

Project number: 6426
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Food & the Marine

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Project dates: Jan 2013- Dec 2015

Evaluation of land suitable for afforestation



Key external stakeholders:

Forest service, DAFM, CoFord, Policy makers, forest industry

Practical implications for stakeholders:

- A total of 450,000 ha are required to increase the area to 18% forest cover
- A study of land resources in Ireland indicates that in principle there is sufficient land available to facilitate the expansion of the forests resource to 18% of the land area.
- The utilisation of marginal and unimproved land which show high levels of productivity may represent a very efficient use of natural resources especially in the context of increasing carbon sequestration from afforestation to assist GHG mitigation strategies

The analysis carried out for the COFORD council working group on land availability for afforestation was aimed at producing more reliable estimates of land availability to facilitate the expansion of forest cover in Ireland.

Main results:

- An area of 3.75 M hectares is deemed suitable for afforestation in Ireland
- Productive land represents 2.45 M hectares and marginal land represents 1.3 M hectares.
- An area of 178,000 ha currently classified as unimproved land may offer a significant potential to increase afforestation rates.

Opportunity / Benefit:

There is sufficient land available for acceleration of afforestation from current rates (c. 5,000 ha per annum) to 16,000 ha. To assist in the achievement of forestry targets, it may be necessary to consider all sources of land, as well as the development of native woodlands that may also fulfill conservation and carbon sequestration objectives

Collaborating Institutions:

Teagasc project team: Dr. Niall Farrelly (Project Leader/PI)

External collaborators: Dr Gerhardt Gallagher, Forestry Consultant

1. Project background:

Forestry expansion has re-emerged at the top of the land-use agenda in Ireland, driven by the need to produce enough fibre to create a sustainable processing sector and the potential for forestry to sequester carbon and offer mitigation potential for agriculture and related sectors. To provide for increased carbon sequestration, an urgent, accelerating new-forest planting above current levels (as well as correcting an unbalanced age-profile within the forest estate), is necessary. A major criterion for state grant aid for afforestation in Ireland is the ability of sites to produce a commercial crop of Sitka spruce with a minimum growth rate of Yield Class 14 (Anon 2011). The afforestation of this land is potentially challenged by the multiple objectives of food and fibre production (e.g. Food Harvest 2020) conservation objectives, and the economics of farming of which reduce its availability. The question arises – do we have sufficient land resources to facilitate forestry expansion? This research aims to provide information on the barriers to land availability for afforestation, and highlight opportunities for the which expansion of forest cover in Ireland

2. Questions addressed by the project:

- To provide information on the potential availability of land for afforestation in Ireland
- Do limitations to land availability ultimately constrain the expansion of the forestry area?
- What are the most likely areas to have potential for forestry expansion?

3. The experimental studies:

An assessment of land use in Ireland was performed in a geographic information system (GIS) using a series of the most up-to-date spatial datasets available on land-related activities, soils and potential agricultural land use (Figure 1). The GIS-analysis method combines features from multiple datasets and uses this information as the basis to classify land into the following categories based on opportunities and constraints for afforestation as follows:

Land biophysically unavailable for forestry:

This covered land composed of existing forest cover, water, urban areas, energy utilities, road and rail infrastructure

Land biologically unsuitable for forestry

Land was considered unsuitable for forestry if it included land incapable of producing a forest crop, such as intact raised bogs, fens, sand dunes, coastal complexes, salt marshes, rock outcrops.

Land subject to national and EU designations and Policies

Land subject to national and EU designations and policies that may impose constraints to afforestation and include designated habitats, etc.

Land most likely to have potential for afforestation

All lands not in the previous categories and classified according to productive and marginal land according to the classification of Gardiner and Radford (1980).

4. Main results:

- An area of 1.49 M hectares or 21.3% of the land area of Ireland was classified as being bio-physically unavailable for afforestation.
- An area of 850,000 hectares was considered to be biologically unsuitable for afforestation
- An area of 897,000 hectares was affected by National and EWU designations and policies
- The total area of Land most likely to have potential for afforestation was 3.75 M ha.
- The area of productive land likely to have potential for afforestation was 2.45 M ha.
- The area of marginal land likely to have potential for afforestation was 1.3 M ha (Figure 1)
- An area of 423,000 ha of wet grassland and unimproved lands, occurring predominately in marginal areas show good potential for afforestation.

Table 1: Area of land potentially suitable for afforestation according to productive and marginal agricultural land and the area that is likely to have the most potential.

Land use	Productive agricultural land (ha)	Marginal agricultural land (ha)	Total area (ha)
Tillage and grassland	2,217,782		2,217,782
Reclaimed grassland	118,299	186,500	304,799
Dry/improved grassland		804,836	804,836
<i>Land with the most potential</i>			
Wet grassland	87,785	156,219	244,004
Other unimproved lands	24,647	154,349	178,996
Total Area	2,448,513	1,301,904	3,750,417

