An Chomhairle Oidhreachta
The Heritage Council

Habitats Survey (Phase V)
County Laois 2009

Feral goats on Baunreagh in the Slieve Bloom Mountains

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Report prepared for Laois Heritage Forum:
An Action of the Laois Heritage Plan

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Contents

Plates

Tables

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Summary

The report contains the results of habitat mapping carried out in 2009 in County Laois. This focussed on townlands associated with the Slieve Blooms. This survey is an expansion of habitat mapping exercises elsewhere in the county, the results of which are in Hickey and Tubridy (2008).

Habitat mapping was informed principally by fieldwork. Information was also gathered through desk research, consultations and interpretation of colour aerial photographs. Ecologists examined habitats field by field within the survey area. A total of 29 townlands were surveyed covering 72.84 sq km. Permission was always sought before survey work took place.

Methodology followed procedures used in previous studies. Habitats were examined and mapped using methodologies promoted by the Heritage Council in 'A Guide to Habitats of Ireland' (Fossitt 2000) and Draft Habitat Survey Guidelines: A standard methodology for habitat survey and mapping in Ireland (The Heritage Council 2002, 2005). Each field or habitat was given a code on a field map. Lists were compiled of flowering plants associated with habitats to assist in habitat descriptions. Further information was recorded at sites which had potential to be recognised as Local Biodiversity Areas.

Results from the marked up maps were digitised to produce computerised versions of the final maps. The location of habitats were linked to target notes and location of potential Local Biodiversity Areas.

Principal findings from 2009 survey are:

A total of 50 habitats are present in this area of Laois. Two new habitats were added to the list of habitats previously identified. Dystrophic lakes and calcareous springs had not previously recorded in habitat surveys in the county.

Most of the land is covered in conifer plantations and improved agricultural grassland respectively. Within intensively farmed areas dominated by improved agricultural grassland, habitats of greater biodiversity interest are found, such as hedgerows and drainage ditches. Field mapping confirmed the presence of 5.01 km of hedgerow per square kilometre. This is lower than that found elsewhere in the county as drainage ditches provide many field boundaries.

Semi-natural habitats, some of which are of high biodiversity value, account for over 26.5% the total area surveyed. This contrasts with c. 3% found in previous surveys. These include upland blanket bog (8.29%), wet heath (7.29%) and dry-humid acid grassland 0.37%. Some habitats are only found at one or two sites such as bog woodland and dystrophic lakes. Almost all areas with important semi natural habitats are now found within designated sites (SAC, SPA, Nature Reserve). A number of other areas have potential to be recognised as Local Biodiversity Areas including parts of the Delour River Valley, the Deerpark estate, land south and east of Conlawn hill, Ballyfin Demesne, parts of the Owennahallia, Owenass and Murglash River Valleys.

The 50 habitats which have been identified support 320 plant species. Species diversity varies greatly between habitats. The most valuable habitats for plants are wet grassland (>131) scrub with >103 species and willow-alder-ash woodland (>96 species). Those with the lowest number of native species include dystrophic lakes, eroding upland rivers, amenity grassland, set aside land, spoil and bare ground, garden shrubberies and some types of woodland. Several other plants found are rare in the region and in Laois.

The habitat and floristic survey provides an essential report on biodiversity for this part of Laois. It can be used to inform management in privately owned land, Coillte property and designated sites.

The report concludes with a number of suggestions on how the results of the mapping exercise can be used to generate greater awareness of habitats and their management needs.

1. Introduction

1.1 Brief

The brief requested that the study address the following tasks:

- To carry out a detailed field survey of habitats in selected townlands in County Laois and to make data collected available in map and report format.
- To liaise with the public and landowners in the areas surveyed, to ensure public awareness of the project being undertaken.
- To use data collected to make recommendations on conservation priorities and any future work that should be carried out.
- To collate and make this information available for future research, through a detailed survey report, annotated maps and a set of raw data (including field notes and maps) as appendices.

1.2 Approach

A habitat is a defined area, which supports a collection of typical plants and animals. By mapping habitats information can be gathered about the plants and animals which are associated with an area. The Heritage Council has promoted methodologies to map habitats. A guide produced by the Heritage Council (Fossitt, 2000) lists habitats found in Ireland and a methodology has been developed to carry out mapping exercises.

Identification of habitats is particularly important to the implementation of the most important piece of wildlife legislation which applies in Ireland; the Habitats Directive (92/43/EEC). The Habitats Directive was brought into force in Ireland through the European Communities (Natural Habitats) regulations 1997 (SI /97/094) and The Planning and Development Regulations 2001 (S.I. 600 of 2001) made under the Planning and Development Act, 2000.

Under this Directive there is a legal obligation on Ireland to protect particular habitats, so called priority and non-priority types, and species listed in annexes to this directive. Appendix 1 lists habitats, which require protection under the Habitats Directive. Priority types include several which might expect to be found in Laois.

While the emphasis in the Habitats Directive is on specific habitats and species it also recognises the need for management of the wider countryside. The preamble recognises that “land use planning and development policies should encourage the management of features of the landscape which are of major importance to flora and fauna”.

Under Article 3 that there are obligations on member states to maintain features of the landscape, which will improve the ecological coherence of the network of designated sites (Special Areas of Conservation or Special Protection Areas) which contain the best examples of the these priority and non priority habitats. The obligations and the type of features are highlighted in Article 10 as follows:

“Such features are those which by virtue of their linear and continuous structure (such as rivers with their banks or traditional systems for marking field boundaries (i.e. hedgerows) or their function as stepping stones (such as ponds or small woods) are essential for the migration, dispersal and genetic exchange of wild species.”

As habitat mapping provides comprehensive maps of biodiversity; the location of priority and non-priority sites, linking features such as rivers and hedgerows and all types of habitats even less natural types will be shown.

Global awareness of the decline in biodiversity has led to a greater focus on managing biodiversity at the local level. The Convention on Biological Diversity (CBD) drawn up in 1992 defined biodiversity as "the variability among living organisms including inter alia marine, terrestrial and aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems". It can be expressed at different levels; landscape, habitats, ecosystems, species and genes.

Ireland ratified the CBD in 1996. Under Article 6 all signatories are obliged to develop a national strategy for biodiversity and to integrate the conservation and sustainable use of biological diversity with relevant sectoral or cross-sectoral plans, programmes and policies. The CBD represents a shift away from preservation of rare species and habitats. It is concerned with biodiversity in all its forms and with integrating biodiversity with development. Arising from its ratification of the CBD Ireland drew up a National Biodiversity Plan in 2002 (Department of Arts, Heritage, Gaeltacht and the Islands). This stated the need for both sectoral biodiversity action plans and plans for local areas such as Local Biodiversity Action Plans for which responsibility was given to Local Authorities.

The wildlife, habitats, flora and fauna found in County Laois are unique to it and thus are a valuable part of its heritage.

Previous habitat mapping exercises each year from 2005 have provided comprehensive and detailed surveys of habitat diversity within County Laois. The approach has evolved as designated areas were only mapped from 2007. A review of geodiversity informed survey work in the Castlecomer area in 2008. In 2008 the methodology included the identification of areas of particular importance "Local Biodiversity Areas". Schemes which evaluate areas impacted by road developments (Appendix 2) have generated criteria to identify Local Biodiversity Areas , called "Areas of Local Biodiversity Importance (NRA, 2005)". In 2008 criteria to identify LBAs in Laois based on information available through the habitat survey were identified and circulated to surveyors (Appendix 3).

This survey work commissioned by the local authority complements survey work on designated areas, particular habitats and areas (land owned by Coillte) and sites for which development is proposed. Habitat mapping is providing information on the general distribution of habitats within the country including man-made habitats such as those found in urban areas, along roadsides and even among the ruins of old buildings. As mapping is digitised it is possible to access this data set and integrate its results with those from other sources of habitat mapping. An important indirect result of habitat mapping is the opportunity it offers for contacts between ecologists and landowners.

The preparation of habitat maps provides baseline information to support the preparation of a local biodiversity action plan. The listing of Local Biodiversity Areas provides further insights into areas of significance. Both types of information should raise awareness among landowners and the public of the usefulness of biodiversity. The information gathered can be used to inform spatial planning, specific local development initiatives such as agri-environmental measures, forestry development, the location of infrastructure, environmental education and special interest or eco-tourism.

2. Methodology

The approach and methodology used for the County Laois Habitats Survey in 2009 follows that described in Hickey and Tubridy (2008) and draws on their experience of habitat mapping in the county since 2005. Brief notes are provided here. A more detailed account of the methodology is contained in previous reports (Hickey and Tubridy, 2005, 2006, 2007, 2008).

The townland was retained as the mapping unit as administrators, residents particularly landowners and land managers identify with it. Townland boundaries are often associated with areas of biodiversity interest. Townland selection was made with the assistance of the Habitats Working Group. Priorities were to include representative features of the landscape of the Slieve Blooms within designated and undesignated areas. Figure 1 shows area surveyed in Laois since 2005. Table 1 lists the townlands surveyed in 2009.

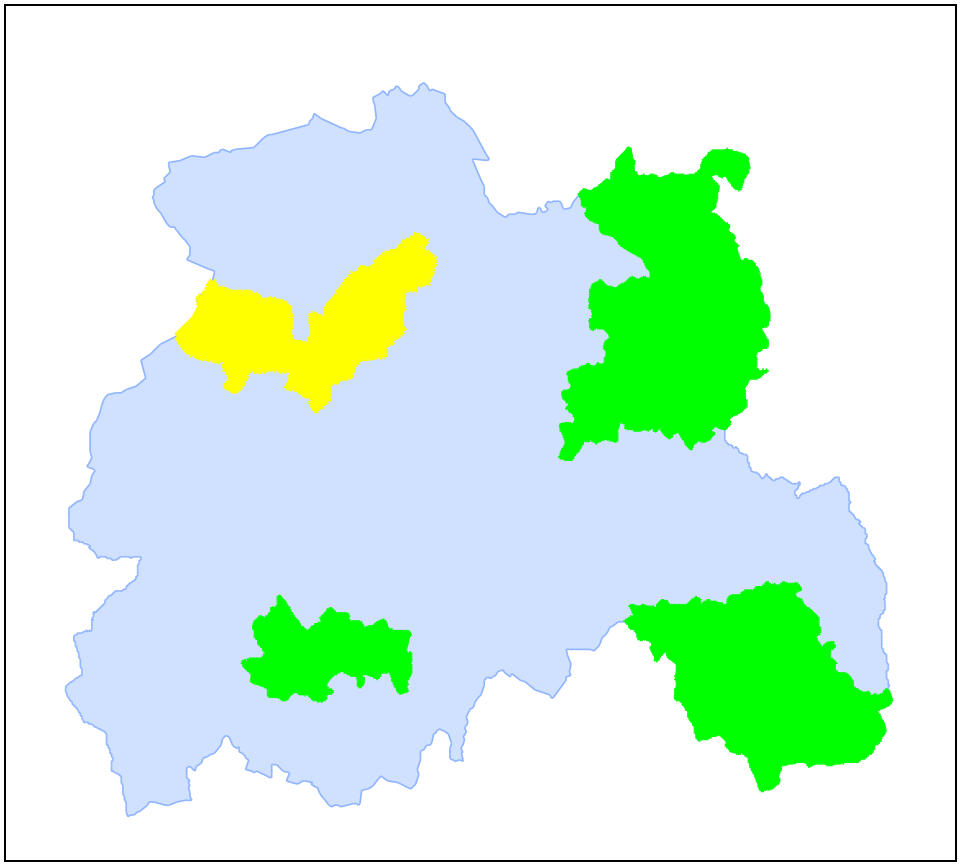


Figure 1. Areas surveyed and digitised during the Laois Habitats Survey

Note: The green shading represents the areas completed from 2005-2008. The yellow shading represents the 2009 survey.

