Woodlands for Water:

Using trees and riparian planting to alleviate flooding

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Department of Agriculture,
Food and the Marine

Forestry in Ireland

- *c.*11% of land area
- 53% public (Coillte), 47% private (21,000 owners)
- Vibrant sector, from nursery to product:
  - Employs 12,000+, mainly rural
  - €2.2 billion contribution to economy (2012)
- Wide range of ecosystem services: water, biodiversity, landscape, carbon & amenity
- This role recognised in current policy (*Forests, products & people*) & 2014-2020 Forestry Programme
- Forest Service (DAFM) is the consenting authority for key forestry activities (afforestation, forest road construction, thinning / felling & replanting, & aerial fertilisation) & implements support schemes under the Forestry Programme

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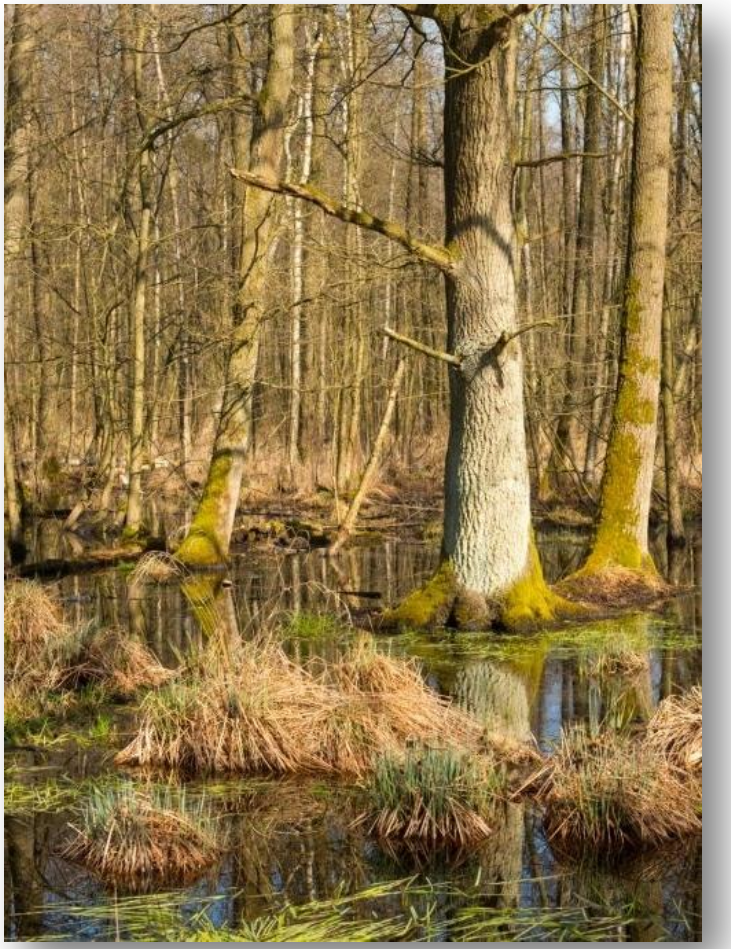
Woodlands, Water & Flood Mitigation

- Approximately 75% of the world's accessible freshwater for agricultural, domestic, urban, industrial and environmental uses comes from forests. (FAO)

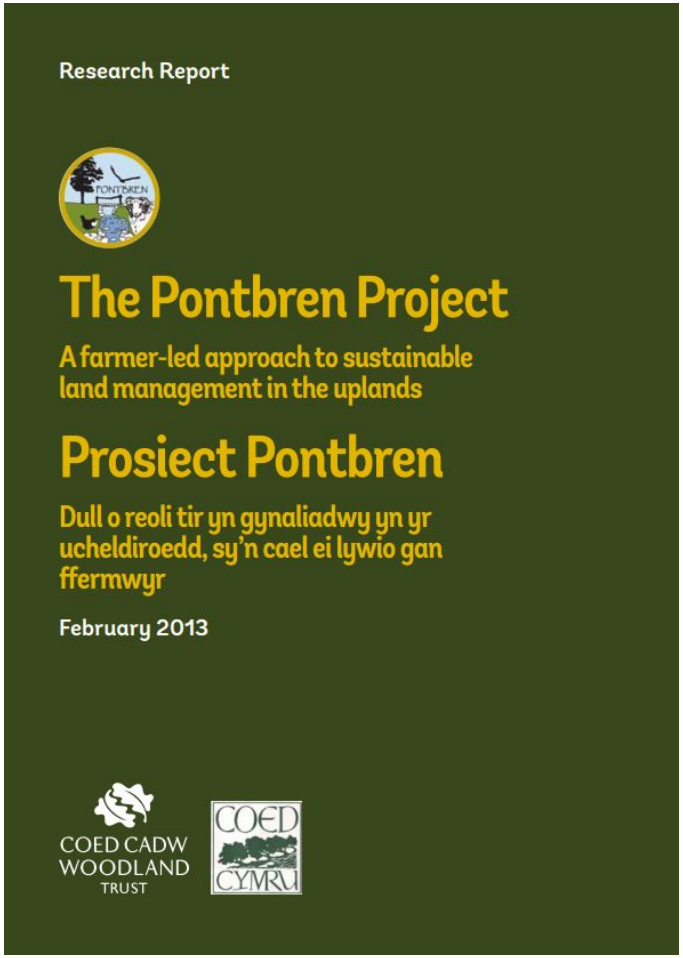
- It is estimated that forests provide more than 4km3 *(= 4 billion m^3 or 4 trillion litres)* of water annually to European citizens. (EEA)

