediation*	Any remedial measure which returns the damaged natural resources and or impaired services to, or towards, baseline condition. (Annex II ELD)
Protected species and natural habitats*	Means - (a) the species mentioned in Article 4(2) of the Birds Directive or listed in Annex I thereto or listed in Annexes II and IV to the Habitats Directive, and (b) the habitats of species mentioned in Article 4(2) of the Birds Directive or listed in Annex I thereto or listed in Annex II to the Habitats Directive, and the natural habitats listed in Annex I to the Habitats Directive and the breeding sites or resting places of the species listed in Annex IV to the Habitats Directive. (Art 2(3) ELD)
Recovery including natural recovery*	Means, in the case of water, protected species and natural habitats the return of damaged natural resources and/or impaired services to baseline condition and in the case of land damage, the elimination of any significant risk of adversely affecting human health. (Art 2(15) ELD)
Regulations	European Communities (Environmental Liability) Regulations 2008 (S.I. 547 of 2008)

Remedial measures*	Means any action, or combination of actions, including mitigating or
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(including remediation)	interim measures to restore, rehabilitate or replace damaged natural resources and/or impaired services, or to provide an equivalent alternative to those resources or services as foreseen in Schedule 2 to the Regulations. (Art 2(11) ELD)
REA	Resource Equivalency Analysis is used to scale debits and credits through resource-specific units other than habitat area (e.g. numbers or biomass of fish). Recently, REA has also been applied to water damages, where remediation is scaled in terms of groundwater and surface water volume or flow. (source REMEDE)
Risk Assessment	The estimation of risk calculated by the magnitude of the potential risk and the probability that that risk will occur.
SAC	Special Area of Conservation means a site of Community importance designated by the Member States through a statutory, administrative or contractual act, or any combination thereof, where the necessary conservation measures are applied for the maintenance or restoration, at a favourable conservation status, of either or both the natural habitats and the populations of the species for which the site is designated.
SPA	Special Protection Areas which are sites classified under the EU Birds Directive but protected under the Habitats Directive (Article 6(3) and (4)). An area classified as a special protection area for the conservation of wild birds under the EU Birds Directive.
SPR	Source-Pathway-Receptor principle of risk management
Services and natural resources services*	Mean the functions performed by a natural resource for the benefit of another natural resource or the public. (Art 2(13) ELD)
Strict Liability	Means an instance where the operator can be linked to the environmental damage and held liable even if he/she has not committed any fault.
VEA	Value Equivalency Analysis is implemented in situations where remediation of similar habitats or resources is either infeasible or undesirable and hence monetary units are needed to ensure equivalency. There are two variations to VEA. The first is the value-to-cost approach which equates the value of the interim loss to the cost of the proposed remediation action. This approach is used when the valuation of the lost services/resources is practicable, but the value of the replacement natural resources and services cannot be performed at a reasonable cost. Most frequently used when smaller impacts to human use services are affected. The second is value-to-value approach which equates the value of the interim loss to the value of the proposed remediation action. Value-to-value scaling can be applied to the variety of situations that are not well-suited for other approaches. For example, in instances where (a) proposed remediation projects provide different natural resources, habitats, or services other than those damaged; (b) organism numbers, habitat area, or important services (as defined by ecosystem experts or the general public) cannot be measured accurately in damage or remediation cases; or (c) differences between damage losses and remediation gains are more important than similarities that could potentially be compared directly between remediation and damage. (source REMEDE)

Water damage*	Means any damage that significantly adversely affects the ecological, chemical and/or quantitative status and/or ecological potential, as defined in the Water Framework Directive, of the waters concerned, with the exception of adverse effects where Article 4(7) of the Water Framework Directive applies. (Art 2(1)(b) ELD)
Water Framework Directive	Means Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000) establishing a framework for Community action in the field of water policy.
Waters*	Means all waters covered by Directive 200/60/EC (Art 2(5) ELD).

Note: For terms denoted with * the definition is derived from the Environmental Liability Directive

APPENDIX B

Case Studies

B1 CASE STUDY 1 – LAND DAMAGE

Scenario

'ABC Healthcare' ('the operator') is a large pharmaceutical manufacturing facility with significant solvent and chemical usage and storage on site in a designated tank farm. The company operates under an IPPC licence from the EPA. The facility is situated above a locally important fractured bedrock aquifer with moderate groundwater vulnerability (6 metres of clayey subsoil) that is used as a local water supply for a small town in Ireland.

During a routine refilling of toluene from a 10,000 litre road tanker to the tank farm via an underground pipeline, level meters on the tanks indicate that 3,000 litres of toluene are unaccounted for and have possibly leaked to the ground from a rupture in the underground pipeline.

In this case, while the ground was contaminated shortly after the incident, the aquifer has not yet been contaminated. However, if the ground contamination is not addressed, contamination of the aquifer is likely to occur causing a significant risk to human health (toluene is toxic in that it is known to pose a risk to unborn children). In this case there is an imminent threat of damage.

Regulations Trigger

Issue	Detail
Liability Regime	Strict Liability (IPPC licence operation listed in Schedule 3)
Damage	<ul style="list-style-type: none">• Imminent threat of damage• Land damage
Damage Description	<p>Threat of damage can be linked to directly to the operator (ABC Healthcare) by means of the solvent plume.</p> <p>Toluene has entered the ground and is sufficiently likely to enter the aquifer if not addressed. If toluene enters the aquifer, then there is a clear risk to human health based on the toxicological properties of the contaminant.</p>

Immediate Action

In line with the obligations under Regulation 7(1), the operator takes the necessary preventive measures to reduce the imminent threat. The facility operates under an environmental management system, which includes provision for an emergency response procedure, and a range of planned immediate actions are undertaken to limit and contain the contamination. The supplier immediately shuts down the filling operation and evacuates all solvent from the pipeline. The pipeline is tagged off and isolated to prevent further use. A specialist contractor is brought to the site to immediately start excavating the area around the underground pipe. The operator commences excavation of the contaminated soil which is quarantined for future treatment.

The EPA is immediately notified by the operator's environmental manager with details of the nature of the incident and the measures taken up to that point to contain the contamination (Regulation 7(2)). The EPA issues a direction under Regulation 8(1) instructing the operator to quantify the extent of toluene that has entered the ground, continue the excavation of the contaminated soil and assess the potential for contamination of the aquifer.

The local authority and the company's insurers are also notified by the operator.

Damage Assessment

Following the initial screening investigation, the EPA found that the contamination has the potential to pose a significant risk to human health if not addressed and is considered 'an imminent threat of environmental damage' under the Regulations.

A land damage screening assessment is undertaken by the EPA to determine the potential for significant risk in the event that the imminent threat is not addressed. The screening assessment found that there was a clear source (the contaminated soil) to pathway (through underlying gravels down-gradient) to receptor (drinking water source) linkage and that there is the potential for a significant risk to human health.

No site specific risk assessment for land damage was undertaken in this case as the damage had not occurred. The screening assessment had provided sufficient information to conclude that land damage and significant risk to human health will occur if the imminent threat of damage is not prevented. ABC Healthcare accepts the EPA finding and the liability for carrying out the necessary preventive measures.

Remediation

The EPA issues a direction under Regulation 11(3) to the operator to identify and implement the necessary preventive measures to address the imminent threat of damage within 2 weeks of the incident. The company engages consultants to assess the options for remediation and submit a report detailing the preferred option to the EPA in line with Regulation 11(4).

The company issues a proposed remediation strategy that builds on the immediate action undertaken and includes a monitoring protocol. The company proposes to excavate fully the soil where the spill occurred within 2 weeks of the date of the incident. In addition, the company proposes installing groundwater monitoring and abstraction wells in the spill zone and immediately down gradient to monitor the impact on the aquifer and prevent the toluene from entering the groundwater.

The EPA gathers relevant information from contaminated land experts on options and best practice strategies in dealing with toluene contamination of soil and groundwater.

Following review of all of the relevant information from the company's remediation report and any additional information gathered, the EPA assess the potential prevention strategies for dealing with the contamination (Regulation 11(7)).

The EPA decides that the best option is that presented by the operator with supplementary measures. The EPA issues a direction under Regulation 12(1) to the company to carry out the following and in this order of priority:

- Within 2 weeks of the date of the spill, the company must excavate all contaminated soil from the site. The soil must be dispatched for treatment at a suitably licensed facility.
- The company must engage suitably qualified experts to prepare a detailed report indicating the extent of soil contamination with reference to the aquifer.
- Within 1 month of the date of the direction, the company must install a series of groundwater boreholes at varying depths to allow for accurate determination of the groundwater quality of the aquifer. The company must undertake monthly monitoring of each of the groundwater wells for toluene for a period of 1 year, subject to further direction from the EPA.

Costs

The total costs incurred by ABC Healthcare include costs for downtime, consultant's fees (reporting and assessment), contractor fees (soil excavation) and waste treatment fees (contaminated soil). In addition, under Regulation 17(2), the EPA costs incurred during the investigation including administration time, consultant's fees, etc. must be met. The total cost incurred by the company for the investigation and remediation strategy amounts to €300,000.

The costs could have amounted to over €3 million if the threat had not been prevented and resulted in the contamination of the public water supply making it unfit for human consumption. These costs would have included provision of a temporary alternative water supply, a permanent alternative water supply, remediation of the groundwater and soil, EPA costs, public relations, etc. The extent of the incident was limited through effective and immediate actions. Proactive risk management limited the duration of the incident, the costs and minimised the risks.

B2 CASE STUDY 2 – DAMAGE TO PROTECTED SPECIES

Scenario

'Wind Energy Ltd' ('the operator') is a company that specialises in the construction and operation of wind farms and is engaged in the construction of a new wind farm on an upland site with blanket peat. The wind farm is subject to a number of environmental conditions based on the Environmental Impact Statement submitted as part of the planning application. One of the key environmental constraints applicable is that the contractor is prohibited from stockpiling peat on the site during construction.

The company does not comply with this condition and stockpiles the peat on site from the initial site clearance works. Following a period of significant and prolonged heavy rain, the stockpile (approximately 45,000m³) becomes dislodged, results in a peat slide and enters a nearby river killing 5,000 salmon.

Regulations Trigger

Issue	Detail
Liability Regime	Fault based liability (activity not listed in Schedule 3) Operator (Wind Energy Ltd) has been negligent in stockpiling the peat and can be directly linked to the damage as the origin of the peat slide can be visibly traced to the operator's site.
Damage	<ul style="list-style-type: none">• Environmental damage• Damage to a protected species (salmon).
Damage Description	The damage has compromised the favourable conservation status of the salmon in this river. Baseline data indicates that the river supported up to 10,000 salmon and the loss of 5,000 salmon represents a significant impact on the population dynamics of the species. As such, the species will not be able to maintain this population on a long term basis.

Immediate Action

The operator fails to take any early action to prevent the damage, i.e. to halt the peat slide, limit the volume of peat or the area covered by the damage. The company also fails to notify the EPA once the damage has occurred. Failure to take immediate action and notify the EPA are offences under Regulation 9(3).

The peat slide is identified by a NPWS Park Ranger, who notifies the EPA of the nature and extent of the incident and the company responsible. The peat slide origin can be visibly traced to the Wind Energy Ltd site (the operator in this case).

Damage Assessment

The EPA carry out a screening assessment of the incident and finds that, as the construction contractor is a non-Schedule 3 operator, water damage is not covered under the Regulations, however, the damage to the salmon (protected species) does apply in this instance. In this case the operator has been at fault in that the stockpiling of peat was prohibited in the planning permission. As the operator is known to be at fault and the damage can be clearly linked to the construction site, the fault based liability regime applies. The species affected by the damage is the salmon (protected

under Annex II and IV of the Habitats Directive 92/43/EEC, and hence the Environmental Liability Regulations).

The EPA issues a direction under Regulation 10(1) instructing the company to supply all relevant information on the extent of the peat slide. In addition, the EPA direction also prescribes the immediate steps that must be undertaken by the operator to prevent further damage and impairment of services.

A detailed ecological assessment is undertaken by the EPA. Baseline conditions for the river and salmon population are available from the Environmental Impact Statement. Baseline information indicates that the river supports up to 10,000 salmon.

An assessment of the damage indicates that the population dynamics of the species has been severely impacted when compared to the baseline condition. This is based on a reduction in population from 10,000 in the baseline condition to 5,000 following the damage. This impact is considered to have reduced the favourable conservation status of the salmon in this river as the species will not be able to maintain this population on a long term basis. Under the criteria listed in the Regulations, this constitutes environmental damage to a protected species.

Remediation

The EPA issues a direction to the operator under Regulation 11(3) to identify and choose the necessary remedial measures.

The operator responds with a letter suggesting the best course of action is to remediate the river through primary remediation by excavation of the peat material (Regulation 11(4)). No further action is proposed by the operator and no complementary or compensatory remediation measures are proposed.

The EPA invites observations from the local authority, NPWS and the Inland Fisheries Ireland to assist in the decision-making for the remediation plans. The NPWS and the Inland Fisheries Ireland respond with a report quantifying the damage to resources and the type of resource required in remediation.

As the operator has not proposed an adequate remediation strategy, the EPA engages specialists to carry out a simple equivalency analysis to determine the extent of the compensatory and complementary remediation that will be required to account for the shortfall in primary remediation and interim losses. The equivalency analysis is summarised in the following table.

Quantify the damage (debit)	5,000 salmon of average maturity 2.5 years (based on a 5 year life cycle) 12,500 salmon years
Quantify the remediation (credit)	8,333 young salmon to be restocked to the river (average age of the salmon 1.5 years) 12,500 salmon years
Scaling factor to account for interim losses	It will take approximately 1 year to allow for clean up of the river to allow for a return to habitable conditions for the salmon. As such, salmon will not be restocked for one year leading to interim losses of resource in this period. 5,000 salmon years are calculated to be lost. An additional 3,333 of the young salmon will be restocked to the river (average age of the salmon 1.5 years) to account for the interim losses. Total restock 11,666 of young salmon. To include 5,000 to the river damaged by the incident (based on calculated capacity of the river to sustain this population). Remaining 6,666 to be restocked to an alternative river of suitably similar habitat conditions.

It should be noted that this analysis is a simple approach and does not apply the detail of the REMEDE toolkit.

Having regard to the options proposed by the contractor, the NPWS and the EPA internal assessment, the EPA formulates a remediation strategy (Regulation 11(7)). The EPA issues a direction under Regulation 12(1) to the operator to carry out these works.

Primary Remediation – The operator is directed to carry out the following works and in this order:

- all peat will be removed from the river ensuring that this excavation does not further damage the river habitat and allows for restoration of the salmon habitat.;
- this shall be followed by the complete restoration of the hydromorphology of the river;
- this work must be carried out within 12 months of the date of the direction and water quality monitoring will be undertaken to ensure suitable restocking conditions; and,
- the river shall then be restocked with 5,000 young salmon to replace those killed by the incident (average age of the salmon 1.5 years).

Complementary Remediation – As the primary remediation is assumed to restore the baseline condition, no complementary remediation measures are proposed.

Compensatory Remediation – In order to account for the interim losses, the scaling factor developed by the EPA in the equivalency analysis above is employed. The compensatory remediation measures required include:

- An additional 6,666 of young salmon (average age of the salmon 1.5 years) must be restocked to an alternative river of suitable habitat conditions to account for the interim losses.

The operator must also arrange for quarterly monitoring of the river quality and salmon population to ensure that the remediation strategy is successful.