Table 1. Townlands surveyed and digitised in 2009

Townland	
Ballyfin	Derrylamogue
Ballyfin demesne	Drim
Ballyfin upper	Drimhill/Quarryfarm
Ballyhuppahane	Glennaglass
Baunreagh	Gorteenameale
Bockagh	Inchanisky
Bordowin	Knocks
Briscula	Moher west
Camcloon	Moher east
Cappalane	Monicknew
Castleconnor	Mountainfarm
Cavansheath	Sconce upper
Clonehurk	Shanavaur
Deerpark	Skerry
Derrycon	

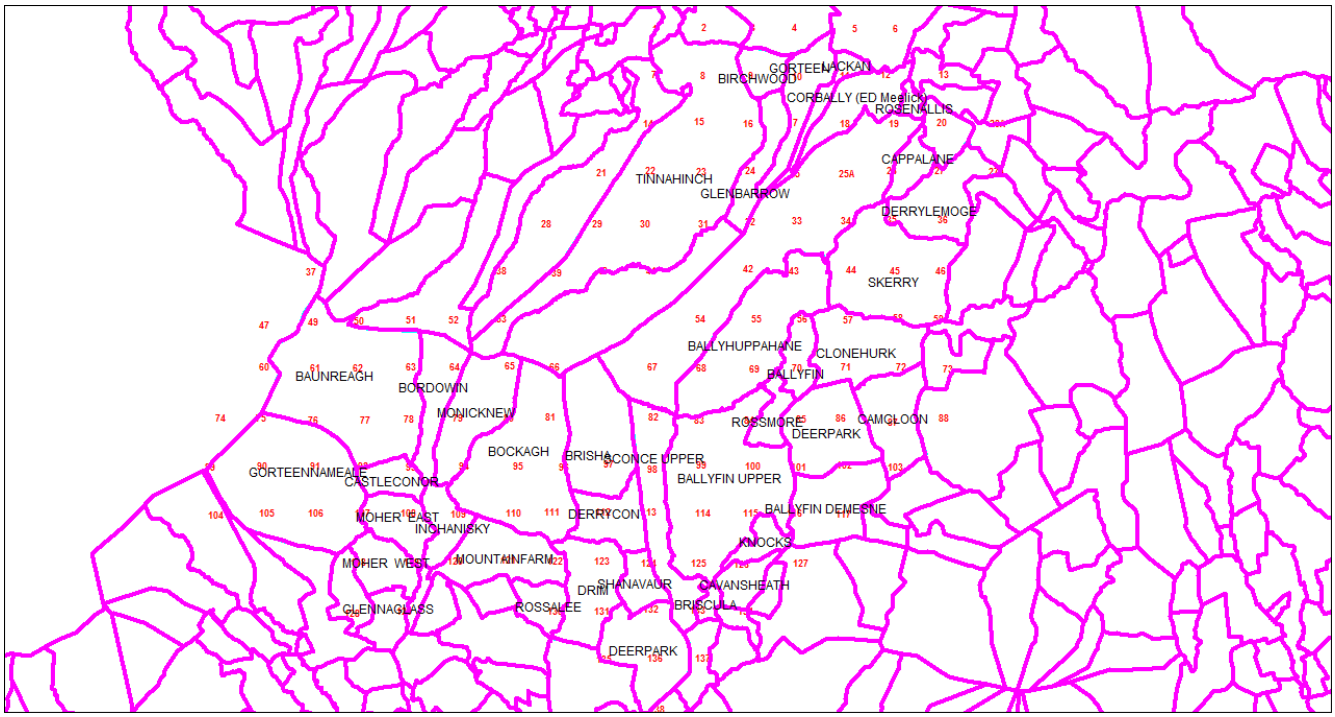


Figure 2 Townlands surveyed in 2009

Trial surveys took place with all field workers (Betsy Hickey, Mark Mc Corry and Mary Tubridy) to test the survey methodology, exploit the local knowledge of one of the field workers, clarify the requirements for mapping and allow for the resolution in differences in interpretation between surveyors.

Ancillary data included Coillte sponsored studies of Biodiversity Areas in their forests (Forest Management Units 705 (FMU) and maps of different forest blocks; NPWS files and mapping on designated areas, a study by Stephen Heery on the priority habitat Petrifying Springs (Heery, 2008) , John Feehan's books on Laois and the Slieve Blooms (Feehan, 2008 reissue) . The account of Coillte Biodiversity Areas was particularly

valuable. However while habitats were listed within Coillte Biodiversity Areas, habitat mapping was not carried out.

Regular consultations were held with the Heritage Officer and Heritage Forum to discuss areas to be surveyed, fieldwork priorities and local contacts. A particular request was made to record presence of meadows with a high cover of Succisa as this species is an important host plant of the marsh fritillary butterfly, a species listed in the Habitats Directive.

A leaflet was produced providing information about the project (see Appendix 4). This was given to landowners, libraries, to members of the public encountered by surveyors and left in local authority offices and libraries. During consultations with farmers information was gathered on past and current land management practices, their aspirations for further development and whether they would be interested in obtaining information about the results of the survey. A list was compiled of landowners who actively participated in the survey. (Appendix 5).

Practises in the field followed conventions used in previous studies (Hickey and Tubridy, 2008). In 2009 hard copy maps and aerial photographs for use in the field were produced by the consultants. Historical OS mapping was accessed to discover continuity of habitat cover. Betsy Hickey was the principal surveyor for the 2008 survey, assisted by Mark Mc Corry and Mary Tubridy. Target notes principally comprising detailed plant species lists were prepared at sites of interest or an aid to compiling habitat descriptions. Photographs were also taken. A record was compiled of the location of invasive species and meadows containing a high cover of *Succisa*. Their location was recorded on the hard copy map and grid referenced.

Potential Local Biodiversity Areas were identified and described following guidelines developed in 2008 (Appendix 3).

Timing affected the completeness of plant lists in surveyed habitats. While almost all habitat types can be identified in all seasons, plants in woodlands were under recorded as they flower early in the season.

All the habitat information and boundaries of LBAs were digitised using Mapinfo. Target notes were linked to the habitat layer, as also were the accounts of LBAs .

This report contains an account of the habitats, illustrated by photographs and complemented by checklists of plants in appendices. It is accompanied by two large hard copy maps 1) habitat map for the survey area and 2) hard copy of map showing LBAs. Further data has been delivered to the Co Co on CD (GIS with habitat layer linked to target notes and LBAs).

3 Results

3.1 Summary

The principal results of the survey are summarised in the following Tables. Table 2 lists habitats identified and associated plant species. Table 3 provides details of the cover associated with these habitats. Table 4 lists important semi natural-types and Table 5 describes linear types. Appendix 6 contains a complete species list of plants recorded in 2009. Other appendices list species associated with particular habitats, location of target notes, invasive exotics and *Succisa* rich meadows.

3.1.1 Habitat and plant species diversity

Table 2 shows the identity of habitats in the area surveyed and total number of plant species recorded from these habitats.

Table 2 Habitats and plant species diversity

Level 1 Habitat	Level 2 Habitat	Level 3 Habitat	No. of species recorded per habitat
F Fresh water	FL Lakes and ponds	FL1 Dystrophic Lakes	0
		FL8 Other artificial lakes and ponds	22
	FW Watercourses	FW1 Eroding/upland rivers	0
		FW2 Depositing lowland rivers	0
		FW4 Drainage ditches	20
	Springs	FP1 Calcareous springs	1
	FS Swamps	FS1 Reed and large sedge swamp	21
G Grassland and marsh	GA Improved grassland	GA1 Improved agricultural grassland	40
		GA2 Amenity grassland (improved)	22
	GS Semi-natural grassland	GS1 Dry calcareous and neutral grassland	65
		GS2 Dry meadows and grassy verges	44
		GS3 Dry-humid acid grassland	46
		GS4 Wet grassland	131
		GM1 Marsh	1
H Heath and dense bracken	HH Heath	HH1 Dry siliceous heath	78
		HH3 Wet heath	50
	HD Dense bracken	HD1 Dense bracken	7
P Peatlands	PB Bogs	PB2	24
		PB4 Cutover bog	47
	PF Fens and flushes	PF2 Poor fen and flush	78
W Woodland and scrub	WN Semi-natural woodland	WN1 Oak-birch-holly woodland	68
		WN2 Oak-ash-hazel woodland	112
		WN4 Wet pedunculate-oak-ash-woodland	5

Level 1 Habitat	Level 2 Habitat	Level 3 Habitat	No. of species recorded per habitat
		WN6 Wet willow-alder-ash woodland	96
		WN7 Bog woodland	8
	WD Highly modified /non-native woodland	WD1 (Mixed) broadleaved woodland	85
		WD2 Mixed broadleaved/ conifer woodland	19
		WD3 (Mixed) conifer woodland	No records
		WD4 Conifer plantation	30
		WD5 Scattered trees and parkland	9
	WS Scrub/transitional woodland	WS1 Scrub	103
		WS2 Immature woodland	17
		WS3A Ornamental/non native hedgerows	4
		WS3B Ornamental/non native shrub	8
		WS5 Recently felled woodland	56
	WL Linear woodland/scrub	WL1 Hedgerows	32
		WL2 Tree line	7
E Exposed rock and disturbed ground	ED Disturbed ground	ED1 Exposed sand, gravel or till	4
		ED2 Spoil and bare ground	4
		ED3 Re-colonising bare ground	7
		ED4 Active quarries and mines	0
B Cultivated and built land	BC Cultivated land	BC1 Arable crops	1
		BC2 Horticultural land	No records
		BC3 Tilled land	No records
		BC4 Flower beds and borders	5
		BL1A Stone wall	3
		BLIB Other stone-works	5
		BL2 Earth banks	71
		BL3 Building and artificial surfaces	No records
		BL3 D Land being developed*	No records

As a result of previous studies sixty different habitats have been identified in Laois. In this area fifty habitats are present. The area has added two new habitats to the list of those recorded for the county, Dystrophic lakes (one site) and Calcareous Springs (two sites).

The fifty habitats which have been identified support 320 plant species. Table 2 reveals that species diversity varies greatly between habitats. The most valuable habitats for plant biodiversity are wet grassland (>131) scrub with >103 species and willow-alder-ash woodland (>96 species). Those with the lowest number of native species include dystrophic lakes, eroding upland rivers, amenity grassland, set aside land, spoil and bare ground, garden shrubberies and some types of woodland.