- In water-basins where the forest cover is 30%, water retention is 25% higher than in basins where the forest cover is only 10%. (EEA)



Woodlands, Water & Flood Mitigation

- Pontbren Project in Welsh Uplands – Farmer led project
- Innovative approach to using woodland management and tree planting to improve the efficiency of upland livestock farming
- Led to a major hydrological research programme at Pontbren, which has provided important new evidence of the role of trees in flood control



Woodlands, Water & Flood Mitigation

The data on water movement showed that in grassland grazed by sheep, the overland water flow can be a more important runoff pathway than the field drains .

The infiltration rates inside the woodland were 60 times those on the pasture ten metres away.

(Pontbren Project Report 2013)

Woodlands, Water & Flood Mitigation

- Scope for trees to alleviate flooding is expected to generally decline with increasing catchment size. (Nesbit, 2015)

- Smaller catchments up to 100km^2 are likely to present the greatest opportunity for woodland to influence flows.

- Tree or woodland planting most likely to be effective at a local scale

- Not suitable for lands with a high water table all year round

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Woodlands, Water & Flood Mitigation

- Even a narrow 20 metre wide forest produced positive results in relation to water protection (Nesbit & Thomas, 2008)

- Multiple small forests can have the same capacity to attenuate floods as an equivalent area of fewer, large forest blocks

Relevant Measures Supported by DAFM Forestry Programme Grant Aid

Native Woodland Establishment (GPC 9 & 10)

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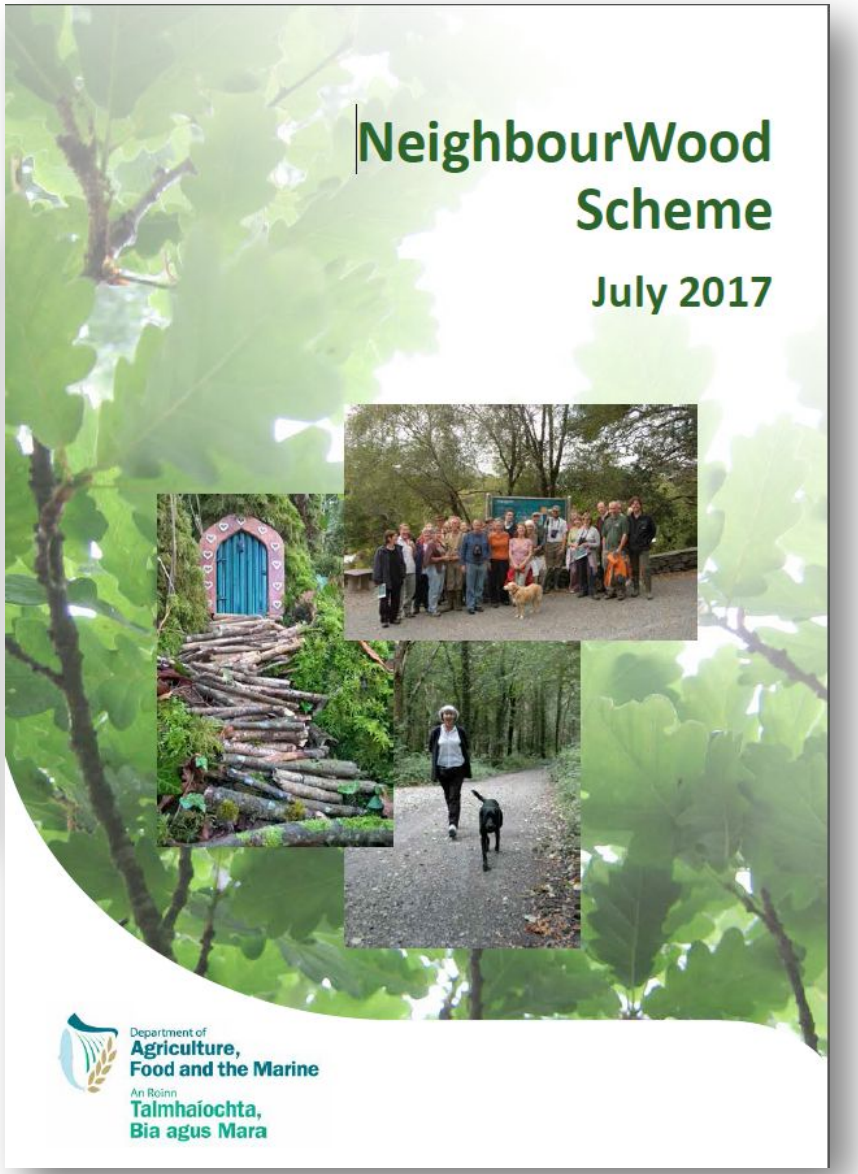
NeighbourWood Scheme



