FOREST SERVICE

Scoping a new forestry plan for forests and woodland in Armagh

February 2021

An Agency within the Department of
Agriculture, Environment
and Rural Affairs
www.daera-ni.gov.uk

Sustainability at the heart of a living, working, active landscape valued by everyone

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This consultation is to enable all stakeholders to participate in the review of the Armagh Forestry Planning Area (FPA) at the earliest possible stage. This scoping consultation is being carried out to find out which of the topics identified in this document are relevant to you as a stakeholder. The consultation gives you the opportunity to say if you would like to engage with the Forestry Planning Team in relation to any opportunities identified in the document.

Forestry Planning

Forestry planning facilitates the delivery of the many different services our forests and woodlands provide, such as sustainable wood production, carbon sequestration, biodiversity, and recreational opportunities. Reviewing forest plans ensures that they are up to date and that forests continue to meet the diverse and sometimes competing needs of people, wildlife, and wood processing industries.

Armagh Forestry Planning Area

The Armagh FPA includes all forests and woodlands within the geographic boundaries of Co. Armagh. The distribution of forests and woodlands in Armagh FPA is recorded in the Northern Ireland Woodland Register and Basemap and is shown in Map 1. Forests and woodland are estimated to cover around 6,900 hectares (ha), which is 5.4% of the FPA. Forest Service manages 39% (2,700 ha) of the area of forests and woodland in Armagh FPA.

Map 1 - Forests and woodland within Armagh Forestry Planning Area (FPA)

Click map to see larger image

| Armagh Forestry Planning Area | Forest Service forests | Other forest and woodland | City/Town |

Forests managed by Forest Service within the Armagh FPA are predominantly coniferous in character, although many include broadleaved and mixed plantations. Most of these forests are in the southern half of the FPA. The areas and composition of forests managed by Forest Service are shown in Appendix I.

Forest Service forests are managed to meet a range of sustainable development objectives in line with the requirements of the UK Forestry Standard, which is the UK Governments' statement on sustainable forestry, Forest Service contributes to the Department of Agriculture, Environment and Rural Affairs' (DAERA's) purpose of '*Sustainability at the heart of a living, working, active landscape valued by everyone*'. Sustainable forest management supports the work of the Department for the Economy, on energy policy, and the Strategic Investment Board in delivering a public sector energy strategy.

For forest design planning purposes, Forest Service forests are grouped into three forest landscape units: Slieve Gullion, The Fews and Gosford, reflecting the wide range of landscape characters in the County.

Forests and woodlands in Armagh that are not managed by Forest Service are typically fragmented and broadleaved in character. The NI Woodland Register and Basemap indicates that these are comprised of more than 6,000 small broadleaved or mixed woodlands less than 1 ha in size. They are scattered throughout the lowland farmed landscape and close to Armagh City and the urban areas of Portadown, Lurgan and Craigavon. There are a few larger areas of broadleaved and mixed woodland (up to 89 ha in area), occurring within or close to nature reserves, such as Peatlands Country Park. Larger areas of woodland also occur in historic country estates, including The Argory, which is managed by the National Trust, and Tynan Estate. There are also a small number of mainly coniferous plantations (up to 23 ha in area) located mostly in the west and southern upland areas of the FPA.

More detailed information on non-Forest Service forests and woodlands, and on woodland owners' management objectives, may be available for woodland managed by public bodies, or where the land is managed under a forestry grant scheme, or has been subject to a felling licence.

Regional Landscape Character Assessments (RLCAs) are geographical descriptions of the landscape that reflect the distinctiveness of different parts of Northern Ireland, including the extent of forests and woodland. Armagh FPA includes parts of four RLCAs: Lough Neagh Basin RLCA in the north, Southern Drumlins and Orchards RLCA to the north-west, Newry Valley and Upper Bann RLCA, to the north-east, and Slieve Gullion and South Armagh Hills RLCA in the south.

Armagh FPA includes a limited number of important areas of native and semi-natural woodland designated as Area of Special Scientific Interest (ASSI). The largest is Peatlands Park ASSI which is also a Special Area of Conservation (SAC). The FPA also includes Caledon and Tynan ASSI, which is a nationally important example of parkland. Lough Neagh ASSI and Brackagh Bog ASSI both include alluvial woodland as an important feature.

Designated areas adjacent to and on land managed by Forest Service are listed in Table 1 of Appendix II.

Participation and Engagement

Forestry planning involves engaging with people, whether as individuals or as representatives of stakeholder organisations, or relevant bodies. The purpose of the engagement is to ensure that a wide range of interests are considered, including those of local communities and specialist interest groups. Armagh FPA overlaps two council areas: Armagh City, Banbridge and Craigavon Borough Council, to the north, and Newry, Mourne and Down District Council to the south.

Woodland Development

Approximately 15% of the 6,900 ha of forest and woodland in the Armagh FPA is described in the Northern Ireland Ancient Woodland Inventory as woodland on sites which have been continuously wooded since at least 1830. The ancient woodland inventory is based on a combination of archive evidence and field survey, and provides some information on the composition of woodland. Much of this woodland is easily accessible, including parts of Gosford, Carnagh and Slieve Gullion forests, and in Peatlands Park, which is managed by the NI Environment Agency (NIEA).

State forestry began in Armagh with the purchase of 83 ha of land at Fathom in 1930. Forest expansion continued in the late 1940s and throughout the 1950s with forests created in Slieve Gullion, Cold Brae, Camlough, Seagahan and Loughgall. Most notably, due to its larger area,

was The Fews, where over 690 ha of land was purchased between 1951 and 1959. Forest establishment peaked in the 1960s with the continued expansion of Loughgall, Slieve Gullion and The Fews forests, amongst others. Although the area of new planting has decreased every decade since then, small annual increases in forest area occurred until the late 1990s. The development of visitor attractions and facilities has featured in Gosford and Slieve Gullion forests, which were named as Forest Parks in 1969 and 1981 respectively.

The rate of increase in woodland area outside of state forestry since the beginning of the 20th Century is not well documented. Information available from an inventory of private woodland undertaken in 1975-79, and other Forest Service records, indicates that approximately 34% of the current non-Forest Service woodland area in the Armagh FPA is comprised of grant-aided planting since 1970. The remainder is divided between woodland referred to in the private woodland inventory, and woodland derived from scrub and woodland succession (as noted in reports of the Northern Ireland Countryside Survey 1998 and 2007).

Forest Plans

Forest plans provide the direction for interventions that will affect the future appearance, composition, or design of forests. Forest plans show areas of felling (which are individually referred to as coupes), the regeneration of felled areas, management to retain areas under continuous woodland cover, and changes to the type of trees that grow in the forest.

Forest design aims to ensure that there is continuity of woodland for timber and wood products and the delivery of a range of non-timber benefits. These benefits include landscape improvement, water protection, places for people, and protection of habitats, including ancient and native woodland.

Forest Service seeks greater involvement of people in the revision of its forest plans, which has taken place on a five yearly cycle for many decades. The forest management plan for Armagh forests was last reviewed in 2014 (Armagh Planning Review 2014). The Forestry Act (Northern Ireland) 2010 placed a duty on Forest Service to promote afforestation and sustainable forestry, and therefore, Forest Service plans will in future include references to non-Forest Service forest and woodland.