In contrast to the presence of native plant species which are rare, reflect local ecological conditions and threaten semi natural habitats, two non-native plants; Japanese knotweed and giant rhubarb were found growing actively in the survey area.

3.1.2 Cover of habitats

Table 3 describes the distribution of habitats in the area. The hard copy habitat map illustrates their location.

Most of the land is covered in conifer plantations (36%)and improved agricultural grassland (32%) respectively. This contrasts with other areas in Laois (5.6% and 56% respectively).

Semi-natural habitats, some of which are of high biodiversity value, account for over 26.5% the total area surveyed (Table 4). This cover contrasts with results of previous surveys which showed a cover of 5%. Important semi-natural habitats include upland blanket bog (8.29%), wet heath (7.29%) and dry-humid acid grassland (0.37%). Some habitats are only found at one or two sites such as bog woodland, calcareous springs and dystrophic lakes. Most of these semi-natural habitats are protected in designated areas.

Table 3. Cover of principal habitats

Habitat	Area (ha) 2009	% total area surveyed
Conifer plantation	2776.40	36.43
Improved agricultural grassland (semi improved in this areas)	2462.23	32.30
Upland Blanket Bog	632.14	8.29
Wet heath	555.38	7.29
Wet grassland	218.60	2.87
Scrub	194.96	2.56
Dry heath	120.95	1.59
Mixed broadleaved woodland	83.49	1.10
Recently-felled woodland	78.46	1.03
Oak-birch-holly woodland	67.41	0.88
Dry meadows and grassy verges	55.84	0.73
Poor fen and flush	46.63	0.62
Buildings and artificial surfaces	40.81	0.54
Wet-willow-alder-ash woodland	37.98	0.50
Immature woodland	32.89	0.43
Scattered trees and parkland	30.30	0.40
Amenity grassland (improved)	30.26	0.40
Dry-humid acid grassland	28.19	0.37
Dense bracken	27.19	0.36
Mixed conifer/broadleaved woodland	25.04	0.33
Oak-ash-hazel woodland	23.40	0.31
Other artificial lakes and ponds	14.57	0.19
Dry calcareous and neutral grassland	11.03	0.14
Arable crops	10.27	0.13
Land under development	4.34	0.06
Recolonising bare ground	2.14	0.03
Spoil and bare ground	2.00	0.03
Horticultural land	1.63	0.02
Cutover bog	1.22	0.02
Mixed conifer woodland	1.08	0.01
Flower beds and borders	0.60	0.01
Marsh	0.59	0.01
Ornamental/non-native shrub	0.58	0.01
Tilled land	0.46	0.01
Exposed sand, gravel or till	0.38	0.00
Bog woodland	0.37	0.00
Reed and large sedge swamp	0.35	0.00
Other stonework	0.22	0.00
Active quarries and mines	0.14	0.00
Dystrophic lakes	0.06	0.00

Table 4 Cover of important semi-natural habitats
Note: Habitats marked with * are listed in the Habitats Directive)

Habitat	Area (ha) 2009	% total area surveyed
Upland Blanket Bog*	632.14	8.29
Wet Heath*	555.38	7.29
Wet Grassland	218.60	2.87
Scrub	194.94	2.56
Dry heath	120.95	1.59
Oak-Birch-Holly Woodland	67.41	0.88
Dry Meadows and Grassy Verges	55.84	0.73
Poor fen and flush	47.63	0.62
Wet Willow-Alder-Ash Woodland	37.98	0.50
Dry Humid Acid Grassland	28.19	0.37
Dense Bracken	27.19	0.36
Oak-Ash-Hazel Woodland	23.40	0.31
Dry Calcareous and Neutral Grassland*	11.03	0.14
Cutover Bog*	1.22	0.02
Marsh	0.59	0.01
Bog woodland*	0.37	0.00
Reed and large sedge swamp	0.35	0.00
Dystrophic lakes*	0.06	0.00

Almost all of these semi-natural habitats are rare nationally, regionally, locally Further research is needed to discover if sites supporting listed habitats which are not in designated areas are good examples of these habitats and thus potential SACs.

The status of linear habitats was measured by length and results are shown in Table 5.

Table 5 Status of linear habitats

Habitat	Length (km) 2009	% of total linear habitats 2009
Hedgerows	364.83	58.34
Upland/eroding rivers	121.12	19.37
Drainage Ditches	46.37	7.42
Tree line	30.03	4.8
Earth Banks	29.46	4.71
Depositing Lowland Rivers	13.37	2.14
Stone Walls	10.89	1.74
Ornamental Non-Native Shrubs	9.23	1.47

Linear habitats such as hedgerows and drainage ditches are particularly important in intensively managed areas, but of lesser importance in the vicinity of the Slieve Blooms. Field mapping confirmed the presence of 5.01 km of hedgerow per square kilometre. This contrasts with a figure of 8.1km revealed through previous surveys. The lower cover indicates the greater importance of drainage ditches as field boundaries in the Slieve Bloom area. Rivers form significant corridors/ linking features of biodiversity interest within the study area. Earth banks are important semi-natural features where they form boundaries along old roads.

3.2 Habitat Diversity

3.2.1 Introduction

Summary descriptions and preliminary assessments of the principal habitats of biodiversity interest are complemented by plant species lists in Appendices 6 and 7. The location of target notes is in Appendix 8.

3.2.2 Wetlands

(FL1) Dystrophic lakes (sky blue horizontal lines).
This habitat type is characterised by having a low pH (3.5-5.5) and few nutrients and is generally found on lowland blanket bogs. Only one example of this habitat type was recorded. This was a small clear circular lake completely surrounded blanket bog in Gorteenameale within the Slieve Blooms SAC and SPA and Nature Reserve (Figs. ? and ?, Grid square N2501 note 1, Tables 5 and 6). Its occurrence is unusual as the blanket bog on Slieve Blooms has relatively few pools compared to other blanket bogs. No aquatic vegetation was observed but there were some flushes around the edges with abundant Sphagnum cover. At the edge of the pool there was a clump of Giant Wood-rush which was being used by roosting waterfowl. Red Grouse was noted in the adjacent blanket bog. A number of tracks used by walkers lead to and from the lake.

Figure3 Dystrophic lakes (FL1), (Grid square N2501, Target note 1). A small clear lake in blanket bog in Gorteenameale within the Nature Reserve.

FW1 Eroding/upland rivers ▬ (dark blue solid line).

Eroding upland rivers were found throughout the study area. Five river systems drain this part of the Slieve Blooms Mountains. These are the Gorteen and Delour rivers in the west, the Mountrath River which is more or less central to the study area and the Owenass and Owennahallia rivers in the east. In all 121.12 km of upland eroding rives were recorded (Table 5). Few plants are found within the rivers as they are spate rivers. Their substrates tend to be stone, gravel or sand or a mixture of all. This is evident on stretches of the Delour River in Moher East, Inchanisky, Glennaglass and Drim or Quarryfarm where the river bed contains the occasional boulder along with gravels and sands. Sand banks can be found in several places along the Delour in particular on bends. In other areas such as Ballyfin Upper and Sconce Upper (Figure 3) waterfalls are found.

Figure 4. Eroding/upland rivers (FW1), forming the boundary between Sconce Upper and Ballyfin Upper (Grid square S3599, Target note 1).

While large stretches of the Gorteen, Delour and Owenass rivers flow through conifer woodland they and the others pass through several different semi-natural habitats including oak-birch-holly woodland, wet willow-alder-ash woodland, scrub, wet grassland, dry-humid acid grassland, wet heath and upland blanket bog. Other habitats include improved agricultural grassland. However many of the rivers in these area tend to have narrow zones of woodland or are adjacent to hedgerows which afford wildlife some protection. Where rivers flow through conifer plantations the majority of which are owned by Coillte the trees traditionally come up to the edges of the river. However, in recent times a number of river systems flowing through Coillte property are classified as Biodiversity Sites and appear to be managed to improve habitat value for wildlife. This includes leaving clear-felled areas next to rivers to regenerate naturally and not re-planting with conifer species within 12 – 20 m of the rivers themselves.

FP1 Calcareous springs (sky blue circle).

A large spring was found in a small oak-ash-hazel woodland dominated by hazel in Ballyfin Upper in a ravine through which the upper sections of the Owennahallia River flows (Grid square N3601 note 2). The second one in Glennaglass (Grid square S2998 note 5), was on the side of a low bank that has dry calcareous and neutral grassland growing on it. Springs are found where lime rich water wells up from underground sources, and where the flow of water is sufficient to allow species such as mosses and liverworts to grow. Deposits of limestone may occur and coat or encrust the surrounding soil or plants, and as a result the springs, are called "petrifying" or tufa forming.

Figure 5. Small calcareous spring in oak-ash-hazel woodland (WN2) in Ballyfin Upper (Grid square N3601, target note 2)

The Tufa spring in Ballyfin Upper was flowing into a small branch of the main stream. This spring is not listed in Heery (2008). The spring is badly damaged by cattle trampling and is in poor condition. The vegetation on the spring is dominated by Liverworts with *Diplophyllum* prominent.. Characteristic moss species of Tufa springs were not recorded. This wood is within the SPA.

The Glennaglass spring was small, with deposits of tufa occurring in small patches along its length. The surrounding area was damp and supported dry calcareous and neutral grassland in which 37 plant species were recorded. Currently, this site is recovering from major disturbance, the footprint of a house and its driveway having been excavated a few years ago. Species found growing on and around the spring included *Cladonia* sp. lichens, bird's foot-trefoil, red clover, sheep's fescue, catsear and bramble.

Grasslands

GS1 Dry calcareous and neutral grassland (yellow squares on white background).

Soils where dry calcareous and neutral grassland is found are usually mineral in origin, free-draining, not acidic and management is not intensive.

Dry calcareous and neutral grassland found in 7 sites in 6 townlands mostly at lower elevations, however dry calcareous and neutral grassland was found in a lay-by in Bordowin surrounded by conifer plantation, (Grid square N2903 GS1 note 1).

Yarrow, eyebright, ox-eye daisy and bird's-foot-trefoil were among the 24 species recorded there. In all 65 species were recorded from the 6 sites including knapweed, pale lady's mantle (Ballyfin demesne Grid square N38000 GS1 note 4) and southern lady's mantle in Drim (Grid square S3398 GS1 note 1).

Figure 6. Dry calcareous and neutral grassland (GS1) close to the Mountrath River in Drim (Grid square S3298 Target note 1).

GS3 Dry-humid acid grassland **(yellow diagonal lines slanting to the left).**

Dry-humid acid grassland is found in areas where fertiliser inputs are rare or very low. It is found on free-draining and often on steeply sloping sites such as in Ballyhuppahane (Grid square N3603 GS3/GS4 note 2), growing in south facing fields around an abandoned farmhouse where it was being grazed by horses. In Baunreagh dry-humid acid grassland was found within a conifer plantation.

This field was used in the past for grazing horses that worked in the forest drawing logs. Crested dogs' tail, red fescue and sweet vernal grasses were recorded along with meadow buttercup, tormentil and knapweed. The owner of the property has seen foxes, badger, red squirrel, pine martens, fallow deer, ravens, kestrels in its vicinity. An observation by them of a tawny owl is a mistake.

