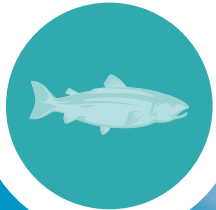


# Biodiversity Guidelines for Infrastructure Staff

Promoting biodiversity and  
sustainability practices





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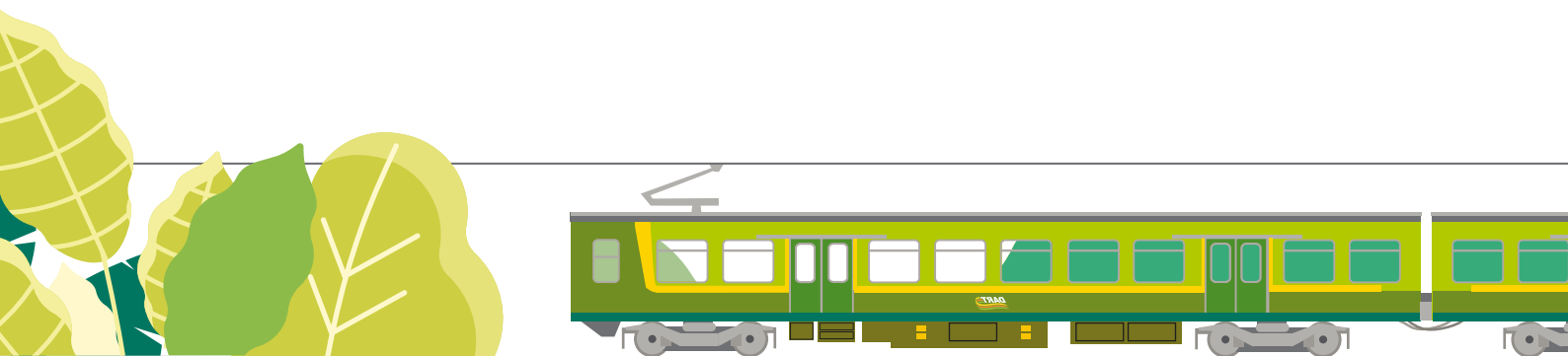
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## Glossary of Terms

**All-Ireland Pollinator Plan** – A framework created to allow collaboration to promote pollinator initiatives throughout Ireland with it being described as the beginning of the process to ensure positive steps are taken to protect our pollinators and the service they provide into the future. Essentially it is a shared plan of action to restore pollinator populations to healthy levels.

**Appropriate Assessment** – An Appropriate Assessment (AA) is an assessment of the potential adverse effects of a development or activity and an examination of the implications on designated sites and its conservation objectives.

**Annex Species** – The main aim of the Habitats Directive is to contribute towards the conservation of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status. These annexes list habitats (Annex I) and species (Annexes II, IV and V) which are considered threatened within the EU.

**Biodiversity** – refers to the variability among living organisms found throughout various habitats such as within the terrestrial or marine environment. There is great diversity within the species found here with each playing an important role in the environment with greater biodiversity boosting the productivity of the ecosystem.

**Biodiversity Action Plan** – The National Biodiversity Action Plan (NBAP), the third such plan for Ireland, captures the objectives, targets and actions for biodiversity that will be undertaken by a wide range of government, civil society and private sectors to achieve Ireland's Vision for Biodiversity. This NBAP provides a framework to track and assess progress towards Ireland's Vision for Biodiversity over a five-year timeframe.

**Biodiversity Net Gain (BNG)** – Is an approach to ensure biodiversity enhancement is considered throughout all stages of development and encourages developers to leave the biodiversity of a site in a better state than before. It first entails avoiding biodiversity loss and striving towards achieving measurable net gains which contribute to both local and strategic biodiversity priorities.

**Biosecurity** – can be defined as efforts to prevent harm from both intentional and unintentional introductions of organisms to human health, infrastructure and the environment with the term originally based in agricultural contexts now is applied in a more holistic approach to environmental risk management.

**Birds Directive** – EU legislation which sets to conserve wild birds throughout Europe by setting out rules for their protection, conservation, management and control in relation to the birds, their eggs, nests and habitats. Member states must also classify suitable sites to be designated as Special Protection Areas (SPAs) which are recognised for their value to various bird species particularly those that rely on wetlands.

**Climate Act** – The Climate Action Plan 2021 provides a detailed plan for taking decisive action to achieve a 51% reduction in overall greenhouse gas emissions by 2030 and setting us on a path to reach net-zero emissions by no later than 2050, as committed to in the Programme for Government and set out in the Climate Act 2021. The Plan lists the actions needed to deliver on our climate targets and sets indicative ranges of emissions reductions for each sector of the economy.

**Closed Season** – A closed season is a specified period during the year in which it is not permitted to hunt specific animals such as deer or to harvest fish such as when they are spawning. For some instances there are a certain number of licences issued to hunt with specific condition attached.

**Construction Environmental Management Plans (CEMP)** – Are developed to provide a framework that outlines how an appointed contractor will manage and where practicable minimise negative environmental effects during the construction of the proposed development.

It should relate to all elements of construction such as site preparation, materials and waste removal, construction activities and associated engineering works. The CEMP identifies requirements with regard to implementing mitigation measures, monitoring, inspections and reporting hierarchy.

**Couch** – A couch is a day-time resting spot for otters which are found above ground in a nest like structure. In certain cases they may be difficult to spot as they only appear as flattened vegetation and seem to offer very little protection from disturbance. A common place for otter to create a couch can be within areas of long grass or reed beds.

**Culvert** – A tunnel designed to carry a stream or open drain under a road or railway often to channel water past an obstacle while allowing the adequate passage of water. Culverts are typically embedded to be surrounded by soil but can also be created from a pipe, reinforced concrete or any other suitable material available.

**Derogation Licence** – In the event that works have the potential to cause harm to a protected species or their associated habitat such as bats and their roosts an application must be sent to NPWS to seek a derogation for works to commence. Failure to do so could lead to prosecution.

**Designated Sites** – Are created to conserve Ireland's habitats and species by designating areas for conservation as a requirement under national and EU Legislation. The National Parks & Wildlife Service (NPWS) is responsible for the designation of conservation sites in Ireland. The NPWS works with farmers and other landowners as well as national and local authorities trying to achieve the best balance possible between farming and land-use while conserving nature in these selected areas.

**Ecologist** – A person that studies the relationships among animals, plants and their environment focusing on the community located within an ecosystem and how each individual interacts with one another. Ecological surveys allow the initial identification of species, their continued recording and monitoring and allows trends to be analysed over extended time frames.

**Eco-plugs** – is a novel method of treating target species as it is the chemical glyphosate in granular form encapsulated in a plastic plug which can be hammered into individual stumps of trees such as stands of buddleia (butterfly bush). The plugs are very effective with practically no risk of contamination to surrounding vegetation.

**Ecosystem** – a biological community of interacting organisms and their physical environment.

**Eradication** – refers to the complete removal, destruction of something with an example being the goal in treating invasive species is their permanent eradication which can be quite a time consuming and expensive task.

**Foreshore** – means the bed and shore, below the line of high water of ordinary or medium tides, of the sea and of every tidal river and tidal estuary.

**Foreshore Licence** – A foreshore licence is required by any person proposing to place any material or to place or erect any articles, things, structures, or works in or on foreshore or to get and take any minerals in foreshore or to use or occupy foreshore for any purpose unless exempt under other legislation or due to existing rights.

**Geographic Information System (GIS) Mapping** – A system that creates, manages, analyses and maps all types of data. GIS connects data to a map, integrating location data with all types of descriptive information. This provides a foundation for mapping and analysis that is used in science and almost every industry. GIS helps users understand patterns, relationships, and geographic context. The benefits include improved communication and efficiency as well as better management and decision making.

**Glyphosate** – Is the active chemical found in certain herbicides such as roundup which is applied to the leaves of plants to kill both broadleaf plants and grasses. Glyphosate is a non-selective herbicide, meaning it will kill most plants by preventing the plants from making certain proteins that are needed for growth.

**Habitats Directive** – The Habitats Directive contributes to ensuring biodiversity in the European Union by conserving natural habitats, wild fauna and flora species and has set up the Natura 2000 network of designated sites, the largest ecological network in the world.

**Habitat Degradation** – refers to the processes whereby habitats no longer support native wildlife with human impacts playing a role in the loss of biodiversity and the disruption of an ecosystem's structure, composition, and functionality.

**Herbicide** – an agent, usually chemical, for killing or inhibiting the growth of unwanted plants, such as residential or agricultural weeds and invasive species.

**Holt** – is an underground den which are frequently used by otter for sleeping or resting with the most common type of holt is a hole leading to a cavity under the roots of a bankside tree. Most holts are situated on the riverbed, but some can be up to 100m away, particularly for otters who may reside closer to the sea.



**IAMS (Infrastructure Asset Management System)** – Is the internal GIS system used by Iarnród Éireann in the mapping and management of assets such as bridges, embankments and culverts. It is a system that can be used as a database for invasive species and acts as reference prior to works being undertaken as the position of Japanese knotweed can be investigated prior to a site visit.

**Imperative Reasons for Overriding Public Interest (IROPI)** – The third stage of appropriate assessment whereby plans or projects which would normally adversely affect the integrity of a protected site are permitted to proceed only for imperative reasons of overriding public interest. These can include situations where there are no alternative solutions and the reasons of a social or economic nature are enough for the project to proceed. However, these reasons will only be considered in circumstances where appropriate compensatory measures are taken.

**Inland Fisheries Ireland (IFI)** – Inland Fisheries Ireland was established in July 2001 by the Inland Fisheries Act 2010 with the organisations principal function being to protect, manage and conserve Ireland’s inland fisheries and sea angling resources.

**Instream Works** – Works that are proposed which can potentially affect a water body including rivers, lakes, streams, canals, estuaries, marine or ground water bodies with works having the potential of improving and or altering the flow dynamics of rivers and streams.

**International Union of Railway’s (UIC)** – The International Union of Railways (UIC) is the worldwide professional association representing the railway sector and promoting rail transport.

**Invasive Alien Species (IAS)** – are species that are introduced into new areas and, once there, are able to adapt, become established, reproduce and spread, colonising the environment, creating new populations and impacting on biodiversity, health and the economy.

**International Union for Conservation of Nature (IUCN) Red List** – The IUCN Red List is a critical indicator of the health of the world’s biodiversity. It is a powerful tool to inform and promote action for biodiversity conservation and policy change, critical to protecting the natural resources we rely so heavily upon. It provides information about range, population size, habitat and ecology, use and/or trade, threats, and conservation actions that will help inform necessary conservation decisions.

**Mitigation Measures** – Mitigation measures are means to prevent, reduce or control adverse environmental effects of a project, and include restitution for any damage to the environment caused by those effects through replacement, restoration, compensation or any other means.

**Natura 2000 Network** – Natura 2000 is a network of protection areas located within the boundaries of the European Union. It is made up of Special Areas of Conservation and Special Protection Areas designated under the Habitats Directive and the Birds Directive, respectively.

**NHA (National Heritage Area)** – Throughout Ireland areas considered important for the habitats present or the types of species it holds are offered needs of protection with the status of NHA being the basic designation for wildlife.

**NIS (Natura Impact Statement) Report** – The second stage of Appropriate Assessment where significant effects are considered likely, in view of the qualifying interests or special conservation interests and the respective conservation objectives of any European site, the Screening (Stage 1 Appropriate Assessment) identifies that Appropriate Assessment is required. Therefore, this NIS report provides mitigation to avoid adverse effects on European site integrity.

**Non-Native** – A plant that has been introduced to a new place or new type of habitat where it hasn’t been previously found due to intentional or accidental help from human activity. It must be noted that not all non-native plants are invasive. Many plants cannot reproduce or spread readily without further human interference such as many ornamental plants.

**Noxious Plants** – Are native species that readily colonise over-grazed or cultivated land which can have an adverse impact on industry such as agriculture but it must be realised that these native species play an important role in the natural biodiversity of an area and are readily utilised by an array of invertebrate and bird species.

**National Parks and Wildlife Service (NPWS)** – is part of the Heritage Division of the Department of Housing, Local Government & Heritage which aims to secure the conservation of a representative range of ecosystems to maintain and enhance populations of flora and fauna in Ireland. As well as designating and advising on the protection of habitats and species identified for nature conservation; it develops and maintains state-owned National Parks and Nature Reserves.

**Phototoxic** – The sap of the invasive species Giant Hogweed is phototoxic whereby if it comes in contact with the skin it causes irritation in the form of blisters and scars brought on by the UV rays of the sun.

**pNHA (Proposed National Heritage Area)** – These are sites that are also recognised as important for wildlife and habitats but have not been statutorily proposed or designated. There are over 630 sites which were published on a non-statutory basis in 1995 with many p NHA's being quite small such as for the protection of a roosting place for a rare species of bat.

**Pollination** – The transfer of pollen between flowers of the same species leads to fertilization, and successful seed and fruit production for plants. Pollination ensures that the plant will produce full-bodied fruit and viable seeds for the following year. This transfer is aided by the wind or by animals with the most important pollinators being insects such as bees and hoverflies as their entire lifecycle depends on flowering plants.

**Protected Species** – Certain species are protected by law, meaning that it can be illegal to kill, injure or capture birds or animals or to pick or damage certain wild plants.

**Rehabilitation** – Land rehabilitation as a part of environmental remediation is the process of returning the land in a given area to some degree of its former state, after some process has resulted in its damage.

**Restoration** – Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. Ecological restoration seeks to initiate or accelerate ecosystem recovery following damage, degradation, or destruction.

**Ecological Effects of Railways on Wildlife (REvErSE Project)** – An international collaborative project facilitated by the UIC to bring members together to discuss and improve the understanding of the impact of railways on biodiversity and to investigate the opportunities there are to enhance it. Over the course of the project the UIC and its members will develop a Biodiversity Action Plan and international guidance for railway operators and infrastructure managers to support, protect and enhance our natural heritage.

**Special Protection Area (SPA)** – Ireland is required under the terms of the EU Birds Directive (2009/147/EC) to designate Special Protection Areas (SPAs) for the protection of listed rare and vulnerable bird species, migratory bird species and the protection of wetlands especially those of international importance.

**Special Area of Conservation (SAC)** – As a requirement of the EU Habitats Directive which has since been transposed into Irish Law prime wildlife conservation areas which can be considered important on a European as well as Irish Level be protected and monitored.

**Stem injection** – A method of chemically treating invasive species whereby an injection gun and kit is used to pierce the stem of the plant with a hollow needle to release the herbicide directly into the stem.

**UN Sustainability Goals** – In 2015 the United Nations proposed 17 Sustainable Development Goals (SDG's) which spurred a call to action to end poverty and protect the planet by 2030 and to secure its future for the next generation. A key element of the goals is that development must balance social, economic and environmental sustainability.

**Vegetation Boards (V Boards)** – Are a white sign with a large black V which are installed to ensure staff can check the viewing distances from a level crossing to ensure compliant to safety regulations which ensure the continued safety of staff and other users on the railway. The V boards are used at level crossings on a curve to check that vegetation is not obstructing the viewing distances which should always be maintained at 12ft (3.66m) from the running edge of the rail with the measurement taken at 4ft (1.22m) above ground level.

**Vegetation Management** – refers to the targeted approach to control and maintain vegetation that has become an issue such as that it can be described as a risk to the active railway line. It is an important maintenance activity to ensure the continued safe operation of the service with annual surveys carried out to plan for vegetation control.

**Wildlife Act 1976 (Amendment 2000, 2010)** – Is the principal piece of legislation in Ireland responsible for providing protection of wildlife and to control activities that can cause adverse impacts. While the act aims to protect the conservation of wild flora and fauna it also provides for the development and protection of game species and is used to regulate their exploitation.

# FOREWORD



### Foreword

Our railway network of approximately 2,200km traverses through a broad and varied array of land types and environments. The linear nature of railways means we have an extensive length of lands with borders on each side. The habitats, species and ecosystems that we host both on and adjacent to our railway corridors are extensive. Unfortunately, the conservation status of many of these habitats and their associated species are considered unfavourable with the government declaring both a National Climate and Biodiversity Emergency in May 2019 with calls for action to improve the response to biodiversity loss.

The legal protections afforded to the many species and habitats that interface with our infrastructure are clear and unambiguous. As such we need to ensure full compliance at all times with the various obligations set out for us in all of our endeavours when working on the maintenance and renewal of our infrastructure. Further than that however, as temporary custodians of the railway infrastructure we also have the moral obligation to ensure that we work diligently to not only sustain biodiversity on our lands, but to look for opportunities when carrying out our works to see where we can enhance biodiversity and to look to further sustain and improve the natural biodiversity associated with the railway infrastructure for the future generations.

Every small act and action plays a part and conformance with our legal obligations should be just the minimum that we achieve, while at the same time not compromising on our core objectives of the safe provision of railway assets for the operation of our train services.

These guidelines have been developed and produced for all of us involved in maintenance and renewal of our assets. They have been produced to help to guide and educate all of us in a wide range of biodiversity topics such as vegetation management, protected species, our legal obligations and much, much more.

They represent a part of our ongoing and developing commitment not only to biodiversity but to the wider sphere of environmental protection. They are an acknowledgement of our responsibilities as a major, national asset owner, but also an acknowledgement of the fact that the activities we need to carry out to maintain and renew our assets can have the potential to be harmful to biodiversity if they are not carried out in an appropriate and considered manner.

Our ongoing commitment to biodiversity is also demonstrated by the development of our Environmental and Sustainability team which continues to grow so as to be able to provide the supports necessary to all involved in the undertaking of works to our assets. This document has been authored by our Ecologist, Jayne Ryan, and as such I wish to commend Jayne on her dedicated work in producing this comprehensive and important document.

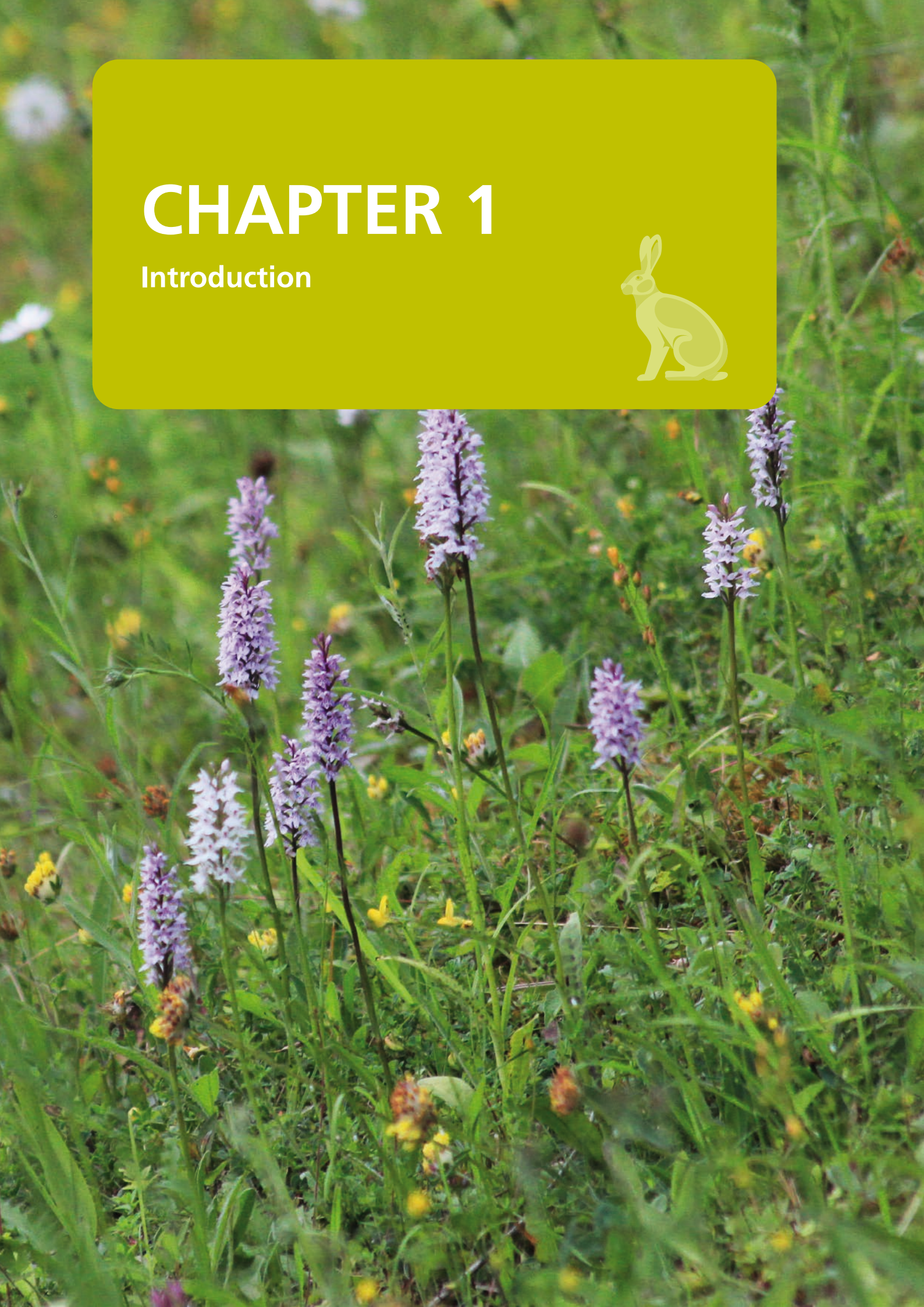
I strongly believe it will be of huge value to all of us in providing the information we need around biodiversity to ensure that together we sustain and enhance biodiversity on and adjacent to our lands while carrying out works to our infrastructural assets.

