

Land Types for Afforestation



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

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

1. To foster the efficient and sustainable development of forestry
2. To increase quality planting
3. To promote the planting of diverse tree species
4. To improve the level of farmer participation in forestry
5. To promote research and training in the sector
6. To encourage increased employment in the sector

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Forest Service
Department of Agriculture, Food & the Marine,
Johnstown Castle Estate
Co. Wexford
Tel. 053 91 63400 / Lo-Call 0761 064 415
E-mail forestryinfo@agriculture.gov.ie
Web www.agriculture.gov.ie/forests-service

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Section 1

Introduction

Overview

The Forest Service Afforestation Scheme (Afforestation, Native Woodland Establishment, Agro-Forestry and Forest-for-Fibre) provides grants and premiums to encourage the planting of land, in keeping with the Forestry Programme 2014-2020 and the European Commission's State Aid approval of that programme.

This document sets out the potential eligibility of land for support under the Afforestation 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. Other species, if proposed and approved for planting, may not achieve the same level of production on the same site.

Regarding the potential eligibility of land for support under the Afforestation Scheme, three separate land types apply, two of which are eligible for particular Grant & Premium Categories (GPCs) under the Scheme:

- **SUITABLE LAND: GPC 2-12**
- **SUITABLE LAND: GPC 1**
- **UNSUITABLE LAND**

This document describes each of the above land types for afforestation, based on the use of ground vegetation to assess the suitability of land for productive Sitka spruce. Photographs illustrate a selection of sites within each type. This provides direction to landowners and Registered Foresters when identifying which land type applies to a particular site (or part thereof), and represents the basis for Forest Service decisions in this regard.

The land types for afforestation presented in this document refer to productivity only. The environmental suitability of a proposed afforestation project is also considered by the Forest Service as part of its overall assessment process, and sites considered to be productive may not be approved, due to other constraints. Please see the Forest Service *Environmental Requirements for Afforestation*.

This document refers to applications for consent under S.I.191 of 2017 and for grant support under the Afforestation Scheme. However, the Forest Service may also apply it to applications for consent only (i.e. non-grant aid applications), on a case-by-case basis.

Using vegetation to assess land suitability

The use of ground vegetation to assess the suitability of land is a long-established method of assessing the suitability of sites for afforestation and as an aid to tree species selection. The presence of certain indicator plants on a site is used to indicate soil quality, based on the particular requirements of different plant species regarding certain soil parameters (nutrients, moisture, reaction (soil pH, water pH), etc.). A range of indicator values has been derived for plants found in UK and Ireland (Hill *et al.*, 1999*).

More recently, Farrelly *et al.* (2011 a&b) showed a strong relationship between the combined R (Reaction) + N (Nitrogen) value and the productivity of Sitka spruce in Ireland. To evaluate site productivity, plants are given combined R+N values and are then weighted by their occurrence to get an overall plot average. Higher indicator values are associated with more fertile sites, and lower indicator values are associated with poorer sites.

Note on reclaimed land

Land reclaimed since 1st January 2011 will be assigned its pre-January 2011 land type classification. This more accurately represents the underlying soil qualities and parameters and / or the level of agricultural activity foregone on the site.

Note on appendices

This document contains the following appendices:

- Appendix A: Mapping, Sampling and Scoring
- Appendix B: Key Indicator Species
- Appendix C: Sample Recording Sheets
- Appendix D: References and Further Reading

All four appendices are an integral part of this document and should be read in conjunction with Sections 1 to 4.

Appendix A sets out the mapping, sampling and scoring methodology underpinning the land type classification set out in this document. It is the responsibility of the Registered Forester to map each land type on the site correctly. This may or may not require the use of the sampling and scoring methodology. On sites where the land types are very clear, sampling and scoring will not be required. It is envisaged that this land type classification system will prove useful to Registered Foresters and the Forest Service in borderline cases and / or in situations where there is a difference of opinion between the Registered Forester and the Forest Service regarding which land type applies to a site (or part thereof) proposed for afforestation.

(* Available for download at <http://nora.nerc.ac.uk/6411/1/ECOFAC2a.pdf>)

Section 2

SUITABLE LAND: GPC 2-12

SUITABLE LAND: GPC 2-12 comprises sites with a R+N score of 6.0 and above, and includes the following:

- Cultivated and fertilised fields used for tillage, crops and pasture grazing, and land reclaimed for grazing prior to the 1st January 2011.
- Fields and dry grassland hill sites where the parent material is limestone or Silurian shale, or where steeper slopes limit the use of agricultural machinery.
- Pasture dominated by soft rush, where poorer drainage restricts agricultural activity.
- Areas of Midland fen peats that have been improved, and peats previously reclaimed for agriculture and now supporting rush pasture vegetation.
- Lands showing evidence of agricultural improvement, either through the soil conditioning of animal husbandry / manuring or historic crop production.
- Old hill pastures composed predominately of velvet bent, tufted hair-grass, sheep's-fescue, Yorkshire-fog and sweet vernal-grass.
- Sites with the following species of rush: sharp-flowered rush, compact rush, bulbous rush and soft rush.
- Drier sites on hillsides, comprising dense bracken.
- If present, purple moor-grass should occur with better pasture grasses, i.e. sweet vernal-grass or bent grass, or with abundant soft rush, and should not constitute heathland-type vegetation.