Achievements

Achievements of the previous forest plan for forests in the Armagh FPA during the period 2014 – 2020 are highlighted in the box below.

- Implementing forest design plans for 293 hectares (ha) of forest, including the creation of additional water buffer areas to enhance water quality and protect aquatic habitats.
- Grant aiding the creation of 122 ha of new woodland.
- Producing an average of 27,000 cubic metres of timber each year to supply the timber processing industry, creating jobs in rural areas and providing resources to reinvest in forests.
- Regenerating 268 ha of Forest Service forest land after clearfelling and planting over 700,000 trees.
- Development of walking trails at Mountain Lodge, Darkley, in The Fews Forest, in partnership with Armagh City, Banbridge and Craigavon Borough Council.
- Development of a walking trail in Seagahan Forest in partnership with Armagh Banbridge and Craigavon Borough Council and NI Water.
- Development of a walking trail in Camlough Forest in partnership with Newry and Mourne District Council.
- Development of a walking trail in Fathom Forest in partnership with Newry and Mourne District Council.

- Development of walking trails, a play park and car parking facilities in Carnagh Forest in partnership with Armagh, Banbridge and Craigavon Borough Council.
- Development of walking trails, a picnic area, a play park, car parking and toilet facilities in Slieve Gullion Forest Park in partnership with Newry and Mourne District Council.
- Development of facilities in Gosford Forest Park in partnership with Armagh Banbridge and Craigavon Borough Council, including a network of cycle trails, walking trails, a picnic area, a play park, parking facilities and enhanced camping facilities.
- Development of fishing stands in the fishery situated in Loughgall Forest and Country Park, in partnership with Armagh, Banbridge and Craigavon Borough Council and NI Water, bringing the total number of stands to 100.

Scoping Topics

Forestry planning opportunities are presented under 11 scoping topics which are intended to reflect the various areas of interest to stakeholders, these are as follows:

- Enhancing Landscapes
- Protecting Rivers and Lakes
- Enabling the Enjoyment of Forests by Local People and Visitors
- Promoting Afforestation and Sustainable Forestry
- Supplying Sustainable Wood Products
- Regenerating Forest Land
- Growing Trees Sustainably
- Minimising the Use of Pesticides and Fertilisers
- Targeting Invasive Species
- Protecting Habitats and Species
- Restoring Peatland Habitats

Appendices

A summary of the composition of Forest Service forests is provided in Appendix I. Details of environmental regulation requirements, designated areas, and historic monuments are provided in Appendix II. Forest Service's strategy for restoring peatland habitats is provided in Appendix III.

"Through the appreciation and analysis of landscape context, forests and woodlands can be designed so that they make a positive contribution to the character of a local area, and in some areas create attractive new landscapes."

UK Forestry Standard, 4th Edition (2017)

Armagh Forest Planning Area (FPA) contains a varied range of landscapes. The north of the county features an extensive area of lowland raised bog surrounding the shores of Lough Neagh. Further south, the landscape is characterised by drumlins, with a mosaic of grazed fields and orchards. In the south east of the county the landscape is dominated by the imposing granite slopes and rocky outcrops of Slieve Gullion, an Area of Outstanding Natural Beauty (AONB). In the east of the county, the broad, open topography of the Newry Valley transitions to areas of raised bog in the north-west and an expansive field pattern in the south west.

Most (80%) of Armagh FPA is in the Slieve Gullion and South Armagh Hills Regional Landscape Character Area (RLCA) and Southern Drumlins and Orchards RLCA. The remaining area includes parts of Lough Neagh Basin RLCA, and Newry Valley and Upper Bann RLCA. These RLCAs are themselves comprised of smaller Landscape Character Areas. Forest Landscape Units reflect landscape similarities between existing Forest Service forests and are not always closely related to RCLAs or LCAs.

Forest Service managed forests are predominantly located in the uplands of Slieve Gullion and South Armagh Hills RLCA, where their presence is visible from several miles in any direction. This includes Slieve Gullion and The Fews, which are the largest forests in the county. Gosford and Loughgall forests are located within Southern Drumlins and Orchards RLCA. Drumbanagher Forest is located in Newry Valley and Upper Bann RLCA.

Non-Forest Service forests and woodlands include the many fragmented small broadleaved and mixed woods scattered throughout the lowland areas of the FPA. There are a number of larger, mainly broadleaved, plantations close to Lough Neagh and on the banks of the River Blackwater. These include the distinctive broadleaved woodlands and parklands of The Argory, and Tynan Estate.

Forests and woodlands, therefore, contribute to the various features of the Armagh landscape and can enhance the experience of visitors to the area. Foresters acknowledge that the visual impacts of forests are important and these can be improved by modifying the design of a forest to compliment the local landscape. Harsh visual impacts can be minimised by removing straight lines or softening hard edges and by encouraging more tree planting.

> Opportunity: Identify where the appearance of forests in the landscape can be improved by modifying the shape of felling boundaries and carefully designed regeneration of felled areas
>
> Opportunity: Consider the potential for softening 'hard' forest edges by encouraging the afforestation of neighbouring agricultural land, subject to the landowners' long-term intentions.

Activity: Undertake visual assessments of Forest Service forests from key viewpoints in the surrounding countryside to determine the potential influence forest management decisions could have on the landscape.

Activity: Apply UK Forestry Standard requirements and forest landscape design guidelines, using Geographic Information Systems tools to undertake assessments and present options.

Outcomes	Benefits
- Increased potential to demonstrate landscape improvements using the regeneration and design plans - Illustrate forests' positive contribution to tourism in the Armagh FPA - Stakeholders can contribute to forest design planning	- Attractive forest landscape views from scenic routes throughout the Armagh FPA

Map 2 - Landscape Considerations for Sleive Gullion Forest

Click the image for a larger version

Click the image for a larger version

"Forests and woodlands have a close relationship with our water resources, and forest management and water quality are closely linked. Sustainable forest management is essential to ensure the supply of good-quality fresh water, provide protection from natural hazards such as flooding or soil erosion and to protect the needs of aquatic species."

UK Forestry Standard, 4th Edition (2017)

Forest Service forests lie within the Blackwater, Upper Bann, Newry, Kilkeel and Mourne Streams, Flurry, Castletown, and Fane catchments. Within the Armagh Forestry Planning Area (FPA) the Blackwater is probably the best-known angling river for its salmon and trout. There are a number of forested catchments of lakes and rivers within the Department of Agriculture, Environment and Rural Affairs (DAERA) Public Angling estate. These water bodies include Clay Lake, close to the town of Keady, Loughgall Lake located in Loughgall Country Park, and Seagahan Reservoir, to the south of Armagh city.

For monitoring purposes, under regulations incorporating the Water Framework Directive, the Armagh FPA lies in the Neagh Bann River Basin District. Monitoring undertaken by the Northern Ireland Environment Agency as part of the 2nd cycle of the Water Framework Directive has indicated no waterbodies are at risk of acidification in the Armagh FPA.

The key forest design activity to protect water in forests has been the creation of buffer areas, comprising of open ground, between forestry land and water bodies. As the benefits of creating native broadleaved woodland adjacent to aquatic habitats have become more widely recognised, the focus of forestry planning has shifted towards enabling the establishment of riparian woodland. An action to create riparian woodland in Forest Service forests is included in the cross-Departmental strategy 'Sustainable Water - A Long-Term Water Strategy for Northern Ireland' (2016).