#### **Cathal Mangan**

Chief Civil Engineer, Infrastructure Management, Iarnród Éireann

# CHAPTER 1

Introduction



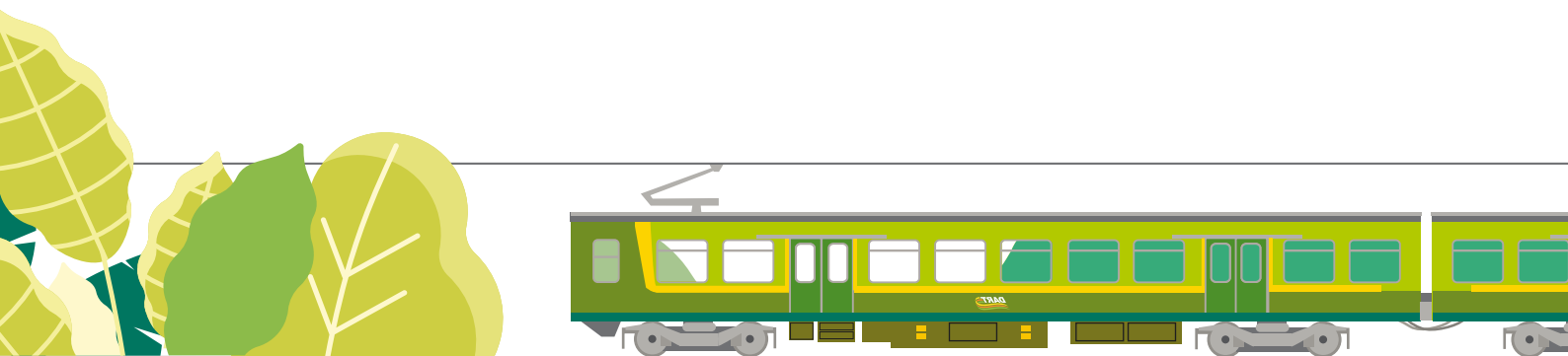
## Introduction

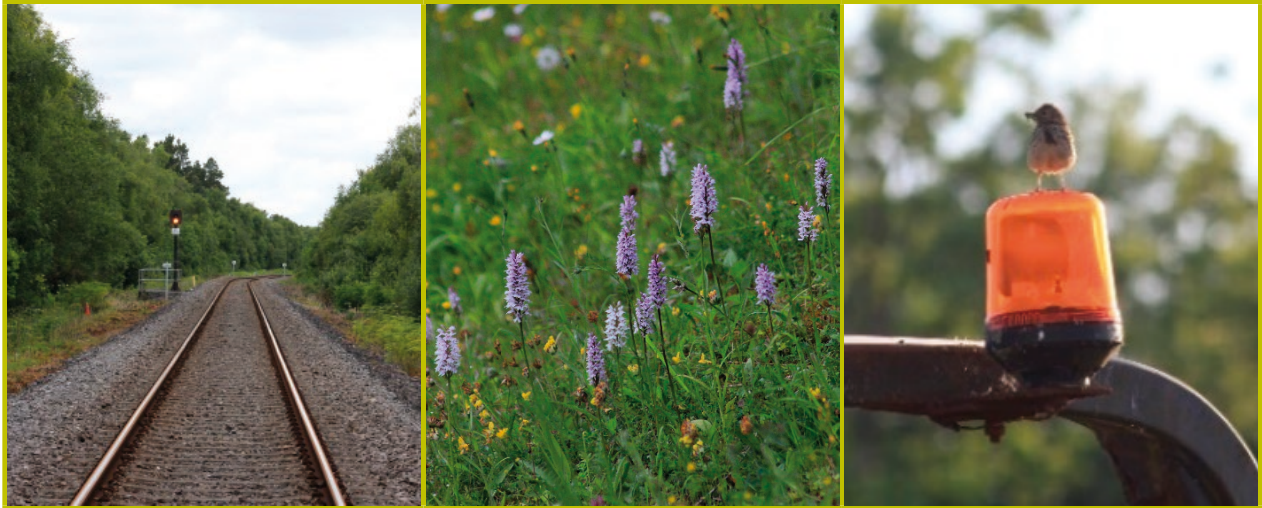
The railway corridor in Ireland is an extensive transport network of approximately 2,200km of linear segregated corridor which delivers essential public transport services to the general public as well as freight transportation. In order to deliver a safe and operational transport system, regular maintenance of track assets, structures and signalling and electrical equipment is required on an ongoing basis.

The track corridor in Ireland traverses through a mosaic of different land types and as such most maintenance activities will invariably have some interface with the natural environment. It is important while planning and implementing our maintenance activities that we consider the protection of the natural environment throughout all elements and phases of maintenance from design stages to planning stages right through to implementation.

### This guideline document aims to:

- Provide staff with an overview of biodiversity, ecological assessment and biodiversity policy in Ireland.
- Outline procedures for maintenance activities which interface with Designated Sites.
- Provide information on protected species and habitats which are associated with the railway environment.
- Provide Information on Invasive plant species identification.





## What is Biodiversity?

Biodiversity refers to the variety of life that is present on Earth consisting of numerous species of plants, animals and even microorganisms with great diversity of genes within these species. Each species play an important role in the environment with greater diversity boosting the productivity of the ecosystem.

## Biodiversity along the Railway

The railway corridor is an extremely dynamic environment with the potential to greatly support the protection of Biodiversity with many rare and protected species found within its remaining refuges. Whilst providing a service to passengers by connecting communities to both rural and urban areas the same service is used by wildlife. With linear features such as embankments and culverts providing the opportunity for species to disperse to other habitats and forage for food.

## Biodiversity Action Plan

Iarnród Éireann (IE) like many other government departments and private (civil) sectors have adopted actions set out by Biodiversity Action Plans to pursue and promote the conservation and sustainable use of resources surrounding biodiversity. While globally there has been increased awareness and efforts to halt biodiversity loss there are still great declines due to human influence such as overexploitation of resource and land changes to intensive agricultural practices. The Biodiversity Plans aim to coordinate action globally to stop Biodiversity loss and promote sustainability measures.

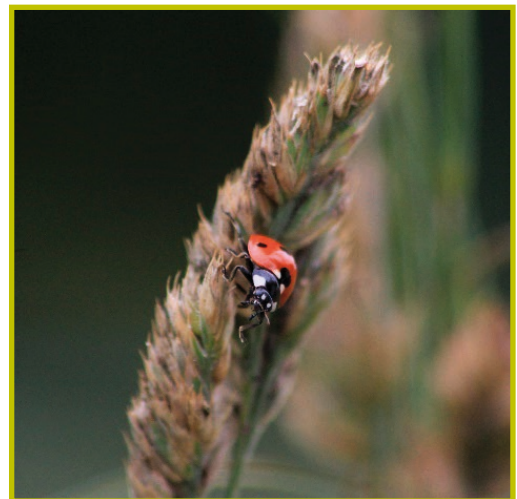
Ireland's First National Biodiversity Plan was launched in April 2002 with the 3rd Action Plan developed for the period 2017-2021. Under the new Biodiversity Action Plan there is a continued commitment to protect our Biodiversity for the benefit of future generations.

This National Biodiversity Action Plan sets the objectives, targets and actions for Biodiversity which will be the focus of a range of government, civil and private sectors to enforce Ireland's Vision for Biodiversity. This framework aims to track and assess progress in achieving targets set over a five-year period from 2017-2021 following on from the seven objectives which we identified in the previous Action plan set in 2011-2016.

**Objective 1:** Mainstream biodiversity into decision-making across all sectors

- Development of green procurement standards throughout the entire company

**Objective 2:** Strengthen the knowledge base for conservation, management, and sustainable use of biodiversity



- Development of a vegetation management competency course for staff to increase the overall knowledge base

**Objective 3:** Increase awareness and appreciation of biodiversity and ecosystem services

- The creation of a “species of the week” series on the Iarnród Éireann internal social media network to inform staff members of the species that are associated with the railway

**Objective 4:** Conserve and restore biodiversity and ecosystem services in the wider countryside

- Becoming a partner within the All-Ireland Pollinator Plan
- Native Species tree planting initiative
- Installation of bat and bird nesting boxes across suitable locations across platforms and outbuildings at stations

**Objective 5:** Conserve and restore biodiversity and ecosystem and ecosystem services in the marine environment

**Objective 6:** Expand and improve management of protected areas and species

**Objective 7:** Strengthen international governance for biodiversity and ecosystem services



The Greater Stitchwort (*Stellaria holostea*) a native perennial can be found pushing its way through dense vegetation such as along road verges or beneath hedgerows.

### International co-operation to protect Biodiversity

Iarnród Éireann is a member of the International Union of Railways (UIC) which is a worldwide organisation that represents the railway sector and aims to promote sustainable rail transport and support their members to ensure success.

Recently Iarnród Éireann has joined UIC’s (rEvERsE) project which stands for Ecological Effects of Railways on Wildlife which aims to understand the railway’s role and effects on Biodiversity and habitats throughout Europe.

The aim of the project through collaboration with other railway organisations is to ensure that land management is carried out in an ecologically sensitive way whilst providing solutions and best practice examples.

Some objectives of the project include:

- To avoid habitat fragmentation and promote biodiversity conservation along railways through shared knowledge and experiences
- To identify how railways threaten the survival of wildlife in Europe and provide solutions to how these may be overcome
- To educate and promote measures that ensures the railway contributes to the UN Sustainable Development Goals

The Climate Action and Low Carbon Development (Amendment) Act 2021 commits Ireland to reach a target of net-zero emissions by 2050 with a reduction to 51% by the year 2030.

The key objectives under this Act emphasise the importance of enhancing and protecting biodiversity through nature-based projects which seek to reduce or increase the removal of greenhouse emissions and support climate resilience. This will help in achieving the objective of transitioning to a more climate resilient, biodiversity rich and environmentally sustainable economy.

#### Adoption of UN Sustainability Goals

The Sustainable Development Goals are a collection of 17 linked global goals designed to achieve a more sustainable future globally. The goals were set in 2015 by the United Nations General Assembly and intended to be achieved by the year 2030. Each goal has roughly 8-12 targets associated to it with progress measured by their implementation and outcome.



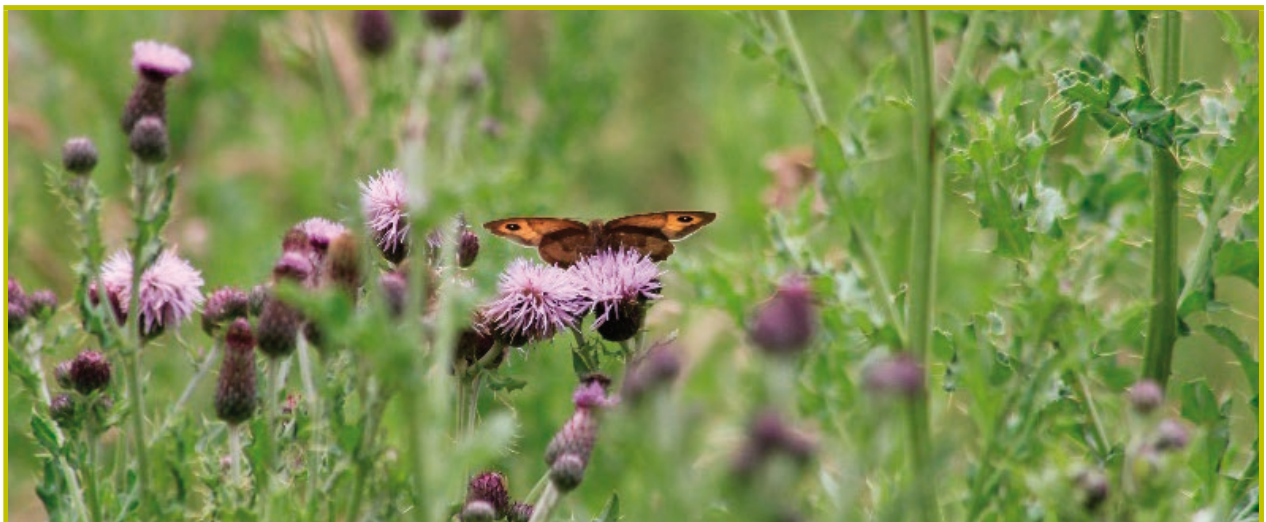
# SUSTAINABLE DEVELOPMENT GOALS



## Why is Biodiversity important?

A healthy ecosystem with greater biodiversity provides numerous natural services such as food, water, soil formation and contributes to climate stability. To ensure the continued conservation of these species, sustainable development strategies must be employed to minimise the risk of damage to species or their habitat and the continued delivery of these ecosystem services.

There are three main ecosystems which can be classified as terrestrial, marine and freshwater. The species that are found here are adapted specifically to survive in these environments.



Terrestrial ecosystem refers to the community of organisms that are found on land such as continents and islands with an example being grasslands.

Marine ecosystems are considered one of the largest aquatic systems on Earth which range from the shoreline to the deepest part of the sea floor. The main defining characteristic is the high salt content. Examples of marine ecosystems include estuaries, lagoons and coral reefs.

Freshwater ecosystems are an aquatic ecosystem that contrasts to marine as they have a lower salt content and are classified by factors such as nutrients and vegetation types. Examples of freshwater ecosystems include lakes, ponds, rivers and wetlands.

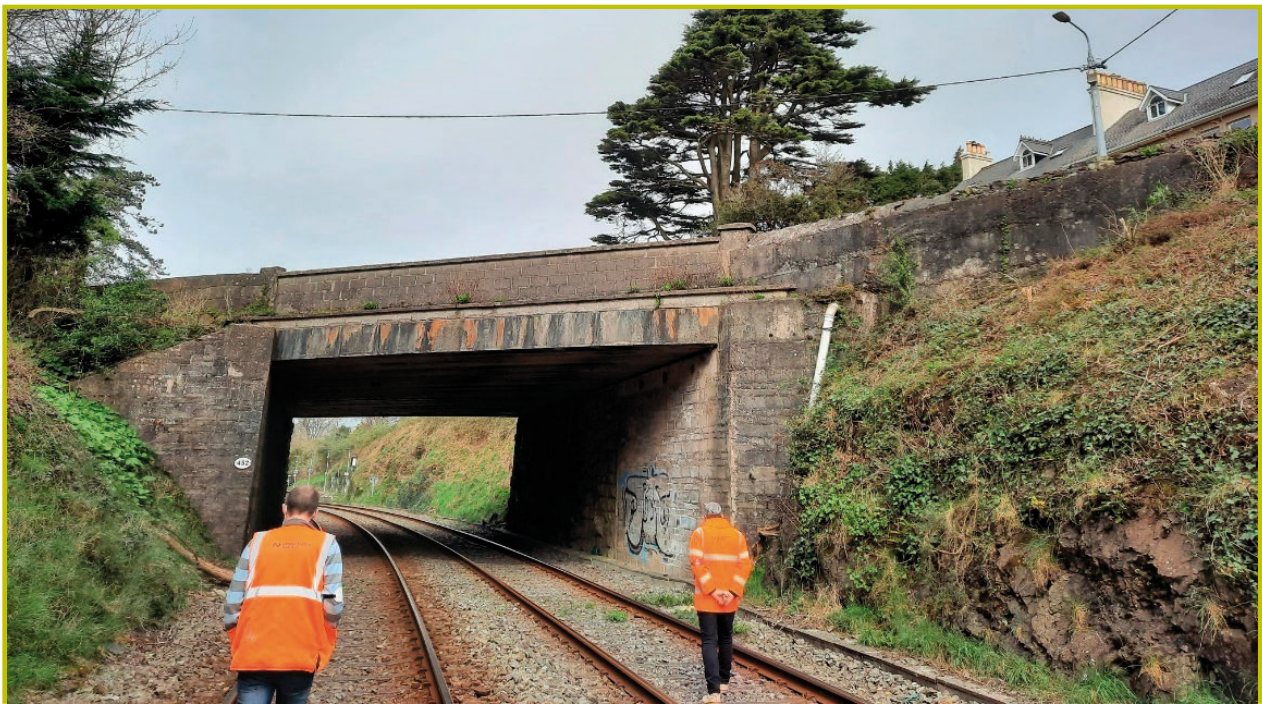
A wide variety of Biodiversity is found along the railway with some of the most common species being Nesting Birds within our hedgerow, Otter along riverbanks and utilising culverts with Badger or Fox also regularly crossing the track to reach their territories. There are also a wide variety of wildflowers naturally occurring in undisturbed areas adjacent to the track.



Neil Dinnen  
[Thewanderer'sphotos.smugmug.com](http://Thewanderer'sphotos.smugmug.com)

## Ecological surveys

- Ecological Surveys should be planned well in advance and conducted prior to any major maintenance activities. This advanced planning allows adequate time to apply for any required licences, ensures works are carried out under correct timelines following best practice guidelines and allows any mitigations that are required to be planned and implemented effectively.
- Ecological surveys are required under the Habitats Directive (92/43/EEC) which forms part of the legal framework set to protect European Designated sites for particular habitats and their associated species. The surveys are an important element of the Appropriate Assessment (AA) process which determine if any plans or projects would be likely to have any significant impacts on the conservation objectives of the designated site.
- There are stages to the Appropriate Assessment process with stage 1 being the drafting of a Screening Report which determines if the planned works are likely to have a significant impact on the surrounding designated sites. If determined there aren't any significant impacts the project can be screened out and continue as per agreed methodology.
- If it is determined through the screening process that the project has the potential to cause a significant impact on a designated site, then this triggers the next stage of the Appropriate Assessment a stage 2 whereby a NIS (Natura Impact Statement) which describes the potential risks to each designated site must be drafted and sent through as part of the planning permission process to receive formal consent prior to works commencing.
- Undertaking of surveys ensure that legally protected species are clearly identified, and that maintenance or construction works that could potentially cause damage to them or their habitat are carried out in the most efficient means possible to avoid or minimise risks.
- The types of surveys that are completed will vary between ecosystems such as terrestrial, marine and freshwater as there are different species that are found throughout these environments. The time of year that these surveys will be undertaken will also vary.