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12 Grant and Premium Categories (GPC) for afforestation

- GPC 1 – Unenclosed
- GPC 2 - Sitka spruce / Lodgepole Pine
- GPC 3 – 10% Diverse Conifer
- GPC 4 – Diverse Conifer
- GPC 5 – Broadleaf
- GPC 6 – Oak
- GPC 7 – Beech
- GPC 8 – Alder / Birch
- GPC 9 - Native Woodland Establishment (Scenarios 1-3)
- GPC 10 - Native Woodland Establishment (Scenarios 4 & 5)
- GPC 11 - Agro-forestry
- GPC 12 – Forestry for Fibre

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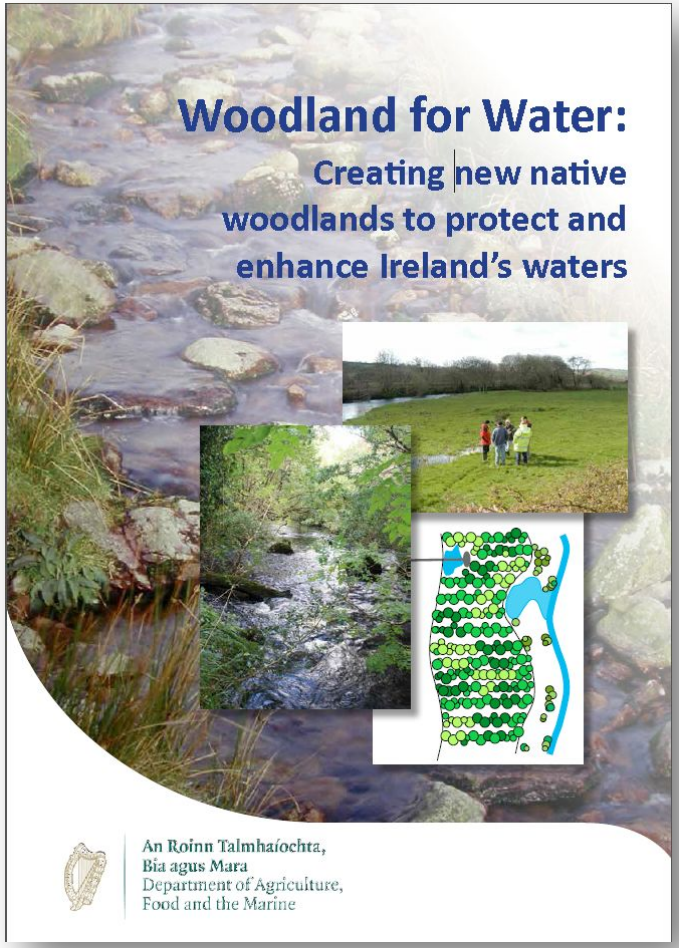
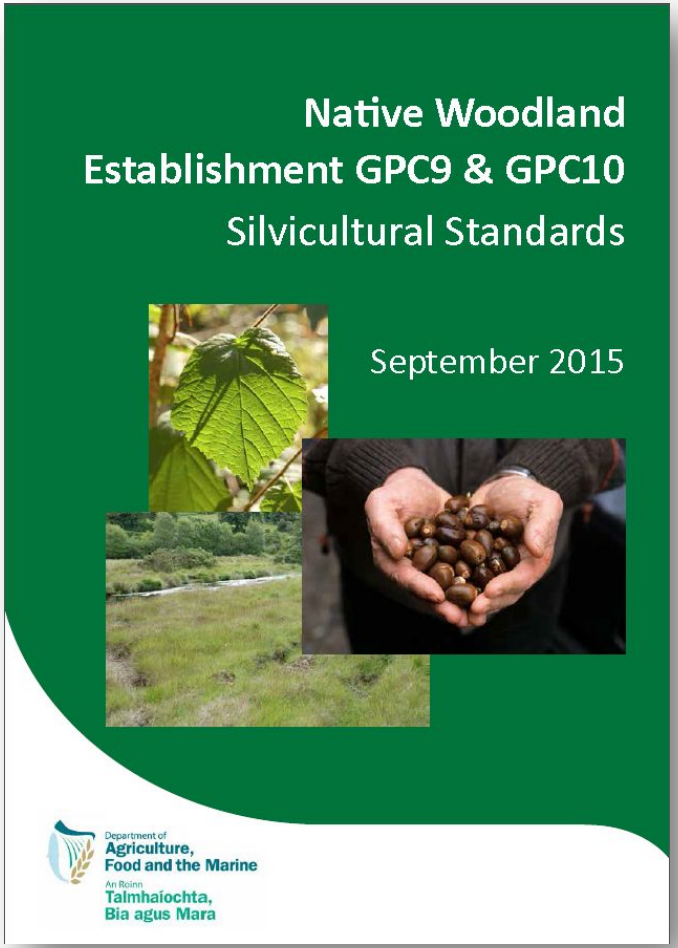
Native Woodland Establishment (GPC 9 & 10)