Afforestation schemes, including the Forest Expansion Scheme, the Small Woodland Grant Scheme, and the 'Establishment of Native Woodland under 5 ha' option of the Environmental Farming Scheme (EFS), provide opportunities to create new riparian woodland. There is also a 'Creation of riparian buffer - 10 metre width - planted with native trees' option under EFS which is also targeted at improving water protection.

Forestry planning can avail of newly available datasets which use topographical and rainfall information to highlight areas most at risk of contributing to erosion and diffuse pollution. The mapping of these risk areas enables better positioning of water protection measures such as riparian woodland or other mechanisms to intercept and trap pollutants.

Opportunity: Identify the potential to increase the extent of riparian woodland by colonisation or planting.

Opportunity: Use new sources of information to review the internal design of forests.

Activity: Identify water buffer areas that have become colonised by native woodland and where riparian woodland establishment by planting is appropriate.

Activity: Use data to improve forestry planning, including the revision of planned felling coupes, forest design plans and forest regeneration plans.

Outcomes	Benefits
- Assurance that risk to the ecological condition of features due to forest operations will be appropriately managed - Establishment of new native riparian woodland contributing to the Northern Ireland Long-Term Water Strategy target	- Significant contribution to biodiversity and to angling, arising from the promotion and practice of sustainable forestry - Long-term protection of water quality resulting from increased extent of riparian woodland

"Access to woodlands is a public benefit that can improve people's health and well-being."

"Woodland visits help build an understanding and appreciation of the forest environment. Access to woodlands can be particularly beneficial for people from urban areas, people from disadvantaged social backgrounds, and people with disabilities..."

UK Forestry Standard, 4ᵗʰ Edition (2017)

The Forestry Act (Northern Ireland) 2010 promotes and encourages the enjoyment and recreational use of Forest Service land by the public, including a right of pedestrian access and promotes the social benefits of other woodland. Partnership arrangements between Forest Service and Councils have been developed in keeping with the implementation of the Forest Service's strategy to Develop the Recreational and Social Use of Our Forests.

Forest Service continues to manage some facilities in its forests, including the car park at Carricatuke viewpoint, in The Fews Forest, and a trail in Ballymoyer Forest. Information on recreation facilities managed by Forest Service is given at https://www.nidirect.gov.uk/information-and-services/forests/public-forests-northern-ireland. Peatlands Park, which is managed by the Northern Ireland Environment Agency (NIEA), includes a number of woodland walks and other visitor attractions https://www.nidirect.gov.uk/articles/peatlands-park-dungannon.

Armagh City, Banbridge and Craigavon Borough Council, and Newry, Mourne and Down District Council are each continuing to develop and manage visitor facilities in a number of Forest Service forests and woodlands. These projects deliver benefits both in terms of the well-being of local communities, and by attracting visitors from further afield.

Armagh City, Banbridge and Craigavon Borough Council manages recreation facilities in Gosford Forest Park, Loughgall Forest, The Fews Forest (Darkley Wood) and Carnagh Forest, and a car park and picnic area adjacent to Seagahan Forest. The most developed location is Gosford Forest Park, which features picnic areas, car parking and toilets, multi-use trails, a children's play area, caravanning and camping facilities, an historic arboretum, and a red deer enclosure. There are multi-use trails in The Fews, Carnagh and Seagahan forests. Other facilities include a children's play area in Carnagh Forest and exercise stations in Loughgall Forest.

Newry, Mourne and Down District Council manages recreation facilities in Slieve Gullion Forest Park, Camlough Forest and Fathom Forest. Slieve Gullion Forest Park features multi-use trails, picnic areas, car parking and toilets, a visitor information office and a scenic drive with trails connecting to the Summit Cairn. In addition there are a wide range of family attractions, including play areas, the impressive Giant's Lair trail, a red squirrel trail and hides, and a sensory trail.

Sections of the Ulster Way pass through Camlough, Slieve Gullion and Fathom forests. Parts of the Sustrans National Cycle Network pass close to Gosford, Camlough and Slieve Gullion forests. Motor sports events attracting large numbers of spectators are held annually in Loughgall Country Park Forest.

Non-Forest Service woodlands in the Armagh Forestry Planning Area (FPA) also provide a wide range of recreational opportunities for users. The Woodland Trust manages several areas of woodland in the FPA including Cranagh Wood near Armagh, Canal Wood near Poyntzpass, Corcrain Community Woodland near Portadown, Daisy Hill Wood near Newry and Taghnevan Community

Woodland near Lurgan. The Argory, which is a property managed by the National Trust, includes woodland walks on the banks of the River Blackwater.

Opportunity: Continue to discuss options for maintaining the existing provision of facilities improving access to forests with Councils and other partners and potential partners.

Activity: Liaise with Councils to increase the recreational use of forests.

Activity: Liaise with public bodies and neighbours to discourage activities presenting a risk to pedestrian users of forests.

Outcomes	Benefits
- Local people are able to make greater use of forests in their area - Promoting recreational use of forests - Delivering sustainable development in partnership with others	- Health and well-being - Development of local businesses

"The General Duty placed on the Department of promoting afforestation and sustainable forestry by the Forestry Act refers to all forests in Northern Ireland, not only the Department's forest land. The Department recognises the valuable contribution that forestry makes in achieving its vision of a thriving sustainable rural community. Through the Forest Service, it aims to ensure the sustainability of forests as an invaluable heritage, expansion of tree cover, management of forests in a way that increases biodiversity, enhances the landscape and assists in improving water quality".

A Delivery Plan for the Implementation of the Forestry Act (Northern Ireland) 2010

'DAERA's purpose is '**Sustainability** *at the heart of a living, working, active landscape valued by everyone*'. Sustainability will be at the heart of what we do, our economic renewal requires the recognition on the importance of our environment as a pathway towards a shared sustainable future and continued access to existing and new markets for our agri-food products'.

Edwin Poots MLA, Minister for Agriculture, Environment and Rural Affairs, 2020.

"As in previous years*, the most popular reason to support forestry in Northern Ireland with public money was 'to provide places for wildlife to live' with 70% of respondents in 2019 selecting this as a benefit. 'To provide places for recreation' (58%), 'to provide places for families to play' (56%) and 'to provide places for relaxation and stress relief' (56%) were also seen as important reasons to support forestry with public money."

* Northern Ireland Public Opinion of Forestry Surveys have been conducted regularly since 2005
Public Opinion of Forestry 2019, Northern Ireland

It is Government policy to promote forest expansion. The importance of creating more forests is recognised by the NI Executive, with 'Forests for Our Future' being one of the foundation programmes in its 'Green Growth' Strategy. The aim to plant 18 million trees over the next decade will help Northern Ireland to meet the UK Governments' net-zero carbon target by 2050. Tree planting can also help contribute to a strong economy, a thriving environment and healthy, active communities.

The operation of forestry grant schemes and Felling Regulations provide opportunities for Forest Service to promote the delivery of ecosystem services from new and regenerated woodland, through the use of appropriate forest design and tree establishment techniques. During the past 5 years 122 hectares of new woodland have been grant aided by the Department within the Armagh Forestry Planning Area.