A photo of a recent nesting bird survey which was undertaken in Rushbrooke along the mainline from Cork to Cobh.

## Some Previous Examples of Aquatic Surveys undertaken on behalf of Iarnród Éireann



Electrofishing is a method of sampling fish where a controlled current is sent through the water to stun the fish allowing their safe capture and collection of data such as species composition, abundance and age. Photo taken along the Woodford River, Killarney during an aquatic survey.

The results from Electrofishing anaesthetised Trout and Atlantic Salmon captured during a survey and released after works commenced along the Bagenalstown weir, September 2013.



Surveying for Freshwater Pearl Mussels involves wading through the river with a bathyscope (glass bottom bucket) to view the riverbed such as with the one pictured in the photo. This survey was carried out during November in 2014 at the Woodford-Flesk Confluence.



An example of some eels that were captured during a survey and their measurements being taken identifying their age. This is important information to collect as the European Eel is listed as critically endangered by the IUCN.

The Railway Bridge located over the River Barrow at Kilree, Bagenalstown. The River Barrow at this particular location is a highly modified channel.



A captivated audience checks on aquatic surveys progress during Scour Counter works along UBW95 on the Carlow Branch Line (Bagenalstown, Co. Kilkenny).



# CHAPTER 2

Railway Maintenance  
and Designated Areas



## Planning Works within or near Designated Sites

Designated sites are those protected under the EU Habitats Directive being recognised as important ecological sites which are selected to ensure the long-term conservation of Europe's most valuable and threatened species and habitats. This network of protected sites is called Natura 2000 which includes Special Protection Areas (SPAs) designated under the EU Birds Directive being recognised as internationally important for a variety of bird species. This network also includes Special Conservation Areas (SAC's) which are designated under the Habitats Directive for internationally important habitats and/or species.

This network of internationally important sites are offered high levels of protection and prior to any works being undertaken the internal GIS Mapping System (IAMS: Infrastructure Asset Management System) must be consulted to ensure the location of the work site doesn't lie within or near a designated site. The Appropriate Assessment process must be followed to ensure any possible disturbance to these sites and protected species are avoided and all projects screened at the earliest planning phases of the work.

The database found on the GIS system (IAMS) can also be used to check for other factors which could impact designated sites such as invasive species and allow Management Plans for these infestations to be developed at the earliest phase of the project.

Protocols for Ecological assessment are outlined in the internal works procedure; Ecological Assessment When planning works

- A full and descriptive works methodology is submitted to the environmental resource when requesting an ecological survey or appropriate assessment.
- Appropriate consents are obtained before works proceed
- All conditions and mitigations associated with such consents must be implemented by the contractor
- Any significant changes to the work method must be reassessed

In the case of an emergency situation within an Environmentally Protected Area in which Safety Critical works are required immediately to avoid risk to human life – These works should proceed immediately, and the Accountable Line Manager shall notify the Chief Civil Engineer.

The NPWS (National Parks and Wildlife Service) shall be notified of safety critical works if carried out within an Environmentally Protected Area as soon as possible.

Certain maintenance activities may be exempt from requiring consent from the National Parks and Inland Fisheries Ireland such as tamping and track or asset surveys/inspections. Please check with the Environmental resource in each case.

Should the unexpected presence of protected habitats or species such as badger setts or nesting birds be discovered during works, all disturbances shall cease until an ecological assessment and appropriate derogation licence has been obtained.

If in-stream works are within an environmentally protected area, refer to the conditions of section 3.1 of the document titled Ecological Assessment: Railway Maintenance and Building Maintenance Activities – CCE

It must be noted that if the Appropriate Assessment Screening Report determines that the project cannot be screened out due to significant impacts on the designated site it must proceed to stage 2 whereby a NIS (Natura Impact Statement) is needed as part of the formal planning permission for formal consent for works to proceed. Works cannot proceed until the decision is received from the planning permission authority.

## Procedure when works have potential environmental impacts on protected areas

1. Identify the work site and determine using IAMS GIS system if it lies within a protected site such as SPA, SAC
2. Planner of works is responsible for contacting the CCE Environmental Resource in writing to provide a full description of the proposal with a location map detailing worksite footprint
3. Both the Planner of works and the CCE Environmental resource shall engage the services of an ecologist to undertake an ecological assessment of the project proposal
4. The Regional manager must appoint a person to project manage the works and ensure that they submit a methodology to the appointed contract ecologist

5. Once a methodology is submitted to the ecologist an “Appropriate Assessment” of the work proposal will be undertaken which is a legal requirement under Article 6 (3,4) EC Habitats Directive

There are four potential stages within the appropriate assessment process;

**Stage 1:** Screening

**Stage 2:** Appropriate Assessment and NIS Report (This stage 2 triggers the need for formal consent under the planning permission process before works are permitted to commence)

**Stage 3:** Imperative Reasons of Overriding Public Interest (IROPI)

**Stage 4:** Alternative Solutions

## Appropriate Assessment

Whereby a proposal has been screened out during the first stage of the appropriate assessment and considered to have no potential significant impacts on the affected Natura 2000 or designated site the works can proceed as per the agreed methodology.

In the case that a proposal cannot be screened out it must go through the next stage of the Appropriate Assessment Process a stage 2 whereby a NIS must be drafted which takes into account the potential impacts on the conservation objectives of the designated sites during phases of the proposed works such as during construction and then during operation. The NIS will also include best practice guidelines and provide mitigation measures to reduce significant long-term impacts.

If it is determined that a stage 2 is required this begins the process of seeking formal consent by applying for planning permission under the Planning and Development Act, 2000 whereby all documentation must be in order before seeking a decision from the local planning authority.

It must be noted that this can be a lengthy process as the planning authorities are obliged to make a decision on an application for planning permission within 8 weeks of its receipt.

The planning authority may also give notice requiring further information on the details of the application and associated works and must make a decision within four weeks of the receipt of additional information.

This timeframe must be considered when planning for future works and to prevent delays to essential maintenance works.

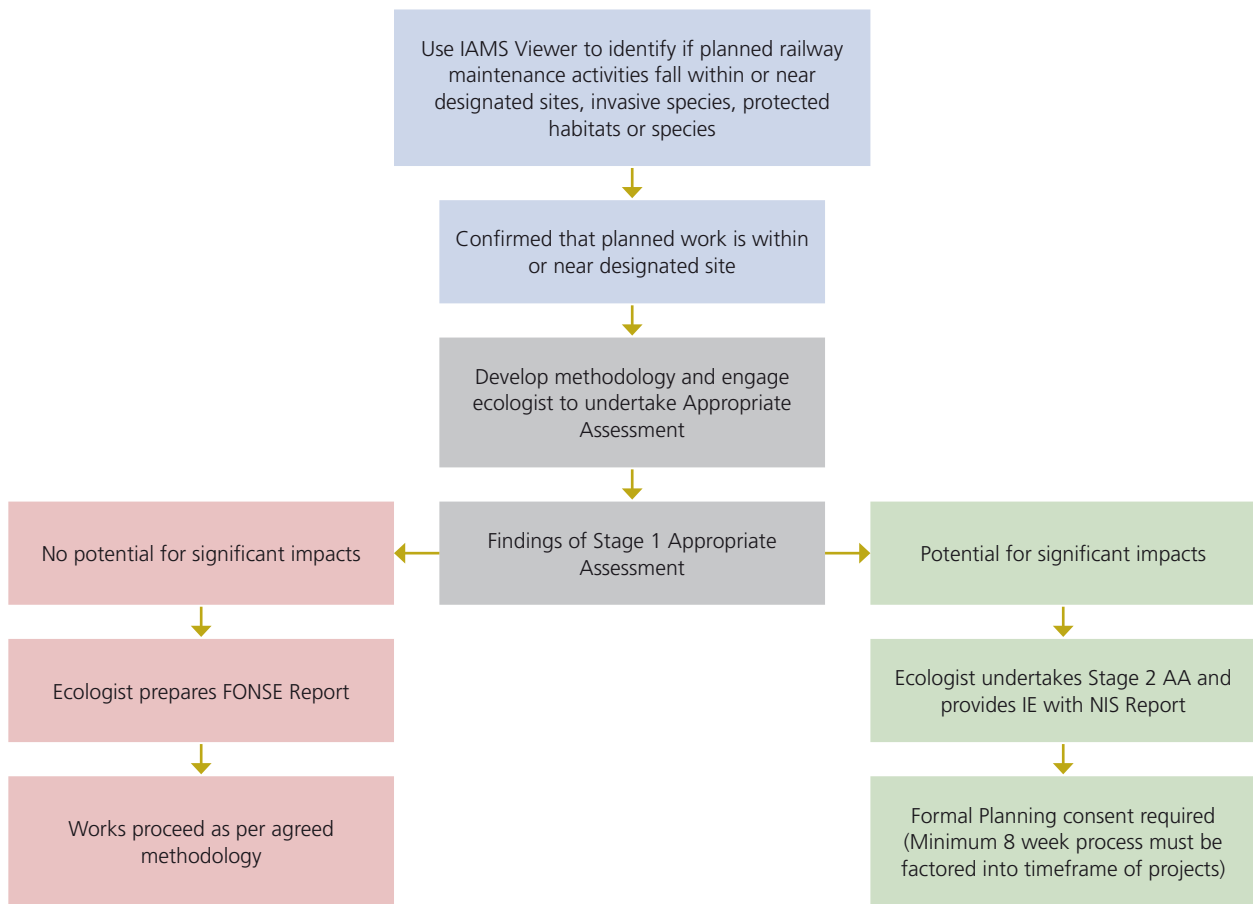
This information has been adapted from the original document: Ecological Assessment-Railway Maintenance and Building Maintenance Activities and should be viewed for further guidance.

A full description of the Appropriate Assessment process can be found in the Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities (The Appropriate Assessment Process (from: Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities, DEHLG, 2009).



The photo above is an example of a designated site along the railway network – Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment Special Area of Conservation (SAC).

## Procedure to follow before any planned maintenance can be carried out on or near a Designated site



Designation	Legislation	Background Information	Agency to get in contact with	Protocol to follow to begin works
<b>European Designation</b>				
Special Protection Area (SPA's)	Council Directive 79/409/EEC on the conservation of wild birds (Birds Directive, adopted in 1979)	This Directive provides a framework for the conservation and management of protected sites and of human interactions with wild birds in Europe.	National Park and Wildlife Service (NPWS)	Works within designated protected areas should be carried out with a derogation licence from the NPWS to protect species within sites. Surveys may be required to determine if protected species are present
Special Areas of Conservation (SACs)	Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (EC Habitats Directive, adopted in 1992)	Under the Directive Member States must: <ul style="list-style-type: none"> <li>introduce measures to protect habitats and species listed under the Annexes</li> <li>to create and maintain a network of protected sites called "Natura 2000"</li> <li>monitoring of habitats and species is required with a report published every six years on progress</li> </ul>	National Park and Wildlife Service (NPWS)	Works within designated protected areas should be carried out with a derogation licence from the NPWS to protect species within sites. Surveys may be required to determine if protected species are present



## SPA – Special Protected Area

The terms of the EU Birds Directive (2009/147/EC) ensure there are sites within Ireland that are designated as Special Protected Areas (SPAs) for the protection of species that are deemed rare or vulnerable, migratory species as well as protecting habitats of significance such as wetlands.

## SAC – Special Area of Conservation

The terms of the EU Habitats Directive state that environmentally important sites throughout Ireland are offered legal protection on both a European and Irish level. SACs are transposed into Irish law by the [European Communities \(Birds and Natural Habitats\) Regulations 2011 \(S.I. No. 477 of 2011\)](#), as amended.

Designation	Legislation	Background Information	Agency to get in contact with	Protocol to follow to begin works
<b>Domestic Designation</b>				
Protected species	Wildlife Act 1976 (Amendment 2000)	It is an offence to deliberately kill or injure a protected species or its associated rest place or breeding site e.g. Otter holt, nesting birds	National Park and Wildlife Service (NPWS)	Minimal disturbance to species and avoid works during breeding season, if critical works required contact NPWS for derogation licence
NHA (Natural Heritage Area)	Wildlife Amendment Act (2000) NHAs – legally protected from date formally proposed for designation	Protection is offered to sites that contain habitats and its species that may be considered as vulnerable	Department of Culture, Heritage and the Gaeltacht National Park and Wildlife Service (NPWS)	Any works that may be required within this area may require a derogation licence from the NPWS depending on habitat type and species present.
pNHA (Proposed Natural Heritage Area)	Under the Wildlife Amendment Act (2000) pNHAs – legally protected while waiting for date whereby formally designated	pNHAs are awaiting designation of a protected status and should be treated as a protected site although with limited protection compared to NHA	Department of Culture, Heritage and the Gaeltacht National Park and Wildlife Service (NPWS)	Any works that may be required within this area may require a derogation licence from the NPWS depending on habitat type and species present.

## NHA – Natural Heritage Area

An area defined as important for the habitats in place which holds species of plants and/or animals whose habitats require protection. An example of an NHA in Ireland is a raised bog: currently there are 75 raised bogs legally protected.

## pNHAs – Proposed Natural Heritage Area

These sites were published on a non-statutory basis in 1995 but haven't since been designated. While they still hold significance for wildlife and associated habitats the designation process is on-going.

# CHAPTER 3

Protected Species



## Protected species

A protected species can be defined as a plant or animal that is protected by specific legislation making it illegal by law to harm or destroy them. Any activities that have the potential to cause harm or threaten species are regulated to reduce these impacts.

### Badger (*Meles meles*)

Badgers are Ireland's largest terrestrial carnivore with its easily recognisable due to its distinctive white head and black stripes either side. They have a powerful stocky grey body with short legs and a short tail.



Source: (Twitter.com)

### Habitat and food preferences

Badgers are widespread throughout the country and occur in a variety of habitat types but are generally associated in grasslands, woodland, scrub or hedgerow, they do occur in urban areas where food is available and disturbance is minimal.

Badgers are opportunistic feeders with their diet varying from wasps, bees, frogs, earthworms and any invertebrates as well as a variety of plant material. They rely on their sense of smell and hearing when foraging with their eyesight good in low light levels but poor over longer distances.

### Social Groups

Badgers form social groups which can vary in size with some having upwards of ten individuals; typically though there are smaller groups of roughly 4-6 individuals controlled by a dominant male and female pair.

### Badger Setts

Badgers are skilled diggers preferring to excavate their own setts usually dug into the banks of a ditch or hedgerow. There can be several setts present within the group's territory with one sett used the most frequent being the main sett, this generally having the most entrances and underground chambers. The main sett can be deemed active if there are fresh piles of earth around, well-worn paths and a latrine or toilet nearby. Setts can be reused from generation to generation with extensions created and collapsed chambers repaired.



Some photos from surveys carried out on behalf of Iarnród Éireann which on the left shows the entrance to a sett and the photo on the right shows fresh soil being dug up for the badgers to use as a latrine.



A recent survey carried out along the Galway Line identified a series of setts with the photo on the left showing a sett entrance with the earth disturbed and some bedding material (dried grass) present outside. The photo on the right is a sett entrance located at a disused culvert. The tell-tale signs of badger activity is disturbed soil or heaps of soil and bedding material located close to or within the sett entrance.

## Legislation

Badgers and their setts are protected under the Wildlife Act 1976 (Amended, 2000) whereby it is an offence to kill or injure the protected species or to intentionally cause damage or interfere with their breeding sites.

## Population Trends and Potential Threats

Badgers are frequently encountered along the Railway and while legislation offers protection during construction or maintenance works there is a high mortality rate across the younger badgers due to collisions on the track and busy roads. While badgers have no natural predators, they are susceptible to disease such as Bovine Tuberculosis found in Cattle and subsequently has spread into the wild badger population leading to government culling schemes.

## Badger Surveys and Guidelines

Badger surveys should be carried out from November to April as it is easier to clearly identify signs of activity or setts due to a reduced amount of vegetation at this time of the year. It is vital to check both sides of hedgerows and field boundaries.

The highest amounts of activities around setts can be observed from January to March as territorial behaviours occur. Evidence of higher levels activity occurring include footprints, paths created by badgers through fields, Latrines or holes dug through grass in search of food.



## Evidence to suggest the presence of Badgers within a survey site



An example to suggest the presence of badgers within an area is the soil being disturbed when the badgers search for food by digging throughout the soil with their claws.

Another indicator that badgers may be present in an area is the presence of mammal tracks through the grass. The ground is disturbed, and a clear line can be followed generally through field boundaries and fences.



The presence of faeces is a strong indicator that badger are found within the surrounding area or are feeding within the survey site.

Inspection of a badger sett for any signs of activity e.g. Footprints or bedding materials.

## Procedure regarding works near badger sett

In the event that a badger sett is located prior to commencing works the IM Environmental Department can be contacted at the email address [cce.environment@irishrail.ie](mailto:cce.environment@irishrail.ie) to organise a survey to determine if the Badger Sett is active.

There are conditions which must be followed prior to works within the vicinity of an active sett particularly when machinery are used with some guidelines highlighted below:

- No Heavy Machinery should be used within 30m of badger setts (unless carried out under licence)
- Lighter Machinery (generally wheeled vehicles) should not be used within 20m of a sett entrance
- Light works such as digging by hand or scrub clearance should not take place within 10m of sett entrances

There are limits to the time of year when works can be carried out whereby works should not be carried out through (December to June) as this is the badgers breeding season and cubs may be present in underground chambers of the sett and should not be disturbed.

## Exclusion of badgers from an active sett

The exclusion of badger from active setts begins prior to the start of safety critical works as this could potentially cause damage to badgers or their sett, with exclusions preventing badgers re-entering the site during the duration of works and allows their return on the completion of works.

It is important to consult the NPWS prior to works regarding badger exclusions to ensure a disturbance licence is obtained and any conditions associated with the licence are followed dutifully. The licencing process is currently under review but the NPWS should be contacted to inform the local conservation officer in the area of the presence of badger and the type of work scheduled to be carried out.

Exclusion of badgers can only be carried out during July to November to avoid the badgers breeding season and the method generally used for exclusion is the installation of one-way gates which is described further in a section below.

Before badgers are excluded from a sett there should be another sett within their territory for them to shelter in, knowledge of an alternative sett should be known prior to exclusions. The aim of exclusion of badgers is to minimise disturbance to badgers and ensure they still remain in their territory after works.

The methods used to exclude badgers include:

**Soft-block** – Whereby soft material such as branches are placed in front of the sett to observe any disturbance over a short period of time.

**One-way gates system** – A system which allows the badgers to leave the sett but closes behind them not allowing them to return, this system should be monitored over an extended time period (Minimum 21 days) to ensure all badgers have been excluded.

While the exclusion of badgers from a disused or inactive sett can be undertaken at any time of the year it is important to ensure the sett is completely empty prior to the commencement of works.

Monitoring of the sett should be carried out for a minimum of five days to ensure there are no cubs below in underground chambers. The monitoring could include setting out sand pads to help identify any badger footprints entering the sett or by placing sticks in front of the entrance to observe any disturbance to the entrance.

Another method used in monitoring of setts that can be used is called bait-marking whereby baits is placed within the affected badgers territory with the food containing harmless indigestible markers that can be used to identify badgers main setts and if they have an alternative sett to move to within their territory.