Costs

The total cost to Wind Energy Ltd in carrying out this remediation strategy to the satisfaction of the EPA was €500,000. This included costs recovered from the company by the EPA for the detailed equivalency analysis (carried out by a specialist consultant) and additional administrative, legal and technical fees (recovered under Regulation 17(2)).

The total remediation cost could have been significantly reduced if the company had taken preventive action to prevent or limit the extent of damage. In addition, a proactive risk assessment of the construction operations by a competent person followed by installation of suitable mitigation measures and work practices would have cost the company significantly less than the €500,000 incurred. This assessment would also have highlighted the failure to meet planning constraints and the prohibition on peat stockpiling.

The company will also be prosecuted under Regulation 9(3) for failure to take immediate action and failure to notify the EPA of the damage.

B3 CASE STUDY 3 – WATER DAMAGE

Scenario

A local authority ('the operator') operates a 60,000 population equivalent wastewater treatment plant in a location beside a large river on the outskirts of a town in Ireland. The plant operates under a Waste Water Discharge Licence from the EPA. Over a weekend, due to a malfunction, the primary settlement tanks overflow leading to a significant discharge of 3,000 m³ of untreated wastewater into the river.

Regulations Trigger

Issue	Detail
Liability Regime	Strict Liability (discharge licence operation listed in Schedule 3)
Damage	<ul style="list-style-type: none">• Environmental damage• Water damage
Damage Description	<p>3,000m³ untreated wastewater has entered the river. The baseline biological condition of the river is recorded through the WFD monitoring programme as 'good' status. Following the incident, biological monitoring of the river indicates that the biological status is 'moderate' quality.</p> <p>As there is a reduction in status of the biological quality element for the classification of surface water, water damage, as defined under the Regulations, has occurred.</p>

Immediate Action

As soon as the local authority staff become aware of the malfunction, the plant is shut down manually and the discharge is stopped.

In this instance the local authority fails to notify the EPA of the incident and the EPA are notified by a member of An Taisce. An Taisce submits observations to the EPA and requests that the EPA performs its function under the Regulations (Regulation 15(1)).

The EPA reviews the third party request and consults with the local authority on the issue (Regulation 15(5)). The EPA is satisfied that environmental damage has occurred and accedes the request for action. The EPA notifies the member of An Taisce of its decision to take immediate action (Regulation 15(6)).

Damage Assessment

Initial screening indicates that as the plant operates under licence from the EPA, the operation is a Schedule 3 activity and water damage is covered under the Regulations through the strict liability regime.

Baseline assessment through the ongoing WFD monitoring programme indicates that water quality in the river is consistently of 'good' status in recent trends. The trend of the biological status element of the river has also been detected as at 'good' quality under the programme.

Following a detailed monitoring assessment of the water quality by the EPA, the accidental discharge is shown to have had an impact on the biological status of the river. This impact is significant and reduces the biological classification of the river from 'good' to 'moderate'. As there is a reduction in the biological quality element for the classification of surface water, water damage, as defined under the Regulations, has occurred.

The EPA issues a direction under Regulation 10(1) for the local authority to take all necessary measures to prevent further damage.

Remediation

The EPA issues a direction to the local authority under Regulation 11(3) to identify and choose the necessary remedial measures.

The local authority engages specialist consultants to assess the various options for remediation of the damage. Based on detailed hydrodynamic modelling of the river flows, capacity of the river and the volume of the discharge, the modelling indicates that the river will recover naturally in 6 to 8 weeks through natural dilution and dispersion. Furthermore, the damaged water is not a drinking water source and there is no significant risk to human health associated with the damage. As such, the local authority proposes a monitored natural attenuation approach, i.e. limited intervention primary remediation.

The EPA invites observations from An Taisce on the remediation options to assist in decision-making (Regulation 11(5)).

The EPA carries out a detailed review of the local authority report (Regulation 11(7)) and all other relevant information gathered by the EPA.

The EPA concludes that the monitored natural attenuation approach is the most viable option and issue a direction to the local authority under Regulation 12(1) to carry out the following works:

- Carry out weekly monitoring of the river at 20 locations upstream and down-stream of the incident site for a 3 month period and fortnightly monitoring thereafter for a period of 1 year. The monitoring is to include a detailed list of biological and chemical parameters to be tested and reported in the manner of the WFD monitoring programme.
- Trend analysis of temporal and spatial variation must be carried out on the monitoring results. These results shall be used to validate and update the hydrodynamic model on a weekly basis.
- Reports are to be issued to the EPA on a weekly basis.

The local authority does not contest the decision and complies with the direction in full.

Costs

While the local authority has not incurred major liability in terms of a detailed remediation strategy, the monitoring costs are significant (€50,000). The local authority has also incurred costs for the use of a specialist consultant (€20,000).

In addition, the EPA recovered all costs incurred during the investigation from the local authority (€10,000) (Regulation 17(2)). These costs are significant when compared to the fractional costs that would have been incurred in a risk assessment of the site and revised mitigation in the event of settlement tank overflow (e.g. level alarms).

B4 CASE STUDY 4 – DAMAGE TO NATURAL HABITATS

Scenario

'Stone Quarries Ltd' ('the operator') is an operator with a small quarry in Ireland that operates under a water discharge licence from the local authority. Because of increased demand, the owner decides to expand his operation into an adjacent part of his site, which is currently oak woodland. He is unaware that sections of this woodland are part of a European designated site (Special Area of Conservation - SAC) and therefore protected under the Regulations. He carries out site clearance of approximately 1 hectare of the SAC removing all trees, vegetation and topsoil from the site.

Regulations Trigger

Issue	Detail
Liability Regime	Strict Liability (water discharge licence operation listed in Schedule 3)
Damage	<ul style="list-style-type: none">• Environmental damage• Damage to protected habitat
Damage Description	<p>1 hectare of oak woodland destroyed. Oak woodland is listed in Annex 1 of Habitats Directive (Natura 2000 Code 91a0) and is therefore covered by the Environmental Liability Regulations.</p> <p>The natural range of the woodland has decreased through the destruction of 1 hectare of the oak trees and other vegetation. This destruction has compromised the long term viability of the habitat and hence the favourable conservation status of the habitat cannot be maintained, thus, damage to a natural habitat under the Regulations.</p>

Immediate Action

The operator is unaware that damage has occurred and does not take any early action or notify the EPA. This is an offence under Regulation 9(3).

During a routine inspection of an adjacent area by an officer of the NPWS, the officer becomes aware of the damage and notifies the EPA. The EPA issues a direction under Regulation 10(1) for the operator to take all necessary measures to prevent further damage, to cease operating in the area and to provide details of times and dates when the site clearance took place.

Damage Assessment

The screening analysis indicates that, given the water discharge licence from the local authority, the activity is listed under Schedule 3 and therefore subject to strict liability. As such, the operator is liable for the damage to the habitat.

Baseline data for the section of woodland damaged is not readily available. However, a section of the woodland that remains undamaged is used as a reference site to determine the baseline conservation status of the damaged oak woodland. An assessment of the population, density, maturity, etc., of this reference site is undertaken to quantify the baseline condition of the damaged woodland.

In addition, GPS measurement and historical aerial photography are used to quantify the area of the damaged woodland. This detailed analysis is carried out by suitably qualified experts.

Based on the assessment of the favourable conservation status of the oak woodland, the experts conclude that there have been significant adverse effects on the conservation status of the woodland. This is primarily based on the fact that the natural range of the habitat has been reduced and the long term viability of the habitat is compromised. Hence, the favourable conservation status of the habitat cannot be maintained. As such, damage to a natural habitat, as defined under the Regulations, has occurred and the operator is liable.

Remediation

The EPA issues a direction under Regulation 11(3) to the quarry operator to identify and choose the necessary remedial measures using habitat equivalency analysis within two weeks of the date of the direction.

The quarry operator refuses to engage with the EPA and does not submit a response to the EPA direction.

The EPA invites an observation from the NPWS to assist in the decision-making process for the remediation plans.

The EPA carries out an assessment of options for remediation of the habitat (Regulation 11(7)). An equivalency analysis is undertaken to determine the level of primary, compensatory and complementary remediation required. The results of this simple equivalency analysis is presented below.

Quantify the damage (debit)	<p>Baseline condition from reference site indicates that oak trees are present at a density of approximately 1 oak tree in every 100m². These trees range in age from 50 to 100 years with a median age of 75 years.</p> <p>Based on a damaged area of 1 hectare the calculated number of trees lost is 100 trees with a median age of 75 years.</p> <p>7,500 oak tree years</p>
Quantify the remediation (credit)	<p>100 nursery oak plants with an age of 5 years old to be replanted in the damaged area as primary remediation.</p> <p>500 oak tree years</p>
Scaling factor to account for interim losses	<p>To account for the remaining services that are lost in the interim complementary and compensatory remediation are required in the form of planting of additional nursery oak plants at a similar density at a separate, but suitable, location.</p> <p>7,000 oak tree years are required to account for interim losses. This equates to 1,400 nursery oak trees to be replanted.</p> <p>At the planting density above (100 per hectare), this will require an additional 14 hectares of suitable land to be acquired for planting of the nursery oak trees. The operator will be required to acquire this land as part of the remediation costs.</p> <p>7,000 oak tree years</p>

It should be noted that this analysis is a simple approach and does not apply the detail of the REMEDE toolkit.

Ongoing monitoring and surveillance of the habitat conservation status is required to allow for analysis of status in relation to the baseline environment. This is expected to take between 10 and 20 years to be fully completed.

The EPA issues a direction under Regulation 12(1) to the operator to implement the proposed remediation, the order of these measures and the timeframe for completion.

The operator contests his liability for the damage and the extent of remediation and appeals the direction in the courts (Regulation 13(1)). The court upholds the EPA direction and confirms the liability of the operator under the Regulations.

Costs

The remediation costs in this case were extensive and include land acquisition (14 hectares), replanting and propagation, monitoring and surveillance, etc. In addition the operator faces legal fees and costs recovered by the EPA. In total the operator is liable for costs totalling €1,500,000.

This figure is a multiple of the costs to the operator of carrying out a proactive risk assessment of the area prior to any works.

A simple risk assessment would have identified the SAC (through the NPWS online mapping) and the sensitivity of this environment. A suitably qualified expert could have carried out this work and identified the key issues well in advance of any site clearance.

APPENDIX C

Further Information on Damage to Protected Species and Natural Habitats

C1 Protected Species and Natural Habitats covered by the Regulations

The following appendix provides broader details on the habitats and species covered by the Regulations. The definition of 'protected species and natural habitats' as contained in the Regulations is presented below:

(a) the species mentioned in Article 4(2) of the Birds Directive or listed in Annex I thereto or listed in Annexes II and IV to the Habitats Directive, and

(b) the habitats of species mentioned in Article 4(2) of the Birds Directive or listed in Annex I thereto or listed in Annex II to the Habitats Directive, and the natural habitats listed in Annex I to the Habitats Directive and the breeding sites or resting places of the species listed in Annex IV to the Habitats Directive;'

The protected species and natural habitats covered by the Regulations include:

- the species of birds identified in the Birds Directive, 79/409/EEC (listed in Annex I of that Directive and referred to in Article 4(2) of that Directive);
- the species of animals and plants identified in the Habitats Directive, 92/43/EEC (listed in Annex II and Annex IV - this includes species listed in both Annexes, and those in either Annex). Examples of these species include the salmon, river lamprey, Killarney shad, white-clawed crayfish, common and grey seals, freshwater pearl mussel, shining sickle moss and petalwort; Killarney fern, Kerry slug; the natterjack toad; all species of whales and dolphin and all species of bat including the lesser horseshoe bat;
- the habitats of species of birds identified in the Birds Directive, 79/409/EEC (listed in Annex I of that Directive and referred to in Article 4(2) of that Directive). For example the habitats of the hen harrier, merlin, corncrake and little egret;
- the habitats of species of animals and plants identified in the Habitats Directive, 92/43/EEC (listed in Annex II of that Directive). For example the habitats of the salmon, river lamprey, Killarney shad, white-clawed crayfish, common and grey seals, freshwater pearl mussel, shining sickle moss and petalwort;
- the natural habitats identified in the Habitats Directive, 92/43/EEC (listed in Annex I of that Directive). Examples of these habitat types include sand dunes and raised bogs; and
- the breeding sites or resting places of the species listed in Annex IV of the Habitats Directive, 92/43/EEC.

The following is a list of national legislation that transpose the relevant sections of the Habitats Directive and Birds Directive into Irish law.

- The Wildlife Acts 1976 to 2010
- European Communities (Conservation of Wild Birds) Regulations (SI 291 of 1985 as amended); and
- European Communities (Natural Habitats) Regulations (SI 94/1997 as amended by SI 233/1998 and SI 378/2005).

Some exceptions to damage to protected species and natural habitats are provided for, including permissions granted to operators in accordance with Articles 6(3) and 6(4) of the Habitats Directive (Regulations 16, 25, 27 and 32 of the 1997 Natural Habitats Regulations) in respect of sites within the Natura 2000 network, i.e. Special Areas of Conservation and Special Protection Areas.

In addition, the Regulations provide exceptions where derogations are granted under Article 16 of the Habitats Directive (Regulation 25 of the 1997 Natural Habitats Regulations) in respect of Annex IV species of animals and plants and where derogations are granted under Article 9 of the Birds Directive (Regulation 25 of the 1997 Natural Habitats Regulations) in respect of species of birds.

The species of birds, animals and plants covered by the Regulations, and their habitats will attract the liability provisions of these Regulations wherever they occur in Ireland. As such, whether such species and habitats are in Special Areas of Conservation (SACs), Special Protection Areas (SPAs), National Parks, Natural Heritage Areas or indeed in any part of Ireland, inclusive of the 200 nautical mile exclusive fishery limit, the same level of protection applies under the Regulations.

It should be noted that under the Environmental Liability Regulations the list of protected species and natural habitats does not include protected species and natural habitats covered specifically by Irish Legislation and which are not afforded protection at EU level (i.e. not listed in the Birds and Habitats Directives).

C2 List of Irish Protected Species and Natural Habitats covered by the Regulations

The following is a list of relevant natural habitats and protected species applicable to Ireland (valid as of May 2011, subject to change).

The Annex I species (Birds Directive) which occur in Ireland:

Red-throated Diver (*Gavia stellata*);
Black-throated Diver (*Gavia arctica*);
Great Northern Diver (*Gavia immer*);
Cory's Shearwater (*Calonectris diomedea*);
Storm Petrel (*Hydrobates pelagicus*);
Leach's Storm-petrel (*Oceanodroma leucorhoa*);
Little Egret (*Egretta garzetta*);
Bewick's Swan (*Cygnus bewickii*);
Whooper Swan (*Cygnus cygnus*);
Greenland White-fronted Goose (*Anser albifrons flavirostris*);
Barnacle Goose (*Branta ruficollis*);
Hen Harrier (*Circus cyaneus*);
Merlin (*Falco columbarius*);
Peregrine (*Falco peregrinus*);
Corncrake (*Crex crex*);
Golden Plover (*Pluvialis apricaria*);
Dunlin (*Calidris alpina schinzii*);
Ruff (*Philomachus pugnax*);
Bar-tailed Godwit (*Limosa lapponica*);
Wood Sandpiper (*Tringa glareola*);
Red-necked Phalarope (*Phalaropus lobatus*);
Mediterranean Gull (*Larus melanocephalus*);
Sandwich Tern (*Sterna sandvicensis*);
Roseate Tern (*Sterna dougallii*);
Common Tern (*Sterna hirundo*);
Arctic Tern (*Sterna paradisaea*);
Little Tern (*Sterna albifrons*);
Black Tern (*Chlidonias niger*);
Short-eared Owl (*Asio flammeus*);
Snowy Owl (*Nyctea scandiaca*);
Nightjar (*Caprimulgus europaeus*);
Kingfisher (*Alcedo atthis*);
Chough (*Pyrrhocorax pyrrhocorax*);
Golden Eagle (*Aquila chrysaetos*)*,
White-tailed Eagle (*Haliaeetus albicilla*)*; and
Red Kite (*Milvus milvus*)*.

