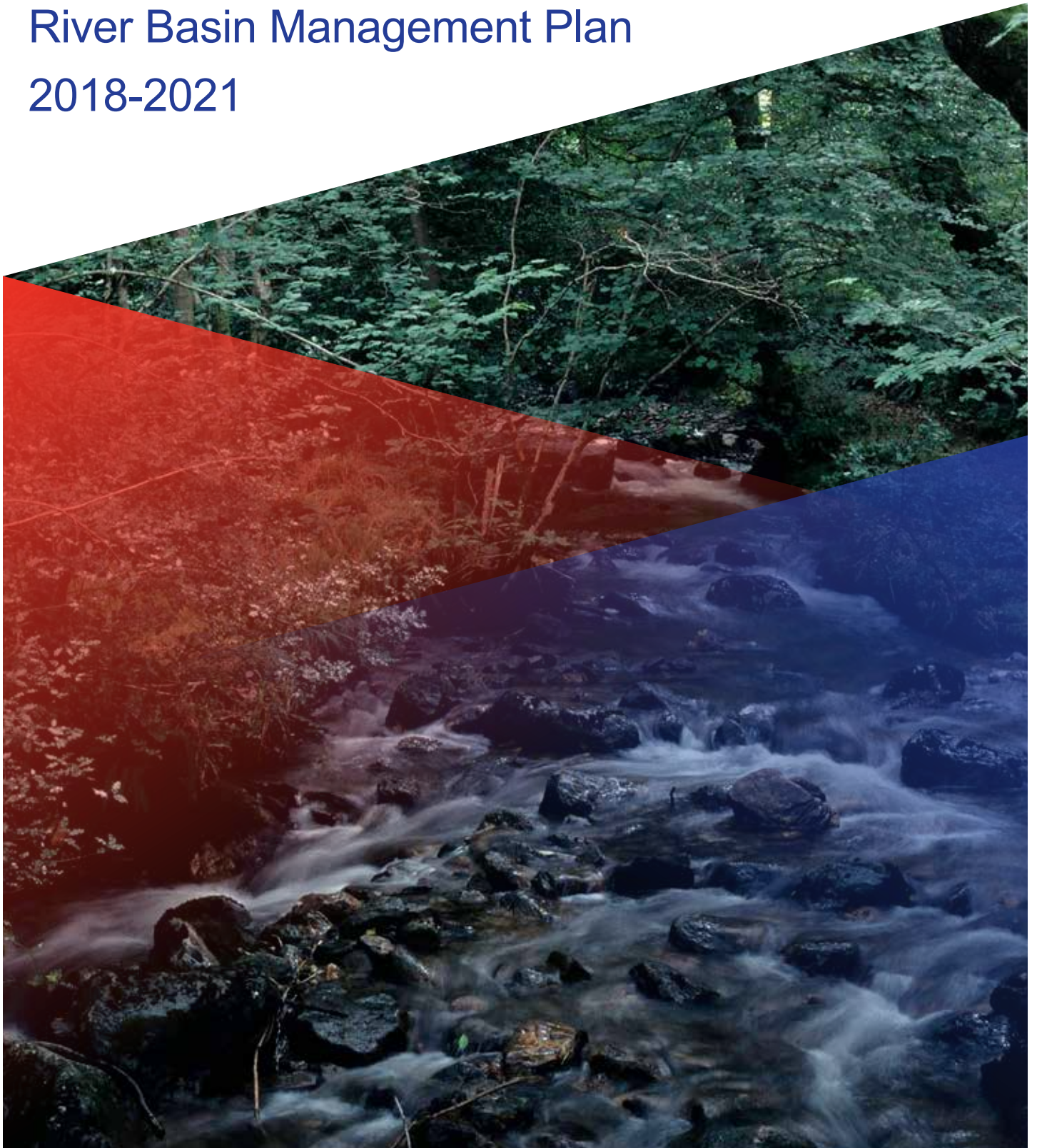




An Roinn Talmhaíochta,  
Bia agus Mara  
Department of Agriculture,  
Food and the Marine

# Forests & Water

Achieving Objectives under Ireland's  
River Basin Management Plan  
2018-2021



The Department of Agriculture, Food & the Marine (DAFM) is responsible for ensuring the development of forestry within Ireland in a manner and to a scale that maximise its contribution to national socio-economic well-being on a sustainable basis compatible with the protection of the environment. Its strategic objectives are to:

- foster the efficient and sustainable development of forestry
- increase quality planting
- promote the planting of diverse tree species
- improve the level of farmer participation in forestry
- promote research and training in the sector
- encourage increased employment in the sector

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# Executive Summary

This document *Forests & Water: Achieving Objectives under Ireland's River Basin Management Plan 2018-2021* sets out how the Department of Agriculture, Food & the Marine (DAFM) and the wider forestry sector will fulfil their role in achieving the objectives under the 2<sup>nd</sup> cycle of the Water Framework Directive (WFD), as set out in the River Basin Management Plan for Ireland 2018-2021 (RBMP), prepared by the Department of Housing, Planning & Local Government.

As part of the development of the 2<sup>nd</sup> cycle of the WFD, the Environmental Protection Agency (EPA) undertook a characterisation and prioritisation assessment of all water bodies within Ireland. This process was based on technical assessments during the period 2014-2016, local knowledge and information from Local Authorities, Inland Fisheries Ireland and Irish Water, and a series of Catchment Characterisation Workshops throughout 2017, held by the Local Authority Waters & Communities Office (LAWCO) and the EPA and involved input from all of the relevant public bodies (including DAFM and Coillte).

The characterisation process has shown that, of the total number of 4,829 water bodies, 1,460 are 'at risk' of not meeting their WFD status objective. Significant pressures deemed to be causing this 'at risk' assessment are: agriculture (53% of the 'at risk' water bodies), hydromorphology (24%), urban waste water (20%), forestry (16%), domestic waste water (11%), peat extractive industry (8%) and urban run-off (9%).

A total of 384 river, lake, transitional and coastal water bodies have a high ecological status (HES) objective, i.e. where the objective is to protect and restore high ecological status. These include 319 river water bodies and 37 lake water bodies. Twenty-eight of these river water bodies lie within the priority eight Freshwater Pearl Mussel (FPM) catchments. In total, 124 river and lake water bodies are 'at risk' of not meeting their HES objective. Of particular relevance to forestry is the risk profile for these water bodies. Forestry is identified as a significant pressure in 51 (40%) of these water bodies, followed by hydromorphology in 43 (34%), agriculture in 35 (28%), peat extraction or disturbances in 16 (13%), and domestic waste water in 13 (10%).

DAFM recognises that inappropriately-sited forests and poorly-managed forest operations can potentially impact water quality and aquatic habitats and species such as salmonids and FPM, particularly in terms of siltation and nutrient runoff. As such, the protection of water forms a key component of its assessment of all applications for forestry licences and grants. DAFM and the wider forest sector also highlight the significant role that properly sited and managed woodlands and forests can themselves play in protecting and enhancing water and aquatic ecosystems, through the delivery of a range of water-related ecosystem services.

**The overall approach is: (i) to safeguard water during all forestry operations; (ii) to restructure existing forests to reflect water sensitivities, where required; and (iii) to situate and design new woodlands and forests in a way that protects water quality. Using the WFD's 'source-pathway-receptor' model, reducing sources and breaking pathways are key. The aim is to fully realise the important role woodlands and forests have in protecting and enhancing Ireland's waters and associated aquatic ecosystems.**

This document sets out how DAFM and the wider forest sector will realise this aim. In summary:

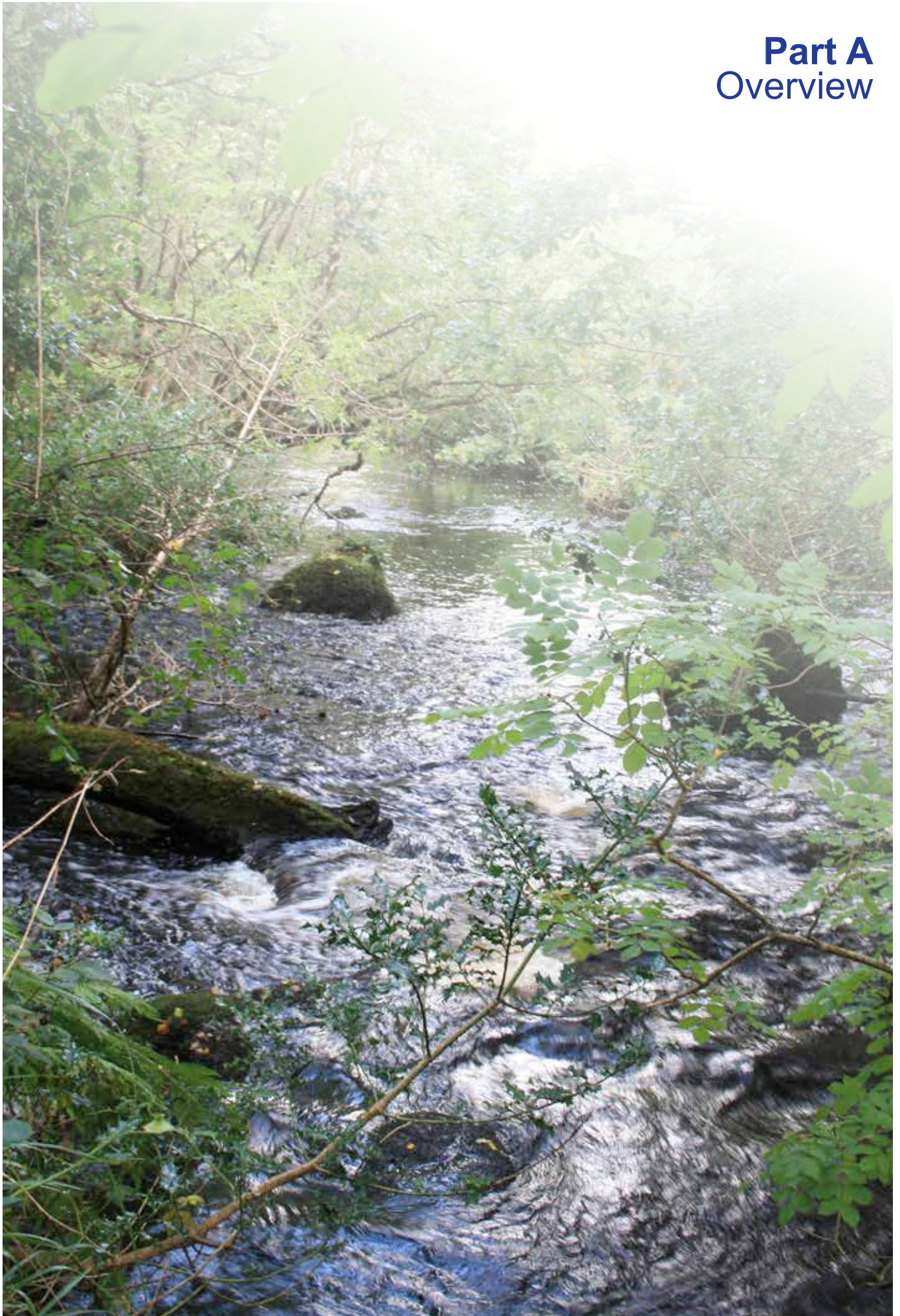
- Section 1 provides an overview of forestry in Ireland, and the role of DAFM in the regulation and promotion of forest development.
- Section 2 sets out the key messages from the RBMP in relation to forestry, and issues the forest sector must address.
- Section 3 details how DAFM will fulfil its responsibilities under the 2<sup>nd</sup> cycle of the WFD, through: inter-agency coordination; training and peer-to-peer learning; involvement in relevant Areas for Action initiatives; the targeting of individual sites for the protection and enhancement of water; the handling of acute incidents regarding forests and water; and the assessment of forest licence and grant applications for afforestation, forest road works, tree felling and aerial fertilisation.
- Section 4 – 16 describe the various regulatory and promotional measures on hand to advance appropriate forest development and good forest practice, in terms of protecting, and where possible, enhancing water quality and aquatic ecosystems. These forests and water measures, which underpin the 'mobilisation' measures detailed in Section 3, are:
  - Forestry Act 2014
  - Forest Policy & Funding



- Scheme Rules
- Application Process
- Land Types for Afforestation
- Environmental Requirements for Afforestation
- Reforestation Objectives & Permanent Forest Removal
- Research & Demonstration
- Plan for Forests & Freshwater Pearl Mussel in Ireland
- Native Woodland Scheme Package
- Agro-Forestry Scheme
- Environmental Enhancement of Forests Scheme
- Woodland for Water

Forestry in Ireland is a multi-faceted land use that provides rural employment, supplies a valuable and sustainable raw material, and supports national efforts to combat climate change. A wide range of other ecosystem services are also delivered by woodlands and forests, such as landscape enhancement, biodiversity linkage and opportunities for outdoor recreation and the promotion of health and well-being. Also of key importance is the contribution woodlands and forests make to protecting and enhancing Ireland's waters. Progress towards realising this contribution, through the application of the above measures, will be monitored, to inform the wider application of the River Basin Management Plan for Ireland.

# Part A Overview







# Section 1

## Forest Regulation & Promotion

### 1.1 About this document

This document *Forests & Water: Achieving Objectives under Ireland's River Basin Management Plan 2018-2021* sets out how the Department of Agriculture, Food & the Marine (DAFM) and the wider forestry sector will fulfil their role in achieving the objectives and priorities under the 2<sup>nd</sup> cycle of the Water Framework Directive (WFD), as set out in the River Basin Management Plan for Ireland 2018-2021 (RBMP), prepared by the Department of Housing, Planning & Local Government (2018).

In summary:

- Section 1 provides an overview of forestry in Ireland, and the role of DAFM in the regulation and promotion of forest development.
- Section 2 sets out the key messages from the RBMP regarding forestry, and issues the forest sector must address.
- Section 3 details how DAFM will fulfil its responsibilities under the 2<sup>nd</sup> cycle of the WFD, through: inter-agency coordination; training and peer-to-peer learning; Areas for Action; the targeting of individual sites for the protection and enhancement of water; handling acute forestry and water incidents; and the assessment of forest licensing and grant applications.
- Section 4 – 16 describe the various regulatory and promotional measures on hand to promote

appropriate forest development and good forest practice, in terms of protecting, and where possible, enhancing water quality and aquatic ecosystems. These forests and water measures, which underpin the 'mobilisation' measures detailed in Section 3, are listed below:

- Forestry Act 2014
- Forest Policy and Funding
- Scheme Rules
- Application Process
- Land Types for Afforestation
- Environmental Requirements for Afforestation
- Reforestation Objectives & Permanent Forest Removal
- Research and Demonstration
- Plan for Forests & Freshwater Pearl Mussel in Ireland
- Native Woodland Scheme Package
- Agro-Forestry Scheme
- Environmental Enhancement of Forests Scheme
- Woodland for Water

### 1.2 An overview of Irish forestry

The following, extracted from *Forests, Products & People: Ireland's Forest Policy – A Renewed Vision*

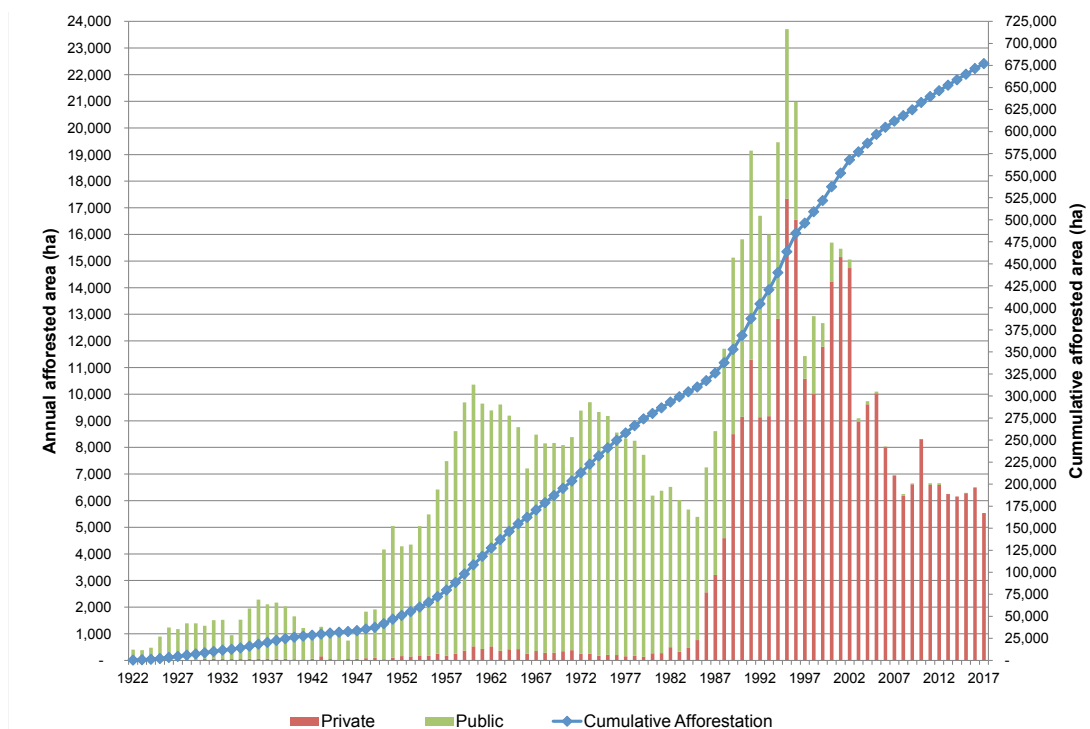
**Photo 1.1 The protection of water and other aspects of the environment underpins the regulation and promotion of forestry in Ireland.**



(DAFM, 2014), the 3<sup>rd</sup> National Forest Inventory 2013-2017 (DAFM, in prep.) and other sources, provide an overview of forestry in Ireland.

- Government Policy on Forestry is “to develop an internationally competitive and sustainable forest sector that provides a full range of economic, environmental and social benefits to society and which accords with the Forest Europe definition of sustainable forest management.”<sup>1</sup>
- The national forest estate is still expanding and has now reached 11% of the total land area, with a wide variety of forest types present. The total forest area has increased from 697,842 ha in 2006 ha to 770,020 ha in 2017. The increase in area is a result of afforestation and the identification of pre-existing forests for the first time during the third NFI cycle.
- National policy is to increase the forest cover from the current level to 18% in 2046.
- Ireland has a strong comparative advantage in the growing of wood fibre, with growth rates of certain species more than double those achievable in some European countries.
- The national forest estate is an important and expanding sink for carbon, at 317 million tonnes. Based on the NFI data, Ireland’s forests have removed 2.8 to 4.8 million tonnes of CO<sub>2</sub> equivalents per year from the atmosphere over the period 2006 to 2016. This carbon resource has proven to be of significance in Ireland achieving its Kyoto target under the first commitment period of 2008-2012.
- Ireland’s forest sector contributes €2.3 billion to the national gross domestic product (GDP).
- Nearly 4 million m<sup>3</sup> of round wood are harvested each year, providing valuable rural incomes and supporting a significant processing sector involving sawn timber, panel boards and other products. This will more than double to 8 million m<sup>3</sup> by 2035.
- In 2010, the total employment supported by the forest sector was estimated to be 12,000, with the majority of jobs rurally-based.
- Forests support a vibrant, export-oriented forest products sector, with over 80% of wood-based panels being exported.
- Over half (50.8%) of forests are in public ownership and 378,663 ha (49.2%) are in private ownership. The share of private forests in the national forest estate has increased by over 6% since 2006.
- Afforestation in Ireland is now undertaken almost uniquely by the private sector, predominantly farmers - see Figure 1.1.
- In general, Ireland’s forest estate is young. Nearly half (44.9%) of the stocked forest estate less than 20 years of age.
- Conifer species are the dominant species type

Figure 1.1 Public (green) and private (red) afforestation in Ireland, 1920-2017.



present, representing 71.2% of the stocked forest area. Broadleaf species account for 28.7% of the area. The share of broadleaf species in the national forest estate has increased by 3% between 2013 and 2017.

- Forests classed as native (i.e. comprising >80% native trees species) and mixed (20-80% native species) comprise 31.7% of Ireland's forests. This represents an increase of 3% on the 2012 figures.
- The total growing stock of Irish forests is estimated to be over 116 million m<sup>3</sup>, an increase of over 19 million m<sup>3</sup> on 2012.
- Gross mean annual volume increment between 2013 and 2017 was 8.4 million m<sup>3</sup> per year, while the mean annual standing volume felled within this period was 4.9 million m<sup>3</sup> per year.

Well-sited, designed and management woodlands and forests also enhance biodiversity and the landscape, and provide for outdoor recreation and knock-on public health, and this ecosystem-focused role is recognised. For example, as set out in *Forests, products & people* (DAFM, 2014), afforestation, the management of existing forests and the development of the forest sector must be undertaken *"in a manner that ensures compliance with environmental requirements and objectives and enhances their contribution to the environment and their capacity for the provision of public goods and services."* A key element in this regard is water.

DAFM recognises that inappropriately sited forests and poorly managed forest operations can potentially impact water quality, aquatic habitats and aquatic species, most notably salmonids and Freshwater Pearl Mussel (FPM), particularly in terms of siltation and nutrient runoff. As such, the protection of water forms a key component of its assessment of all applications for forestry licences and grants. However, DAFM and the wider forest sector also highlight the significant role that properly sited and managed woodlands and forests can play in protecting and enhancing water and aquatic ecosystems, through the delivery of a range of water-related ecosystem services.

**The overall approach is: (i) to safeguard water during all forestry operations; (ii) to restructure existing forests to reflect water sensitivities, where required; and (iii) to situate and design new woodlands and forests in a way that protects water quality. Using the WFD's 'source-pathway-receptor' model, reducing sources and**

**breaking pathways are key. The aim is to fully realise the important role woodlands and forests have in protecting and enhancing Ireland's waters and associated aquatic ecosystems.**

Particular opportunities exist under the Afforestation Grant & Premium Scheme (which facilitates nuanced design using undisturbed setbacks and the planting of a wide range of forest types, including native woodland and agro-forestry) and also at the clearfelling / reforestation stage, where targeted restructuring around water can be undertaken. This is particularly the case in relation to older forestry plantations established pre-1990, before the introduction of forestry and water guidelines and mandatory water setbacks.

### 1.3 Role of the Department of Agriculture, Food & the Marine

The role of the Department of Agriculture, Food & the Marine is to lead the sustainable development of the agri-food, forestry and marine sector and to optimise its contribution to national economic development and natural environment. In relation to the forest sector, key functions include: the implementation of national forest policy; the administration of forestry support schemes; the control of felling; forest protection; and the National Forest Inventory.

Throughout its regulatory and promotional role, DAFM is guided by the principles of SFM, a key component of which is the protection of water and aquatic ecosystems, and where possible, the realisation of the proactive role woodlands and forests can play in this regard.

#### 1.3.1 Forest regulation

Regarding regulation, DAFM regulates key forest activities undertaken both within the private sector and by Coillte CGA, principally through the Forestry Act 2014 and the Forestry Regulations 2017 (S.I. 191 of 2017) regarding afforestation and forest road work, tree felling (thinning, clearfelling and reforestation, as relevant) and the aerial fertilisation of forests.

This regulatory role generates considerable activity. For example, in the years 2014 to 2015, the following were carried out under DAFM assessment procedures: 12,449 ha of new forests were planted on 1,981 sites, comprising 21% broadleaves and 79% conifers. As per the required standards, each

<sup>1</sup> Forest Europe (The Ministerial Conference on the Protection of Forest in Europe) is the pan-European political process for the sustainable management of the continent's forests and defined SFM (Helsinki 1993) as *"the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems."*



**Photo 1.2 Lifting and bagging of stock at None-So-Hardy Nursery, Shillelagh, Co. Wicklow, before transportation to planting sites. Ireland's forest nursery sector supplies the afforestation programme and other forest management operations (e.g. reforestation) with suitable planting stock.**



**Photo 1.3 Thinnings from both conifer and broadleaf forests represent a valuable source of income for forest owners.**



**Photo 1.4 Launch of the Dunmore East NeighbourWood project, Co. Waterford. Ireland's woodlands and forests provide a venue for a wide range of outdoor activities, promoting health and well-being.**





site included 15% open space and retained habitat (include water setbacks) and a minimum of 10% broadleaves. A total of 4,908 Felling Licences were issued, covering 32,929 ha of thinning and 23,595 ha of clearfell. A total of 326 km of new forest roads were also constructed.

As the consenting authority, DAFM has key responsibilities under the WFD regarding its assessment of any application for a licence (with or without grant support) to undertake a forest activity. Specifically, the Minister for Agriculture, Food & the Marine is identified as a relevant public authority under transposing legislation European Communities (Water Policy) Regulations 2003 (S.I.722 of 2003). These regulations set out the general duties of public authorities, as follows:

#### **Section 4**

3.(1) *It shall be the duty of every public authority to –*

*(a) exercise its functions in a manner which is consistent with the provisions of the Directive and which achieves or promotes compliance with the requirements of the Directive;*

*(b) take such actions as may be appropriate in the context of its functions to secure compliance with the Directive and with the provisions of any river basin management plan made, and any programme of measures established, in accordance with these Regulations;*

*(c) consult, co-operate and liaise with other public authorities and with the competent authorities in Northern Ireland in such a manner and to such extent as is necessary to ensure co-ordination of the requirements of the Directive for achievement of the environmental objectives in relation to the whole of each river basin district and international river basin district including requirements as to the analysis of its characteristics, the review of the impact of human activity on the status of surface waters and on groundwater, the monitoring of water status, the preparation of river basin management plans and the implementation of programmes of measures;*

*(d) provide such information appropriate to its functions as may be reasonably required by any other public authority for the purpose of compliance with the Directive and, insofar as is practicable, provide such information, where so requested, in a form disaggregated by reference to river basin districts, river basins, sub-basins or such other areas as may be specified;*

*(e) encourage the active involvement of all interested parties in relation to the measures being taken by the authority for implementation*

*of the Directive; and*

*(f) provide access to background documents and information used for the development of a draft river basin management plan.*

As a listed public body, the Minister for Agriculture, Food & the Marine also has a direct responsibility under the European Communities (Birds & Natural Habitats) Regulations 2011 (S.I.477 of 2011). For example, as part of its evaluation of an afforestation application, the Department must carry out the following:

*42.(1) A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site [i.e. a Special Area of Conservation (SAC) or a Special Protection Area (SPA)], shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site.*

*(2) A public authority shall carry out a screening for Appropriate Assessment under paragraph (1) before consent for a plan or project is given, or a decision to undertake or adopt a plan or project is taken.*

#### **1.3.2 Forest promotion**

Another key role of DAFM is the promotion of appropriate and sustainable forestry, and this is achieved through various grant schemes for (*inter alia*) afforestation, forest roading, native woodland conservation, tending and thinning, and neighbourwoods developed for local amenity. These supports are available under the current State-funded Forestry Programme 2014-2020, which is aimed at: increasing forest cover; increasing wood and forest biomass production; carbon capture and climate change mitigation; providing support for forest owners; and realising environmental and social benefits of new and existing forests.

In total, 24,500 ha have been afforested, and 300 km of private forest road constructed, under the current Forestry Programme during the period 2014-2017.

The Forestry Programme recently underwent its Mid-Term Review, with resulting amendments set out in Section 5.4.

### 1.3.3 Other activities

DAFM also undertakes the National Forest Inventory, to record and assess the composition and condition of the entire forest estate, both public and private, at a national level. This is required in order to provide information to monitor SFM and to collect data to support forest policy, specifically in relation to volume, biomass/carbon, forest area, species composition and forest structure, forest biodiversity, and forest health and vitality. DAFM also plays a central regulatory role in relation to forest protection, the International Standards for Phytosanitary Measures No. 15 (ISPM15) (relating to wood packaging in international trade), and forest reproductive material.

## 1.4 Overview of the application process

Under the Forestry Regulations 2017, when assessing an application for licensing (with or without grant support) for a regulated forest activity, DAFM undertakes a detailed assessment of the project and (*inter alia*) its potential impact on the environment, to ensure that any licence issued is in keeping with the principles of SFM and the protection of the environment, including water.

This entails a combination of field inspection and GIS-based desk assessment by the Department's Forestry Inspectors, internal referral to a professional Ecologist and Archaeologist, screening for appropriate assessment and environmental impact assessment, public consultation, referral to various statutory consultees, and an appeals system. Any activity that is subsequently licensed must adhere to the *Code of Best Forest Practice – Ireland*, a suite of mandatory environmental 'guidelines' and requirements relating to (*inter alia*) water quality, biodiversity and harvesting, and all relevant scheme requirements. In particular areas, other specific procedures, protocols and requirements may also apply, such as the Acid Sensitivity Protocol or the Forestry & FPM Requirements. Finally, project-specific conditions are typically attached to any licence issued.

DAFM undertakes various post-utilisation checks to ensure that all conditions attached to a particular licence have been satisfied. Failure in this regard can result in various steps being taken, such as penalties, professional sanctions and legal recourse.

For full details on the application process, see Section 7.

## 1.5 Ability to control and influence

DAFM must act within its regulatory remit, and therefore has a defined ability to control and influence forest management. It is important to set out the scope of this influence.

DAFM cannot compel land- / forest owners to undertake afforestation or felling specifically aimed at protecting and enhancing water quality. Instead, it regulates key forest activities through the Forestry Regulations 2017, by assessing applications received and by attaching appropriate conditions to any licences issued, to ensure a nuanced approach using water setbacks, operational restrictions and other safeguards. It also operates particular schemes, i.e. the Native Woodland Establishment Scheme, the Native Woodland Conservation Scheme and the NeighbourWoodland Scheme (and the Environmental Enhancement of Forests Scheme, once released), which can be used specifically for the targeted delivery of water-related ecosystem services, in partnership with owners and others.

Table 1.1 provides an overview of the main statutory, regulatory and funding controls applied by DAFM in relation to various forest activities, to protect the environment, including water.

Furthermore, under the European Communities (Birds & Natural Habitats) Regulations 2011 (S.I.477 of 2011) and within the context of appropriate assessment, the following applies:

### **Consent by public authorities**

*44. (1) The provisions of Regulations 42 and, if applicable, 43, apply before a public authority may give consent for a plan or project under these Regulations.*

*(2) A public authority may, for the purposes of these Regulations, attach conditions to any consent or at any time vary such conditions as the public authority deems appropriate, or revoke such consent if, in the opinion of the public authority, the conditions attached to such consent have been breached or the continuation of such consent would be liable to destroy, or significantly alter, damage or interfere with the species and habitats for which the site may be or has been designated and the public authority shall communicate in writing anything determined pursuant to this paragraph to the persons concerned.*

**Table 1.1 An overview of the statutory, regulatory and funding controls applied by DAFM to forest activities to protect the environment, including water. In each case, the tick symbol indicates relevance (to varying degrees) of the listed control (row) to the corresponding forest activity (column).**

CONTROL	FOREST ACTIVITY					
	Afforestation	Forest Road Works	Thinning	Clearfelling & Reforestation	Aerial Fertilisation	
Forestry Act 2014 (including provisions for EIA) (via S.I.191 of 2017)	✓	✓	✓	✓	✓	
Birds & Habitats Directives (via S.I.477 of 2011).	✓	✓	✓	✓	✓	
Water Framework Directive (via S.I.722 of 2003)	✓	✓	✓	✓	✓	
Appropriate Assessment Procedure	✓	✓	✓	✓	✓	
Scheme Terms & Conditions (including penalties)	✓	✓	✓	✓	N/A	
<i>Felling &amp; Reforestation Policy</i> (May17)	N/A	✓	✓	✓	N/A	
<i>Land Types for Afforestation</i> (Oct17)	✓	N/A	N/A	N/A	N/A	
<i>Environmental Requirements for Afforestation</i> (Dec16)	✓	N/A	N/A	N/A	N/A	
<i>Forest Biodiversity Guidelines</i>	N/A	✓	✓	✓	✓	
<i>Forestry &amp; Water Quality Guidelines</i>	N/A	✓	✓	✓	✓	
<i>Forestry &amp; Archaeology Guidelines</i>	N/A	✓	✓	✓	✓	
<i>Forestry &amp; the Landscape Guidelines</i>	N/A	✓	✓	✓	N/A	
<i>Forest Harvesting &amp; the Environment Guidelines</i>	N/A	✓	✓	✓	N/A	
<i>Aerial Fertilisation Requirements</i> (Jan14) (to be updated ref. S1191 of 2017)	N/A	N/A	N/A	N/A	✓	
<i>Forestry &amp; Otter Guidelines</i>	✓	✓	✓	✓	N/A	
<i>Forestry &amp; Kerry Slug Guidelines</i>	✓	✓	✓	✓	N/A	
<i>Forest Protection Guidelines</i>	✓	✓	✓	✓	N/A	
DAFM / EPA / COFORD Acid Sensitivity Protocol	✓	Feb13: NWS Est. allowed	N/A	N/A	N/A	N/A
<i>Forestry Standards Manual</i> (Nov15)	✓	✓	✓	N/A	N/A	

# Section 2 Forestry & the River Basin Management Plan

## 2.1 Overview

This section outlines the key issues regarding forestry set out in the River Basin Management Plan for Ireland: 2018-2021, prepared by the Department of Housing, Planning & Local Government (2018). For full details and background information, please refer to the RBMP document itself.

The Water Framework Directive sets out the environmental objectives which must be met through the process of river basin planning and the implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The challenges presented in achieving the objectives are very significant, and therefore a key purpose of the RBMP is to set out priorities and to ensure that implementation is guided by this prioritisation.

### 2.1.1 Environmental objectives set out in the WFD

Article 4 of the WFD sets out the environmental objectives of the Directive, the application of the objectives, and possible exemptions. In summary, the general thrust of these objectives is as follows:

*For surface waters:*

- To prevent deterioration of the status of surface waters.
- To protect, enhance and restore surface waters with the aim of achieving good status (ecological and chemical) for all water bodies.
- For heavily modified water bodies and artificial water bodies, the aim is to protect and enhance those bodies to achieve good ecological potential and good chemical status.
- To progressively reduce pollution from priority substances and cease or phase out emissions, discharges and losses of priority hazardous substances into surface waters.

*For groundwater:*

- To prevent deterioration of the status of groundwater.
- To protect, enhance and restore all bodies of groundwater, and ensure a balance of abstraction and recharge, with the aim of achieving good groundwater status (quantitative and chemical).

- To reverse any significant and sustained upward trends in the concentration of pollutants in groundwater.

*For protected areas:*

- To achieve compliance with objectives and standards under which the individual protected areas have been established.