## Disused or abandoned sett

Where it has been determined that a sett has been abandoned or disused the entrance can be soft blocked with sand or vegetation to ensure the badgers don't re-enter. This soft-blocking method should be in place for a minimum of 5 days before the sett can be destroyed. If there is no longer evidence to suggest the presence of badger after the period of monitoring the destruction of the sett should be scheduled as soon as possible. Destruction of a badger sett can be destroyed under the supervision of qualified ecologist/personnel or licence holder. Destruction of a badger sett can be destroyed under the supervision of NPWS to "qualified ecologist/personnel" or "licence holder".

If there is a delay in the destruction of a sett the entrance which was once soft-blocked must be replaced with a hard-blocking method which would involve fencing the sett off and installing a one-way gate system to ensure no badgers have re-entered before destruction.

## Destruction of a badger sett

1. Once confident the sett has been completely evacuated it can be destroyed under the guidance of a qualified ecologist/personnel or licence holder.
2. A 12-25 ton digger is generally used in the destruction process which starts 25 metres away from the outer sett entrances and work slowly towards the centre.
3. Exposed tunnels must be checked regularly to ensure no sign of badgers with the sett being destroyed in several directions from above until only the centre is left.
4. The remaining structures can be destroyed after a final check for badgers and back-filled to finish the process. The destruction should be completed within one day as badgers may try to re-enter exposed tunnels.
5. A report is drafted detailing the entire process through to destruction and any other concerns relating to the site must be submitted to the NPWS to comply with the conditions of the licence that has been issued.

## Bats (*Chiroptera*)

Bats can be described as the only mammal that is capable of true flight with 10 species being found throughout Ireland which are classified into two families: *Rhinolophidae* (Horseshoe) and *Vespertilionidae* (Common bats).

### Habitat and food preferences

Bats can be found roosting within man-made structures such as old buildings as well as crevices within bridges. These secluded areas are favoured by bats as they provide safety from predators with the water flowing beneath helps maintain temperatures and controls humidity.

While buildings are often chosen as a suitable roost bats can also be found in suitable gaps or cracks in trees and behind Ivy.

Most bats squeeze deep into crevices for shelter. The optimal crevices are probably those that are at least 400mm deep and between 17mm and 35mm wide. However, almost any crevice greater than 50mm deep and 12mm wide can be used as a roost or to gain access to a bigger chamber behind. (Bat Conservation Trust).

As the railway line is lined with mature hedgerows and trees they can provide a commuting corridor and feeding sites for bat species.

Bats are insectivorous meaning they feed exclusively on insects; they feed at night when it is dark using high pitched sounds to locate their prey called echolocation.



Source: [Irishwildlifetrust.ie](http://Irishwildlifetrust.ie)



A masonry bridge close to the railway network in Monasterevin which could be potentially used by bats to shelter in and roost. Bats will crawl through crevices between the blocks of the bridge to find shelter.

There are many outbuildings along the Network which can be utilised by bats for shelter especially when they are heavily overgrown with Ivy such as this one in Mullingar.

## Social Interactions

Irish bats become more active in late spring and early summer when days are longer and nights are warmer, where bats can forage for insects at longer intervals.

In the early summer a number of female bats gather together in a suitable nursery or maternity roost forming what is known as a colony. Mothers give birth around late June or early July to a single pup that is completely dependent as they are born blind and furless. The pup suckles on milk from the mother for roughly 6-7 weeks until independent and able to fly and echolocate its own prey.

Females then leave the maternity roost in August to avail of the late summers insects to build up body fat stores to ensure survival over the winter. As winter approaches and temperatures drop males and females move into hibernation roosts. In Ireland bats as well as hedgehogs are the only mammals that undergo hibernation which takes place from Winter through to early Spring (October through to April/May).



Source: [Batconservationireland.org](http://Batconservationireland.org)

A bat found during a survey of a bridge whereby surveys are required prior to any maintenance works.

## Legislation

Under the Wildlife Act 1976 (Amendment 2000), Wild Fauna and Flora (Habitats Directive) 1992 and the EC Directive on the Conservation of Natural Habitats it is an offence to kill, injure or disturb bats or destroy their breeding sites.

Consequently, it is a criminal offence to:

- Possess or control any live specimen.
- Wilfully interfere with any structure or place that is used for breeding or resting by bats even if individuals aren't present at the time of survey.
- Wilfully interfere with a bat while it is occupying a structure for resting.
- To legally allow works on a known bat roost (a notifiable action under current legislation), a derogation licence must be obtained from the National Parks and Wildlife Service (NPWS) prior to such works beginning. Failure to comply may result in prosecution.

## Population Trends and Potential Threats

Bats in Ireland are afforded a high level of protection in Ireland under the Wildlife Act 1976 as well as under the EU Habitats Directive Annex II ensuring strict protection of the bats as well as roosts. There are several monitoring schemes to track population trends of the species of bat throughout Ireland with the population of 3 considered to be stable highlighting the possible success of protection and surveys prior to construction.

This increasing trend of populations follows historical declines which have taken place in the past with local bat roosts and habitats being vulnerable to threats such as water pollution, increased artificial night lighting and habitat loss such as hedgerow loss.



## Bat Surveys and Guidelines

When carrying out inspections and surveys of railway bridges initial information can be obtained in relation to the distribution of bat species throughout Ireland. There are various online resources that can be used including databases of known bat roosts:

NPWS ([www.npws.ie](http://www.npws.ie)) holds a database of known roosts of lesser horseshoe bats (an Annex II listed and Red Data Book Species)

Wildlife Conservation Ranger for that area may be aware of local information such as feeding and commuting routes of various bat species.

Environmental groups such as Bat Conservation Ireland ([www.batconservationireland.org](http://www.batconservationireland.org)) which has developed a search engine listing all ten known Irish bat species with distribution mapping for all counties.

Local bat groups may also be able to provide information on bats within the area

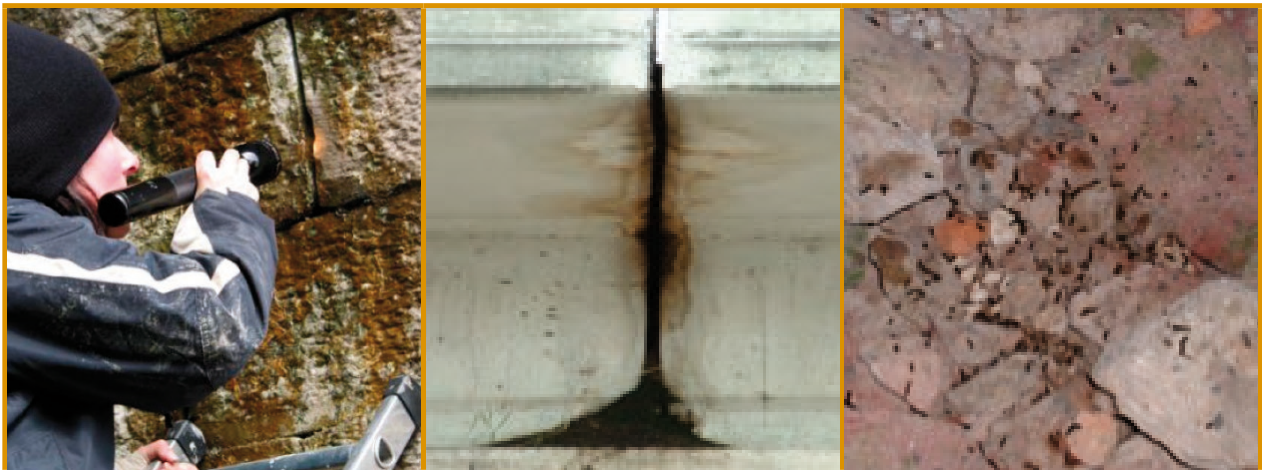
Collins (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines. 3rd edition. Bat Conservation Trust, London  
BCI (2010). Bats and Waterways – Guidance Notes for: Planners, Engineers and Developers

## Visual Inspection

Visual inspection of crevices in all bridges should be checked by using a high-powered, narrow-beam torch and/or an endoscope. This applies whether or not there are visible signs of bat activity. Bats are species that hang freely by their hind feet which may be present within crevices but initially unnoticed because they are upside down. It should also be noted that bats can be hidden behind stonework or not visible beyond bends in crevices, and so may be missed.

## Evidence of bat roosts

The presence of bats in a structure can be indicated by external signs such as droppings and grease marks. It should be noted that bats may be present within a structure without there being any obvious external signs.



Visual inspection of bridges are carried out prior to any maintenance works.

The photos above are examples of evidence of the presence of bats with grease marks visible in the photo on the left and droppings are visible beneath the arch of a bridge in the photo on the right.

## Procedure to follow if bat roost detected

In the event that bats or their roosts are detected during inspection works, please inform the relevant environmental resource so that appropriate measures are taken to protect the bats.

## Otters (*Lutra lutra*)

Otters are widespread throughout the waterways of Ireland but despite this they are quite elusive with rare glimpses in the wild. Historically Otter populations have declined throughout Europe with Irish Otter population remaining largely stable and being regarded as a stronghold.

Otters are a large mammal capable of reaching 1.2m in length. Features such as a long body and short powerful legs with webbed feet make them great swimmers. Brown in colour they possess a broad muzzle with small eyes, ears and a long tapering tail that is thick at the base. When observed swimming their body can't be seen only the head shows above the water.



Source: [species.biodiversityireland.ie](https://species.biodiversityireland.ie)

## Habitat and food preferences

Irish otter are found in a diverse array of aquatic habitats ranging from small streams to major rivers, upland lakes and even coastal lagoons and sandy beaches with them regularly returning to freshwater to bathe.

Otters forage in rivers and lakes using their sensitive whiskers to help find prey in the murky water such as salmon, trout, eel and small fish such as stickleback. The otter's diet is not strictly limited to fish, when available they will target prey such as frogs, crayfish (invertebrates) and even birds or small mammals found along the coast forage during low tide among the seaweed covered rock pools.

## Social Interactions

Otters are generally solitary animals that are highly territorial with each marked with droppings called spraints. Otter territories can stretch for several kilometres with the size dependent on food availability.

Throughout their territories there are several holts that the otter utilise, these are natural crevices found near the roots of trees growing along the river bank. These holts have many entrances that give the otter a chance to escape if disturbed.

Otters can breed at any time of the year but most occurs during spring or early summer with the female scent marking signalling to males that they are ready to mate. Two months later cubs are born in natal holts with usually two pups being born. The pups remain in the natal holt for up to two months before venturing out on their own.

## Legislation

Otters are protected in Ireland under the Wildlife Act 1976 (Amended, 2000) whereby it is an offence to kill or injure the protected species or to intentionally cause damage or interfere with their breeding sites.

Otters are also protected by the EC Habitats Directive whereby they are classed as a "European Protected Species" and therefore given the highest level of species protection.

Whereby it is illegal to:

- deliberately kill, injure or capture an otter
- deliberately disturb or harass an otter
- damage, destroy or obstruct access to breeding site or resting place of an otter

Therefore otter shelters are legally protected whether an otter is present or not.

## Population Trends and Potential Threats

While Otter populations have historically declined throughout Europe and have either disappeared or are rare from significant areas of its former range. There is a more positive outlook for the Irish Otter population with it remaining largely stable and can be regarded as a European stronghold. There are many possible reasons for the stability of the Irish Otter population such as the protection provided through the designation of sites such as Special Areas of Conservation (SAC), ongoing national assessments and targeted surveys particularly important prior to instream works.

While the population has been described as stable there are risks to the otter such as the availability of food and suitable sites for creating holts within preferred habitats.

## Otter or Mink?

Otter and Mink are easily misidentified as there are some similarities between the two, with both found in similar habitats and feeding on similar prey. While the Otter is native to Ireland the Mink is native to woodland areas of North America and is considered an invasive species after being introduced to Europe for fur farms. The first documented escape from fur farms in Ireland is from Co. Tyrone in 1961, since then deliberate releases have secured the Minks presence in Ireland.

### Otter (*Lutra lutra*)



Source: Guardian.com

### American Mink (*Neovison vison*)



Source: Independent.ie

Males roughly weigh 7-12kg	Males roughly weigh 1.5kg
Light brown with large white chest patch	Dark brown with small white chest marking (various shapes/sizes)
Swim lower in the water with only head visible	Swim higher in the water back entire back visible

## Otter Surveys and Guidelines

Otter surveys typically involve a systematic search for evidence for otter presence along a watercourse. Otter are highly mobile with evidence of their presence observed more than a kilometre away from the riverbank.

Surveys can be carried out at any time of the year but is recommended that they are carried out in Spring as evidence of Otters are easier to see with water levels low and paw prints easier to see in exposed mud. A survey licence is required especially when techniques such as endoscopes and camera traps are used to determine if Otter are present at a site.

## Evidence of Otter Presence



Otter spraint found during a survey which show some crayfish remains.

An otter holt located during a survey along the River Loobagh at Kilmallock Co. Limerick.

Source: [Discoverwildlife.com](https://discoverwildlife.com)

### Spraint

Dung from the Otter that are described as black and slimy and is usually 3-10cm in length which can have a distinct sweet smell. They can contain fish scales, shells and bones from different prey.

### Holt

An otter's den is called a holt which generally have more than one entrance in the case of disturbance and to prevent flooding to the inside of the holt. Within otter territory they will utilise numerous holts which are usually natural crevices associated with the roots of trees along the riverbank.

### Lay-out

Within an otter's home range they will utilise various resting places across the river bank with some being used more frequently than others. These rest areas can include holes among tree roots or above ground in patches of scrub in undisturbed areas of tall grass or other tall vegetation with above ground resting places called couches.

## Guidelines for site works in the vicinity of Active Otter Holts

On occasion, otter holts may be directly affected by development works. To ensure the welfare of otters, they must be evacuated from any holts prior to any construction works commencing.

The following provisions should apply to all maintenance/construction works:

- Prior to works commencing an ecologist must be engaged to undertake an assessment of the scope of the project in relation to the presence of Otters and their habitat.
- Where presence of the species is identified a derogation licence must be sought in advance of the works commencing and all associated conditions must be integrated in to the construction environmental management plan.
- No works should be carried out within 150m of any holts as breeding females or cubs may be present.
- Consultation with the NPWS may allow works closer to breeding holts but appropriate measures must be used e.g. screening and/or restricted working hours on site.
- No wheeled or tracked vehicles should be used within 20m of an active, non-breeding otter holt.
- Light work such as digging by hand or scrub clearance should not take place within 15m of holts except under licence.
- The working area associated with otter holts should where appropriate be fenced off temporarily prior to any possibly invasive works.

## Freshwater Pearl Mussel (*Margaritifera margaritifera*)

The freshwater pearl mussel (*Margaritifera margaritifera*) is a large filter-feeding bivalve found exclusively in near-pristine freshwater habitats. Adult freshwater pearl mussels can reach lengths of up to 15cm and live buried in the riverbed. They are filter feeders inhaling and expelling up to 50L of water through siphons while retaining food particles.



A freshwater pearl mussel photographed during an aquatic survey of the riverbed of Woodford River, Killarney.

Mussels of varying sizes pictured next to a young trout which when fertilised egg are released into the water will attach to the gills of the trout. (Pictured within Ballinderry Rivers Trust Facility).

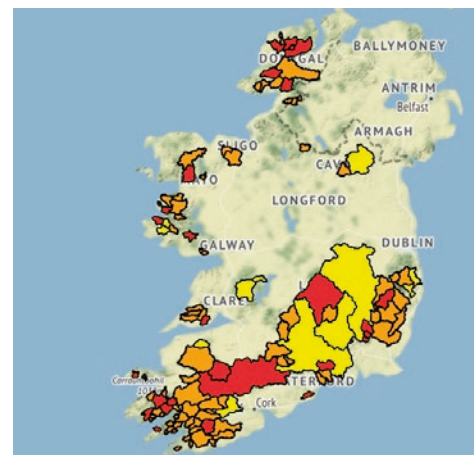
### Lifecycle

- In early Spring Female Mussel uptake Male sperm and once developed into a fertilised egg (Glochidia) it is released into the water
- The glochidia within the water column must attach to the gills of fish specifically Atlantic Salmon or Brown Trout to develop further
- The following summer the young mussel drop off and must land in a suitable habitat with the right sediment type where they bury themselves until they have reached a size to withstand the currents within the river
- Once the mussel has matured they lie on the bottom of the river bed and filter feed

### Population trends and potential threats

There is a worrying trend throughout European freshwater pearl mussel populations which have declined by 90% over the past century. In Ireland there are 27 populations that are protected within SAC (Special Areas of Conservation). Eight of the 27 populations hold more than 80% of the total freshwater pearl mussel populations and have gained the name "Top 8 catchments".

There are a variety of causes for the decline in populations such as pollution in the river by the introduction of silt or other nutrients which can suffocate the juvenile mussels as they require clean, well-oxygenated riverbed with a constant flow of freshwater. Intensive agricultural practices occurring close to the riverbanks is one of the main causes of this decline of water quality.



**Margaritifera\_sensitive\_areas**

Margaritifera Sensitive Areas (2017)(ITM)

- Catchments of SAC populations listed in S.I. 296 of 2009
- Catchments of other extant populations
- Catchments with previous records of *Margaritifera*, but current status unknown

Distribution of river catchments in which FPM are known to occur, or has been previously recorded on the island of Ireland: Department of Culture, Heritage and the Gaeltacht (<https://data.gov.ie/>)



An example of a preferred river for Pearl Mussels which has been managed by Ballinderry Rivers Trust for the Conservation of the mussel.

### Legislation

The Freshwater Pearl Mussel (*Margaritifera margaritifera*) is a highly threatened species and is listed on the IUCN Red List as Endangered. In Ireland it is protected under the Wildlife Act and under the EU Habitats Directive listed as an Annex II and V Species.

### Crayfish (*Austropotamobius pallipes*)

The white-clawed crayfish is Ireland's only crayfish species and are large, mobile freshwater invertebrates and can reach 40g in five years. They grow by moulting their shell and increasing in size by 10% in length before the new shell hardens. Throughout its natural range in Europe there has been a decline in crayfish over the last 150 years due to overfishing, habitat degradation and the introduction of non-native crayfish species and disease. It has an important role ecologically as it grazes plants within the rivers or lakes and is considered an important food source for Otter.



White-clawed crayfish captured during a survey in the main channel of the River Barrow at Bagenalstown, September 2013.

### Population trends and potential threats

While crayfish populations are struggling across Europe with the introduction of the North American species which bring crayfish plague, they seem to be resistant making them carriers of this fatal disease. However, Ireland holds one of the largest surviving populations with it protected under both Irish Law and the EU Habitats Directive making the Irish population one of substantial conservation importance.

While the North American crayfish species are resistant to the crayfish plague they pass the disease to the susceptible white-clawed crayfish. Until 2015 there had been no evidence that this disease had been introduced to Ireland but now has been recorded in 5 rivers possibly introduced by spores on fishing equipment.

If alien crayfish were to become established, it could have a detrimental impact on other important freshwater species such as salmon and trout and their freshwater habitats by destabilising riverbanks by burrowing. New regulations have been introduced to provide Irish authorities power to prevent the arrival of non-native species of crayfish which are noted on the EU list of invasive alien species.

### Legislation

The White-clawed Crayfish is a threatened species globally and Ireland can be considered as a stronghold having the largest surviving populations. It is the only crayfish species found within Ireland and is protected under Irish law by the Wildlife Act and under the EU Habitats Directive where it is listed as an Annex II and V species.

## Nesting birds

Nesting birds are protected under the Wildlife Act 1976 (Amendment 2000) whereby it is illegal to cause damage to the birds themselves or the places they have built nests such as hedgerows.

This Act also bans the cutting of hedges from March 1st to August 31st every year. Iarnród Éireann however is exempt from this act in relation to the cutting of trees within the nesting season under Section 49 of the Transport (Railway Infrastructure) Act 2001.