(Woodland for Water)





Native Woodland Establishment (GPC 9 & 10)

- NWE is the establishment of new native woodland on previously unplanted sites
- Native species and native provenance
- Low impact ground preparation and reduced inputs
- Prescribed species mixes depending on the site type

GPC 9
- 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)

GPC 10
- Scenario 4 (Gleys / Alder-Oak-Ash Woodland)
- Scenario 5 (Highly modified peat & peaty podzols / Pioneer Birch Woodland)

- Grant covers all the costs associated with establishment

GPC	Grant (€/ha)	Premium (15 yrs) (€/ha)*
9	€6220	€665 (<10ha) €680 (>10ha)
10	€5880	

*Public bodies are eligible for the grant, but not the premium payments

- Miniumum area of 0.1ha with minimum width of 20 metres (tree-to-tree)
- Evolving – Scenario 5 added this year, options to develop alluvial woodlands/specific water measures (Scenario 6).

Native Woodland Establishment (GPC 9 & 10)

- ❖Scenario 1 (Podzols / Oak-Birch-Holly Woodland)
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- ❖ Scenario 4 (Gleys / Alder-Oak-Ash Woodland)
- ❖Scenario 5 (Highly modified peat & peaty podzols / Pioneer Birch Woodland)
- **❖Scenario 6 Riparian and alluvial woodlands being developed**

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Native Woodland Establishment (GPC 9 & 10)