Note, SUITABLE LAND: GPC 2-12 spans the Afforestation Scheme Grant & Premium Categories 2 to 12. However, within this range, the actual GPC (or combination of GPCs) that applies will depend on site conditions, specific GPC rules and other factors.

Sites are excluded from the category SUITABLE LAND: GPC 2-12 if they are included in the list of UNSUITABLE LAND types (see Section 4).

Examples of SUITABLE LAND: GPC 2-12



Photo 1

Wet grassland,
with soft rush
and perennial
rye-grass.



**Photo 2
(foreground)**

Neutral
grassland with
Yorkshire-fog,
sweet vernal-
grass, red fescue
and common
sorrel.

Examples of SUITABLE LAND: GPC 2-12



Photo 3

Improved pasture with creeping thistle, broad-leaved dock and creeping buttercup.



Photo 4

Neutral upland grassland, with bent grass, meadow buttercup, white clover and common sorrel.

Examples of SUITABLE LAND: GPC 2-12



Photo 5

Site dominated by bracken, and some sweet vernal-grass.

Section 3

SUITABLE LAND: GPC 1

SUITABLE LAND: GPC 1 is characterised by vegetation indicative of moderate fertility, and includes the following:

1. Sites purely comprising purple moor-grass and with an average peat depth of less than 50 cm.
2. Sites comprising purple moor-grass combined with bog-myrtle, and with an average peat depth of less than 50 cm.
3. Sites comprising purple moor-grass with a proportion of higher scoring plants such as soft rush, sharp-flowered rush, sweet vernal-grass, bent grass, bramble, gorse or bracken.

This land type is generally used for extensive grazing. For heavily-grazed sites where the vegetation is difficult to assess, there must be confidence that the site would revert to (1), (2) or (3) above, if left ungrazed.

As phosphorus is often deficient, this land type will normally require an application of phosphorus fertiliser at establishment for successful tree growth. As set out in Section 1, sites 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.

SUITABLE LAND: GPC 1 includes sites with a R+N score of 5.4 to 5.9. It also includes sites scoring 5.0 to 5.3 where the site has an average peat depth of less than 50 cm and is capable of being suitably drained.

Sites are excluded from the category SUITABLE LAND: GPC 1 if they are included in the list of UNSUITABLE LAND types (see Section 4).

Examples of SUITABLE LAND: GPC 1



Photo 6

Purple moor-grass site in winter.



Photo 7

Upland grassland site with purple moor-grass, heath rush and sweet vernal-grass.

Examples of SUITABLE LAND: GPC 1



Photo 8

Site dominated by purple moor-grass on peat less than 50 cm in depth.

Section 4

UNSUITABLE LAND

UNSUITABLE LAND includes a range of sites that are deemed to be unsuitable for afforestation under the Afforestation Scheme, due to infertile conditions (as indicated by vegetation) and / or other inhibiting site factors. (Considerable overlap occurs within this land type with Annex 1 habitats, particularly wet and dry heath and blanket and raised bog.)

Sites falling into the UNSUITABLE LAND category are ineligible under the Afforestation Scheme, irrespective of their combined R+N score.

UNSUITABLE LAND includes the following:

1. 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.
2. 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).
3. Sites over 300 metres above sea level in the west of Ireland, and over 400 metres above sea level in the east of Ireland.
4. Sites that cannot be adequately drained, and sites that are prone to flooding.
5. Sites with rock outcrop and associated shallow soils in excess of 25% of the area.
6. Severely exposed sites and some sea-facing locations.
7. Former and existing industrial cutaway peatlands.
8. Sites with shell marl within 70 cm of the soil surface.
9. Sites where it is not possible or practical to access or construct forest roads to facilitate the movement of timber to a suitable public road network.
10. Private gardens.
11. Golf courses. (However, areas that are not an integral part of the playing course can be considered for afforestation on application.)
12. Lands excluded for environmental reasons - see the Forest Service *Environmental Requirements for Afforestation*.

Examples of UNSUITABLE LAND



Photo 9

Active blanket bog.



Photo 10

Lowland blanket bog with black bog-rush, bog asphodel and ling heather.

Examples of UNSUITABLE LAND



Photo 11

Raised bog with heathers, bog cotton and bog asphodel.