The largest area of dry-humid acid grassland was found in Ballyhuppahane in Grid square N3605 whilst the smallest area was also in Ballyhuppahane (Grid square N3704). The main semi-natural habitats associated with dry-humid acid grassland are scrub and wet grassland, hedgerows and conifer plantations. A total of 21.9 ha of dry-humid acid grassland was recorded along with 46 species of plants (Tables 4, 5 and 6).

Figure 7. Dry-humid acid grassland (GS3) in Ballyhuppahane (Grid square N3704, target note 1) with lesser butterfly orchid growing in association with wood speedwell, clover and grasses.

GS4 Wet grassland (yellow diamonds on a white background).

Found on poorly drained flat or sloping land on several soils types and in upland and lowland areas, wet grassland occurred in every townland within the study area, often forming clusters in close proximity to river valleys. Wet grassland covered 218.60 ha of land, the third highest area of semi-natural habitats in the study (Tables 5 and 6).

Most of the wet grassland sites were connected to other semi-natural habitats by hedgerows, drainage ditches of earth banks, apart from two areas which were surrounded by conifer forest in Bordowin and Baunreagh. Many formed complexes with a number of habitats for example in Ballyfin Upper (Grid square N3603 FW1/WS1/GS4 note 1) where wet grassland was found with eroding upland rivers and scrub, whilst in Drimhill or Quarryfarm it was found with scrub and dense bracken (Grid square S2999 GS4WS1HD1 note 5).

Wet grassland had the greatest species diversity (131 different plants, Table 4) of all habitats featuring rushes such as soft rush and jointed rush. Purple moor grass, lesser spearwort, self heal and horsetails commonly occurred. Occasionally ling heather was recorded in wet grassland such as in Moher East (Grid square N2800 GS4 note1) and in Ballyfin upper (Grid square N3603 GS4 note 1). Devils bit scabious was also found in Moher East (Grid square N2800 GS4 note1) and in at least seven other sites within the wet grassland areas. Oval sedge, green ribbed sedge and star sedges were among the ten recorded sedges in wet grassland. The lesser butterfly orchid and the heath spotted orchid were both found in a wet grassland/dry-humid acid mosaic in Ballyhuppahane (Grid square N3704 GS4 note 1).

Figure 8. Wet grassland (GS4) in Deerpark (Grid square S3498, target note 1).

GA1 improved agricultural grassland (yellow horizontal lines on a white background).

Improved agricultural grassland is usually intensively managed, receiving large inputs of fertilisers in tandem with high stocking rates and or severe cutting regimes to produce winter fodder for animals. As a result species diversity tends to be poor with usually one species dominating. This is perennial ryegrass or as in Ballyfin Demesne (Grid square N3801 GA1 note 3), the grassland consisted almost entirely of Timothy grass which gave the impression of semi-natural grassland from the aerial photograph.

In the study area, in contrast to other parts of Laois much of the improved agricultural grassland (in total 2,462 ha, Table 5), tended to be less intensively managed, only receiving fertiliser inputs every few years or so. In wet years other forms of management such as topping thistles and rushes are not carried out as the ground is too wet to support machinery. Grazing by animals may also be reduced due to causing severe poaching.

Some improved grasslands surveyed were more species rich than is the norm at least 18 species were recorded including yellow rattle, red clover knapweed and crested dogs tail (Ballyhuppahane, grid square N3604 note 1, Figure 8, Table 4).

Figure 9. Species rich Improved agricultural grassland (GA1) in Ballyhuppahane (Grid square N3604, Target note 1).

3.3 4 Heath and Bog Habitats

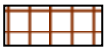
HH1 Dry siliceous heath (brown horizontal lines on a white background).

Dry heath was found in Ballyfin, Ballyfin Upper, Drim, Inchanisky, Knocks, Mountainfarm (Figure 9), and Sconce Upper with the larger areas occurring in Ballyfin Upper (e.g. grid squares S3559 notes 1 and 3, N3600 note 1,) and Inchanisky. A total of just over 120 ha of dry heath habitat were recorded (Tables 5 and 6).

Figure 10. Dry siliceous heath (HH1) in Mountainfarm (Grid square N3100, Target note 2) with a sky lark nest built among ling heather, tormentil and deergrass.

Dry heath typically occurs on poor dry acidic soils in either upland or lowland regions. In the Slieve Bloom Mountains areas dry heath tended to occur on fairly level or gently sloping ground and at lower elevations. The depth of peat is one of the deciding factors in distinguishing dry heath from wet heath (HH3) or bog and it ranged from 0 - 20 cm in the study area. Fifteen centimetres depth of peat is usually regarded as the upper limit for dry heath and the deeper depths generally occurred in transition zones between dry heath and wet heath.

Visually, both on the ground and on aerial photographs good quality dry heath tends to be darker in colour than wet heath, ranging from deep pink to purple, with some green hues. However, if it is badly degraded following poaching by animals such as cattle it can appear paler and or a green-yellow colour and confusion with HH3 may occur. Recolonising dry heath habitats following burning tend to be dominated by purple moor grass and this can make identification difficult as it is usually associated with wet heath. Shrub cover and height categorise heath, shrubs are low and cover at least 25% of the habitat. *Calluna vulgaris* was usually the dominant shrub species found on dry heath. Seventy eight plant species were recorded for dry heath (Table 4), including several sedges (glaucous sedge, tawny sedge, bottle sedge and green-ribbed sedge), tormentil, heath woodrush and heath milkwort.

HH3 Wet heath  (brown squares on white background).

In wet heat peat depth ranges from 15 – 50 cm. Low shrubs covers at least 25% of the habitat area. Wet heath is usually dominated by ling heather (*Calluna vulgaris*) and or cross-leaved heath and sometimes by purple moor grass. Heath rush (*Juncus squarrosus*) is usually only found on wet heath and not on dry heath, similarly it is rare to find orchids on dry heath.

Wet heath appears taller than dry heath when it is part of a mosaic and when viewed in the field it varies in colour from a very pale pink with a greenish/yellow appearance to a tawny light brown colour. On aerial photographs it tends to be paler than dry heath (see note on dry heath above) with a hints of yellow/green/orange/brown. Wet heath was found in nine townlands including Bockagh, Briscula and Inchanisky where the amounts were small. In all just 550 ha of wet heath habitat was recorded (Tables 5 and 6). The largest area of wet heath was in Ballyfin Upper taking up about two thirds of the townland (Figure X, Grid squares N3400, N3401, N3501, N3502, N3600, N3601 and N362).

All of the HH3 in Ballyfin Upper was in an SAC while none of the other wet heath habitats were. Other townlands with HH3 included Derrycon and Sconce Upper. The Derrycon wet heath is contiguous with that of Ballyfin Upper but is not part of the SAC. All of the wet heath habitats are within SPAs with the exception of a site in Briscula (Grid square S3598).

Figure 11. Wet heath (HH3) habitat in Ballyfin Upper with Dry Heath in foreground (Grid square N3502, target note 6). The view looks south towards the summit of Conlawn Hill.

Fifty species were recorded from wet heath including Sphagnum papillosum, bilberry, cranberry (Table 4, Figure 3), tufted hair grass, crowberry and tormentil. At least 5 different sedges were found in wet heath including glaucous sedge, bottle sedge and common sedge. Heath spotted orchid (*Dactylorhiza maculata*) was also recorded (Derrycon Grid square N3000 N4).

PB2 Upland Blanket Bog  **(parallel vertical violet lines on white background).**

The average depth of peat in upland blanket bog habitats is between 1 and 2 m, but it can range from 50 cm - 2 m or more. As a rule upland blanket bog is found above 150 m on level ground or where the ground is gently sloping. The vegetation is dominated by ling heather, deer grass and can include purple moor grass. Sphagnum mosses such as *Sphagnum caprifolium* and *S. papillosum* can be abundant in particular if the bog is not damaged or degraded.

The deer grass and the ling when viewed from the ground and from aerial photographs give the bog an even dull olive green – to a yellow- brown colour which can continue over considerable distances. This swath of colour is broken from time to time by patches of pure or dominant areas of ling which are pink-purple in colour.

Figure 12. Typical Upland Blanket Bog (PB2) habitat on Wolftrap Mountain, Baunreagh within the Nature Reserve (Grid square N 2704 target note 1), with ling, deergrass and Sitka spruce.

The majority of upland blanket bog is found in the upper parts of the Slieve Bloom Mountains in Gorteenameale, Baunreagh, Bordowin, Bockagh and Monicknew and most of it (> 85%) is within the Slieve Bloom SAC and Nature Reserve. Those areas that are not within the SAC tend to be small and isolated within conifer platations. Smaller unconnected areas of upland blanket bog were also found in Derrycon, Mountainfarm, Drim and Glennaglass, all of them are surrounded by conifer forest and none of them in the SAC. Both harestail cotton-grass and common cotton-grass were included in the 24 species recorded for upland blanket bog (Table 4). Bilberry, cranberry, crow berry and bog rosemary were all found. White beaked sedge was found in Gorteenameale (Grid square N2602 note 1) with cranberry (Figure 3) and crowberry. Bog rosemary and crowberry were found in Baunreagh (Grid square N2704 note 1) along with Cladonia lichens and bog asphodel.

3.2.5 Woodland and scrub habitats

WN1 Oak-birch-holly woodland (green horizontal parallel lines).

Oak-birch-holly woodland was found in seventeen townlands and had the highest cover of land of all the semi-natural woodland (67.41 ha, Tables 5 and 6). The majority of sites were associated with rivers. However, this habitat category does not occur on waterlogged soils but soils may be damp or dry. The pH of these soils is usually acidic to base poor. Under most conditions sessile oak or a mix of sessile and pedunculate oak are the dominant species. In many of the oak-birch-holly woodland in the study area oak was rare. It occurred in small quantities in Deerpark (Grid square N3803 note 1), in Gorteenameale (Grid square N2700 note 3), and in Derrycon (Grid square N3300 note 1). . Common cow wheat was also found in the Gorteenameale wood which had a total of 38 species. The total number of species recorded for this habitat category came to 68 (Table 4).

Figure 13 Oak-birch-holly woodland (WN1) growing on both sides of the Gorteen River in Gorteenameale (Grid square N2700, Target note 1)

The woodland in Derrycon has developed along the Mountrath River, in a ravine near a waterfall. It contains a small patch of Oak woodland (shown on 1st ed OS Map, which is a part of the original Derrycon Woodland. There was very little woodland elsewhere in the study area that contained any mature Oak. Mature Beech was also present in the canopy. The ground flora was dominated by great woodrush, bilberry and mosses. In the other oak-birch-holly woodlands that were surveyed downy birch dominated, other species included rowan, willow and holly. The shrub layers tended to be of gorse and or brambles and great wood rush was a common component in many of the woodlands.