While it is recommended that all vegetation works such as tree cutting be carried out between 1st September and 28th February but if safety critical works are needed during the nesting season refer to the appendix of the Vegetation Management Standard). (CCE – TMS 381 Control and Management of Vegetation).



Source: Flickr.com



## Hedgerows and Tree lines Linear Habitats and Corridor

### The Importance of Hedgerows for Nesting Birds

- Hedgerows are a man-made functional feature to separate field and townland boundaries with 1.5% of land cover in Ireland denoted by Hedgerows which equates to roughly 300,000km.
- Hedgerows generally contain many shrub species normally found on the woodland edge such as: Dog Roses (*Rosa canina*), Elder (*Sambucus nigra*), Hawthorn (*Crataegus monogyna*), Blackberry (*Rubus fruticosus*), Wild Cherry (*Prunus avium*) and Blackthorn (*Prunus spinosa*).
- Hedgerows support a variety of species by providing a vital food source and offering shelter for breeding birds within its impenetrable thickets.
- The wren is an example of a bird that relies on hedgerows for both food and shelter with it feeding on a variety of small insects, spiders and seeds with the males building dome-shaped nests for females too choose to lay eggs in.
- Other examples of birds that rely on hedgerows are Blackbirds and Song Thrush for both nesting sites and food sources especially during Autumn and Winter months.
- Song Thrush and Blackbirds also rely heavily on hedgerows to find various food sources with the Song Thrush searching for snails to smash against rocks with Blackbirds hunting mainly for worms or other insects. During harsher autumn months both birds will scavenge for fruits such as the berries found on Holly and Ivy.
- As well as birds there are a variety of Mammals which rely on hedgerows for food sources and shelter such as Hedgehogs, Badgers, Foxes and the Pygmy Shrew.
- Hedgehogs are one mammal that rely heavily on the protective cover of the hedgerow with hibernation within dry leaves under hedges occurring in Ireland from October right through to March.
- While hedgehogs are mainly insectivorous with various species preferred such as moth larvae, ear wigs, beetles, spiders, harvestman, caterpillars as well as slugs and earthworms. It has also been noted that hedgehogs will feed on frogs, eggs and small mammals. Hedgehogs are under pressure to gain weight during the active period to prepare for hibernation.

- Badgers are a distinct species that are associated with hedgerows where they utilise their strong limbs and claws for digging underground burrows called setts. Each sett can have multiple underground tunnels and chambers with several entrances in the case of disturbance. The same setts can be used by the same family of badgers for several years. Badgers are omnivorous and rely on earthworms, insects, nuts and berries as a food source.
- Foxes visit hedgerows to prey upon small mammals and young birds.
- Pygmy Shrew are Ireland's smallest mammals weighing only 5 grams. They are common through hedgerows or habitats with good cover and plenty of small invertebrates to forage for.
- Small mammals such as Shrews form an integral part of the diet of birds of prey such as the Common Buzzard and the Barn Owl.



### Wildlife Derogation licence

Wildlife Derogation licences permit actions that can otherwise be considered unlawful or illegal and are only granted under certain circumstances. An example for applying for such a licence would be when work is required near a known bat roost with the licensing department of the National Parks and Wildlife Service issuing and regulating the terms of such licences. Before applying for a licence it must be shown that all steps were taken to minimise the risk to bats and their habitats. There are terms and conditions associated within the licence with only certain actions allowed.



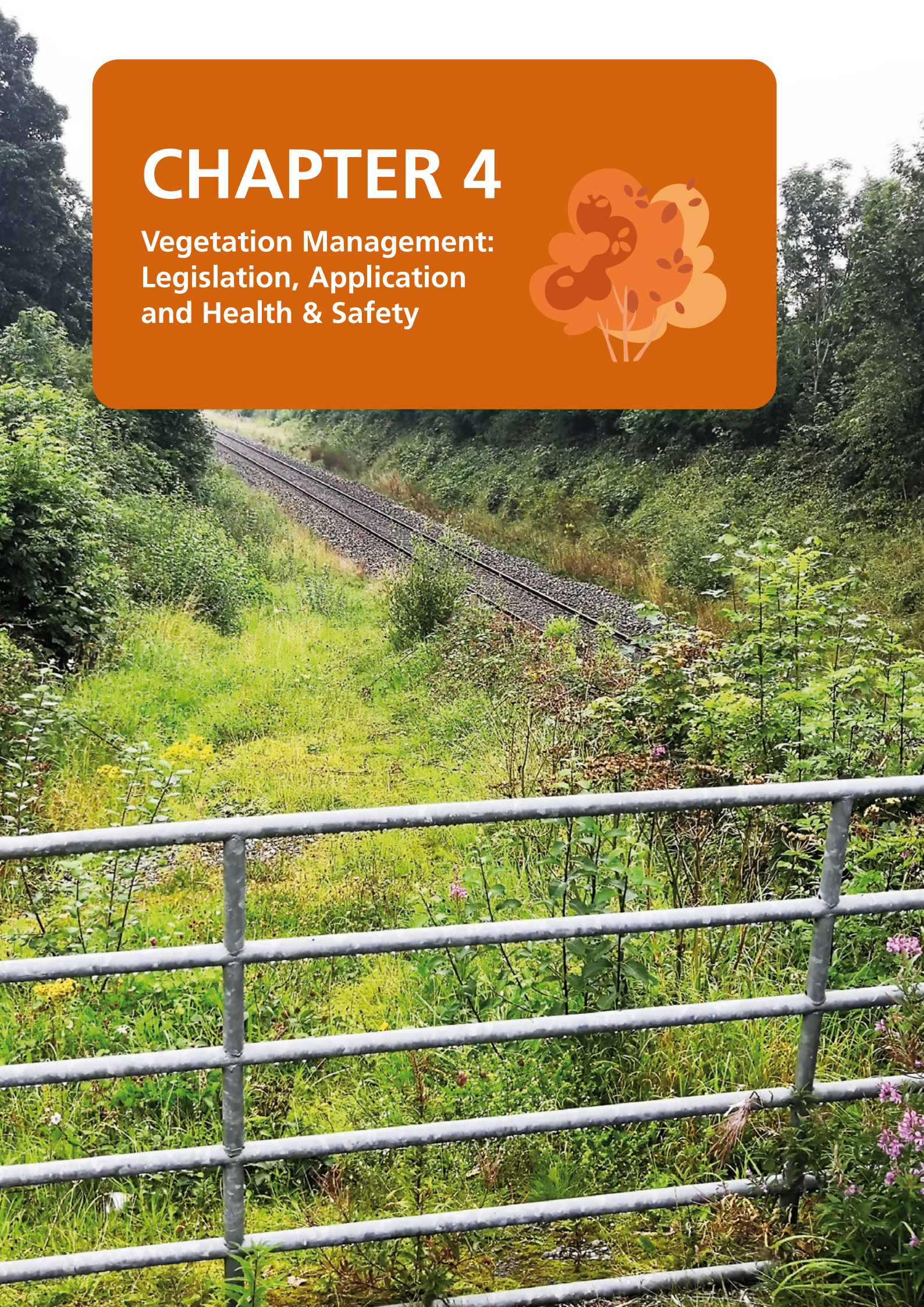
Section 23 (5)(d) of the Wildlife Act 1976 as amended states "that any person who wilfully interferes with or destroys the breeding place or resting place of any protected wild animal, shall be guilty of an offence".

**Appendix E of the Management and Control of Vegetation Standard can be viewed for further guidance on criteria for vegetative Management during the nesting season.**



# CHAPTER 4

Vegetation Management:  
Legislation, Application  
and Health & Safety



## Planning for annual vegetation management

In general, annual vegetative surveys are organised for each line to identify works that are required and to develop a vegetation maintenance regime. Following the initial assessment priorities are established into work orders for completion by the Infrastructure Management Department.



The potential damage vegetation on the line can cause to carriages. The above train from Westport to Dublin was delayed and had to reduce speed due to extensive windscreen damage.

Vegetation (V) boards are located at level crossings to warn drivers of a limited view from the crossings such as on a curve in the track. If an obstruction occurs that blocks the board vegetation clearance is required.

There is a clear need and requirement for vegetation management to maintain the safety of railway operations and ensure the structural safety of the network assets. This need to maintain a clear envelope for train movements and remove risks that might impact track clearance is due to annual climatic events which have recently increased in frequency and intensity.

Work order for vegetation management can include clearance at access points, bridges, culverts and at level crossings, signals and yards.

Day-to-day maintenance works involving the control and management of vegetation must be undertaken when required depending on the degree of urgency and priority.

While maintenance works for vegetation are required to ensure the safe operation of the train line it should be undertaken in a manner that regards the environment as a valuable asset and contributes to the rehabilitation of the site.

Surveys can identify potential hazards such as:

- Vegetation that intrudes on lines of sight or adjacent property
- Dead and diseased vegetation
- Broken branches
- Potential for branch or tree fall onto the track
- Potential leaf fall onto the track
- Unsound or poorly rooted trees
- Unbalanced trees that require removal, pruning, coppicing or windsailing
- Fire risk
- Rubbish

Vegetation management and control is important with the following aims to be achieved:

- To keep the track zone free from vegetation
- To keep vegetation on lineside structures within certain limits
- To ensure signage at level crossings accessible to both staff and the general public are clear and visible
- To prevent staff slipping or tripping on overgrown anti-trespass guards or cattle grids

Uncontrolled growth on the track, lineside or on other lineside assets can pose several risks to the safety and operation of the railway such as:

- Restrict visibility of assets on the railway
- Obstruct sight lines to signals or level crossings
- Obscure the view of staff working on the railway or effect other users of the railway such as at level crossings
- Increase the risk of fire hazards due to dried vegetation
- Leading to undermining of track stability

### Ensuring Procedure is followed to allow Hedgerow Regeneration

While vegetation management is a vital maintenance activity it can be the subject of criticism when extensive coppicing or flailing is carried out along a section of track. Coppicing involves the vegetation being cut to ground level to ensure a clear view to drivers whilst also allowing the hedgerow to regenerate naturally over the coming years. This is evident throughout the Railway Network and all procedures must be followed to allow regeneration to occur. An example can be seen below along the Limerick to Waterford Line which was coppiced in 2014, and the second photo shows the same area 5 years after completion showing the hedgerows regeneration.

NRA (2006) Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post-Construction of National Road Schemes. Dublin: National Roads Authority.

<https://www.tii.ie/technical-services/environment/construction/Guidelines-for-the-Protection-and-Preservation-of-Trees-Hedgerows-and-Scrub.pdf>



The photo shows the method of coppicing of Hedgerow along a section of track completed in 2014 (Limerick to Waterford Line).

This photo is of the same area as above but 5 years after the coppicing has taken place highlighting the natural regeneration of the hedgerow after a disturbance (Photo taken December 2019).

## Control Methods

There are a variety of control methods used which comprise of a mixture of herbicides, selective cutting and clear cutting and replanting. Natural cycles are used to assist if possible e.g. tree-cutting and clearance after leaf fall with herbicide use in the summer.

## Herbicide and Pesticide Application

Both herbicides and pesticides are used along the railway track to remove unwanted vegetation or insects considered pests with specific procedures outlined in the Technical Management Standard – Control, Management and Application of Pesticides. This technical standard outlines procedures regarding health and safety, training, handling and storage etc. and should be viewed for more detailed information. The specification for herbicides and pesticides is reviewed periodically to ensure compliance with European and Irish legislative requirements.

## Health and Safety

There are relevant safety aspects that apply to persons involved in the control of vegetation with further information available to read in the Technical Management Standard (CCE-TMS-381), Control and Management of Vegetation.

Relevant procedure should be followed in regards to the risks associated with vegetation control which can include:

- Risks surrounding the proper storing, handling, application and disposal of chemicals
- Risks associated with the use of dangerous and sharp cutting tools such as chainsaws
- The danger associated with the removal or pruning of trees such as tree falling onto adjacent property
- Risks associated with exposure to loud noise from using mechanical tools for extended periods

When using chemicals such as herbicides a person should comply with:

- The conditions and directions stated on the label of the product
- Should work in accordance with the principles stated for good plant protection practice

All Professional Users undertaking weed spray/vegetation control activities must undertake and document a safety risk assessment before commencing the activity

## Environmental Legislation

Environmental legislation set out for herbicide use in Ireland can be found in the S.I. 155 of 2012; EC (Sustainable Use of Pesticides) Regulations 2012 and sets out the minimum requirements for the use of pesticides in the community; ensuring to reduce the risks to human health and the environment while promoting the use of an integrated pest management.

## Training

Only those who have completed the relevant approved training course should be involved in the spraying and control of vegetation.

On completion of the course staff must register as a professional user through the Department of Agriculture, Food and Marine.

## Application Methods

To ensure large areas of railway track are free of vegetation a method of applying herbicides is utilised called Lineside Spraying which involves a Multi-Purpose Vehicle with Weed Spray Applicator.

An annual programme is developed through the Infrastructure Production Plan Manager (IPPM) regarding the lineside weed spraying carried out by the Multi-Purpose Vehicle (MPV). The MPV is generally used once a year as a minimum standard practice but depending on growth rates further runs may be needed.

## Unsuitable conditions for the use of the Weed Spray Train

There are some limitations to the use of the weed spray train which include:

- Wind speeds exceeding 16km/h
- Temperature range in shaded areas exceed 25°C and wind speed is recorded at less than 5km/h or exceeds 16km/h
- Speed of the train exceeds more than 40km/h or reaches less than 5km/h
- Risks to both the members of the public or staff has been identified such as spray or drift of the herbicide into areas outside the operational boundary fence



Multi-Purpose Vehicle (MPV) with Weed Spray Applicator.

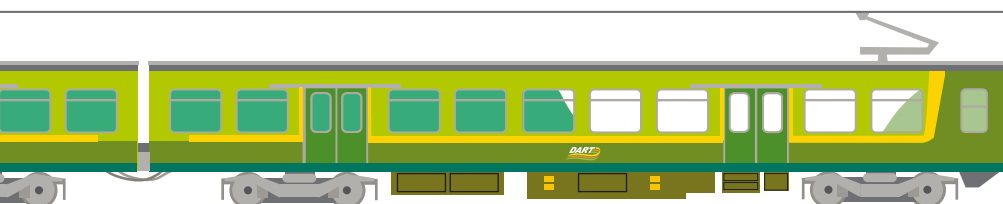
An example of Eco-plugs on a recently cut tree-stump. **Source:** [Green-tech.co.uk](http://Green-tech.co.uk)

## In-situ vegetation control methods

These methods involve dealing with the vegetation as it occurs such as spot treatment of invasive plants such as Japanese knotweed. There are various methods that can be used depending on the species that is targeted with Japanese knotweed being recognised as one of the most common species but there are other invasives of concern mentioned in section 5 of this document.

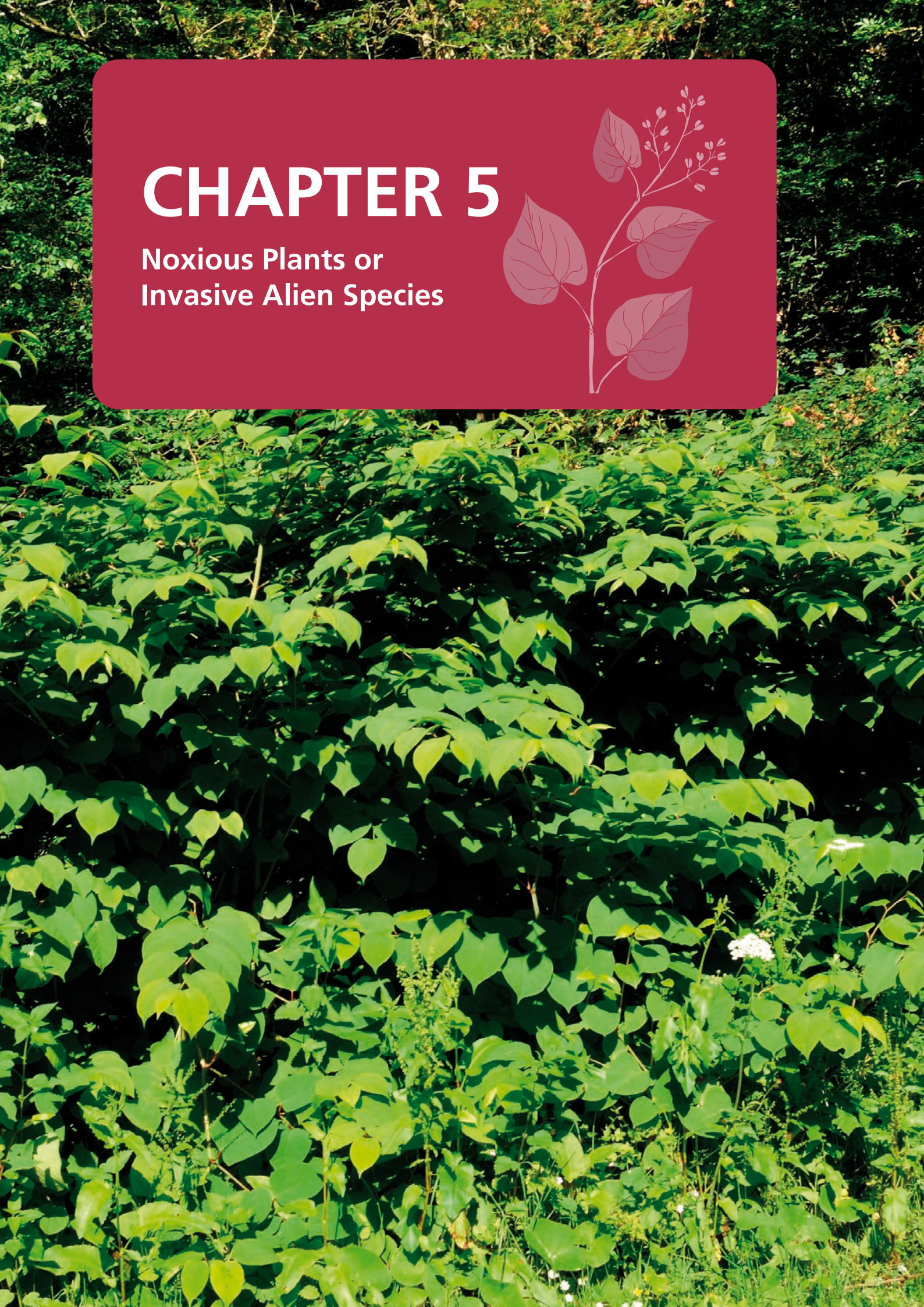
Eco plugs: Each plug contains 300mg of granular glyphosate herbicide and can be inserted or hammered into place whereby the herbicide is released directly into the targeted plant such as individual tree stumps.

In the following section of this guideline document the treatment options for a variety of noxious or invasive plants are described in detail. For further guidance and information the Technical management standard (CCE – TMS-383) on the Control, Management and Application of Pesticides can be viewed.



# CHAPTER 5

## Noxious Plants or Invasive Alien Species



## Noxious Plants or Invasive Alien Species

A noxious plant or invasive alien species is a species that is considered a weed whereby authorities have deemed it destructive to the agricultural sector, habitats/ecosystems, human or livestock. These weeds can cause injury through contact or ingestion and can pose a significant threat to Ireland's native species and biodiversity.

There are various introduced species that can be found in Ireland which include Japanese Knotweed, Himalayan Balsam and Giant Hogweed, each of these species cause problems such as outcompeting native species and Giant Hogweed causes a significant skin irritation that can persist long after contact with the leaves has been made.



An infestation of Japanese Knotweed identified at a railway access point which has become well established within the existing hedgerow.

Map highlighting the presence of Japanese knotweed across Ireland. National Biodiversity Centre, 2017-2020.

## Japanese Knotweed

### Background Information

Japanese Knotweed is a robust perennial (grows every year) and has been classified as a non-native invasive species.