Photo 12

Raised bog pool and sphagnum hummock, with bog moss, bog bean and white beak-sedge.

Examples of UNSUITABLE LAND



Photo 13

Purple moor-grass and ling heather on deep peat (50 cm or greater).



Photo 14

Site with purple moor-grass and ling heather.

Examples of UNSUITABLE LAND



Photo 15

Cutover bog with old turf bank.



Photo 16

Wet heath, with ling heather, cross-leaved heath, hare's-tail cottongrass and purple moor-grass.

Examples of UNSUITABLE LAND



Photo 17

Dry heath,
with western
gorse and bell-
heather.



Photo 18

Dry heath, with
ling heather and
bilberry.

Examples of UNSUITABLE LAND



Photo 19

Site with exposed rocky outcrops.

Appendix A

Mapping, Sampling and Scoring

Overview

It is the responsibility of the Registered Forester to map each land type on the site correctly. This may or may not require the use of the sampling and scoring methodology set out in this appendix. On sites where the land types are very clear, sampling and scoring will not be required.

Mapping

Where there is a clear demarcation between areas based on vegetation types, these areas should be mapped as separate 'vegetation units'. A minimum vegetation unit of 0.2 ha applies. The use of aerial imagery from different years (as available on iNET) can provide an initial basis for demarcating such areas (see Figure 1).

For land types SUITABLE LAND: GPC 2-12 and SUITABLE LAND: GPC 1, areas 0.2 ha or greater of the same vegetation type must be mapped as separate plots and assigned the appropriate GPC.

The following must be mapped and excluded from any application under the Afforestation Scheme:

- Areas 0.2 ha or greater of the land type UNSUITABLE LAND.
- Clearly demarcated turf banks and rock outcrops less than 0.2 ha in area.
- Any clearly demarcated area of UNSUITABLE LAND situated along the perimeter of the proposed afforestation site.

Where an area shows a mosaic of mixed vegetation types with no clearly defined boundaries, or where the area contains different vegetation in pockets less than 0.2 ha, the area should be treated as one vegetation unit for the process of assessment, i.e. where a plot drifts through into UNSUITABLE LAND which takes up less than 0.2 ha, this can be included within the plot as long as the overall plot and average R+N scores recorded classify the plot as SUITABLE LAND.

Sampling

Having identified and mapped the vegetation units, vegetation sampling must be carried out separately for each vegetation unit, ensuring an adequate representation of the vegetation cover within that vegetation unit.

Vegetation sampling plots measuring 3 metre x 3 metre should be laid out within vegetation that is representative of the vegetative unit. Avoid any unrepresentative features such as drains and boundary edges. Table 1 provides further guidance.

Figure 1 An example of an initial stratification of vegetation units, based on aerial imagery and compiled prior to the site visit by the Registered Forester, which may subsequently lead to further refinement. (Note, this map is an example only and does not indicate whether or not this land is suitable for afforestation.) (Ordnance Survey Ireland Licence No. EN 0076413. Copyright Ordnance Survey Ireland/Government of Ireland.)