In Ballyfin Upper (Grid square N3601) in the upper reaches of the Owennahallia river on Conlawn Hill hazel was found in the wood. It is rare to find hazel on acid woodland. It was surrounded by gorse scrub. Devils bit was found in woodland next to the Delour River in Inchanisky and Moher East (Grid squares N2900, S2999 note 1). This wood was also dominated by downy birch with grey willow and rowan, gorse in the shrub layer.

WN6 Wet willow-alder-ash woodland (green diamonds on a white background).

Wet willow-alder-ash woodland occurs on soils that are permanently waterlogged. This can make them difficult to survey in particular if the substrate is deep. In Drimhill or Quarryfarm (Grid square S2999 note 3) the woodland was so wet and deep it was dangerous and surveying was carried out from adjacent ground. Meadowsweet, water mint, fool's watercress and opposite golden-leaved saxifrage were present.

Wet willow-alder-ash woodland was found in nine locations and all were associated with rivers. The most significant area of woodland is along the Gorteen and Delour Rivers both of which are within Coillte Biodiversity Areas.

Species diversity in wet willow-alder-ash woodland was quite good and contained 26 more species than oak-birch-holly woodland (Table 4), even though oak-birch-holly woodland covered the greater area of land (Tables 5 and 6).

This area is associated with other semi-natural habitats including oak-birch-holly woodland, scrub, wet grassland, flushed areas with springs. In some sections there was abundant cover by giant horsetail whilst in other areas remote sedge dominated the ground flora.

Figure 14. Wet willow-alder-ash woodland (WN6) at the base of small hill in Glennaglass. WN2 (oak-ash-hazel woodland) growing on top. (Grid square S2998, Target note 6).

Wet willow-alder-ash woodland has also developed along parts of the Owenass River in Ballyfin Upper (Grid square N3703 note 1), this is also part of a Coillte Biodiversity Area. It developed in hollow where drainage was poor. It is dominated by grey willow. Other species present in the canopy include birch, hazel and rowan. The ground cover is dominated by opposite-leaved golden saxifrage, floating sweet grass, creeping bent, mint, bramble, angelica and horsetails. There are some stagnant pools with open water within the woodland.

WD1 (Mixed) broadleaved woodland (bright green horizontal parallel lines, white background).

(Mixed) broadleaved woodland is usually a highly modified woodland type. It was the commonest type of broadleaved woodland in the study area (83.49 ha).
There are some good examples of this woodland type within the study area, for example in Ballyfin Demesne (Grid square N3800 note 2, Figure X) where there is a mixed broadleaved woodland of very old trees that are dominated by beech. The woodland is open and the shrub layer is mainly holly. Some very fine specimens of trees were found in this woodland which encompasses three sides of the lake, including an enormous old horse chestnut at the southern end of the wood. It had some large holes in it and is probably provides an important roost for bats.

Figure15. (Mixed) broadleaved woodland (WD1) in Ballyfin Demesne (Grid square N3800, Target note 2).

The age of this wood and the low management allowed several native tree and shrub species to colonise it including ash and hawthorn. However rhododendron and laurel are both found in this woodland and need to be monitored and or removed. In all 49 species were recorded the majority of which were found on the woodland floor (Table 4). Among these were the chanterelle (*Cantharellus cibarius*) and amethyst deceiver mushrooms. Several species typical of woodland and shaded areas were in the wood such as herb bennet, herb robert, bluebells, wood sorrel, wood sanicle and primroses.
(Mixed) broadleaved woodland was also found adjacent to the Delour River in Drimhill or Quarryfarm (Grid square S2998 and S2999 WD1 note 2). However this is a young wood planted 1987 with red oak and beech in drier areas, deer graze in it and the understory is quite grassy and fairly open.

3.2.6 Cultivated and built land habitats

Earth banks (BL2)  (a single grey horizontal line with vertical parallel lines through it).

A total of 71 species were found in 29.46 km of earth bank habitats (Table 4). In contrast to other areas surveyed, few of the earth banks in the study area were adjacent to drainage ditches. Sometimes they are faced in field stone. A species rich stone breasted earth bank formed the townland boundary along a small lane dividing Cloneyhurke from Ballyfin (Grid square N3704 note 1) contained 53 species. In all a total of 71 species were found (Table 4).

One of the criteria for differentiating earth banks from hedgerows is that woody species may be present but should not dominate. There were at least nine woody species associated with the bank including bilberry, gorse, hazel, elder and honeysuckle (Figure 15).

Figure 16. Earth banks (BL2) forming part of the townland between Ballyfin and Cloneyhurke (Grid square N3704 N1). The saxifrage St. Patrick's cabbage can be seen at the bottom of the photograph.

Grasses accounted for a further eight species and included false oat grass, tall fescue, cocksfoot, and sweet vernal grass.

The saxifrage St. Patrick's cabbage was also found growing on the bank in association with ferns, hazel, and bramble and Yorkshire fog. Most of the earth banks were located on the eastern side of the survey area and nearly all were associated with improved agricultural grassland or semi-natural grassland.

3.3 Local Biodiversity Areas

Six sites were identified as Local Biodiversity Areas. These were centred on the following areas:

- Delour River Valley
- Deerpark estate
- Conlawn hill (south and east)
- Ballyfin Demesne
- Owennahallia River Valley
- Owenass and Murglash River Valleys

Detailed accounts of these sites are in Appendix 11. They comprise significant areas of countryside which contain important and typical habitats associated with the Slieve Blooms. While most of the land which is important for biodiversity is already within designated areas the additional areas identified by this study, outside designated areas, have potential to be designated as Local Biodiversity Areas.

4. Conclusions

4.1 Introduction

The results provide a review of biodiversity and a list of important sites outside designated areas in this part of the Slieve Blooms. The nature of biodiversity can be compared with other areas around the Slieve Blooms, other parts of the county or similar landscapes in other counties where similar mapping exercises have occurred. A comprehensive account of biodiversity must await a comprehensive habitat map of the entire Slieve Blooms area and county.

It is not surprising that there is a relatively high level of cover of semi-natural habitats in this area and that most are contained within designated areas. Of equal significance is the presence of other areas of biodiversity importance, outside designated areas which have the potential to be identified as Local Biodiversity Areas. Many of these are linked to river valleys. These areas are principally in in multiple private ownership and are managed as farmland.

In the short term the priority is to highlight the results of the mapping project to interested stakeholders particularly NPWS, foresters and farmers who manage land of high biodiversity value. Agri environmental schemes which target habitats, operated by NPWS or being proposed to replace REPS 4 should be informed by the results of such detailed habitat mapping. The management of Coillte Biodiversity Areas would benefit from the results of habitat mapping. Physical planning should be informed by the location of rarer habitats and potential LBAs.

The initiatives suggested here should be used as a basis for discussion. While some could be initiated directly by the Heritage Forum, their active promotion by other organizations even independently of the Heritage Forum should be pursued.

4.2. Information and awareness raising

Target audience: the public/landowners/householders

In the short term organise a demonstration of the digital and hard copy habitat map to landowners who allowed their land to be surveyed. A limited demonstration could be provided at the annual Heritage Seminar or a suitable location in the Slieve Blooms. A public information campaign, initiated and promoted by the Heritage Forum could include some or all of the following:

- Production of a leaflet highlighting high cover of semi-natural habitats, listing areas surveyed, and stating where maps can be viewed.
- Promotion of the principal results in local newspaper.
- A display of hardcopy maps in relevant local library in a temporary exhibition.
- Put map and report on council web site.
- Use the results of this and other relevant studies to start the process of setting up a local Biological Records Centre. This could be web based or developed through the library service (by setting up a section on local biodiversity in the Local Studies Section of the Library).
- The habitat map and account of biodiversity should be publicised to relevant Tidy Towns groups, eco tourism operators, groups entering the Golden Mile project and other community/development organisations operating within or adjacent to survey areas.

Target audience: schoolchildren

- Brief locally based specialists who go into schools as part of the Heritage Council/INTO 'Heritage in Schools Scheme' to encourage them to incorporate the results in their educational programmes in local schools.
- Liaise with geography teachers (through the Laois Education Centre) to use the habitat map as a teaching tool to explore local habitats.

Target audience: advanced students/specialists/advisors/Local Authority staff e.g. planners

- Expand habitat mapping exercise to other parts of the mountains and county.
- Engage in consultations with potential users on ways of using the habitat map and associated information as an aid to strategic planning and land management. Potential users include landowners interested in participating in agri environmental schemes, Coillte, NPWS, planners in the local authority. This may involve manipulation of the data base or further interpretation.
- Provide a presentation to REPS planners, organised in conjunction with Teagasc to inform them of its value to their REPS advisory service.
- Ensure results of habitat mapping are fully integrated with councils own GIS.
- Promote additional survey work (for fauna, breeding birds) in townlands examined. There is potential for research on ecological corridors linking habitat areas of importance inside and outside designated areas. As digital data sets are used increasingly by researchers to locate survey sites there will be greater interest in the Laois data set.
- Ensure that surveyors observe similar protocols when contacting landowners and all results are provided in an appropriate form for local usage.
- Promote research to utilise and add value to habitats database i.e. integrate with FIPS/EPA soils/subsoils data base, local geology (from GSI) and 1st edition OS mapping.
- Continue to liaise with environmental NGOs and all interested members of the public to exchange information on biodiversity.

4.3 Managing change

Suggested initiatives include:

- Support Teagasc to provide a targeted advisory service for landowners who have good examples of semi-natural habitats. A future agri environmental scheme is likely to focus on habitats, not farms.
- Develop a list of good examples of semi--natural habitats in the county, starting with woodlands, after informing owners individually of the proposal to develop such a list.
- Organise for the removal of invasive species such as Japanese knotweed and Gunnera starting with one site in 2010.
- Expand habitat mapping to areas which are the subject of strategic plans (Local Plans, Development Plans etc) and use the results to inform an SEA (Strategic Environmental Assessment) of the draft plans which are produced.
- Encourage the Council's Roads Department to cease the practise of spraying grass verges and banks and consider trimming, which is equally effective and less harmful to biodiversity.

4.4 Partnership with the statutory authorities
Suggested initiatives include:

- Encouragement to NPWS to provide habitat mapping to Level 3 for the lands which have been designated by NPWS, thus expanding the coverage of habitat mapping in the mountains and county.
- Review of Coillte Biodiversity Areas to incorporate the results of this survey.
- Promotion of riparian management with the Fisheries Board in the context of the Water Framework Directive
- A policy statement on biodiversity and habitat biodiversity in the County Development Plan which recognises the current low level of cover of semi-natural habitats in the county, the abundance of biodiversity in the Slieve Blooms and states an objective to support sustainable development in the region which recognises its biodiversity importance.