### 2.1.2 Prioritisation for the 2<sup>nd</sup> cycle of the WFD

While the objectives of the Directive clearly set out the end goals, the challenges presented in achieving these objectives are very significant. Therefore, a key purpose of the RBMP is to set out priorities and to ensure that the implementation of this plan is guided by this prioritisation. This prioritisation must maximise the value of constrained resources, ensure the cost-effectiveness of measures, and ensure that the delivery of the RBMP is most effective and efficient over the short, medium and long term. The process of prioritisation was carried out through scientific characterisation, various public consultation processes and a broad consideration of resources and resource constraints.

The latest information on the status of Ireland's water bodies and the outputs of the risk characterisation process were particularly important in deciding on these priorities. Some key findings include the following:

- Further progress is necessary to achieve full compliance with existing EU legislation.
- Over the period of the 1st WFD cycle, 900 monitored river or lake water bodies showed an apparent change in status (i.e. either improved or dis-improved), with a net decline of 3% in the number at satisfactory ecological status (high or good).
- Further progress is necessary if Ireland is to meet the protected area requirement. For example, 24% of SACs with water dependency are assessed as being at risk of not meeting their protected area objectives.
- The deterioration of high ecological status (HES) water bodies has emerged as an important issue, with 130 river water bodies or lakes assessed as being at risk of not meeting their high status objective.
- The characterisation process has found a



complex position with regard to the frequency of different significant pressures across the river basin district, with 73% of 'at risk' water bodies subject to more than one significant pressure.

- Hydromorphology, including barriers, has emerged as a significant pressure impacting on water quality within the river basin district.

In line with the above, the following prioritisation was decided upon for the 2<sup>nd</sup> cycle of the WFD (as set out in the RBMP):

- Ensure full compliance with relevant existing EU legislation.
- Prevent deterioration.
- Meet the specific water-related objectives required for protected areas.
- Specifically protect and restore high status objective water bodies.
- Implement focused sub-catchment pilot schemes that will: (i) target water bodies where evidence suggests they could achieve status improvements during this cycle; and (ii) progress pilots in sub-catchments with more complex issues that require multi-disciplinary and cross-agency approaches.
- Work to improve the knowledge and understanding of hydromorphology and barriers as pressures impacting on water quality. This includes identifying the scale of these issues and building the expertise necessary to address them.

This document, *Forests & Water: Achieving Objectives under Ireland's River Basin Management Plan 2018-2021*, sets out measures necessary to ensure that the forest sector in Ireland plays its part in achieving these objectives.

## 2.2 Challenges and opportunities for forestry

As the consenting authority, DAFM has key responsibilities under the WFD regarding its assessment of any application for a licence (with or without grant aid) to undertake a forest activity. Specifically, the Minister for Agriculture, Food & the Marine is identified as a relevant public authority under S.I.722 of 2003. These regulations set out the general duties of public authorities, which include the following:

### **Section 4**

3. (1) *It shall be the duty of every public authority to –*

(a) *exercise its functions in a manner which is consistent with the provisions of the [Water Framework] Directive and which achieves or promotes compliance with the requirements of*

*the Directive;*

DAFM recognises that inappropriately-sited forests and poorly-managed forest operations can potentially impact water quality and aquatic habitats and species such as salmonids and Freshwater Pearl Mussel, particularly in terms of siltation and nutrient runoff. As such, the protection of water forms a key component of its assessment of all applications for forestry licences and grants.

DAFM and the wider forest sector also highlight the significant role that properly sited and managed woodlands and forests can themselves play in protecting and enhancing water and aquatic ecosystems, through the delivery of a range of water-related ecosystem services.

## 2.3 Characterisation and prioritisation assessment

As part of the development of the 2<sup>nd</sup> cycle of the WFD, the Environmental Protection Agency (EPA) undertook a characterisation and prioritisation assessment of all water bodies within Ireland. This took place through technical assessments during the period 2014-2016, based on over 142 national datasets comprising information on pressures, impacts and physical settings. The impact of forestry was assessed using: sediment and nutrient water quality monitoring data; aerial photography to check for new plantations and recent clearfelling; DAFM and Coillte forestry mapping; soil drainage characteristics that could facilitate sediment runoff; and clearfelling licence applications. In addition, Local Authorities, Inland Fisheries Ireland and Irish Water provided local knowledge and information that was incorporated into the assessment.

The process also incorporated a series of Catchment Characterisation Workshops throughout 2017, held by the Local Authority Waters & Communities Office (LAWCO) and the EPA and involving input from all of the relevant public bodies (including DAFM and Coillte). See [www.catchments.ie](http://www.catchments.ie) for full details.

The identification of the significant pressures provides the means to target local measures, as well as providing a picture at the national level to inform overarching measures and national policy requirements. The assessment of risks and pressures has helped to inform the formulation of measures contained in this *Forests & Water* document.

## 2.4 Forestry as a significant pressure

The characterisation process has shown that, of the total number of 4,829 water bodies, 1,460 are 'at

risk' of not meeting their WFD status objective. Table 2.1 and Figure 2.1 show the frequency of significant pressures causing river and lake water bodies to be 'at risk'. These include agriculture (53%), hydromorphology<sup>1</sup> (24%), urban waste water (20%), forestry (16%), domestic waste water (11%), peat extractive industry (8%) and urban run-off (9%).

Of the 1,460 water bodies that are 'at risk' of not meeting their WFD status objective, 765 (52%) are impacted by a single significant pressure, while the remaining 695 (48%) are impacted by more than one significant pressures.

Forestry is deemed to be a significant pressure in 238 (16%) water bodies at risk of not meeting their WFD status objective. This equates to 215 rivers, 18 lakes and 5 groundwater bodies. The pressure is largely associated with clearfelling, drainage, and planting and establishment, and is predominantly focused in catchment headwaters, often coincident with catchment boundaries (Figure 2.2). Forestry may be the single pressure or act in combination with the following pressures: agriculture, urban waste water, hydromorphology and peat extraction.

## 2.5 Water bodies with a high ecological status objective

Nationally, there are 384 river, lake, transitional and coastal water bodies that have a high ecological status (HES) objective, i.e. where the objective is to protect and restore high ecological status<sup>2</sup> - see Figure 2.3. These include 319 river water bodies and 37 lake water bodies. Also included are 28 river water bodies within the priority eight FPM Catchments.

In total, 243 (63%) of these 384 water bodies are currently meeting their HES objective and are therefore 'not at risk'. A further 14 (4%) are 'at review'. However, 127 (33%) are 'at risk' of not meeting their HES objective and require further action.

In total, 124 river and lake water bodies are 'at risk' of not meeting their HES objective. Of particular relevance to forestry is that the risk profile for these is different to the general risk profile across all water bodies nationally. Forestry is identified as a significant pressure in 51 (40%) of these water bodies, followed by hydromorphology in 43 (34%), agriculture in 35 (28%), peat extraction or disturbances in 16 (13%), and domestic waste water

in 13 (10%) (Figure 2.4).

Figure 2.5 shows HES objective water bodies deemed to be 'at risk', where forestry is a significant pressure, either alone or in combination with other significant pressures. (These equate to Forests & Water Sensitivity Category B1 – see Section 3.)

## 2.6 Freshwater Pearl Mussel

Freshwater Pearl Mussel is a highly threatened species of European importance, and populations in Irish streams and rivers represent a significant proportion of the total European population. The species' longevity, low reproduction rate, complex lifecycle and exacting requirements regarding water quality make it highly vulnerable to siltation and nutrient runoff and other impacts arising from various land uses, including forestry.

There are 27 SAC-designated populations of FPM in Ireland, all except one of which are at Unfavourable Conservation Status. The Strategy for Conservation of the Freshwater Pearl Mussel (National Parks & Wildlife Service, 2011) prioritises the conservation of FPM populations within eight catchments, and aims to achieve maximum conservation outputs for the restoration effort in terms of numbers of mussels and populations conserved and protected over the long term. These eight catchments, listed below, represents 80% of the total FPM population and include those with the best chance of recovery.

- Bundorragha (HA32) (Co. Mayo)
- Dawros (HA32) (Co. Galway)
- Ownagappul (HA21) (Co. Cork)
- Leannan-Glaskeelan (Co. Donegal)
- Cumeragh-Currane (HA21) (Co. Kerry)
- Caragh (HA22) (Co. Kerry)
- Kerry Blackwater (HA21) (Co. Kerry)
- Corrib-Owenriff (HA30) (Co. Galway)

These eight catchments comprise 28 river water bodies, all of which are assigned the HES objective. Of these, 12 (43%) met this objective in the 2010-2015 monitoring cycle. However, 15 are 'at risk' of decline, with forestry deemed to be a significant risk (either alone or in combination with other pressures) in seven - see Figure 2.6.

<sup>1</sup> River bank erosion; embankments; overgrazing; dams, barriers, locks and weirs; land drainage; and channelisation.

<sup>2</sup> HES objective water bodies include water bodies currently at high status, and water bodies earmarked to achieve high status. HES objective water bodies will remain (largely) fixed over the lifetime of the 2<sup>nd</sup> cycle of the WFD, as opposed to the number of high status sites, which may fluctuate, hopefully upwards.

## 2.7 High status rivers and lakes - principal actions for the 2<sup>nd</sup> WFD cycle

The following sets out the principal planned actions related to high status rivers and lakes:

- Existing measures, such as the GLAS scheme, forestry schemes and septic tank inspections will continue to promote the protection of high status waters. Uptake of these schemes in high status areas will continue to be promoted and a proportion of septic tank inspections will be weighted towards high status catchments.
  - Recognising that protecting high status waters is a priority, a Blue Dot Catchments Programme will be developed and implemented. This will establish a network of river and lake catchments with the shared objective of protecting and restoring high ecological status waters. This programme will be delivered through local authority structures, integrating with wider implementation structures, and will facilitate focused deployment of resources to Blue Dot catchments.
  - In addition to facilitating focused deployment of resources, the Blue Dot programme will facilitate public awareness and engagement including the development of community-led catchment initiatives through LAWCO.
- stakeholders – with local authorities in particular – to ensure the strategic deployment of forestry measures. Particular focus will be given to the protection of high status objective water bodies and to progressing the other priorities set out in the RBMP.
- DAFM and the EPA will continue to undertake forestry and water research to inform future forestry practices, so that they contribute to the protection and enhancement of water quality.

## 2.8 Principal forestry actions for the 2<sup>nd</sup> WFD cycle

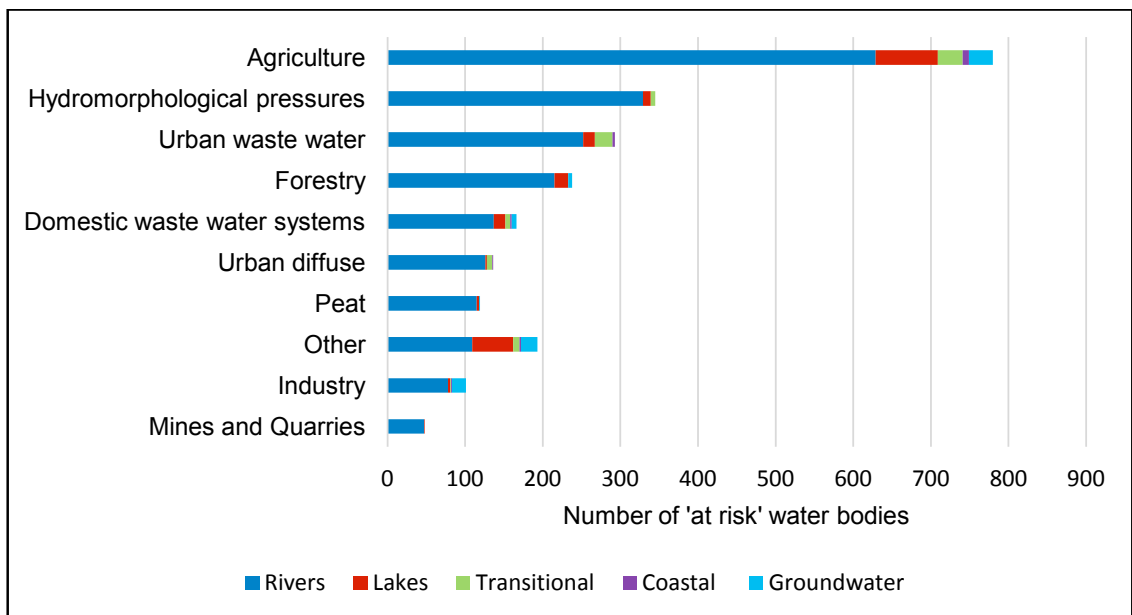
In the context of the above, following sets out the principal actions relating to forestry:

- DAFM will implement the forestry-related regulations, policies and requirements that are being realigned with national water policy.
- Coillte, which owns over half of Ireland's forested lands, will continue to implement and refine its integrated Environmental Risk Assessment approach to its forestry operations.
- DAFM will promote the uptake of the Native Woodland Establishment Scheme and the Native Woodland Conservation Scheme, and will finalise and launch the Environmental Enhancement of Forests Scheme.
- With regard to the protection of FPM populations from forestry pressures, DAFM will develop and implement the proposed Plan for Forests & Freshwater Pearl Mussel in Ireland, and will continue its engagement with KerryLIFE, with a view to assessing and adopting appropriate measures for possible wider application.
- Through the strengthened inter-agency cooperation structures, DAFM will work with other

**Table 2.1 Significant pressures identified as impacting on 'at risk' water bodies. (Note, an individual 'at risk' water body may be impacted upon by several significant pressures.)**

SIGNIFICANT PRESSURE	WATER BODY TYPE					No. 'at risk' WBs impacted	% of 'at risk' WBs impacted
	River	Lake	Transitional	Coastal	Ground-water		
Agriculture	629	80	32	8	31	780	53
Hydro-morphology	329	10	6	–	–	345	24
Urban Waste Water	252	15	23	3	–	293	20
<b>Forestry</b>	<b>215</b>	<b>18</b>	–	–	<b>5</b>	<b>238</b>	<b>16</b>
Domestic Waste Water	137	15	6	2	6	166	11
Diffuse Urban	126	2	7	1	–	136	9
Peat	115	3	–	–	1	119	8
Other	107	52	8	2	21	190	13
Industry	78	3	1	1	18	101	7
Mines & Quarries	47	1	–	–	–	48	3

**Figure 2.1 Significant pressures identified as impacting on 'at risk' water bodies. (Note, an individual 'at risk' water body may be impacted upon by several significant pressures.)**





**Figure 2.2 'At risk' water bodies where forestry is a significant pressure, either alone or in combination with other significant pressures.**

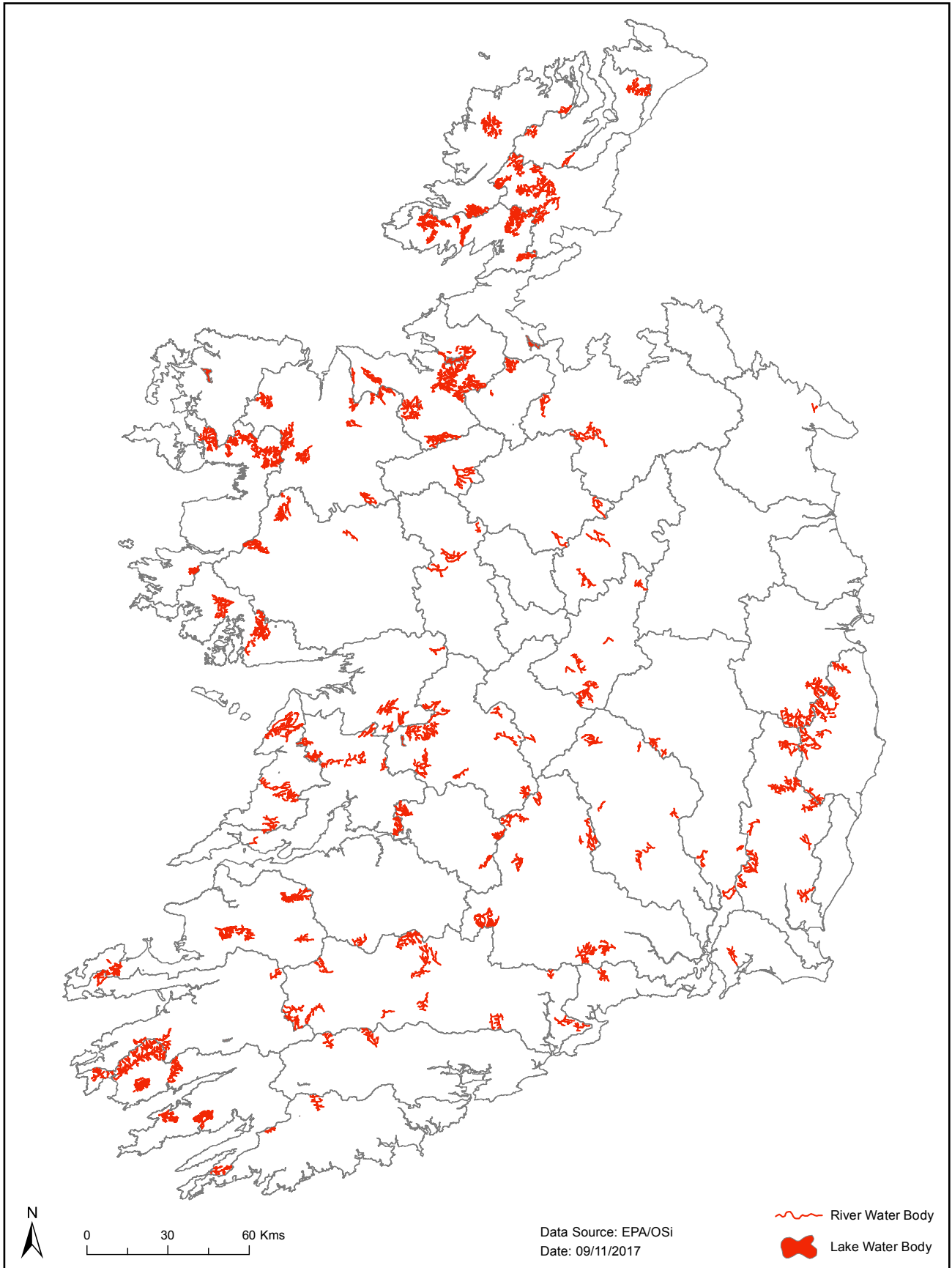
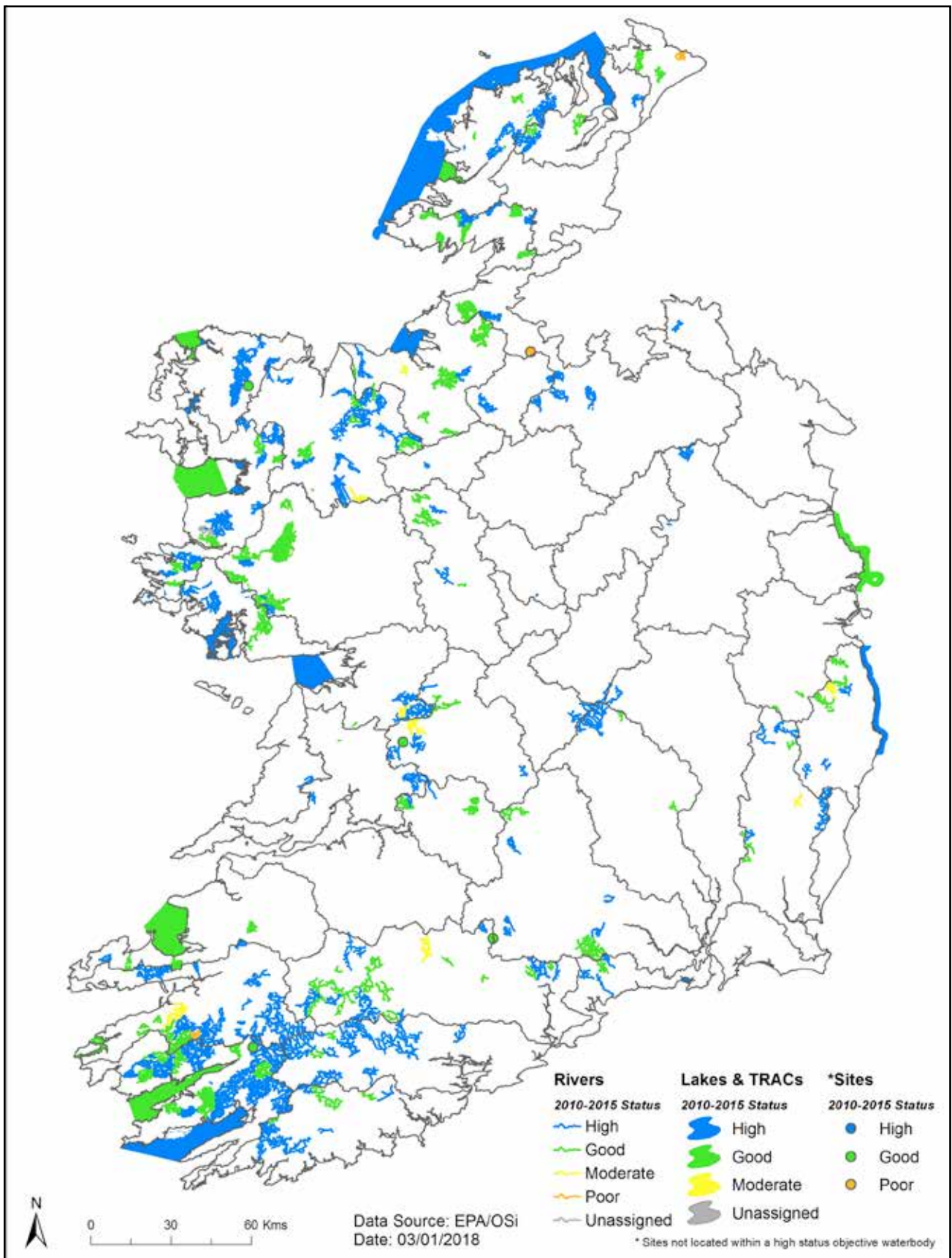


Figure 2.3 Location and condition of high ecological status (HES) objective water bodies and sites.



**Figure 2.4 Significant pressures impacting on high ecological status objective river water bodies deemed to be at 'at risk'.**

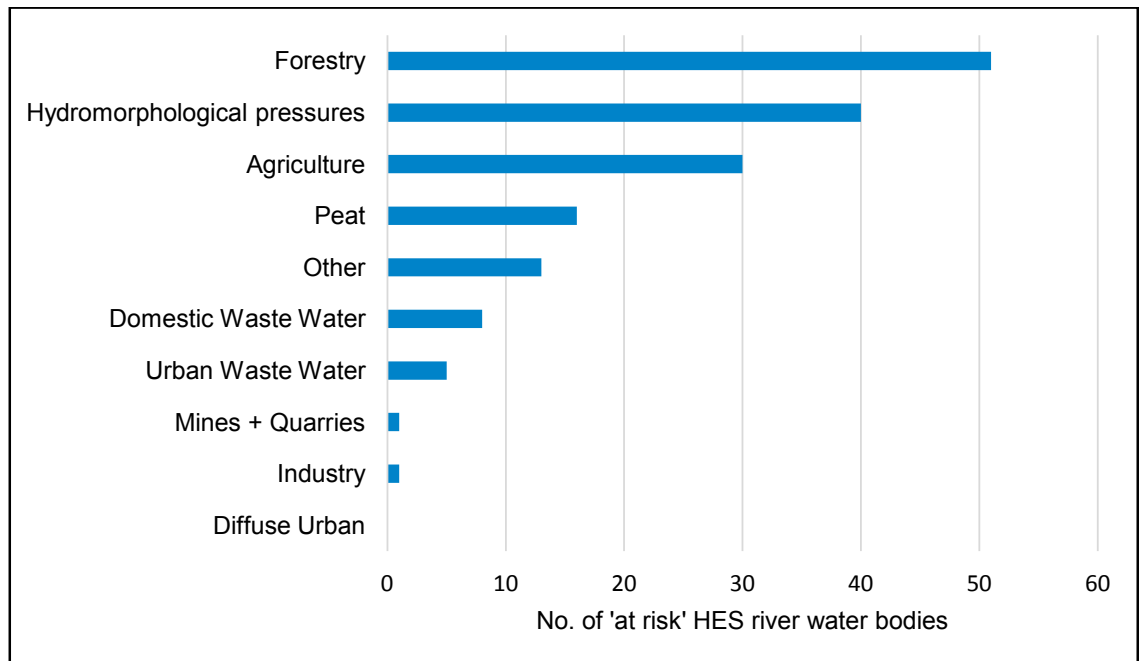
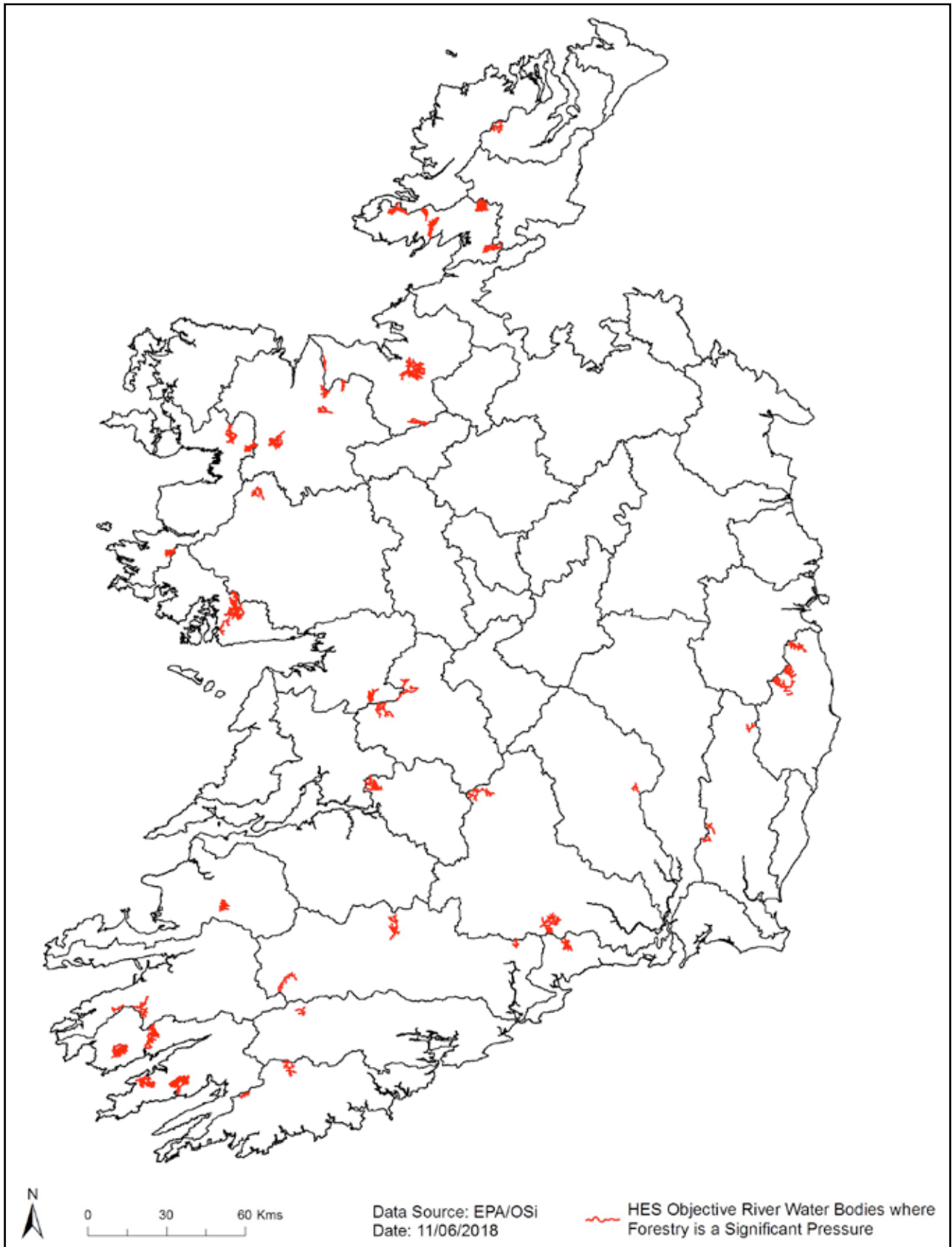
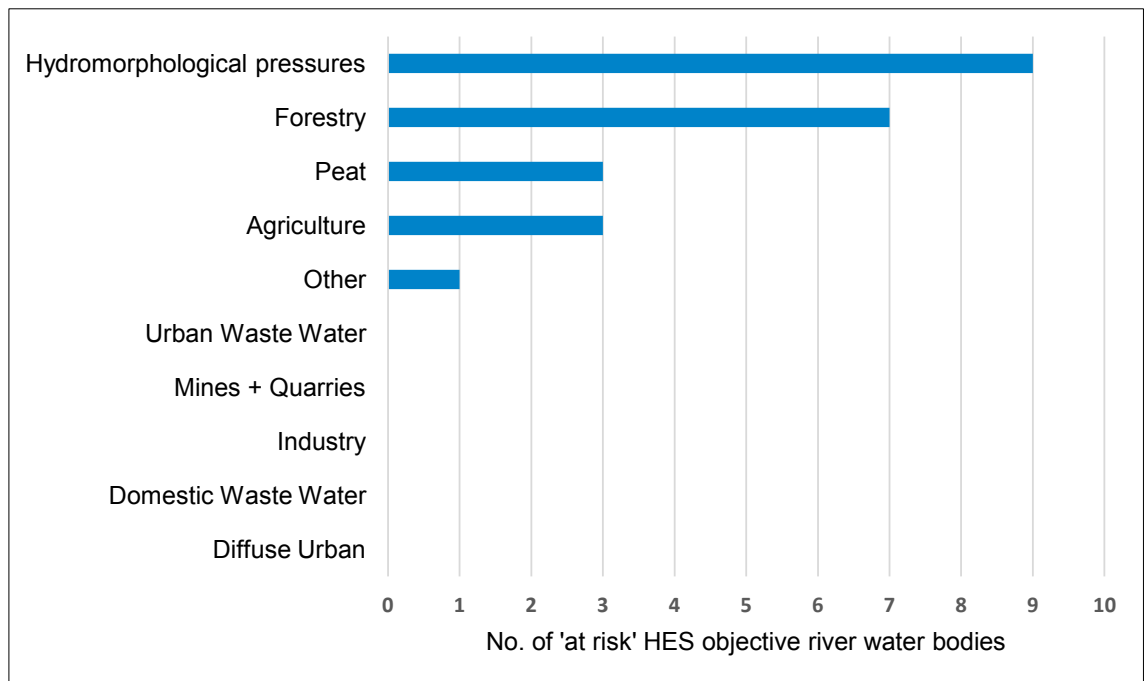


Figure 2.5 High ecological status objective water bodies deemed to be 'at risk', where forestry is a significant pressure, either alone or in combination with other significant pressures.





**Figure 2.6 Significant pressures impacting on the 15 'at risk' HES objective river water bodies within the eight priority FPM catchments.**



# Section 3 Forests & Water Measures: Implementation

## 3.1 Overview

This section introduces various regulatory and promotional measures that have a direct relevance to forestry and water, and describes how these will be applied to fulfil the role of the forest sector in realising the objectives of the River Basin Management Plan for Ireland 2018-2021.

**The overall approach is: (i) to safeguard water during all forestry operations; (ii) to restructure existing forests to reflect water sensitivities, where required; and (iii) to situate and design new woodlands and forests in a way that protects water quality. Using the WFD's 'source-pathway-receptor' model, reducing sources and breaking pathways are key. The aim is to ensure that woodlands and forests become recognised as important contributors to the protection and enhancement of Ireland's waters and associated aquatic ecosystems.**

## 3.2 Summary of the Forests & Water Measures

The following table outlines various regulatory and promotional measures relevant to forests and water in Ireland, developed and implemented by the Department of Agriculture, Food & Marine in partnership with the wider forest sector. These measures represent the controls and influences the DAFM can apply to bring about change, set within the context of awareness-raising and targeted training for owners, foresters and contractors, and the coordination of activities with the EPA, National Parks & Wildlife Service (NPWS), Inland Fisheries Ireland, Local Authorities, Irish Water and others, through the various WFD structures and other forums. Many of these measures have been developed and refined with a focus on their application as part of DAFM's response to the RBMP.

Table 3.1 lists these measures and summarises their relevance to the RBMP. A more detailed description of each is set out in Part B. Figure 3.1 illustrates the typical process applied during the assessment of an afforestation licence application (as an example) under the Forestry Regulations 2017, showing how many of these measures are applied.

## 3.3 Mobilisation mechanisms

Specific mechanisms to focus the application of the various forest and water measures set out in Table 3.1, are as follows:

- inter-agency coordination;
- training and peer-to-peer learning;
- involvement in relevant Areas for Action initiatives;
- the targeting of individual sites for the protection and enhancement of water;
- the handling of acute incidents regarding forests and water; and
- the assessment of forest licence and grant applications.

## 3.4 Inter-agency coordination

DAFM regards existing and proposed inter-agency structures under the WFD as key to the success of the RBMP, by facilitating better co-ordination and targeting of its implementation, from policy level through to the on-the-ground operational level.

The 2<sup>nd</sup> cycle of the WFD adopts a 3-tier structure across relevant authorities. At Tier 1, the Minister for the Housing, Planning & Local Government has responsibility for policy, necessary legislation and resourcing the plan. The Minister is supported by the high level Water Policy Advisory Committee (WPAC), which brings together the key national organisations that contribute to the delivery of the WFD in Ireland, including the Department of Agriculture, Food & the Marine. Tier 2 is led by the Environmental Protection Agency (EPA), which is responsible for the characterisation process and assisting and advising the Minister. Tier 3 comprises the co-ordinating local authorities, who have responsibility for the implementation of measures on-the-ground, and the local knowledge required for successful delivery of many potential measures.

(For an overview of the governance and coordination structures for the implementation of the 2<sup>nd</sup> cycle of the WFD, see the RBMP report.)

Regarding coordination, key structures are outlined below.