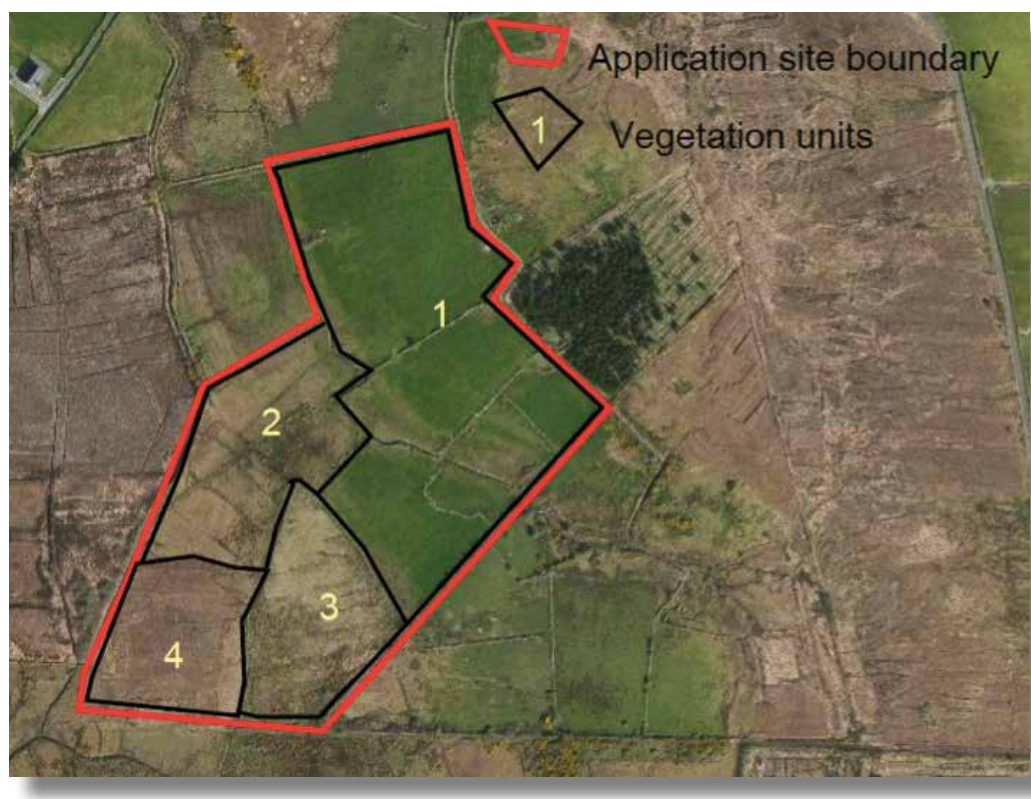


Table 1 Guidance on the number of vegetation sample plots required, based on the area of, and the vegetation variability within, the vegetation unit.

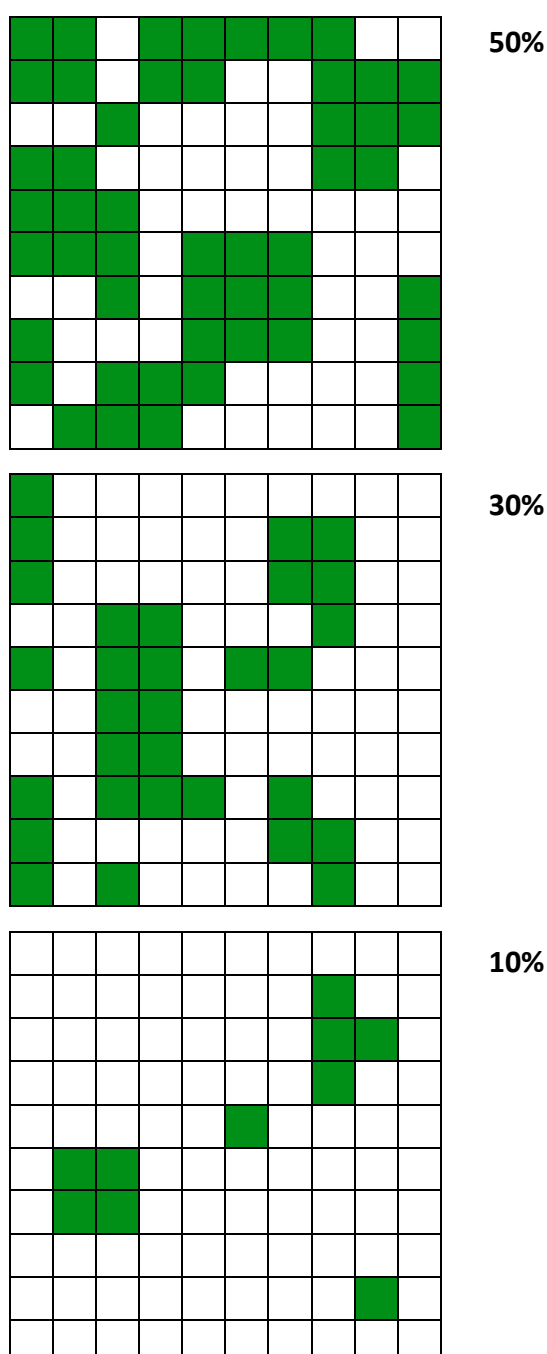
Area of vegetation unit	Variation within vegetation	Number of sample plots
< 8 ha	Uniform vegetation	5
< 8 ha	Variable vegetation	10
≥ 8 ha	Uniform or variable vegetation	≥ 10

Recording species percentages

Use a measuring tape and / or marking poles, mark out the boundary of the 3 metre x 3 metre vegetation sample plot. Identify the various plant species within this sample plot, and estimate the percentage cover of each species in the plot. Figure 2 can be used as a guide to estimating the percentage cover of individual plant species.

A botanical field guide currently being prepared by Teagasc will aid in the identification of different plant species.

Figure 2 A guide to estimating the percentage cover of individual plant species. The visual representations below show 50% cover, 30% cover and 10% cover.



Recording procedure

A list of common indicator plant species and their corresponding R+N scores is provided in Appendix B. For other species, see Hill *et al.* (1999), available for download at <http://nora.nerc.ac.uk/6411/1/ECOFAC2a.pdf>

Tables 2 and 3 set out the steps required. (Note, Steps 1 to 5 are undertaken within *each* vegetation sampling plot.) Appendix C provides sample recording sheets for use in the field.