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Appendix 1. Habitats listed in the Habitats Directive

Priority type habitats are in bold. Reference numbers refer to numbering system in EU (2003)

Types of freshwater habitats
Natural dystrophic lakes and ponds (3160)
Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) (3160)
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoteo-Nanojuncetea (3130)
Hard oligo-mesotrophic waters with benthic vegetation of Chara sp. (3140)
Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation (3150)
Turloughs (3180)
Watercourses of plain to montane levels with the Ranunculion-fluitanitis and Callitochio-Batrachion vegetation (3260)
Rivers with muddy banks with Chenopodium rubri p.p. and Bidention p.p. vegetation (3270)
Petrifying springs with tufa formation (Cratoneurion) (7220)
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430)

Habitats associated with grasslands and marsh
Semi-natural dry grassland and scrubland facies on calcareous substrates (Festuco-Brometea) (*important orchid sites) (6210)
Juniperus communis formations on heaths or calcareous grasslands (5130)
Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) (6510)
Species rich Nardus grasslands on siliceous substrates in mountain areas (and submountain areas in continental Europe) (6230)
Calaminarian grasslands of the Violetaria calaminariae (6130)
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleaea)
(6410)
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430)

Habitats in areas dominated by heathers
European dry heaths (4030)
Juniperus communis formations on heaths or calcareous grasslands (5130)
Northern Atlantic wet heaths with Erica tetralix (4010)
Alpine and boreal heaths (4060)

Habitats associated with peatlands (or boglands)
Active raised bogs (7110)
Degraded raised bogs still capable of natural regeneration (7120)
Blanket bog (*if active bog) (7130)
Depressions on peat substrates of the Rhynchosporion (7150)
Calcareous fens with Cladium mariscus and species of the Caricion davallianae (7120)
Alkaline fens (7230)
Transition mires and quaking bogs (7140)

Woodland type habitats
Old sessile woods with Ilex and Blechnum in the British Isles (91AO)
Taxus baccata woods in the British Isles (91JO)
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-padion, Alnion incarae, Salicion albae) (91EO)
Bog woodland (91DO)

Habitats associated with exposed rock

Siliceous rocky slopes with chasmophytic vegetation (8220)
Calcareous rocky slopes with chasmophytic vegetation (821))
Limestone pavements (8240)
Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Caleopsietalia ladani) (8110)
Calcareous and calcshist screes of the montane to Alpine levels (Thlaspietea rotundifolii (8120)
Caves not open to the public (8310)

Appendix 2. Evaluation of Local Biodiversity Areas (NRA 2004)

Rating
Internationally important

- Sites designated (or qualifying for designation) as SAC* or SPA* under the EU Habitats or Birds Directives.
- Undesignated sites containing good examples of Annex I priority habitats under the EU Habitats Directive.
- Major salmon river fisheries.
- Major salmonid (salmon, trout or char) lake fisheries.

Nationally important

- Sites or waters designated or proposed as an NHA* or statutory Nature Reserves.
- Undesignated sites containing good examples of Annex I habitats (under EU Habitats Directive).
- Undesignated sites containing significant numbers of resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive or species protected under the Wildlife (Amendment) Act 2000.
- Major trout river fisheries.
- Water bodies with major amenity fishery value.
- Commercially important coarse fisheries.

High value, locally important

- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or significant populations of locally rare species.
- Small water bodies with known salmonid populations or with good potential salmonid habitat.
- Sites containing any resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive.
- Large water bodies with some coarse fisheries value.

Moderate value, locally important

- Sites containing some semi-natural habitat or locally important for wildlife.
- Small water bodies with some coarse fisheries value or some potential salmonid habitat.
- Any water body with unpolluted water (Q-value rating 4-5).

Low value, locally important

- Artificial or highly modified habitats with low species diversity and low wildlife value.
- Water bodies with no current fisheries value and no significant potential fisheries value.

Appendix 3. Guidelines for identifying Local Biodiversity Areas in Laois

1 Background

The objective is to produce accounts of sites which are not already recognised under a national /international biodiversity designation. Identifying such sites will maximise the benefit of having experienced ecologists doing habitat mapping.

LBAs will be linked to the habitat map and summaries will be put into the main report.

The account will be non-technical, but incorporate the species lists. It will help the non specialist particularly owner, local authority planner/Teagasc advisor to identify the site, explain why it is of local biodiversity interest and provide some guidelines regarding its management.

2 What is a site of local biodiversity interest?

It is worth listing if, in the context of Co. Laois, it is a good example of a rare semi-natural habitat or it is linked functionally or spatially to a designated site. These are semi-subjective criteria. When habitat mapping is complete we will be able to support these assessments with a measurement of rarity as it will be possible to calculate 1) the total area covered by each habitat and therefore habitat rarity and 2) number of sites of particular habitats. For the purpose of this study it will be possible to make a good professional judgement. Given our field experience in Laois we can be confident that at a later stage, when more objective criteria will be applied or there is more information about these sites, our judgement will be vindicated.

3 Information to be contained in the account of each LBA

An account will be prepared following the headings below. The account should not exceed two pages.

3.1 Summary

To include townland name (s), name of nearest settlement, number on vector map (over the site). **GPS (centre**). Provide ecological account similar to NPWS site synopsis heavily emphasising plant species. One paragraph.

3.2 Evaluation

Criteria to consider: How important is it? How rare it is, is it a good or bad example of its type, is it linked to another type of site.
Is it rare internationally, rare nationally, rare locally?
Nationally rare sites should be of NHA quality, international if SAC quality. Is the site linked to a designated site (NHAs or SACs). These links can be inferred if the sites share habitats, species or there are obvious commuting corridors (terrestrial or aquatic) between them). Linkages will make a site which appears to be of local interest, more important. Such a locally important site should be rated as “nationally important” due to its linkage to such a site.

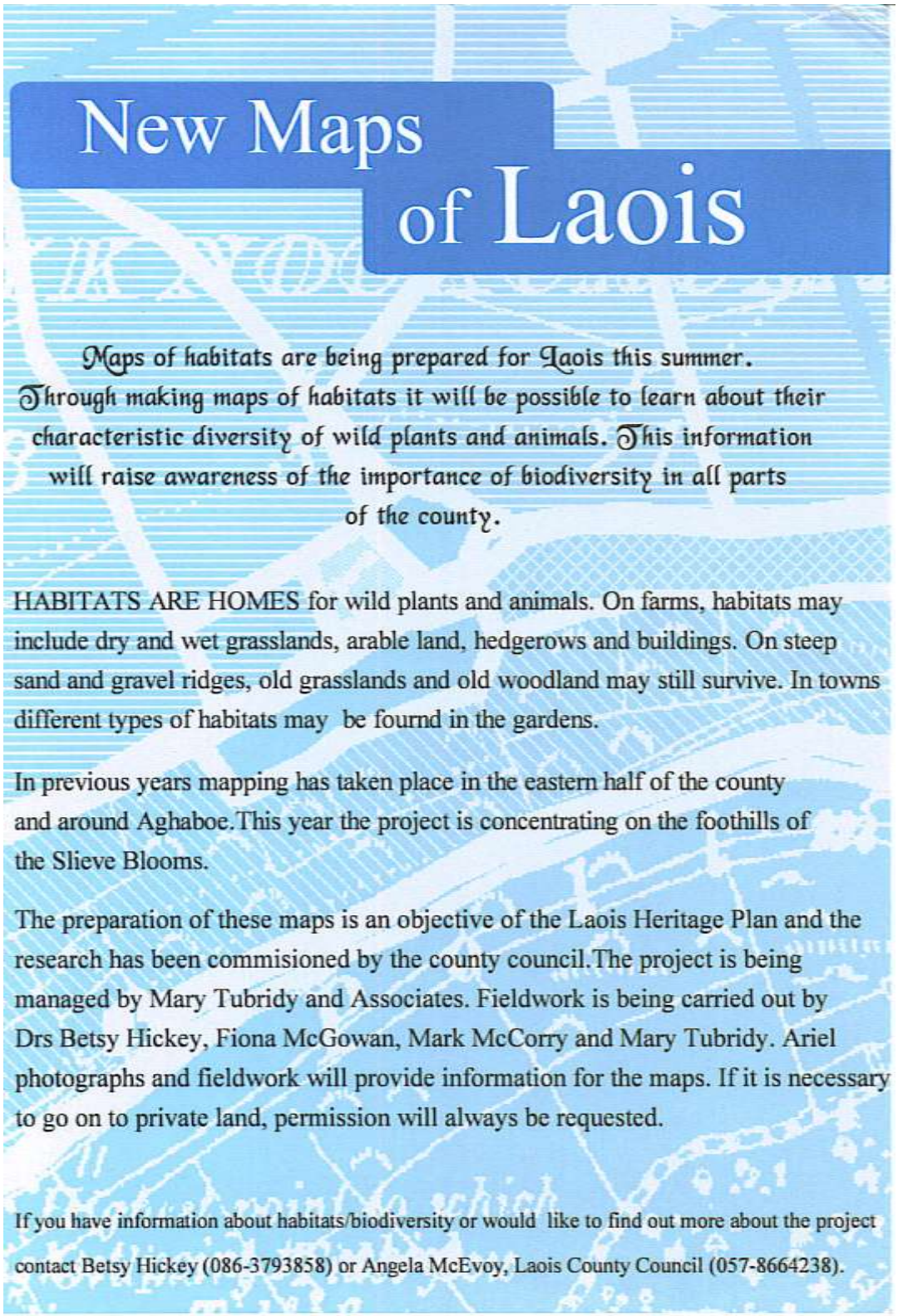
Vulnerability

Consider the nature of impacts which could cause the site to disappear or deteriorate. Look at local land use and try to understand what land managers are doing at other sites. If it looks like it might still be there in five/ten years say so! Use your common sense!

Preferred management
Consider what needs to be done to the site to enhance its biodiversity value. Or maybe it's doing OK without intervention. Direct guidelines at owner, regulatory authority, or anyone who might have a role. Be practical.

Don't say put a fence around it and leave it alone!

Appendix 4. Information leaflet



New Maps of Laois

Maps of habitats are being prepared for Laois this summer. Through making maps of habitats it will be possible to learn about their characteristic diversity of wild plants and animals. This information will raise awareness of the importance of biodiversity in all parts of the county.

HABITATS ARE HOMES for wild plants and animals. On farms, habitats may include dry and wet grasslands, arable land, hedgerows and buildings. On steep sand and gravel ridges, old grasslands and old woodland may still survive. In towns different types of habitats may be fournd in the gardens.

In previous years mapping has taken place in the eastern half of the county and around Aghaboe. This year the project is concentrating on the foothills of the Slieve Blooms.

The preparation of these maps is an objective of the Laois Heritage Plan and the research has been commisioned by the county council. The project is being managed by Mary Tubridy and Associates. Fieldwork is being carried out by Drs Betsy Hickey, Fiona McGowan, Mark McCorry and Mary Tubridy. Ariel photographs and fieldwork will provide information for the maps. If it is necessary to go on to private land, permission will always be requested.

If you have information about habitats/biodiversity or would like to find out more about the project contact Betsy Hickey (086-3793858) or Angela McEvoy, Laois County Council (057-8664238).

Appendix 5. List of Landowners

Many thanks to the landowners listed below and sincere apologies and thanks to those we unwittingly omitted all of who gave freely of their time and knowledge while the survey was being carried out.