Note: Birds marked with "*" denotes species recently re-introduced to Ireland

The Annex I habitats (Habitats Directive) which occur in Ireland:

Code	Habitat
1110	Sandbanks which are slightly covered by sea water all the time
1130	Estuaries
1140	Mudflats and sandflats not covered by sea water at low tide
1150	Coastal lagoons*
1160	Large shallow inlets and bays
1170	Reefs
1210	Annual vegetation of drift lines
1220	Perennial vegetation of stony banks
1230	Vegetated sea cliffs of the Atlantic and Baltic coasts
1310	<i>Salicornia</i> and other annuals colonising mud and sand
1320	<i>Spartina</i> swards (<i>Spartinion maritimae</i>)
1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)
1410	Mediterranean salt meadows (<i>Juncetalia maritimi</i>)
1420	Mediterranean and thermo-Atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>)
2110	Embryonic shifting dunes
2120	Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes")
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")*
2140	Decalcified fixed dunes with <i>Empetrum nigrum</i> *
2150	Atlantic decalcified fixed dunes (<i>Calluno-Ulicetea</i>)*
2160	Dunes with <i>Hippophae rhamnoides</i>
2170	Dunes with <i>Salix repens</i> spp. <i>argentea</i> (<i>Salicion arenariae</i>)
2190	Humid dune slacks
3110	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>)
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea
3140	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp.
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation
3160	Natural dystrophic lakes and ponds
3180	Turloughs*
3260	Watercourses of plain to montane levels with the <i>Ranunculion fluitantis</i> and Callitriche-Batrachion vegetation
3270	Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidention</i> p.p. vegetation
4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>
4030	European dry heaths
4060	Alpine and Boreal heaths
5130	<i>Juniperus communis</i> formations on heaths or calcareous grasslands
6130	Calaminarian grasslands of the <i>Violetalia calaminariae</i>
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometea</i>) (*important orchid sites)
6230	Species-rich <i>Nardus</i> grasslands on siliceous substrates in mountain areas (and submountain areas in continental Europe)*
6410	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
6510	Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>)
7110	Active raised bogs*
7120	Degraded raised bogs still capable of natural regeneration
7130	Blanket bog (*if active bog)
7140	Transition mires and quaking bogs
7150	Depressions on peat substrates of the Rhynchosporion
7210	Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davallianae*
7220	Petrifying springs with tufa formation (Cratoneurion)*

7230	Alkaline fens
8110	Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)
8120	Calcareous and calcshist screes of the montane to alpine levels (<i>Thlaspietea rotundifolii</i>)
8210	Calcareous rocky slopes with chasmophytic vegetation
8220	Siliceous rocky slopes with chasmophytic vegetation
8240	Limestone pavement*
8310	Caves not open to the public
8330	Submerged or partially submerged sea caves
21A0	Machairs (*in Ireland)
91A0	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles
91D0	Bog woodland*
91E0	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-padion</i> , <i>Alnion incanae</i> , woodland <i>Salicion albae</i>)*
91J0	<i>Taxus baccata</i> woods of the British Isles*

Note: Habitats marked with "*" denotes priority habitat

In May 2010 the Department of Environment, Heritage and Local Government confirmed that the derogation granted in 1999 to allow a continuation of non commercial turf-cutting has ended for 32 raised bog Special Areas of Conservation (SACs) in Ireland. These are listed below. Further turf-cutting or associated drainage works on these sites cannot proceed without the express consent of the Minister. Similar derogations will end for a further 24 SACs at the end of 2011 and for 75 Natural Heritage Areas at the end of 2013.

Killyconny Bog (Cloghbally) Cavan and Meath
 Barroughter Bog Galway
 Cloonmoylan Bog Galway
 Kilsallagh Bog Galway
 Lisnageeragh Bog and Ballinstack Turlough Galway
 Lough Corrib Galway and Mayo
 Lough Lurgen Bog/Glenamaddy Turlough Galway
 Shankill West Bog Galway
 Sheheree (Ardagh) Bog Kerry
 Ballynafagh Bog Kildare
 Lough Ree Ros/LD/WM
 Derrynabrock Bog Mayo and Roscommon
 Flughany Bog Mayo and Sligo
 Tawnaghbeg Bog Mayo
 All Saints Bog and Esker Offaly
 Clara Bog Offaly
 Ferbane Bog Offaly
 Mongan Bog Offaly
 Moyclare Bog Offaly
 Raheenmore Bog Offaly
 Sharavogue Bog Offaly
 Bellanagare Bog Roscommon
 Carrowbehy/Caher Bog Roscommon
 Cloonchambers Bog Roscommon
 Derrinea Bog Roscommon
 Cloonshanville Bog Roscommon
 Ballyduff/Clonfinane Bog Tipperary
 Kilcarren-Firville Bog Tipperary
 Garriskil Bog Westmeath
 Carrownagappul Bog Galway
 Lough Forbes Complex Longford and Roscommon
 Corliskea/Trien/Cloonfelliv Bog Galway and Roscommon

The Annex II and IV Species (Habitats Directive) which occur in Ireland:

Code	Latin name	Common Name	Annex of Habitats Directive
1013	<i>Vertigo geyeri</i> Lindholm	Geyer's whorl snail	II, V
1014	<i>Vertigo angustior</i> Jeffreys	Narrow-mouthed whorl snail	II, V
1016	<i>Vertigo moulinsiana</i> (Dupuy)	Desmoulin's whorl snail	II, V
1024	<i>Geomalacus maculosus</i>	Kerry slug	II, IV
1029	<i>Margaritifera margaritifera margaritifera</i> (Linnaeus)	Fresh water pearl mussel	II, V
1065	<i>Euphydrias aurinia</i>	Marsh Fritillary	II
1092	<i>Austropotamobius pallipes</i>	White-clawed crayfish	II, V
1095	<i>Petromyzon marinus</i>	Sea Lamprey	II
1096	<i>Lampetra planeri</i>	Brook Lamprey	II
1099	<i>Lampetra fluviatilis</i>	River Lamprey	II, V
1102	<i>Alosa alosa</i>	Allis Shad	II V
1103	<i>Alosa fallax fallax</i>	Twaite Shad	II, V
1106	<i>Salmo salar</i>	Atlantic Salmon	II, V
1202	<i>Bufo calamita</i>	Natterjack toad	IV
1223	<i>Dermodochelys coriacea</i>	Leatherback turtle	IV
1303	<i>Rhinolophus hipposideros</i>	Lesser Horseshoe	II, IV
1309	<i>Pipistrellus pipistrellus</i>	Common pipistrelle	IV
1314	<i>Myotis daubentoni</i>	Daubenton's bat	IV
1317	<i>Pipistrellus nathusii</i>	Nathusius' pipistrelle	IV
1320	<i>Myotis brandtii</i>	Brandt's bat	IV
1322	<i>Myotis nattereri</i>	Natterer's bat	IV
1326	<i>Plecotus auritus</i>	Brown long-eared bat	IV
1330	<i>Myotis mystacinus</i>	Whiskered bat	IV
1331	<i>Nyctalus leisleri</i>	Leisler's bat	IV
1345	<i>Megaptera novaeangliae</i>	Humpback Whale	IV
1348	<i>Eubalaena glacialis</i>	Northern Right Whale	IV
1349	<i>Tursiops truncatus (tursio)</i>	Bottlenose dolphin	II, IV
1350	<i>Delphinus delphis</i>	Common Dolphin	IV
1351	<i>Phocoena phocoena</i>	Harbour porpoise	II, IV
1355	<i>Lutra lutra</i>	Otter	II IV
1364	<i>Halichoerus grypus</i>	Grey seal	II, V
1365	<i>Phoca vitulina</i>	Harbour seal	II, V
1365	<i>Phoca vitulina vitulina</i>	Common (Harbour) Seal	II, V
1393	<i>Drepanocladus vernicosus</i>	Shining Sickle-Moss/Slender Green Feather-Moss	II
1395	<i>Petalophyllum ralfsii</i>	Petalwort	II
1421	<i>Trichomanes speciosum</i>	Killarney Fern	II, IV
1528	<i>Saxifraga hirculus</i> L.	Yellow Marsh Saxifrage	II, IV
1831	<i>Luronium natans</i> (L.) Raf.	Floating Water-Plantain	II
1833	<i>Najas flexilis</i>	Slender Naiad	II, IV
1990	<i>Margaritifera margaritifera durrovensis</i> Phillips	Nore Freshwater Pearl Mussel	II, V
2027	<i>Orcinus orca</i>	Killer Whale	IV
2028	<i>Pseudorca crassidens</i>	False Killer Whale	IV
2029	<i>Globicephala melas</i>	Long-finned Pilot Whale	IV
2030	<i>Grampus griseus</i>	Risso's Dolphin	IV
2031	<i>Lagenorhynchus acutus</i>	White-sided Dolphin	IV
2032	<i>Lagenorhynchus albirostris</i>	White-beaked Dolphin	IV

2034	<i>Stenella coeruleoalba</i>	Striped Dolphin	IV
2035	<i>Ziphius cavirostris</i>	Cuvier's Beaked Whale	IV
2037	<i>Mesoplodon mirus</i>	True's Beaked Whale	IV
2038	<i>Mesoplodon bidens</i>	Sowerby's Beaked Whale	IV
2618	<i>Balaenoptera acutorostrata</i>	Minke Whale	IV
2619	<i>Balaenoptera borealis</i>	Sei Whale	IV
2621	<i>Balaenoptera physalus</i>	Fin Whale	IV
2622	<i>Kogia breviceps</i>	Pygmy Sperm Whale	IV
5009	<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle	IV
5020	<i>Balaenoptera musculus</i>	Blue Whale	IV
5029	<i>Delphinapterus leucas</i>	Beluga/White Whale	IV
5031	<i>Physeter macrocephalus</i>	Sperm Whale	IV
5033	<i>Hyperoodon ampullatus</i>	Northern Bottlenose Whale	IV
5034	<i>Mesoplodon europaeus</i>	Gervais' Beaked Whale	IV
5046	<i>Alosa fallax killarnensis</i>	Killarney Shad	II, V

Note: Some Annex II species are also listed under Annex V of the Habitats Directive. While Annex V species are not covered by the Environmental Liability Regulations, their inclusion under Annex V is noted in this table for completeness. Any species listed in Annex V alone is not covered by the Regulations.

C3 Strategic Ranking of Habitats and Species protected under EU and Irish Legislation

The Habitats and Species protected under EU and Irish Legislation have been strategically ranked as illustrated in **Figure C1**. To determine the degree of legislation protecting a habitat or species, three levels of determination have been identified.

Level 1	The habitats or species listed under Level 1 are protected under EU legislation (Habitats Directive or Birds Directive) and are subject to the Environmental Liability Regulations.
Level 2	The species listed under Level 2 are not protected under EU legislation and therefore, are not subject to the Environmental Liability Regulations. However, they are protected under National legislation and any relevant information should be forwarded to the NPWS for further investigation.
Level 3	The species listed under Level 3 are not protected under either EU or National legislation, but are of conservation interest in Ireland. Any relevant information should be forwarded to the NPWS for further investigation.

Note: Any species protected under both EU and Irish legislation is subject to the Environmental Liability Regulations and therefore, listed under Level 1 only.

In **Figure C1**, the habitats and species listed under Levels 1, 2 and 3 are strategically ranked in order of overall conservation status. The categories of prioritisation in the strategic ranking are listed below in **Table C1**. The habitats and species listed and ranked under Level 1 correspond with **Table C2**. The species listed and ranked under Levels 2 and 3 correspond with **Tables C3** and **C4**, respectively.

Table 1: Categories and Descriptions of Habitats and Species of Overall Conservation Status

Category	Description
Priority Habitats	All designated Priority Habitats should be avoided at all costs (Red Flag).
Higher Overall Conservation Status	Habitats and species which are of higher overall conservation status based on the following: Habitats – Range; Area; Structure & Function; and Future Prospects. Species – Range; Population; Area of Suitable Habitat; and Future Prospects.
Lower Overall Conservation Status	Habitats and species which are of lower overall conservation status based on the following: Habitats – Range; Area; Structure & Function; and Future Prospects. Species – Range; Population; Area of Suitable Habitat; and Future Prospects.
Overall Conservation Status Unknown	Species whose overall conservation status can not be determined at present due to lack of data. Under the precautionary principal, these species are ranked highest.
Vagrant Species	Species which are vagrant species in Irish waters and are rarely recorded.

Some examples of how the strategic ranking of habitats and species can be utilised:

Q1 A pipeline development route cut through a Sand Martin colony, resulting in damage to that colony. Are Sand Martins protected under EU or Irish legislation, and subject to the Environmental Liability Regulations?

Answer: The Sand Martin is not listed under the EU Birds Directive (Level 1 – Figure C1) in Ireland and therefore, is not subject to the Environmental Liability Regulations. It is listed under Irish legislation as a species of medium conservation concern and therefore, all relevant information should be forwarded to the NPWS for further investigation.

Q2 A marshland was drained in order to facilitate development of an access road contrary to planning permission, which contained a population of Slender Green Feather Moss, resulting in the loss of the moss population and habitat. Is the Slender Green Feather Moss protected under EU or Irish legislation, and subject to the Environmental Liability Regulations?

Answer: The Slender Green Feather Moss is listed under the EU Habitats Directive (Level 1 – Figure C1) in Ireland and therefore, is subject to the Environmental Liability Regulations. The Slender Green Feather Moss is ranked in the least conservation concern category, but is protected under EU legislation. All relevant information should be forwarded to the EPA for investigation and remediation under the Environmental Liability Regulations.

Q3 A peat slide occurred adjacent to a river which contained a population of Freshwater Pearl Mussels, resulting in the loss of that colony of Pearl Mussels. Are Freshwater Pearl Mussels protected under EU or Irish legislation, and subject to the Environmental Liability Regulations?

Answer: The Freshwater Pearl Mussel is listed under the EU Habitats Directive (Level 1 – Figure C1) in Ireland and therefore, is subject to the Environmental Liability Regulations. The pearl mussel is ranked in the highest conservation concern category. All relevant information should be forwarded to the EPA for investigation and remediation under the Environmental Liability Regulations.

Q4 An aquaculture facility discarded netting and equipment inappropriately resulting in the death of three White-beaked Dolphins. Are White-beaked Dolphins protected under EU or Irish legislation, and subject to the Environmental Liability Regulations?

Answer: The White-beaked Dolphin is listed under the EU Habitats Directive (Level 1 – Figure C1) in Ireland and therefore, is subject to the Environmental Liability Regulations. The White-beaked Dolphin is ranked in the highest conservation concern category, under the precautionary principal. All relevant information should be forwarded to the EPA for investigation and remediation under the Environmental Liability Regulations.