**Table 3.1 A summary of the forests and water measures and their relevance to the River Basin Management Plan (see relevant sections of this document for a detailed description of each).**

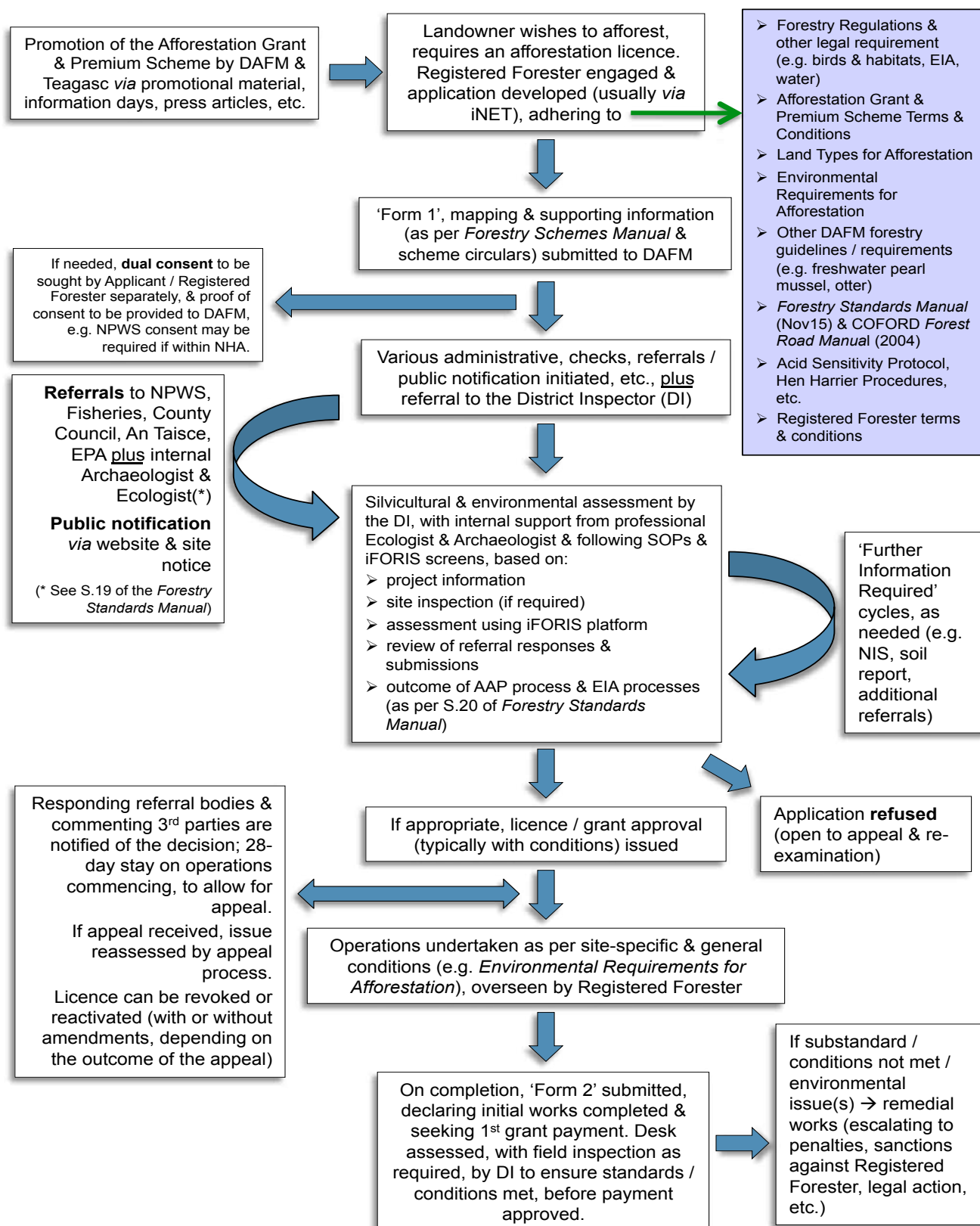
Measure	Relevance to the River Basin Management Plan
<b>Forestry Act 2014</b> (Section 4)	This Act (commenced by the Forestry Regulations 2017(S.I.191 of 2017)) integrates the protection of the environment and associated EU and national legislation into the central licensing process regulating the key forestry activities of afforestation, tree felling, forest road works and the aerial fertilisation of forests.
<b>Forest Policy &amp; Funding</b> (Section 5)	Changes in Ireland's forest policy and funding (as represented by EU funding rules and the Forestry Programme 2014-2020) recognise the water-related ecosystem services woodlands and forests can deliver, and further integrate the protection of water and aquatic ecosystems into State funding for forestry.
<b>Scheme Rules</b> (Section 6)	Any forestry activity receiving grant aid is subject to particular scheme rules. These incorporate the protection of the environment and outline consequences, where breaches occur.
<b>Application Process</b> (Section 7)	DAFM's forestry application process provides a solid platform for assessing applications for licences, approvals and / or grants in relation to regulated forest activities. A central tenet throughout is compatibility with the protection of water and aquatic ecosystems and species.  Components include: <ul style="list-style-type: none"> <li>➤ Pre-approval assessment &amp; other inspection processes</li> <li>➤ Land Types for Afforestation, Environmental Requirements for Afforestation, &amp; the Felling &amp; Reforestation Policy</li> <li>➤ iFORIS &amp; iNET</li> <li>➤ Referral process &amp; public consultation</li> <li>➤ Acid Sensitivity Protocol</li> <li>➤ Appropriate Assessment Procedure &amp; Assessment to Determine EIA Requirement</li> <li>➤ Requirements, mandatory 'guidelines' and other procedures</li> <li>➤ Requests for further information</li> <li>➤ Licensing conditions</li> <li>➤ Sanctions</li> <li>➤ Training for Registered Foresters</li> </ul> See Figure 3.1 for an overview of the application process.
<b>Land Types for Afforestation</b> (Section 8)	This procedure, introduced in March 2016, rules out afforestation on a range of water-sensitive site types, thereby eliminating potential pressures on water associated with this land use change.
<b>Environmental Requirements for Afforestation</b> (Section 9)	These requirements, released in December 2016, consolidate and update environmental safeguards relating to afforestation previously contained in DAFM 'guidelines' for water, archaeology, landscape and biodiversity. The Requirements enhance baseline protection regarding water, with the water setback representing an important feature.  Corresponding Environmental Requirements for Felling & Reforestation in preparation.

*Continued*

Measure	Relevance to the River Basin Management Plan
<p><b>Reforestation Objectives &amp; Permanent Forest Removal</b> (Section 10)</p>	<p>The DAFM document <i>Felling &amp; Reforestation Policy (2017)</i> sets out a series of Reforestation Objectives, each with a particular application and set of prescriptions. Two of these, 'Reforestation for Continuous Cover Forest' and 'Reforestation for Biodiversity &amp; Water Protection', are highly relevant to the site-specific restructuring of existing forests, to protect water.</p> <p>The same document also clarifies situations where permanent tree removal may be acceptable in relation to protected habitats, species and water.</p>
<p><b>Research &amp; Demonstration</b> (Section 11)</p>	<p>Recent and ongoing research and demonstration projects are directly influencing policy and practice regarding forests and water.</p> <p>Includes (<i>inter alia</i>) FORMMAR, HYDROFOR, CROW, HYDROFOR and KerryLIFE.</p>
<p><b>Plan for Forests &amp; Freshwater Pearl Mussel in Ireland</b> (Section 12)</p>	<p>In line with the national conservation strategy, DAFM is currently developing a draft Plan for Forests &amp; Freshwater Pearl Mussel in Ireland. This Plan, once implemented, will have direct relevance in relation to HES objective water bodies.</p>
<p><b>Native Woodland Scheme Package</b> (Section 13)</p>	<p>This grant package provides support to farmers and other landowners to establish new native woodland and to restore existing native woodland (including conversion from conifer forest to native woodland), to protect and enhance water and aquatic ecosystems.</p>
<p><b>Agro-Forestry Scheme</b> (Section 14)</p>	<p>Agro-forestry, supported under GPC 11 of the Afforestation Scheme, facilitates forestry and agriculture on the same piece of land and has a potential role in protecting waters from agricultural pressure.</p>
<p><b>Environmental Enhancement of Forests Scheme</b> (Section 15)</p>	<p>This proposed grant scheme is designed to encourage forest owners to undertake particular works within existing forests and during current rotations, to achieve structural changes and to improve the environmental 'footprint' of those forests regarding impacts on (<i>inter alia</i>) water quality.</p>
<p><b>Woodland for Water</b> (Section 16)</p>	<p>The Woodland for Water measure highlights to the wider 'water community' the use of new native woodland and associated setbacks to protect water and aquatic ecosystems.</p>



**Figure 3.1 An overview of the assessment of an application for an afforestation licence under the Forestry Regulations 2017. Similar processes apply in relation to licence applications for felling, forest road works and aerial fertilisation. Also, various elements of the process also apply to Form 3 inspections (for 2<sup>nd</sup> instalment grant payments, if relevant), premium inspections (if relevant) and *ad hoc* inspections.**



### 3.4.1 National Technical Implementation Group (NTIG)

This group oversees the technical implementation of the RBMP at a national level and provides a forum to ensure co-ordinated actions amongst all relevant State actors and to address operational barriers to implementation that may arise. The group is chaired by the EPA, and membership includes Local Authorities, OPW, Inland Fisheries Ireland, Teagasc, DAFM, Irish Water, DHPLG, Coillte, NPWS and other implementing bodies, as appropriate. It reviews progress on an ongoing basis and provides updates to the National Co-ordination & Management Committee (NCCMC) on the implementation and effectiveness of measures. The NTIG is also a forum for information exchange and to promote the consistency of regional implementation. The EPA, who is statutorily responsible for reporting on the WFD, will coordinate ongoing tracking of the implementation of actions and will, in conjunction with others, undertake assessment of their effectiveness *via* the monitoring programme.

DAFM is also directly involved in the following NTIG Working Groups:

➤ **Management Strategies for Agriculture Working Group:** To date, the recommendations of this WG to NTIG are as follows:

1. The Working Group recommends that measures under the Rural Development Plan should be spatially targeted in a manner that supports the environmental objectives of the RBMP.
2. The Working Group proposes the development of best practice guidance for planners to support a consistent approach in assessing planning applications for agricultural development.
3. The Working Group identified a need for further research in innovative and new technologies to support agriculture in the efficient management and utilisation of nutrients to achieve best practice in soil fertility.

➤ **Further Scientific Assessment Development Working Group:** This WG is producing guidance on further scientific assessment in both rural and urban areas, together with an online portal, for use by the scientific assessment, support and advisory teams to be appointed under the regional local authority structures to undertake further scientific assessments on individual water bodies where issues arise. To date, DAFM has inputted into the drafting of a technical guidance manual and the development of the portal for personnel undertaking further scientific assessments. It is envisaged that DAFM Inspectors will also accompany the scientific assessment team during their initial assessments, to aid in their interpretation regarding forestry pressures and also to gain knowledge regarding water and pressure assessment.

### 3.4.2 Regional Local Authority Structures

At Tier 3 in the governance structure, local authorities have responsibility for coordinating of the implementation of the national plan and for public engagement. To facilitate their role, five Regional Water & Environment Management Committees have been established, as set out in Table 3.2. Each committee is chaired by a local authority Chief Executive and membership is made up of local authority and EPA staff.

The five Regional Committees have each established an Operations Committee to coordinate RBMP implementation. Each Operations Committee is chaired by a local authority Director of Service and membership includes personnel from all of the implementing bodies, including local authorities, EPA, OPW, Inland Fisheries Ireland, Irish Water, Geological Survey Ireland, DAFM, NPWS, National Federation of Group Water Schemes, Marine Institute, Waterways Ireland, etc.

The local authorities are developing a scientific assessment, support and advisory team in each region which will report to the operations committee.

**Table 3.2 Counties included under each of the five Regional Water and Environment Management Committees.**

Border	Midland East	West	South East	South West
Cavan	Dublin	Galway	Carlow	Clare
Donegal	Kildare	Mayo	Kilkenny	Cork
Leitrim	Longford	Roscommon	Laois	Kerry
Louth	Meath		Tipperary	Limerick
Monaghan	Offaly		Waterford	
Sligo	Westmeath		Wexford	
	Wicklow			

The role of the team is to provide the field / site scale assessment of water bodies at risk and to propose actions to be taken in each water body to mitigate that risk. They will also assist in the implementation of those actions. The team will work closely with field staff from other implementing bodies including DAFM, Teagasc, etc.

Local authorities have also set up a Waters & Communities Office (LAWCO). The role of this office is to ensure public and stakeholder engagement and to activate and support local communities in the water quality and protection area.

DAFM regards the five operations committees and their supporting scientific assessment, support and advice teams as the key channel through which issues concerning specific sites / incidences can be dealt with, and relevant personnel will participate.

### 3.4.3 Local Authority Waters & Communities Office (LAWCO)

This office plays a very important role at various levels, not least in terms of ensuring public and stakeholder engagement in the WFD at the local level. DAFM will maintain contact with the LAWCO Community Water Officers, particularly around the application of the Woodland for Water measure and the NeighbourWood Scheme, as follows:

- DAFM Forest Inspectors will establish contact with their corresponding Community Water Officers, and LAWCO details will be circulated to all Registered Foresters, to promote awareness of its activities.
- DAFM is currently developing a leaflet with input from LAWCO and Woodlands of Ireland, summarising the Woodland for Water measure, for LAWCO use during outreach with the farming community and other landowners.
- DAFM is keen to see the NeighbourWood Scheme used to develop water-related community projects. As per page 16 of the scheme brochure (DAFM, 2017), under Section 5: Interaction with other Schemes and Initiatives:

#### **Community-based water projects**

*Many landowners and communities around Ireland are developing projects aimed at protecting and enhancing streams, rivers and lakes as part of the local environment and heritage, often with the support of the nationwide Local Authority Waters & Communities Office(\*).*

*Many of these projects involve the development of local amenities to allow people to experience and to enjoy the beauty of our waterways and the amazing wildlife they support. The NeighbourWood Scheme can be used to provide*

*funding for these amenities, where woodland is involved. For example, an existing riverside walk could be enhanced by establishing sections of new woodland along its length, to enrich the experience for walkers. Similarly, an existing woodland along a waterway could be 'upgraded' with the addition of pathways, information signs and a wildlife hide.*

*Well-sited and managed woodlands also contribute in many ways to the protection and enhancement of water and aquatic life, and the NeighbourWood Scheme (and the Native Woodland Scheme) provide opportunities for realising these benefits in a way that also enhances people's experience, enjoyment and appreciation of Ireland's inland waters.*

*(\* The Waters and Communities Office was set up in February 2016 under the Water Framework Directive to promote better management of our streams, rivers, lakes, estuaries, coastal waters and groundwater for the benefit of current and future generations. A key objective is to engage local communities and promote public participation in the management of our water environment. For further information and to contact the local Community water Officer working in your area, see [www.watersandcommunities.ie/](http://www.watersandcommunities.ie/))*

### 3.4.4 Blue Dot Working Group

'Blue Dot' sites refer to a network of river and lake catchments that have a high ecological status objective (i.e. where the objective is to protect and restore high ecological status). There has been substantial loss of these sites over the past three decades. The purpose of the Blue Dot programme is to provide a way to focus attention and resources across a range of agencies with the aim of protecting and (where required) restoring high ecological status.

The River Basin Management Plan stipulates that a 'Blue Dot Catchments Programme' will be delivered through local authority structures, integrating with wider implementation structures, and will facilitate focussed deployment of resources. The intention for this programme is to ensure that HES waters are prioritised for the implementation of supporting measures and for available funding. This 'Blue Dot' concept is used by DAFM as a key trigger in escalating water protection measures, as outlines later in this section.

A Blue Dot Working Group, in which DAFM participates, has been established to coordinate and focus efforts and resources across a number of key agencies for the purpose of protecting and restoring high status. This working group is established at a national level and will be led by local authority regional structures. It also includes key stakeholders involved in delivering sectoral measures within these priority Blue Dot catchments. The EPA will provide technical support and advice.

Key tasks for the Blue Dot working group include devising a strategic approach to taking effective

actions in Blue Dot catchments, such as:

- Identify risks to water quality in the Blue Dot catchments through local investigation which may include targeted environmental monitoring and assessments;
- broad education / awareness raising initiatives in Blue Dot catchments to promote best environmental practice (e.g. in land management and the maintenance of septic tanks);
- improving the exchange of information within and across agencies to monitor activities on an ongoing basis in Blue Dot catchments (e.g. land use change, new developments) which may result in deterioration in the future, and to take early corrective action to eliminate risks to water quality;
- promoting and supporting the establishment of community-led catchment initiatives in Blue Dot catchments;
- providing targeted agri-environmental advisory support to farmers in Blue Dot catchments to assist in identifying risks to water at the farm level and to develop tailored solutions;
- identifying and promoting the uptake of relevant grant schemes, where appropriate, in the Blue Dot catchments for the purpose of improving the protection of water quality, e.g. GLAS, the Locally-Led Targeted Agri-Environment Schemes, the Native Woodland Scheme Package (including the Woodland for Water measure) and NeighbourWood Scheme, and the LEADER programme (under the sub-theme 'Protection and Sustainable Use of Water Resources'); and
- identifying research needs with the aim of developing solutions to the environmental pressures facing high status waters, and measuring the effectiveness of existing solutions (this role should also include the promotion of high status waters as a priority theme in the development of research policies by key stakeholders).

## 3.5 Training and peer-to-peer learning

Training and peer-to-peer learning represent a key mobilisation mechanism. This will take place across three separate fronts.

### 3.5.1 In-house training

DAFM will undertake the further upskilling of Forestry Inspectors, Teagasc Forestry Advisors, Registered Foresters, forest contractors and forest owners regarding water and hydrology, the WFD, and the threats and opportunities presented by forestry

regarding water.

Circulars to Registered Foresters will summarise the WFD / RBMP process, the forests and water measures, procedural changes, and available resources, e.g. [www.catchments.ie](http://www.catchments.ie) and the Environmental Data Exchange Network (EDEN) online resource, the LAWCO network.

DAFM engages in ongoing training (most recently in relation to Annex I Habitat Recognition and the deployment of Areas for Biodiversity Enhancement / environmental setbacks). Similar training will take place for Forestry Inspectors and Registered Foresters, focusing on appropriate responses within water sensitive areas. The participation of Forestry Inspectorates in the EPA Catchment Science & Management 6-day Training Course 2017 was of significant benefit, and DAFM is keen to explore with the EPA how this course might be repackaged in a more condensed format, for the forest sector. Training will be topic-driven and regional in nature and will include direct input, as 'guest speakers', from the EPA, the Regional Scientific Assessment, Support & Advisory Team, LAWCO Officers, etc.

### 3.5.2 Outward training

DAFM recognises that a number of groups involved in the implementation of the RBMP may require a greater understanding of the details of forestry as a land use, including forest practices, existing safeguards against potential negative impacts, and opportunities for positive contributions (e.g. Woodland of Water, NWS Conservation). In this regard, DAFM will provide necessary modules within various training courses and workshops aimed at upskilling key personnel within other bodies (e.g. the incoming Regional Catchment Scientists and Teagasc Agricultural Sustainability Advisors, existing Local Authority staff). DAFM will tailor its input to the specific training needs involved, and can facilitate field trips to forestry sites.

### 3.5.3 Peer-to-peer learning

DAFM recognises the importance of peer-to-peer learning between forestry professions (including Forestry Inspectors, Registered Foresters and forest contractors) and the wide range of other professionals involved in implementing the RBMP. The value of this type of learning is evident from the level of information gained and imparted by Forestry Inspectors attending the series of EPA / LAWCO Catchment Assessment Workshops throughout 2017, and other related forums.

DAFM is keen to pursue this avenue of learning further, for example, by ensuring that relevant District Inspectors accompany Regional Catchment



Scientists during their investigative assessments ('stream-walking') of particular water bodies where forestry is identified as a significant pressure.

### 3.6 Areas for Action

Following the national characterisation and prioritisation assessment, a number of water bodies have been identified as 'Areas for Action', where resources can be focused during the lifetime of the RBMP. It is envisaged that each Regional Committee will focus on one or two Areas for Action initially. See Figure 3.2 and [www.watersandcommunities.ie/areas-for-action/](http://www.watersandcommunities.ie/areas-for-action/) for the distribution of these areas.

There are 190 Areas for Action, 69 of which relate to forestry in whole or in part. It is difficult to set out a standardised approach to the projects that may emerge, as each will entail specific processes and partners. DAFM will input and engage in relevant activities, as appropriate to its remit.

### 3.7 Targeting individual sites for the protection and enhancement of water

Through coordination with the EPA, the Regional Catchment Scientists, LAWCO, Teagasc Agricultural Sustainability Advisors, Inland Fisheries Ireland, NPWS, Woodlands of Ireland and other partners, individual forest sites may be identified where particular pressures or risks exist (e.g. the overshadowing of a sensitive stream by an unstable forest canopy). In relation to such sites, it may be possible to engage with the relevant forest owner (private or public) in order to initiate required change at the earliest possible opportunity. This is particularly relevant to HES objective water bodies deemed to be 'at risk' due to forestry (alone or in combination with other pressures), where issues identified by Regional Catchment Scientists will need to be addressed proactively.

Similarly, opportunities will also be apparent where a deliberate intervention at a strategic location may bring about a positive impact (e.g. the deployment of the Woodland for Water measure to create protective woodland, or opportunities to intervene at reforestation to realise Reforestation Objectives relating to 'Continuous Cover Forestry' (CCF) or 'Biodiversity & Water Protection' (BIO).

The availability of supports will remain a critical element in realising the above changes. Of particular relevance are: NWS Establishment; NWS Conservation; the proposed Environmental Enhancement of Forests Scheme; and support for continuous cover forestry, as proposed under the mid-term review of Forestry Programme.

It is difficult to set out a standardised approach

to these projects, as the processes and solutions involved will be unique to each. However, any solutions will be arrived at through agreement between the landowner and the key partners involved, and any resulting licence applications and accompanying grant applications will be subjected to the full DAFM assessment process.

Note that DAFM cannot compel a landowner or a forest owner to submit a licence for afforestation, forest road works or felling. The approach being taken is one of persuasion and cooperation. In situations where a landowner or forest owner is not prepared to engage despite a significant risk to water quality, legal action will be considered as a last resort, and only when other options have been exhausted. If the outcome of legal action requires the owner to carry out prescribed works, DAFM will process associated licence applications in this context and may still make available grant support under the above schemes, to facilitate the necessary change.

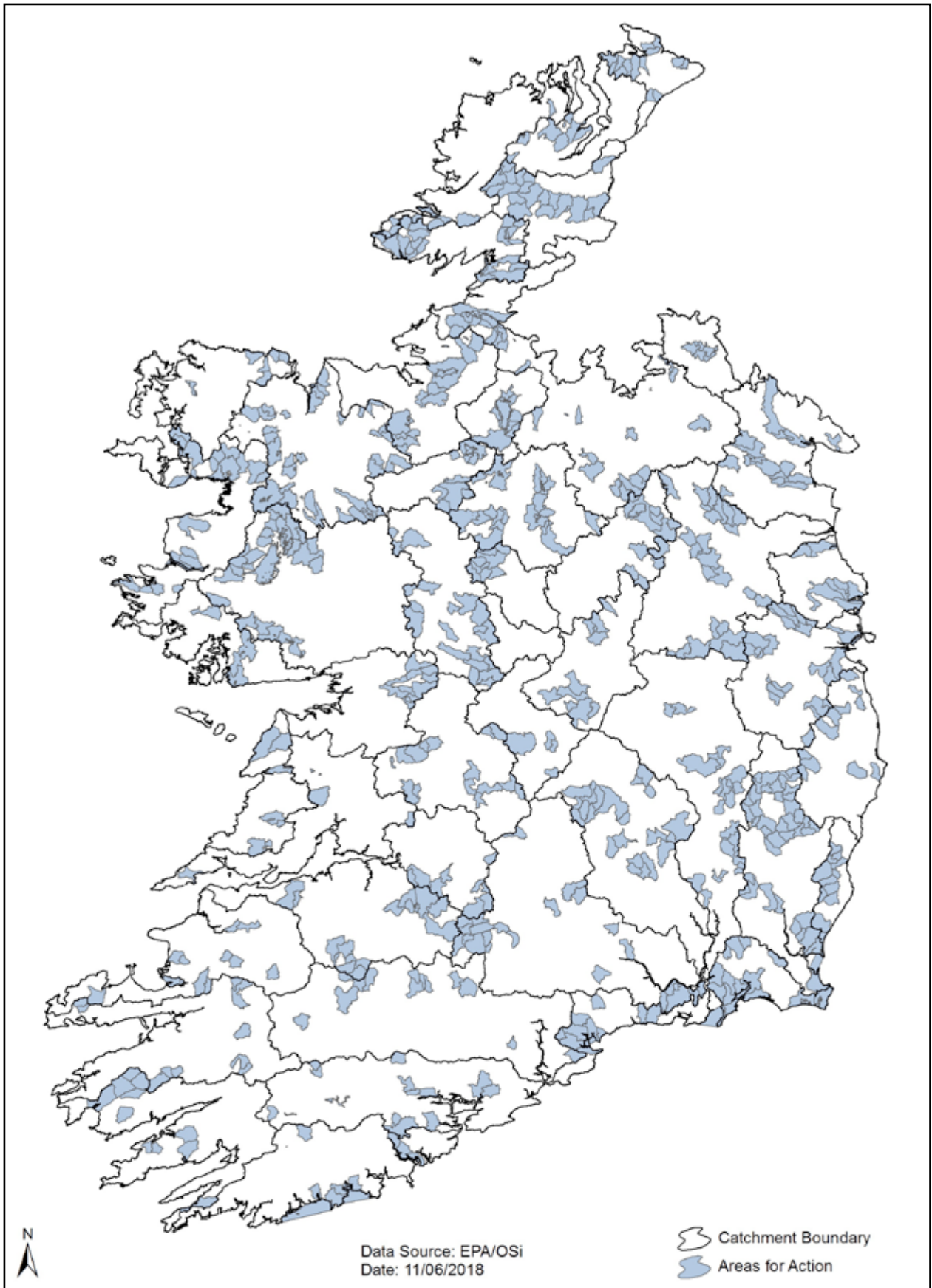
Regarding the realisation of opportunities for positive contributions, DAFM will also assess associated licence and grant applications in this context. DAFM is keen to work with the EPA to develop a spatial approach identifying water bodies where the Woodland for Water measure is likely to have a meaningful impact. This will facilitate linkage with possible enhanced payments under the Woodland Fund (as proposed under the mid-term review of the Forestry Programme) and / or the Microsoft, Natural Capital Partners and Green Belt initiative (following possible adjustment to include water ecosystem services alongside carbon abatement). This would facilitate an additional payment alongside those under NWS Establishment, in recognition of the enhanced ecosystem services delivered regarding water quality. The exact mechanisms for this to happen are to be explored.

### 3.8 Protocol for acute forests and water incidents

Incidents can arise where water is being directly impacted upon, or is under impending risk, due to forestry activities (afforestation, forest road works, felling, etc.) or events such as extensive windblow along a watercourse. In such cases, the following sets out the possible actions to be followed by the DAFM. (Note, individual steps may run concurrently, and others may not apply. Similarly, other statutory bodies may also take action.)

- On direct discovery or on receipt of a report, DAFM will trigger an initial review and if necessary, a fuller investigation, typically involving the relevant District Inspector supported, if needed, by a fellow Inspector

Figure 3.2 Distribution of the Areas for Action. Also see [watersandcommunities.ie/areas-for-action/](http://watersandcommunities.ie/areas-for-action/)



- involved in coordinating water-related activities. Outside hydrological expertise may also be engaged, if deemed necessary.
- The relevant owner and Registered Forester will be notified and directed to stop works (either throughout the site or in relevant parts). Alternatively, the licence can be suspended or revoked under the Forestry Regulations 2017 or under Section 44(2) of the European Communities (Birds & Natural Habitat) Regulations 2011 (S.I.477 of 2011).
  - Relevant officials from the Local Authority, Inland Fisheries Ireland, NPWS, etc. will be informed as necessary, initially at the local level. (Notification to the relevant Local Authority Enforcement Team may trigger investigation and action under the Water Pollution Acts, including requests for information, orders to carry out mitigation works and orders to cease activity.) Internal cross-reporting within DAFM will also apply, as relevant.
  - Follow-up actions may include the following, as appropriate:
    - The deployment of emergency measures as an immediate response to prevent the ongoing runoff of silt / sediment into receiving waters, if still occurring, while more suitable mitigation measures are being prepared. Likely emergency measures include (*inter alia*) silt traps and silt curtains, augmented by brush and straw bale filters.
    - The development and subsequent deployment of appropriate mitigation measures to stabilise the site. This process may include input locally from other water-related bodies, and the application of the Appropriate Assessment Procedure by the DAFM,
    - The initiation of a water monitoring programme, with sample points at appropriate locations both upstream and downstream of the site, to assess the current water quality conditions, and to track these, as the mitigation measures take effect and the site stabilises.
    - The engagement of professional expertise by the forest owner to develop the proposed mitigation measures and to oversee their deployment, and to undertake monitoring, if prescribed.
    - The submission of a report to the DAFM detailing how the incident arose, the emergency and mitigation measures taken, and water monitoring results.
    - In the case of forestry companies and larger forest owners, the DAFM may also seek a review of the training and instructions given to operators with regard to the protection of water, processes to identify sensitivities and appropriate safeguards, the supervision of operations and the monitoring for possible impacts on water, and contingency planning processes in place for dealing with such occurrences.
  - In the case of situations where operations have been stopped on instruction, DAFM will permit operations to recommence once the mitigation measures are implemented and the site has stabilised. Further site inspection(s) by the DAFM Forestry Inspector may also be scheduled, to ensure adherence and follow-through.
  - As each case develops, DAFM will remain in contact with officials from the relevant statutory bodies, with representative from local groups, and with adjoining residents, as appropriate.
  - Possible penalties, Registered Forester sanctions, and legal action will be considered and pursued by DAFM, as it deems appropriate.
  - The DAFM will also review each incident and follow-up action internally, to identify appropriate changes to standards, procedures, internal SOPs, etc..
  - The development of a portal on the EDEN website may also be considered, whereby water-related officials can notify the DAFM of incidents. This would ensure that the incident is logged centrally, and would provide a shared platform for tracking developments.
- The above protocol is intended for acute incidents linked primarily to forestry operations, where immediate and significant intervention is required. Other structures are in place, such as the Regional Operations Committees, for addressing ongoing issues.
- ### 3.9 Assessment of forest licence and grant applications
- This involves the ongoing refinement of iFORIS (for DAFM Inspectorate and Administration personnel) and the parallel iNET system (for Registered Foresters) to incorporate updated 'triggers' prompting the deployment of the various water-related measures summarised in Table 3.1 and Part B of this document.
- The development of iFORIS and iNET is to include the following:
- The incorporation of the current water body dataset into the GIS-based MapViewer (for both iFORIS and iNET), with concise water body information (status, trends, drivers, etc.) and an

- embedded link to [www.catchments.ie](http://www.catchments.ie), to facilitate interpretation and decision-making by Registered Foresters and Forestry Inspectors during the development and assessment of forestry licence and grant applications.
- The incorporation of the Forests & Water Sensitivity Categories set out in Table 3.3 into iFORIS / iNET, to prompt the escalation of protective measures for water, depending on the degree of sensitivity. If a proposed site / operation overlaps with a particular Forests & Water Sensitivity Category, Table 3.3 details the appropriate response by the Registered Forester when preparing the licence application, and by DAFM, when assessing the application.
  - The incorporation into iFORIS and iNET of the Areas for Action (forestry and non-forestry related) and water bodies incorporated under the 'Blue Dot' programme.
  - The development of a catchment-level tool, whereby the iFORIS MapViewer highlights all forest cover and all recent, ongoing and planned forestry activity (as per licence and grant applications and available forecasting) within a catchment area (individual or nested), to provide a stronger basis for assessing possible cumulative impacts.
  - The refinement of questions and background spatial checks to drive the querying of these layers, to be incorporated into: (i) the iNET application form completed by the Applicant and the Registered Forester; (ii) the iFORIS-driven assessment process undertaken by the District Inspector (including AA and EIA-related screening); and (ii) relevant internal SOPs.
  - The refinement of risk management, whereby mandatory field inspections (at Form 1 stage and subsequently) are weighted towards more water-sensitive sites, in terms of operation type, size, soil, slope and possible cumulative impacts. This is to include a greater focus on during- and post-operation inspections in relation to felling.
  - Full implementation of measures set out in Sections 3.2 to 3.9 of the DAFM *Forests & Water* document.
  - Breakdown of details regarding applications for afforestation, forest road works and felling within each Forests & Water Sensitivity Category. Such details may include project type, area, ownership (public / private), proximity to aquatic zones, soil, slope, licence utilisation, inspection record, and overall numbers and distribution.
  - The number of water-related projects (plus area and distribution) realised under NWS Establishment (including the Woodland for Water measure), NWS Conservation (including conversion from conifer to native woodland), and the Agro-Forestry measure under the Afforestation Scheme.
  - The number of water-related projects (plus area and distribution) realised under the proposed Environmental Enhancement of Forest Scheme and the Continuous Cover Forestry Scheme.
  - Area of forest restructured post-clearfell for water protection / enhancement purposes, including areas subjected to Reforestation Objectives CCF and BIO.
  - The number of training events for Forestry Inspectors, Registered Foresters, forestry contractors and forest owner, focusing on water and hydrology, integrated catchment management, site management, protection and mitigation.
  - The number of acute forests and water incidents reported, together with outcome, lessons learnt and feedback into procedures, requirements, etc.
  - The publication of the proposed *Environmental Requirements for Felling & Reforestation* and supporting guidance.
  - Progress under the Forests & Freshwater Pearl Mussel Plan (once implemented), including various monitoring activities envisaged under the plan.

### 3.10 Possible Key Performance Indicators

The following are possible key performance indicators to track progress regarding the implementation of measures set out in this document *Forests & Water: Achieving Objectives under Ireland's River Basin Management Plan 2018-2021*. These are in addition to the overall monitoring and evaluation of implementation by the National Co-ordination & Management Committee and the National Technical Implementation Group, as set out in Section 10.4 of the document *River Basin Management Plan for Ireland 2018 - 2021*.