Information on the extent of land that could be potentially suitable for afforestation is published on the Department of Agriculture, Environment and Rural Affairs website (Indicative map for woodland creation).

Research commissioned by Forest Service and prepared by Forest Research demonstrates how afforestation can contribute to flood alleviation by identifying priority areas for woodland creation to benefit flood risk management and mitigation. (Opportunity mapping for woodland creation to reduce flood risk in Northern Ireland).

The damaging impact of flooding is illustrated by the extreme flooding events in Portadown and Loughgall in 2014 which caused considerable damage to local property. Similarly, flash flooding in June 2020 in Portadown further demonstrates the need for action to manage floods.

Forestry planning will seek to identify opportunities for woodland expansion to deliver benefits that are complementary to those provided by Forest Service forests. These benefits can include contributing to the local landscape character and increasing connectivity between forests and woodlands in the landscape.

Information on the potential contribution of woodland to community development, and its capacity to deliver ecosystem services, is integral to understanding the contribution of sustainable forestry to '*sustainability at the heart of a living, working, active landscape valued by everyone*'. Consideration of non-forestry uses of land adjacent to forests can also be relevant to the Department's purpose, and may lead to opportunities to realise both environmental and economic benefits.

> Opportunity*:* Identify potential for promoting woodland expansion adjacent to Forest Service forests, where appropriate.
>
> Opportunity*:* Review the extent of non-Forest Service woodland in the Armagh Forestry Planning Area (FPA), and the range of pressures that could affect its sustainability.

Activity: Assess provision of ecosystem services by non-Forest Service woodland adjacent to forests.

Outcomes	Benefits
- Landscape improvement through tree planting	- Woodland ecosystem services, benefitting people, the environment, and the economy
- Baseline information on woodland management	- Landscape scale woodland management

5 - Supplying Sustainable Wood Products

"Our forests support development of the Northern Ireland economy by supplying wood for industrial use. We sold 414,000 cubic metres of logs for £9.95 million, and we estimate that £24 million of value was added by industry in harvesting, timber haulage, and manufacture for construction, fencing, pallet and packaging, and energy. We obtained more of our timber supplies from tree thinning operations as part of our strategy to extend the life of plantations and reduce the impact of forestry operations on the environment."

Forest Service Annual Report 2015 - 2016

Timber harvesting operations are managed to avoid adverse environmental impacts, particularly preventing movement of sediment and pollutants into watercourses. Since 2014, Armagh forests have produced an average of 27,000 cubic metres (equivalent to 900 lorry loads) of timber per year, mainly from clearfelling.

To provide assurances of sustainable management, Forest Service forests and management are subject to a periodic assessment and annual audits of compliance by an independent certification body. In the UK, certification bodies use the UK Woodland Assurance Standard (UKWAS) to assess the management of Forest Service forests against the requirements of both the Forest Stewardship Council® (FSC®) (Licence code: FSC-C084232), and, the Programme for Endorsement of Forest Certification (PEFC) (Licence code: PEFC/16-40-1924). As a result of FSC® and PEFC forest management and ensuing 'chain of custody' certification components, wood products derived from Forest Service forests can be marketed by processors using the logos of the FSC® and PEFC. The logos signify that wood products have come from responsibly managed forests.

Over time, forest plans will seek to reduce the proportion of the total amount of timber produced by clearfelling, and increase timber production from thinning of plantations that will eventually be clearfelled. Where site conditions are suitable, plantations will be managed using low impact silvicultural systems (LISS), in which clearfelling is avoided and continuous forest cover is maintained.

Opportunity: Review the timing and boundaries of planned felling, to complement landscape design and enhance water protection, using Geographic Information Systems (GIS) tools and datasets.

Opportunity: To optimise the supply of timber from thinning and use of LISS, including continuous cover forestry.

Activity: Make use of advanced GIS tools and datasets to improve the design of felling coupes.

Activity: Optimise thinning in Armagh forests, and enhance planning capability.

Activity: Develop and apply a rationale for identifying further areas where the use of LISS is appropriate.

Outcomes	Benefits
- Maintain supply of certified timber - Improved knowledge of future timber availability - Greater resilience of timber availability through the use of alternative silvicultural systems	- Sustainable economic activity in the rural landscape - Industrial output of home produced wood products to a variety of markets, including construction, agriculture, energy, and domestic heating

Clearfell:
112 hectares of Gosford Forest is currently managed using a clearfell system. These areas will be evaluated to determine if there is potential to convert them to LISS. Where a clearfell system is appropriate the fell year will be reviewed using all available data.

Extended Rotation:
Areas where trees are retained beyond the normal age of clearfelling. Six hectares of Gosford Forest area is currently managed as extended rotation. The potential to increase this area will be reviewed particularly where it is of benefit to priority species, such as red squirrels.

Low Impact Silviculture Systems (LISS):
92 hectares of Gosford Forest area is managed under LISS, an alternative approach to timber production that does not involve clearfell. Further opportunities to extend the use of LISS will be explored.

Thinning Area:
'Thinning' is the selective removal of trees to improve the growth rate or health for the remaining trees. Thinning will be planned for both clearfell and LISS areas following survey work carried out as part of this review.

Legend:
- Felling coupe boundary
- Thinning areas
- Areas managed under LISS
- Extended rotation
- Open ground
- Arboreta and Amenity woodland
- Water
- Forest roads

0   0.25   0.5 Kilometres

Ordnance Survey of Northern Ireland – © Crown Copyright and Database Right (2015)

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6 - Regenerating Forest Land

"Forest regeneration is the act of renewing tree cover by establishing young trees naturally or artificially - generally, promptly after the previous stand or forest has been removed. The method, species, and density are chosen to meet the goal of the landowner."

Land Use, Land-Use and Forestry Fact Sheet 4.12 Intergovernmental Panel on Climate Change

Regeneration of forest land after felling (or occasionally, after destruction by fire) is an opportunity to improve the design of a forest to meet longer term objectives. These objectives include enhancing the landscape, protecting water, using a wider range of trees species, improving wildlife habitats and increasing the resilience of the forest. Felled areas may be replanted, or allowed to regenerate naturally from seed or left unplanted to include more open ground in a forest. In some circumstances wood production can be increased by using improved planting material, for example, grown from seed harvested in seed orchards.

The development and improvement of forest design and regeneration plans are a significant forest management activity, involving extensive engagement with Government bodies, organisations, local people and other stakeholders. Forest design plans have resulted in the creation of additional water buffer areas, some of which are suitable for establishing new native woodland. Forestry planning has also been undertaken in relation to non-Forest Service forests and woodland in the Forestry Planning Area in conjunction with the regeneration of areas subject to felling regulation.

Management of forests under some low impact silvicultural systems (LISS) involves making use of natural regeneration, where it occurs, and supplementary planting if required.

> Opportunity: Review and revise forest design and forest regeneration plans, to include more native broadleaved trees and open ground, and favour the use of a wider range of conifer species for regeneration, where appropriate.
>
> Opportunity: Revise felling and regeneration plans to increase age, species and structural diversity in forests.
>
> Opportunity: Specify the use of more productive Sitka spruce (*Picea sitchensis*) planting material in regeneration plans, where site conditions are suitable.

Activity: Assess the suitability of current and planned water buffer areas for the establishment of new native woodland.