Table 2 Land Types for Afforestation recording procedure.

FOR EACH VEGETATION SAMPLE PLOT	Step 1	Identify and list the plant species within the vegetation sample plot, and estimate the percentage cover for each (identified as [A] in Examples 1-5).
	Step 2	For each species, find its combined R+N score [B], using Appendix B.
	Step 3	For each species, multiple its R+N score [B] by its corresponding percentage cover, to arrive at the weighted R+N score for that species [C].
	Step 4	Sum up the weighted R+N scores for all species to get the total weighted R+N score [D].
	Step 5	Determine the soil type. If peat, determine the peat depth (cm) at the centre of the vegetation sample plot, using a soil stick or similar instrument.
	Step 6	Repeat Steps 1 to 5 above for <i>each</i> vegetation sample plot along the transect line crossing the vegetation unit.
	Step 7	Examine the scores of each vegetation sample plot to verify the boundary of the vegetation unit. For example, if plots along the first half of the transect score high and along the second half of the transect score low, this may indicate the presence of more than one vegetation unit. If so, adjust the boundary accordingly.
	Step 8	Calculate the average R+N score for the vegetation unit, by adding up the total weighted R+N scores [D] and dividing by the number of vegetation sample plots involved.
	Step 9	Similarly, calculate the average peat depth for the vegetation unit.
	Step 10	Using Table 3, assign a land type category (SUITABLE LAND: GPC 2-12; SUITABLE LAND: GPC 1; UNSUITABLE LAND) to the vegetation unit, along with (as applicable) the proposed GPC.

Table 3 R+N score, peat depth (if applicable) and corresponding Land Type category.

Average R+N score of vegetation unit	Average peat depth of vegetation unit	Corresponding Land Type of vegetation unit *
6 or greater		Suitable Land GPC 2-12
5.4 to 5.9		Suitable Land GPC 1
5.0 to 5.3	Less than 50 cm	Suitable Land GPC 1
5.0 to 5.3	50 cm or greater	Unsuitable Land
4.9 or less		Unsuitable Land
* Sites are excluded from the categories SUITABLE LAND: GPC 2-12 and SUITABLE LAND: GPC 1 if they are included in the list of UNSUITABLE LAND types.		

Examples

The follow examples (overleaf) demonstrate the scoring of individual vegetation sample plots following Steps 1 to 5 in Table 2, and the outcome regarding which land type category applies (assuming the same results are reached for other plots within the vegetation unit).

Example 1

Soil type: Brown podzolic

Vegetation: Dense bracken

Peat depth: N/A

Species within the vegetation sample plot	% cover [A]	Combined R+N score [B]	Weighed R+N score [C]
Bracken (<i>Pteridium aquilinum</i>)	70	6	4.2
Sweet vernal-grass (<i>Anthoxanthum odoratum</i>)	25	7	1.8
Velvet bent (<i>Agrostis canina</i>)	5	6	0.3
Total cover (%)	100%	Total weighted R+N score [D] 6.3	

→ Therefore, SUITABLE LAND: GPC 2-12

Example 2

Soil type: Peat

Vegetation: Wet grassland

Peat depth: <50 cm

Species within the vegetation sample plot	% cover [A]	Combined R+N score [B]	Weighed R+N score [C]
Purple moor-grass (<i>Molinia caerulea</i>)	70	5	3.5
Bracken (<i>Pteridium aquilinum</i>)	15	6	0.9
Sweet vernal-grass (<i>Anthoxanthum odoratum</i>)	10	7	0.7
Soft rush (<i>Juncus effusus</i>)	5	8	0.4
Total cover (%)	100%	Total weighted R+N score [D] 5.5	

→ Therefore, SUITABLE LAND: GPC 1

Example 3Soil type: Peaty gleyVegetation: Wet grasslandPeat depth: <30 cm

Species within the vegetation sample plot	% cover [A]	Combined R+N score [B]	Weighed R+N score [C]
Purple moor-grass (<i>Molinia caerulea</i>)	90	5	4.5
Sweet vernal-grass (<i>Anthoxanthum odoratum</i>)	10	7	0.7
Total cover (%)	100%	Total weighted R+N score [D] 5.2	

→ Therefore, SUITABLE LAND: GPC 1**Example 4**Soil type: Intact blanket peatVegetation: Lowland blanket bogPeat depth: >50 cm

Species within the vegetation sample plot	% cover [A]	Combined R+N score [B]	Weighed R+N score [C]
Ling heather (<i>Calluna vulgaris</i>)	30	4	1.2
Cross-leaved heath (<i>Erica tetralix</i>)	15	3	0.45
Bog-myrtle (<i>Myrica gale</i>)	15	5	0.75
Hare's-tail cottongrass (<i>Eriophorum vaginatum</i>)	15	3	0.45
Bog cotton (<i>Eriophorum angustifolium</i>)	5	5	0.25
Deergrass (<i>Trichophorum germanicum</i>)	5	3	0.15
Purple moor-grass (<i>Molinia caerulea</i>)	5	5	0.25
Sedge (<i>Carex</i> spp.)	5	5	0.25
Sundew (<i>Drosera</i> spp.)	5	3	0.15
Total cover (%)	100%	Total weighted R+N score [D] 3.9	