**Table 3.3 Forests & Water Sensitivity Categories and appropriate responses regarding the preparation, assessment and utilisation of forestry licence applications (with or without grant aid) under S.1.191 of 2017 (i.e. afforestation, forest road works, felling of trees, aerial fertilisation).**


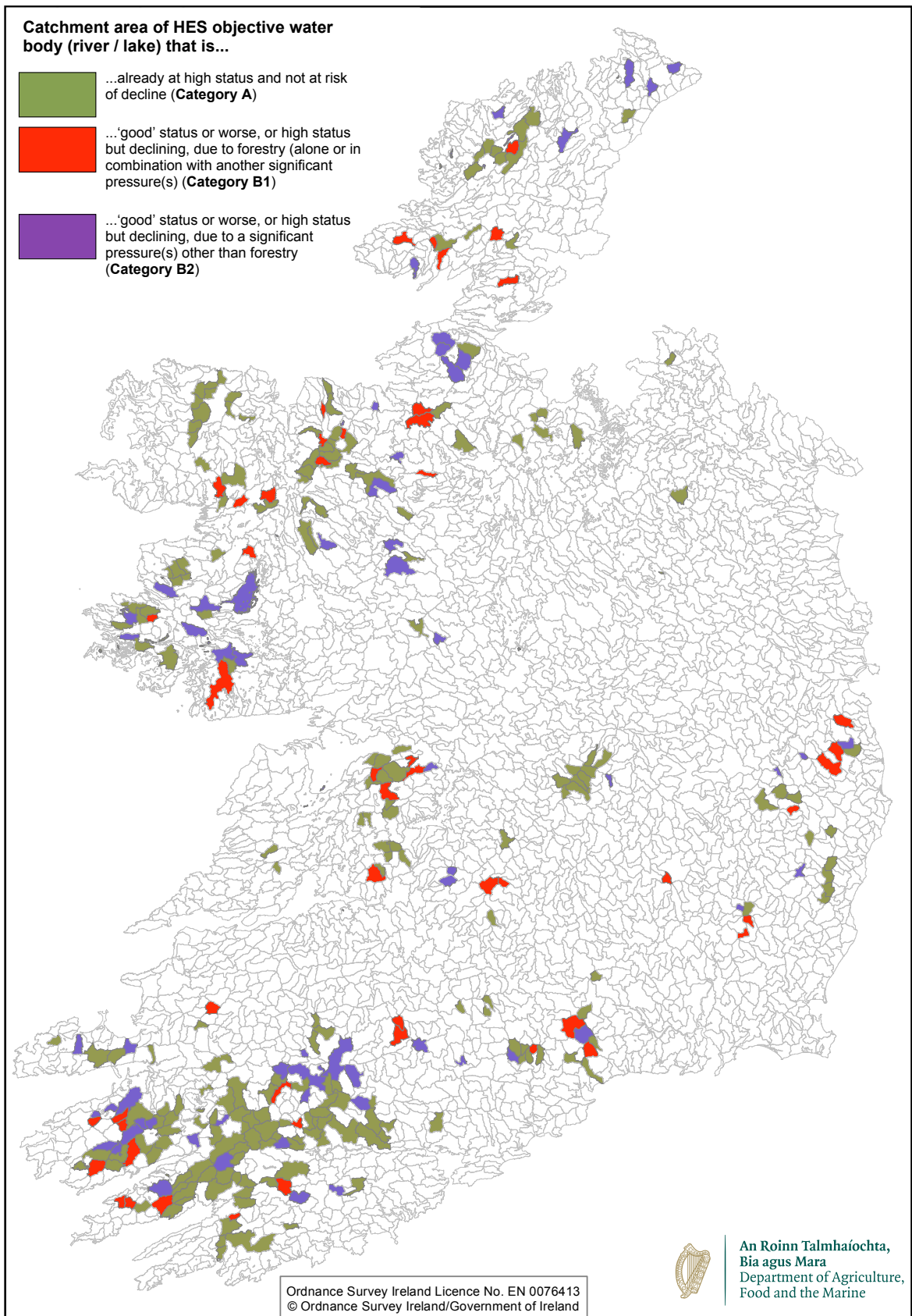
<p>If the project area ('site') of the forestry licence application is within or partially within an area where one or more of the following Forests &amp; Water Sensitivity Categories applies (as shown on iNET &amp; iFORIS), ...</p>	<p>... THEN, the appropriate response(s) by the Registered Forester (in developing the application) and DAFM (in assessing the application) is as follows...</p> 
<p><b>Category A</b> (see Figure 3.3)  <b>Catchment area of a high ecological status (HES) objective water body (river or lake) which is already at 'high' status and <u>not at risk of decline</u></b>                  The maintenance of this high status is key.</p>	
<p><b>Category B</b> (See Figure 3.3)  <b>Catchment area of a HES objective water body (river or lake) which is at 'good' status or worse, or 'high' status but with a declining trend, due to...</b></p>	<p><b>B1 ...forestry, alone or in combination with another significant pressure(s)*</b>                  (* Agriculture, Domestic Waste, etc.)</p>
<p><b>B2 ...a significant pressure(s) other than forestry</b></p>	

Table 3.3 Continued

<p>(Category A &amp; B, continued)</p> <p>NOTE: The Blue Dot Programme and Areas for Action represent subsets of Categories A &amp; B.</p>	<ul style="list-style-type: none"> <li>➤ In more extreme cases, permanent forest removal may be justified on a case-by-case basis, under Section 5.2 of the Policy, i.e. over-riding environmental considerations may “exist under the Water Framework Directive, where provisions under the Reforestation Objectives CCF and BIO may not suffice. In such situations, permanent forest removal may be considered by the Forest Service, on application.” Often, these areas are of low forest productivity, and reforestation may be uneconomical. However, once cleared, the issue of habitat restoration arises, alongside the control of unwanted species such as regenerating conifers or rhododendron.</li> <li>➤ It is unlikely that aerial fertilisation will be permitted within Forests &amp; Water Sensitivity Categories A and B.</li> <li>➤ As appropriate, DAFM will inform the relevant Regional Scientific Team Leader of licences issued and the commencement period, to ensure operational awareness and to allow integration into monitoring. (Under the existing consultation and appeal procedures, individuals &amp; referral bodies commenting at pre-approval stage are informed of the decision to approve (or otherwise), &amp; given the right to appeal.)</li> <li>➤ Regarding licensed and grant-supported afforestation and forest road works, adherence to conditions is checked during the 1<sup>st</sup> grant instalment inspection. DAFM field inspections directed by risk weighting. Also, during-operation inspections to be increased, with a focus on high risk operations and sites (based on area, soil type, slope, hydrological connectivity).</li> </ul>
<p><b>Category C</b> Catchments covered by the Plan for Forestry &amp; FPM in Ireland (in prep.)</p>	<p>May be significant overlap with Categories A &amp; B above. Therefore, the corresponding appropriate responses apply, <u>plus</u> the application of the Forest Management Framework envisaged under the Plan for Forestry &amp; FPM in Ireland.</p>
<p><b>Category D</b> Aquatic-based Special Areas of Conservation (SACs) &amp; Special Protection Areas (SPAs)</p>	<p>May be significant overlap with Categories A &amp; B. Therefore, the corresponding appropriate responses apply, <u>plus</u> existing triggers regarding referral to NPWS (as per Section 19 of the Forestry Standards Manual) &amp; the FS-DAFM Appropriate Assessment Procedure (as per Section 20 of the Forestry Standards Manual).</p>
<p><b>Category E</b> Fisheries Sensitive Areas</p>	<p>May be significant overlap with Categories A &amp; B. Therefore, the corresponding appropriate responses apply, <u>plus</u>: the existing Referral Procedure with Inland Fisheries Ireland, as per Section 19.3.1 and Appendix 12 of the Forestry Standards Manual.</p>
<p><b>Category F</b> Acid Sensitivity Areas</p>	<p>May be significant overlap with Categories A &amp; B. Therefore, the corresponding appropriate responses apply, <u>plus</u>: the existing Acid Sensitivity Protocol, as per Appendix 11 of the Forestry Standards Manual.</p>
<p><b>Category G</b> Remaining areas / catchments</p>	<p>As a baseline, the DAFM application process (&amp; associated procedures / referrals / protocols / requirements) to apply, as relevant to each application, plus any additional safeguards deemed necessary by DAFM, following scrutiny of the application, site and environmental datasets.</p>

Figure 3.3 Forests & Water Sensitivity Categories A, B1 and B2.



### 3.11 Forests and flood risk management

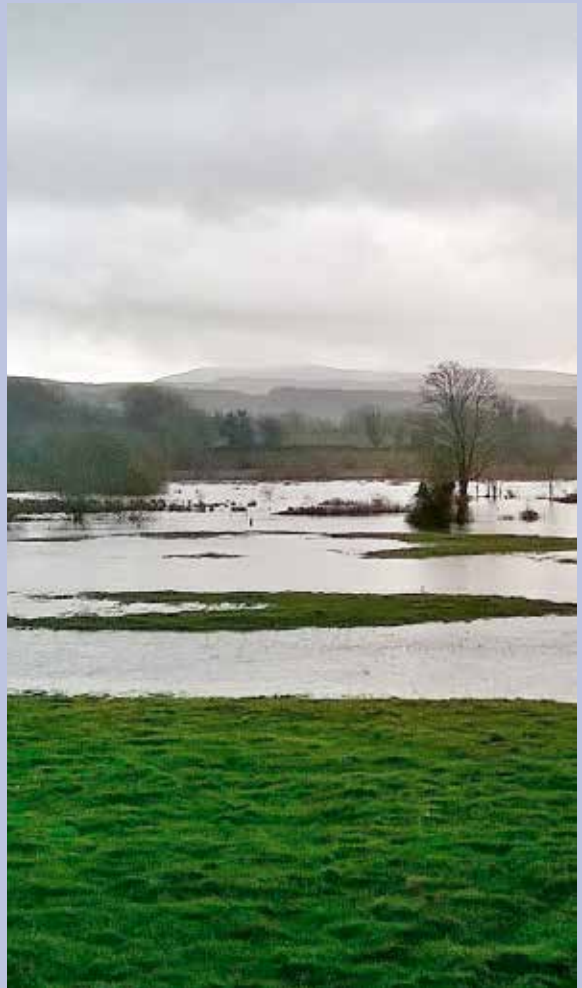
DAFM welcomes the recent adoption of the 29 Flood Risk Management Plans for Ireland, detailing proposed flood relief measures (see [www.floodinfo.ie/](http://www.floodinfo.ie/)). Flood risk is a combination of the probability of a flood occurring in a particular area together with the potential damage which that flood could cause to material assets such as built infrastructure. These measures have been informed by the costs, benefits and environmental factors used to manage the flood risk in each community. This initiative also provides access to Flood Plans and Flood Maps developed by the Office of Public Works (OPW) and information on flood risk management in Ireland. Each Flood Risk Management Plan sets out a strategy which includes a set of measures to facilitate the cost-effective and sustainable, long-term management of flood risk, focusing on where the damage caused to infrastructure and the physical environment as a result of a flood is unacceptably high.

This DAFM *Forests & Water* document sets out measures relating to the Water Framework Directive and the River Basin Management Plan 2018-2021. However, many of the measures detailed will also have a direct application in the context of the Flood Directive and the Flood Risk Management Plans.

DAFM and the wider forest sector recognise the role of woodlands and forests (together with shelter belts and hedgerows) as a natural means of flood attenuation, when applied strategically as part of a wider integrated catchment approach. Conversely, it is recognised that inappropriately sited and designed forests and poor forest practices can contribute to flood risk.

Over the last 30 years in Europe and the USA, there has been considerable research into, and focus on, the implementation of 'green solutions' in relation to flood risk management. Good flood risk management requires appropriate planning decisions that take into account the interactions with water arising from any proposed land use change (Nisbet & Broadmeadow, 2003; Nisbet, 2015). Forests are particularly well-positioned to deliver flood risk management objectives through the attenuation of peak flows while also providing protection to downstream infrastructure, enhancing water quality and biodiversity, enabling timber production and mitigating climate change (Nisbet *et al.*, 2011; European Environment Agency, 2016).

Specifically in relation to floodplain areas, the design and specifications of proposed floodplain forests (which usually comprise native tree species) are inherently more complex than their non-flooding counterparts. Not all floodplains are be suitable for the establishment of forests. On larger sites in particular, poor planning decisions based on incomplete data may result in undesirable consequences, both upstream and downstream. Therefore, it is imperative that the characteristics of the floodplain (topography of the site and the rate, period, frequency, volume and depth of inundation) are given due regard (Peterkin & Hughes, 1995; Nisbet & Broadmeadow, 2003).





**Part B**  
**Forests & Water Measures**







## Section 4

# Forestry Act 2014

This Act (commenced by the Forestry Regulations 2017) integrates the protection of the environment and associated EU and national legislation into the central licensing process regulating the key forestry activities of afforestation, tree felling, forest road works and the aerial fertilisation of forests.

### 4.1 Overview

The Forestry Act 2014 (as commenced by the Forestry Regulations 2017, S.I.191 of 2017) draws together the consent systems for key forestry activities previously set out under various legislation, i.e. afforestation and forest road works (previously under S.I.558 of 2010); tree felling, including thinning, clearfelling / reforestation (previously under the Forestry Act 1946); and the aerial fertilisation of forests (previously under S.I.125 of 2012). It also contains strengthened provisions regarding the protection of the environment, creating closer integration with the Habitats and Birds Directives, the Water Framework Directive and the Environmental Impact Assessment Directive (and transposing legislation).

The scope of the Forestry Act 2014 is as follows:

*An Act to make further and better provision in*

*relation to forestry, to provide for the development and promotion of forestry in a manner that maximises the economic, environmental and social value of forests within the principles of sustainable forest management, to confer power on the Minister for Agriculture, Food and the Marine to make regulations for the effective management of the forestry sector, to make further provision for the giving effect to acts of the institutions of the European Union by regulation made by that Minister in respect of forestry and forestry-related activities, to repeal the Forestry Act 1946, to amend the Wildlife Act 1976, to amend the Agriculture Appeals Act 2001, to amend the Environment (Miscellaneous Provisions) Act 2011 and to provide for related matters.*

Under the Forestry Act 2014, the general functions of the Minister for Agriculture, Food & the Marine

**Photo 4.1 Regulated tree felling is key to realising, on an environmentally sustainable basis, previous and ongoing investments in Ireland's forests.**



include specific reference to water and biodiversity:

5. (1) Without prejudice to any other functions conferred on the Minister by this Act, the Minister shall have the following functions:

- (a) to promote afforestation;
- (b) to promote the development of forests and forest-related activities and industries in such a way that forests provide an economically, environmentally and socially sustainable yield of forest goods and services, while maintaining and enhancing their biological diversity;
- (c) to promote good forest practice within the forestry and forestry-related sectors;
- (d) to regulate and monitor forestry operations to ensure that forests are properly managed in accordance with this Act and good forest practice; [...]
- (f) to promote education and training in forestry and related matters;
- (g) to promote research in forestry and related matters; [...]
- (m) to promote the development of non-timber forest products;
- (n) to promote and monitor the protection and enhancement of water quality in all aspects of forestry, including ensuring that forestry operations and forest-based activities regulated under this Act are compatible with the requirements of Directive No. 2000/60/EC of the European Parliament and of the Council of 23 October 2000 on water policy;
- (o) to promote and encourage the development of forests for the purposes of biodiversity, public amenity and recreation; [...]

#### **Specific functions of Minister**

6. Without prejudice to any other functions conferred on the Minister by this Act, the Minister may—

- (a) grant licences and, where appropriate, attach conditions thereto, for—
  - (i) the felling or otherwise removing of a tree or trees and the thinning of a forest,
  - (ii) afforestation,
  - (iii) forest road works, and
  - (iv) aerial fertilisation of forests,
- (b) give approvals and, where appropriate, attach conditions thereto, for forest management plans,
- (c) give approval for and provide grants for any activity related to his or her functions under the relevant statutory provisions and

may attach conditions thereto,

- (d) produce and implement guidelines, codes of practice and standards for good forest practice, [...]
- (g) undertake, participate in or promote any scheme or project related to his or her functions, [...]
- (k) make regulations relating to any of the foregoing functions.

#### **Granting of licences, etc. by Minister**

7.(1) Where the Minister, following an application under the relevant statutory provisions—

- (a) grants a licence,
- (b) gives an approval,
- (c) makes a grant, or [...]

he or she may grant, give or make it, as appropriate, with or without conditions.

(2) Where a matter to which subsection (1) relates has been granted, given or made, the Minister may where appropriate, in whole or in part, subsequently—

- (a) vary any conditions, or
- (b) suspend or revoke the licence, approval or grant, or remove the entry, having regard to all the circumstances of the case, including non-compliance with any conditions, but a revocation of a licence or of another foregoing matter shall not take place unless the Minister is satisfied that—
  - (i) there are substantial grounds warranting that course of action, and
  - (ii) the exercise of none of the other powers under this subsection would remedy the matter.

Section 11 of the Act sets out the role of Minister of Agriculture, Food & the Marine in safeguarding the environment:

#### **Role of Minister in safeguarding environment**

11. The Minister, in performing his or her functions under the relevant statutory provisions, shall—

- (a) have regard to the social, economic and environmental functions of forestry,
- (b) follow good forest practice,
- (c) take particular account of—
  - (i) the different habitats and species in forests, and
  - (ii) natural and semi-natural woodland,
- (d) consider whether the subject matter of the function being performed requires the carrying out of one or more of the following:



- (i) a screening for an environmental impact assessment;
- (ii) the submission of an environmental impact statement;
- (iii) an environmental impact assessment;
- (iv) his or her functions under the Habitats Regulations, including—
  - (I) a screening for an appropriate assessment,
  - (II) the submission of a Natura Impact Statement, and
  - (III) the carrying out of an appropriate assessment,
 within the meaning of those Regulations,
- and
- (e) where there is such a requirement under paragraph (d), ensure that it is carried out.

Sections 5 and 11 of the Act set out the overarching provisions within the Forestry Act 2014 relating to the protection of the environment, and draw in the requirements and procedures under the Habitats Directive, the Water Framework Directive and the EIA Directive (and relevant transposing legislation).

Section 7 sets out the provisions for attaching and varying conditions to a licence, approval and / or grant, and for suspending or revoking the licence, approval or grant.

Section 19 allows for the felling of trees without a licence, in situations where the tree is “[...] *in the opinion of the Minister, required to be removed— [...] to mitigate a threat to a habitat or other important environmental resource, [...]*”

Sections 26 details the making of replanting orders, whereby:

26. (1) *Where trees have been—*
- (a) *felled or otherwise removed without a licence under section 7,*
  - (b) *felled under a licence and, either at the time of such felling or subsequently, a condition of the licence is contravened, or*
  - (c) *in the opinion of the Minister, seriously damaged,*

*the Minister may issue a replanting order in respect of the owner requiring him or her to replant or to fulfil any or all of the conditions that attached to the licence (or, in a case in which no licence was granted, any or all of the conditions that would, in the opinion of the Minister, have been attached to a licence had such been granted) in accordance with the provisions of the order.*

Sections 27-29 detail offences and corresponding

penalties, from fixed penalties to (on conviction) substantial fines and imprisonment.

Taken together, Sections 7 and 26-29 provide flexibility to the Minister in term of attaching environmental conditions to a licence, approval or grant, and enforcing those conditions.

Finally, Section 30 enables the Minister to produce supplementary regulations, if needed to give effect to the principles and policies set down in the Act. These can be produced under various headings, including “(y) *protection of the environment, habitats and biodiversity;*”.

Taken together, the above measures integrate the protection of the environment and the associated Directives and transposing legislation into the central decision-making process concerning the assessment of applications for, and the issuing of, licences, approvals and / or grants by DAFM. This is reflected in the scope of the Act, “...*to provide for the development and promotion of forestry in a manner that maximises the economic, environmental and social value of forests within the principles of sustainable forest management...*”.

## 4.2 Forestry Regulations 2017 (S.I.191 of 2017)

The purpose of the Forestry Regulations 2017 is to provide detailed rules for the control of forestry activities in the areas of afforestation, forest road works, tree felling and the aerial fertilisation of forests, as provided for in the Forestry Act 2014. The Regulations also give further effect to the European Directives relating to EIA.

The Forestry Regulations 2017 were enacted in May 2017, commencing the Forestry Act 2014.

For further details on the Forestry Act 2014 and the Forestry Regulations 2017, see the DAFM document *Felling & Reforestation Policy* (2017) and the websites [www.agriculture.gov.ie/forests-service/forestry-and-the-law/](http://www.agriculture.gov.ie/forests-service/forestry-and-the-law/) and [www.agriculture.gov.ie/forests-service/tree-felling/](http://www.agriculture.gov.ie/forests-service/tree-felling/)

## 4.3 Birds & Natural Habitats Regulations 2011

Under the European Communities (Birds & Natural Habitats) Regulations 2011 (S.I.477 of 2011) and within the context of Appropriate Assessment, for following applies:

### **Consent by public authorities**

44. (1) *The provisions of Regulations 42 and, if applicable, 43, [both detailing Appropriate Assessment] apply before a public authority [i.e.*

Minister for Agriculture, Food & the Marine] may give consent for a plan or project under these Regulations.

*(2) A public authority may, for the purposes of these Regulations, attach conditions to any consent or at any time vary such conditions as the public authority deems appropriate, or revoke such consent if, in the opinion of the public authority, the conditions attached to such consent have been breached or the continuation of such consent would be liable to destroy, or significantly alter, damage or interfere with the species and habitats for which the site may be or has been designated and the public authority shall communicate in writing anything determined pursuant to this paragraph to the persons concerned.*

## Section 5

# Forest Policy & Funding

Changes in Ireland's forest policy and funding (as represented by EU funding rules and the Forestry Programme 2014-2020) recognise the water-related ecosystem services woodlands and forests can deliver, and further integrate the protection of water and aquatic ecosystems into State funding for forestry.

### 5.1 Policy Framework

The document *Forests, products and people: Ireland's forest policy – a renewed vision* (DAFM, 2014) sets out an updated national forest policy strategy that takes account of the substantial changes that have occurred in Irish forestry since the publication of its forerunner *Growing for the Future* in 1996. This updated policy, developed by the DAFM with input from the Forest Policy Review Group, aims to steer and guide the expansion of the forest sector out to the year 2046 in a sustainable and cost-efficient manner.

The document presents a summary of the recommended policies and actions, two of which relate specifically to the protection of water and other environmental receptors:

**Expansion of the Forest Resource: To increase the forest area, in accordance with sustainable forest management (SFM) principles, in order to support a long term sustainable roundwood supply of 7 to 8 million cubic metres per annum.**

*The main focus is to increase the level of annual afforestation to 15,000 ha. The planned level of afforestation will ensure a sustainable level of future timber supply for the wood processing and wood energy sectors. Species choice will need to take account not only the implications of climate change but will also need to be aligned with future market requirements and carbon sequestration capacity. All afforestation will comply with updated environmental and regulatory procedures (see Environment and Public Goods). Support for afforestation will be primarily within the context of agricultural support schemes aimed at the most efficient use of natural resources.*

**Environment and Public Goods: To ensure**

**that afforestation, management of existing forests and development of the forest sector are undertaken in a manner that ensures compliance with environmental requirements and objectives and enhances their contribution to the environment and their capacity for the provision of public goods and services.**

*In line with increasing knowledge of the impact of forestry on the environment and on the changing regulatory framework, all environmental guidelines will be updated. DAFM, in collaboration with the Department of Environment, Community and Local Government) DoECLG, the National Parks and Wildlife Service (NPWS) and statutory bodies will bring together under a single protocol all legal compliance and best practice guidance for forestry. A better understanding of the value of non-timber benefits will be fostered through continued research and information dissemination by DAFM and these should be taken into account in any economic appraisal of forestry at the national level. All proposed European Union (EU) regulations, EU Directives and national legislation should be subject to full stakeholder consultation and Regulatory Impact Assessment (RIA).*

### 5.2 EU Funding Rules

Although the Forestry Programme 2014-2020 is entirely State aid funded and approved under the European Union Guidelines for State aid in the agricultural and forest sectors and in rural areas, the rules governing it ensure coherence with those set out in the Rural Development Regulation (Regulation (EU) 1305/2013). These include compliance with State aid rules regarding minimum environmental requirements in relation to the afforestation and

creation of woodland measure. Specifically, paragraph (509)a of the above Guidelines states that:

*[...] the selection of species to be planted, of areas and of methods to be used shall avoid the inappropriate afforestation of sensitive habitats such as peat lands and wetlands and negative effects on areas of high ecological value including areas under high natural value farming. On sites designated as Natura 2000 pursuant to Council Directive 92/43/EEC and Directive 2009/147/EC of the European Parliament and of the Council only afforestation consistent with the management objectives of the sites concerned and agreed with the Member State's authority in charge of implementing Natura 2000 shall be allowed; [...]*

### 5.3 Forestry Programme 2014-2020

The document entitled *Forestry Programme 2014-2020: IRELAND* (DAFM, 2015) sets out Ireland's proposals for 100% State aid funding for the Forestry Programme for the period 2014-2020 (see [www.agriculture.gov.ie/forests-service/forestry-programmes-2014-2020/](http://www.agriculture.gov.ie/forests-service/forestry-programmes-2014-2020/)). The measures described are consistent with the forest policy framework set out in *Forests, products and people Ireland's forest policy – a renewed vision*, and are designed to address the following sectoral needs:

- to increase on a permanent basis, Ireland's forest cover to capture carbon, produce wood and help mitigation;
- to increase and sustain the production of forest-based biomass to meet renewable energy

targets;

- to support forest holders to actively manage their plantations; and
- to optimise the environmental and social benefits of new and existing forests.

To meet these needs, the following funding measures are included in the Forestry Programme:

- *Afforestation and Creation of Woodland: Support for establishment and 15 premium payments for the creation of new forests. This measure includes afforestation, agro-forestry, forestry for fibre, and native woodland establishment (the latter focused on important native woodland types and opportunities for habitat linkage, and on environmentally sensitive areas, with a view to realising wider ecosystem services such as water protection).*
- *NeighbourWood Scheme: Provides support for the development of attractive 'close-to-home' woodland amenities for public access, use and enjoyment. This measure is aimed primarily at local authorities.*
- *Forest Roads: Support for the construction of forest roads is provided under this measure.*
- *Reconstitution Scheme: Support for forest holder to restore and retain forests following significant damage by natural causes.*
- *Woodland Improvement Scheme: This scheme provides support for forest management operations for broadleaf woodlands and actions within existing forests, which effect structural changes aimed at protecting and enhancing water quality and other environmental sensitivities.*
- *Native Woodland Conservation Scheme:*

**Photo 5.1** The Afforestation Scheme provides a diverse range of afforestation options, including commercial conifers, native woodland, forest-for-fibre and agro-forestry (right). Agro-forestry GPC 11 enables the practising of forestry and agriculture (grass production and / or grazing) on the same piece of land.





*Supports the protection and enhancement of existing native woodlands and where appropriate, the conversion of conifer forest to native woodlands. This measure is focused on important native woodland types and opportunities for habitat linkage, and on environmentally sensitive areas, with a view to realising wider eco-system services such as water protection.*

- *Knowledge Transfer and Information Actions: Supports the setting up of knowledge transfer groups, continuous professional development, and training.*
- *Producer Groups: Support is provided under this measure to help forest holders to work together to create a critical mass for forestry operations and mobilising timber.*
- *Innovative Forest Technology: Support for early adopters of new technology, e.g. variable tyre systems, inventory equipment.*
- *Forest Genetic Reproductive Material: Annual payment towards the cost of managing and conserving registered seed stands and establishing seed orchards.*
- *Forest Management Plans: Support for forest holders to prepare management plans for their forest holdings.*

The document *Forestry Programme 2014-2020: IRELAND* recognises the importance of protecting water and aquatic habitats and species (in particular, Freshwater Pearl Mussel and salmonids) throughout forestry development and describes specific measures to do so. These include: the revision of environmental guidelines; enhanced protection within certain water-sensitive catchments; additional provisions for sites proposed for afforestation where significant areas have peat depths greater than 0.5 metres; and the development of relevant support schemes (i.e. the Native Woodland Scheme package, the Agro-Forestry Scheme and the Environmental Enhancement of Forests Scheme) to protect and enhance water (as described in Sections 13-15).

## 5.4 Mid-Term Review for the Forestry Programme

The mid-term review (MTR) of the Forestry Programme 2014-2020 was completed in early 2018 following extensive consultation (see [www.agriculture.gov.ie/forests-service/forests-service-general-information/forestry-programme-2014-2020-mid-term-review/](http://www.agriculture.gov.ie/forests-service/forests-service-general-information/forestry-programme-2014-2020-mid-term-review/)). The review was necessary under:

- the Forestry Programme itself, to ensure continued focus on value for money, the

environment and species mix;

- the EU State aid approval of the Programme, to ensure increased forest cover and compliance with conditions of State aid approval; and
- the Programme for a Partnership Government (May 2016), in relation to participation rates, environment and contribution of forestry to rural communities and land use policy.

The changes arising from the MTR remain firmly anchored to the original targets and objectives set out in the Forestry Programme, and aim to redistribute available funds to (*inter alia*) address those parts of the Programme where set targets have not been achieved. These include, for example, the 30% broadleaf planting target (e.g. a rate of 19% was achieved in 2016) and the targets set for NWS Establishment and NWS Conservation. MTR changes to the Programme include the following:

- a 7% increase in grant and a 5% increase in premium for broadleaf afforestation, including that under NWS Establishment and Agro-Forestry;
- support for continuous cover forestry (CCF);
- the establishment of a Woodland Fund to attract contributions from 3rd parties (including corporations), to facilitate payments for ecosystem services to landowners entering NWS Establishment in recognition of the various ecosystem services provided (including those relating to water);
- a new forest deer fencing and tree shelter scheme;
- a doubling of the NWS Conservation grant for public bodies (Coillte, NPWS), to bring it in line with the rate available to private woodland owners; and
- the potential to avail of additional fencing allowance under NWS Conservation.

These measures will increase the focus on broadleaf (including NWS Establishment) afforestation and will increase the attractiveness of schemes that have a particular use regarding the protection and enhancement of water, as set out elsewhere in this document.

The MTR changes are being introduced in stages, with the first dealing primarily with grant and premium increases - see Circular 03/2018.

## Section 6 Scheme Rules

Any forestry activity receiving grant aid is subject to particular scheme rules. These incorporate the protection of the environment and outline consequences, where breaches occur.

### 6.1 Overview

A key role of DAFM is to promote sustainable forest development. It does this by (*inter alia*) offering financial support in the form of grants and (in some cases) multi-annual premium payments under various support schemes. The current suite of schemes available under the Forestry Programme 2014-2020 includes the Afforestation Grant & Premium Scheme (with 12 distinct sub-measures for commercial conifers, native woodland, agro-forestry, etc.), the Forest Road Scheme, the Woodland Improvement (Tending & Thinning) Scheme, the Native Woodland Conservation Scheme and the NeighbourWood Scheme.

Each scheme is governed by specific terms and conditions, setting out (*inter alia*) the environmental assessment process undertaken by DAFM, and the central requirement for all successful applicants to adhere to measures to protect the environment (including water). Furthermore, breaches of these rules can result in disqualification from the scheme in question and the recouping of monies paid.

For example, from the scheme document setting out the Afforestation Scheme 2014-2020 (DAFM, 2015):

- Under Section 1.2: “Beneficiaries must also comply with national and EU legislation, and all operational and environmental guidelines and requirements published by the Department.”
- Under Section 10.1: “All applications for afforestation approval under the Afforestation Grant and Premium Scheme will undergo an environment assessment procedure to ensure that proposed projects are compatible with the protection and enhancement of the environment, including, *inter alia*, water, biodiversity, archaeology and landscape. The cost of supplying any additional information (e.g. EIS, NIS, ecological report) that is required by the Forest Service in order to enable it to further assess the application must be borne by the Applicant, as the proponent of the proposed

*afforestation.”*

- Under Section 15.1: “Failure to comply with the terms and conditions of the Scheme, incorporating The Code of Best Forest Practice – Ireland; Forestry Standards and Procedures Manual [i.e. the *Forestry Standards Manual*]; circulars amending scheme requirements; and the relevant environmental guidelines and requirements may result in an appropriate penalty or sanction being applied.”

## Section 7

# Application Process

DAFM's forestry application process provides a solid platform for assessing applications for licences, approvals and / or grants in relation to regulated forest activities. A central tenet throughout is compatibility with the protection of water and aquatic ecosystems and species.

### 7.1 Overview

Under the Forestry Regulations 2017 (S.I. 191 of 2017), all applications for licences for afforestation, forest road construction projects, whether grant-aided or not, and for aerial fertilisation and tree felling operations, require the prior written approval of the Minister for Agriculture, Food and the Marine. Before the Minister can grant approval for any of the above, s/he must first determine if the project is likely to have a significant environmental effect.

DAFM assesses applications for licensing in relation to afforestation, tree felling, forest road works and the aerial fertilisation of forests (the latter, to permit the treatment of nutrient-deficient forest land by air). These activities were previously regulated under S.I.558 of 2010 (as amended), the Forestry Act 1946 and S.I.125 of 2012, but are now regulated under the Forestry Act 2014 and associated Forestry Regulations 2017.

Many of these applications also represent applications for support under the various grant schemes operated by the Department under the Forestry Programme 2014-2020, e.g. Afforestation Grant & Premium Scheme, Forest Road Scheme, Woodland Improvement (Tending & Thinning) Scheme, Native Woodland Conservation Scheme, NeighbourWood Scheme.

When assessing an individual application for licensing (with or without grant aid) for any of the above activities, the Department undertakes a detailed assessment of the project and (*inter alia*) its potential impact on the environment, including water. The various interconnected components of the process, are listed as follows:

- Pre-approval assessment

- Other inspection processes
- Land Types for Afforestation, Environmental Requirements for Afforestation & the Felling & Reforestation Policy<sup>1</sup>
- iFORIS & iNET
- Referral process
- Public consultation
- Acid Sensitivity Protocol
- Appropriate Assessment Procedure
- Assessment to Determine EIA Requirement
- Requirements, mandatory 'guidelines' & other procedures
- Requests for Further Information
- Licensing conditions
- Sanctions
- Register of Foresters & Forestry Companies
- Training for Registered Foresters

(Other processes not directly relevant to the protection of water, such as those relating to Curlew, Hen Harrier and Small White Orchid, are excluded from this account.)

The following sections describe the majority of these components (with others described elsewhere in this document), with a focus on their relevance to the protection of water and aquatic habitats and species. Figure 3.1 gives an overview of the application process for a 'typical' afforestation approval.

### 7.2 Pre-approval assessment

All applications for licences (with or without grant aid) are referred (primarily electronically *via* iFORIS-based worklists - see below) to the relevant

<sup>1</sup> The Land Types for Afforestation procedure, the Environmental Requirements for Afforestation and the Felling & Reforestation Policy are described in Sections 8-10.

District Forestry Inspector whose operational area (or 'district') includes the site in question. S/he then undertakes a pre-approval evaluation of the proposed project, focusing on compliance with regulatory requirements and scheme rules (if relevant), and silvicultural and environmental suitability.

This evaluation follows established Standard Operating Procedures and includes a review of all available information (including project details, multiple GIS layers on iFORIS and responses received from the referral process) and a site inspection (triggered by risk evaluation or otherwise, at the Inspector's discretion). During the process, the Inspector may trigger various procedures as deemed necessary, such as a 'Further Information Required' request to the applicant, internal referral to the Forest Service Ecologist, or non-spatially driven referrals to NPWS, Inland Fisheries Ireland, etc. S/he also undertakes a series of processes, including those relating to Appropriate Assessment and Environmental Impact Assessment. Furthermore, the Inspector has the option to engage outside expertise (e.g. hydrologist) if particular circumstances merit it.

For most work streams (including afforestation, forest road works and tree felling), this process takes place within the iFORIS platform *via* a series of work screens to be completed by the Inspector. (Smaller, more bespoke schemes such as NWS Conservation and the NeighbourWood Scheme are primarily paper-based.)

All initial licence applications (or 'Form 1s' in the case of all work streams apart from felling) received by the Department undergo a 100% desk assessment (using the iFORIS platform) by the relevant District Inspector, supplemented by a field inspection rate of

over 40%, deliberately biased towards risk factors.