Names of landowners			
Philip Bennet	Patrick Thompson	Patsy Higgins	Matty Egan
James and Joan Bennet	Catherine Margaret Delaney	Sean Quinn	Martin Kelly
Sean Kennedy	P.J. Delaney	Harry Dunne	Cathleen Dunne
Peter Dobban	Dieter Taeler	Helen O'Rourke	Rebecca Thompson
Dermot O'Neill	Chris Phelan	Ger Cuddy	Billy Young
Sheila Farrelly	John Joe Conroy	Tim and Martha Chambers	Seamus Fitzpatrick
Tonge	Larry and Catherine Phelan	Stephen Cahill	Arthur McDonald
Mr. Alexanders	Catherine Donnelly	Mick Delaney	McLoughlins
Mick Scully and his daughter	Jim Reynolds	Austin Flynn	Seamus Bennet
Mick Phelan	Nancy Coogan	René Mayer	Gerry Dunne
Brid Conroy	Dan Donovan	Sheila Bennet	Seamus Dunne
Sam Dunne	Norman Graham	Pat and Joe Gorman	Trevor Shaw
Tom Hyland	Elaine Gorman		

Appendix 6. Checklist of plant species

Checklist of all species recorded during 2009. Species are listed alphabetically by Latin name followed by their English name.

Scientific name	English name
Abies alba	Fir
Acer platanoides	Norway maple
Acer pseudoplatanus	Sycamore
Achillea millefolium	Yarrow
Aesculus hippocastanum	Horse chestnut
Agrostis canina	Velvet bent grass
Agrostis capillaris	Common bent
Agrostis sp.	Bent grass
Agrostis stolonifera	Creeping bent grass
Ajuga reptans	Bugle
Alchemilla filicaulis	Southern Lady's mantle
Alchemilla xanthochlora	Pale lady's mantle
Alisma plantago-aquatica	Common water-plantain
Alnus glutinosa	Alder
Alopecurus geniculatus	Marsh foxtail
Alopecurus pratensis	Meadow foxtail
Amanita sp.	Mushroom
Anagallis tenella	Bog pimpernel
Andromeda polifolia	Bog rosemary
Anemone nemorosa	Wood anemone
Angelica sylvestris	Wild angelica
Anthoxanthum odoratum	Sweet vernal grass
Arctium sp.	Burdock
Arrhenatherum elatius	False oat grass
Arum maculatum	Arum lily
Asplenium ruta-muraria	Wall-rue
Asplenium trichomanes	Maidenhair spleenwort
Athyrium filix-femina	Lady fern
Bellis perennis	Daisy
Berberis darwinii	Barberry
Betula pubescens	Downy birch
Blechnum spicant	Hard fern
Brachypodium sylvaticum	False brome
Briza media	Quaking grass
Bromus sp.	Brome
Callitriche sp.	Water starwort
Calluna vulgaris	Ling heather
Caltha palustre	Marsh marigold
Camellia japonica	Camellia
Canna sp.	Canna lily
Cantharellus cibarius	Chanterelle mushroom
Cardamine flexuosa	Wavy bittercress
Cardamine pratensis	Lady's smock
Carex aquatilis	Lesser pond sedge
Carex binervis	Green-ribbed sedge
Carex demissa	Yellow sedge

Scientific name	English name
Carex diandra	Grey sedge
Carex disticha	Brown sedge
Carex echinata	Star sedge
Carex flacca	Glaucous sedge
Carex hirta	Hairy sedge
Carex hostiana	Tawny sedge
Carex laevigata	Smooth-stalked sedge
Carex limosa	Bog sedge
Carex nigra	Common sedge
Carex ovalis	Oval sedge
Carex panicea	Carnation sedge
Carex paniculata	Greater tussock sedge
Carex pendula	Pendulous sedge
Carex pulicaris	Flea sedge
Carex remota	Remote sedge
Carex riparia	Greater pond sedge
Carex rostrata	Bottle sedge
Carex sp.	Sedge
Carex sylvatica	Wood sedge
Carex vesicaria	Bladder sedge
Castanea sativa	Spanish chestnut
Centaurea nigra	Black knapweed
Cerastium fontanum	Mouse ear chickweed
Chrysanthemum sp.	Common centaury
Chrysosplenium oppositifolium	Opposite-leaved golden saxifrage
Circaea lutetiana	Enchanter's nightshade
Cirsium arvense	Creeping thistle
Cirsium dissectum	Meadow thistle
Cirsium palustre	Marsh thistle
Cirsium vulgare	Spear thistle
Cladonia portentosa	Lichen
Conopodium majus	Pignut
Corylus avellana	Hazel
Crataegus monogyna	Hawthorn
Crepis paludosa	Marsh hawksbeard
Crosocmia x crocosmiiflora var.	Montbretia
Cynosuros cristatus	Crested dog's-tail
Cytisus scoparius	Broom
Dactylis glomerata	Cock's-foot
Dactylorhiza maculata	Heath spotted orchid
Dactylorhiza sp.	Orchid
Danthonia decumbens	Heath grass
Deschampsia caespitosa	Tufted hair-grass
Deschampsia flexuosa	Wavy hair grass
Digitalis purpurea	Foxglove
Diplophym	Liverwort
Drosera rotundifolia	Round-leaved sundew
Dryopteris affinis	Scaly male fern
Dryopteris carthusiana	Narrow buckler fern
Dryopteris dilatata	Broad buckler fern
Dryopteris filix-mas	Male fern
Elatine hydropiper	Eight-stamened waterwort

Scientific name	English name
Eleocharis palustris	Common spike-rush
Elymus repens	Couch grass
Empetrum nigrum	Crowberry
Epilobium angustifolium	Rosebay willow herb
Epilobium hirsutum	Great willowherb
Epilobium montanum	Broad-leaved willowherb
Epilobium palustre	Marsh willowherb
Epilobium parviflorum	Hoary willowherb
Epilobium sp.	Willowherb
Equisetum arvense	Field horsetail
Equisetum fluviatile	Water horsetail
Equisetum hymale	Rough horsetail
Equisetum palustre	Marsh horsetail
Equisetum sp.	Horsetail
Equisetum sylvaticum	Wood horsetail
Equisetum telemateia	Great Horsetail
Erica tetralix	Cross-leaved heath
Eriophorum angustifolium	Common cotton-sedge
Eriophorum vaginatum	Hare's-tail cotton-sedge
Euphrasia officinalis agg.	Eyebright
Fagus sylvatica	Beech
Festuca arundinacea	Tall fescue
Festuca ovina	Sheep's fescue
Festuca pratensis	Meadow fescue
Festuca rubra	Red fescue
Festuca sp.	Fescue
Festuca vivipara	Viviparous fescue
Filipendula ulmaria	Meadowsweet
Fissidens sp.	Moss
Fragaria vesca	Wild strawberry
Fraxinus excelsior	Ash
Fraxinus excelsior pendula	Weeping ash
Galeopsis tetrahit	Common hemp nettle
Galium aparine	Cleavers
Galium odoratum	Woodruff
Galium palustre	Marsh bedstraw
Galium saxatile	Heath bedstraw
Galium sp.	Bedstraw
Gaultheria mucronata	Pernettya
Geranium robertianum	Herb robert
Geranium sp.	Geranium
Geum urbanum	Herb bennet
Glechoma hederacea	Ground ivy
Glyceria fluitans	Floating sweet-grass
Glyceria maxima	Reed sweet-grass
Glyceria sp.	Sweet-grass
Grisilina littoralis	Grisilina
Gunnera tintoria	Giant rhubarb
Hedera helix	Ivy
Helianthemum nummularium	Rock rose
Heracleum sphondylium	Hogweed
Hieracium sp.	Hawkweed

Scientific name	English name
Holcus lanatus	Yorkshire fog
Holcus mollis	Creeping soft-grass
Hyacinthoides non-scriptus	Bluebell
Hydrocotyle vulgaris	Marsh pennywort
Hypericum androsaenum	Tutsan
Hypericum pulchrum	Slender St. John's-wort
Hypericum tetrapterum	Square-stalked St. John's-wort
Hypochaeris radicata	Car's-ear
Ilex aquifolium	Holly
Iris pseudacorus	Flag iris
Juncus acutiflorus	Sharp-flowered rush
Juncus articulatus	Jointed rush
Juncus bufonius	Toad rush
Juncus conglomeratus	Compact rush
Juncus effusus	Soft rush
Juncus squarrosus	Heath rush
Laburnum x vosii	Laburnum
Laccaria amethystina	Amethyst deciever
Lapsana communis	Nipplewort
Larix decidua	European larch
Lathyrus montanus	Bitter-vetch
Lathyrus pratense	Meadow vetchling
Lemna sp.	Duckweed
Leontodon autumnalis	Autumn hawkbit
Leontodon sp.	Hawkbit
Leucanthemum vulgare	Ox-eye daisy
Ligustrum ovalifolium	Privet
Ligustrum vulgare	Common privet
Lolium perenne	Perennial ryegrass
Lonicera nitidia	Wilson's honeysuckle
Lonicera periclymenum	Honeysuckle
Lotus corniculatus	Bird's-foot-trefoil
Lotus uliginosus	Greater bird's-foot trefoil
Luzula campestris	Field woodrush
Luzula multiflora	Heath woodrush
Luzula sylvatica	Wood rush
Lychnis coronaria	Rose campion
Lychnis flos-cuculi	Ragged robin
Lycopus europaeus	Gipsywort
Lysimachia nemorum	Yellow pimpernel
Matricaria discoidea	Pineapple weed
Medicago lupulina	Black medick
Melampyrum arvense	Common cow wheat
Mentha aquatica	Water mint
Mentha sp.	Mint
Menyanthes trifoliata	Bogbean
Molinia caerulea	Purple moor-grass
Myosotis secunda	Creeping forget-me-not
Myrica gale	Bog myrtle
Myriophyllum sp.	Water milfoil
Nardus stricta	Mat grass
Narthecium ossifragum	Bog asphodel

Scientific name	English name
Nymphaea alba	White water-lily
Nymphaea sp.	Water-lily
Osmunda regalis	Royal fern
Oudemansiella mucida	Porcelain fungus
Oxalis acetosella	Wood sorrel
Pedicularis sylvatica	Lousewort
Phalaris arundinacea	Reed canary-grass
Phleum pratense	Timothy
Phyllitis scolopendrium	Hart's-tongue fern
Phyllostachys sp.	Bamboo
Picea abies	Norway spruce
Picea sitchensis	Sitka spruce
Pinus sp.	Pine
Pinus sylvestris	Scot's pine
Plantago lanceolata	Narrow leaved plantain
Plantago major	Broad leaved plantain
Platanthera bifolia	Lesser butterfly orchid
Poa annua	Annual meadow-grass
Poa sp.	Meadow-grass
Poa trivialis	Rough meadow-grass
Polygala serpyllifolia	Heath milkwort
Polygala vulgaris	Common milkwort
Polygonum amphibium	Amphibious bistwort
Polygonum persicaria	Redshank
Polygonum sp. possibly hydropiper	Water-pepper
Polypodium vulgare	Common polypody fern
Polystichum setiferum	Soft shield fern
Polytrichum commune	Moss
Potamogeton sp.	Pondweed
Potentilla anserina	Silverweed
Potentilla erecta	Tormentil
Potentilla palustris	Marsh cinquefoil
Potentilla reptans	Creeping cinquefoil
Potentilla sterilis	Barren strawberry
Primula vulgaris	Primrose
Prunella vulgaris	Self heal
Prunus avium	Wild cherry
Prunus laurocerasus	English laurel
Prunus pissardia nigra	Purple plum
Prunus spinosa	Blackthorn
Pteridium aquilinum	Bracken
Quercus robor	Pedunculate oak
Ranunculus acris	Meadow buttercup
Ranunculus flammula	Lesser spearwort
Ranunculus repens	Creeping buttercup
Reynoutryia japonica	Japanese knotweed
Rhinanthus minor	Yellow rattle
Rhododendron ponticum	Rhodendron
Rhynchospora alba	White-beaked sedge
Rosa arvensis	Field rose
Rosa canina	Dog rose
Rosa sp.	Wild rose