→ Therefore, UNSUITABLE LAND

Example 5

Soil type: Peat

Vegetation: Wet heath with heather, bog cotton, rush

Peat depth: 90 cm

Species within the vegetation sample plot	% cover [A]	Combined R+N score [B]	Weighed R+N score [C]
Ling heather (<i>Calluna vulgaris</i>)	40	4	1.6
Bog cotton (<i>Eriophorum angustifolium</i>)	10	5	0.5
Soft rush (<i>Juncus effusus</i>)	5	8	0.4
Sweet vernal-grass (<i>Anthoxanthum odoratum</i>)	5	7	0.33
Heath rush (<i>Juncus squarrosus</i>)	8	4	0.32
Common sedge (<i>Carex nigra</i>)	7	5	0.35
Purple moor-grass (<i>Molinia caerulea</i>)	5	5	0.25
Total cover (%)	80% *		3.75
	Total weighted R+N score [D] (adjusted for % cover) = (3.75 / 80) x 100 = 4.7		

→ Therefore, due to peat depth >50 cm, UNSUITABLE LAND

(* Vegetation cover may be less than 100% where there is high moss cover or bare ground.)

Appendix B

Key Indicator Species

The following table lists key plant species indicative of varying degrees of site fertility, together with their corresponding R+N score (from Hill *et al.*, 1999). The full list is available for download at <http://nora.nerc.ac.uk/6411/1/ECOFAC2a.pdf>

Common name	Scientific name	Hill Ellenberg R Score	Hill Ellenberg N Score	Combined R+N Score
Ferns				
Scaly Male-fern	<i>Dryopteris affinis</i>	5	5	10
Broad Buckler-fern	<i>Dryopteris dilatata</i>	4	5	9
Bracken	<i>Pteridium aquilinum</i>	3	3	6
Rushes				
Field wood rush	<i>Luzula campestris</i>	5	2	7
Heath wood rush	<i>Luzula multiflora</i>	3	3	6
Great wood rush	<i>Luzula sylvatica</i>	4	4	8
Heath rush	<i>Juncus squarrosus</i>	2	2	4
Sharp-flowerd rush	<i>Juncus acutiflorus</i>	4	2	6
Jointed rush	<i>Juncus articulatus</i>	6	3	9
Bulbous rush	<i>Juncus bulbosus</i>	4	2	6
Compact rush	<i>Juncus conglomeratus</i>	4	3	7
Soft rush	<i>Juncus effusus</i>	4	4	8
Hard rush	<i>Juncus inflexus</i>	7	5	12
Black Bog rush	<i>Schoenus nigricans</i>	7	2	9
Sedges				
Green-ribbed Sedge	<i>Carex binervis</i>	3	2	5
Brown Sedge	<i>Carex disticha</i>	6	4	10
Star Sedge	<i>Carex echinata</i>	3	2	5
Glaucous Sedge	<i>Carex flacca</i>	6	2	8
Common Sedge	<i>Carex nigra</i>	4	2	6
Carnation Sedge	<i>Carex panicea</i>	4	2	6
Remote Sedge	<i>Carex remota</i>	6	6	12
Wood-sedge	<i>Carex sylvatica</i>	6	5	11
Common Cottongrass	<i>Eriophorum angustifolium</i>	4	1	5
Hare's-tail Cottongrass	<i>Eriophorum vaginatum</i>	2	1	3
Deergrass	<i>Trichophorum cespitosum</i>	2	1	3
Grasses				
Velvet Bent	<i>Agrostis canina</i>	3	3	6
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	4	3	7
Tufted Hair-grass	<i>Deschampsia cespitosa</i>	5	4	9
Sheep's-fescue	<i>Festuca ovina</i>	4	2	6
Yorkshire-fog	<i>Holcus lanatus</i>	6	5	11
Purple Moor-grass	<i>Molinia caerulea</i>	3	2	5
Mat-grass	<i>Nardus stricta</i>	3	2	5
Common Bent	<i>Agrostis capillaris</i>	4	4	8