The above process – which typically involves two or more 'loops' for referrals or 'Further Information Required' requests – leads to a final certification being made by the District Inspector as to whether or not the project should be licensed, and if so, the conditions to be attached. This approach provides the basis for the Department to identify sensitivities regarding water, biodiversity, archaeology, landscape, etc. and to ensure that any licences issued includes the necessary safeguards and amendments to the project required to avoid impact. Projects can be refused if deemed incompatible with the protection of the environment, silvicultural requirements or (if relevant) scheme conditions.

Note that applications for felling licences received from Coillte first undergo an internal assessment before submission to the DAFM. This internal process, Coillte's Environmental Risk Assessment, is set out below.

### 7.2.1 Coillte's Environmental Risk Assessment procedure

As the owner of over half of Ireland's forested lands, Coillte has a significant role to play in protecting water quality from potential impacts arising from its forest operations.

A key component of SFM is the protection of water quality and aquatic species and habitats, and where possible, the realisation of the proactive role woodlands and forests can play in this regard. Since 2001, the Forest Stewardship Council (FSC), an independent, non-governmental, not-for-profit organisation established to promote the responsible

**Photo 7.1 Through the detailed assessment of felling applications, the restructuring of existing forests to protect water and other sensitive features, can be realised at reforestation.**





management of the world's forests, has certified that Coillte's forests are managed responsibly in accordance with strict environmental, social and economic criteria.

In compliance with FSC criteria, that includes adherence to all DAFM requirements and guidelines, an Environmental Risk Assessment (ERA) is conducted as part of Coillte's internal planning for all forms of forest activities, including felling.

Areas identified for felling undergo a spatial analysis and review by experienced personnel, based on set rules for different environmental receptors (e.g. Soil and Water, Biodiversity, Archaeology). Sites are assigned 'Green' or 'Blue', the former reserved for sites where standard practices and safeguards are deemed to be sufficient, and the latter applied to sites deemed to be of a higher sensitivity. 'Blue' sites then undergo a further of assessment by Coillte staff, involving a walkover of the operational site by an Environmental Officer, to identify potential impacts on receptors and to provide the necessary level of detail regarding environmental sensitivities and operational safeguards, appropriate for onsite operators and supervisors.

This process is supported by contractor training, contingency planning and input and oversight by assigned Environmental Managers and Quality Assessors within Coillte. Furthermore, where water sensitivities apply, a monitoring programme is also adopted that entails the daily visual monitoring of all watercourses to ensure that operational safeguards are effective. On the most sensitive of sites, water sampling is conducted prior to and post forest operation.

Applications are subsequently submitted to the DAFM colour-coded 'Green' or 'Blue', with the later accompanied by supplementary information and maps. Using this information, the Department undertakes its own assessment of each application, as set out elsewhere in this section.

Coillte's ERA procedure identifies the sensitivity of sites to certain forestry activities and then specifies the planning actions and mitigation options that must be considered on various site types. The ERA procedure therefore integrates environmental risk assessment into each stage of the planning and operational process associated with tree felling.

### 7.3 Other inspection processes

In addition to the pre-approval certification process, a range of other inspection processes are undertaken by the Department. Each of these involve the direct input of the relevant District Inspector, and often entail a site inspection.

These including (where relevant) follow-up 'Form 2', 'Form 3' and 'Premium' inspections undertaken before grant and premium payments are made, to ensure adherence to the original licence conditions and mandatory measures, including those relating to the protection of water. Where relevant, subsequent applications for grant payment following the completion of initial works ('Form 2s') and (in the case of the Afforestation Scheme) 4 years into the forest cycle ('Form 3'), are subjected to a combined field inspection rate of greater than 50%.

In all cases, failure to adhere to the original licence conditions and mandatory measures may trigger a variety of responses. Depending on the activity involved, these include remedial works, the application of penalties of up to 100%, the recouping of monies paid, professional sanctions against the Registered Forester, the revoking of the licence, and legal recourse, as per Section 27-29 of the Forestry Act 2014.

*Ad hoc* inspections are also undertaken where particular issues give rise to the need for an assessment by the Inspector. These include standard checks such as boundary discrepancies, and also inspections triggered by reports from various parties (e.g. members of the public, officials from other statutory bodies) regarding unlicensed felling, afforestation or road works, breaches of environmental conditions, and environmental damage. Such incidents are given high priority by the Department, often leading to the issuing of 'cease and desist' instructions, a site inspection and the interviewing under caution of individuals by the Forestry Inspector. Appropriate short-term mitigation, site restoration, the involvement of relevant public agencies and legal follow-up are all pursued, as deemed appropriate.

(Other inspection processes not directly related to water, such as reforestation inspections and audit inspections, are excluded from this account.)

### 7.4 iFORIS & iNET

iFORIS (integrated FORestry Information System) is a GIS-based platform shared by both the Inspectorate and Administration within the Department, for assessing forestry applications and for managing associated processes, including contact with the applicant, referrals and submissions. Numerous checks regarding water and other environmental receptors are integrated into iFORIS and form an integral component of the District Inspector's workflow as individual applications are assessed. The system provides the framework for the Department to undertake the following:

- silvicultural and environmental assessment

- spatially-driven and discretionary referral to statutory bodies, and review of responses received
- the review of submissions from members of the public and other third parties
- Appropriate Assessment Procedure
- Assessment to Determine EIA Requirement
- 'Further Information Required' requests (e.g. Natura Impact Statement)
- final certification ('Refuse', 'Approve', 'Approve with Conditions')
- follow-up compliance inspections and ongoing premium inspections.

Central to iFORIS is the GIS-based MapViewer, which contains spatial data checked as a matter of course by the District Inspector during his / her evaluation of the application. This includes multiple layers relating to the environmental sensitivities such as water, biodiversity, archaeology and landscapes. The following lists the spatial layers that relate specifically to water:

- EPA rivers and lakes
- Catchment Area of High Status Objective Water Bodies (see later)
- Freshwater Pearl Mussel, 6 km catchment and entire catchment (based on populations within rivers designated as SACs for the species) (see later)
- Designated sites (including SACs, SPAs, NHAs, pNHAs) plus 3 km and 0-0.5 km buffers
- Areas of Potential Fisheries Sensitivity (see later)
- Acid Sensitive Areas (see later)
- Water Abstraction Point plus 250 m radius buffer
- Water bodies (note, this layer originates from the 1<sup>st</sup> WFD cycle and is being updated)
- Office of Public Works' Flood Hazard Areas (rainfall, river and groundwater)
- Teagasc Soils cover (to identify potentially erodible soils such as peat)
- Orthophotography (both up-to-date and historical)
- 1:10,560 maps (to assess mapped watercourses that may not be represented of the EPA hydrology layers)
- 50,000 map, for slope / contours.

iFORIS also undertakes a series of automatic spatial checks which: (i) trigger certain referrals to NPWS and Inland Fisheries Ireland; and (ii) populate certain fields within the EIA screens to inform decisions regarding cumulative impacts – see below.

Through a series of screens, iFORIS directs the District Inspector through the process whereby s/ he evaluates the silvicultural and environmental

suitability of the application, reviews referral responses and submissions received, undertakes the Appropriate Assessment Procedure and the Assessment to Determine EIA Requirement (as required), and makes a determination (or 'certification') to seek further information (e.g. NIS), to referral for further consultation, to approve (typically with conditions attached), or to refuse.

iFORIS also provides a platform for follow-up 'Form 2' and 'Form 3' grant payment inspections, premium inspections and *ad hoc* inspections.

A parallel 'shop-front' system called iNET is available online for Registered Foresters (with training), enabling these individuals to query the same spatial datasets (bar sensitive layers such as Curlew and Hen Harrier breeding sites), to tailor their application accordingly, and to submit online (which now accounts for over 95% of all afforestation applications received by the Department).

Through in-house GIS expertise and contact with various bodies, iFORIS (and iNET) undergoes continual updating and refinement, to reflect changing requirements under legislation, scheme conditions, etc. and to capture new or updated GIS layers containing relevant information.

## 7.5 Referral process

Referral to various bodies takes place as part of the pre-approval process, as set out in the Forestry Regulations 2017 and other protocols. Referrals are triggered automatically by certain scenarios (e.g. if an afforestation application is greater than 5 ha in area and within a Fisheries Sensitive Area) or at the discretion of the District Inspector. Referral bodies include NPWS, Inland Fisheries Ireland, Local Authorities, Irish Water, An Taisce and (in relation to the Acid Sensitivity Protocol) the EPA.

Specific referral protocols are in place in relation to Inland Fisheries Ireland (as driven by Areas of Potential Fisheries Sensitivity - see Appendix 12 of the *Forestry Standards Manual* (DAFM, 2015) and NPWS (as driven by an agreed referral matrix covering various scenarios involving forestry activities and designation areas). Internal referrals also take place to the professional Ecologist and Archaeologist within the Forestry Inspectorate.

The overall referral process, including referral triggers and standard referral periods, is summarised in Table 19.1 and Section 19.3 of the *Forestry Standards Manual*. Responses received are returned to the District Inspector (typically *via* the iFORIS worklist system), to inform his / her further evaluation of the application. The Inspector must review all responses received and cannot complete his / her assessment if the referral period for responses has

not yet expired.

The extent of referrals is considerable. For example, 715 afforestation applications were referred to prescribed bodies in 2017, representing 50% of the total number received in that year (1,409). The breakdown was as follows (note, an individual application may be referred to more than one body):

- Local Authorities (various): 560
- An Taisce: 296
- NPWS: 232
- Inland Fisheries Ireland: 217

## 7.6 Public consultation

The Forestry Regulations 2017 set out the process regarding public consultation.

When making an application for afforestation and road works licence, the applicant (or their agent) must also place a site notice to adequately inform the public. This notice must be maintained in position for at least 5 weeks from the date of the application and must be renewed or replaced if it is removed or becomes defaced or illegible. Third parties may make submissions or observations from the date the site notice is in place.

(In the context of tree felling, no site notice is required before the final licensing decision is made. However, a site notice must be in place whenever a licensed felling operation is taking place. See DAFM's document *Felling & Reforestation Policy* (2017) for details.)

The DAFM also publishes on its website notice of the applications for approval that have been received for afforestation and forest road construction projects (whether grant-aided or not), and for aerial fertilisation and tree felling operations. Applications may be inspected free-of-charge at the Department's offices or made available if requested in writing. Any person can make a submission on the likely environmental effect of the proposed project within 30 days. Submissions, or requests for further information, must be made in writing (by post or e-mail).

All submissions received must be reviewed by the Forestry Inspector during the course of his / her assessment of the application.

If and when a final certification has been made to licence (typically with conditions attached), the applicant is issued an approval letter (i.e. the licence) with a 28-day hold, to allow for appeals. In parallel, the decision is advertised on the Department's website and all third parties who made submissions are also informed. If a third party appeal is received within this 28-day period, the licence is suspended

pending the outcome of the appeal. Having exhausted the appeals process, an applicant or third party may also seek a Judicial Review of the decision in the High Court.

## 7.7 Acid Sensitivity Protocol

DAFM operates the Forest Service / COFORD / EPA-agreed Acid Sensitivity Protocol, whereby afforestation applications must be accompanied by water sampling at pre-approval stage, to assess the sensitivity of receiving waters to acidification. Appendix 11 of the *Forestry Standards Manual* sets out full details, including the designated Acid Sensitivity Areas (as identified by a series of OS Sheet numbers) in which the protocol applies, the prescribed water sampling procedure, and the resulting CaCO<sub>3</sub> thresholds that drive the final outcome.

In summary, sampling and analysis (by an accredited laboratory) must be carried out on at least four separate occasions within the period 1<sup>st</sup> February to the 31<sup>st</sup> May inclusive, with each sample taken at least 28 days apart. Where the minimum alkalinity of any one of the four samples taken is <8 mg CaCO<sub>3</sub> / litre, no afforestation is permitted. If the result is 8-15 mg CaCO<sub>3</sub> / litre, full, partial or no afforestation may be approved, following discussion and agreement between DAFM, EPA and Inland Fisheries Ireland. If the result is >15 mg CaCO<sub>3</sub> / litre, afforestation may be licensed.

Water sampling is undertaken by the Registered Forester before the application is submitted or (more typically) during the approval process. A regime of parallel sampling by the District Inspector also takes place. The results of the analyses are entered onto iFORIS, for review by the District Inspector, who then drives the relevant outcome.

Note that water sampling under the Acid Sensitivity Protocol is not required for NWS Est. applications within Acid Sensitive Areas. This refinement of the protocol was proposed by DAFM with Woodlands of Ireland, Inland Fisheries Ireland, NPWS and other scheme partners (DAFM, 2013), and was subsequently agreed to by the EPA due to the range of ecosystem services delivered by new native woodlands (included the protection of water). The amendment came into effect in early 2013 (see Circular 04/2013). It only applies to applications that comprise solely of native woodland establishment GPCs 9 and 10 on 'enclosed / improved' land, with the further restriction that no fertiliser application takes place.

## 7.8 Appropriate Assessment Procedure

The overall aim of the Habitats Directive (92/43/EEC) is to maintain or restore the favourable conservation status of habitats and species of Community interest. These habitats and species are listed in the Habitats Directive and the Birds Directive (2009/147/EC), and Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are designated to afford protection to the most vulnerable of these. Both designations are also termed 'European sites' and are collectively known as the 'Natura 2000 network'.

The Habitats and Bird Directives are transposed into Irish law by (*inter alia*) the European Communities (Birds & Natural Habitats) Regulations 2011 (S.I.477 of 2011) (see the Irish Statute Book [www.irishstatutebook.ie](http://www.irishstatutebook.ie)).

As required under the Habitats Directive and as set out under S.I.477 of 2011, on receipt of any application for licensing and / or grant approval, DAFM (as the consenting authority) must undertake 'screening' to assess whether or not the project - either individually or in combination with other plans or projects - is likely to have a significant effect on a SAC or SPA (whether surrounding, adjoining or remote), in view of both the conservation objectives of that Natura site and best scientific knowledge.

If a significant effect is likely or where uncertainty exists, DAFM must seek a Natura Impact Statement (NIS) from the applicant. Upon receipt of the NIS, it then undertakes an 'appropriate assessment' to gauge whether or not there will be an adverse effect on the integrity of the Natura site(s) concerned, based on (*inter alia*) the nature of the impact and the effectiveness of any avoidance, amelioration or mitigation measures proposed.

Screening for appropriate assessment, and the appropriate assessment itself, must be carried out in accordance with Regulation 42 of the European Communities (Birds & Natural Habitats) Regulations 2011. When carrying out the appropriate assessment (if required), the Department must include a determination under Article 6(3) of the Habitats Directive as to whether or not the project would adversely affect the integrity of the Natura site(s) concerned. The assessment carried out under Article 6(3) cannot have any deficiencies or data / information gaps and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of a project on the Natura site(s) concerned.

DAFM can only approve an application where it deems (at screening stage) that there is no likely significant effect on any Natura site, or (at appropriate assessment stage, if required) that

there will be no adverse effect on the integrity of any Natura site.

This process is set out in the Forest Service Appropriate Assessment Procedure, developed in consultation with NPWS. The AAP is described to applicants, Registered Foresters and the wider forest sector, in Section 20 and accompanying Appendices 20-22 of the *Forestry Standards Manual* (with Appendix 20 setting out guidance on compiling a NIS) (DAFM, 2015). The document *Forest Service Appropriate Assessment Procedure: Forestry Inspector's Manual* (DAFM, 2013) sets out the standard operating procedure for District Inspectors undertaking the AAP.

The Forestry Inspector applies the AAP as part of his / her assessment of an application, and is supported in this role by the Forest Service Ecologist. The AAP is embedded into the iFORIS workstream for afforestation, with the relevant AA Screening Form and (if required) the Appropriate Assessment Form on-screen to guide the Inspector through the evaluation required. Other workstreams involving tree felling, forest road works and the aerial fertilisation of forests utilise paper-based forms, pending incorporating into iFORIS.

## 7.9 Assessment to Determine EIA Requirement

The EIA Directive (meaning Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 as amended by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014) requires that certain types of development, including afforestation and forest road works, must be assessed to determine the likely environmental effect of the development, before a licence can be granted.

The licensing system operated by the Department of Agriculture, Food & the Marine, as set out in the Forestry Regulations 2017, provides for an environmental impact assessment (EIA) to be carried out in certain cases. An EIA is mandatory for initial afforestation involving an area of 50 hectares or more, or and for forest road works involving a length of 2,000 metres or more. Applications for such projects must be accompanied by an environmental impact statement (EIS), to enable DAFM to undertake the EIA. An EIS is an environmental impact assessment report satisfying the requirements of Article 5(10) of the EU Directive and prepared by competent experts. The information to be contained in an EIS is set out in Schedule 4 of the Regulations.

In addition, the Forestry Regulations 2017 provide that all proposed afforestation and forest road



works below the above mandatory thresholds must be screened for EIA, to consider whether or not significant effects on the environment are likely. This consideration must take into account criteria involving the characteristic of the project, its location, and the type and characteristics of the potential impact, as set out in Schedule 3 of the Regulations. Where it is considered that a proposed sub-threshold development is likely to have significant effects on the environment and should therefore be subject to an EIA, DAFM requires the applicant to submit an EIS to enable the EIA to be undertaken.

Screening for sub-threshold EIA is an assessment undertaken by the Department as part of the normal procedure for evaluating the silvicultural and environmental suitability of a proposed development. The District Forestry Inspector undertakes EIA screening as part of the iFORIS workflow for afforestation and forest road works application, by responding to questions under the following headings:

- Project description
- Existing land use
- Cumulative effect and extent of the project
- Water
- Soil
- Protection of Freshwater Pearl Mussel
- Archaeology
- Landscape
- Designated habitats
- Non-Designated habitats
- Social
- Accidents
- Trans-frontier
- Public participation and NGO participation.

This is supported by spatial analysis concerning the area of forest within various hinterlands of the proposed development. In undertaking the EIA screening, the Inspector uses project details and information gained from their scrutiny of orthophotography and various GIS layers on the iFORIS mapping system, combined with information gained through third party datasets, field inspection, referral responses (if any) from consulted bodies, and submissions from third parties. This process culminates into a decision as to whether or not an EIA is required and an EIS is to be sought.

The EIA process includes numerous questions relating to water, including questions supported by background spatial analyses. Examples (taken from the Forest Road Works work stream) include the following:

- *When considered in combination, does the*

*proposed forest road AND other recent, ongoing or planned works, represent the construction of single or multiple lengths of forest road totalling 2000 m or more within the area?*

- *Will adherence to water quality guidelines, harvesting guidelines and any condition to be attached to approval, be sufficient to prevent any potential significant impact to aquatic zones and water quality arising from the project?*
- *In relation to the underlying water body or water bodies, is the project, together with any condition to be attached to approval, compatible with Water Framework Directive objectives, i.e. to prevent any deterioration in water body status and to restore the water body to at least good status?*
- *Do soil, terrain and slope, separately or in combination, create any unusual or exceptional constraints on forest road construction?*
- *Is the proposed forest road within the 3 km buffer zone, upstream of, and hydrologically connected to, a SAC, SPA, National Park, NHA, pNHA or Nature Reserve?*
- *Should this application be referred to the Forest Service Ecologist?*

DAFM has various options to address individual environmental concerns that arise in relation to a proposed forest development. For example, specific conditions, such as increase setbacks or exclusions in relation to water, habitats, dwellings, etc., can be added to the licence, to avoid any impact. The Department may seek further information in the form of an expert report in relation to, e.g. archaeology, potential Annex 1 habitats, concerns regarding groundwater, and address any potential impacts identified through licence conditions. Furthermore, the Department has incorporated several protocols into the assessment process, designed to avoid impact on particular sensitivities, e.g. surface water acidification, Hen Harrier, Curlew, Freshwater Pearl Mussel, Small White Orchid.

Therefore, while the EIA screening process may identify potential environmental impacts, these can often be addressed in an individual basis and do not culminate in a significant environment impact which would otherwise trigger an EIA.

## 7.10 Requirements, mandatory 'guidelines' and other procedures

The Department has in place a range of requirements, mandatory 'guidelines' and procedures that detail measures required to avoid impact on key

environmental receptors including water, biodiversity, archaeology and landscape. These form the baseline level of environmental protection built into all licences and approvals issued. Failure to comply can result in a requirement for remedial work and delayed grant / premium payment (typically), penalties and / or sanctions levelled against the Registered Forester, or the initiation of legal proceedings.

Requirements and mandatory 'guidelines' include: *Forestry & Water Quality Guidelines* (2000), *Forestry & Archaeology Guidelines* (2000), *Forestry & the Landscape Guidelines* (2000), *Forest Biodiversity Guidelines* (2000), *Harvesting & the Environment Guidelines* (2000), *Forest Protection Guidelines* (2002), *Aerial Fertilisation Requirements* (2015), *Forestry & Freshwater Pearl Mussel Requirements* (2008), species guidelines for Kerry slug and otter; and, most recently, the *Environmental Requirements for Afforestation* (2016).

The *Environmental Requirements for Afforestation*, published in December 2016 following consultation, consolidate into a single document those measures and safeguards relating to afforestation within the existing water, archaeology, landscape and biodiversity guidelines. The protection of water features strongly within this document - see Section 9 for details. In addition, new Environmental Requirements for Felling & Reforestation are currently being prepared.

Other specific guidelines containing measures to protect water include the *Forest Harvesting & the Environment Guidelines* (focusing on thinning and clearfelling) and the *Forest Protection Guidelines*. Also, the COFORD *Forest Road Manual* (2004) sets out basic specifications regarding the construction of forest roads and associated features such as water

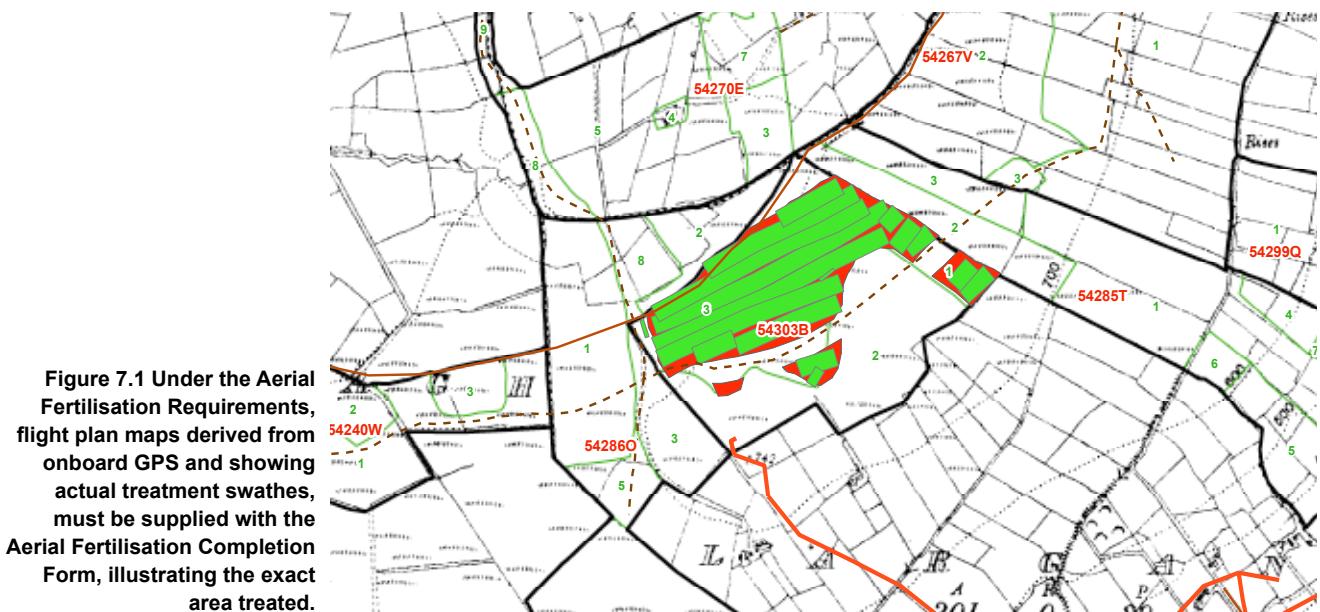
crossings.

*Forest Protection Guidelines* sets out requirements regarding the use of herbicides and other pesticides, with the protection of water a central consideration. Various sections detail measures regarding with labelling, integrated pest management, reasoned decision-making, the need to minimise the amount used, exclusion zones, training, transport, site management (before, during and after), record keeping, contingency planning in case of spillage, preparation and storage, and the disposal of surplus chemicals and containers.

In relation to threats such as rhododendron, "However it is necessary to make an exception to this [i.e. herbicide application within water setback] *only in the case of the removal and control of invasive species such as rhododendron and laurel. The prior approval of the [Inland Fisheries Ireland] must be received before applying herbicide, screefing or uprooting of these species within the buffer zone. Herbicide application may occur only where this approval has been obtained and the label instructions and advice allow for application within the vicinity of waterways.*"

In relation to the use of water for fire control, the following is specified: "If a lake or other aquatic zone is to be used as a water reservoir prior approval should be obtained from [Inland Fisheries Ireland] and, if it is a source of potable water, from the Local Authority."

Aerial fertilisation, regulated under S.I.191 of 2017, is subject to measures set out in the document *Aerial Fertilisation Requirements*, released with Forest Service Circular 11/2015 (DAFM, 2015). (These requirements are to be updated to reflect Forestry Act 2014 and the Forestry Regulations 2017.)



The key focus of this document is on enabling the effective aerial fertilisation of nutrient-deficient forest crops, while protecting receiving waters from nutrient run-off. As set out in the document, key requirements include advance notice of the commencement of approved applications, adherence to restrictions regarding setbacks and weather conditions, the tailoring of fertiliser types and amounts to actual crop requirements (based on foliar analysis), and the use of specialised helicopter operators equipped with GPS-enabled hoppers to ensure the targeted delivery of the application.

The above requirements and mandatory guidelines are supplemented by additional requirements and procedures, where necessary, e.g. for Curlew (regarding afforestation and felling), Hen Harrier (disturbance operations), Small White Orchid (afforestation) and Kerry Slug (afforestation and felling). Specifically in relation to water, these include the *Forestry & Freshwater Pearl Mussel Requirements* and the *Forestry & Otter Guidelines*, described below.

#### 7.10.1 Forestry & Freshwater Pearl Mussel Requirements

The Department applies specific safeguards regarding FPM, as set out in the *Forestry & Freshwater Pearl Mussel Requirements: Site Assessment and Mitigation Measures* (DAFM, 2008), subsequently amended to include thinning and aerial fertilisation, as per Appendix 22 of the *Forestry Standards Manual*. These requirements, developed in conjunction with the NPWS, take cognisance of the Directive on Pollution caused by Certain Dangerous Substances discharged into the Aquatic Environment of the Community (EU Directive 2006/11/EC) and the subsequent European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 (S.I.296 of 2009). The requirements centre on the submission of a Site Assessment and details of Mitigation Measures ('Form A' and 'Form B', respectively) with all applications for forestry approvals and licences within the 6 km hydrological catchment of FPM populations within rivers and lakes designated as SACs for the species, and within the entire catchment of the priority eight FPM catchments. (Specific procedures are in place for Coillte, based on its Environmental Risk Assessment framework.) The Forest Service Appropriate Assessment Procedure is also applied - see Section 7.8.

Note, the *Forestry & Freshwater Pearl Mussel Requirements* will be replaced by measures set out in the Plan for Forests & Freshwater Pearl Mussel in Ireland, once commenced - Section 12.

#### 7.10.2 Forestry & Otter Guidelines

As an Annex IV species under the Habitats Directive, otter (*Lutra lutra*) is strictly protected wherever it occurs, making it an offence to deliberately disturb the species or damage or destroy its breeding or resting place. Forest Service *Forestry & Otter Guidelines* (DAFM, 2009) sets out specific measures in relation to afforestation, harvesting, reforestation and forest road development, to ensure the protection during operations. For example, for afforestation, the guidelines require the undisturbed retention of areas of woodland / dense scrub within 50 m of watercourses, and the avoidance of any mechanised operations within 50 m of known holt or couch sites, where possible.

#### 7.11 Requests for further information

As part of its evaluation of the application, DAFM can issue a 'Further Information Required' request to the applicant, if deemed necessary. In total, 1,020 FIR requests were made in 2016, concerning 842 individual Contact Numbers (CNs). Most of these CNs (694) were subjected to a single FIR, 121 required two FIR requests, 24 required three, and three required four FIR requests. Table 7.1 described the nature of environmental FIR requests made in 2016 in connection with afforestation applications.

#### 7.12 Licensing conditions

Under the Forestry Act 2014, the specific functions of the Minister for Agriculture, Food & the Marine include the following:

6. *Without prejudice to any other functions conferred on the Minister by this Act, the Minister may—*
- (a) *grant licences and, where appropriate, attach conditions thereto, for—*
    - (i) *the felling or otherwise removing of a tree or trees and the thinning of a forest,*
    - (ii) *afforestation,*
    - (iii) *forest road works, and*
    - (iv) *aerial fertilisation of forests,*
  - (b) *give approvals and, where appropriate, attach conditions thereto, for forest management plans,*
  - (c) *give approval for and provide grants for any activity related to his or her functions under the relevant statutory provisions and may attach conditions thereto,[...]*

Following its assessment of an individual project (including site inspection, referrals, public consultation, AA and EIA procedures, further

**Table 7.1 The nature of environmental 'Further Information Required' requests made in 2016 in connection with afforestation applications. (Other types of FIR requests are not included below, e.g. those relating to marl issues, incorrect mapping, incorrect setbacks being applied.)**

No. of FIR requests made	Nature of the FIR request
52	Referral to ecologist, ecological report, or both
38	Referral to archaeologist, archaeology report, or both
14	Landscape report, landscape concern, or both
3	EIA sought
17	NIS sought
83	Water concern, including floods and water setbacks
51	A drainage report / survey
120	Concern for dwellings setback or harvesting impacts on dwellings
158	Exclusions sought, usually requiring the resubmission of plot details / certified species map (reasons can vary and be multiple e.g. fertility as evidenced by vegetation, existing woodlands, rock outcrops, incorrect setbacks, habitats, etc.)
106	Land types concern or existing woodland or outcrop i.e. scheme eligibility
19	Referral to NGO, An Taisce
2	Ornithologist report
39	Designated lands i.e. NATURA sites or NHAs
16	Annex species or habitats of concern
67	Fisheries concern or refer to Inland fisheries
101	Referral to NPWS
10	Acid Sensitivity
103	Referral to County Council Planning Authority

information requests, etc.), the Department may issue a licence under the Forestry Regulations. In the case of activities involving grant support, this licensing may also require a separate application for financial approval under the relevant scheme.

In all cases, licensing is subject to a range of conditions, both general and site-specific. These include environmental conditions deemed necessary to protect various environmental receptors, including water, biodiversity, archaeology and landscape. In relation to water and aquatic ecosystems, approval conditions include (as relevant):

- adherence to those requirements and 'guidelines' relevant to water, including the *Environmental Requirements for Afforestation*, the *Forestry & Water Quality Guidelines*, the *Forest Harvesting & the Environment Guidelines* and the *Forest Protection Guidelines*.
- adherence to the *Code of Best Forest Practice* -

*Ireland;*

- adherence to other specific procedures, protocols and requirements that may also apply, including the *Forestry & Otter Guidelines* and the Acid Sensitivity Protocol (regarding afforestation).
- adherence to the basic environmental conditions underpinning the various schemes, as set out in the relevant scheme documentation and in the *Forestry Standards Manual*.
- adherence to site-specific environmental conditions deemed necessary by the Forestry Inspector, following his / her iFORIS-based desk assessment and (where undertaken) site inspection. Such conditions are typically influenced by input from the Forest Service Ecologist, responses from referral bodies (NPWS, Inland Fisheries Ireland, etc.) and third party submissions, and also the outcome of any relevant processes, including the Appropriate Assessment Procedure and the Acid Sensitivity



Protocol (regarding afforestation).

The above conditions form the basis for licensing issued for any regulated forest activity. Compliance is therefore mandatory and subject to follow-up inspections, which facilitates checks.

In addition to provisions under the Forestry Act, notwithstanding the issuing of the forestry licence itself, under the statutory powers available through Section 44(2) of the European Communities (Birds & Natural Habitats) Regulations 2011 (S.I.477 of 2011), the Department may at any time vary licence conditions as it deems appropriate, or revoke a licence if, in its opinion, the conditions attached to the licence have been breached or if the continuation of the licence would be liable to destroy, or significantly alter, damage or interfere with species and habitats for which a SAC or SPA has been designated. Should this situation arise, DAFM communicates in writing, anything determined pursuant to Section 44(2), to the holder of the licence.

## 7.13 Sanctions

Breaches detected by the above procedures may elicit sanctions, depending on their nature and extent. This may entail one or more of the following measures:

- The withholding of grant and premiums until appropriate remedial work is carried out to the satisfaction of the Department.
- The application of financial penalties under the Department's Forest Service penalty system.
- The revoking of forestry licences issued.
- Established sanctions under the DAFM's

Registered Forester system, including an increased site inspection regime applied to projects involving the Registered Forester in question, or his / her removal from the list of Registered Foresters and consequential exclusion from future work.

- Incidences of unlicensed afforestation, forest road construction and tree felling are pursued through the provisions set out in the Forestry Regulations and the Forestry Act 2014. These provisions include the reinstatement of the site to its original condition, and criminal prosecution.
- There are related sanctions under relevant environmental legislation including the European Communities (Birds & Natural Habitats) Regulations 2011, and the European Communities (Environmental Liability) Regulations 2008 (S.I.547 of 2008).

### 7.13.1 Penalties

DAFM operates a penalty system in relation to breaches of the terms and conditions of the various schemes it operates. Full details are set out in the Department's document *Forestry Scheme Penalty Schedules* (Edition 2/2015) (2015). As set out in that document, *"In the other more serious cases [other than minor remedial works], where remedial works are required, where terms or conditions are breached or are not adhered to (in accordance with the table of penalties and explanations of the penalties [presented]), a penalty will automatically be imposed."*

The scope of the penalty schedule is set out in the following extract from Section 1.8:

*Penalties may be applied for non-compliance at*



**Photo 7.2 Follow-up 'Form 2' inspections of projects funded under the various support schemes facilitate checks regarding compliance with environmental conditions (both general and specific) attached to the original approval.**

*each stage of the application process and will be based on the severity of breach and or frequency of its occurrence. A maximum penalty of €5000 will apply for each non-compliance or breach of scheme requirements in addition to recoupment of grants and premiums where required. Proportionality will apply where multiple offences have occurred and the total penalty amount will take in to consideration the cumulative nature of combined offences. These penalties are in addition to any penalties that may be imposed where an offence has been committed under any Act or Regulation.*

Failure to protect the environment (including water) can trigger penalties, as set out below (from Section 2.8):

*In any situation where failure to comply with environmental guidelines results in permanent or serious damage to the environment, particularly but not exclusively, in respect of archaeological sites and monuments, water or important habitats the scheduled penalty of no grant or premium payments will apply.*

In relation to (for example) the Afforestation Scheme, this can result in a 100% penalty (up to €5,000 for each non-compliance or breach of a scheme requirement), applicable to the grant and / or premium.