This plant was first introduced to Britain and Ireland in the 19th century and can tolerate extreme environmental conditions such as low temperatures, acidic soils and waterlogged/saline habitats.

It grows rigorously and can spread rapidly – up to 2m in one season. It has extensive root systems with the underground root systems potentially reaching over 7m. It has spread throughout the countryside with it establishing in areas of high disturbance such as on roadsides and along riverbanks.

## Legislation

The Wildlife Amendment Act 2000 states: “anyone found planting or otherwise causing to grow in the wild (any place in the state) any species of exotic flora, or the flowers, roots, seeds or spore shall be guilty of an offence”

Section 49-50 European Communities (Birds and Habitats) Regs 2011:

“It is an offence to allow into the environment (Incl.spreading) an invasive species (plant or animal)”.

## Potential structural damage caused by Japanese Knotweed

Japanese Knotweed has the potential to cause significant damage due to its ability to grow through concrete, tarmac or other hard standing areas. This can cause significant damage and disruption within the railway environment as the roots can seriously undermine the structural integrity of various railway assets in particular the track, station buildings, car parks, fencing and masonry walls.

## Identification of Japanese Knotweed

Japanese Knotweed is easily identifiable through various distinguishable features such as its large triangular shaped leaves attached on reddish coloured stems with the plant capable of reaching heights of 2 metres.

Seasonally there can be changes observed in its appearance with small clusters of white flowers observed in August through to October with its bamboo – like stems dying back during the winter months. This dieback of the Knotweed can cause issues for native species as they become obstructed by the larger knotweed and can't receive sufficient sunlight.



An infestation of Japanese Knotweed found adjacent to Athlone Train Station.

Some photos to highlight the key features used in the identification of Japanese Knotweed including the size and shape of the leaves, the red zig-zag stems and the distinct white flowers.





## Protocols regarding the reporting of Invasive Species

Infestations of Japanese Knotweed, Giant Hogweed or any other species considered invasive can be reported to Jayne Ryan CCE Ecologist ([cce.environment@irishrail.ie](mailto:cce.environment@irishrail.ie)).

The following information should be included in the report:

- Date
- Division
- Line
- Mileage
- Associated Asset
- GPS Co-ordinates (if available)
- Additional comments/description.
- Photos of the infestation (if available)

All data contained in the reports will be entered onto the Invasive Weeds Data Base by the authorised user and will be available to view on the IAMS Viewer.

A record of treatments will be undertaken along with the type of herbicide used should be reported to Jayne Ryan, CCE Ecologist ([cce.environment@irishrail.ie](mailto:cce.environment@irishrail.ie)) in order to track the effectiveness of treatment regimes.

All reports of Japanese Knotweed from external bodies can be forwarded to Jayne Ryan, CCE Ecologist ([cce.environment@irishrail.ie](mailto:cce.environment@irishrail.ie)).

## Training Requirements and Herbicides

All persons who use herbicides in the course of their professional duties must receive training from a certified body which is approved by the Department of Agriculture food and the Marine.

Line managers must ensure that the relevant staff who undertake weed control activities receive the appropriate training including contractors who are undertaking weed control activities on behalf of Iarnród Éireann.

Herbicides to be used for treatment projects must be approved for use by the Pesticides Control Division of the Department of Agriculture Food and the Marine.

## Treatment of Japanese Knotweed

The removal and eradication of Japanese Knotweed can be a difficult process due to its extensive growth and its ability to grow throughout cracks in concrete. There are various methods that can be deployed to help in its removal and eradication with continued management required as the Japanese Knotweed has the potential to return even after being treated.

There are two main methods used in the treatment of Japanese Knotweed which include herbicide treatment that can be applied either through a knapsack application or by stem injection.

While there are various methods that can be used in the treatment of Japanese Knotweed, it must never be cut by strimmer or any other cutting equipment as these small fragments created can form new plants and can be counter-productive to treatment.



A warning sign to highlight the presence of Japanese Knotweed.

An infestation that was treated last year along the Killarney Junction (Mallow) to Killarney Line – this infestation measured at least 8 metres in length and there are already signs of re-growth.

### Herbicide Treatment (Knapsack Treatment)

This method involves the application of a glyphosate-based herbicide to the foliage of the knotweed. It is recommended that it be used at early growth stages which generally start in May in the first year of treatment with a follow up spray in mid-late September.

For the second – or third-year treatments, an alternative herbicide with a picloram based active ingredient should be used in order to prevent knotweed becoming resistant to glyphosate-based herbicides.

During spraying it is recommended to apply during dry weather conditions in order to increase the effectiveness of treatment. Application during dry weather also ensures that spray can be applied to target species only and reduce the impact of native species being affected.

### Herbicide Treatment (Stem injection)

This treatment method involves injecting undiluted glyphosate into the base of the stem of the Knotweed. This method is a suitable treatment option when carried out within an environmentally protected area or areas considered of high amenity value.

By targeting stems of the knotweed this significantly reduces the risk of causing damage to protected native species.

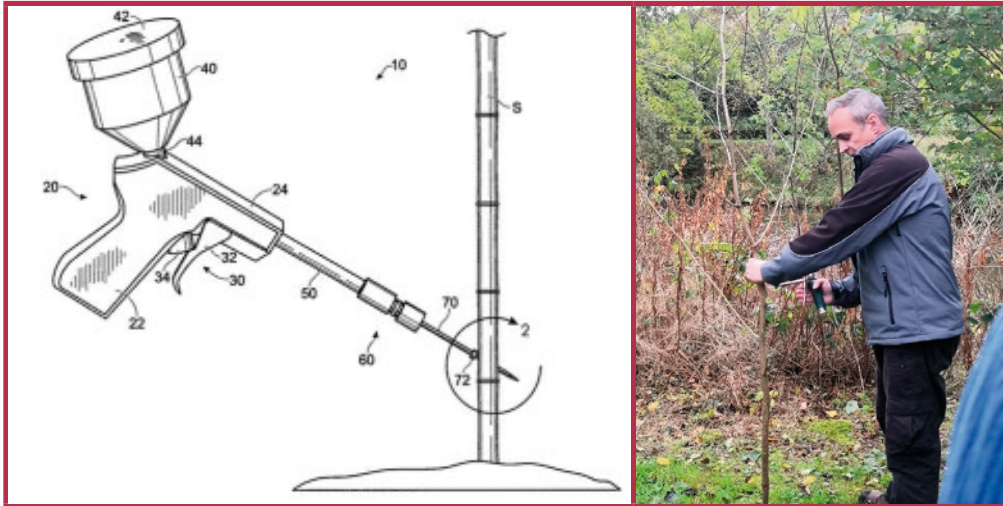
It has been shown that the most effective method of removing Japanese Knotweed may be a combination of both knapsack spraying and then follow up with stem injection.

### Eradication options

There are three methods that are employed to eradicate Japanese knotweed from infected sites.

These methods include:

- Long-term treatment with herbicides
- Excavation and disposal at a licensed landfill site
- Excavation, deep burial and/or bunding on site prior to treatment with herbicide



The diagram above highlights the stem injection gun which is used in the treatment of invasive species such as Japanese Knotweed.

Source: [invasivespeciesireland.com](http://invasivespeciesireland.com)

## Biosecurity Measures

- Areas infested with invasive species must be clearly identified with fencing or warning tape.
- Any stockpiles of soil that are contaminated with invasive species must be clearly marked ready to be removed by a licensed waste carrier that is aware that the waste contains invasive species as part of the waste transfer documentation.
- It is important to contact the licensed landfill site in advance to ensure that the invasive species waste will be accepted. Failure to inform the landfill site that the waste contains invasive species would be an offence under both wildlife and waste legislation.
- Designated and clearly marked stations must be present on site to allow for the cleaning and/or disinfection of staff, vehicles or machinery.
- Where it is absolutely necessary to work within contaminated areas the use of vehicles with caterpillar tracks should be avoided.
- All vehicles and equipment that have been used within contaminated areas must be thoroughly pressure-washed in a designated wash-down area each time they leave the work site and once the job has been fully completed.
- The disinfection of equipment should also include footwear, PPE, tools and any other light equipment ensuring to remove soil that may contain seeds or plant fragments. **If not disinfected thoroughly there is a possibility of infected material being transported and transplanted to other sites.**

## Japanese Knotweed Management Plans

A management plan for Japanese Knotweed should be developed to ensure appropriate measures are taken to effectively treat the knotweed and reduce the risk of it spreading to other sites, residential areas or nearby water courses.

Following the Management Plan is vital ensuring that all relevant staff are briefed and aware of the Japanese Knotweed issues and procedures that must be followed.

Elements of the Management Plan should include the following:

1. Identify where the Japanese Knotweed is on site and update the internal mapping system (IAMS GIS System)
2. Ensure staff and other personnel on site such as contractors are aware of Japanese Knotweed on site and adheres to Biosecurity measures and ensure good site hygiene
3. Biosecurity measures can include marking out of infected sites, ensuring vehicles with caterpillar tracks do not work within the infected sites, ensure the correct removal of contaminated soils
4. Long standing infestations can have extensive rhizome growth making it more difficult to control or eradicate
5. Implement the Management Plan to guide work plans and ensure all staff are aware of the issue with Japanese knotweed, it should include timeframes for planned clearance and repeated treatments
6. The appropriate treatment options should be decided based on the site and follow-up site visits to ensure that Japanese knotweed is treated completely

### Prevention measures

- Do not strim, flail or physically cut Japanese Knotweed.
- Do not disturb the plant or the soil underneath the growth area.
- Avoid using vehicles with caterpillar tracks in areas where Japanese Knotweed is present.
- Always wash down vehicles before and after leaving an area with an infestation or at worksites adjacent to watercourses in order to prevent the spread of invasive species.
- Infestations of Japanese Knotweed must be reported to [cce.environment@irishrail.ie](mailto:cce.environment@irishrail.ie)
- Both in house staff and contractors must risk assess work projects in areas where invasive species are present and include in Method Statement.



Japanese Knotweed regrowth located close to an infestation that was treated last year in Killarney.

## Himalayan Balsam

### Background Information

Himalayan balsam or 'Asian orchid' is originally native to the Western Himalayas and was introduced to Ireland in the 1800s where it has since become an invasive species. It is associated with damp soils such as along riverbanks or within damp woodlands.

Individual plants can reach 2-3m in a single season outcompeting native species for space and when the balsam dies back in autumn it leaves the ground bare and vulnerable to erosion especially along riverbanks.

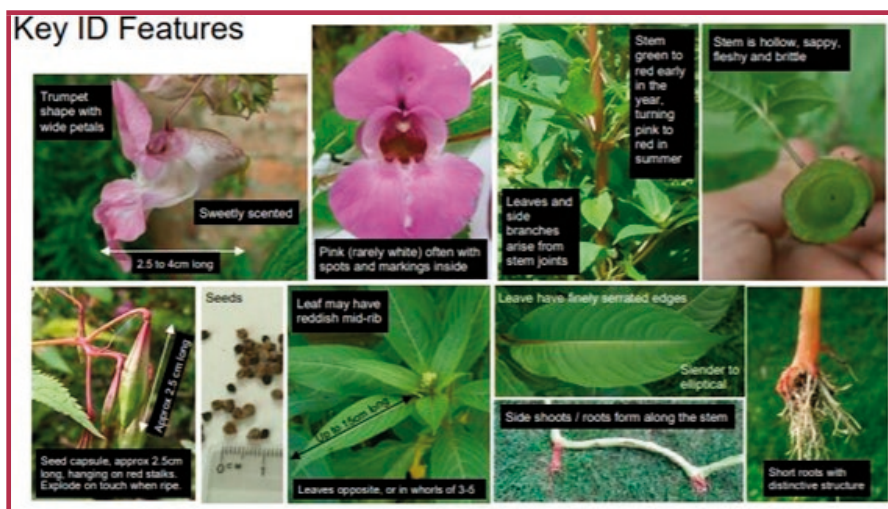
There are also reports that the balsam produces more nectar than native species attracting more pollinators resulting in competition and fewer native species being pollinated.



### Identification

Himalayan balsam is described as a tall, attractive annual herb with distinctly shaped flowers usually pink/purple or white in colour growing on delicate stems with large oval-shaped pointed leaves.

Flowers can be observed from June to October and once flowering has finished identification becomes more difficult as only the stems remain. The seeds germinate in March and when seed capsules are mature the slightest touch from either Animals or Humans cause the capsules to explode dispersing roughly 5,000 seeds up to 20 feet into the environment.



**Fig.4:** Poster highlighting the key features that are used to identify Himalayan balsam.

Source: [Invasivespecies.ie](http://Invasivespecies.ie)

### Treatment methods

The complete eradication of Himalaya balsam like the removal of any invasive species can be a difficult task requiring continued management and treatment. There are two methods that are used in the removal of species which are classified as physical removal or chemical treatment using herbicides.

## Physical removal methods

Mechanical control is an effective tool for the control of large stands of Himalayan balsam where the plant is cut or mowed below the lowest node of the stem to prevent regrowth. It is advised that cutting should be carried out in June as the plants are at an acceptable height but haven't flowered yet reducing the risk of exploding seed pods and the accidental spreading of new plants.

The seeds of the Himalayan balsam are robust and can survive for up to 18 months which highlights the need for a minimum 2-year eradication plan for effective removal.

## Chemical treatment using Herbicides

Guidelines suggest that glyphosate should be applied during periods of active growth before the germination of seeds and just long enough for stems to reach roughly (50cm) to ensure adequately covered by spray.

The first application of herbicides should be carried out in either May or June with follow-up treatment and monitoring throughout July-August and September – October. The herbicides can be applied as a spot treatment to individual plants using a knapsack or an overall spray for larger stands using machine-mounted spray systems.

Herbicide application will not kill seeds in the seed bank and monitoring with follow-up control repeated annually over 2-3 years to eradicate new plants re-growth and reduce growth from one year to the next.

## Giant Hogweed

### Background Information

Giant hogweed is a large non-native species that was first introduced to Britain and Ireland during the 19th century for ornamental reasons and is easily recognised as one of the most invasive species of plant found throughout Ireland.

Giant hogweed favours areas close to rivers and stream bank environments as this allows its large seeds to be transported downstream to start new populations. While river corridors are generally the more favourable habitat for Hogweed, they can be found growing in other areas such as along railway lines, disused waste areas and damp undisturbed ground. The continued spread of giant hogweed causes significant concern in relation to the biodiversity of the local area and its threat to human health.



Map highlighting the presence of Giant Hogweed across Ireland. National Biodiversity Centre, 2017-2020.

An infestation of Giant Hogweed which was identified on the main Dublin to Sligo line.

## Potential safety concerns arising from Giant Hogweed

Giant hogweed can cause damage to the environment as it dies back every winter leaving the riverbank exposed and at risk of erosion. Its large surface area also means it shades out native species preventing them from establishing.

The most significant threat Giant hogweed poses is that to human health due to the production of a hazardous sap that can cause severe burns and scarring by sensitising the skin to light (UV radiation).

This painful skin irritation can recur for several years after the first exposure. The reaction varies from individual with some more effected than others. Reports have shown that Giant hogweed affects both animals and humans and caution should be observed if Giant hogweed is found.



Examples of Giant Hogweed that have been treated with Glyphosate.

## Legislation

The Wildlife Amendment Act 2000 states: "anyone found planting or otherwise causing to grow in the wild (any place in the state) any species of exotic flora, or the flowers, roots, seeds or spore shall be guilty of an offence"

Section 49 – 50 European Communities (Birds and Habitats) Regs 2011:

"It is an offence to allow into the environment (Incl.spreading) an invasive species (plant or animal)".

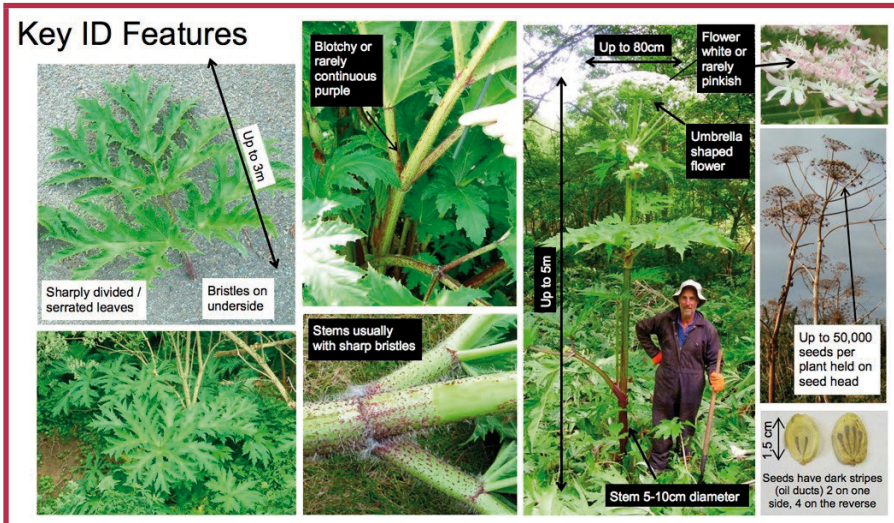
## Identification of Giant Hogweed

Giant hogweed is characterised by its size reaching up to 3-5m in height producing large umbels (flower heads) of small white flowers up to 0.5m across. The main stem of the plant is large, hollow with hairy bristles (5-10cm) in diameter and purple blotches may be observed occasionally along the stem.

The flowers are white in colour and appear from June to August with up to 50,000 seeds per plant, the seeds can lay dormant in the soil for up to 15 years before finally germinating under suitable conditions.

It is usually biennial, forming a rosette of leaves in the first year before sending up a flower spike in the second. The plant typically dies after flowering and setting seed.

The leaves of the hogweed are serrated and sharply divided with leaves reaching up to 3m in length and 1.5m wide.



Poster highlighting the key features that are used to identify Giant Hogweed.  
**Source:** [invasivespeciesireland.com](http://invasivespeciesireland.com)

### Giant hogweed or Native hogweed?

Giant hogweed is distinguishable from the native hogweed (*H.sphondylium*) through features such as size and structural differences.

#### Giant hogweed



#### Native hogweed



**Source:** [biodiversity.galwaycommunityheritage.org](http://biodiversity.galwaycommunityheritage.org)

Reaches heights of 5m	Reaches heights of over 1m
Thick stems with bristles with purple blotches	Thinner stems which turn green to purple but no blotches are present
Cluster of flowers (umbel) measure 60cm in across	Similar clusters of white flowers which are smaller in size
Deeply lobed leaves with jagged, serrated edges	Leaves are less jagged and more round



## Procedure to follow if Giant hogweed is identified:

1. Care should be taken as contact with giant hogweed can result in a reaction that leaves skin sensitive to ultra-violet light.
2. **In the event of contact with giant hogweed** – the skin should be covered to prevent exposure to sunlight and washed immediately with soap and water.
3. All identifications of giant hogweed should be reported within 2 days to the relevant Permanent Way Inspector or Regional Manager.
4. As an initial mitigation, the Regional Manager must within 1 week of confirmed identification of giant hogweed, erect a '**Danger – Hazardous plant**' sign.
5. Details for signage can be obtained from CCE Technical Managers Office
6. The further control and elimination of the giant hogweed must be arranged by the Regional Manager. Guidance on this can be sought from the CCE Technical Managers office.

## Treatment of Giant hogweed

The overall aim in controlling Giant hogweed is to either eradicate the plant completely or at least prevent the plant from producing seed. As the seeds remain viable for 15 years, control will require continued input over several years to be complete. The soil within 4m of the plant may also contain seeds and may also need to be removed.

**\* Full protective clothing including masks or safety glasses and hood should be worn when undertaking any type of control of giant hogweed.**

Caution must be observed when working with giant hogweed as the stems and the undersides of the leaves are coated with fine hairs that contain a phototoxic sap that leaves the skin sensitive to ultraviolet light. The slightest touch can result in the release of sap which results in severe or painful blistering of the skin.