Activity: Identify areas suitable for use of alternative conifer species, including Norway spruce (*Picea abies*), Douglas fir (*Pseudotsuga menziesii*) and western red cedar (*Thuja plicata*).

Activity: Identify areas where wildlife habitat can be enhanced by planting a wider range of tree species.

Activity: Identify areas managed as LISS where supplementary under planting is appropriate.

Outcomes	Benefits
- Regeneration plans identifying the establishment of native woodland adjacent to watercourses and the appropriate use of alternative conifer species	- Forests which deliver better ecosystem services and have more natural capital - Forests that are more resilient to the effects of disease, climate change and other pressures

"The essential consideration for the landowner or manager is to ensure that the forest thrives and is not degraded. This includes protecting young trees to make sure they become successfully established, and protecting the health of forests and woodlands, for example by ensuring they have the necessary resilience to cope with emerging threats and changing conditions – in particular climate change. It also involves maintaining levels of fertility and site potential for future rotations."

UK Forestry Standard, 4th Edition (2017)

Growing trees sustainably involves monitoring the health and vitality of the forest, and responding appropriately to threats. Armagh forests are vulnerable to a similar range of threats occurring elsewhere in Northern Ireland. Harm to forest users and the environment arise from criminal or anti-social behaviour, the effects of fire, pests, diseases, wind and storm damage, and loss of soil fertility.

Areas recently planted with native and other broadleaved trees, including new riparian woodland, are particularly susceptible to damage by deer and from uncontrolled livestock grazing. Cattle, sheep, deer and feral goats are also able to hinder or prevent woodland development by natural colonisation and regeneration. Management of deer to prevent damage to young trees is routinely undertaken in a number of forests, including Slieve Gullion, Drumbanagher and Gosford forests.

Additionally, tree diseases can also impact forest growth and development. The ongoing impact of ramorum disease (*Phytophthora ramorum*) on larches (*Larix spp.*) in forest plantations remains a concern. In addition, it is apparent that the effects of ash dieback disease (*Hymenoscyphus fraxineus*) are becoming increasingly widespread in some Forest Service forests, including Loughgall Forest and Gosford Forest Park, and in woodland and trees in the wider environment.

The risk of damage from many of these threats is managed by operational measures and contingency planning, in conjunction with monitoring and regularly liaising with neighbours, partners and stakeholders.

> Opportunity: Liaise with neighbours and statutory bodies in relation to controlling damage to woodlands, preventing deer poaching and other wildlife crime.

Activity: Collate and analyse monitoring information, including assessments of tree growth and nutrition.

Outcomes	Benefits
- Updated monitoring and contingency plans	- Healthy, safe forests - Protected natural environments

"The use of artificial pesticides and fertilisers is generally a last resort in practising sustainable forest management…Pesticides and fertilisers are expensive, and should only be deployed in a reactive way to protect trees when a problem has been identified or is highly likely. Their use on special sites such as ancient woodland is particularly discouraged."

UK Forestry Standard, 4th Edition (2017)

Pesticide use in Forest Service forests is restricted by statutory regulation and the adoption of a specific integrated pest management strategy to minimise pesticide use. This strategy requires non-chemical control options to be considered and favoured wherever possible, for example, where there is risk of causing harm to people and the environment. In principle, pesticides are used as a last resort, and the use of specific pesticides by the forestry industry is kept under constant review.

There are two main uses of chemical control for pests and diseases in forests; one is to protect forests from the fungal disease causing stem rot, *Heterobasidion annosum*, using a solution of urea applied to tree stumps after cutting. The other is to protect trees replanted after felling from insect damage caused by the pine weevil (*Hylobius abietis*), on a proportion of sites during the initial 1 – 2 years. The preferred currently available option involves the use of a product containing a neonicotinoid substance (acetamiprid) applied off-site to trees before planting, and where necessary after planting. Control of invasive rhododendron (*Rhododendron ponticum*) and laurel (*Prunus laurocerasus*) is normally achieved using a glyphosate based herbicide, in combination with cutting.

Environmental monitoring of water bodies carried out in recent years has identified both detections of pesticides and biological effects. Although forestry may not be the only source of pesticides, it has not been conclusively ruled out by the Northern Ireland Environment Agency (NIEA), given the targeted use in forestry of some of the pesticides detected.

Fertilisers have been routinely used to enable woodland establishment and promote tree growth in upland forests since the early 1960s, although not in Armagh Forestry Planning Area. Elsewhere, fertiliser use followed prescriptions for different tree species and site conditions that had been developed over many decades of research and monitoring.

Opportunity: To contribute to the minimisation of pesticide use by planning the sequencing of felling years and increasing the area of forest managed under low impact silvicultural systems (LISS).

Activity: Environmental monitoring of forested catchments, in conjunction with NIEA.

Outcomes	Benefits
- Pesticide use is minimised to the extent that residues are significantly below environmental monitoring thresholds	- Economic activity in forests contributing to the health and well-being of local people

9 - Targeting Invasive Species

"Here, as elsewhere in the world, invasive species are increasingly a serious threat to biodiversity and the benefits that healthy ecosystems provide to us… They are a risk to our unique flora and fauna, our economic interests such as forestry, fishing, and farming, our health, and our recreational interests."

An Invasive Alien Species Strategy for Northern Ireland (2013)

A number of invasive, non-native plant species occur in most forests, with the potential to affect access, biodiversity, regeneration of forests and tree growth. The most widely occurring invasive plant species are rhododendron and laurel. Both are susceptible to *Phytophthora ramorum* (the cause of 'ramorum disease' of larch, and known in the USA as 'sudden oak death') and can act as hosts for the disease in a woodland. This can increase the amount of inoculum in an area. Although there are fewer invasive non-native mammal species in forests than plants, the impact on biodiversity and tree health of the grey squirrel (*Sciurus carolinensis*), and of introduced deer species, can be locally significant.

Some invasive species are subject to regulation under the Wildlife and Natural Environment Act (Northern Ireland) 2011, and, more recently, the Invasive Alien Species (Enforcement and Permitting) Order (Northern Ireland) 2019. Actions targeted against invasive species by public bodies are co-ordinated under the Invasive Alien Species Implementation Plan. Effective action against invasive non-native species is generally very costly and is not undertaken without good justification, for instance removal from threatened protected habitats, ancient woodland sites and riparian areas.

Opportunity: Prioritise areas where control of rhododendron and laurel is required.

Opportunity: Prioritise areas where control of colonising woodland is required in protected habitats and riparian areas in Forest Service forests.

Activity: Collate and analyse data on the occurrence of invasive plant species in forests.

Activity: Assess extent of colonisation of protected habitats and water buffer areas by Sitka spruce and other conifers.

Outcomes	Benefits
- Decreasing area of forest land affected by invasive plant species - Reduced threats to biodiversity and tree health	- Forests are more attractive - Better access for angling

"Northern Ireland's biodiversity plays a significant role within its economy. A healthy, properly-functioning natural environment is the foundation of sustained economic growth, prosperous communities and personal well-being."

Valuing Nature A Biodiversity Strategy for Northern Ireland to 2020.

A quarter of the 76,000 ha of land managed by the Forest Service is designated for nature conservation. Designations include Special Area of Conservation (SAC), Special Protection Area (SPA), Area of Special Scientific Interest (ASSI) or National Nature Reserve (NNR).