Figure C1. Summary Schematic Illustrating Strategic Ranking of Habitats and Species Protected Under EU and National Legislation

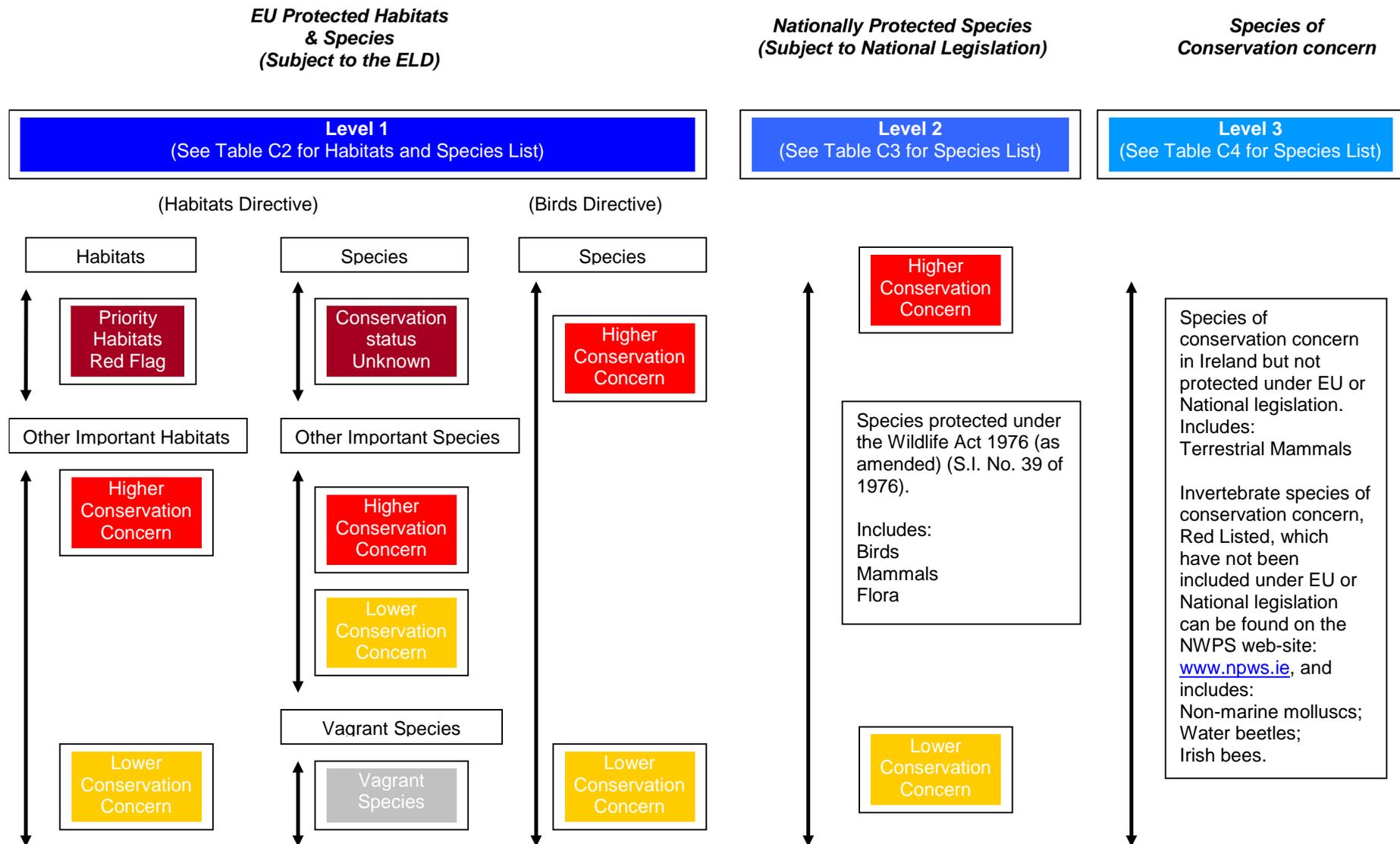


Table C2: Level 1 – Habitats and Species Protected under EU Legislation

Habitats Directive				Birds Directive	
Habitats	Ranking	Species	Ranking	Species	Ranking
Coastal Lagoons (Code 1150)	Priority	Humpback Whale (<i>Megaptera novaeangliae</i>) (Code 1345)	Unknown*	Bewick's Swan (<i>Cygnus bewickii</i>)	Red List* Species
Fixed Coastal Dunes with Herbaceous Vegetation (Code 2130)	Priority	Killer Whale (<i>Orcinus orca</i>) (Code 2027)	Unknown*	Corncrake (<i>Crex crex</i>)	Red List* Species
Decalcified Fixed Dunes with <i>Empetrum nigrum</i> (Code 2140)	Priority	Long-finned Pilot Whale (<i>Globicephala melas</i>) (Code 2029)	Unknown*	Golden Plover (<i>Pluvialis apricaria</i>)	Red List* Species
Atlantic Decalcified Fixed Dunes (Code 2150)	Priority	Risso's Dolphin (<i>Grampus griseus</i>) (Code 2030)	Unknown*	Red-necked Phalarope (<i>Phalaropus lobatus</i>)	Red List* Species
Machair (Code 21ao)	Priority	White-beaked Dolphin (<i>Lagenorhynchus albirostris</i>) (Code 2032)	Unknown*	Nightjar (<i>Caprimulgus europaeus</i>)	Red List* Species
Turloughs (Code 3180)	Priority	Striped Dolphin (<i>Stenella coeruleoalba</i>) (Code 2034)	Unknown*	Golden Eagle (<i>Aquila chrysaetos</i>)	Red List* Species
Semi-Natural Dry Grassland and Scrubland Facies on Calcareous Substrates (Code 6210)	Priority	Cuvier's Beaked Whale (<i>Ziphius cavirostris</i>) (Code 2035)	Unknown*	Red-throated Diver (<i>Gavia stellata</i>)	Amber List* Species
Species-Rich Nardus Grasslands, on Siliceous Substrates in Mountain Areas (Code 6230)	Priority	Sowerby's Beaked Whale (<i>Mesoplodon bidens</i>) (Code 2038)	Unknown*	Black-throated Diver (<i>Gavia arctica</i>)	Amber List* Species
Active Raised Bogs (Code 7110)	Priority	Blue Whale (<i>Balaenoptera physalus</i>) (Code 5020)	Unknown*	Cory's Shearwater (<i>Calonectris diomedea</i>)	Amber List* Species
Blanket Bog (Active) (Code 7130)	Priority	Sperm Whale (<i>Physeter macrocephalus</i>) (Code 5031)	Unknown*	Storm Petrel (<i>Hydrobates pelagicus</i>)	Amber List* Species
Calcareous Fens with <i>Cladium mariscus</i> (Code 7210)	Priority	Northern Bottlenose Whale (<i>Hyperodon ampullatus</i>) (Code 5033)	Unknown*	Whooper Swan (<i>Cygnus Cygnus</i>)	Amber List* Species
Petrifying Springs with Tufa Formation (Code 7220)	Priority	Sei Whale (<i>Balaenoptera borealis</i>) (Code 2619)	Unknown*	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>)	Amber List* Species
Limestone Pavements (Code 8240)	Priority	Allis Shad (<i>Alosa alosa</i>) (Code 1102)	Unknown*	Barnacle Goose (<i>Branta ruficollis</i>)	Amber List* Species
Bog Woodland (Code 91d0)	Priority			Hen Harrier (<i>Cirus cyaneus</i>)	Amber List* Species

Alluvial Forest (Code 91e0)	Priority	Other Important Species		Merlin (<i>Falco columbarius</i>)	Amber List* Species
<i>Taxus baccata</i> Woods of the British Isles (Code 9580)	Priority	Nore Freshwater Pear Mussel (<i>Margaritifera durrovensis</i>) (Code 1990)	1*	Dunlin (<i>Calidris alpine schinzii</i>)	Amber List* Species
Natural Eutrophic Lakes (Code 3150)	1	Desmoulin's Whorl Snail (<i>Vertigo moulinsiana</i>) (Code 1016)	1	Ruff (<i>Philomachus pugnax</i>)	Amber List* Species
Lowland Hay Meadows (Code 6510)	1	Leatherback Turtle (<i>Dermochelys coriacea</i>) (Code 1223)	1	Bar-tailed Godwit (<i>Limosa lapponica</i>)	Amber List* Species
Natural Dystrophic Lakes and Ponds (Code 3160)	1	Natterjack Toad (<i>Bufo calamita</i>) (Code 1202)	1*	Wood Sandpiper (<i>Tringa glareola</i>)	Amber List* Species
Northern Atlantic Wet Heaths with <i>Erica tetralix</i> (Code 4010)	1	Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) (Code 1029)	1*	Mediterranean Gull (<i>Larus melanocephalus</i>)	Amber List* Species
Shifting Dunes along the Shoreline with <i>Ammophila arenaria</i> (Code 2120)	1	Maerl (<i>Lithothamnion coralloides</i>) (Code 1376)	2	Sandwich Tern (<i>Sterna sandvicensis</i>)	Amber List* Species
Molinia Meadows on Calcareous, Peaty or Clayey-Silt-Laden Soils (Code 6410)	1	Maerl (<i>Phymatolithon calcareum</i>) (Code 1377)	2	Roseate Tern (<i>Sterna dougallii</i>)	Amber List* Species
Old Sessile Oak Woods with <i>Ilex</i> and <i>Blechnum</i> in British Isles (Code 91a0)	1	White-clawed Crayfish (<i>Austropotamobius pallipes</i>) (Code 1092)	2*	Common Tern (<i>Sterna hirundo</i>)	Amber List* Species
Mediterranean and Therno-Atlantic Halophilous Scrubs (Code 1420)	2	Sea Lamprey (<i>Petromyzon marinus</i>) (Code 1095)	2*	Arctic Tern (<i>Sterna paradisaea</i>)	Amber List* Species
Reefs (Code 1170)	2	Twaite Shad (<i>Alosa fallax fallax</i>) (Code 1103)	2*	Little Tern (<i>Sterna albifrons</i>)	Amber List* Species
Humid Dune Slacks (Code 2190)	2	Pollan (<i>Coregonus autumnalis</i>) (Code 5076)	2*	Short-eared Owl (<i>Asio flammeus</i>)	Amber List* Species
Oligotrophic Waters containing very few minerals of Sandy Plains (Code 3110)	2	Atlantic Salmon (<i>Salmo salar</i>) (Code 1106)	2*	Snowy-Owl (<i>Nyctea scandiaca</i>)	Amber List* Species
Oligotrophic to Mesotrophic Standing Waters (Code 3130)	2	<i>Lycopodium</i> species group (Code 1413)	2*	Kingfisher (<i>Alcedo atthis</i>)	Amber List* Species
Hard Oligo-Mesotrophic Waters with Benthic Vegetation of <i>Chara</i> Spp. (Code 3140)	2	Geyer's Whorl Snail (<i>Vertigo geyeri</i>) (Code 1013)	2	Chough (<i>Pyrrhocorax pyrrhocorax</i>)	Amber List* Species
Water Courses of Plain to Montane	2	Narrow-mouthed Whorl Snail	2	Leach's Storm-petrel	Amber List*

Levels with Aquatic Vegetation (Code 3260)		(<i>Vertigo angustior</i>) (Code 1014)		(<i>Oceanodroma leucorhoa</i>)	Species
Transition Mires and Quaking Bogs (Code 7140)	2	Marsh Fritillary (<i>Euphydryas aurinia</i>) (Code 1065)	2	Great Northern Diver (<i>Gavia immer</i>)	Green List* Species
Alkaline Fens (Code 7230)	2	Irish Hare (<i>Lepus timidus hibernicus</i>) (Code 1334)	3*	Little Egret (<i>Egretta garzetta</i>)	Green List* Species
Perennial Vegetation of Stony Banks (Code 1220)	2	Slender Naiad (<i>Najas flexilis</i>) (Code 1833)	3*	Peregrine (<i>Falco peregrinus</i>)	Green List* Species
Salicornia and other Annuals Colonizing Mud and Sand (Code 1310)	2	<i>Sphagnum</i> genus (Code 1409)	3*	Black Tern (<i>Chlidonias niger</i>)	Green List* Species
Atlantic Salt Meadows (Code 1330)	2	<i>Cladonia</i> subgenus <i>Cladina</i> (Code 5113)	3*		
Embryonic Shifting Dunes (Code 2110)	2	Grey Seal (<i>Halichoerus grypus</i>) (Code 1364)	3*		
Alpine and Boreal Heaths (Code 4060)	2	Common (Harbour) Seal (<i>Phoca vitulina vitulina</i>) (Code 1365)	3*		
Juniperus communis Formations on Heaths or Calcareous Grasslands (Code 5130)	2	Bottle-nosed Dolphin (<i>Tursiops truncatus</i>) (Code 1349)	3*		
Siliceous Scree (Code 8110)	2	Common Dolphin (<i>Delphinus delphis</i>) (Code 1350)	3*		
Calcareous and Calc Schist Scree (Code 8120)	2	White-sided Dolphin (<i>Lagenorhynchus acutus</i>) (Code 2031)	3*		
Calcareous Rocky Slopes with Chasmophytic Vegetation (Code 8210)	2	Minke Whale (<i>Balaenoptera acutorostrata</i>) (Code 2618)	3*		
Siliceous Rocky Slopes with Chasmophytic Vegetation (Code 8220)	2	Fin Whale (<i>Balaenoptera physalus</i>) (Code 2621)	3*		
Estuaries (Code 1130)	3	White Cushion Moss (<i>Leucobryum glaucum</i>) (Code 1400)	4*		
Large Shallow Inlets and Bays (Code 1160)	3	Common Frog (<i>Rana temporaria</i>) (Code 1213)	4*		
Mudflats and Sandflats not covered by seawater at low tide (Code 1140)	3	Otter (<i>Lutra lutra</i>) (Code 1355)	4*		

Annual Vegetation of Drift Lines (Code 1210)	3	Killarney Fern (<i>Trichomanes speciosum</i>) (Code 1421)	4*		
Vegetated Sea Cliffs of the Atlantic and Baltic Coasts (Code 1230)	3	Marsh Saxifrage (<i>Saxifraga hirculus</i>) (Code 1528)	4*		
Spartina Swards (Code 1320)	3	Slender Green Feather-Moss (<i>Hamatocaulis vernicosus</i>) (Code 1393)	4*		
Mediterranean Salt Meadows (Code 1410)	3	Petalwort (<i>Petalophyllum ralfsii</i>) (Code 1395)	4*	Highest Conservation Concern	1
Dunes with <i>Salix repens</i> ssp. <i>Argenta</i> (Code 2170)	3	Kerry Slug (<i>Geomalacus maculosus</i>) (Code 1024)	4*	High Conservation Concern	2
European Dry Heaths (Code 4030)	3	River Lamprey (<i>Lampetra fluviatilis</i>) (Code 1099)	4*	Medium Conservation Concern	3
Hydrophilous Tall Herb Fringe Communities (Code 6430)	3	Brook Lamprey (<i>Lampetra planeri</i>) (Code 1096)	4*	Least Conservation Concern	4
Degraded Raised Bogs Still Capable of Natural Regeneration (Code 7120)	3	Killarney Shad (<i>Alosa fallax killarnensis</i>) (Code 5046)	4*	Least Conservation Concern, Birds Only	4
Caves not open to the public (Code 8310)	3	Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) (Code 1303)	4*		
Submerged or Partly Submerged Sea Caves (Code 8330)	3	Common Pipistrellus (<i>Pipistrellus pipistrellus</i>) (Code 1309)	4*		
Sand Banks which are slightly covered by sea water at all times (Code 1110)	4	Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>) (Code 5009)	4*		
Calaminarian Grassland (Code 6130)	4	Nathusius' Pipistrelle (<i>Pipistrellus nathusii</i>) (Code 1317)	4*		
Rhyncosporion Depressions (Code 7150)	4	Natterer's Bat (<i>Myotis nattereri</i>) (Code 1322)	4*		
Chenopodion rubric (Code 3270)	4	Daubenton's Bat (<i>Myotis daubentonii</i>) (Code 1314)	4*		
		Whiskered Bat (<i>Myotis mystacinus</i>) (Code 1330)	4*		
		Brandt's Bat (<i>Myotis brandtilli</i>) (Code 1320)	4*		
		Brown Long-eared Bat (<i>Plecotus auritus</i>) (Code 1326)	4*		