The reaction may take up to 24 hours to occur and may result in permanent recurrent phytophotodermatitis – a type of dermatitis that flares up in sunlight. As the plant hairs are extremely fine and brittle, they can pierce light clothing.

In the event of contact with the sap, the skin should be covered to prevent exposure to sunlight and washed immediately with soap and water.

## Physical removal

- Physical removal of the hogweed using specific hand tools while wearing appropriate full P.P.E.
- Removal should be carried out in **Spring** particularly following rainfall.
- Follow-up removals may be required after seeding for up to five years.

## Chemical removal

Two chemicals are used in the treatment of Giant hogweed:

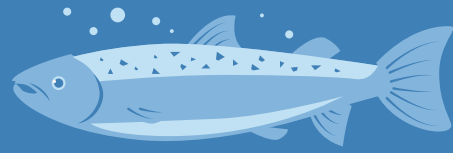
Glyphosate	Foliar spray in <b>mid-spring</b> before stem elongation. Otherwise, cut back and spray re-growth. Stem injection during growing season.	Foliar spray, wiper applicator, spot treatment or stem injection
2,4 – D		Wiper application or spot treatment

All Plant Protection Products should be used in accordance with the product label and with Good Plant Protection Practice as prescribed in the European Communities (Authorisation, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003). It is an offence to use Plant Protection Products in a manner other than that specified on the label.

Stem injection is the final method used in the control of invasive species and uses pure, non-diluted glyphosate; this allows a more effective method of removal and reduces the environmental risk. It can be potentially used in the removal of Hogweed but can be difficult as stems are delicate and the danger of sap from the leaves. It has been shown that the most effective method may be a combination of both knapsack spraying and then follow up with stem injection.

# CHAPTER 6

## Instream Works



## Instream Works

Works that are proposed which can potentially affect a water body including rivers, lakes, streams, canals, estuaries, marine or ground water bodies.

### Potential damages that can occur during Instream works

- Water pollution due to oil or fuel spills that can directly impact fish and fish habitats
- Sedimentation due to material being stirred up through the water column which can smother fish eggs or freshwater mussels on the riverbed
- Cement, grout, concrete and other building materials can be toxic to fish if accidents or spills occur
- Removal of bed material leading to the destruction of fish spawning and nursery habitats
- Loss of shelter and cover and food (plant debris)
- Can lead to riverbank collapse or instability



The Maynooth line which runs adjacent to the Royal Canal.

The view from the underside of the bridge UBC422 along the main Cork to Cobh line with this bridge roughly 500m from Fota Island, Cork.

### Protocols to follow before commencing Instream works

All in-stream works within water bodies must be notified to Inland Fisheries Ireland and contact should be made with the CCE Environmental Resource when planning in-stream works.

If in-stream works are within an environmentally protected area, refer to the conditions of section 3.1 of the document titled Ecological Assessment: Railway Maintenance and Building Maintenance Activities – CCE.

In-stream works shall be carried out within the seasonal restrictions of each particular river basin district unless circumstances dictate otherwise (Safety Critical Works). Usually this period is between July to the End of September seasonally.

**If safety critical works are required during the closed season, a certificate of authorisation must be sought from Inland Fisheries Ireland to permit the works to proceed. The CCE Environmental Resource must be notified in this instance.**



The abutment along the bridge located at UBE30 required repair due to scouring. A dry cell or bund is created and electro-fished to ensure all fish are removed from site while works are carried out and returned once works are completed.

The western abutment shown here with obvious signs of scouring in need of repair.

### Seasonal Calendar for Instream works with the associated fish lifecycle highlighted

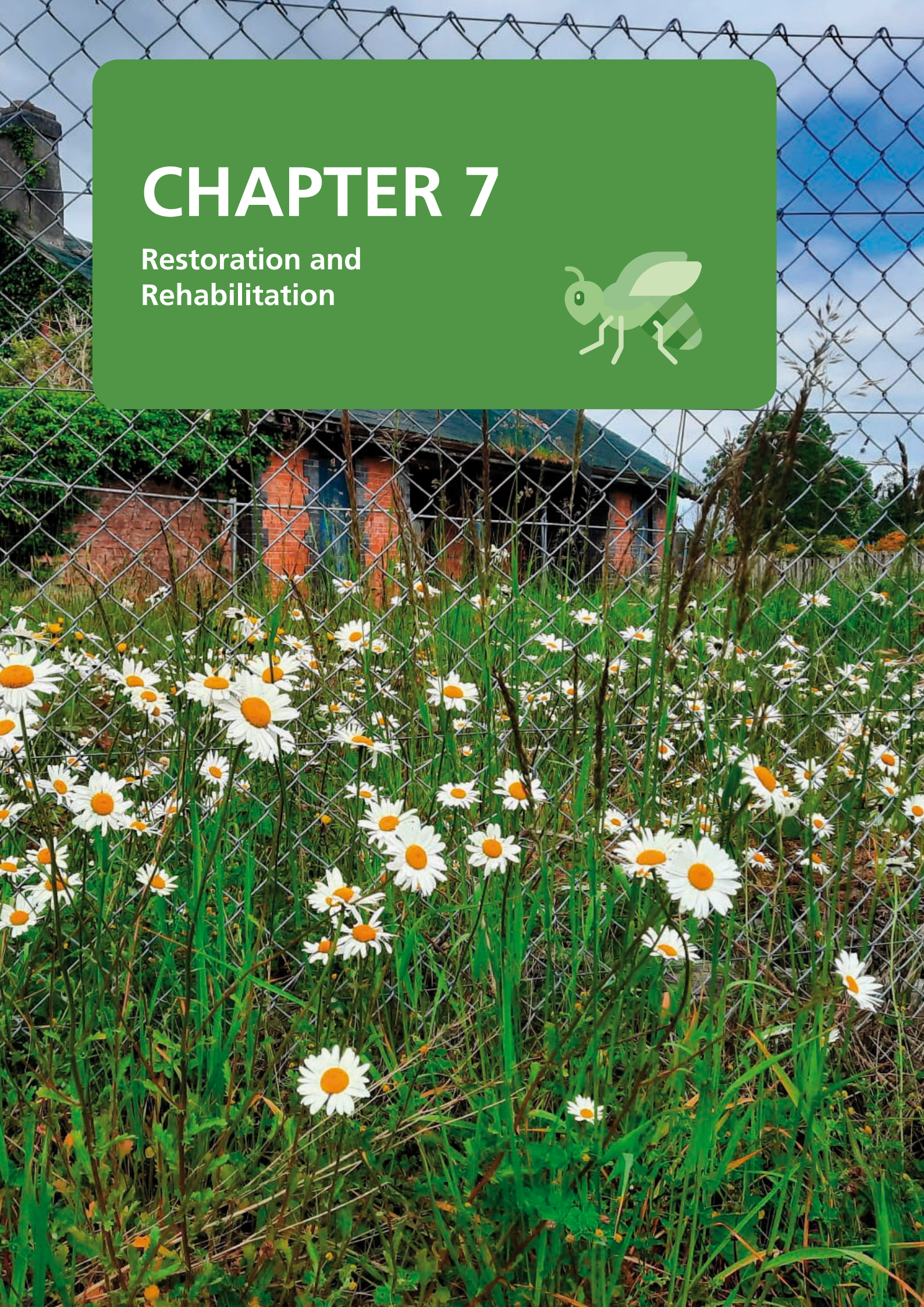
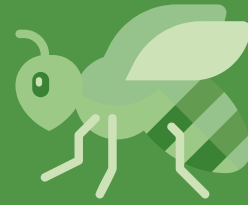
Month	Works Permitted or Not	Fish Lifecycle
January	<b>Instream Works not permitted</b>	Some late spawning Incubation of eggs continues
February	<b>Instream Works not permitted</b>	Incubation of eggs continues Spring Salmon runs
March	<b>Instream Works not permitted</b>	Incubation of eggs continues and swim-up of young salmonids begins Spring Salmon runs Coarse fish spawning
April	<b>Instream Works not permitted</b>	Incubation ending, Swim-up on-going, young salmonids dispersing, Coarse fish spawning
May	<b>Instream Works not permitted</b>	Young salmonids migrating downstream into nursery areas
June	<b>Instream Works not permitted</b>	Young salmonids in nursery areas, Adult Sea Trout returning to rivers Coarse fish spawning and fry feeding
July	<b>Instream Works permitted</b>	Trout moving upstream
August	<b>Instream Works permitted</b>	Low river flows Sea Trout run tailing off
September	<b>Instream Works permitted</b>	Low River flows
October	<b>Instream Works not permitted</b>	Spawning run commences as flows increase
November	<b>Instream Works not permitted</b>	Spawning and incubation of eggs underway
December	<b>Instream Works not permitted</b>	Spawning and incubation of eggs continues

Table is adopted from guideline on website: [www.fingalbiodiversity.ie](http://www.fingalbiodiversity.ie)

It must be noted that for instream works where a dry cell or dewatering is required there must be an application sent into Inland Fisheries Ireland (IFI) for a section 14 licence before the works can proceed and electrofishing will be needed to allow the translocation of fish prior to dewatering which must be carried out by a competent, qualified technician.

# CHAPTER 7

Restoration and  
Rehabilitation



## Restoration and Rehabilitation

The entire network of operational railway in Ireland spans over 2,200km with various natural and man-made heritage features that support native wildlife across a range of diverse habitats. While majority of the rail corridors are still in operation there are another 450km of track that are considered non-operational which aren't as closely managed in terms of vegetative control and management allowing areas around the disused track to return to a wild natural state providing an ideal environment for various bird and plant species.



The photos above from a closed section of track in Mullingar highlighting how nature will reclaim the area surrounding the closed tracks across the network and become a wildlife hotspot with some beautiful common spotted orchids (*Dactylorhiza fuchsia*) appearing amongst the old ballast.

There are 145 stations through the railway network with most being old buildings and station yards which offer and provide shelter for birds and small mammals. The ground around stations and yards which have poor soil can support various plants such as dandelions and wildflower species much better compared with intensively mown and manicured sites.

Under the Climate Action Act 2021 there is a call to consider Biodiversity from the earliest stages of planning development and to ensure any project leaves the environment in a better condition than before with an aim to ensure Biodiversity Net Gain forms the basis of all engineering projects.

Biodiversity Net Gain is an approach to embed and demonstrate biodiversity enhancement, minimise biodiversity loss whilst achieving measurable gains and is an integral part in ensuring sustainable development. The recent publishing of a new British Standard for Biodiversity Net Gain has called for an Irish Standard to be developed and applied throughout industry in this country also.

It is imperative in going forward that retaining and bolstering existing habitats should form the core part of a project and not become an afterthought to be compensated or replaced.



A native Irish Bee species on purple clover (*Oxalis triangularis*).

Ox-eye Daisy (*Leucanthemum vulgare*) have seized the opportunity and colonised a busy area of railway yard.



A selection of wildflowers which will be beneficial to pollinators found growing close to the former Cratloe Station, Co. Clare.

An example of pollinator friendly flowers which were planted along the platform at Greystones.

## Pollinator Plan

Iarnród Éireann participates in various national schemes and initiatives to continue promoting the importance of supporting biodiversity along the railway. The All-Ireland National Pollinator Plan is one of these initiatives which aim to address the recent decline in important pollinators such as bees, hover flies and butterflies with many of them relying on flowering plants for pollination. Throughout the country many train stations have begun to plant pollinator-friendly plants to attract more pollinators.

## Actions of the All-Ireland Pollinator Plan

- Identify and protect existing areas that are good for pollinators
- Reduce the frequency of mowing of grassy areas
- Ensure Pollinator-friendly planting
- Provide wild pollinator nesting habitat: Hedgerows, earth banks and bee hotels
- Reduce the use of pesticides
- Promote the aims of the All-Ireland Pollinator Plan in planning of new infrastructure and make staff aware of management actions for pollinators



## Examples of Stations adopting actions from the All-Ireland Pollinator Plan

There has been an increased uptake of actions set out by the All-Ireland Pollinator Plan throughout the Iarnród Éireann network with 20 stations involved this year an increase from 3 stations in 2017. Actions that have been achieved across stations and associated platforms include:

- Planting of pollinator friendly flowers across platforms.
- A reduction in the frequency of mowing around stations.
- The identification of areas that could be used to promote Biodiversity such as the installation of Bat or Bird boxes in suitable trees or old buildings.

## Athlone Train Station

Athlone Train Station is one example of many stations that are promoting pollinators by planting pollinator friendly flowers along platforms and around station buildings. The All-Ireland Pollinator Plan has guidelines suggesting appropriate species to plant such as herbs like rosemary and lavender. Traditional bedding plants such as begonias and geranium should be avoided as they offer little or no pollen to pollinators.

## Westport Station

As set out by the All-Ireland Pollinator Plan to promote native species to grow they suggest reducing the frequency of mowing within amenity areas around stations to just twice during the growing season beginning in mid-April. This will allow food sources for pollinators to grow such as dandelions or common orchids.

## Thurles Station

While the actions of the pollinator plan are being undertaken across stations there are also other initiatives being investigated to promote Biodiversity. These involve the surveying of station carparks and adjacent station buildings to determine suitable sites for the installation of both bat and bird boxes. Throughout Thurles Station there have been various trees and outbuildings identified that are suitable for nest boxes.

## Importance of Hedgerows for Pollinators

The All-Ireland Pollinator Plan has identified the importance of good quality hedgerows as they provide for the needs of pollinators:

- Source of pollen and nectar for food: Native trees, shrubs and wildflowers beneath the hedgerows provide food throughout the season from Spring through to Autumn. Mature Hawthorn provide a good source of food during the late spring followed by elder. While Ivy becomes a critical food supply during the Autumn.
- Places to breed or overwinter: The hollow stems of dead branches or brambles provide nesting or over-wintering sites for cavity nesting solitary bees. Hedgerows that are found in sandy, earth or earth and stone banks provide both nesting and over-wintering sites for mining solitary bees particularly if found in a south facing position.
- Provide Corridors and pathways to ensure travel across the landscape: Pollinators use linear features such as hedgerows to travel between nesting and feeding sites with hedges giving them protection from the wind and rain. Hedgerows also allow and increase the connectivity between plant and pollinators that would otherwise be isolated.



Mature Hawthorn usually flower towards the end of April and the beginning of May.

There are extensive hedgerows bordering the railway line consisting of many native species such as Blackthorn and Hawthorn as seen along this section of track in Galway.



## Examples of Stations adopting actions from the All-Ireland Pollinator Plan



This planter is located on a windowsill at the main entrance to Athlone Train Station with important species for pollinators such as Cosmos present.

Mowing of grassy areas should be carried out twice a year to allow species such as Common Orchids (Right picture) to appear as a food source for pollinators.



Trees such as the one pictured found within the grounds of Thurles Station have been previously surveyed for bats and the potential installation of nesting boxes for either Bats or Birds.



An example of a bird nesting box fitted to a tree for potential use. Guidelines suggest that the boxes are placed in a quiet place at least 2m from the ground facing between north and south-east to avoid adverse weather conditions such as the hottest sun and the worst of the rain.

Outbuildings such as the one found within Thurles Station have potential to act as roosts for bats or allow the installation of birds boxes for species such as swift or sparrow.



The pollinator friendly plants which were planted in a corner of Thurles Train Station with signage in place to highlight to passengers the significance of the flower bed.



## Iarnród Éireann Pollinator Actions for 2020-2025

- Improvement of grassland management and pollinator friendly planting across all existing stations.
- Grass cutting frequency to move from condition-based maintenance to a specified program, i.e., reduced number of cuts per year.
- All new landscaping planting specifications to incorporate AIPP pollinator friendly planting code.
- Areas of pollination management mapped on GIS.
- Reduction in the use of pesticides on the network. Commit to trialing alternatives to glyphosate in station carparks and platforms.
- Control and manage the spread of invasive plant species.
- Creation of pollinator friendly habitat on non-operational lands.



A native species of Irish Bee visiting the species Common Vetch (*Vicia sativa*).



Cuckoo flower (*Cardamine pratensis*).



The Orange tip-butterfly (*Anthocharis cardamines*) is native to Ireland with the male above sporting vibrant orange patches on either wing. This species relies on the Cuckoo flower (*Cardamine pratensis*) as its larval foodplant to complete its lifecycle and support the next generation.

The reduction of mowing allows the seeds of native species lying dormant in the soil to emerge when conditions are favourable. This is an important factor that must be considered prior to the planting of a wildflower meadow especially as some mixes don't contain native Irish species. In stations such as Sallins and Naas as well as in Templemore there has been incredible results from reducing the frequency of mowing amenity areas and allowing native species to appear. The photos below highlight just a few of the wonderful species that have made an appearance in the stations.



## Other initiatives to promote biodiversity

### Creation of Native Woodland on Public Lands Scheme

Iarnród Éireann are the first public body to secure approval for the establishment of a native forest under the Department of Agriculture, Food and the Marine's 'Woodland Creation on Public Lands' scheme. When completed the 4.5ha site, will consist of over 14,000 trees, consisting of willow, birch and alder. Iarnród Éireann will continue to assess its land bank to assess whether other sites may also be suitable for entry into the scheme.

When undertaking new planting or replanting schemes trackside, the planting of native trees should be considered first over other choices. While it is vitally important to promote the use of native trees, plants and wildflower seeds it is also important to add to the existing vegetation to make the new hedgerow or tree line cohesive and productive for biodiversity and to prevent fragmented habitats.

It has been suggested that for new native hedgerows there should be mostly Whitethorn (75%) planted with the remaining made up of Blackthorn, Hazel, native Willows, Wild Cherry, White beam, Spindle, Rowan, Wild Roses, or Elder (25%).



## How Iarnród Éireann has implemented the UN Sustainability Goals

### New technology

Iarnród Éireann have utilised new technology such as Remote sensing (Hyperspectral imagery) to accurately identify tree species and tree height along the railway reducing the risk of traditional vegetation management techniques by walking the track and identifying trees which pose a risk to falling onto the track.



### Community Engagement and Partnership

Iarnród Éireann has also become involved with many community projects and has partnered with the All-Ireland Pollinator Plan which sets actions to promote pollinators and their habitats. A total of 20 stations have adopted the action from the Pollinator Plan.

There has also been a partnership with Birdwatch Ireland to place Bird and Bat boxes across suitable train stations and within the newly planted Native Woodland on Iarnród Éireann lands to provide nesting and roosting sites to native birds and bat species.

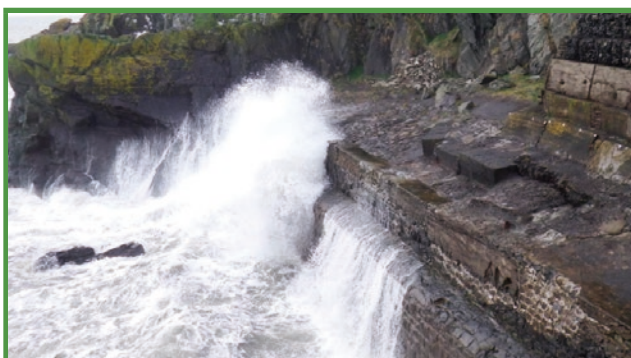
The focus on green procurement commenced in 2021 with continuing development to ensure practices within procurement using public funds will include green criteria by 2023 and to follow new legislation that now applies to the procurement of goods, services, buildings, vehicles, lighting. The EPA will also provide green procurement training to Iarnród Éireann Staff in 2020/2021 with further trainings planned for the future.