Designated areas in and adjacent to Armagh forests are listed in Appendix II. As a competent authority, Forest Service is required to undertake assessments of the potential impact of forestry on areas designated as either SAC or SPA. In the Armagh Forestry Planning Area (FPA) this includes Slieve Gullion SAC, Peatlands Park SAC, and Lough Neagh and Lough Beg SPA.

In addition to designated areas, forest plans identify areas in forests that correspond to priority habitats formerly described in the EU Habitats Directive. These include native woodland, parkland, species-rich grassland, bog and heathland. No critical threats to remnant ancient woodland features were identified in Armagh Forest Planning Area (FPA) following a survey of ancient woodland sites in Forest Service forests, conducted in 2013 – 14. Forest design plans identify areas as natural reserves, in which intervention is restricted, areas for native woodland expansion, current and planned open habitats (including areas which may currently be afforested). Forest design plans also identify where areas should be maintained as open ground, including internal forest edges.

Forests and woodlands provide habitats for a number of rare and protected plants, invertebrates, birds and mammals, and support populations of wild deer, which are managed to prevent damage to susceptible trees. Biodiversity of forests is also enhanced through management of deadwood habitat, and protecting ancient woodland remnant features, veteran trees, and other features of high biodiversity value from damage in the course of forest operations. Other measures include extending the period of time between planting and clearfelling (extended rotation), and converting the management of areas to low impact silvicultural systems to maintain continuous forest cover.

Ancient semi-natural woodland is particularly important as it provides a range of habitats which support a rich diversity of plants and animals compared to more recent woodland. However, it is very limited in extent and there are relatively few intact examples outside of protected areas. Such woodland can be found in or close to Forest Service forests such as Drumbanagher Forest and Slieve Gullion Forest.

Forest Service records indicate that badgers (*Meles meles*) are the most widely distributed mammal in Armagh FPA and have been recorded in Drumbanagher, Gosford, Slieve Gullion, Loughgall, Seagahan and Ballymoyer forests. Red squirrels (*Sciurus vulgaris*) have been recorded in Loughgall and Fathom forests, with the latter population benefitting from the activities of the Ring of Gullion and Cooley Red Squirrel Group. The Irish hare (*Lepus timidus hibernicus*) has been recorded in Fathom and Slieve Gullion forests. There have been relatively few recorded sightings of birds of prey in Armagh FPA compared to other parts of Northern Ireland. However, buzzard (*Buteo buteo*) and red kite (*Milvus milvus*) have been recorded in Drumbanagher and Camlough forests respectively.

The use of low impact silvicultural systems in conifer stands is generally understood to be

beneficial in terms of increasing biodiversity. Some raptor species, such as hen harrier, benefit from a mosaic of plantation ages resulting from managed clearfelling. Forest glades and unplanted breaks, or rides, are particularly important for nesting and foraging of forest edge dwelling raptor species. These species include buzzard, merlin, red kite, goshawk (*Accipiter gentilis*), kestrel (*Falco tinnunculus*) and raven (*Corvus corax*).

Forest operations are planned to avoid adverse effects on rare and vulnerable species. It is also important that people wishing to use forests for recreational purposes are aware of the needs of protected species, particularly easily disturbed breeding raptors.

Opportunity: Complete Habitats Regulations Assessments (HRAs) of revised forest plans in respect of SACs as appropriate.

Opportunity: Identify areas of open habitat where intervention is necessary to address potential loss of biodiversity, and maintain ecological connectivity.

Activity: Review potential effects of forest operations specified in forest plans.

Activity: Undertake assessments of the risk to open and parkland habitats from colonising trees and other threats to biodiversity.

Outcomes	Benefits
- Contribution of forests to Northern Ireland biodiversity is maintained or increased	- Opportunities for watching birds and wildlife in forests

11 - Restoring Peatland Habitats

"Peatland covers 12% of the land area of Northern Ireland... It is a resource which is of enormous importance to the stability and general well-being of our environment, creating distinctive upland and lowland landscapes, conserving biodiversity, and affecting river catchment hydrology. Peatland is also valuable as an archival record of climatic and vegetational history and archaeological remains. Globally, peatland acts as a massive carbon store with implications for the 'greenhouse effect' ".

Conserving Peatland in NI (1993)

Internationally, peatland habitats are threatened from human activities, climate change and are therefore considered areas of high conservation importance. Historically, in Northern Ireland, land with a peat depth of more than 50 cm was acquired on a large scale because it was considered to be suitable for afforestation without compromising agricultural production. These areas were planted with Sitka spruce and lodgepole pine (*Pinus contorta*), which are tolerant of exposure and wet soil conditions. However, as the areas acquired became more extensive and increasingly infertile, it was found that greater inputs, in terms of cultivation, drainage and fertiliser were needed to establish plantations and to maintain tree growth. This took place over large areas of Ireland and Scotland, and to a lesser extent, in Wales and northern England. Similar activity has also taken place in other European countries, particularly in northern Sweden and Finland.

Growing trees which require repeated inputs of fertiliser is not consistent with sustainable forestry, and requires forestry planners to specify species and silvicultural systems that require lower inputs. This limits options for productive forestry on the more infertile areas of peat, which have a poor capacity to retain nutrients which are required for growth.

Restoring areas of afforested peat that are unsuitable for growing trees to open peatland habitat safeguards the storage of carbon in soil, and enables the recovery of biodiversity associated with bog habitats. However, it also requires inputs in terms of tree removal or treatment of felled areas. Inputs can include removal of branches remaining from harvested trees, blocking of drains, burying of stumps, and ground-smoothing by tracked excavator. Conversion of forest to non-forest would result in a reduction in the wood production potential of forests, and, possibly, limit recreation opportunities. Therefore, it is critical that potential restoration sites are identified and carefully considered. Forest Service has developed a new approach to prioritising the restoration of peatland habitats, which is given in Appendix III.

Afforested peat comprises just under a fifth of the area of Forest Service forests in Armagh. The largest areas occur in Carnagh, The Fews and Cold Brae forests, although there are also small areas in Slieve Gullion and Loughgall forests.

> Opportunity: Identify and prioritise areas of afforested peat more than 50 cm deep for restoration to open peatland habitat.

Activity: Apply the process outlined in Appendix III for identifying and mapping potential candidate restoration areas based on peat depth, slope and topography.

Outcomes	Benefits
− Reduction in area of regeneration of upland forests and their timber production potential − Change in upland forested landscapes − Reconnection of remnant patches of isolated peatland	− Flood risk mitigation and carbon storage − Improved NI greenhouse gas projection

Appendix I

Composition of Forest Service forests

The areas and composition of Forest Service forests in Armagh Forestry Planning Area are shown by Forest Landscape Unit in Tables 1.1, 1.2 and 1.3 below.