Common name	Scientific name	Hill Ellenberg R Score	Hill Ellenberg N Score	Combined R+N Score
Grasses (continued)				
Creeping Bent	<i>Agrostis stolonifera</i>	7	6	13
Meadow Foxtail	<i>Alopecurus pratensis</i>	6	7	13
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	4	3	7
False Oat-grass	<i>Arrhenatherum elatius</i>	7	7	14
False-brome	<i>Brachypodium sylvaticum</i>	6	5	11
Quaking-grass	<i>Briza media</i>	7	3	10
Meadow Brome	<i>Bromus commutatus</i>	8	6	14
Tufted Hair-grass	<i>Deschampsia cespitosa</i>	5	4	9
Wavy Hair-grass	<i>Deschampsia flexuosa</i>	2	3	5
Sheep's-fescue	<i>Festuca ovina</i>	4	2	6
Red Fescue	<i>Festuca rubra</i>	6	5	11
Yorkshire-fog	<i>Holcus lanatus</i>	6	5	11
Reed Canary-grass	<i>Phalaris arundinacea</i>	7	7	14
Timothy	<i>Phleum pratense</i>	7	6	13
Common Reed	<i>Phragmites australis</i>	7	6	13
Smooth Meadow-grass	<i>Poa pratensis</i>	6	5	11
Rough Meadow-grass	<i>Poa trivialis</i>	6	6	12
Herbaceous flowering plants				
Bog Pimpernel	<i>Anagallis tenella</i>	5	3	8
Wild Angelica	<i>Angelica sylvestris</i>	6	5	11
Daisy	<i>Bellis perennis</i>	6	4	10
Common Knapweed	<i>Centaurea nigra</i>	6	5	11
Common Mouse-ear	<i>Cerastium fontanum</i>	5	4	9
Creeping Thistle	<i>Cirsium arvense</i>	7	6	13
Meadow Thistle	<i>Cirsium dissectum</i>	4	2	6
Marsh Thistle	<i>Cirsium palustre</i>	5	4	9
Spear Thistle	<i>Cirsium vulgare</i>	6	6	12
Smooth Hawk's-beard	<i>Crepis capillaris</i>	7	4	11
Round-leaved Sundew	<i>Drosera rotundifolia</i>	2	1	3
Great Willowherb	<i>Epilobium hirsutum</i>	7	7	14
Common Eyebright	<i>Euphrasia officinalis agg.</i>	5	3	8
Cross-leaved Heath	<i>Erica tetralix</i>	2	1	3
Meadowsweet	<i>Filipendula ulmaria</i>	6	5	11
Marsh-bedstraw	<i>Galium palustre</i>	5	4	9
Heath Bedstraw	<i>Galium saxatile</i>	3	3	6
Lady's Bedstraw	<i>Galium verum</i>	6	2	8
Hogweed	<i>Heracleum sphondylium</i>	7	7	14
Cat's-ear	<i>Hypochaeris radicata</i>	5	3	8
Meadow Vetchling	<i>Lathyrus pratensis</i>	6	5	11
Autumn Hawkbit	<i>Leontodon autumnalis</i>	6	5	11
Oxeye Daisy	<i>Leucanthemum vulgare</i>	7	4	11
Common Twayblade	<i>Listera ovata</i>	7	5	12
Perennial Rye-grass	<i>Lolium perenne</i>	6	6	12
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	6	2	8
Greater Bird's-foot-trefoil	<i>Lotus pedunculatus</i>	6	4	10
Ragged-Robin	<i>Lychnis flos-cuculi</i>	6	4	10