		Leisler's Bat (<i>Nyctalus leisleri</i>) (Code 1331)	4*		
		Pine Marten (<i>Martes martes</i>) (Code 1357)	4*		
		Harbour Porpoise (<i>Phocoena phocoena</i>) (Code 1351)	4*		
		Vagrant Species			
		Northern Right Whale (<i>Eubalaena glacialis</i>)	Vagrant*		
		False Killer Whale (<i>Pseudorca crassidens</i>)	Vagrant*		
		True's Beaked Whale (<i>Mesoplodon mirus</i>)	Vagrant*		
		Pygmy Sperm Whale (<i>Kogia breviceps</i>)	Vagrant*		
		Beluga/White Whale (<i>Delphinapterus leucas</i>)	Vagrant*		
		Gervais' Beaked Whale (<i>Mesoplodon europaeus</i>)	Vagrant*		

* Also protected under National legislation under the Wildlife Act 1976 and 2000 (as amended) (S.I. No. 39/1976)

Table C3: Level 2 – Species Protected under National Legislation only

Species	Ranking	Species	Ranking	Species	Ranking
Birds *					
Barn Owl	1	Garganey	3	Ringed Plover	3
Black-headed Gull	1	Goldeneye	3	Sand Martin	3
Black-necked Grebe	1	Goosander	3	Scaup	3
Common Scoter	1	Goshawk	3	Shag	3
Curlew	1	Grasshopper Warbler	3	Shelduck	3
Golden Eagle	1	Great Black-backed Gull	3	Skylark	3
Grey Partridge	1	Great Crested Grebe	3	Slavonian Grebe	3
Herring Gull	1	Great Skua	3	Snipe	3
Lapwing	1	Greenshank	3	Spotted Crake	3
Quail	1	Greylag Goose	3	Spotted Flycatcher	3
Red Grouse	1	Grey Plover	3	Starling	3
Redshank	1	Guillemot	3	Stock Dove	3
Ring Ouzel	1	House Martin	3	Swallow	3
Twite	1	House Sparrow	3	Swift	3
Yellowhammer	1	Kestrel	3	Teal	3
Balearic Shearwater	1	Kittiwake	3	Tree Sparrow	3
Knot	1	Lesser Black-backed Gull	3	Tufted Duck	3
Pintail	1	Lesser Whitethroat	3	Turtle Dove	3
Shoveler	1	Linnet	3	Water Rail	3
Sooty Shearwater	1	Little Grebe	3	Wheatear	3
Black Guillemot	3	Manx Shearwater	3	Whinchat	3
Black-tailed Godwit	3	Mute Swan	3	Wigeon	3
Brent Goose	3	Oystercatcher	3	Woodcock	3
Common Gull	3	Pied Flycatcher	3	Wood Warbler	3
Common Sandpiper	3	Pochard	3	Yellow Wagtail	3
Coot	3	Puffin	3		
Cormorant	3	Razorbill	3		
Eider	3	Red Kite	3		
Gadwall	3	Redstart	3		
Gannet	3	Reed Warbler	3		
Mammals					
Red Squirrel (<i>Sciurus vulgaris</i>)	3	Fallow Deer (<i>Dama dama</i>)	4	Pygmy Shrew (<i>Sorex minutes</i>)	4

Red Deer (<i>Cervus elaphus</i>)	4		Badger (<i>Meles meles</i>)	4		Hedgehog (<i>Erinaceus europaeus</i>)	4
Red Fox (<i>Vulpes vulpes</i>)	4		Irish Stoat (<i>Mustela erminea hibernica</i>)	4		Wood Mouse (<i>Apodemus sylvaticus</i>)	4
Flora							
<i>Vascular Plants</i>							
Basil Thyme	FPO		Slender Cotton Grass	FPO		Round Prickly-headed Poppy	FPO
Chives	FPO		Red Hemp Nettle	FPO		Pillwort	FPO
Orange Foxtail	FPO		Opposite-leaved Pondweed	FPO		Alpine Bistort	FPO
Fringed Sandwort	FPO		Limestone Fern	FPO		Small-white Orchid	FPO
Perennial Glasswort	FPO		Bog Orchid	FPO		Tufted Salt-marsh Grass	FPO
Wild Asparagus	FPO		Common Rockrose	FPO		Round-leaved Wintergreen	FPO
Lanceolate	FPO		Meadow Barley	FPO		Great Burnet	FPO
Spleenwort	FPO		Irish Hydrilla	FPO		Meadow Saxifrage	FPO
Forked Spleenwort	FPO		Canadian St. John's Wort	FPO		Hart's Saxifrage	FPO
Purple Milk Vetch	FPO		Hairy St. John's Wort	FPO		Yellow Marsh Saxifrage	FPO
Wood small-reed	FPO		Irish Fleabane	FPO		Alpine Saxifrage	FPO
Short-leaved Water-Starwort	FPO		Sea pea	FPO		Triangular Club Rush	FPO
Narrow leaved Bitter-Cress	FPO		Mudwort	FPO		Annual Knawel	FPO
Northern Rockcress	FPO		Slender Cudweed	FPO		Kerry Lily	FPO
Starved Wood Sedge	FPO		Hairy Birdsfoot Trefoil	FPO		Drooping Lady's Tresses	FPO
Divided Sedge	FPO		Marsh Clubmoss	FPO		Betony	FPO
Lesser Centaury	FPO		Penny Royal	FPO		Killarney Fern	FPO
Narrow-leaved Helleborine	FPO		Oyster Plant	FPO		Clustered Clover	FPO
Autumn Crocus	FPO		Recurved Sandwort	FPO		Subterranean Clover	FPO
Parsley Fern	FPO		Lesser Snapdragon	FPO		Globe Flower	FPO
Bog Hair Grass	FPO		Slender Naiad	FPO		Bitter Vetch	FPO
Chickweed Willow Herb	FPO		Wood Cudweed	FPO		Hairy Violet	FPO
Moore's Horsetail	FPO		Cottonweed	FPO		Pale Heath Violet	FPO
<i>Mosses</i>							
Bryum calophyllum R.Br.	FPO		Orthotrichum pallens Brid.	FPO		Tetraplodon angustatus (Hedw.) Br. Eur.	FPO
Bryum marratii Wils.	FPO		Orthotrichum sprucei Mont.	FPO		Tortella inclinata (Hedw.f.) Limpr.	FPO
Catoscopium nigratum (Hedw.) Brid.	FPO		Orthotrichum stramineum Hornsch. ex Brid.	FPO		Weissia longifolia Mitt.	FPO

Drepanocladus vernicosus (Mitt.) Warnst.	FPO	Paludella squarrosa (Hedw.) Brid.	FPO	Weissia rostellata (Brid.) Lindb.	FPO
Leptobarbula berica (De Not.) Schimp.	FPO	Pottia wilsonii (Hook.) Br. Eur.	FPO		
<i>Liverworts</i>					
Leiocolea gillmanii (Aust.) Evans syn. Lophozia gillmanii (Aust.) Schust.	FPO	Petalophyllum ralfsii (Wils.) Nees & Gott.	FPO	Plagiochila atlantica F. Rose	FPO
Leiocolea rutheana (Limpr.) K. Müll.) syn. Lophozia rutheana (Limpr.) Howe	FPO				
<i>Lichens</i>					
Fulgensia fulgens (Sw.) Elenkin	FPO				
<i>Stoneworts</i>					
Foxtail Stonewort	FPO	Slender Stonewort	FPO		

*All wild birds and their nests and eggs are protected under Section 19 of the Wildlife Act 1976 and 2000 (as amended) (S.I. No. 39/1976)

FPO: Flora Protection Order 1994 (S.I. No. 94/1994)

Table C4: Level 3 – Species of Conservation Concern in Ireland but not Protected under EU or National Legislation

Species	Ranking		Species	Ranking		Species	Ranking
Black Rat/Ship Rat (<i>Rattus rattus</i>)	1		Rabbit (<i>Oryctolagus cuniculus</i>)	4		House Mouse (<i>Mus musculus</i>)	4

C4 Main source of information on Protected Species and Natural Habitats

The main source of information relating to habitats and species is the National Parks and Wildlife Service (NPWS). The NPWS is part of the Department of Environment, Heritage and Local Government and is charged with the conservation of a range of habitats and species in Ireland.

Detailed information can be found on the NPWS website (www.npws.ie) relating to designated sites, protected species as well as detailed mapping for the country. This resource should be used by any person looking to gather information on the sensitivity of a site, any designations for habitat or species, and the broader details of wildlife conservation in Ireland.

The screenshot shows the NPWS website homepage in a web browser. The page features a green header with navigation links: English | Gaeilge | Home | Site Map | Forms & Downloads | FAQs | About Us | Data Policy | Related Links | Contact Us. Below the header is a search bar and a breadcrumb trail: You are here: Home. A left-hand navigation menu lists categories such as National Parks, Protected Sites, Nature Reserves, Biodiversity, Work with NPWS, Wildlife, Planning & the Law, Farmers & Landowners, Marine, Publications & Literature, Maps & Data, Current Research Projects, and Education Centres. The main content area is titled 'Welcome to the National Parks and Wildlife Service' and includes a paragraph about the NPWS's role. It features a prominent banner for the '2010 - International Year of Biodiversity' with a logo and text explaining the significance of the year. Below this, there are four informational boxes: 'Information for Land Owners', 'Maps and Data', 'Marine', and 'Conservation Management Plans'. The 'Information for Land Owners' box includes a small image of a landscape. The 'Maps and Data' box includes a small map image. The 'Marine' box includes a small image of a boat. The 'Conservation Management Plans' box includes a small image of a landscape. On the right side of the page, there are sections for 'Current Projects' (listing 'Latest News', 'Kerry Slug TRP', 'New Irish Wildlife Manuals', and 'Appropriate Assessment guidance') and 'Forms & Downloads' (listing 'Application for Hunting Fauna in State-Owned Foreshores' and 'Capture/kill Protected Wild Animals for Educational or Scientific Purposes'). The browser's address bar shows 'http://www.npws.ie/en'. The taskbar at the bottom shows the Windows Start button, several open applications, and the system clock showing 10:09.

National Parks and Wildlife Service (NPWS) Website - Irish Species - Windows Internet Explorer provided by RPS Group

http://www.npws.ie/en/Biodiversity/IrishSpecies/

English | Gaeilge | Home | Site Map | Forms & Downloads | FAQs | About Us | Data Policy | Related Links | Contact Us

National Parks & Wildlife Service

Department of the Environment, Heritage & Local Government

You are here: Home > Biodiversity > Irish Species

Irish Species

Ireland is a land of varied habitats, a patchwork of farmland, woodland, cliff and marsh, sand dunes, caves, heath, bracken, grassland, bog, fens and flushes, turloughs, lakes, ponds, springs and swamps. We have over 7,800 kilometres of coastline. All of these habitats contain a host of species, some common, some rare, and some unique to Ireland.

To read more about Irish species, please select one of the following:

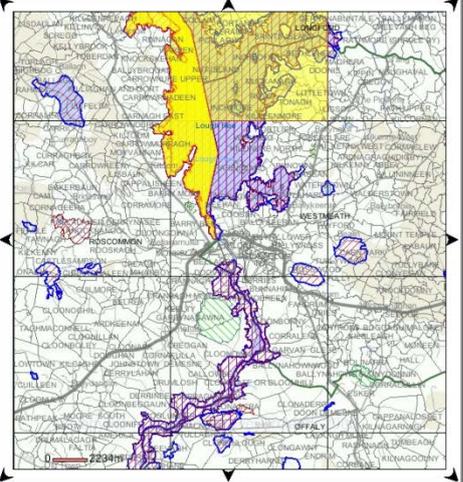
		
Higher plants	Mammals	Reptiles
		
Lower plants	Birds	Amphibians
		
Fungi & Lichens	Fish	Invertebrates

National Parks and Wildlife Service Public Mapviewer - Windows Internet Explorer provided by RPS Group

National Parks & Wildlife Service - Map Viewer

Contents Query Results

Zoom to Results View Detailed Results



X: 201708.949 Y: 255784.248 Scale: 1:187641 © Ordnance Survey/ Ireland

National Parks & Wildlife Service, 7, Ely Place, Dublin - 2. Phone: +353 1 8882000. Fax: +353 1 8883272

Grid 10K	SPECIES	9 found
N05	<i>Lutra lutra</i>	
N05	<i>Lutra lutra</i>	
N05	<i>Mustela martes</i>	
N05	<i>Mustela erminea</i>	
N05	<i>Papaver hybridum</i>	
N05	<i>Papaver hybridum</i>	
N05	<i>Stachys officinalis</i>	
N05	<i>Stachys officinalis</i>	
N05	<i>Stachys officinalis</i>	

Natural Heritage Areas	0 found
Proposed Natural Heritage Areas	1 found
Special Areas of Conservation	1 found
Special Protected Areas	1 found
Site Code	Site Name
000440	Lough Ree
Site Code	Site Name
000440	Lough Ree
Site Code	Site Name
004054	Lough Ree SPA

C5 Additional sources of baseline information on Protected Species and Natural Habitats

The range of possible information sources that might be used to determine baseline conditions for protected species and natural habitats in Ireland is presented below.

Site-specific Studies

Typical examples of site-specific studies that would be available to determine a habitat or species baseline conditions would include any ecological studies completed prior to an activity being developed on site. Typically, Environmental Impact Assessments (EIA Directive 85/337/EEC) and Appropriate Assessments (Habitats Directive 92/43/EEC) would have site specific details on protected species and habitats present, their abundance, potential impacts etc. However, there is currently no central register of this information in Ireland. Some information may be available on the local planning authority websites.

Conservation Plans - NPWS

The NPWS (www.npws.ie) has developed Conservation Management Plans for some of the designated SAC and SPA sites in Ireland. These plans set out baseline conditions where available, qualifying features of the site, objectives and strategies, to maintain favourable conservation status. Where available, such plans are ideal in identifying baseline conditions of a site and furthermore, in assessing the damage to a particular site. Five-year management plans are also available for two of the National Parks, Wicklow Mountains National Park Management Plan and Killarney National Park Management Plan. These plans set out the baseline conditions and management objectives for the Parks.