Table 1.1
Slieve Gullion Forest Landscape Unit

Forests	Area (Ha)	Composition (%)			
		Conifer	Broadleaf	Mixed	Open ground + water
Camlough	305	72	4	3	21
Fathom	146	53	6	30	11
Slieve Gullion	947	46	7	4	43
Total Landscape Unit	1397	52	6	7	35

Table 1.2
The Fews Forest Landscape Unit

Forests	Area (Ha)	Composition (%)			
		Conifer	Broadleaf	Mixed	Open ground + water
Ballymoyer	19	32	9	55	4
Carnagh	142	52	24	12	12
Cold Brae	161	85	5	1	9
Drumbanagher	71	19	22	52	7
Seagahan	61	72	22	2	4
The Fews	1079	82	7	3	8
Total Landscape Unit	1532	76	10	6	8

Table 1.3
Gosford Forest Landscape Unit

Forests	Area (Ha)	Composition (%)			
		Conifer	Broadleaf	Mixed	Open ground + water
Gosford	255	14	16	54	16
Loughgall	83	9	25	64	2
Total Landscape Unit	338	13	18	56	13

Appendix II

Environmental Regulation, Designated Areas, and the Historic Environment

1. Environmental Regulation

Afforestation, deforestation, forest road works and forest quarry works are subject to regulation under the Environmental Impact Assessment (Forestry) Regulations (Northern Ireland) 2006, as amended under the Environmental Impact Assessment (Forestry) (Amendment) Regulations (Northern Ireland) 2017. Thresholds beyond which projects must be screened are determined by the type of project and existence of a designation, as listed in Schedule 2 of the 2006 Regulations.

In areas designated as Special Area of Conservation (SAC) or Special Protection Area (SPA), management plans and, where necessary, operational plans in connection with forestry or recreational activities, are subject to regulation under the Conservation (Natural Habitats *etc.*) (Northern Ireland) Regulations (as amended), commonly referred to as the Habitats Regulations. Operational plans for forest management activities in Areas of Special Scientific Interest (ASSI) are subject to regulation under the Environment Order (Northern Ireland).

Nature Reserves (NR) and National Nature Reserves (NNR) are declared under the Nature Conservation and Amenity Lands Order (Northern Ireland) 1985, and are managed in accordance with a management plan.

2. Designated areas

Forestry land is designated under the Habitats Regulations, the Environment Order, and the Nature Conservation and Amenity Lands Order (Northern Ireland) 1985. Forestry land may also include Sites of Local Nature Conservation Importance (SLNCI), which are local areas designated by Councils under the Strategic Planning Statement (SPPS) for Northern Ireland, and Planning Policy Statement (PPS) 2: Natural Heritage. Designated areas adjacent to and on land managed by Forest Service are shown in Table 1.

Table 1
Designated areas adjacent to and including Forest Service land.

Designated site or area	Designation type	Forest adjacent or included within
Ring of Gullion	AONB	Camlough
		Fathom
		Slieve Gullion
Slieve Gullion	SAC	Camlough
		Slieve Gullion
Cam Lough	ASSI	Camlough
Carlingford Lough	ASSI	Fathom
Clermont and Anglesey Mountain	ASSI	Fathom
Fathom Upper	ASSI	Fathom
Glendesha	ASSI	Slieve Gullion
Mullaghbane	ASSI	Slieve Gullion
Slieve Gullion	ASSI	Slieve Gullion
		Camlough
Straghans Lough	ASSI	Carnagh
Aghmakane Fen South	SLNCI	Camlough
Anglesey Mountain	SLNCI	Fathom
Aughadanove	SLNCI	Slieve Gullion
Ballymacdermot Mountain	SLNCI	Camlough
Cam Lough Mountain	SLNCI	Camlough

Carnagh Lake and Forest	SLNCI	Carnagh
Clay Lake	SLNCI	Carnagh
Clontygora	SLNCI	Fathom
Crosslieve	SLNCI	Slieve Gullion
Cully Water/Ummercam River	SLNCI	Cold Brae
Fathom Lower Woods and grasslands	SLNCI	Fathom
Flagstaff	SLNCI	Fathom
Glendesha	SLNCI	Slieve Gullion
Gosford Forest Park	SLNCI	Gosford
Hawthorn Hill	SLNCI	Slieve Gullion
Hawthorn Hill Upper	SLNCI	Slieve Gullion
Lough Road Fen	SLNCI	Slieve Gullion
Loughgall Lake	SLNCI	Loughgall
Mullaghbane Mountain	SLNCI	Slieve Gullion
Mullaghbane	SLNCI	Slieve Gullion
Slievegullion grassland	SLNCI	Slieve Gullion
Tievecrom	SLNCI	Slieve Gullion

Woodland is a main component in some designated areas including Slieve Gullion Forest. However, for others, although forestry isn't a main component they are located in areas which are highly modified by afforestation, such as Clermont & Anglesey Mountain ASSI.

3. Forests and the Historic Environment

Forests and woodland often include historic sites, such as earthworks, ruined structures and buried archaeological features. These may be designated as state care or scheduled sites and monuments, or they may be non-scheduled. Features listed in the Northern Ireland Sites and Monuments Record (NISMR) that are located in forests or within 50m of forest boundaries are shown in Table 2. Some Forest Service forests include areas of historic parks, gardens and demesnes, including Gosford Castle and The Manor House, Loughgall.

Table 2
State-care, scheduled and non-scheduled historic sites and monuments located in or near forest boundary (within 50m).

Forest	Townland	Type	Protection	Location
Ballymoyer	Cavankill	Souterrain	Non-scheduled	Near forest
Camlough	Ballymacdermot	Court tomb	State care and Scheduled	Near forest
	Derry More	A.P. site*	Non-scheduled	Near forest
Carnagh	Crossnenagh	Folklore site - boulder	Non-scheduled	In forest
Fathom	Clontygora	Megalithic tomb (prehistoric)	Scheduled	In forest
Gosford	Ballyanny	Rath	Non-scheduled	Near forest
	Gosford Demense	Crunaght fort: Rath	Non-scheduled	In forest
	Gosford Demense	Enclosure	Non-scheduled	In forest
	Gosford Demense	Enclosure	Non-scheduled	In forest
	Gosford Demense	Gosford Castle (fortification)	Non-scheduled	In forest
	Gosford Demense	Greer's Fort: Rath	Scheduled	In forest
	Gosford Demense	Swift's Well, St Patrick's Well: Holy well	Non-scheduled	In forest

Loughgall	Ballytyrone	Crannóg	Scheduled	Near forest
	Ballytyrone	Drumilly Bawn, walled garden: Enclosure	Non-scheduled	Near forest
	Loughgall	Bawn and settlement site	Non-scheduled	In forest
Slieve Gullion	Ballard, Slieve Gullion	Multiple-cist cairn: North cairn	State care	In forest
	Carrickastickan	Large enclosure and cairn: Forkhill Mountain	Scheduled	In forest
	Carrickastickan	Rath	Non-scheduled	Near forest
	Carrickbroad	Round cairn with cist: Cofracloghy	Scheduled	In forest
	Carrickbroad	Rath	Scheduled	In forest
	Longfield	Enclosure	Non-scheduled	Near forest
	Shean	Souterrain (unlocated)	Non-scheduled	In forest
	Slieve Gullion	Passage tomb: south cairn, Calliagh Berra's House	State care	In forest
	Tievecrom	Cashel	Non-scheduled	In forest
The Fews	Clady Beg	Cairn: The Green Height	Non-scheduled	In forest
	Tullyvallen	Three cairns	Non-scheduled	In forest

*Unverified site identified by aerial photography

Appendix III

Strategy for Restoring Peatland Habitats

1.   Rationale

1.1   Northern Ireland Forestry Strategy

The Northern Ireland Forestry Strategy, 'Northern Ireland Forestry – A Strategy for Sustainability and Growth' (2006) restates policy as:

- The sustainable management of existing woods and forests.