### Climate Adaptation and Resilience

Along the East Coast of the railway network there has been ongoing monitoring in place as the coastline has been subjected to continuous erosion, instability of coastal defence structures and waves overtopping these defences. This is particularly evident in areas such as the Murrough in Co. Wicklow where coastal erosion has become more prevalent due to more frequent and powerful storm events.

A series of feasibility studies have been conducted as part of the cuttings and embankments programme to determine and implement the most effective coastal defences which are best suited to the local site conditions.

There are two main solutions for coastal defences which are categorised as either hard or soft engineering solutions. The first solution uses heavy rock armour to create structures which are then applied in areas of steep rocky headland where the railway line runs in a series of embankments and rock cuttings supported at their base by masonry retaining structures.



In other areas where the railway line runs along straight sections of track adjacent to sandy beaches which are readily used as an amenity by the local communities. Soft engineering solutions in these areas are used to preserve the amenity of the beach with either new material added to the beach in a process called beach enrichment or in other cases new revetments are partially buried into the beach with reconstructed dunes created with planted marram grass on top.

This photo shows the original 19th Century Sea Walls which are 3m thick and up to 8m high and can be found along the Bray DART line.

The new East Coast Railway Infrastructure Protection Programme (ECRIPP) has been established to protect the coast and the railway line that runs along it. Previous monitoring of the East Coast under Erosion Studies have identified sections of the track that are subject to high rates of erosion and allows for the most effective engineering solution to provide coastal defence to be implemented based on the conditions of the local site.

The East Coast Railway Infrastructure Protection Programme (ECRIPP) in conjunction with the National Development Plan is Forecasting a 10-year timeline before the track is fully fortified.



An example of a hard engineering solution is the installation of gabion baskets or cages which are used to protect the coastline against the erosive power of waves during storm events.



The active track above is the Shanganagh Junction to Wexford Line along the East Coast and in certain parts of track there is roughly 130m between track and the Sea.

The photo above were taken at Broad Lough Co. Wicklow which lies within a Designated Natura 2000 site: The Murrrough Special Protection Area highlighting the force of wave action on the land along the east coast.

## Appendix

### Seasonal Calendar for surveys and construction activities

	Approx. Survey Timings											
	Approx. Mitigation Timings											
	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
	Cutting allowed outside of nesting bird season								Cutting allowed outside of nesting bird season			
							Instream works allowed from July to September					
<b>Bats</b>	Inspection of Hibernation roosts		Limited Activity	Dawn Dusk Bat Surveys					Limited Surveys	Hibernation		
	No closure of roosts		Optimum period for roosts closure		Roost closure possible, no closure of maternity roosts				Optimum period for roost closure	No closure of hibernation roosts		
<b>Badger</b>	Sett survey and bait marking			Limited sett survey					Sett Survey			
	Breeding season no sett closure					Sett Closure under licence			Breeding season			
<b>Otter</b>	Surveys year round											
	Site specific mitigation											
<b>Freshwater Fish</b>	Surveys carried out under licence											
					Works may be limited		Instream work					

(CIRIA C587, from <http://www.ciria.org>)

# CHAPTER 8

## Operational Procedure for Ecological Assessment



## Operational Procedure for Ecological Assessment

Guidelines to follow when protected species are encountered along the railway, certain procedures must be followed to comply with environmental legislation in particular while within a designated habitat.

### Badgers

1. Desktop research: Use the IAMS GIS database to check if badgers setts have been identified within the work site.
2. Works should be avoided if during the breeding season (December to June) as young badger can be found within underground chambers.
3. If work is safety critical then contact should be made with the Environmental Department to obtain a derogation licence from the National Park and Wildlife Service (NPWS).
4. Generally badgers can be excluded from setts with the installation of one-way gates which doesn't allow their re-entry. It is recommended that this system is in place for 21 days with monitoring carried out to ensure all badgers are evacuated and have moved to other setts within their territory.
5. Artificial setts can be constructed if no alternative setts are available for relocation or if setts have to be destroyed due to posing a risk to asset safety.
6. The destruction of setts must be completed under the licence and supervision of the NPWS to adequately monitor the sett to ensure no badger remain underground.

### Bats

1. Desktop research: Various databases of known bat roosts can be obtained for sources such as the NPWS and local bat conservation groups such as Bat Conservation Ireland ([www.batconservationireland.org](http://www.batconservationireland.org)).
2. Additional information on known bat roosts can be requested from the environmental resource prior to works commencing.
3. Consult the IAMS Database to determine if work site lies within a designated area such as SAC,SPA.
4. Visual inspections must be carried out with a high-powered narrow-beam torch and/or endoscope. Inspections must be carried out whether or not there are any visible signs of bats.
5. In the event that bats or roosts are detected during an inspection please inform the Environmental Department to ensure that appropriate measures are taken to protect the bats.
6. A derogation licence will be required for any planned works near the bat roost with conditions of the licence set by the Wildlife Licencing Department in the National Parks and Wildlife Service (NPWS).



## Otter

1. Undertake desktop research to determine if any historical records of Otter found along the work site.
2. Consult the IAMS Database to determine if work site lies within a designated area such as SAC, SPA.
3. As Otter can breed all year round, where possible works should be planned ahead of time to allow for Otter surveys to be carried out (Determines if any are present and if exclusions must be made).
4. If essential works are required a derogation licence can be obtained from the NPWS (National Parks and Wildlife Service).
5. Conditions will be set by NPWS to minimise risk to the environment as works that occur near water source such as rivers have the potential for risks occurring further up river (if works occur upstream of SAC, pollution etc. could travel to affect the protected habitat).
6. Exclusion of otter to holts procedure is similar to that of badger with one-way gates installed or otter proof fencing used to minimise disturbance.
7. Works which involve wheeled machinery should not be used within 20m of an active non-breeding otter holt.
8. Light work such as digging or scrub clearance should not take place within 15m of holts except under licence and supervision of NPWS.

## Nesting birds

1. Where possible vegetation management should be carried out outside of the birds breeding season and not during the period 1st March to the 31st August.
2. Iarnród Éireann however is exempt from this act in relation to the cutting of trees within the nesting season under Section 49 of the Transport (Railway Infrastructure) Act 2001 in the event the works are considered safety critical.
3. Vegetation works should be planned in advance (Annual Vegetation Management Programme) and prioritised to minimise the risk to breeding birds and their nesting sites.
4. NPWS should be contacted to inspect the site prior to works and to give consent to the cutting of trees.
5. Visual inspection of the vegetation that is being cut should be carried out to prevent injury or damage to any birds potentially nesting here.
6. Attention should be taken towards the rehabilitation of the site for future growth for hedgerows which are important for biodiversity and the species that rely on them.

## General application of Herbicides

1. Desktop research: Ensure application of herbicides/pesticides is permitted within work site, Identify any invasive species that may be present to ensure procedure is followed to prevent spread to other areas.
2. Proper PPE is worn such as goggles and face mask when dealing with chemicals.
3. Dosage of chemicals is accurate and complies with that agreed with the Pesticide Control Division, Department of Food and Marine and is found on the list of approved PPP (Plant Protection Products).
4. Check that weather conditions are suitable for the application of chemicals ensuring wind speed is minimal and temperatures aren't high (lower than 20°C).
5. All trained staff undergoing weed spraying or vegetation control must undertake and document a safety risk assessment before commencing works.
6. All equipment such as knapsack sprays must be checked for leaks or flaws before spraying starts.
7. If working in an area with Invasive species present measures must be introduced to reduce the spread such as disinfecting boots in boot wash when leaving site, washing down any equipment as well as any vehicles that were on the site.
8. Any accidents in relation to the environment must be reported immediately to the CCE Environmental Department.

### Application near Amenity Areas/Car Parks

Extra caution should be taken when the application of herbicides is undertaken in Amenity and Station areas or Car parks as there are greater numbers of people found here. Guidelines have been set out by the pesticides control division called guidance on Responsible Pesticide Use in Public and Amenity and Garden Areas.

1. Assess the need
2. Appraise the tools available and agree on most suitable solution
3. Alleviate risks where possible
4. Await suitable conditions
5. Apply using trained staff
6. Apply using appropriate equipment
7. Avoid public, pets and water
8. Always store PPPs safely
9. Always dispose of PPPs and packaging safely
10. Audit results and maintain records

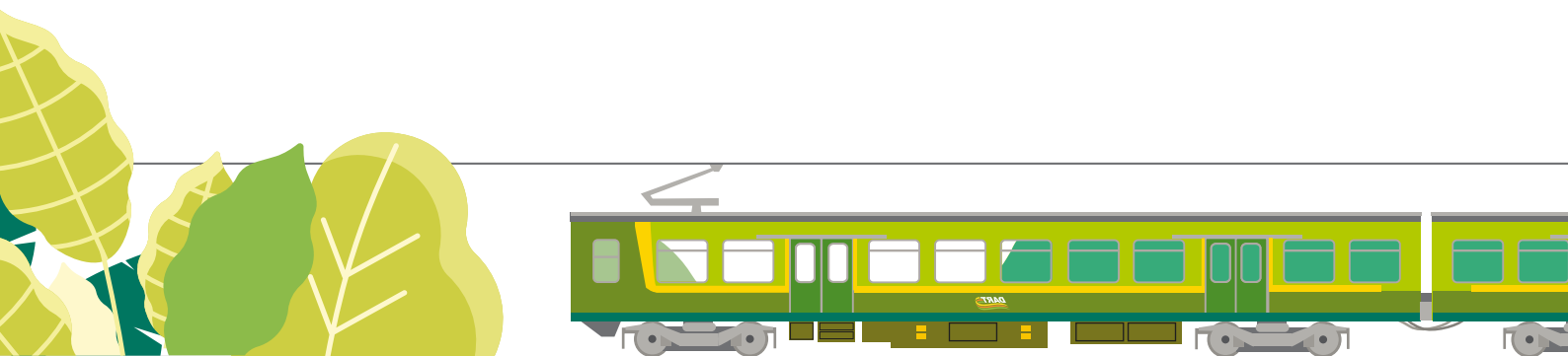
Areas that are signed “Managed for wildlife” or “Pollinator Friendly Area” should not be sprayed. These areas have either been left untouched by cutting machinery or pesticides to allow wild areas to appear which are favoured by pollinators due to native plants colonising these areas.

### Application near Watercourses and non-target areas

To minimise the risk of accidents during the application of herbicides near watercourses or non-target areas procedures outlined as per the EPA Guidelines 2014 must be followed. With further information regarding these guidelines found on the website ([www.epa.ie](http://www.epa.ie)) where there are information leaflets to view for advice.

Guidelines to follow when undergoing vegetation control near watercourses

1. Only PPP (Plant Protection Products) which have been approved for use in or near watercourse can be used in these environments.
2. The weed spraying train should not operate along sections of track which are found alongside watercourses.
3. To avoid spray drift onto species that are not targeted and other third party properties only hand held applicators should be used to spot treatment the area.
4. Weather conditions must be favourable for boom sprayers or large applicators during windy conditions.
5. Recommended that sprayer setting is set to a coarse spray which produces the largest droplets reducing the risk of spray drift while not compromising the efficiency of the chemical.



## References

### Chapter 1

#### Introduction:

- [www.UN.org](http://www.UN.org)
- [www.irishrail.ie](http://www.irishrail.ie)

#### Biodiversity and its importance:

- [Wikipedia.org](http://Wikipedia.org)
- [uic.org/projects/article/reverse](http://uic.org/projects/article/reverse)

#### Types of surveys:

- [Ecofact.ie](http://Ecofact.ie)
- [Aquafact.ie](http://Aquafact.ie)

### Chapter 2

#### Procedures for planning works within designated areas:

- Information gathered from Technical Standards in use by Iarnród Éireann staff
- [www.NPWS.ie/Legislation](http://www.NPWS.ie/Legislation)

### Chapter 3

#### Protected Species:

##### Badgers

- [www.vincentwildlife.ie/species/badger](http://www.vincentwildlife.ie/species/badger)
- [www.conserveireland.com/mammals/badger.php](http://www.conserveireland.com/mammals/badger.php)
- Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes (<https://www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Badgers-prior-to-the-Construction-of-a-National-Road-Scheme.pdf>)

##### Bats

- [www.batconservationireland.org](http://www.batconservationireland.org)
- Information gathered from Technical Standards in use by Iarnród Éireann staff
- [https://cdn.bats.org.uk/uploads/pdf/Resources/Bat\\_Survey\\_Guidelines\\_2016\\_NON\\_PRINTABLE.pdf?v=1542281971](https://cdn.bats.org.uk/uploads/pdf/Resources/Bat_Survey_Guidelines_2016_NON_PRINTABLE.pdf?v=1542281971)
- [https://www.batconservationireland.org/wp-content/uploads/2013/09/BCI\\_Guidelines\\_waterways.pdf](https://www.batconservationireland.org/wp-content/uploads/2013/09/BCI_Guidelines_waterways.pdf)

##### Otter

- [www.vincentwildlife.ie/species/otter](http://www.vincentwildlife.ie/species/otter)
- [en.wikipedia.org/wiki/Otter](http://en.wikipedia.org/wiki/Otter)
- [www.npws.ie/sites/default/files/publications/pdf/IWM76.pdf](http://www.npws.ie/sites/default/files/publications/pdf/IWM76.pdf)
- Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes
- [www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Otters-prior-to-the-Construction-of-National-Road-Schemes.pdf](http://www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Otters-prior-to-the-Construction-of-National-Road-Schemes.pdf)

## REMEMBER!

- A **SINGLE** drop of pesticide lost to a water body such as a typical small stream (1 metres wide, 0.3 metres deep), for example, can be enough to breach the legal limit for pesticides in drinking water of 0.1 part per billion along 30 km of its length.
- Always read and follow the product label.
- Be aware of how near water bodies (ditches, streams, ponds, rivers, lakes, etc.), drains or wells are to where you are working.
- Find out if the treatment area is in the vicinity of a drinking water abstraction point or well.

### Freshwater Pearl Mussel

- <https://www.pearlmusselproject.ie/freshwater-pearl-mussel.html>
- <https://www.npws.ie/research-projects/animal-species/invertebrates/freshwater-pearl-mussel/appropriate-assessment>

### White-clawed Crayfish

- <https://www.biodiversityireland.ie/crayfish-regulations/#:~:text=%E2%80%8BThe%20White%2Dclawed%20Crayfish,and%20the%20EU%20Habitats%20Directive>
- <https://www.npws.ie/research-projects/animal-species/invertebrates/white-clawed-crayfish-austropotamobius-pallipes>

### Nesting birds

- [www.npws.ie/news/restrictions-burning-and-hedgecutting](http://www.npws.ie/news/restrictions-burning-and-hedgecutting)
- Information gathered from existing Technical standards used by Iarnród Éireann staff

## Chapter 4

### Vegetation Management:

- Information gathered from existing Technical standards used by Iarnród Éireann staff

## Chapter 5

### Noxious Plants:

#### Japanese Knotweed

- [ecoadvocacy.ie/threats-to-ecology/noxious-weeds](http://ecoadvocacy.ie/threats-to-ecology/noxious-weeds)
- The Management of Invasive Alien Plant Species on National Roads – Standard  
[www.tiiipublications.ie/library/GE-ENV-01104-01.pdf](http://www.tiiipublications.ie/library/GE-ENV-01104-01.pdf)
- [www.thejapaneseknotweedcompany.com/japanese-knotweed-ireland](http://www.thejapaneseknotweedcompany.com/japanese-knotweed-ireland)
- [www.biodiversityireland.ie/projects/invasive-species/japanese-knotweed](http://www.biodiversityireland.ie/projects/invasive-species/japanese-knotweed)
- [invasivespecies.ie/invasive-plants-japanese-knotweed/japanese-knotweed](http://invasivespecies.ie/invasive-plants-japanese-knotweed/japanese-knotweed)
- <http://www.westmeathppn.ie/sites/default/files/2018-07/jap%20knot%20management.pdf>

#### Himalayan balsam

- [invasivespecies.ie/invasive-plants-japanese-knotweed/himalayan-balsam](http://invasivespecies.ie/invasive-plants-japanese-knotweed/himalayan-balsam)
- [invasivespeciesireland.com/species-accounts/established/terrestrial/himalayan-balsam](http://invasivespeciesireland.com/species-accounts/established/terrestrial/himalayan-balsam)
- [www.agriculture.gov.ie/media/migration/farmingschemesandpayments/glastraining/HimalayanBalsamFinalDraft230616.pdf](http://www.agriculture.gov.ie/media/migration/farmingschemesandpayments/glastraining/HimalayanBalsamFinalDraft230616.pdf)

#### Giant Hogweed

- [invasivespecies.ie/invasive-plants-japanese-knotweed/giant-hogweed](http://invasivespecies.ie/invasive-plants-japanese-knotweed/giant-hogweed)
- [species.biodiversityireland.ie/profile.php?taxonId=29131](http://species.biodiversityireland.ie/profile.php?taxonId=29131)
- [www.jackravenbushcraft.co.uk/hogweed-and-giant-hogweed](http://www.jackravenbushcraft.co.uk/hogweed-and-giant-hogweed)
- [en.wikipedia.org/wiki/Heracleum\\_sphondylium](http://en.wikipedia.org/wiki/Heracleum_sphondylium)

Treatment methods information gathered from Technical Standards already in use by Iarnród Éireann staff

## Chapter 6

### Instream works:

- Seasonal Calendar adapted from ([www.fingalbiodiversity.ie/resources/biodiversity\\_guidelines/Protection%20of%20Fish%20Habitat.pdf](http://www.fingalbiodiversity.ie/resources/biodiversity_guidelines/Protection%20of%20Fish%20Habitat.pdf))
- Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters ([www.fisheriesireland.ie/documents/624-guidelines-on-protection-of-fisheries-during-construction-works-in-and-adjacent-to-waters/file.html](http://www.fisheriesireland.ie/documents/624-guidelines-on-protection-of-fisheries-during-construction-works-in-and-adjacent-to-waters/file.html))
- Old River Shannon Trust – ([oldrivershannon.com/2014/09/17/instream-works-in-ireland](http://oldrivershannon.com/2014/09/17/instream-works-in-ireland))

## Chapter 7

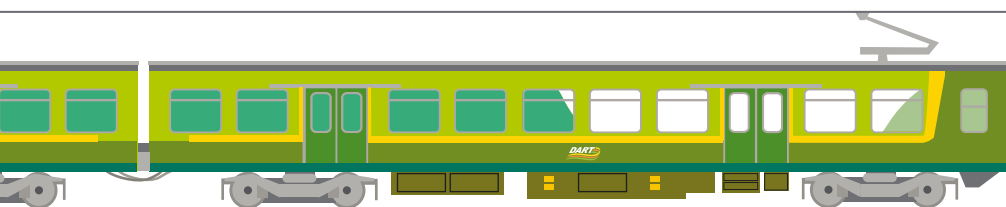
### Restoration and Rehabilitation:

- All-Ireland Pollinator Plan ([https://pollinators.ie/wp-content/uploads/2019/10/Transport-Corridors\\_actions-to-help-pollinators-2019-WEB.pdf](https://pollinators.ie/wp-content/uploads/2019/10/Transport-Corridors_actions-to-help-pollinators-2019-WEB.pdf))
- The National Biodiversity Plan (<https://www.npws.ie/sites/default/files/publications/pdf/National%20Biodiversity%20Action%20Plan%20English.pdf>)
- Engineers Ireland – Protecting Biodiversity The role of engineers ([https://www.engineersireland.ie/LinkClick.aspx?fileticket=7\\_YWTYMZ1NM%3D&portalid=0&resourceView=1](https://www.engineersireland.ie/LinkClick.aspx?fileticket=7_YWTYMZ1NM%3D&portalid=0&resourceView=1))

## Chapter 8

### Operational Procedures for Ecological Assessment:

- Information gathered from existing technical standards already in use by Iarnród Éireann staff







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