Typically, penalties in relation to environmental issues are triggered by the Forestry Inspector, following his / her site inspection. The applicant is regarded as the principal person or body upon which the penalty will be imposed.

## 7.14 Register of Foresters and Forestry Companies

Applications for forest licensing and for grant payment require the input of, and sign-off by, a Registered Forester. To this end, DAFM operates a Register of Foresters and Forestry Companies.

Forest Service Circular 16/2015 and accompanying document entitled *Terms and Conditions for the Registration of Foresters and Forestry Companies* set out the professional requirements that apply to such individuals under the current Forestry Programme 2014-2020. As set out, entry onto the Register is based on forestry qualifications, valid professional indemnity insurance of a stated value, and a declaration regarding compliance with (*inter alia*) the *Code of Best Forest Practice – Ireland*, the Department's environmental requirements and guidelines (including the *Environmental Requirements for Afforestation*), and the principles of sustainable forest management. In addition, Registered Foresters wishing to develop applications under NWS Establishment or NWS Conservation must complete the Native Woodland Scheme Training Course, run jointly by DAFM and Woodlands of Ireland.

The above document also sets out sanctions that can be applied where (for example) "*Negligent action contrary to the forestry standards and procedures leading to significant environmental or other impacts*" has occurred. These include a formal written warning and suspension from the Register for a period of months not normally exceeding 12 months. If triggered, this latter sanction can severely limit the level of forest-related business the individual can engage in, and represents a professional sanction



**Photo 7.3 Training in Annex 1 habitat recognition, undertaken in August 2017 and to be repeated in 2018, is mandatory for all Registered Foresters.**

that can be applied in the case of events arising from neglect, poor management, etc., which impact negatively on water quality and aquatic habitats and species. These sanctions may be applied in addition to any penalty applicable under individual schemes, as described above.

## **7.15 Training for Registered Foresters**

In addition to documents and circulars to the trade, the Department undertakes periodic training for Registered Foresters. Recent training events have been targeted at supporting the implementation of the Land Types for Afforestation procedure and the Environmental Requirements for Afforestation (including separate courses on Annex 1 habitat recognition and the use of environmental setbacks).

Such courses are delivered by personnel from the both the Inspectorate and the Administration sections of the Department, assisted by outside experts, as required. These events are highly effective in communicating key messages directly to Registered Foresters. Courses focused on water, hydrology, integrated catchment management, Freshwater Pearl Mussel, site management, protection and mitigation, and are envisaged for 2018 and beyond, targeted at Forestry Inspectors, Registered Foresters and Forestry Contractors.

## Section 8

# Land Types for Afforestation

The Land Types for Afforestation procedure, introduced in March 2016, rules out afforestation on a range of water-sensitive site types, thereby eliminating potential pressures on water associated with this land use change.

### 8.1 Overview

The DAFM document *Land Types for Afforestation* document<sup>1</sup> sets out the procedures to assess potential eligibility of land for support under the Afforestation Grant & Premium Scheme, based on the capability of that land to produce a sustainable commercial crop of timber. The productivity requirement under the Afforestation Scheme is that land must be capable of growing to full rotation a commercial timber crop of Sitka spruce of yield class 14 or greater, based on one standard application of phosphorus at establishment. (Sitka spruce is used as an indicator species, regardless of which species is being proposed.) The procedure uses ground vegetation to assess timber productivity, based on the Ellenberg indicator values system, which utilises the parameters R (Reaction) and N (Nitrogen), and Irish-based research linking scores to Sitka spruce productivity.

Regarding the potential eligibility of land for support under the Afforestation Scheme, three separate land types apply:

- SUITABLE LAND: GPC<sup>2</sup> 2-12
- SUITABLE LAND: GPC 1
- UNSUITABLE LAND

The *Land Types for Afforestation* document includes numerous photographs of sites deemed suitable and unsuitable on productivity grounds, to illustrate to landowners and Registered Foresters the likely outcome of the scoring procedure.

The land type UNSUITABLE LAND is described in Section 4 of the document. This land type excludes a range of site types from the Afforestation Scheme on timber

productivity grounds, due to infertile conditions (as indicated by vegetation) and / or other inhibiting site factors. Many of these site types are highly sensitive from a water perspective (e.g. Annex 1 habitats such as wet heath and blanket bog within the catchment of HES objective water bodies), and their exclusion effectively eliminates possible pressures on water associated with afforestation.

UNSUITABLE LAND includes the following:

- Sites which, for any reason, are not capable of growing to full rotation a commercial timber crop of Sitka spruce of yield class 14 or greater, based on one standard application of phosphorus at establishment.
- Sites with a R+N score of 5.3 or less (with the exception of sites that score between 5.0 to 5.3 and which have an average peat depth of less than 50 cm and which are capable of being suitably drained – such sites fall under SUITABLE LAND: GPC 1).
- Sites over 300 metres above sea level in the west of Ireland, and over 400 metres above sea level in the east of Ireland.
- Sites that cannot be adequately drained, and sites that are prone to flooding.
- Sites with rock outcrop and associated shallow soils in excess of 25% of the area.
- Severely exposed sites and some sea-facing locations.
- Former and existing industrial cutaway peatlands.
- Sites with shell marl within 70 cm of the soil surface.
- Sites where it is not possible or practical to access or construct forest roads to facilitate the

<sup>1</sup> Originally released in March 2016 under Circular 03/2016, and subsequently reissued in October 2017 (see Circular 01/2018), with amendments made to field methodology.

<sup>2</sup> 'GPC' stands for Grant & Premium Category. Twelve separate GPCs are available under the current Afforestation Grant & Premium Scheme. Each GPC is designed to promote a certain type of forest cover. For example, GPC3 supports Sitka spruce plus 15% diverse conifers / broadleaves, GPC9 supports certain types of native woodland, and GPC11 supports agro-forestry). Each GPC has its own grant and premium level and set of GPC rules.



movement of timber to a suitable public road network.

- Private gardens.
- Golf courses. (However, areas that are not an integral part of the playing course can be considered for afforestation on application.)
- Lands excluded for environmental reasons - see the DAFM Environmental Requirements for Afforestation.

Photos 8.1 to 8.3 illustrate examples of sites that fall under the land type UNSUITABLE LAND and therefore excluded from the Afforestation Scheme.

(Note, the *Land Types for Afforestation* document refers to timber productivity only. Environmental issues are considered by the DAFM as part of the assessment process, and the Environmental Requirement for Afforestation apply. Sites considered to be productive may not go on to be approved, due to environmental constraints subsequently identified.)

**Photo 8.1 Site with purple moor-grass and ling heather ('UNSUITABLE LAND').**



**Photo 8.2 Wet heath with ling heather, cross-leaved heath, hare's-tail cottongrass and purple moor-grass ('UNSUITABLE LAND').**



**Photo 8.3 Site with exposed rocky outcrops ('UNSUITABLE LAND').**



## Section 9

# Environmental Requirements for Afforestation

The Environmental Requirements for Afforestation, released in December 2016, consolidate and update environmental safeguards relating to afforestation previously contained in DAFM ‘guidelines’ for water, archaeology, landscape and biodiversity. The Requirements enhance baseline protection regarding water, with the water setback representing an important feature.

### 9.1 Overview

Following consultation<sup>1</sup>, the DAFM published the *Environmental Requirements for Afforestation* on the 6<sup>th</sup> December 2016 (see Circular 14/2016 and amending Circular 12/2017). The Requirements came into force with immediate effect in relation to all afforestation licences (with or without grant approval) issued from that date onwards.

The overall aim of the Environmental Requirements for Afforestation is to ensure that the establishment of forests is carried out in a way that is compatible with the protection and enhancement of the environment, in relation to water quality, biodiversity, archaeology, landscape and other environmental

receptors. Regarding water, the focus is on reducing and eliminating sources of pollution, and preventing the creation of pathways to receiving waters.

Any licensing (with or without grant aid) for afforestation<sup>2</sup> issued by DAFM under S.I.191 of 2017 is conditional on adherence to the measures set out in the Requirements, in addition to any site-specific conditions attached and to the various standards and procedures set out in the *Forestry Standards Manual* (DAFM, 2015). Where a parallel approval for grant aid is been issued under the Afforestation Scheme, the terms and conditions of that scheme also apply. (Note, any site presented for an afforestation licence (with or without grant aid) must satisfy the productivity requirement set out in the *Land Types*



**Photo 9.1 Adherence to the Environmental Requirements for Afforestation is a condition of all afforestation licences (with or without grant aid) issued by DAFM.**



for *Afforestation* document, and this eliminates many water-sensitive areas from this land use change. See Section 8 for details.)

The Environmental Requirements for Afforestation consolidate into a single document existing safeguards previously contained within the following Forest Service environmental 'guidelines': Forestry & Water Quality Guidelines; Forestry & Archaeology Guidelines; Forestry & the Landscape Guidelines; and Forest Biodiversity Guidelines. They also incorporate more recent developments in relation to environmental regulation, research and changes in forest practices, effectively enhancing the baseline level of protection regarding (*inter alia*) water during afforestation and early forest development. The use of the word 'requirements' in the title was selected over 'guidelines', in order to underline the mandatory nature of the measures therein.

The Environmental Requirements for Afforestation are set out in three stages that reflect project development, i.e. pre-application design, site works, and ongoing site management. While some overlap exists, these three stages reflect the typical sequence of activities undertaken by an Applicant and her / his Registered Forester, and the corresponding sequence of mandatory environmental measures that apply, throughout afforestation up until the end of the premium period (or 15 years, for non-grant aided forests).

In addition to established practices regarding site cultivation and other inputs, key safeguards in relation to water include the following:

- The requirements under the Habitats Directive, the Water Framework Directive, and the European Communities (Sustainable Use of Pesticides) Regulations 2012 (S.I.155 of 2012) are highlighted.
- The Requirements introduce 'relevant watercourses', 'hotspots' and 'abstraction points' alongside aquatic zones, as water features requiring setbacks. The following definitions apply (see amending Circular 12/2017):
  - Aquatic zone: "Any natural river, stream of lake (but not an artificial drain) illustrated on an Ordnance Survey 6 inch map. (Note, the EPA water layer on iNET may not capture all aquatic zones onsite.)"
  - Relevant watercourse: "Any other watercourse that has the potential to act as a pathway for the movement of significant amounts of sediment and/or nutrients

from the site to an aquatic zone. Relevant watercourses are often artificial, and include existing drains and channels and other potential pathways that may contain flowing water during and immediately after rainfall. Note, not every watercourse is a 'relevant watercourse'. For example, a well-vegetated agricultural drain or ditch draining a small area of moderately sloping ground may not be a relevant watercourse, as there will be little or no potential for it to carry significant amounts of sediment/nutrients."

- Hotspot: "An area that is a potential source of sediment and/or nutrient loss during afforestation works and/or future harvesting. Examples include pockets of soft wet ground, flushes and springs."
- Abstraction point: "An abstraction point of any surface water, borehole, spring or well used for drawing water for human consumption in a water scheme."
- Regarding aquatic zones, the Requirements specify water setback width based on slope leading to the watercourse, and whether or not the site is on peat soil or within the catchment area of a High Ecological Status (HES) objective water body. Setback widths are details in Table 9.1.
- Each newly-introduced water feature is assigned a specific setback: 5 metres for relevant watercourses; 5 metres for hotspots; and 20 metres for abstraction points.
- The Requirements introduce a mechanism to reduce the extent of water setbacks on peat soils and on sites within the catchment area of HES objective water bodies, through the inclusion of native woodland plots. As per Table 5 of the Requirements document, the wider setback required for such sites "can be reduced by 10 metres (from the landward side) if an appropriate GPC9 or GPC10 plot is included instead of this 10 m strip. For example, where a 25 m setback applies, this can be reduced to 15 m by applying the following sequence: aquatic zone → 15 m unplanted water setback → GPC9 or GPC10 plot. Standard requirements for GPC9 & GPC10 plots apply [...]" As set out in the Section 13, this use of NWS Establishment can yield significant ecosystem services regarding (*inter alia*) water, and encourages the integration of native woodland into standard afforestation projects.
- The Requirements specify a more nuanced

<sup>1</sup> See [www.agriculture.gov.ie/forests-service/public-consultation/environmental-requirements-for-afforestation/](http://www.agriculture.gov.ie/forests-service/public-consultation/environmental-requirements-for-afforestation/)

<sup>2</sup> Under the Forestry Act 2014, 'afforestation,' is "the conversion of land to a forest", a 'forest' meaning "land under trees with (a) a minimum area of 0.1 hectare, and (b) tree crown cover of more than 20 per cent of the total area, or the potential to achieve this cover at maturity, and includes all species of trees; [...]"



**Photo 9.2, 9.3 & 9.4 Water features defined in the Environmental Requirements for Afforestation include (clockwise from top left): aquatic zones; relevant watercourses; and hotspots.**

**Also included, but not illustrated, are abstraction points.**



design of the water setback, to enhance its value regarding water protection, biodiversity and landscape: *“Widen the water setback at various points along its length, to include adjoining wet hollows and other low-lying areas where water gravitates towards as it drains from the land [i.e. where site hydrology and slope increase the vulnerability of receiving waters]. Based on the immediate landform / topography, vary the setback to avoid artificial lines and to create a naturally undulating forest edge.”*

- The Requirements contain improved operational safeguards for site development works, addressing drainage and cultivation, fertiliser application, vegetation management, the preparation, storage and use of potentially hazardous material, water crossings, site

management, and contingency measures.

- The European Communities (Sustainable Use of Pesticides) Regulations 2012 (S.I.155 of 2012) and Good Plant Protection Practice are also integrated. For example, Table 7 of the Requirements sets out Schedule 2 of S.I.155 of 2012, which itself defines pesticide (including herbicide) exclusion zones around different types of abstraction points for water for human consumption.
- The Environmental Requirements for Afforestation are also accompanied by a Supporting Document (in preparation), which will contain a Potential Water Risk Scenario table and a template Water Management Plan, the latter to be used where stipulated by DAFM where particular concerns exist regarding water.

Table 9.1 Required water setback widths for aquatic zones.

Slope leading to the aquatic zone (applied as appropriate, where slope varies over the site)	Setback width	Setback width for peat soils or if within the catchment of a HES objective water body
Moderate (even to 1-in-7 / 0-15%)	10 m	20 m
Steep (1-in-7 to 1-in-3 / 15-30%)	15 m	25 m
Very steep (1-in-3 / >30%)	20 m	25 m

## 9.2 Water setback

A key tool embedded in the Environmental Requirements for Afforestation is the use of setbacks between the forest canopy and associated operations, and a range of environmental receptors such as water, habitats, archaeology, public roads, utilised buildings and landscape. The use of environmental setbacks in this way is well-established, and the Requirements consolidate related specifications into two separate tables: Table 5 ('Environmental setback type and purpose, and corresponding minimum setback distance and additional design requirements') and Table 6 ('Treatment of environmental setbacks during site works').

The specifications regarding water setbacks are described below. Also see Figure 9.1.

### 9.2.1 Purpose

The purpose of the water setback within the context

of afforestation is to create, at the very outset of site development, an intact buffer of natural vegetation positioned between defined water features (aquatic zones, relevant watercourses, hotspots and drinking water abstraction points) and the forest crop and associated operations, in order to protect water quality and aquatic ecosystems from possible sediment and nutrient runoff and contamination, at afforestation and throughout the remainder of the forest rotation. In effect, the water setback breaks the 'pathway' between the source of possible pollution and the receiving watercourse.

The water setback must be left largely undisturbed, to enable it to develop into a well-vegetated area comprising a mosaic of natural ground vegetation and (potentially) pockets of native scrub. It is a permanent feature to be left *in situ* throughout the rotation and into the next. Its purpose is to filter out sediment and nutrients from overland flow off the site, and to create distance between receiving waters and the various forestry operations and inputs that may potentially impact on that natural resource.

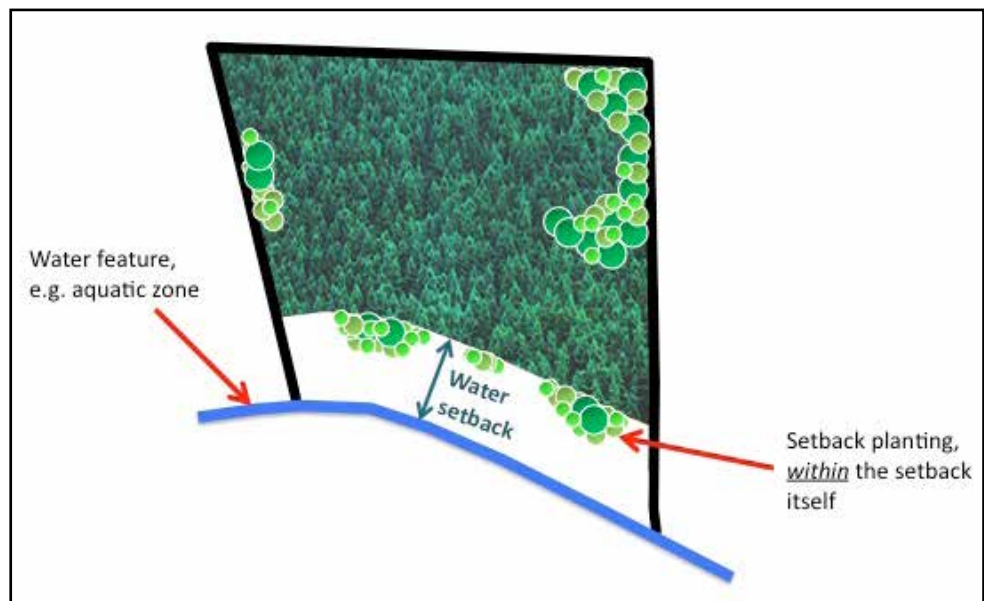


Figure 9.1 Schematic showing a typical water setback on an afforestation site.



**Photo 9.5 A typical water setback on an afforestation site, at establishment.**



All new drains installed as part of the afforestation project must terminate in sediment traps outside the water setback. Furthermore, a water setback must not be used for any forest operation or for any purpose that could compromise its protective function or damage the aquatic feature being protected. As a general rule, all afforestation operations (including cultivation / drainage, fencing, planting, fertiliser and herbicide application, and the on-site storage of fertiliser, fuel, etc.) must be excluded - see Table 6 ('Treatment of environmental setbacks during site works'). Machine traffic must also be excluded, apart from limited passage with prior DAFM agreement (e.g. for once-off fencing of a property boundary).

Water setbacks are eligible as Areas for Biodiversity Enhancement (ABEs), alongside other environmental setbacks for retained habitats, archaeology, public roads, etc. The function of the ABE is to "conserve and encourage the development of diverse habitats, native flora and fauna, and overall biodiversity on the site throughout the rotation." Furthermore, "In addition to their primary setback or management function, [water setbacks] will have an intrinsic biodiversity value within the emerging forest, both as open habitat and through the development of the 'edge effect' between the forest canopy and the open space. This edge effect can be significantly enhanced with a small level of additional design." Projects under the Afforestation Scheme can include up to 15% ABE without any reduction in grant and premium payments - see Circular 16/2017 for details.

The ecosystem function of water setbacks is further enhanced through 'forest edge planting' and 'environmental setback planting'. The specifications for each are as follows, as per the Requirements document:

#### Forest edge planting

*Forest edge planting comprises the planting of single, small groups and irregular belts of native species (e.g. birch, rowan, oak and Scots pine, as site conditions allow) along the outer edge of conifer GPC plots, typically those adjoining environmental setbacks.*

*This measure enhances the landscape and biodiversity value of the forest edge.*

*Where applied, forest edge planting must not encroach into the environmental setback itself, in order to maintain the necessary setback width. Forest edge planting forms part of the GPC plot.*

*Where applied as single trees, ensure that the tree is adequately protected against grazing, using a standard tree shelter or a deer guard, as necessary.*

*Where applied as groups, adopt a robust planting design using trees with compatible growth rates, planted with necessary protection against grazing. Group size may vary from 5-10 trees to 50 trees and over, depending on landscape scale. In deer-prone areas, wider spacing and the use of deer guards may be appropriate - specify details on the Certified Species Map.*

#### Environmental setback planting

➤ *Environmental setback planting comprises the planting of single, small groups and irregular belts of native species (e.g. birch, rowan, oak and Scots pine, as site conditions allow) within an environmental setback.*

➤ *This measure enhances the environmental*

*role of the setback itself, [...]*

- *Where applied as single trees, ensure that the tree is adequately protected against grazing, using a standard tree shelter or a deer guard, as necessary.*
- *Where applied as groups, adopt a robust planting design using trees with compatible growth rates, planted with necessary protection against grazing. Group size may vary from 5-10 trees to 50 trees and over, depending on landscape scale. In deer-prone areas, wider spacing and the use of deer guards may be appropriate - specify details on the Certified Species Map.*
- *Environmental setback planting should not exceed 20% of the area of the setback.*
- *Note, setback planting may be counter-productive within setbacks likely to be important for deer management, as it may obstruct sight lines.*
- *The following applies specifically in relation to planting within water setbacks:*
  - *Strategic planting within water setbacks may help to deliver direct in-stream ecosystem services such as bank stabilisation, cooling / shading, and food drop into the aquatic ecosystem.*
  - *Pursue water setback planting only where agreed in advance with Inland Fisheries Ireland and (where relevant) NPWS.*
  - *Limit to single or small groups (5-10 trees) of native riparian species (birch, willow, and occasional alder and pedunculate oak) at strategic points within the water setback.*
  - *Such trees should be pit-planted and protected from grazing, as necessary.*

The Registered Forester must ensure that all operators are aware of the importance of any environmental setbacks (including water setbacks) required onsite, their location and extent, and what is and is not permitted within them. As set out in the Requirements, “An environmental setback must not be used for any forest operation or for any other purpose which could compromise its protective function or which could damage the environmental feature or sensitivity being protected.”

Under the Forestry Scheme Penalty Schedules (DAFM, 2015), failure to adhere to the required environmental setbacks can incur significant penalties.

Registered Foresters are encouraged to mark out water setbacks prior to operations commencing, to avoid incursions.



**Photo 9.6 Suitable native trees planted singly or in groups within the water setback must be protected against grazing. Tree guards can be used to protect against grazing animals, including deer.**

### 9.2.2 Ongoing maintenance

The treatment of these setbacks during Stage 3: Ongoing Management, up to year 15, is as follows:

- *The intended protective function of these setbacks must be maintained throughout this stage of the forest’s development. This generally entails leaving these areas undisturbed and allowing natural ground vegetation to develop. Management may be required in some cases, e.g. to control woody growth within a setback adjoining a dwelling, to retain an important view or to prevent fire risk.*
- *Monitor the development of forest edge planting and environmental setback planting (where undertaken) and maintain trees as appropriate (e.g. vegetation management, replacement of mortalities, adjustment and eventual removal of tree shelters) until the trees are established and free of grazing pressure.*



- *Adhere to the specifications set out in Table 6 regarding permitted operations within setbacks.*
- *The type of natural vegetation that will emerge within the various setbacks will vary according to soil, elevation, aspect, grazing pressure, etc. On most sites, a mosaic of natural ground vegetation and pockets of woody growth will typically emerge throughout this stage.*
- *Monitor and apply appropriate control to prevent the colonisation of setbacks by rhododendron and other exotic invasives. This requirement also applies to paths required in relation to 'designated' archaeological sites and monuments and 'designated' buildings and structures, to maintain access by archaeological officials.*
- *The colonisation of the water setback with exotic invasives, in particular, Japanese knotweed, Himalayan balsam and rhododendron, is of significant concern regarding water quality. Where best practice involves herbicide use, consult with Inland Fisheries Ireland and other relevant bodies in advance. Controlling such species is difficult and expensive, and often requires a wider catchment approach for progress to be sustained.*

### 9.3 Training

As set out in Section 7.15, the Forest Service held training in November 2017 for Registered Foresters, to support the implementation of the Environmental Requirements for Afforestation. These sessions focused on the various environmental setbacks prescribed (including those for water) and the calculation of ABEs for grant and premium calculation purposes. See Circulars 16/2017 and 01/2018.

## Section 10

# Reforestation Objectives & Permanent Forest Removal

The DAFM document *Felling & Reforestation Policy (2017)* sets out a series of Reforestation Objectives, each with a particular application and set of prescriptions. Two of these, 'Reforestation for Continuous Cover Forest' and 'Reforestation for Biodiversity & Water Protection', are highly relevant to the site-specific restructuring of existing forests, to protect water.

The same document also clarifies situations where permanent tree removal may be acceptable in relation to protected habitats, species and water.

### 10.1 Reforestation Objectives

The DAFM document *Felling & Reforestation Policy*, published in May 2017 (see [www.agriculture.gov.ie/forests-service/tree-felling/](http://www.agriculture.gov.ie/forests-service/tree-felling/)) to coincide with the commencement of the Forestry Act 2014 by S.I.191 of 2017, sets out a series of Reforestation Objectives, to clarify the intentions of the forest owner in relation to the subsequent rotation after clearfell. These Reforestation Objectives are as follows:

- Conifer Forest predominantly for Wood Production (abbreviated as 'CF')
- Broadleaf Forest predominantly for Wood Production (BF)
- Mixed Forest predominantly for Wood Production (MF)
- Continuous Cover Forestry (CCF)
- Reforestation for Biodiversity & Water Protection (BIO)
- Other (as specified in application) (Other)
- Forest Removal (DEFOR)

Each Reforestation Objective is accompanied by a set of prescriptions (silvicultural and other) DAFM requires for each objective.

A forest owner wishing to apply for a Felling Licence is required to include in the application form and the accompanying map, the Reforestation Objective(s)

s/he is proposing to pursue for all or parts of the site for the next rotation, to a scale of 0.1 ha. As part of its assessment of the application, DAFM then evaluates the suitability of the Reforestation Objective(s) selected, thus informing decisions surrounding referrals, Appropriate Assessment, etc.

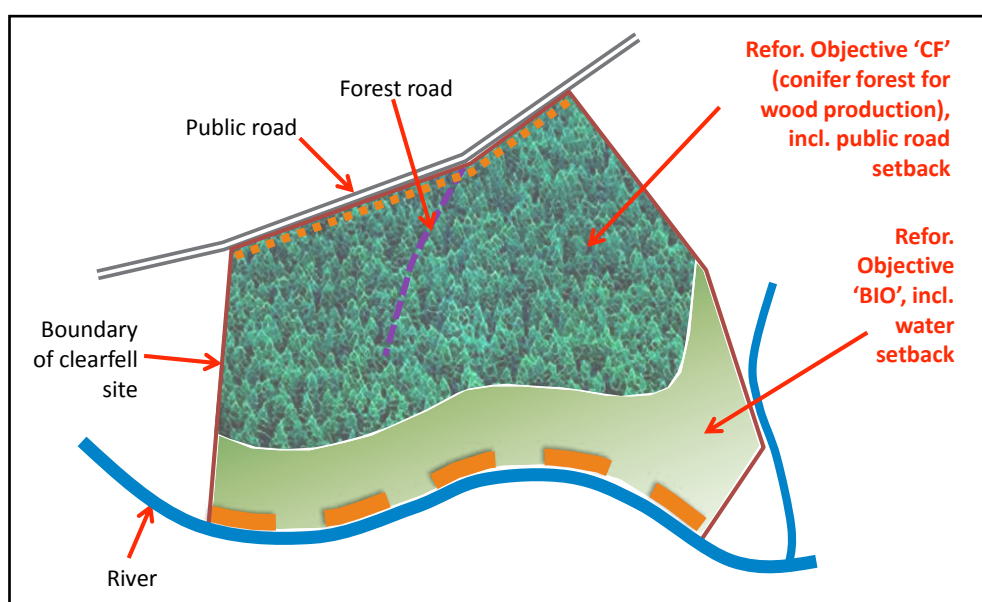
The Reforestation Objectives relate primarily to the silvicultural management needed to create a forest capable of 'delivering' the products and services required in the future, e.g. commercial sawlog, onsite biodiversity and wider habitat linkage, landscape amelioration, water protection, amenity. Reforestation Objectives can be combined on individual sites, for example, to differentiate between areas where different types of reforestation are being proposed (see Figure 10.1).

The Reforestation Objectives 'Reforestation for Continuous Cover Forestry' (CCF), 'Reforestation for Biodiversity & Water Protection' (BIO) and 'Forest Removal' (DEFOR) have particular relevance in relation to the protection and enhancement of water quality and aquatic ecosystems. This is demonstrated by the following specifications for 'CCF' and 'BIO', drawn from the *Felling & Reforestation Policy* document.

**Photo 10.1** The Reforestation Objectives framework facilitates the introduction of appropriate semi-natural areas along sensitive water bodies, within the subsequent forest rotation. River Licky, Co. Waterford.



**Figure 10.1** Schematic illustrating how different Reforestation Objectives can be combined to achieve appropriate forest restructuring, post-clearfell.



## 10.2 Reforestation for Continuous Cover Forest (CCF)

### 10.2.1 Appropriate applications

- [The 'CCF' reforestation objective] applies to situations where reforestation of the clearfelled site is intended to create permanent forest cover (as opposed to a subsequent rotation ending in another clearfell).
- Reforestation species can be conifer and / or broadleaved. Any mixtures used must be silviculturally compatible.
- This objective is generally suitable for sites where timber production will be sought but where other forest objectives (e.g. amenity, biodiversity, water protection, landscape)

favour a continuous cover approach.

- This objective may be suitable where reforestation is aimed at replacing an even aged conifer plantation with high forest native woodland, for example, where water sensitivities are high (e.g. within freshwater pearl mussel catchments or alongside high status objective water bodies at risk of decline due to forestry, under the Water Framework Directive).

### 10.2.2 Prescription

- Where planting is undertaken [under the 'CCF' reforestation objective], the minimum initial planting density required is 2,500 stems / ha (at 2 m x 2 m spacing) for conifers and

**Photo 10.2 Reforestation with native woodland, to be managed under CCF (i.e. Reforestation Objective 'CCF'). Glenree, Co. Wicklow.**



*mixtures, and 3,300 stems / ha (at 2 m x 1.5 m spacing) for broadleaves.*

- *Natural regeneration (NR) may also be acceptable as a component of reforestation under this objective, but only where viable (see Section 4.10 [of the Felling & Reforestation Policy document]). Where NR is being proposed, management details are required regarding safeguards (i.e. maintenance and supplementary planting, if needed) to achieve the required stocking rate at Year 6 (as defined below), should NR prove inadequate.*
- *Appropriate vegetation management and filling-in are required to achieve a minimum of 90% stocking of free-growing trees evenly distributed throughout the plot by Year 6 after planting and / or initial site preparation for NR.*
- *Where applicable, the reforestation plot is to also include setbacks in relation to watercourses, archaeological features, dwellings, etc. – Section 4.9 [of the Felling & Reforestation Policy document].*
- *Note, projects under the Native Woodland Conservation Scheme must meet specific scheme requirements in relation to (inter alia) stocking density and the origin of planting material. See scheme documentation [i.e. DAFM (2015)] for further details.*

### 10.3 Reforestation for Biodiversity and Water Protection (BIO)

#### 10.3.1 Appropriate applications

- *[The 'BIO' reforestation objective] applies to situations where the objective is to create a*

*mixture of native woodland and open habitat, predominantly for biodiversity or water protection. This objective involves the creation of woodland cover comprising native broadleaf species and Scots pine, through:*

- *planting,*
- *planting supplemented by natural regeneration, or*
- *natural regeneration alone.*
- *Note, Objective BIO is generally limited to plots no greater than 1 ha in size, and can be used adjoining unplanted setbacks installed alongside watercourses, in order to reinforce the protection of water. However, it can be applied at a larger scale in situations where water sensitivities are high (e.g. within freshwater pearl mussel catchments or alongside high status objective water bodies at risk of decline due to forestry, under the Water Framework Directive).*
- *In general, wood production is not a management objective under BIO. However, small scale wood production may be appropriate, e.g. the occasional felling of individual trees by chainsaw, for domestic firewood use.*
- *Objective BIO may be pursued where specific case-by-case justification is presented to, and accepted by, the Forest Service.*

#### 10.3.2 Prescription

- *Felling Licence application [proposing the 'BIO' reforestation objective] to be accompanied by a management plan and map setting out the*



*justification for selecting this objective, site preparation and fencing details, the proposed species composition and details of the future management regime (including provisions for natural regeneration – see below).*

- *Where planting is undertaken, the minimum initial planting density required is 1,100 stems / ha, planted at 3 m x 3 m spacing, using planting stock derived from sources within Ireland.*
- *Natural regeneration may also be acceptable as a component of the reforestation, but only where viable – see Section 4.10 [of the Felling & Reforestation Policy document]. Where NR is being proposed, the required management plan must detail safeguards (i.e. maintenance and supplementary planting, if needed) to achieve the required stocking (defined below), should NR prove inadequate.*
- *Projects may include measures to reinstate natural hydrological conditions onsite.*
- *Appropriate vegetation management and filling-in are required to achieve a minimum of 90% stocking of free-growing trees evenly distributed throughout the plot by Year 6 after planting and / or initial site preparation for NR.*
- *Where applicable, the reforestation plot is to also include setbacks in relation to watercourses, archaeological features, dwellings, etc. – Section 4.9 [of the Felling & Reforestation Policy document].*
- *Note, projects under the Native Woodland Conservation Scheme must meet specific scheme requirements in relation to (inter alia) stocking density and the origin of planting material. See scheme documentation for further details.*

## 10.4 Pesticide usage on Coillte reforestation sites

The use of pesticides (either as insecticides or herbicides) in forestry is typically limited to two specific points in the overall forest cycle, i.e. afforestation and reforestation. It has been estimated that this usage accounts for less than 1% of pesticides applied nationally.

Insecticides are generally used to protect establishing trees against Pine Weevil, by pre-treating ('dipping') young plants in the nursery and / or by spot application to trees on susceptible reforestation sites, where warranted. Herbicides are generally spot-applied to control competing vegetation during the first few years after planting on both afforestation and reforestation sites, as needed. Other forestry-related uses of herbicide include stem injection and stump treatment to tackle unwanted woody vegetation, e.g. rhododendron or non-native sycamore within a native woodland restoration site.

Mandatory Forest Service 'guidelines' relating to water quality and forest protection set out various environmental safeguards governing when, where and how pesticides are to be used in forests. A key measure is the exclusion of pesticide use within defined water setbacks (or 'aquatic buffer zones'), unless undertaken with the explicit agreement of relevant bodies to achieve specific environmental aims, e.g. stem injection to tackle a bankside infestation of rhododendron.