- A steady expansion of tree cover to increase the many diverse benefits that forests provide.

The strategy indicated that an amended Forestry Act would place a duty on the Department to promote afforestation and sustainable forestry, which duly came into effect in 2010.

The Northern Ireland and UK Governments approach to sustainable forestry is set out in the UK Forestry Standard (UKFS), which is currently in its 4th edition (2017). The UKFS reiterates the legal requirement that "Appropriate protection and conservation must be afforded where sites, habitats and species are subject to the legal provisions of EU Directives and UK and country legislation". In addition in Northern Ireland, the WANE Act (2011) places a General Duty on every public body to 'further the conservation of biodiversity so far as is consistent with the proper exercise of those functions [it exercises]'.

The UKFS includes a number of general forestry practice requirements and guidelines that are applicable to afforested peat.

The standard requires forest plans to take full account of a range of requirements and guidelines relating to forest design, biodiversity, water, soil, climate change and provides scope for undertaking peatland restoration projects to improve the delivery of ecosystem services. The requirements that are most relevant to the topic of restoring peatland habitats are Forests and Biodiversity general forestry practice requirements 1 and 4:

- Forests and woodlands should be managed in such a way that conserves or enhances biodiversity; opportunities for enhancing biodiversity should be considered in forest management plans.

- Particular consideration should be given to conserving, enhancing or restoring priority habitats and species identified in the statutory lists of priority species and habitats for England, Scotland, Wales and Northern Ireland, through the delivery of country biodiversity strategies and local level plans.

Forests and Biodiversity Guidelines 24 and 26 refer specifically to restoration of habitats and degraded features:

- Consider practical opportunities to restore open habitats where their value could be reinstated and sustained.

- Ensure wetland features such as springs, flushes and bogs are protected, and take opportunities to restore degraded features.

The UKFS is also the basis of forestry practice for the independent UK Woodland Assurance Standard (UKWAS), which is used for voluntary independent certification. The relevant UKWAS sections include: 2. Management Planning, and 4. Natural, historical and cultural environment:

- 2.1 Long-term policy and objectives

- 2.2 Documentation

- 2.11 Conservation

- 2.13 Conversion

- 2.14 Implementation, amendment and revision of the plan

- 2.15 Monitoring

- 4.1 Statutory designated sites and protected species

1.2   Northern Ireland Biodiversity Strategy

The Northern Ireland Biodiversity Strategy, 'Valuing Nature - A Biodiversity Strategy for Northern Ireland to 2020' (2015), refers to the importance of peaty soils and associated priority habitats, including blanket bog and lowland raised bogs, in providing ecosystem services, such as clean water supplies, carbon storage, and recreation, and identifies forestry and other land management practices as potential threats to these services.

The strategy indicates that many ecosystems, such as peatlands, are in a relatively poor condition, and states the need to reverse the decline and work towards Favourable Conservation Status. It emphasises the importance of peatland soils and vegetation as a carbon store and suggests their value in sequestering carbon may become a particularly economically advantageous characteristic as carbon accounting becomes more important.

1.3   Review of forest design plans

The review stage of forestry planning involves re-examining management objectives, and the forest data on which they are based. Long-term objectives are presented in the form of design plans, which show planned boundaries between forest and open ground, and planned felling and regeneration. Forest design plans meet the requirements of the UK Forestry Standard in relation to the proportions of tree species, the proportion managed as open ground, and overall area managed primarily for biodiversity. Adjustments to these proportions are made in the course of felling and regeneration, which can include the introduction of more open ground, and through specific programmes, including, for example, tree planting, and removal of trees colonising open ground.

1.4   Stakeholder engagement

'Restoring Peatland Habitats' is one of 11 topics identified as a basis for engaging with stakeholders at the initial, scoping, stage of forestry planning. Stakeholders responding to the Sperrin scoping consultation in 2018 indicated they were in favour of the restoration of afforested peatlands; responses from forest industry stakeholders suggested that peatland forestry was, in some cases, an unsustainable land use, while others indicated that restoration could generate environmental benefits, including carbon sequestration and flood risk mitigation.

Stakeholders are given the opportunity to comment on proposals to review forest design plans via the forestry pages on the DAERA website. As planning proceeds proposals will be developed for all remaining forests.

1.5   Restoration potential

The rationale for restoration of blanket bog reflects the potential to achieve appropriate hydrological conditions, based on external peat depth and slope datasets. Proposals to convert woodland to priority bog habitat will exclude sites that have become degraded due to peat cutting or erosion, intensively drained areas dominated by heather, areas colonised by native tree species, and areas that have developed into native wet woodland.

1.6   Sustainable wood production

The strategy should not affect the potential of forests to deliver sustainable wood production. Candidate restoration areas will mainly consist of areas that were, until recently, identified as open priority habitats. A number of assessments in recent years have indicated that peatland

forests also include a proportion of uneconomic stands comprised of checked (where growth has ceased or stagnated), nutrient deficient or dying trees.

2. Prioritisation of candidate bog restoration areas

2.1 Site selection criteria

- Planned open ground (either current or in forest design plan).

- Adjacent and integral to designated areas*, or non-designated priority habitat.

- Peat depth ≥0.5m and slope ≤3° over most of the area.

- Colonised with > 400 conifer seedlings/ha, or uneconomic (failed, checked, nutrient deficient or dying).

  *SAC/ASSI, ASSI, NNR, LNR, and SLNCI

2.2 Prioritisation of restoration

Priority 1: Meeting all criteria; uneconomic stands or colonised areas shown as open ground priority habitat in design plans, adjacent and integral to designated or non-designated priority habitat, and where peat depth ≥0.5m and slope ≤3° over most of the area.

Priority 2: Planned open ground, predominantly meeting remaining criteria; may include up to 30% productive stands (≥Sitka spruce General Yield Class 8 or Lodgepole pine General Yield Class 6).

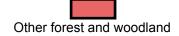Priority 3: As for Priority 2, but does not fully meet peat depth and slope criterion.

3. Strategy

- The strategy for open habitat restoration in forests reflects Northern Ireland strategies for forestry and biodiversity.

- The strategy replaces the expired Strategy for the Restoration of Open Ground Semi-Natural Habitats, and Register of Open Habitat Restoration Sites.

- Prepare operational plans for bog restoration for Priority 1 areas, subject to the acceptance of proposals by planning meetings.

- By 2020, to ensure monitoring of restoration areas is embedded within the planning process.

- By 2030, to review strategy and undertake a strategic review of candidate bog restoration projects.

4. Review

The rationale and strategy will be subject to review as necessary in respect of:

- The potential to make adjustments to felling plans in response to significant changes to timber marketing conditions affecting poor quality and diseased lodgepole pine, and checked and nutrient deficient Sitka spruce stands.

- The requirement to undertake restoration of heathland habitats; this will be assessed as planning reviews take place.

- The development of a wider Forest Service strategy for the management of open priority habitats.

- New research and technical information.

Map 1 - Forests and woodland within Armagh Forestry Planning Area (FPA)

Armagh Forestry Planning Area   Forest Service forests   Other forest and woodland   Towns

Map 2 - Landscape Considerations for Slieve Gullion Forest