Common name	Scientific name	Hill Ellenberg R Score	Hill Ellenberg N Score	Combined R+N Score
Herbaceous flowering plants (contined)				
Black Medick	<i>Medicago lupulina</i>	8	4	12
Water Mint	<i>Mentha aquatica</i>	7	5	12
Water Forget-me-not	<i>Myosotis scorpioides</i>	6	6	12
Bog Asphodel	<i>Narthecium ossifragum</i>	2	1	3
Lousewort	<i>Pedicularis sylvatica</i>	3	2	5
Mouse-ear-hawkweed	<i>Pilosella officinarum</i>	7	2	9
Ribwort Plantain	<i>Plantago lanceolata</i>	6	4	10
Silverweed	<i>Potentilla anserina</i>	7	6	13
Tormentil	<i>Potentilla erecta</i>	3	2	5
Selfheal	<i>Prunella vulgaris</i>	6	4	10
Meadow Buttercup	<i>Ranunculus acris</i>	6	4	10
Bulbous Buttercup	<i>Ranunculus bulbosus</i>	7	4	11
Lesser Celandine	<i>Ranunculus ficaria</i>	6	6	12
Creeping Buttercup	<i>Ranunculus repens</i>	6	7	13
Yellow-rattle	<i>Rhinanthus minor</i>	6	4	10
Bramble	<i>Rubus fruticosus</i>	6	6	12
Sorrel	<i>Rumex acetosa</i>	5	4	9
Broad-leaved Dock	<i>Rumex obtusifolius</i>	7	9	16
Common Ragwort	<i>Senecio jacobaea</i>	6	4	10
Common Chickweed	<i>Stellaria media</i>	6	7	13
Devil's-bit Scabious	<i>Succisa pratensis</i>	5	2	7
Purple Clover	<i>Trifolium purpureum</i>	7	5	12
White Clover	<i>Trifolium repens</i>	6	6	12
Common Nettle	<i>Urtica dioica</i>	7	8	15
Germander Speedwell	<i>Veronica chamaedrys</i>	6	5	11
Wood Speedwell	<i>Veronica montana</i>	6	6	12
Tufted Vetch	<i>Vicia cracca</i>	7	5	12
Vetch	<i>Vicia sativa</i>	7	4	11
Bush Vetch	<i>Vicia sepium</i>	6	6	12
Wood Vetch	<i>Vicia sylvatica</i>	7	5	12
Common Dog-violet	<i>Viola riviniana</i>	5	4	9
Low shrubs				
Ling Heather	<i>Calluna vulgaris</i>	2	2	4
Bell Heather	<i>Erica cinerea</i>	2	2	4
Cross-leaved heath	<i>Erica tetralix</i>	2	1	3
Bog-myrtle	<i>Myrica gale</i>	3	2	5
Gorse	<i>Ulex europaeus</i>	5	3	8
Western Gorse	<i>Ulex gallii</i>	3	2	5
Grey Willow	<i>Salix cinerea</i>	6	5	11
Bilberry	<i>Vaccinium myrtillus</i>	2	2	4
Mosses *				
	<i>Aulacomnium palustre</i>	3	2	5
	<i>Brachythecium rutabulum</i>	6	6	12
	<i>Breutelium chrysocoma</i>	4	2	6
	<i>Calliergonella cuspidata</i>	7	4	11

Common name	Scientific name	Hill Ellenberg R Score	Hill Ellenberg N Score	Combined R+N Score
Mosses * (continued)				
	<i>Campylium stellatum</i>	6	2	8
	<i>Campylopus introflexus</i>	2	2	4
	<i>Ctenidium molluscum</i>	7	2	9
	<i>Dicranum scoparium</i>	3	2	5
	<i>Drepanocladus cossonii</i>	7	2	9
	<i>Drepanocladus revolvens</i>	6	2	8
	<i>Eurhynchium praelongum</i>	5	6	11
	<i>Fissidens adianthoides</i>	6	2	8
	<i>Hylocomium splendens</i>	4	2	6
	<i>Hypnum jutlandicum</i>	2	2	4
	<i>Philonotis fontana</i>	4	3	7
	<i>Pleurozium schreberi</i>	2	2	4
	<i>Polytrichum commune</i>	2	2	4
	<i>Rhytidiadelphus loreus</i>	2	2	4
	<i>Rhytidiadelphus squarrosus</i>	5	4	9
	<i>Scleropodium purum</i>	6	3	9
	<i>Scorpidium scorpiodes</i>	6	2	8
Bog Moss	<i>Sphagnum capillifolium</i>	2	1	3
	<i>Sphagnum cuspidatum</i>	1	2	3
	<i>Sphagnum palustre</i>	3	2	5
	<i>Sphagnum papillosum</i>	1	1	2
	<i>Sphagnum subnitens</i>	3	2	5
* Mosses included for information only, and do not form part of the Land Types for Afforestation assessment procedure.				

Appendix C

Sample Recording Sheets

The following pages set out sample recording sheets for use in the field where a Land Types for Afforestation assessment is being undertaken. These sheets, to be photocopied as required, can be used to record the information required in Steps 1 to 5 of the procedure detailed in Table 2 of Appendix A: Mapping, Sampling and Scoring.

Land Types Recording Sheet

CN	Date
Townland & county	Recorder's name

Topography	Slope (level / moderate / steep)
Soil type	Peat depth (cm)
Exposed rock % cover	Surface water % cover
Habitat type As listed in Fossitt's <i>A Guide to Habitats in Ireland</i> (2000)	
Land type general description 	

Vegetation Sample Plot No:			
Species within the sample plot	% cover [A]	Combined R+N score [B]	Weighted R+N score [C]
Total weighted R+N score [D]			

CN	Date
Townland & county	Recorder's name

Vegetation Sample Plot No:			
<i>Species within the sample plot</i>	<i>% cover [A]</i>	<i>Combined R+N score [B]</i>	<i>Weighted R+N score [C]</i>
<i>Total weighted R+N score [D]</i>			

Vegetation Sample Plot No:			
<i>Species within the sample plot</i>	<i>% cover [A]</i>	<i>Combined R+N score [B]</i>	<i>Weighted R+N score [C]</i>
<i>Total weighted R+N score [D]</i>			

Appendix D

References and Further Reading

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