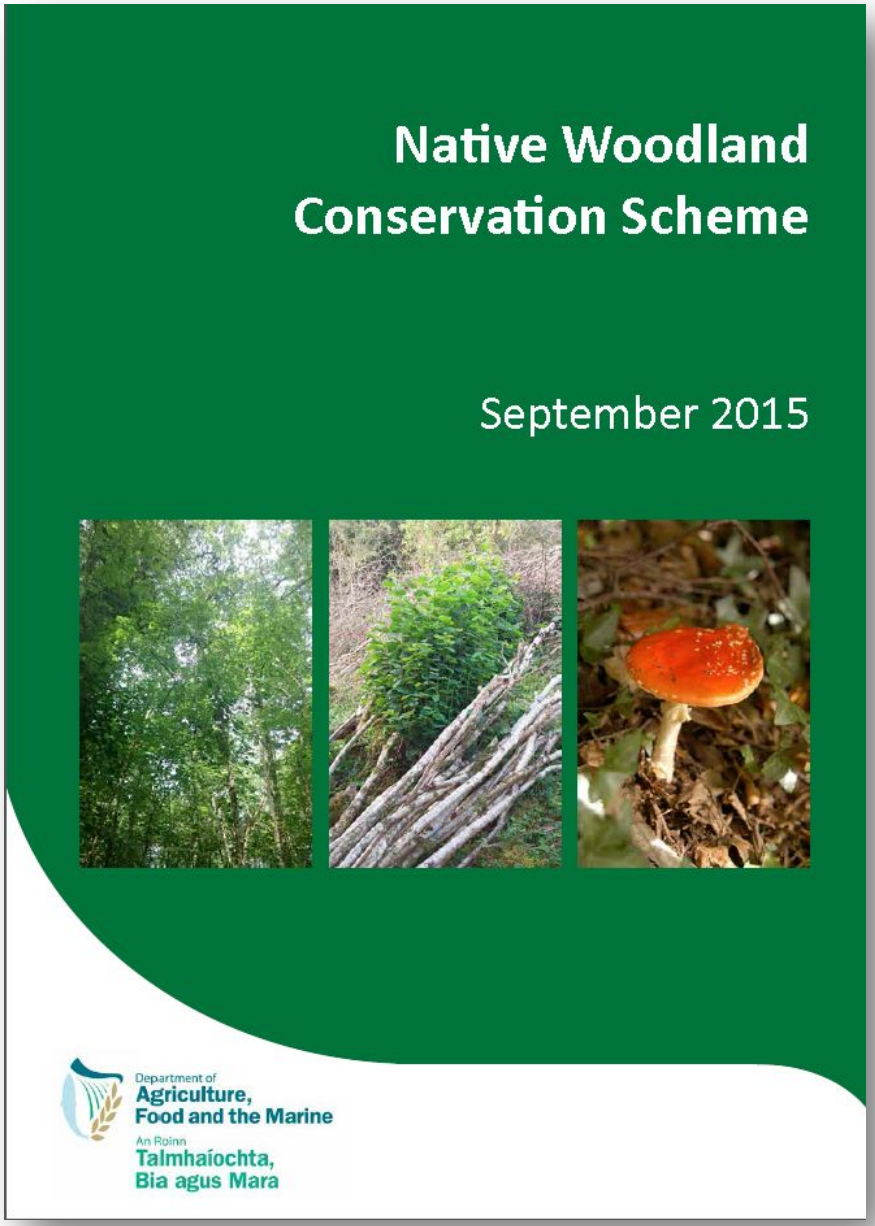
Water-related benefits

- removal /reduction of existing pressure on water quality through replacing with woodland
- 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 are in addition to other ecosystem services such as native woodland biodiversity, habitat linkage within the wider landscape, carbon sequestration, amenity and environmental interpretation, etc.

Further targeting may also be possible through the **Woodland Environmental Fund**, an initiative arising from the mid-term review of the Forestry Programme.

Native Woodland Conservation



Native Woodland Conservation

- Promotes the appropriate restoration of existing native woodland (including the conversion of non-native forest to native woodland), through the provision of financial support to forest holders

- 2 Criteria:
  - ❖*High Forest*
  - ❖*Emergent Woodland*

- Grant covers:
  - ❖ Preparation of a site-specific Native Woodland Plan by a NWS Ecologist and NWS Forester
  - ❖Purchase of suitable native planting stock
  - ❖Ground preparation, where appropriate
  - ❖Forest protection
  - ❖Clearance of invasive species
  - ❖Costs associated with non-commercial tree felling
  - ❖Woodland rejuvenation
  - ❖Maintenance
  - ❖Woodland edge management
  - ❖Maintenance of open spaces, rides and glades
  - ❖Re-spacing
  - ❖The restoration of former coppice
  - ❖On application, other related operations, as deemed appropriate

Native Woodland Conservation

•Grant and Premium Rates

Category	Total grant available (€/ha)	Premium (€/ha for 7 years) (not available to public bodies)
High Forest	€5,000	€350
Emergent Woodland	€2,500	

•Minimum area of 0.1 ha, and 20 metres tree-to-tree.
•Maximum area of 12 ha in any single application

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Native Woodland Conservation

- Native Woodland Conversion:

The conversion of existing conifer forest to native woodland (e.g. the removal a of uniform Sitka spruce plantation adjoining a sensitive watercourse, deer fencing if required, and reforestation with native woodland, through planting and / or natural regeneration).

Old, pre-guidelines upland planting

Converted to native woodland

Agro-forestry (GPC 11)

- Agro-forestry is the growing of both trees and agricultural crops on the same piece of land in order to provide tree and agricultural crop products, while also protecting, conserving, diversifying and sustaining vital economic, environmental, social and natural resources.

- Option for farmers who might not otherwise have considered conventional afforestation

- Grant of up to €6220, plus €645-660/ha/annum direct to landowners for a period of 5 years

- Minimum area of 0.5ha, and 20 metres tree-to-tree

- Stocking of 400-1,000 trees/ha

- Larger trees, pit-planted

Agro-forestry and Water

- Provides a function in mitigating water runoff and soil erosion, thereby reducing potential losses of silt, organic matter and nutrients that may otherwise enter watercourses

- Root systems penetrate the lower soil horizons, allowing water to filter down through the soil (Improved infiltration rates)

- Water uptake from the trees can provide a role in improving the soil quality for agriculture, and may reduce the need for agricultural drainage