Link: <http://www.npws.ie/en/PublicationsLiterature/ConservationManagementPlans/>

Species Action Plans - NPWS

The NPWS has published a number of Species Action Plans (SAPs) for species of highest conservation concern within Ireland. The purpose of these plans is to outline the work to be done and strategies to be followed for the conservation of the species. On publication of this guidance 11 separate plans have been published by the NPWS. These plans provide some information for the assessor regarding their potential locations, main threats and further action plans to conserve the species. They are a good source of reference for further research. This may be useful when assessing the baseline conditions of a site that is confirmed to have one of these species.

Link: <http://www.npws.ie/en/PublicationsLiterature/SpeciesActionPlans/>

The Status of the EU Protected Habitats and Species - NPWS

This publication makes an assessment of all protected species and habitats (protected under the Habitats Directive). It offers an overview of the range, area, structure and function as well as status and future prospects of each species or habitat at a national level. The map presents each habitat or species and gives the known or best estimate of distribution, shown as hatched squares.

Link: <http://www.npws.ie/en/media/Media,6440,en.pdf>

Water Framework Directive

The Water Framework Directive requires that Member States achieve a good water quality status for their waters (rivers, lakes, groundwater, estuaries and coastal waters). In response to this Ireland has developed River Basin Management Plans for the entire country. The Plans outline the current status of Irish waters, the proposed environmental objectives for these waters, and the measures which may be necessary in order to achieve these objectives. These plans and their supporting documentation may provide a good source of information to determine the baseline conditions of aquatic habitats and species.

Link: <http://www.wfdireland.ie/documents.html>

Habitat Mapping

Some local authorities have begun the process of habitat mapping for large areas of their jurisdiction in conjunction with the Heritage Council. Professional ecological consultants have been employed by some local authorities to map and provide supplementary information relating to all habitats to level III of the Fossitt (2000) classification system, all habitats listed on Annex I of the European Habitats Directive and sites of local biodiversity value, flooding potential, ecological corridors and buffer zones. The mapping is provided digitally within a GIS database and also includes detailed species lists, current land use, habitat condition and recommendations for future protection of species and habitats outside of the remit of protected sites.

The Habitat Mapping is carried out using standard methodologies prepared by the The Heritage Council as presented in the "Best Practice Guidance for Habitat Survey and Mapping" (2011). Where available, such mapping would prove an ideal source of obtaining baseline conditions. This is particularly relevant for identification of protected species and habitats outside of protected site boundaries. "The Status of EU Protected Habitats and Species in Ireland", "Guide to Habitats" (Fossitt 2000; reprint with 'notes to reader' in 2007) and the "Interpretation Manual" are also valuable sources of information for habitat mapping.

Marine Habitat Mapping

In marine areas, the Marine Institute and Geological Survey of Ireland (GSI) have a number of programmes dedicated to habitat mapping the seabed. These include the Irish National Seabed Survey and INFOMAR programmes which have collected baseline information that is currently being processed. In addition, there are a number of national and European programmes, such as BioMAR which is a point source habitat-mapping project based on the methods developed by the UK MNCR. There is also the current Marine Institute and NPWS mapping of coastal SACs with habitats classified under JNCC or the EUNIS classification systems.

Use of Reference Sites

Where no baseline conditions are available for a site under assessment it may be possible to assess a similar site or reference site, which is known to contain similar species and habitats. Where the assessment is concentrated on a species or a habitat of an aquatic nature, i.e. stream or river, it should be possible to obtain a baseline data upstream of the area under assessment. If applying such a strategy it is important to have a clear understanding of the nature of the water-course, i.e. flows, mixing zones, morphology etc. and of the activity under investigation, i.e. is it a point discharge or diffuse runoff that is under assessment. This will have a substantial bearing on the location chosen for upstream comparison.

Modelling

In the case where there is no available existing data and no suitable reference site, it may be possible to generate baseline conditions from a model. In marine areas habitats can be determined from historical industry or academic data assessed with seabed sediment data from GSI or INFOMAR. The techniques can be used to assess the likelihood of Annex I habitats occurring in marine areas without baseline data. There are more advanced modelling techniques that can be used to assess the likelihood of Annex II species occurring by using detailed physical and hydrodynamic modelling to model potential niche availability (ETSU). This requires considerable hydrodynamic baseline information or unchanged hydrodynamics post an event.

Reference Documents

Historical mapping, aerial photography, GIS databases, Species Atlases and various literature sources can be examined (where appropriate) to provide some baseline information. National Atlases based on 10x10km squares are available for; Breeding Birds, Wintering Birds, Butterflies & Moths, Bats, Flora, Marine, etc. National surveys are carried out and data is also submitted by Botanical Recorders of the British Isles (BSBI) County Recorders, NPWS Regional Staff, Local Conservation Groups, and Universities.

Examples of key sources of terrestrial information

- Crowe, O. (2005). Ireland's Wetlands and their Waterbirds: Status and Distribution. BirdWatch Ireland, Newcastle, Co. Wicklow,
- Irish Wetland Bird Survey (I-WeBS) Reports,
- Preston, C. D., D. A. Pearman, and T. D. Dines. 2002. New Atlas of the British and Irish Flora: An Atlas of the Vascular Plants of Britain, Ireland, the Isle of Man, and the Channel Islands. Oxford University Press. Oxford, UK.
- Sharrock, 1976, and Gibbons et al., 1993. The Atlases of Breeding Birds
- <http://www.batconservationireland.org/>
- <http://www.butterflyireland.com/index.htm>
- www.biology.ie
- <http://www.bto.org/birdatlas/>

Examples of key sources of coastal and marine information.

- INFOMAR, INSS and SEAMAP (UK)
- MIDAS
- MarLIN
- Marine Institute and CSO Stock Assessments
- Academic and educational institutions
- Universities, research centres, marine research centres and colleges, etc.
- National and international government-funded research organisations and laboratories
- International Organisations, ICES OSPAR, North Sea Task Force, INTERREG
- Natural Environment Research Council (UK); Eolas and GSI (Ireland); National Ocean Service, US Geological Service, IFREMER (France); etc.
- The industrial sector
- Insurance companies; real estate agencies; banks; etc.
- Tourism
- Resort operators; tourism agencies; national and regional tourist organisations; etc.
- Military and defence
- Coastguard; off-shore rescue services; fisheries protection vessels; customs and excise; etc.
- Local government, e.g. local authorities, planning departments and applications.
- Including Local Biodiversity Record Centres where available
- Regional councils; urban and rural authorities; Port and Harbour Authorities; etc.
- National and international NGOs
- International Hydrographic Organisation; National Trust (UK); European Union for Coastal Conservation; Coastwatch Europe; Marine Conservation Society (UK); etc.
- Local Groups, Birdwatch Ireland, BTO, RSPB, IWDG, Sea Turtle Trust

APPENDIX D

Further Information on Water Damage

D1 Background Information on the Water Framework Directive

The Water Framework Directive 2000/60/EC (WFD) provides a framework for the protection of the aquatic environment as well as for terrestrial ecosystems and wetlands directly dependant on the aquatic environment. It is an overarching piece of legislation, consolidating and strengthening water policy in general by bringing together relevant existing EU legislation as well as requiring Member States to introduce new national legislation in several key areas. The WFD is aimed at preventing any deterioration in the existing status of waters, including the maintenance of 'high status' where it exists, and at ensuring that all waters achieve at least 'good status' by 2015.

River Basin Management Plans (RBMPs) have been introduced to ensure that the objectives of the WFD are met and include a set of management measures. These include measures introduced under eleven pre-existing EU Directives, new measures introduced by the WFD, and measures introduced on a needs basis where the measures from the Directives are not sufficient to meet WFD objectives.

The WFD requires governments to manage all of their waters: rivers, canals, lakes, reservoirs, groundwaters, protected areas (including wetlands and other water dependent ecosystems), estuaries and coastal waters. Member States must ensure that their waters achieve at least good status, generally by 2015, and that the status of all waters does not deteriorate. The objectives of the WFD are to:

- Achieve good ecological status and chemical status in surface waters;
- Achieve good chemical status and quantitative status in groundwaters;
- Achieve good ecological potential and chemical status in artificial and heavily modified waters;
- Prevent deterioration in status of surface and groundwaters;
- Reverse pollution trends;
- Achieve objectives and standards for protected areas; and
- Cease Priority Hazardous Substances discharges.

While all of the waters covered are important, some areas require greater protection because they contain sensitive habitats or wildlife species. Other areas are protected because of their beneficial uses or the need to protect human health, including drinking water sources, shellfish growing areas and bathing areas.

The WFD has been transposed into national law by means of the following:

- European Communities (Water Policy) Regulations 2003;
- Waste Water Discharge (Authorised) Regulations 2007;
- European Communities (Drinking Water) (No. 2) Regulations 2007; and
- European Communities Environmental Objectives (Surface Waters) Regulations 2009.

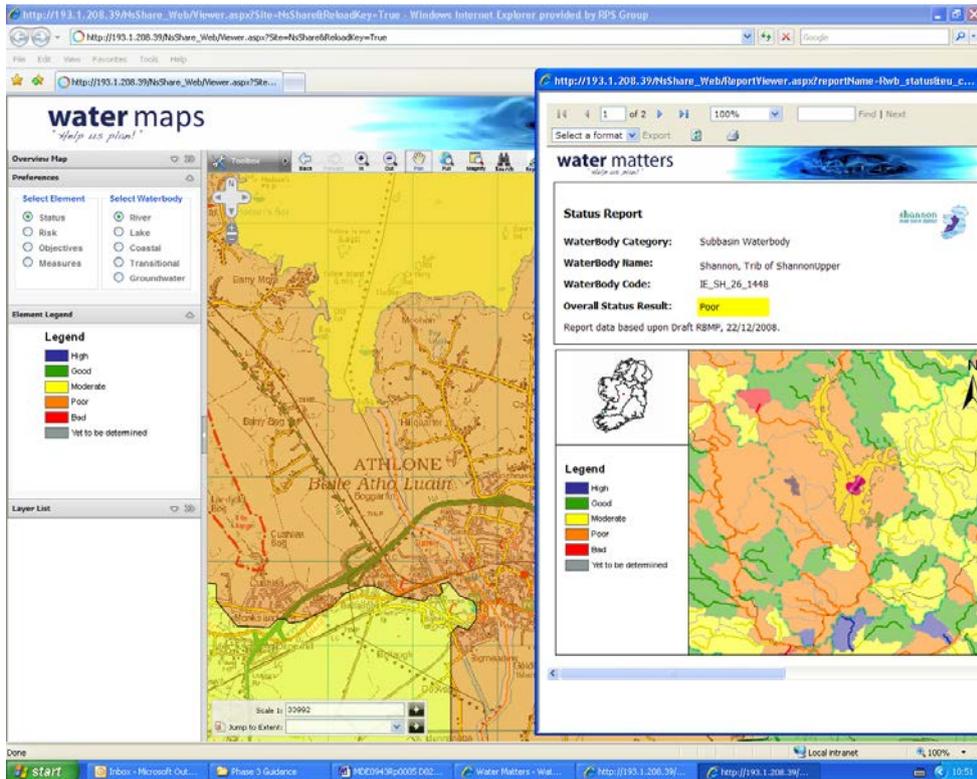
The following sections provide details on where to source water quality data gathered under the WFD for use in the assessment of environmental damage under the Environmental Liability Regulations.

D2 Sources of Information on Water Quality in Ireland

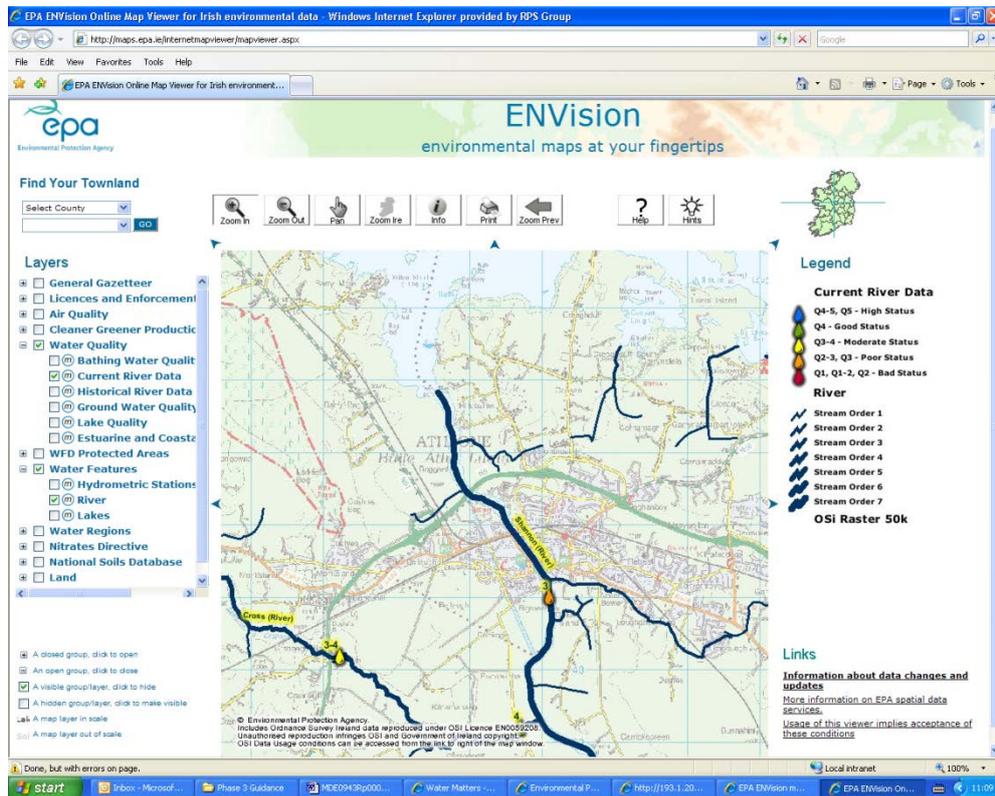
The principal source of information and published reports relating to the work carried out under the Water Framework Directive (WFD) can be found at <http://www.wfdireland.ie/>. The website has been set as an information resource for anyone interested in learning more about the WFD or the River Basin Management Plans prepared for Ireland. All documentation and reports prepared under WFD are available on this website.



This website also contains a mapping resource (called watermaps) that allows users to easily identify the water quality status and risk of any water body in the country.



An alternative resource for information on water quality status and supporting data is through the EPA ENVision map viewer website <http://maps.epa.ie/internetmapviewer/mapviewer.aspx>. Similar to the mapping resource on the WFD website, the EPA website allows users to view water quality status for all water bodies in the country.



Other key sources of information are the management plans prepared by each of the River Basin Districts (RBDs). These plans include detailed mapping and data of all water bodies within the RBD margin and their current status. For illustration, sample maps for the Shannon International River Basin District (source Shannon IRBD River Basin Management Plan) are presented below (surface water bodies and ecological status and groundwater status). Similar mapping is available for the other RBDs and more detailed mapping and reports are available for all water bodies in the form of Water Management Unit Action Plans.