Regarding Coillte's use of pesticides, only two of the pesticides licensed by the Pesticide Registration & Controls Division (DAFM) for forestry are used by Coillte: cypermethrin (insecticide) and glyphosate (herbicide). A Forest Stewardship Council (FSC)



**Photo 10.3** Where viable, natural regeneration can form part of Objective 'BIO'. Glengarriff, Co. Cork.

derogation on the use of cypermethrin will end in March 2021 and no further derogation will be provided. After that time, cypermethrin cannot be used within FSC certified forests, both Coillte and private.

Coillte is also striving to further reduce pesticide application. The amount of pesticide applied within Coillte forests since 1999 has dropped by over 70%, due to changes in the types of pesticides used, better formulations and better monitoring programmes. Such measures have significantly reduced the potential risk of pesticides applied with a Coillte forest having an impact on water quality. Coillte continues to review and evaluate non-chemical methods of pest and vegetation management and will continue to use alternative strategies such as site cultivation, the use of vigorous plants, early entry into restock areas ('hot planting'), stump removal and manual vegetation control on certain sites.

## 10.5 Policy on permanent forest removal

The DAFM document *Felling & Reforestation Policy* (2017) sets out the current policy regarding felling and reforestation in Ireland. As a general policy, in the interests of maintaining and expanding Ireland's forest estate, replanting – either on the land where the felling has taken place (typically) or on alternative land – is a standard condition of any Felling Licence issued. However, Section 5 of the document describes scenarios where permanent tree removal may be considered, including a scenario relating to protected habitats, species and water. The relevant extracts are as follows:

**Photo 10.4 DAFM's Felling & Reforestation Policy sets out situations where permanent forest removal may be acceptable, due to overriding environmental considerations.**

**These primarily focus on inappropriately-sited forests where reforestation is wholly unsuitable due to, e.g. acute water sensitivity.**



## 5.1 Overview

*The Forest Service promotes sustainable forest management as a central principle of Irish forest policy, whereby forests are managed to provide economic, social and environmental benefits on a sustainable basis for both current and future generations. The permanent removal of trees and forests (without reforestation) where a felling licence is required under the Forestry Act 2014 may also be considered under exceptional circumstances. This section sets out the main scenarios whereby the permanent removal of trees and forests may be considered acceptable, and whether or not alternative reforestation is required. However, readers should note that felling licence applications proposing the permanent removal of trees and forests are assessed on a case-by-case basis and considered on their own individual merit.*

## 5.2 Overriding environmental considerations

*[...], certain natural habitat and species of Community interests are protected under the Habitats and Birds Directives. In certain situations, trees and forests may be incompatible with the conservation of protected Annex habitats and species at a site and / or national level, and deforestation may be considered. For example, the continuation (via reforestation) of forest cover on a particular site within an SAC may be deemed incompatible with the maintenance and restoration of a particular habitat for which that SAC was designated. Similar situations may also exist under the Water Framework Directive, where provisions under the Reforestation Objectives CCF and BIO may not suffice. In such*

*situations, permanent forest removal may be considered by the Forest Service, on application. [...]*

*Deforestation will be viewed as an option for such sites where the conversion of the site to an 'open habitat' is key to benefiting the habitat or species in question. For other habitats and species, deforestation may not be strictly required. An alternative may be to use low density native woodland planting to create an open mosaic of woodland and open habitats. Each application will be assessed by the Forest Service on a case-by-case basis.*

*Felling licence applications must be accompanied by a management plan and map setting out the justification for deforestation and details of the future management proposed for the site, including provisions for the control of natural regeneration. [...], in cases where the Forest Service accepts deforestation under this scenario, alternative afforestation and the refunding of grants and premiums are not required.*



# Section 11 Research & Demonstration

Recent and ongoing research and demonstration projects are directly influencing policy and practice regarding forests and water.

## 11.1 Overview

The DAFM Research & CODEX Division operates three research programmes relating to food, agriculture and forestry. The latter is called the Programme of Competitive Forest Research for Development (CoFoRD Programme). The document *Forest Research Ireland FORI: Meeting the needs of Ireland's forest sector to 2017 and beyond, through research and innovation* (DAFM, 2014) helps guide the forest research agenda. The purpose of this document – compiled with input from the sector-led COFORD Council Forest Research Working Group (which included NPWS and the EPA) – was to capture specific policy, knowledge and production-focused research topics and ideas relevant to the needs of forest stakeholders. The research programme allows significant scope for water-related research, as described in Forest Research Ireland under (for example) Theme 3.6 Ecosystem Services:

*Forests produce wood for the forest owner and for industry. For society, especially a society that pays to address market failures, forests are*

*generally seen more from the wider benefits people obtain from forest ecosystems or their ecosystem services – including biodiversity, climate change mitigation and leisure values. Research can improve the delivery of ecosystem services, value them and help society make choices between sometimes conflicting outputs. Stating that Research can improve the delivery of ecosystem services, value them and help society make choices between sometimes conflicting outputs.*

This section sets out key research needs regarding ecosystem services, with sub-section 3.6.3 focusing specifically on water:

- *Examine forest planning and design to maximise contribution to water quality and quantity, enhancement of aquatic ecosystems and regulation of stream flows, soil stabilisation, habitat creation, reduced surface water run-off and shading as potential benefits of forests.*
- *Examine the reasons why there has been no detected increase in lake pH or a*



Figure 11.1 The DAFM Research & CODEX Division's document *Forest Research Ireland* sets out the current forest research agenda.



decrease in labile aluminium in forested catchments, notwithstanding the decline in sulphur emissions and concentrations in the atmosphere. The work could include examination of the role of forestry, marine sulphates and organic acids in the recovery of lakes from acidification.

- Examine the effect of broadleaves, conifers and moorland vegetation on atmospheric deposition, leaching and acidification of waterways.
- Examine the role of native woodland in peatland catchments including evaluation of its contribution to biodiversity, the effect of shading on watercourses and its potential in buffer zones to address issues including erosion and leaching of dissolved organic carbon, nutrients and suspended solids within the catchments.
- Consider the role of trees in reducing infiltration of rainfall via evapotranspiration and assess, with a view to guiding best practice, the role of forests and forest management, impacting on flow rates in catchments during dry spells or extreme rain events affecting water availability or flood risk.
- Examine the effectiveness of the use of broadleaf plantations as buffer zones, planting in critical source areas or hotspots to minimise nutrient losses, particularly phosphorus loss. Consider the role of planting of tree belts on farms with the potential to provide this function and also contribute to the on-farm carbon balance.
- Investigate the impact of larger scale (>10 ha) clearfells on a range of different sites. Research should focus on harvest practice and related water, nutrient and sediment movement and should include impact of road building.
- explore the range of eco-system services which forestry, as a landuse, can deliver in relation to water quality and related habitats and species (e.g. buffering, sediment and nutrient interception, bank stability, the restoration of natural hydrology; water temperature regulation, the provision of appropriate in stream inputs, downstream flood abatement, etc.; and
- set out mechanisms to deliver these eco-system services [for example, through the restructuring of existing forests, the creation of new forests and woodlands (including native riparian woodland), and the strategic deployment of measures, based on water body status]; and
- increase awareness of these eco-system services and measures amongst Bodies coordinating and inputting into meeting Ireland's obligations under the WFD, to ensure closer integration of the targeted deployment of relevant forestry measures into water policies and plans.

The 2014-15 Competitive Call for Research Proposals included scope for a long-term research initiative under the following two headings:

#### **Forest harvesting on sensitive sites (4.1)**

- Examine issues relating to clearfelled peatland forests including: options to prevent loss of nutrients to water from brash breakdown; re-seeding with native grasses immediately after harvesting to capture phosphorus; options for future management including the non-replanting of these areas; the occurrence / use of natural regeneration; rhododendron control, and an economic evaluation of alternatives to reforestation.
- Forest harvesting on sensitive sites will continue to be a significant issue for the sector in the years ahead. Outcomes from the research will be expected to continue to focus on and inform policy and practice needs.

#### **Forests for water (4.2)**

- Examine forest planning and design to maximise contribution to water quality and quantity, enhancement of aquatic ecosystems and regulation of stream flows, soil stabilisation, habitat creation, reduced surface water run-off and shading as potential benefits of forests.
- Forests have significant potential to positively impact on water and generate related and valuable ecosystem services. Outcomes from the research will inform policy and practice.

## **11.2 DAFM's Competitive Call for Research Proposals**

The DAFM Research & CODEX Division ([www.agriculture.gov.ie/research/](http://www.agriculture.gov.ie/research/)) included research into forests and water in the Competitive Call for Research Proposals issued in both 2013 and 2015, as detailed below.

The 2013 call included scope for a project on 'Forestry and the Water Framework Directive' (D.4.1), described as follows:

*A Small Project examining the opportunities for forestry, as a landuse, to contribute proactively to meeting Ireland's obligations under the Water Framework Directive (WFD). The study will:*

Although not awarded, the inclusion of the above research opportunities within the 2013 and 2015 calls demonstrate DAFM's increasing focus on the protection of water and the delivery of related ecosystem services, as set out in the *Forest Research Ireland* document.

The current (2017) Competitive Call for Research Proposals included the following scope for water-related research under C.6.3 Ecosystem Services: Forests and Water, to examine opportunities for forestry to contribute proactively to meeting Ireland's obligations under the 2<sup>nd</sup> cycle of the WFD:

*The proposal should include the following aspects:*

- *Explore the range of ecosystem services which forestry, as a land use, can deliver in relation to water quality and related habitats and species (e.g. buffering against impacts for adjacent land use, sediment and nutrient interception, bank stability, the restoration of natural hydrology; water temperature regulation, mitigation against surface water acidification, the provision of appropriate in-stream inputs, flood mitigation, etc.); and*
- *Set out mechanisms to deliver these ecosystem services [for example, through the restructuring of existing forests, the creation of new forests and woodlands (including native riparian woodland), and the strategic deployment of measures, based on WFD]; and*
- *Increase awareness of these eco-system services and measures amongst Bodies coordinating and inputting into meeting Ireland's obligations under the WFD, to ensure closer integration of the targeted deployment of relevant forestry measures into water policies land use.*

### 11.3 Water Research Coordination Group

In 2010, the EPA and Enterprise Ireland established in a national Water Research Coordination Group (WRCG). This group is a forum for funders of research, where priorities for inclusion in various calls for research proposals and longer-term objectives are presented and discussed, in order to enhance synergies and collaboration between national funders, and to avoid duplication. The WRCG comprises the following:

- EPA
- Enterprise Ireland
- the Department of Communications, Climate Action & Environment

- the Department of Agriculture, Food & the Marine
- Teagasc
- Science Foundation Ireland
- Irish Research Council
- the Geological Survey of Ireland
- Marine Institute
- Inland Fisheries Ireland
- Office of Public Works
- Irish Water

### 11.4 Recent and ongoing research, demonstration and networks

Historically, COFORD (formerly the Council for Forest Research & Development, now subsumed into DAFM as the Programme of Competitive Forest Research for Development) funded numerous research projects studying the interaction between forests, forest operations and water. More recent projects included FORMMAR, CROW and HYDROFOR, and outputs are carefully evaluated and incorporated (where deemed appropriate) into forest policy and practice.

These and other relevant research and demonstration initiatives described below.

#### 11.4.1 FORMMAR

A research project studying Forest Management for the Freshwater Pearl Mussel *Margaritifera margaritifera* (FORMMAR) was completed under the FIRM / RSF / CoFoRD 2011 Research Call (Moorkens *et al.*, 2013). The study was undertaken to assess Irish and international research and best practice and to identify appropriate (within the Irish context) site and catchment-level forest management measures to advance the conservation of FPM.

The report was commissioned to specifically address forestry issues, but acknowledged that forestry is not the predominant land use in most FPM catchments and that the implementation of forestry measures in isolation from other land uses and pressures such as agriculture, peat harvesting and septic tanks, will not be sufficient.

The project began with a desk study, but later included two field trips: the first to a selection of Coillte forests in the Caragh and Kerry Blackwater catchments in Co. Kerry; and the second to Coillte sites located in the Bundorragha and Owenriff catchments in Counties Mayo and Galway. It included a quantification of the forest resource in the Bundorragha and Owenriff catchments, following similar quantification undertaken by the Forest Service in the Caragh and Kerry Blackwater catchments.

The final report was published in 2013 and described a number of potential policy and management measures for forestry (although costs were not addressed in the measures). Many of these measures are specific to individual site requirements, and included:

- the establishment of protection forests to mitigate flow, sediment and nutrient pressures;
- the conversion of forest to non-forest land;
- the restoration of natural hydrology, which could include blocking of drains, no replanting on parts of a site and the establishment of native woodland;
- the establishment of functional buffer zones and buffer strips;
- the establishment of native woodland buffers or areas;
- drain blocking as a standalone measure;
- increased and better use of sediment traps;
- reduction in coupe sizes and restructuring forests in terms of age class and species;
- employing alternative silvicultural systems such as Continuous Cover Forestry;
- felling-to-waste, ring-barking or minimal intervention;
- removal of brash from site;
- whole tree harvesting;
- the use of cable and winching systems instead of forwarders;
- the use of helicopter logging systems;
- grass seeding post-clearfell; and
- pollarding of retained broadleaves.

#### 11.4.2 Combined Research on Riparian Woodland (CROW)

The CROW project was a 4-year project (2010-2014) funded by COFORD and DAFM and involving the National University of Ireland, Dublin (NUI - Dublin), Woodlands of Ireland and Coillte. The project explored the relationships between aquatic buffer zones (ABZs) (now termed 'water setbacks') in forests, as required at afforestation stage by Forest Service guidelines since 1991. The ultimate objective of the project was to construct a knowledge base derived from research in north-west Europe: (i) to assess the condition of ABZs in commercial forest plantations; (ii) to explore key ecological interactions between the ABZs and the aquatic zone; and (iii) to make specific recommendations regarding their future management, based on manipulations conducted at selected sites.

Key recommendations from CROW are as follows:

- *ABZs in commercial forests should be*

*widened to at least the minimum required, i.e. 10 m to 25 m, to maximise aquatic zone protection, with scope for widening the ABZ further into areas of preferential flow, especially in vulnerable sections of the ABZ.*

- *Manual harvesting/sensitive extraction is a recommended only in very sensitive sites/catchments, especially in steep headwaters, e.g. high water status catchment (such as Freshwater Pearl Mussel (FPM) and salmonid SACs).*
- *Premature clearfelling should be carried out on susceptible soils where small crowns resulting in low brash volume pertains, resulting in insufficient brash paths. Thinning is an option in upper catchments on stable slopes via manual felling to a small harvester, followed by forwarding to the roadside.*
- *Natural regeneration is the most effective and rapid means of re-establishment in harvested ABZs. Tree planting is an option in very sensitive, high water status catchments (FPM and salmonid SACs) in order to supplement natural regeneration and to counteract grazing pressure from deer and/or livestock. It is also an option on peat soils to control stream temperatures (mitigate future climate change) and on mineral soils where the ABZ is isolated from seed sources of native tree species.*
- *Planting (with protection) will accelerate development of diverse vegetation communities, stabilise banks and increase instream productivity. Deciduous native trees species (planted and/or via natural regeneration) will increase carbon to streams and also provide the preferred pollen for adult stoneflies. Planting mixtures should match site type and should comprise primarily willow, birch and alder.*
- *Improving the retention of coarse organic matter is desirable as it would enhance invertebrate production. However, there is a requirement to improve instream retention to allow terrestrial carbon to be conditioned.*
- *A guidance note on the management of ABZs in plantation forests would contribute to the Sustainable Forest Management policy of the Forest Service.*

#### 11.4.3 HYDROFOR

The HYDROFOR Project was a 7-year (2008–2014 inclusive) inter-institutional co-operative project jointly funded by the EPA and the DAFM. It involved a multi-disciplinary group of researchers from UCD, UCC and NUI - Galway investigating the

relationships between conifer forests, forestry operations, and surface water quality and ecology in Irish rivers and lakes. The research was built on the existing knowledge base from completed research projects on forest and water interactions in Ireland, and to address specific knowledge gaps in order to inform the further development of WFD measures relevant to forest operations.

The project's final report, entitled HYDROFOR: Assessment of the impacts of forest operations on the ecological quality of water (Kelly-Quinn *et al.*, 2016), was published in July 2016 under the EPA Research Report No. 169.

Policy recommendations presented by the authors were as follows:

- *Sediment release to water courses during felling and replanting may be reduced by careful onsite management of felling and windrowing operations, installation of silt traps and greater application and oversight of best practice guidelines.*
- *A combination of several sediment traps may be more effective at trapping a range of sediment particle sizes than single isolated traps.*
- *Retention of phosphorus requires attention, as it is more challenging on peat soils and will depend on the occurrence of mineral content in riparian soils or installation of mineral barriers.*
- *Based on the suite of impacts from planting to harvesting, including elevated DOC, nutrient and sediment release, and aquatic biodiversity concerns, cessation of afforestation<sup>1</sup> on peat soils in acid-sensitive headwater<sup>2</sup> catchments is recommended by the project team. In relation to reforestation of sites in such catchments, there are serious concerns with respect to the aforementioned impacts. Where replanting is considered, the design should be hydrologically informed and demonstrate empirically on a site-specific basis that it can mitigate impacts on water quality and aquatic biodiversity through the forest management cycle, as highlighted in this report. A number of mitigation measures (riparian buffer zones and sediment traps) were investigated in this study, and the research evidence highlighted their ability to reduce some pollutant inputs. Their effectiveness is likely to be site specific and other measures, not investigated in this project, e.g. reduced catchment tree cover,<sup>3</sup> minimising drainage and soil disturbance, may reduce impact, but these remain to be validated by further research.*

<sup>1</sup> *The current Afforestation Grant and Premium Scheme 2014–2020 [...] excludes infertile and designated blanket and raised bogs from funding, but afforestation on shallow peats may be considered where it is capable of producing at least yield class 14 and where there are no adverse environmental impacts.*

<sup>2</sup> *Headwaters are normally defined as comprising first- and second-order streams but small third-order streams may also be included [...]. A first-order stream is one with no tributaries, while a second-order stream starts where two first order streams converge. First- and second-order streams can be permanent, ephemeral or intermittent.*

<sup>3</sup> *The lack of suitable sites within the lower end of the forest cover gradient (e.g. only one forested site with <20% forest cover and four sites with 20% to 30% forest cover) precluded identification of a safe threshold for catchment forest cover.*

#### 11.4.4 Management Strategies for the Protection of High Status Water Bodies

This research was undertaken under the EPA-administered STRIVE (Science, Technology, Research & Innovation for the Environment) Programme 2007–2013, in response to the decline in high ecological quality river sites. These are indicators of largely undisturbed conditions and reflect natural background status or only minor distortion by anthropogenic influences. The aim of the research was:

- to review existing legislation relevant to the protection and management of high status sites;
- to review international best practice on protecting these sites; and
- to recommend new approaches to ensuring that high status water bodies remain at high status.

As set out in Ní Chatháin *et al.* (2012), the study highlighted five key issues:

- planning and development in high status catchments is an environmental issue;
- high status catchments provide valuable ecosystem services;
- high status catchments have little to no capacity for further intensification;
- high status catchments and (WFD-related) protected areas require similar protection strategies; and
- County Development Plans and all land use plans and policies should reflect the sensitivity of high status water bodies.

The study proposed 10 separate strategies to protect and manage high status waters, with four (designated below by “\*\*”) regarded as priorities:

- High status catchment delineation and prioritisation for protection measures\*
- The establishment of a spatial network of high status waters\*



- The establishment of a 'blue dot' monitoring system by the EPA
  - Potential additional measures under the WFD over and above European Directive requirements
  - Assessment of potential impacts, and consideration of the risk of failing to meet high status\*
  - Planning / Licensing control and assessment of cumulative impacts
  - Centralised GIS database, or activities database
  - Integrated monitoring and protection\*
  - Unregulated activities, where control mechanisms are required
  - Public awareness campaigns
- to demonstrate sustainable management techniques for farming and forestry in FPM catchments; and
  - to provide guidance for farming and forestry practices that support the conservation of FPM.

The project has a significant potential to inform best practice regarding forestry within FPM catchments. KerryLIFE is a partnership project involving NPWS, DAFM (both the Forest Service and the Nitrates, Biodiversity & Engineering Division), Coillte, Teagasc and the community-based South Kerry Development Partnership, and focuses heavily on securing ownership of the project amongst the local community within the project area. KerryLIFE will run from July 2014 to December 2019, with an overall budget of almost €6 million. Almost half of the €0.5 million commitment by the Forest Service (DAFM) is for native woodland creation under the Conservation and Establishment elements of the Native Woodland Scheme.

KerryLIFE is trialling a wide range of approaches under both agriculture and forestry, and the outcome of the latter will have the potential for much wider application within the forest sector.

See [www.kerrylife.ie/](http://www.kerrylife.ie/) for further details.

#### 11.4.5 KerryLIFE

KerryLIFE is an EU LIFE co-funded project focusing on the sustainable land use management for the conservation of FPM (LIFE13 NAT/IE/000144). The project is based on the Caragh and Kerry Blackwater catchments in the southwest, which together host the two largest populations of FPM in Ireland, each supporting in excess of 2.75 million adults. Currently, recruitment is insufficient to maintain the adult populations into the future, and both catchments are classified as being in an unfavourable condition.

The objectives of KerryLIFE are:

- to demonstrate effective conservation measures that will restore FPM to favourable conservation condition in the Caragh and Blackwater catchments;
- to enhance awareness and understanding of FPM amongst local stakeholders;

#### 11.4.6 The Effect of Land Use on Sediment Dynamics

The Teagasc Walsh Fellowship Scheme is funding doctorate research that employs sediment provenance and flux methods within representative sub-catchments to further the understanding of the effect of land use on sediment dynamics within extensively managed Irish catchments with

**Photo 11.1** The KerryLIFE project, based in the Caragh and Kerry Blackwater catchments, is a multi-agency initiative demonstrating sustainable land use for FPM conservation. The project is trialling different forestry approaches and techniques, with potential application within other FPM catchments and elsewhere.



significant FPM populations. The study is part of the KerryLIFE Project and is being conducted within three rural sub-catchments within the Kerry Blackwater and Caragh SACs, i.e. the Kealduff, the Owenroe and the Bridia (Upper Caragh).

The main aims of the study are as follows:

- to assess the annual sediment yields and load flux of the three sub-catchments, in order to develop an understanding of the effect of land management on sediment dynamics;
- to identify the critical source areas (CSAs) of sediment in the study catchments, through in-depth soil analysis and sediment fingerprinting; and
- to investigate historical trends in sediment yields in catchments dominated by extensive agriculture and forestry.

#### **11.4.7 INTERREG Freshwater Pearl Mussel Project**

The INTERREG Freshwater Pearl Mussel Project was aimed at helping to secure the conservation of the species, in light of its continuing unfavourable conservation status and possible extinction in the near future as a result of recruitment failure. The project was carried out by Donegal County Council in partnership with the Northern Ireland Environment Agency with consultancy support from the RPS Group. The project was grant-aided under the European Union's European Regional Development Fund INTERREG Programme. Its study area covered Northern Ireland and the border region of Ireland.

The project has three main tasks, carried out in close liaison with state agencies and stakeholders in both jurisdictions:

- The preparation of management plans for a number of FPM catchments, including the Upper Ballinderry River and the Owenkillew River (both in Co. Tyrone) and the Claddagh (Swanlinbar) River (Co. Fermanagh). The plans identify any issues relevant to FPM conservation, and propose realistic solutions.
- The trialling of a suite of agricultural, forestry and septic tank- related measures within selected catchments, to establish which actions are likely to be effective and cost-efficient in terms of the protection of FPM populations.
- The drafting of technical codes of practice to assist agencies, local authorities, public authorities and key stakeholders in relation to proposed developments, works and activities within FPM catchments, to allow for a sustainable approach that prevents impact on the species' survival. Key sectors covered include agriculture

and forestry.

The Freshwater Pearl Mussel Project hosted an end-of-project conference in Belfast in June 2014 to outline its results and findings, and the various codes of practice are currently being finalised.

For various outputs, see [www.donegalcoco.ie/services/environment/fresh%20water%20pearl%20mussel/](http://www.donegalcoco.ie/services/environment/fresh%20water%20pearl%20mussel/)

#### **11.4.8 Integrated Land Use Analysis: The Impact of Afforestation on Water Quality**

Agriculture, afforestation and independent wastewater treatment systems (IWWTS) are key pressures that influence water quality in rural catchments. In Europe, over 70% of land use is dominated by forest cover and agriculture, while up to 18% of the population rely on IWWTS. This study, involving Teagasc and the Plant & AgriBiosciences Research Centre in NUI-Galway, investigates the impact of afforestation (in a predominantly agricultural setting) and other land uses on water quality over a 20-year period in the Republic of Ireland. This is the first study to combine forest, agriculture and population data over an extended period of time. The research also involves an analysis of a land use change simulation predicting water quality outcomes for increased afforestation and forest cover and a corresponding decrease in agricultural area. Results show a minor positive impact on water quality outcomes when agriculture is replaced by forest cover. Such findings have important implications for future land use planning.

#### **11.4.9 European COST Action on forests and payments for water-related ecosystem services**

Another relevant initiative is the European COST Action entitled 'Payments for Ecosystem Services (Forests for Water)' (PESFOR-W COST Action (CA15206)). The aim of this COST Action, which involves researchers, practitioners and policy makers from throughout Europe, is to improve Europe's capacity to use Payments for Ecosystem Services (PES) to achieve WFD targets and other policy objectives, through incentives for planting woodlands to reduce agricultural diffuse pollution to watercourses. The action will run until 2020. Its specific objectives are:

- to characterise and evaluate governance models;
- to evaluate environmental effectiveness of targeted woodland planting;
- to explore cost-effectiveness of woodland planting for reducing diffuse pollution;
- to create an European PES repository of case studies; and

- to develop user guidance on the suitability of pollutant, ecosystem service and catchment scale models to quantify the effectiveness of tree planting to reduce diffuse pollution.

Ireland is represented on PESFOR-W COST Action by representatives from Teagasc, NUI - Dublin and Woodlands of Ireland. See [www.forestry.gov.uk/fr/pesforw](http://www.forestry.gov.uk/fr/pesforw) for details.

The ongoing Microsoft / Natural Capital Partners / Green Belt initiative (see below) and the Woodland Fund arising from the Forestry Programme's MTR, are precursors to the application of this approach in Ireland.

#### 11.4.10 Microsoft / Natural Capital Partners / Green Belt initiative

An innovative project is now operating in Ireland, involving the computer multi-national Microsoft, the UK-based Forest Carbon Ltd., Natural Capital Partners and Green Belt Ltd. Under the project, Microsoft is funding the payment of €1,000 / ha to supplement the grant available under NWS Establishment, to further encourage farmers to enter that scheme. Whilst farmers retain ownership of their land, trees and the resulting timber, Microsoft is focused on the environmental benefits of the woodlands in order to support Ireland's forest creation goals, and on demonstrating its commitment to the country's environmental targets.

Phase 1 of the project involves a target to plant 136 ha in the Spring 2017 and 2017 / 2018 planting seasons, in Counties Cork, Kerry, Galway and Mayo. To date, 50 ha have been planted, with the remaining area on course for completion and payments to participating farmers have commenced. Microsoft is evaluating future phases of the native woodland programme that will expand and accelerate the achievement of Ireland's native woodland goals.

Carbon sequestration has been, and will continue to be, a key focus of the programme. For example, planting under Phase 1 will sequester an estimated 35,600 tonnes of carbon dioxide over 40 years. As part of its evaluation of the programme's possible extension, Microsoft is exploring how best to align it further with the focus within Irish forestry on delivering broader ecosystem services, particularly those relating to water (as set out in the *Woodland for Water* document - see Section 16).

#### 11.4.11 INTERREG Source to Tap Project

Source to Tap is an EU INTERREG funded project delivered by a partnership led by Northern Ireland Water and including Irish Water, the Agri-Food & Biosciences Institute (AFBI), the East Border Region,



**Photo 11.2 The ongoing Microsoft / Natural Capital Partners / Green Belt initiative is actively engaging farmers in native woodland creation for carbon capture, thereby contributing significantly to national planting targets for such woodland.**

Ulster University and the Rivers Trust.

The project aims are as follows:

- to produce a Sustainable Catchment Area Management Plan (SCAMP) for the Erne and Derg cross border catchments;
- to prevent pollution of raw water used for drinking water abstraction from pesticides and sediment pollution;
- to implement a learning and outreach strategy to engage with local communities on the importance of protecting drinking water resources;
- to pilot best forest practice to prevent sediment run-off causing colour and turbidity issues in raw water;
- to undertake peat restoration of former afforested land along river banks;
- to pilot a land incentive scheme to change land management practices by farmers; and
- to undertake benefits analysis to determine the



**Photo 11.3 Minister Andrew Doyle TD, Minister of State with responsibilities for forestry, at the launch of Woodlands of Ireland's Strategy for Native Woodlands in Ireland 2016-2020 in July 2016, Glencree, Co. Wicklow.**



cost effectiveness of removing pollutants at source, compared with treatment processes.

Source to Tap was officially launched in December 2017, and DAFM participates on the External Advisory Group. Forestry measures are to be trialled within properties owned and managed by the Northern Ireland Forest Service (north) and Coillte (south).

windblown trees. The Strategy also commits to the promotion of the ecosystem service values (including water-related values) of native woodlands and their potential to deliver these services, amongst policy-makers, the forest industry and the general public.

(See [www.woodlandsofireland.com/publications](http://www.woodlandsofireland.com/publications))

#### **11.4.12 Strategy for Native Woodlands in Ireland**

A Strategy for Native Woodlands in Ireland 2016-2020, developed by Woodlands of Ireland (2016) following extensive consultation with relevant statutory bodies, eNGOS, practitioners, owners, researchers and other stakeholders, sets out key elements required to realise a more sustainable level of native woodland cover in Ireland. The Strategy builds on the support for the Native Woodland Scheme package under the Forestry Programme 2014-2020, and the national framework in place to protect and conserve native woodland habitats.

A stated element is *“To promote the strategic creation of protective native woodlands on sites adjoining watercourses, in order to maintain and improve water quality and to contribute towards the mitigation of increased flooding predicted as a result of climate change.”* As a relevant action, the Strategy calls for the creation and restoration of new and existing native woodlands to be targeted at aquatic-based SACs designated for FPM and salmonids. The planning and management of native riparian woodlands is also highlighted, with a focus on maximising the water protection role of such woodlands and avoiding potentially negative factors, such as over-shading and risks associated with



## Section 12

# Plan for Forests & Freshwater Pearl Mussel in Ireland

In line with the national conservation strategy, DAFM is currently developing a draft Plan for Forests & Freshwater Pearl Mussel in Ireland. This Plan, once implemented, will have direct relevance in relation to HES objective water bodies.

### 12.1 Overview

Freshwater Pearl Mussel is a highly-threatened species of European importance that is extremely vulnerable to impacts arising from (*inter alia*) forestry. The Strategy for Conservation of the Freshwater Pearl Mussel (NPWS, 2011) prioritises the conservation of populations within eight catchments comprising 28 water bodies. However, 15 of these water bodies are 'at risk' of decline. As set out in Section 2.6, forestry is deemed to be a significant pressure (either along or in combination with other significant pressure(s)) within seven of these 15 water bodies.

DAFM is currently developing a Plan for Forests & Freshwater Pearl Mussel in Ireland, which will apply to the catchments (including the priority eight) of those rivers designated as SACs for the species. It aims to ensure that all forestry activity regulated under the Forestry Act 2014 is undertaken in a manner that does not threaten the achievement of the conservation objectives for those SACs, namely *"To maintain or restore the favourable conservation condition of the Annex I habitat(s) and / or the Annex II species for which the SAC has been selected."*

The Plan is likely to incorporate a Forest Management Framework which matches appropriate approaches and techniques to site risk, across forestry activities regulated under Forestry Act 2014, i.e. afforestation, forest roading and felling (and reforestation). NWS Establishment (i.e. the Woodland for Water measure) and NWS Conservation are likely to be key drivers regarding implementation.

See [www.agriculture.gov.ie/forests-service/publicconsultation/](http://www.agriculture.gov.ie/forests-service/publicconsultation/) for an update on the current status of the draft Plan.



**Photo 12.1** Freshwater Pearl Mussel is extremely vulnerable to impacts arising from (*inter alia*) forestry. The draft Forests & FPM Plan will aim to eliminate these impacts and to promote the positive contribution woodlands and forests can play in conserving the species.

# Section 13

## Native Woodland Scheme Package

This grant package provides support to farmers and other landowners to establish new native woodland and to restore existing native woodland (including conversion from conifer forest to native woodland), to protect and enhance water and aquatic ecosystems.

### 13.1 Overview

The Native Woodland Scheme (NWS) grant package provides funding to farmers and other landowners to undertake works primarily to protect and expand Ireland's native woodlands and associated biodiversity. This DAFM package, launched in 2000 and now available under the Forestry Programme 2014-2020, comprises two separate schemes, both capable of delivering a range of significant ecosystem services to protect and enhance water and aquatic ecosystems:

- **Native Woodland Establishment Scheme (NWS Establishment) (as represented by Grant & Premium Categories (GPCs) 9 and 10 under the general Afforestation Grant & Premium Scheme):** This scheme funds the establishment of new native woodland on open greenfield sites. NWS Establishment can be used to create stand-alone native woodland, or

to incorporate a native woodland component into a conventional afforestation project, to address a specific environmental sensitivity (e.g. water, landscape, wider habitat linkage). This scheme underpins the Woodland for Water measure (see below).

- **Native Woodland Conservation Scheme (NWS Conservation):** This scheme funds the appropriate restoration of existing native woodland, and the conversion of non-native (e.g. conifer) forest to native woodland. The scheme incorporates specific criteria to focus available funding on (*inter alia*) water-sensitive sites.

Scheme details are contained in the documents *Native Woodland Establishment GPC9 & GPC10: Silvicultural Standards (September 2015)* (DAFM, 2015) and *Native Woodland Conservation Scheme (September 2015)* (DAFM, 2015), with updates set out under Circular 03/2018 and Circular 05/2018.