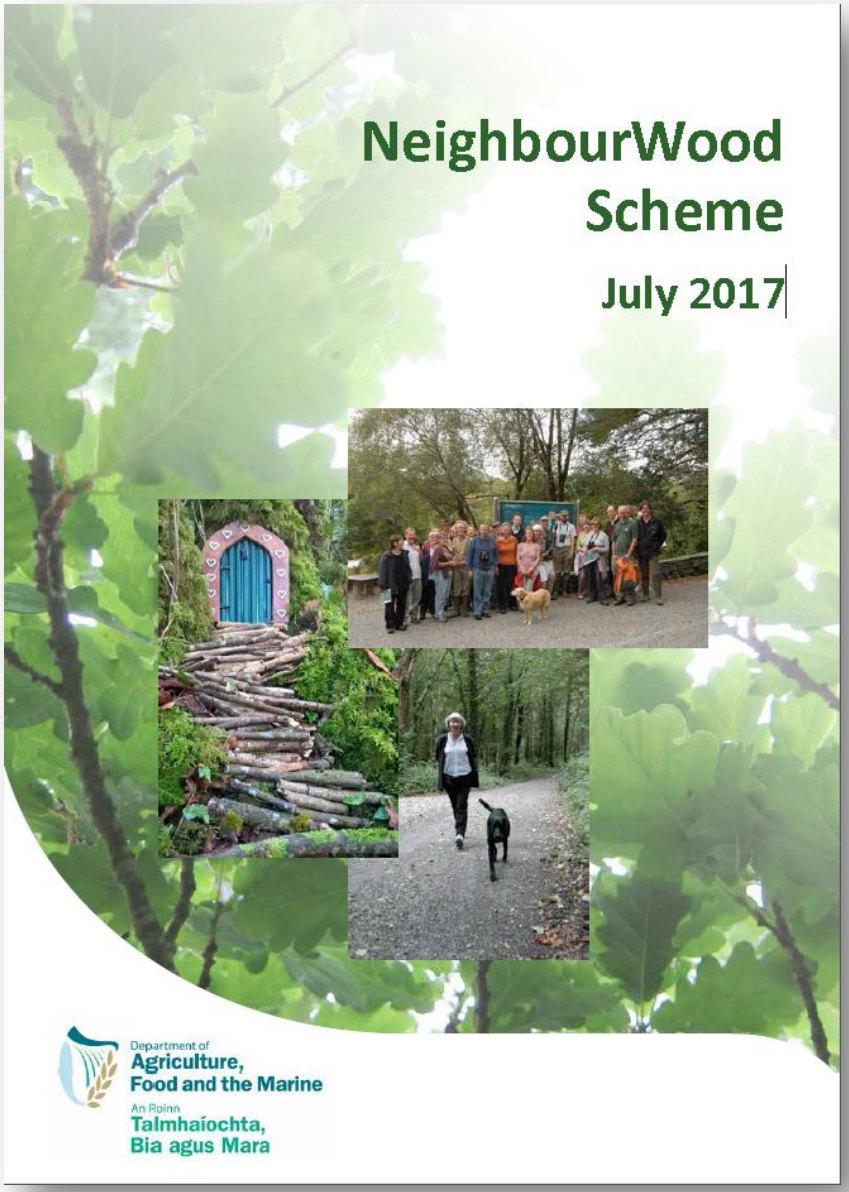
- Increases the amount of organic matter in the soil over time

- Soil disturbance as a result of machinery use is reduced & extends the period for machinery access.

Images: AFBI NI

afbi Agri-Food and Biosciences Institute

NeighbourWood Scheme



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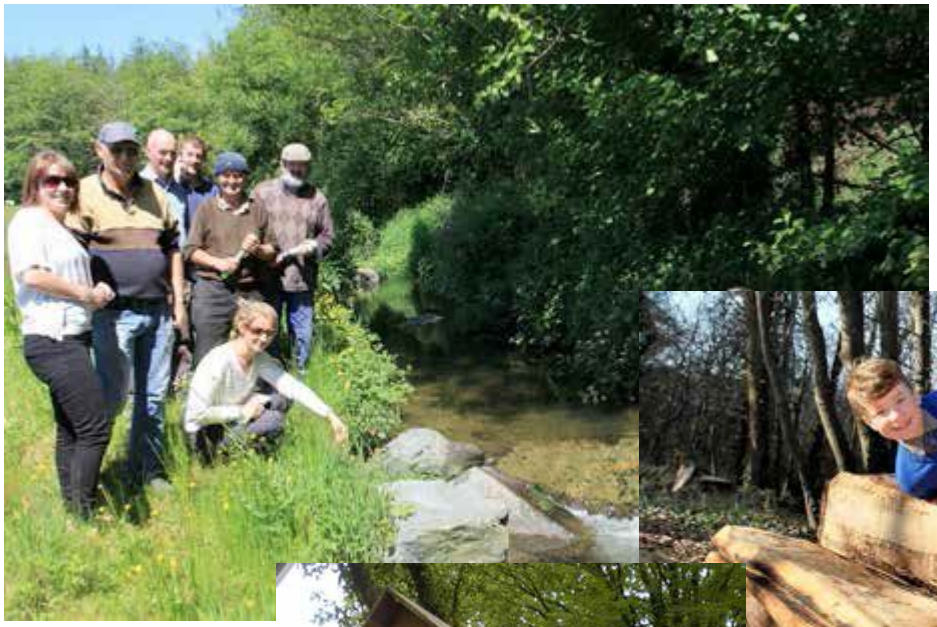

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NeighbourWood Scheme

- Supports the development of attractive close-to-home woodland amenities (or 'neighbourwoods') for public use and enjoyment.