Figure D1: Sample Surface Water Ecological Quality mapping for the Shannon International River Basin District (source; Shannon IRBD River Basin Management Plan)

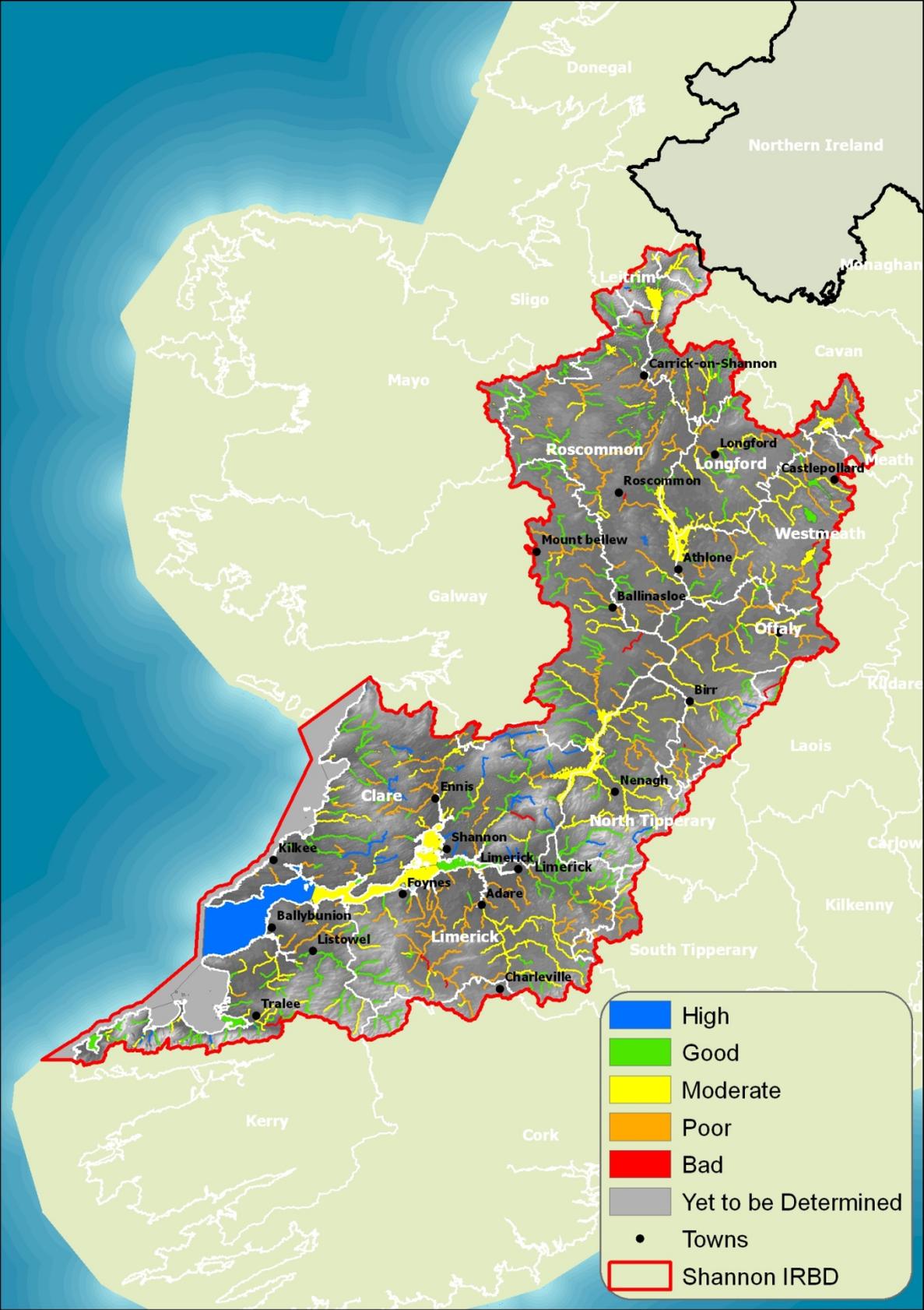
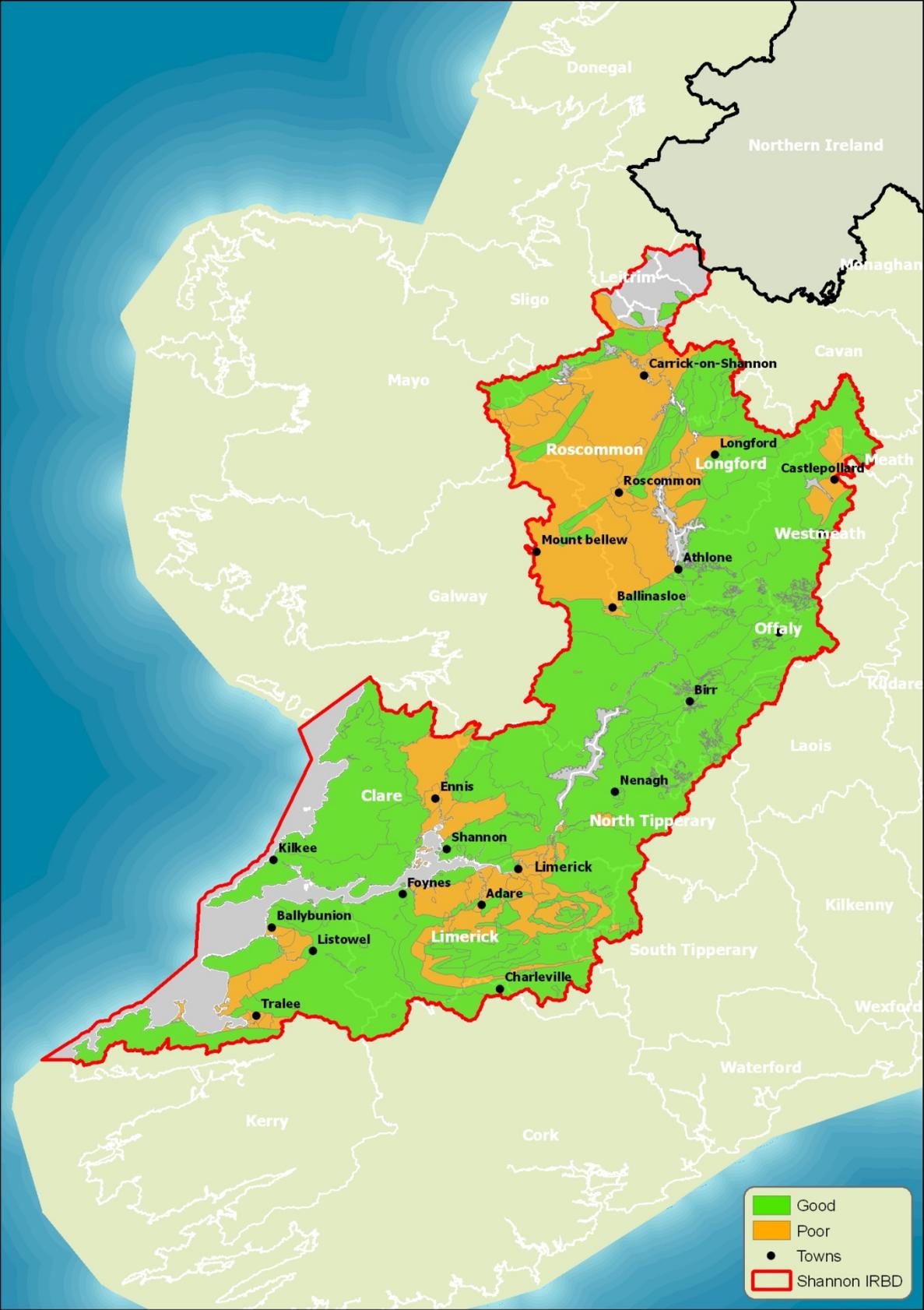


Figure D2: Sample Groundwater Quality Status mapping for the Shannon International River Basin District (source; Shannon IRBD River Basin Management Plan)



APPENDIX E

Remediation of Damage to Protected Species, Natural Habitats and Water

E1 Further information on options for remediation of water damage, habitats and species

Primary Remediation

The definition of Primary Remediation is '*any remedial measure which returns the damaged natural resources or impaired services to, or towards, baseline condition*'.

The purpose of primary remediation, as defined in the Regulations is:

'Where the damaged natural resources and/or services do not return to their baseline condition, then complementary remediation will be undertaken. The purpose of complementary remediation is to provide a similar level of natural resources or services, including, as appropriate, at an alternative site, as would have been provided if the damaged site had been returned to its baseline condition. Where possible and appropriate the alternative site should be geographically linked to the damaged site, taking into account the interests of the affected population'.

Should the assessment of damage to natural resources conclude that the impact has been significant, the first priority is to seek to achieve primary restoration, i.e. restoration of the damaged habitat, species or water body. Primary remediation considers options to directly restore the natural resources and services to, or towards baseline condition, through active intervention on an accelerated time frame, or through natural recovery. The range of possible levels of intervention for primary intervention are presented below.

Non-intervention (including natural recovery) - Where possible, restoration should seek to assist natural processes to repair the damage inflicted to waters, habitats or species populations, such as through natural recovery.

Attempts to clean up and restore resources may result in greater damage than if they had been left alone. This can happen, for example, with oil pollution damage to saltmarshes where the soft nature of the substrate and sensitivity of the vegetation to oil-dispersing chemicals makes it difficult or impossible to remove oil from such habitats. Therefore, the best option in such circumstances is to leave the oil to degrade naturally. However, due to the often anoxic conditions found within a short distance from the surface of such soft sediment coastal habitats, oil can remain trapped within the substrate for a very long time and can become environmentally 'active' again following erosion or other disturbance.

Non-intervention costs are likely to be the least expensive but will include:

- Damage assessment and preparation a restoration / monitoring strategy; and
- Monitoring and surveillance strategy.

Although the cost items may be limited, the length of post damage monitoring and surveillance may be longer than in other options and hence more expensive. The rate at which such habitats recover is also likely to be slow and, as such, interim losses and the scale of compensatory habitat restoration may be greater. The nature conservation value of habitats that recovered through natural processes is likely to be higher as planting or importation genetic material, soil or other material can be avoided.

Limited Intervention - A limited level of intervention may be the most preferable option to restore water and ecological relationships in some instances. This may be appropriate, for example, in the

restoration of damage to coastal sand dunes, where some level of ecological stability is required to prevent wind erosion of the dunes, which may best be provided by planting of marram grass.

As with full intervention, it will be important to ensure the genetic integrity of a site is maintained when resorting to planting or reintroduction of species and might therefore require the development of specific propagation or breeding programmes may be required. Also, as with the full intervention option, there may be some species that benefit from the damaged ecosystem that will decline in population size or distribution following restoration. However, decisions on restoration techniques should focus on restoring the overall ecosystem balance of a resource to pre-damage levels even if this results in disadvantages to opportunist species. Costs involved will need to be calculated along similar lines to those for full intervention but are likely to be smaller in magnitude.

This option may be less costly, but this is not the reason why such a limited intervention is preferable to a full intervention option. The most sustainable and valuable resources are often those that have a high degree of naturalness. By allowing natural processes to restore a resource around the basic framework provided by limited intervention, the resultant water body, habitat or ecosystem (complex of habitats) will be of greater value than one that is simply a facsimile of the original. It should be noted that taking the limited intervention option will probably take a longer time to achieve restoration and hence there will be greater interim losses. This would increase the necessary scale of compensatory restoration options.

Cost items for limited intervention are likely to be similar to those for full intervention. However, the magnitude of the costs involved is likely to be much reduced. For example, there is unlikely to be a need to undertake captive breeding programmes for species restoration and the amount of plant propagation needed will also be much reduced or even absent.

Cleaning costs may be as significant, or even more significant than in total restoration, as in this option the objective is to restore the physical structure of the damaged resource to allow natural processes to restore the diversity. Clean up and some physical resource manipulation may, therefore, be all that is required, but this will need to be completed to a very high standard. Though the time needed for natural processes to restore a resource following limited intervention will be greater, limited intervention options have ecological advantages over full intervention in that the final resource will be far more natural and hence of higher nature conservation value.

Full Intervention - Full restoration intervention of a badly damaged resource is likely to be of long duration and highly expensive. Damage to a resource can also create temporary new habitats that might be exploited by species that are of high nature conservation value in their own right.

For instance, where forest cover is damaged as a result of 'acid rain' the resultant forest clearings may be colonised by birds associated with such clearings such as the black grouse *Tetrao tetrix*, a species listed on Annex I of the EU Birds Directive. Restoration of former forest cover might restore the habitat to a pre-damage state but would result in the loss of the black grouse habitat. In other cases, the cessation of hunting or fishing activity post-damage may also allow species populations to recover.

In such circumstances, it will be important to restore the resource to pre-damage condition even if this means some loss of populations that have taken advantage of the damage or management intervention following the damage.

The cost of full intervention options will need to include:

- Damage assessment and preparation of a restoration and monitoring strategy;
- Cleaning in full intervention options can be considerable, e.g. removal of oil from contaminated beaches. The ecological advantage of cleaning will vary immensely between sites, but a full cleaning option might be appropriate on coast sediment shores composed of sand or shingle, where habitats are adapted to a high degree of habitat mobility and are liable to re-establish

rapidly after cleaning. On soft sediment coasts, including mudflats and saltmarshes, cleaning is both more difficult and can lead to reduced levels of natural restoration;

- Species population restoration might include captive breeding and reintroduction programmes or simply appropriate habitat restoration, such as creation of woodland glade micro-habitats for woodland butterflies or re-introduction of appropriate stock grazing to create specific grassland sward height and structure;
- Habitat restoration may require propagation of appropriate trees, shrubs, grasses and other plants from indigenous genetic stock, including growth of these plants in a suitable nursery environment and replanting. This may need to be combined with appropriate soil restoration, restoration of hydrology and water quality and, in certain circumstances, may require the re-formation of geomorphological features, such as riverine structures (e.g. meanders and pools); and
- Monitoring and surveillance strategy.

Complementary Remediation

Complementary remediation is defined as *'any remedial measure taken in relation to natural resources or services to compensate for the fact that primary remediation does not result in fully restoring the damaged natural resources and/or services'*.

The purpose of complementary remediation, as defined in the Regulations is:

'Where the damaged natural resources and/or services do not return to their baseline condition, then complementary remediation will be undertaken. The purpose of complementary remediation is to provide a similar level of natural resources or services, including, as appropriate, at an alternative site, as would have been provided if the damaged site had been returned to its baseline condition. Where possible and appropriate the alternative site should be geographically linked to the damaged site, taking into account the interests of the affected population'.

Complementary remediation applies when it is not possible to restore the original resource to its baseline condition using primary remediation alone. Complementary remediation may also be appropriate before the event in order to offset resources expected to be lost as a result of planned land use or development, e.g. in the context of the Habitats and Birds Directives and EIA Directives where such measures are called 'compensatory measures'.

It is important to note that the 'compensatory measures' of the Habitats Directive are not the same as the 'compensatory remediation measures' of the Regulations. The two terms do not have the same meaning and focus on different types of remediation measures (or at least have different objectives). The purpose of the 'compensatory measures' under the Habitats Directive is to provide a similar level of natural resources and services at an alternative site, or at a part of the original site not impacted by the project concerned. Therefore, the 'compensatory measures' of the Habitats Directive are more comparable with the 'complementary remediation measures' of the Regulations.

Complementary methods would be dependent on equivalency determinations, including scaling, to ensure that the alternatives offer, for example, an equivalent ecological value compared to the resources or services lost. Resource-to-resource or service-to-service and economic valuation approaches are frequently used depending on the circumstances (refer Section E2).

Compensatory Remediation

Compensatory remediation is defined as *'any action taken to compensate for interim losses of natural resources or services that occur from the date of damage occurring until primary remediation has achieved its full effect'*.

The purpose of compensatory remediation, as defined in the Regulations is:

'Compensatory remediation shall be undertaken to compensate for the interim loss of natural resources and services pending recovery. This compensation consists of additional improvements to protected natural habitats and species or water at either the damaged site or at an alternative site. It does not consist of financial compensation to members of the public'.