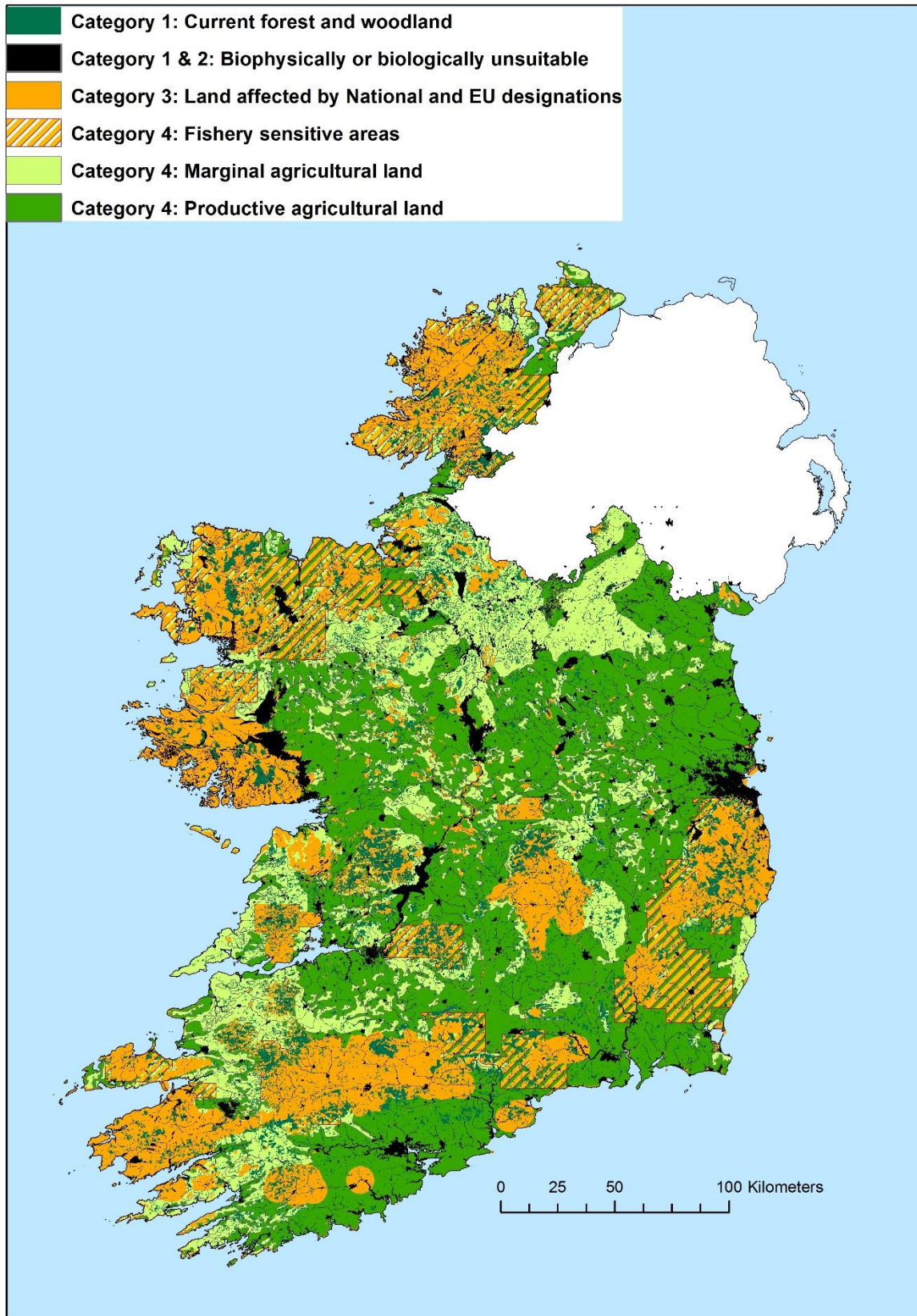


Figure 2: Classification of Irelands land area in relation to availability for forestry expansion and the area of productive and marginal agricultural land with the most potential for afforestation.

5. Opportunity/Benefit:

The primary stakeholder of the research is DAFM Forest Sector Development and CoFoRD, DAFM. The strategic nature of this project means that it will be of particular interest to the Forest Service, DAFM. These results of this study indicate that there is potentially enough land to achieve forest cover targets. There may be greater opportunities to establish forests on lands classified as marginal or poorer quality or with a limited capacity for agriculture owing to positive economic returns from forestry and more limited returns from agricultural enterprises.

6. Dissemination:

Land types for afforestation. Training day in association with the Forest Service, DAFM. April 5th, 2016. Glenville, Co. Cork.

Land types for afforestation. Training day in association with the Forest Service, DAFM. April 11th, 2016 Castlebaldwin, Co. Sligo.

Main publications:

Farrelly, N., and Gallagher, G. 2013. Classification of lands suitable for afforestation in the Republic of Ireland. Report to the COFORD Council Land Availability Working Group (CCLAWG). 56 pp.

Farrelly, N., and Gallagher G. 2015. The potential availability of land for afforestation in the Republic of Ireland. *Irish Forestry* 72: 120-138.

Farrelly, N., and Gallagher, G. 2015. The development of a site classification for Irish Forestry. *Irish Forestry* 72: 166-168.

Farrelly, N. and Gallagher, G. 2016. Classification of land for afforestation in the Republic of Ireland. Society of Irish Foresters, Gleneally, Co. Wicklow, Ireland. 61 pp.

Farrelly, N., and Gallagher, G. 2016. Potential availability of land for forestry. *TResearch* Vol 11, 26-28.

Farrelly, N. 2016. Assessing the eligibility of land for support under the afforestation scheme. *Teagasc Research Impact Highlights 2016*. Oakpark, Co. Carlow. p10.

7. Compiled by: Dr Niall Farrelly