- Majority driven by local "Champions", and regularly have a water element

- Available to both public and private landowners, working in partnership with local communities. (Applications from other landowners may be considered on a case-by-case basis.)

- Funding available under three separate elements:
  - ❖ NeighbourWood Establishment (€5,000/ha plus fencing allowance)
  - ❖ NeighbourWood Enhancement (€5,000/ha)
  - ❖ NeighbourWood Facilities (€3,880/ha)

- Can be used to support community based water projects

- Maximum area of 12ha in any single application

(Individual applications can comprise a combination of NBR Establishment and NBR Enhancement subject to a limit of 12 ha in total, plus NBR Facilities subject to a limit of 12 ha).

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Woodland Environmental Fund launched in Sept. 2018 - provides an access point for individual businesses to help expand Ireland's native woodland resource

Additional Measures with Water Quality Benefits to be launched

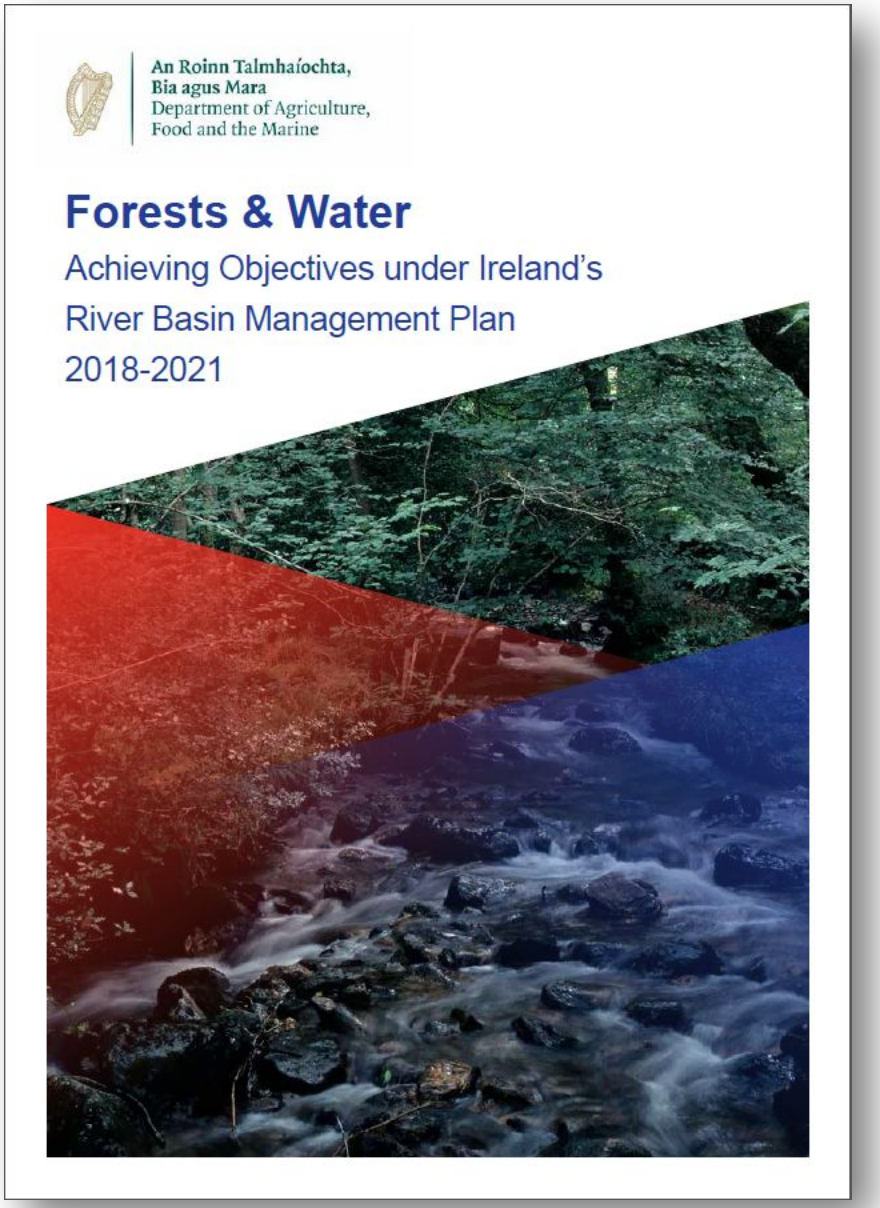
- Continuous Cover Forestry

- Environmental Enhancement Scheme

(*support various actions within existing forests, which effect structural changes that will protect and enhance water quality, archaeological sites, habitats and species, sensitive landscapes and other environmental features*)

Forests and Water: Achieving Objectives under Ireland's River Basin Management Plan 2018-2021.