Compensatory remediation is needed to compensate for losses from the time that damage occurred until recovery to baseline conditions. Such losses are called the 'interim losses'. Compensatory mechanisms could also be used to reimburse a governmental agency's direct and indirect costs associated with, for example, assessing damage, planning and monitoring restoration measures and administrative overheads.

The term 'interim losses' means losses which result from the fact that the damaged natural resources or services are not able to perform their ecological functions or provide services to other natural resources or to the public until the primary or complementary measures have taken effect. It does not consist of financial compensation to members of the public.'

E2 Equivalency Analysis

There are a number of options for carrying out Habitats Equivalency Analysis (HEA) and Resource Equivalency Analysis (REA) ranging from the very simple to the more complex approaches. The chosen approach should be appropriate and reflect the complexity of the remediation options. This section provides additional information and approaches to those presented in Section 7.2.6 of the main guidance document.

Conducting a HEA or REA involves three main steps:

- Quantify the effects of environmental damage in terms of the extent and degree of lost resources or services. This step is carried out as damage assessment under the Regulations.
- Identify and evaluate remediation options in terms of the quantity and quality of service or resource replacement anticipated to be provided. This step is carried out as the preferred remediation option under the Regulations.
- Scale the remediation to compensate for the lost resources or services over time. Essentially this step involves varying the degree of remediation to account for the time lost in implementation (i.e. the interim losses).

A simple example would be where water damage leads to a fish kill involving the death of 1,000 fish. To remediate the damage the river is restocked with 1,000 new fish. In this case no scaling has been undertaken to take into account the time lost in restocking the fish.

To develop the above example, an operator may decide to restock the river with 1,500 fish. The additional 500 fish are based on a scale up of the initial 1,000 fish to compensate for the interim losses

for the time taken to restock the river. In this instance scaling has been applied but with no scientific basis for calculating the additional compensatory remediation.

A number of approaches have been developed, initially in the US but also in Europe, to provide a scientific basis to the scaling used in HEA and REA. An example of a more complex tool that may be applied is the REMEDE 'Toolkit for Performing Resource Equivalency Analysis to Assess and Scale Environmental Damage in the European Union'.

Link: http://www.envliability.eu/docs/D13MainToolkit_and_Annexes/D13MainToolkit.html

The REMEDE (Resource Equivalency Methods for Assessing Environmental Damage in the EU) project comprises of a team of ecologists, economists and legal experts from Europe and the US set up by the EU to develop and test methods for determining the scale of the remedial measures necessary to adequately offset environmental damage.

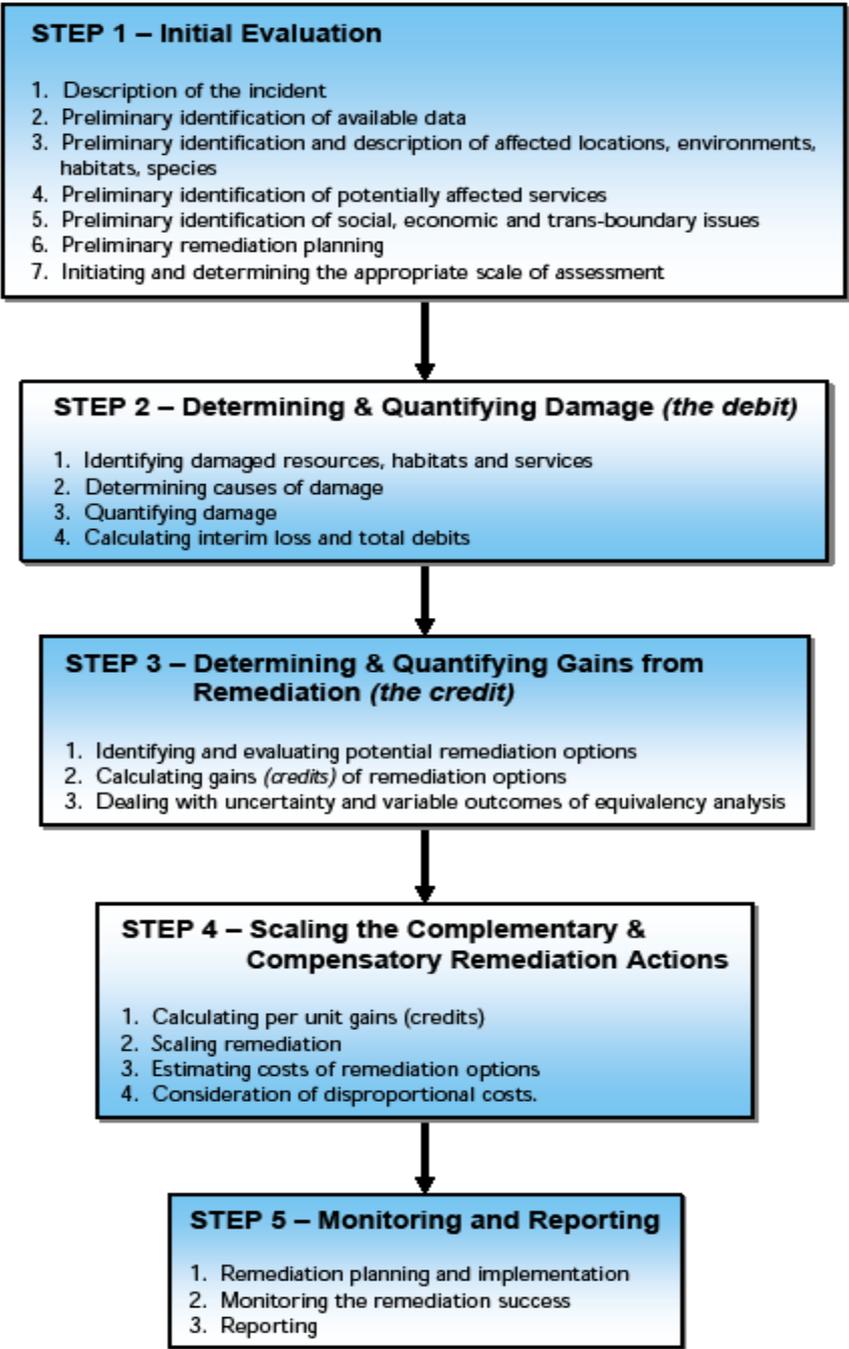
The REMEDE Toolkit has been developed and outlines analytical steps that can be used to assess and remediate different types of environmental damage and incidents covered by the Environmental Liability Directive, Habitats Directive, Birds Directive and the Environmental Impact Assessment Directive. The Toolkit assists in answering two fundamental questions:

- How are losses of or damages to natural resources or services assessed and quantified?
- How much complementary and compensatory remediation is needed to make up for those losses or damages?

Note: The Toolkit does not, and cannot, contain universally-applicable answers to these questions. Neither does it offer best practice guidance that will suit all possible scenarios. The wide range of environmental resources and incidents that can cause damage under the relevant Directives, as well as the complexity of the issues raised, prevents the Toolkit from being universally-applicable. Therefore, the 'correct' approach necessarily will be context-dependent. However, the Toolkit does provide users with a set of approaches that can be applied to a wide array of incidents and settings.

The five key stages in using the REMEDE toolkit for equivalency analysis are presented in Figure E1. For further information on the methodology and criteria refer to the REMEDE website.

Figure E1: REMEDE Procedure for Equivalency Analysis



APPENDIX F

Further Information on Land Damage and Remediation

F1 Further information on Risk Assessment

Further guidance on the principles of undertaking qualitative risk assessment for land damage and ground contamination can be found in the following publications:

- EPA 'Code of Practice for Environmental Risk Assessment of Unregulated Waste Disposal Sites', 2007.

Link: http://www.epa.ie/downloads/advice/waste/waste/EPA_CoP_waste_disposal_sites.pdf

- Environment Agency (England and Wales) and Defra 'Model Procedures for Management of Land Contamination', 2002. This publication includes details on the **CLR11** model approach for assessing contaminated land.

Link: <http://publications.environment-agency.gov.uk/pdf/SCHO0804BIBR-e-e.pdf>

- Details on the Contaminated Land Exposure Assessment (**CLEA**) approach adopted by the Environment Agency (England and Wales) can be found on the Environment Agency's website. This website provides information on the CLEA software and guidance as well as support information such as Soil Guideline Values and Health Criteria Values.

Link: <http://www.environment-agency.gov.uk/research/planning/33714.aspx>

- Further sources on toxicology are provided on the Environment Agency (England and Wales) toxicological section of the website.

Link: <http://grdp.org/research/planning/64002.aspx>.

F2 Further information on natural attenuation

The use of monitored natural attenuation may be considered as a remediation measure for land damage with reference to the following guidance:

- Environment Agency 'Monitored Natural Attenuation – dealing with pollution using natural processes', 2004.

Link: <http://publications.environment-agency.gov.uk/pdf/SCHO0104BHTD-e-e.pdf>

- USEPA 'Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites', 1999.

Link: <http://www.epa.gov/swerust1/directiv/d9200417.pdf>

An Gníomhaireacht um Chaomhnú Comhshaoil

Is í an Gníomhaireacht um Chaomhnú Comhshaoil (EPA) comhlachta reachtúil a chosnaíonn an comhshaoil do mhuintir na tíre go léir. Rialaímid agus déanaimid maoirsiú ar gníomhaíochtaí a d'fhéadfadh truailliú a chruthú murach sin. Cinntímid go bhfuil eolas cruinn ann ar threochtaí comhshaoil ionas go nglactar aon chéim is gá. Is iad na príomh-nithe a bhfuilimid gníomhach leo ná comhshaoil na hÉireann a chosaint agus cinntiú go bhfuil forbairt inbhuanaithe.

Is comhlacht poiblí neamhspleách í an Gníomhaireacht um Chaomhnú Comhshaoil (EPA) a bunaíodh i mí Iúil 1993 faoin Acht fán nGníomhaireacht um Chaomhnú Comhshaoil 1992. Ó thaobh an Rialtais, is í an Roinn Comhshaoil agus Rialtais Áitiúil a dhéanann urraíocht uirthi.

ÁR bhFREAGRACHTAÍ

CEADÚNÚ

Bíonn ceadúnais á n-eisiúint againn i gcomhair na nithe seo a leanas chun a chinntiú nach mbíonn astuithe uathu ag cur sláinte an phobail ná an comhshaoil i mbaol:

- áiseanna dramhaíola (m.sh., líonadh talún, loisceoirí, stáisiúin aistrithe dramhaíola);
- gníomhaíochtaí tionsclaíocha ar scála mór (m.sh., déantúsaíocht cógaisíochta, déantúsaíocht stroighne, stáisiúin chumhachta);
- diantalmhaíocht;
- úsáid faoi shrian agus scaoileadh smachtaithe Orgánach Géinathraithe (GMO);
- mór-áiseanna stórais peitreal.
- Scardadh dramhúisce

FEIDHMIÚ COMHSHAOIL NÁISIÚNTA

- Stiúradh os cionn 2,000 iniúchadh agus cigireacht de áiseanna a fuair ceadúnas ón nGníomhaireacht gach bliain.
- Maoirsiú freagrachtaí cosanta comhshaoil údarás áitiúla thar sé earnáil - aer, fuaim, dramhaíl, dramhúisce agus caighdeán uisce.
- Obair le húdaráis áitiúla agus leis na Gardaí chun stop a chur le gníomhaíocht mhídhleathach dramhaíola trí chomhordú a dhéanamh ar líonra forfheidhmithe náisiúnta, díriú isteach ar chiontóirí, stiúradh fiosrúcháin agus maoirsiú leigheas na bhfadhbanna.
- An dlí a chur orthu siúd a bhriseann dlí comhshaoil agus a dhéanann dochar don chomhshaoil mar thoradh ar a gníomhaíochtaí.

MONATÓIREACHT, ANAILÍS AGUS TUAIRISCIÚ AR AN GCOMHSHAOIL

- Monatóireacht ar chaighdeán aer agus caighdeán aibhneacha, locha, uisce taoide agus uisce talaimh; leibhéil agus sruth aibhneacha a thomhas.
- Tuairisciú neamhspleách chun cabhrú le rialtais náisiúnta agus áitiúla cinntiú a dhéanamh.

RIALÚ ASTUITHE GÁIS CEAPTHA TEASA NA HÉIREANN

- Cainníochtú astuithe gáis ceaptha teasa na hÉireann i gcomhthéacs ár dtiomantas Kyoto.
- Cur i bhfeidhm na Treorach um Thrádáil Astuithe, a bhfuil baint aige le hos cionn 100 cuideachta atá ina mór-ghineadóirí dé-ocsaíd charbóin in Éirinn.

TAIGHDE AGUS FORBAIRT COMHSHAOIL

- Taighde ar shaincheisteanna comhshaoil a chomhordú (cosúil le caighdeán aer agus uisce, athrú aeráide, bithéagsúlacht, teicneolaíochtaí comhshaoil).

MEASÚNÚ STRAITÉISEACH COMHSHAOIL

- Ag déanamh measúnú ar thionchar phleananna agus chláracha ar chomhshaoil na hÉireann (cosúil le plannanna bainistíochta dramhaíola agus forbartha).

PLEANÁIL, OIDEACHAS AGUS TREOIR CHOMHSHAOIL

- Treoir a thabhairt don phobal agus do thionscal ar cheisteanna comhshaoil éagsúla (m.sh., iarratais ar cheadúnais, seachaint dramhaíola agus rialacháin chomhshaoil).
- Eolas níos fearr ar an gcomhshaoil a scaipeadh (trí cláracha teilifíse comhshaoil agus pacáistí acmhainne do bhunscoileanna agus do mheánscoileanna).

BAINISTÍOCHT DRAMHAÍOLA FHORGHNÍOMHACH

- Cur chun cinn seachaint agus laghdú dramhaíola trí chomhordú An Chláir Náisiúnta um Chosc Dramhaíola, lena n-áirítear cur i bhfeidhm na dTionscnamh Freagrachta Táirgeoirí.
- Cur i bhfeidhm Rialachán ar nós na treoracha maidir le Trealamh Leictreach agus Leictreonach Caite agus le Srianadh Substaintí Guaiseacha agus substaintí a dhéanann ídiú ar an gcrios ózóin.
- Plean Náisiúnta Bainistíochta um Dramhaíl Ghuaiseach a fhorbairt chun dramhaíl ghuaiseach a sheachaint agus a bhainistiú.

STRUCHTÚR NA GNÍOMHAIREACHTA

Bunaíodh an Gníomhaireacht i 1993 chun comhshaoil na hÉireann a chosaint. Tá an eagraíocht á bhainistiú ag Bord lánaimseartha, ar a bhfuil Príomhstíúrthóir agus ceithre Stíúrthóir.

Tá obair na Gníomhaireachta ar siúl trí ceithre Oifig:

- An Oifig Aeráide, Ceadúnaithe agus Úsáide Acmhainní
- An Oifig um Fhorfheidhmiúchán Comhshaoil
- An Oifig um Measúnacht Comhshaoil
- An Oifig Cumarsáide agus Seirbhísí Corparáide

Tá Coiste Comhairleach ag an nGníomhaireacht le cabhrú léi. Tá dáréag ball air agus tagann siad le chéile cúpla uair in aghaidh na bliana le plé a dhéanamh ar cheisteanna ar ábhar imní iad agus le comhairle a thabhairt don Bhord.

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