**Photo 13.1 Native woodland conservation, restoration and expansion require the combined input of ecologists and foresters working closely with landowners, and supported in their efforts by relevant public bodies and eNGOs. Joint Forest Service / Woodlands of Ireland training, Ballycoyle, Co. Wicklow.**



The NWS package has evolved since its initial launch in 2000, under an ongoing partnership with Woodlands of Ireland, NPWS, the Heritage Council, Inland Fisheries Ireland and other native woodland stakeholders. It is underpinned by agreed ecological principles regarding (for example) 'target' native woodland types, species composition, site inputs and compatible wood production. The EPA has also engaged within the context of the Forest Service / COFORD / EPA Acid Sensitivity Protocol, to facilitate the creation of new native woodlands in areas where surface water is deemed to be vulnerable to acidification. The implementation of NWS is supported by an ongoing training programme jointly held by DAFM and Woodlands of Ireland. These courses – which to date have trained over 800 practitioners (foresters and ecologists predominantly<sup>1</sup>) in native woodland ecology and management – include strong elements regarding the use of NWS to protect water. The most recent course was held in Enniskerry, Co. Wicklow, October 2016, and included a joint Woodlands of Ireland / Inland Fisheries Ireland presentation entitled 'Protecting and enhancing water quality and aquatic habitats through the strategic application of the NWS'. For an online video of the session, see [www.woodlandsofireland.com/native-woodland-scheme-training](http://www.woodlandsofireland.com/native-woodland-scheme-training)

Various publications have also been developed in support of the NWS package. These include the Woodlands of Ireland Native Woodland Information Note No. 4, entitled *Native Riparian Woodlands: A Guide to Identification, Design, Establishment and Management* (2017). This provides background information on native riparian woodland in Ireland, and reviews the ecological and protective functions such woodlands play *vis-à-vis* the aquatic system and water quality. (For the full list of Woodlands of Ireland publications, see [www.woodlandsofireland.com/publications/](http://www.woodlandsofireland.com/publications/))

Other highly relevant publications include the joint NPWS / Forest Service publication *Management Guidelines for Ireland's Native Woodlands* (Cross & Collins, 2017), and *Pro Silva Silviculture: Guidelines on Continuous Cover Forestry / Close to Nature Forestry Management Practices* (Sanchez, 2017).

The following describes NWS Establishment and NWS Conservation, focusing on the application of each in relation to the protection of water.

## 13.2 Native Woodland Establishment Scheme

### 13.2.1 Scheme objectives

NWS Establishment supports the creation of new native woodland on open 'greenfield' sites by farmers and other landowners. This is encouraged in order to promote the expansion of Ireland's native woodland resource and associated biodiversity, and to realise wider ecosystem services that new native woodlands can deliver. In particular, these include the protection and enhancement of water quality and aquatic ecosystems, and the creation of linkage between semi-natural habitats at a landscape level, using natural features such as watercourses.

Specifically, a range of significant water-related ecosystem services can be realised using NWS Establishment together with the required water setback, particularly in relation to the following:

- reduction in sediment mobilisation and runoff into watercourses
- interception of nutrient runoff into watercourses
- bank stabilisation
- food input into the aquatic ecosystem
- shading / cooling
- regulation of floodwater
- riparian restoration

These ecosystem services explored in the document entitled *Woodland for Water: Creating new native woodlands to protect and enhance Ireland's waters* (DAFM, 2018) - see Section 16.

Many sites under NWS Establishment are suitable for the future realisation of quality timber and other wood products on an ongoing basis. This is encouraged in order to provide an economic basis for the ongoing management of these woodlands, similar to what is being achieved in Wales under the Coed Cymru project (see [www.coedcymru.org.uk](http://www.coedcymru.org.uk)). However, this co-objective is only acceptable where compatible with ecological objectives and site conditions. Furthermore, wood production can only be pursued using continuous cover forestry (CCF) systems such as selection, shelterwood and coppicing. CCF is 'close-to-nature' forestry that mimics natural woodland processes and excludes large scale clearfelling – see ProSilva Ireland ([www.prosilvaireland.wordpress.com](http://www.prosilvaireland.wordpress.com)) for further information.

Areas planted under NWS Establishment create opportunities for traditional types of woodland

<sup>1</sup> To operate both schemes, Registered Foresters must complete the NWS Training Course. This also applies to ecologists wishing to operate NWS Conservation. Other criteria apply, as set out in the scheme documentation.



management (e.g. coppice) that form part of the countryside heritage. Other important ecosystem services include carbon sequestration, landscape enhancement and cohesion, the strengthening of the cultural and historical heritage associated with Ireland's native woodlands, and the provision of local amenities and opportunities for woodland interpretation and environmental education.

### 13.2.2 Ecological focus

NWS Establishment has an overriding ecological focus. For example, site disturbance and inputs must be minimised, species selection must reflect the most appropriate native woodland type for the site, and all planting material must come from suitable sources within Ireland (with limited practical exceptions). Since its inception in the late 1990s, DAFM has developed and implemented the scheme in close partnership with Woodlands of Ireland, NPWS, the Heritage Council and a wide range of other stakeholders with a direct and indirect interest in native woodland, including Inland Fisheries Ireland and the EPA, the latter in the context of agreed changes to the Acid Sensitivity Protocol for Afforestation (see later).

With this focus, NWS Establishment creates opportunities for farmers and other landowners within environmentally-sensitive areas to create woodlands that have the potential for wood production and income generation, while also contributing to the protection of the particular sensitivity involved, e.g. habitats, species, water, landscape. This is achieved through the DAFM approval system (including the referral process, the Appropriate Assessment Procedure, and the Environmental Requirements for Afforestation) and through coordination with landowners, NWS Foresters, other statutory bodies, and with Woodlands of Ireland and other scheme partners.

### 13.2.3 Funding

Following increases for broadleaf planting arising from the Mid-Term Review of the Forestry Programme 2014-2020, NWS Establishment now provides a grant (over two instalments) of up to €6,220 / ha for approved establishment works, and a 15-year annual premium of €665 / ha / year (increasing to €680 for sites over 10 ha). This premium represents the highest available under the Afforestation Scheme. A target of 2,700 ha of new native woodland has been set under the Forestry Programme for NWS Establishment, representing a potential investment of over €16.5 million.

### 13.2.4 Specifications

The following detail specifications under NWS Establishment that relate specifically to water. For full details on these and other specifications, see scheme documentation (DAFM, 2015).

#### Site requirements

Each site proposed for NWS Establishment must be capable of supporting the vigorous growth and sustainable long-term development of the most appropriate native woodland type identified for that site (or parts thereof). This must be possible without the need for fertiliser input (with limited exceptions – see below).

Generally, sites that flood are excluded from the Afforestation Scheme. However, NWS Establishment (GPCs 9 and 10) plots located on natural floodplains may be acceptable, where:

- the frequency of flooding and the inundation periods involved do not impede woodland establishment and development; and
- such plots form part of a larger application or a wider multi-site project developed with input from other statutory bodies and aimed at the strategic development of native woodland along a sensitive watercourse, for water protection.

This is in recognition of the rarity of riparian and alluvial woodlands (for example, residual alluvial forests are a priority Annex I habitat under the Habitats Directive) and their role in protecting water and the aquatic ecosystem.

#### Area, size and width

Sites and individual plots proposed for NWS Establishment must be 0.1 ha or greater in area and 20 metres or greater in width, as measured tree-to-tree (i.e. excluding required setbacks for water, archaeology, public roads, etc.). In certain situations (e.g. to cater for landscape and existing features), 10% of the proposed area can be less than 20 metres in width. These lower limits allow NWS Establishment to be used to create relatively narrow woodland strips along watercourses, without encroaching too greatly on agricultural land.

Conversely, individual native woodland plots can be widened at key locations onsite, where adjoining land uses, site hydrology and slope increase the vulnerability of receiving waters.

#### Native woodland type

Each project under NWS Establishment must promote the native woodland type that would



**Photo 13.2** Emerging pioneer birch woodland on a sheltered upland site, Co. Wicklow.



occur naturally on the site (or parts of the site). This decision is made by the NWS Forester at the planning stage, using the NWS Framework (see Circular 05/2018). This framework uses location, soil and main habitats and vegetation to identify the most ecologically appropriate native woodland type. Five scenarios currently apply:

- Scenario 1: Podzols (Oak-Birch-Holly Woodland)
- Scenario 2: Brown Podzolics (Oak-Birch-Holly with Hazel Woodland)
- Scenario 3: Brown Earths (Oak-Ash-Hazel Woodland)
- Scenario 4: Gleys (Alder-Oak-Ash Woodland)
- Scenario 5: Highly Modified Peat & Peaty Podzols (Pioneer Birch Woodland)

For illustration, Figure 13.1 is an extract from the framework, describing Scenario 2 sites.

#### Acceptable species and mixtures

All tree species proposed under NWS Establishment must be: (i) native to the island of Ireland; and (ii) representative of the native woodland type identified for the site (or parts thereof).

To achieve this, each of five scenarios is underpinned with a prescribed species mix designed as a 'starter kit' for the woodland type associated with that scenario. For example, Scenario 2: Brown Podzolics (Oak-Birch-Holly with Hazel Woodland) plots must be planted with the following mixture:

*Planting mixture: Sessile oak (50%), with hazel (15%) and downy birch (10%) scattered intimately throughout, and with wild cherry (5%) planted in groups of 5 to 10 trees. Scots pine*

*(10%) planted in small pure groups on free-draining areas of the plot, particularly on slopes.*

*Minor species (10%) to comprise at least two of the following, positioned alongside planned woodland edges & glades: hawthorn, holly, rowan, crab apple.*

In order to ensure traceability and to protect native genetic biodiversity, rules apply regarding the source of all forest reproductive material (i.e. seed, plants, cuttings) used.

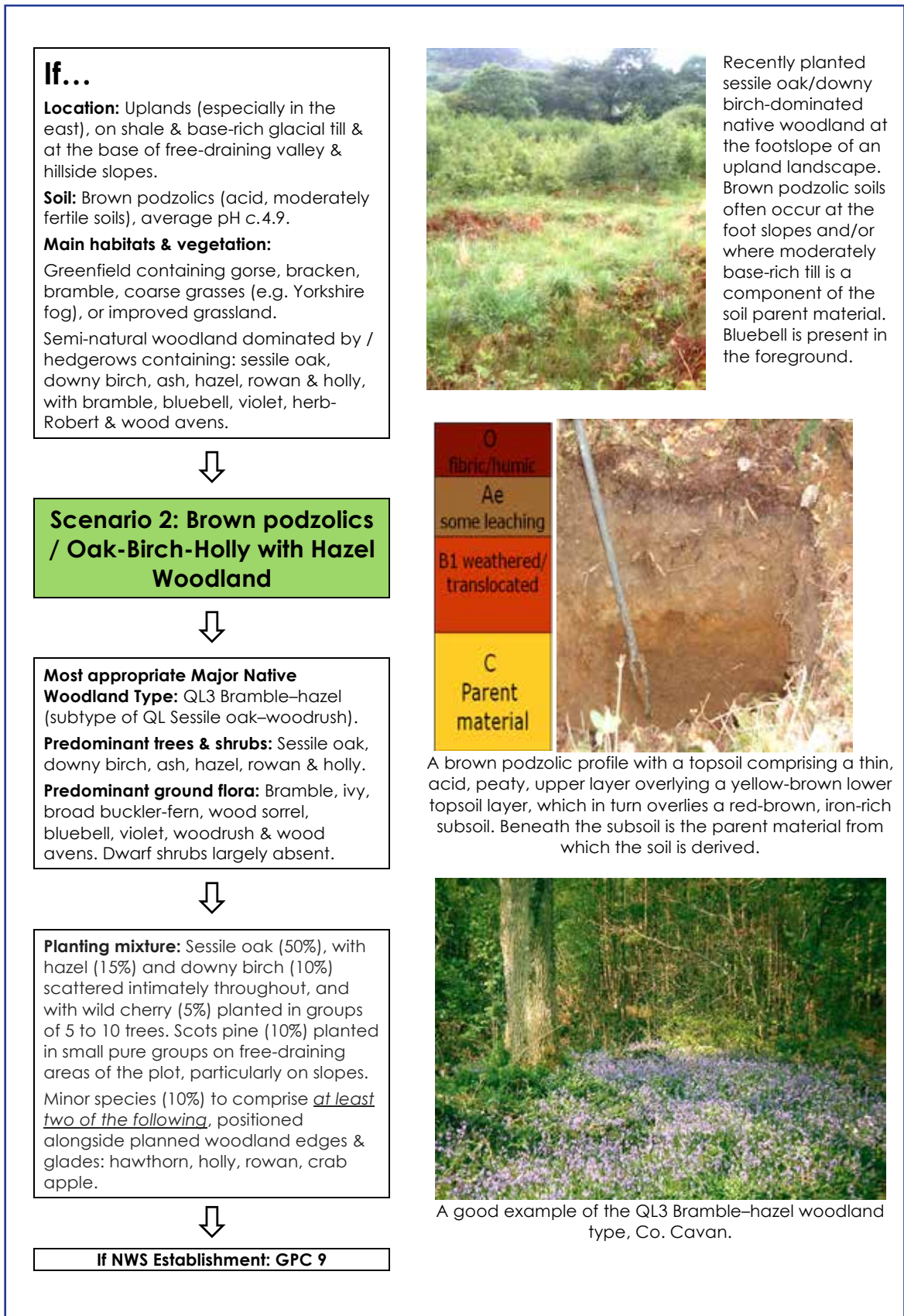
#### Site inputs

Under NWS Establishment, the identified woodland type should be realised with the minimal amount of site inputs and disturbance. The focus is on retaining natural site conditions and facilitating the emergence of the native woodland type that would occur naturally on the site.

Ground preparation is largely limited to inverted mounding, scrap mounding, shallow ripping, pit planting and auger planting. While standard afforestation drainage practices are not accepted under NWS Establishment, localised drainage may be allowed in certain situations to aid establishment – full details must be provided with the submitted application. The slow-water damming of existing land drains may be acceptable, to reinstate natural hydrological conditions and to improve how well the water setback protects the adjoining watercourse.

While standard fertiliser application is not accepted under NWS Establishment, a once-off hand application at establishment (using slow release formulations) is allowed on marginal sites, in order to boost initial growth. In any case, fertiliser application

**Figure 13.1 Extract from the NWS Framework (from Circular 05/2018), showing the application of Scenario 2: Brown Podzolics (Oak-Birch-Holly with Hazel Woodland).**





**Photo 13.3 Scrap mounding on a riparian site, illustrating the low level of site disturbance at planting stage under NWS Establishment.**



is not permitted within 20 metres of an aquatic zone or within the associated water setback, whichever is greatest. Furthermore, fertilisation is not permitted on NWS Establishment sites within acid sensitive areas - see below. The application of vermicompost (worm cast) may have a role in such areas and on marginal sites. This additive can encourage mycorrhizal development within the root zone, thereby enabling establishing trees to access existing soil nutrients quicker and more effectively.

The control of competing vegetation such as grasses, herbaceous plants, bramble and bracken is vital for the rapid establishment and growth of young trees. Inadequate control will result in poor growth and increased mortality, leading to further inputs later on (e.g. beating up). Non-herbicide control (trampling, mulches, mats, etc.) is only realistic on a small scale, such as highly sensitive parts of individual sites. Otherwise, targeted herbicide application represents the most practical and effective method of vegetation management.

Pre- and post-planting herbicide application must be kept to the minimum required to ensure success, and should be used together with other methods, e.g. planting with larger transplants. Post-planting application should be carried out using a knapsack sprayer, with the aim of maintaining a 1-metre wide control area around the base of each tree until it has become fully established and free of competing vegetation.

Herbicide application is not permitted within the water setback or within 20 metres of an aquatic zone, whichever is greatest. Limited exemptions may apply, where agreed by the relevant statutory body (e.g. stem injection to eliminate stream-side rhododendron, in order to tackle infestation and to

reinstate natural vegetation.)

#### [Acid Sensitivity Protocol for Afforestation](#)

NWS Establishment applications within acid sensitive areas are exempt from the water sampling requirement under the Acid Sensitivity Protocol for Afforestation, as set out in Appendix 11 of the *Forestry Standards Manual* (DAFM, 2015). This change to the protocol was proposed by DAFM with the support of Woodlands of Ireland, Inland Fisheries Ireland and other scheme partners, and subsequently agreed by the EPA and implemented in early 2013 (see Forest Service Circular 04/2013). The amendment only applies to applications that comprise solely of GPC9 and / or GPC10 on enclosed / improved land, and no fertiliser application is permitted.

This amendment is particularly relevant to the Priority 8 Freshwater Pearl Mussel Catchments, the majority of which are also acid sensitive areas under this protocol.

#### [Incorporating NWS Est. plots into standard afforestation projects](#)

NWS Establishment GPC9 and GPC10 can be used on their own to create a stand-alone native woodland, or as part of a wider afforestation project alongside other Grant & Premium Categories, e.g. GPC3 (Sitka spruce with 15% broadleaves). This allows for the integration of native woodland into standard forest design, specifically to realise associated ecosystem services regarding (for example) water, landscape and wider habitat linkage.

This integration is encouraged by the Environmental Requirements for Afforestation, in that the wider

water setback required on peat sites or within the catchment area of HES objective water bodies can be reduced through the use of an adjoining GPC9 or GPC10 plot. See Section 9 for details.

### 13.3 NWS Conservation

NWS Conservation funds the appropriate restoration of existing native woodland, and the conversion of non-native (e.g. conifer) forest to native woodland. The stated objectives of NWS Conservation include the following: *“In addition to [native woodland biodiversity], NWS Conservation also supports the realisation of wider ecosystem functions and services that native woodlands can deliver. In particular, these include the protection and enhancement of water*

*quality, aquatic habitats and in-stream species, [...]”* For example, restoring existing native woodland also reinstates that ecosystem’s natural functionality regarding the protection of water (e.g. rhododendron removal results in the return of native ground flora, thereby enabling nutrient and sediment interception from overland flow). Similarly, converting conifer forest to native woodland along watercourses eliminates a range of potential issues that might otherwise impact water.

NWS Conservation incorporates specific eligibility criteria to focus available funding on (*inter alia*) water-sensitive sites: *“Applications [...] must satisfy at least one of the qualifying criteria set out below. ... A woodland / forest adjoining a sensitive watercourse, where native woodland restoration [including conversion from conifer forest to native*

**Photo 13.4 & 13.5 NWS Conservation can be used to restore native woodland on sites adjoining watercourses, to benefit water. Potential sites include native woodlands dominated by invasive exotics such as laurel and rhododendron (left), and inappropriately-sited conifer plantations alongside highly sensitive watercourses (right).**



**Photo 13.6 Restoring native woodland ecosystems reinstates the ecological functionality of these habitats regarding the protection and enhancement of water quality.**





*woodland] can contribute to the protection of water quality and aquatic habitats and species. Water sensitive areas include Freshwater Pearl Mussel catchments, fisheries sensitive areas, Acid Sensitive Areas, and high status water bodies identified under the Water Framework Directive.”*

Annex 6 of the NWS Conservation scheme document also contains details regarding how the scheme can be used on sites adjoining watercourses, both for the restoration of existing native woodlands and the conversion of non-native woodland (including commercial conifer plantations) to native woodland.

NWS Conservation is open to private woodland owners, Coillte and NPWS. As revised by Forest Service Circular 03/2018, the scheme offers €5,000 / ha (over two separate instalments) to private landowners and to public bodies, including Coillte and NPWS, together with the fencing allowance available under the Afforestation Scheme. In addition, the Forest Fencing & Tree Shelter Scheme arising from the Mid-Term Review of the Forestry Programme will also apply. Furthermore, private owners under the scheme are eligible for an annual premium of €350 / ha for 7 years.

A target of 1,950 ha of restored native woodland has been set for NWS Conservation under the 2014-2020 Forestry Programme, representing an investment of over €7.3 million.

## Section 14 Agro-Forestry Scheme

Agro-forestry, supported under GPC 11 of the Afforestation Scheme, facilitates forestry and agriculture on the same piece of land and has a potential role in protecting waters from agricultural pressure.

### 14.1 Overview

The planting of agro-forestry is supported under Grant & Premium Category (GPC) 11 of the Afforestation Scheme, available under the Forestry Programme 2014-2020.

Agro-forestry is the growing of both trees and agricultural crops on the same piece of land. The concept is not new to Europe and has been practised for centuries. However, since the 1970s, it has been increasingly regarded as a new land use, somewhere between agriculture and forestry. The objective of agro-forestry is to provide tree and agricultural crop products, while also protecting, conserving, diversifying and sustaining vital economic, environmental, social and natural resources. It is an attractive option for farmers who might not otherwise have considered conventional afforestation.

Research over the past 20 years has confirmed that agro-forestry can be more biologically productive, profitable and sustainable than forestry or agricultural

monocultures.

There are four recognised types of agro-forestry:

- silvo-pastoral, incorporating grass production and / or grazing with widely-spaced trees;
- silvo-arable, incorporating rows of trees planted widely apart and crops grown in between (alley cropping);
- forest farming, involving the management of an existing woodland to produce wood products and food; and
- forest gardening, which is similar to permaculture, with different sized plants grown on the same piece of land at different levels producing different products (wood, fruit, vines, herbs, vegetables, etc.).

In Ireland, DAFM provides support for silvo-pastoral agro-forestry systems, under GPC 11 of the Afforestation Scheme. A capital grant up to a maximum of €6,220 / ha is available to support the cost of establishment, with an additional payment of

**Photo 14.1 Recently established agro-forestry under GPC 11 of the Afforestation Scheme.**



**Photo 14.2** Under agro-forestry GPC 11, trees are planted at a low density (400 stems / ha) and are protected individually with staked tree guards, allowing grazing inbetween.



€645-660 / ha / year direct to landowners for a period of 5 years. Currently, Ireland is the only country in the EU where agro-forestry is funded under an afforestation measure (although some funding is available in other Member States through agricultural schemes and measures).

The system results in a parkland landscape in the medium- to long-term, as trees are reduced from an initial planting of 400 stems / ha at planting, to around 150 trees / ha as they mature. The trees are managed to ensure that 25-40% of the canopy remains open to encourage grass growth.

Agro-forestry delivers a range of ecosystem services. For example:

- Biodiversity is greatly enhanced, with greater numbers of invertebrates within the canopy of the trees attracting birds, bats and other animals. A more diverse mix of tree species will also provide greater resilience against forest and tree damaging insects and diseases.
- The commercial products produced directly from the trees includes veneer quality timber, renewable biofuel / energy, and fruit and nuts (15% of tree species). Agricultural produce can include poultry, sheep, small cattle, hay and silage. The trees also provide a function in carbon sequestration.
- Animal welfare is greatly enhanced as the trees provide shelter and alternative food supplements, either through leaf material or through sacrificial specimens where the animals are allowed to feed on the branches. An example of a sacrificial tree is willow planted with a tree shelter protecting its stem, but with the branches encouraged to droop down.

## 14.2 Agro-forestry and water

Agro-forestry can provide a function in mitigating water runoff and soil erosion, thereby reducing potential losses of silt, organic matter and nutrients that may otherwise enter watercourses. This is facilitated through root systems that penetrate the lower soil horizons, allowing water to filter down through the soil. Water uptake from the trees can provide a role in improving the soil quality for agriculture, and may reduce the need for agricultural drainage.

Trees will also increase the amount of organic matter in the soil over time due to the leaf litter and increased worm activity. In addition, soil disturbance as a result of machinery use is reduced.

Establishing agro-forestry does not require extensive soil cultivation, as typically, each tree is pit-planted (i.e. small individual holes dug for each tree). Additional fertiliser (nitrogen for grass growth) is optional, and in sensitive areas, can be replaced with organic fertilizers or none at all.

Also, the spot-spraying of vegetation once before planting at the base of each tree shelter is optional. Similar to fertiliser applications, this stipulation can be removed if the area is sensitive. In general, agro-forestry GPC 11 is predominantly targeted at land that would traditionally be considered good agricultural land. Therefore, in most cases, grant-aided agro-forestry planting will not require fertiliser, but may require at least some manual vegetation control (pulling grass out from the tree shelters).

For these reasons, agro-forestry can be a useful tool in mitigating agricultural pressures, where water protection is an objective.

## Section 15

# Environmental Enhancement of Forests Scheme

This proposed grant scheme is designed to encourage forest owners to undertake particular works within existing forests and during current rotations, to achieve structural changes and to improve the environmental 'footprint' of those forests regarding impacts on (*inter alia*) water quality.

### 15.1 Overview

The Environmental Enhancement of Forests Scheme is a funding measure included under Measure 5 (Investments Improving the Resilience and Environmental Value of Forestry) of the Forestry Programme 2014-2020. The aim of the proposed scheme is to support various actions within existing forests, which bring about structural changes that will proactively protect and enhance water quality, important habitats and species, archaeological sites, sensitive landscapes and other environmental features.

A fixed grant of up to €750 / ha will be available under the scheme. The aim will be to support the environmental enhancement of 1,000 ha of forests under the lifetime of the Forestry Programme. Through the mechanism, funding will be provided

to forest owners to undertake particular actions and to achieve structural changes within existing forests and during current rotations, to improve the environmental 'footprint' of those forests regarding impacts on water quality, habitats and species, archaeological sites, landscape and other environmental sensitivities.

A clear example in relation to water is the retrofitting of a water setback and slow-flow damming of forest drains, within a wind-firm plantation adjoining a sensitive watercourse. This would introduce a protective buffer during the rotation itself, which will be fully established and functioning whenever future thinning and clearfelling take place. Similarly, heightened measures for water protection required on particularly water-sensitive sites during thinning and clearfelling, may also be considered eligible under the scheme.

**Photo 15.1 The Environmental Enhancement of Forests Scheme will fund works during the rotation, to improve the environmental 'footprint' of existing forests. Photo shows a potential site for retro-fitting a water setback into a young plantation.**





The Environmental Enhancement of Forests Scheme is currently in development stage and once released (provisionally mid-2018), will be of relevance to existing forests within the catchment area of HES objective water bodies, and within other sensitive areas.

# Section 16

## Woodland for Water

The Woodland for Water measure highlights to the ‘water community’ the use of new native woodland and associated setbacks to protect water and aquatic ecosystems.

### 16.1 Overview

The DAFM document *Woodland for Water: Creating new native woodlands to protect and enhance Ireland’s waters* (2018) proposes the strategic deployment under the 2<sup>nd</sup> cycle of the Water Framework Directive, of new native woodlands and associated undisturbed water setbacks, to form permanent semi-natural habitats designed to deliver critical water-related ecosystem services, i.e.

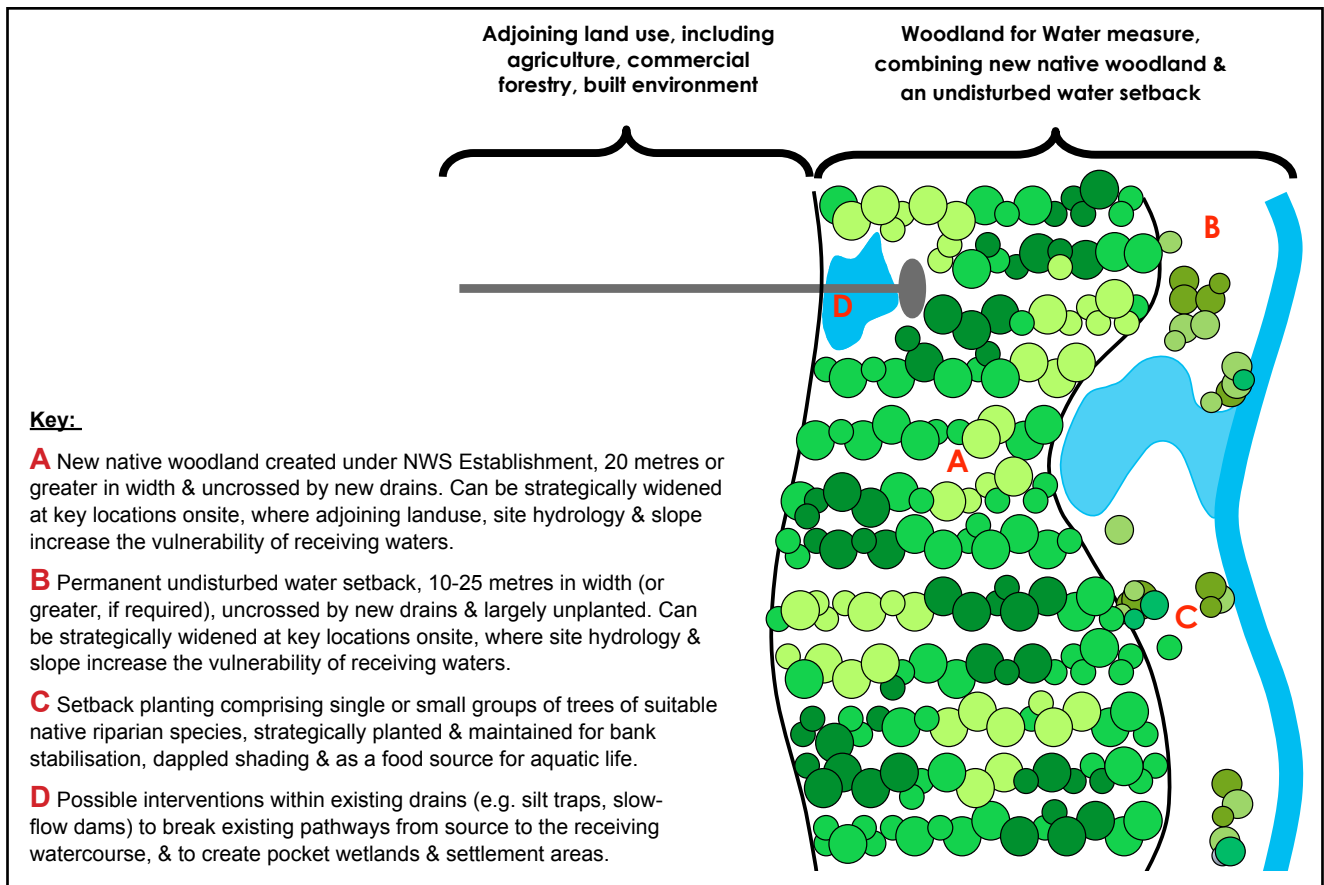
- reduction in sediment mobilisation and runoff into watercourses;

- interception of nutrient runoff into watercourses;
- bank stabilisation;
- food input into the aquatic ecosystem;
- shading / cooling;
- regulation of floodwater; and
- riparian restoration.

Figure 16.1 illustrates the Woodland for Water measure, and Photos 16.1 and 16.2 illustrate its realisation under NWS Establishment

The Woodland for Water document also presents

Figure 16.1 Schematic of the Woodland for Water measure.



**Photos 16.1 & 16.2 The application of the Woodland for Water measure on grazing land, pre-planting (top) and at Year c.16. Ballyvary, Co. Mayo.**



an overview of relevant research and initiatives in Ireland, the UK and elsewhere, which demonstrates the water-related ecosystem services provided by this approach, as listed above. This overview was compiled with input from Woodlands of Ireland within the context of the partnership between that organisation and DAFM in the ongoing development and implementation of the Native Woodland Scheme package.

Funding is currently in place under the existing NWS Establishment to realise the Woodland for Water measure, and many projects demonstrating the approach have already been realised. As set out in Section 5.4 and 11.4.10, the targeting of strategic areas may become possible through payments for ecosystem services under the proposed DAFM Woodland Fund, similar to the ongoing Microsoft /

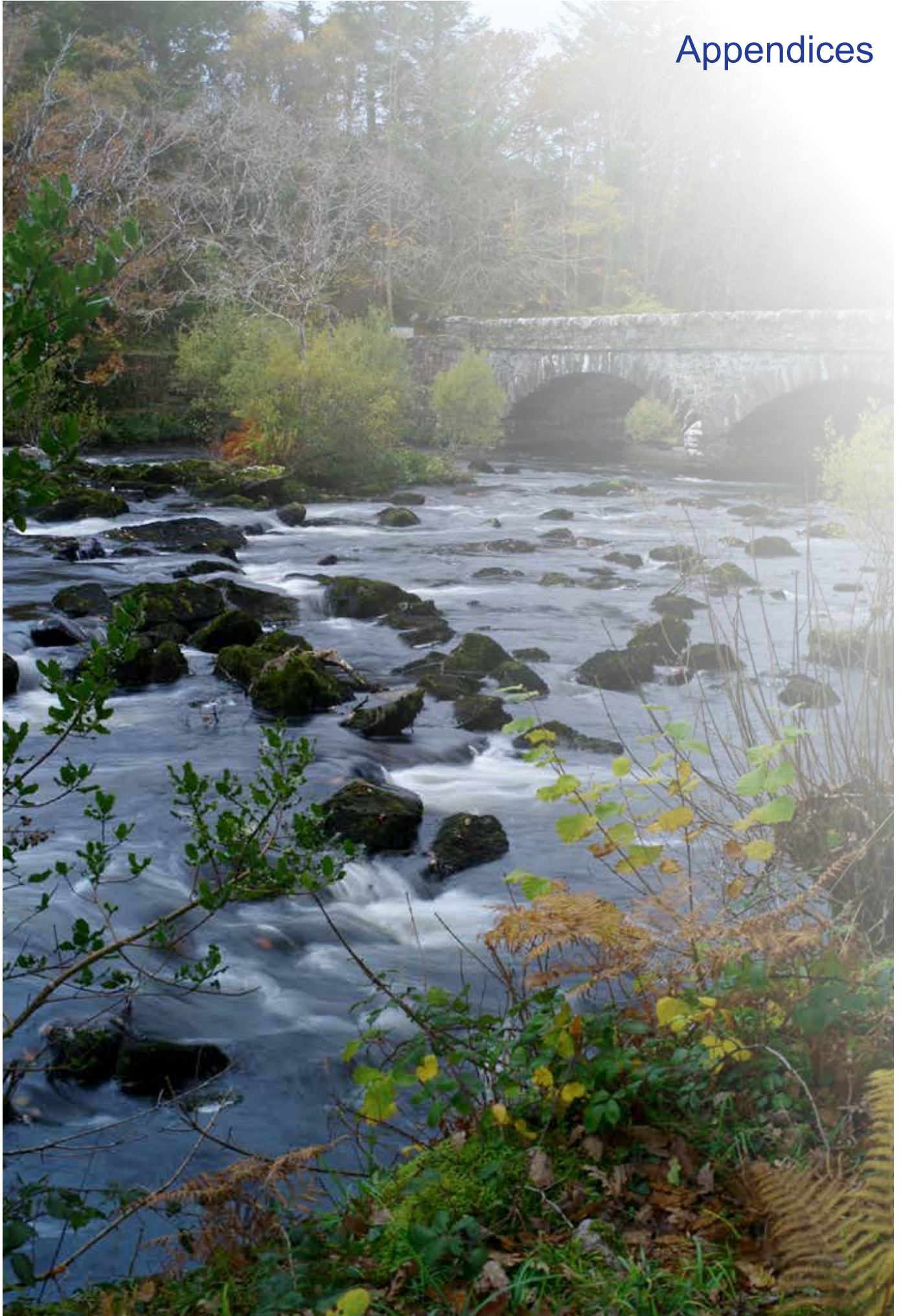
Green Belt initiative.

The Woodland for Water measure was launched by Andrew Doyle TD, Minister of State with responsibility for forestry at the Department of Agriculture, Food & the Marine, at the National Native Woodland Conference entitled '20 Years A-Growing', Glenview, Co. Wicklow, April 2018.





# Appendices





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