Sets out all that all that DAFM is doing in forestry to help protect water quality & details commitments under the Water Framework Directive and the River Basin Management Plan for Ireland



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Acknowledgements

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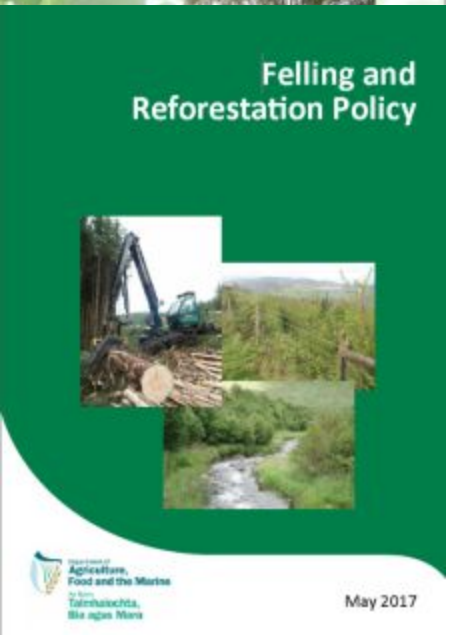
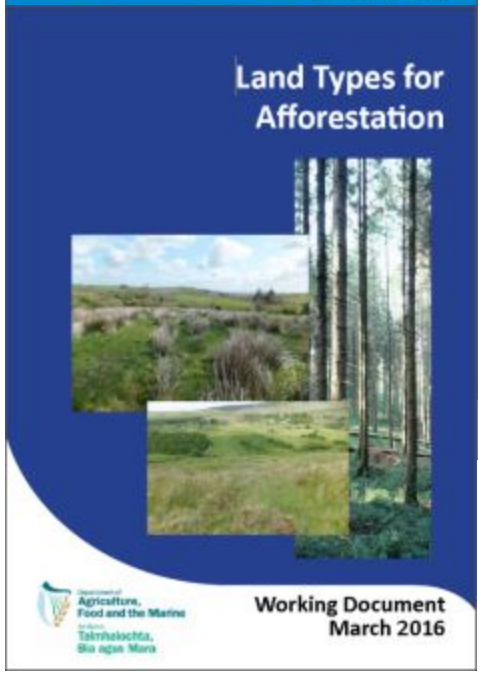
  Kerry (Agroforestry)

- AFBI NI – Use of Agroforestry Images





Thank You

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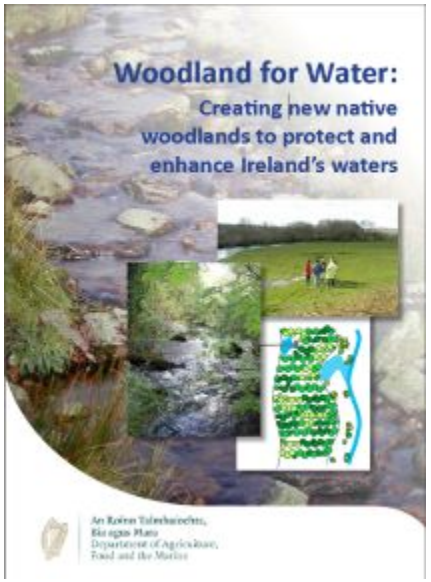

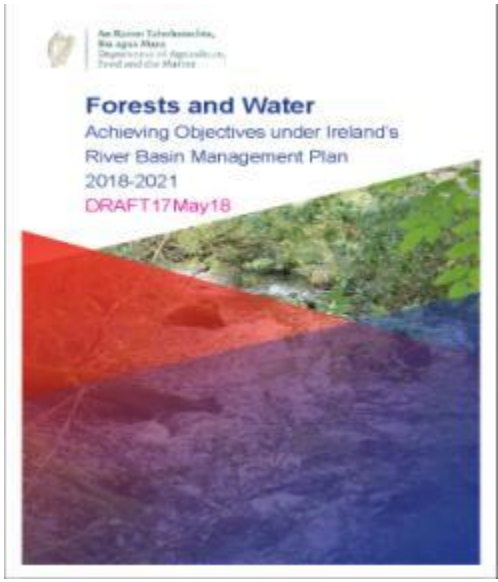

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