Scientific name	English name
Rubus fruticosus agg.	Bramble
Rubus idaeus	Raspberry
Rumex acetosa	Common sorrel
Rumex acetosella	Sheep's sorrel
Rumex crispus	Curled dock
Rumex obtusifolius	Broad leaved dock
Rumex sanguineus	Wood dock
Russula sp.	Russule fungus
Sagina sp.	Pearlwort
Salix aurita	Eared willow
Salix caprea	Goat willow
Salix cinerea	Grey willow
Salix sp.	Willow
Sambucus nigra	Elder
Sanicula europaea	Wood sanicle
Saxifraga spathularis	St. Patrick's cabbage
Schoenplectus lacustris	Club-rush
Scrophularia nodosa	Common figwort
Senecio aquaticus	Marsh ragwort
Senecio jacobaea	Common ragwort
Senecio vulgaris	Groundsel
Silene dioica	Red campion
Solidago virgaurea	Goldenrod
Sonchus oleraceus	Smooth sow-thistle
Sorbus aucuparia	Mountain ash
Sorbus hibernica	Irish whitebeam
Sparganium erectum	Branched bur-reed
Sphagnum caprifolium	Sphagnum moss
Sphagnum papillosum	Sphagnum moss
Sphagnum sp.	Sphagnum moss
Stachys palustre	Marsh woundwort
Stachys sylvatica	Hedge woundwort
Stellaria graminea	Lesser stitchwort
Stellaria holostea	Greater stitchwort
Stellaria palustre	Marsh stitchwort
Stellaria uliginosa	Bog stitchwort
Succisa pratensis	Devil's-bit scabious
Symophoricarpos albus	Snowberry
Syringa vulgaris	Lilac
Taraxacum officinale	Dandelion
Teucrium scorodonia	Woodsage
Thuidium tamariscinum	Moss
Thuja plicata	Western red cedar
Tilia sp.	Lime
Torilis arvensis	Upright hedge parsley
Trichcophorum caespitosum	Deer-sedge
Trifolium dubium	Lesser trefoil
Trifolium pratense	Red clover
Trifolium repens	White clover
Tussilago farfara	Colt's-foot
Typha latifolia	Common reedmace
Uex europaeus	Gorse

Scientific name	English name
Ulmus glabra	Wych elm
Urtica dioica	Stinging nettle
Vaccinium myrtillus	Bilberry
Vaccinum oxycoccus	Cranberry
Valeriana officinalis	Common valerian
Veronica beccabunga	Brooklime
Veronica chamaedrys	Germander speedwell
Veronica montana	Wood speedwell
Vicia cracca	Tufted vetch
Vicia sepium	Bush vetch
Viola palustre	Marsh violet
Viola sp.	Violet
x Cupressocyparis leylandii	Leyland cypress
x Cupressus macrocarpa	Macrocarpa

Appendix 7. Rare or occasional plant species

Scientific name	Common name
Andromeda polifolia	Bog rosemary
Lathyrus montanus	Bitter vetch
Platanthera bifolia	Lesser butterfly-orchid
Rhynchospora alba	White beaked sedge
Vaccinium oxycoccos	Cranberry
Sorbus hibernica	Irish whitebeam
Carex aquatilis	Lesser pond sedge
Elatine hydropiper	Eight-stamened waterwort
Equisetum hymale	Rough horsetail
Myrica gale	Bog myrtle
Osmunda regalis	Royal fern
Saxifraga spathularis	St. Patrick's cabbage

Appendix 8. List of species recorded by habitat

FL8 Other artificial lakes and ponds
Alisma plantago-aquatica
Angelica sylvestris
Betula pubescens
Equisetum fluviatile
Eriophorum angustifolium
Gunnera tintoria
Hydrocotyle vulgaris
Iris pseudacorus
Juncus acutiflorus
Juncus articulatus
Juncus effusus
Lemna sp.
Mentha aquatica
Myriophyllum sp.
Nymphaea alba
Phalaris arundinacea
Polygonum amphibium
Potomageton sp.
Ranunculus flammula
Salix cinerea
Schoenplectus lacustris

FW4 Drainage ditches
Agrostis stolonifera
Callitriche sp.
Calluna vulgaris
Cardamine pratensis
Eriophorum angustifolium
Galium palustre
Juncus articulatus
Juncus bufonius
Juncus effusus
Luzula multiflora
Molinia caerulea
Polytrichum communis
Potentilla erecta
Rubus fruticosus agg.
Salix aurita
Sphagnum papillosum
Trichophorum caespitosum
Typha latifolia

Ulex europaeus
Viola palustre

FP1 Calcareous springs
Diplophym
Liverworts

FS2 Tall-herb swamp
Agrostis stolonifera
Alnus glutinosa
Carex riparia
Epilobium hirsutum
Epilobium palustre
Equisetum fluviatile
Filipendula ulmaria
Galium palustris
Juncus effusus
Myosotis secunda
Phalaris arundinacea
Polygonum sp.
Ranunculus repens
Rubus fruticosus
Salix cinerea
Schoenplectus lacustris
Scrophularia nodosa
Sparganium erectum
Stachys palustre
Trifolium repens
Urtica dioica

GA1 Improved agricultural grassland
Achillea millefolium
Agrostis canina
Agrostis capillaris
Agrostis stolonifera
Alopecurus pratensis
Anthoxanthum odoratum
Centaurea nigra
Cerastium fontanum
Cirsium arvense
Cirsium dissectum
Cirsium palustre
Cirsium vulgare
Cynosurus cristatus
Dactylis glomerata
Festuca rubra
Heracleum sphondylium
Holcus lanatus
Hypochoeris radicata
Juncus acutiflorus
Juncus effusus
Lolium perenne
Medicago lupulina

Phleum pratense
Plantago lanceolata
Poa sp.
Poa trivialis
Potentilla erecta
Prunella vulgaris
Pteridium aquilinum
Ranunculus acris
Ranunculus repens
Rhinanthus minor
Rumex acetosa
Rumex acetosella
Rumex obtusifolius
Senecia jacobea
Taraxacum officinale
Trifolium dubium
Trifolium pratense
Trifolium repens

GA2 Amenity grassland (improved)

Agrostis stolonifera
Bellis perennis
Cirsium vulgare
Dactylis glomerata
Festuca rubra
Holcus lanatus
Hypochoeris radicata
Juncus effusus
Lolium perenne
Plantago lanceolata
Poa annua
Potentilla erecta
Prunella vulgaris
Prunella vulgaris
Ranunculus acris
Ranunculus repens
Rumex obtusifolius
Senecio jacobaea
Taraxacum officinalis
Trifolium pratense
Trifolium repens
Veronica chamaedrys

GS1 Dry calcareous and neutral grassland

Achillea millefolium
Agrostis capillaris
Agrostis stolonifera
Alchemilla filicaulis
Alchemilla xanthochlora
Anthoxanthum odoratum
Bellis perennis
Betula pubescens
Briza media
Calluna vulgaris
Carex diandra
Carex disticha
Carex flacca
Carex panicea
Carex sylvatica
Centaurea nigra
Cerastium fontanum
Cirsium palustre
Cirsium vulgare
Cladonia sp.
Cynosurus cristatus
Dactylis glomerata
Epilobium parviflorum
Euphrasia sp.
Festuca ovina
Festuca rubra
Heracleum sphondylium
Hieracium sp.
Holcus lanatus
Hypochoeris radicata
Juncus acutiflorus
Juncus articulatus
Juncus bufonius
Juncus effusus
Lathyrus pratensis
Leucanthemum vulgare
Lolium perenne
Lotus corniculatus
Luzula sylvatica
Pedicularis sylvatica
Phleum pratense
Picea sitchensis
Plantago lanceolata
Potentilla anserina
Potentilla erecta
Prunella vulgaris
Prunus spinosa
Pteridium aquilinum
Ranunculus acris
Ranunculus repens
Rubus fruticosus agg.
Rumex acetosa
Rumex crispus
Senecio jacobaea
Stachys sylvatica
Stellaria graminea
Stellaria holostea
Taraxacum officinale
Trifolium dubium
Trifolium pratensis
Trifolium repens
Vaccinium myrtillus
Veronica chamaedrys
Viola sp.

GS2 Dry meadows and grassy verges

Achillea millefolium
Agrostis canina
Angelica sylvestris
Anthoxanthum odoratum
Briza media
Carex binervis
Carex flacca
Carex nigra
Carex panicea
Cerastium fontanum
Cirsium arvense
Cirsium vulgare
Crataegus monogyna
Cynosuros cristatus
Dactylis glomerata
Deschampsia caespitosia
Deschampsia flexuosa
Digitalis purpurea
Epilobium angustifolium
Equisetum arvense
Euphrasia officinalis agg.
Festuca sp.
Filipendula ulmaria
Heracleum sphondylium
Holcus lanatus
Hypochaeris radicata
Juncus articulatus
Juncus effusus
Luzula multiflora
Luzula sylvatica
Molinia caerulea
Plantago lanceolata
Platanthera bifolia
Poa annua
Potentilla anserina
Ranunculus acris
Ranunculus flammula
Ranunculus repens
Salix aurita
Succisa pratensis
Trifolium pratense
Tussilago farfara
Ulex europaeus
Viola sp.

GS3 Dry-humid acid grassland

Agrostis canina
Agrostis stolonifera
Alopecurus geniculatus
Anthoxanthum odoratum
Calluna vulgaris
Carex disticha
Carex ovalis
Carex panicea
Centaurea nigra
Cerastium fontanum
Cirsium arvense
Cirsium palustre
Cirsium vulgare
Cynosurus cristatus
Dactylis glomerata
Digitalis purpurea
Festuca ovina
Festuca rubra
Galium saxatile
Holcus lanatus
Holcus mollis
Hypochaeris radicata
Juncus articulatus
Juncus effusus
Lathyrus pratense
Leucanthemum vulgare
Lolium perenne
Lotus corniculatus
Luzula multiflora
Molinia caerulea
Pedicularis sylvatica
Phleum pratense
Plantago lanceolata
Polygala serpyllifolia
Potentilla erecta
Ranunculus acris
Ranunculus repens
Rubus fruticosus agg.
Rumex acetosa
Rumex acetosella
Rumex obtusifolius
Solidago virgaurea
Succisa pratensis
Trifolium pratense
Trifolium repens
Ulex europaeus

GS4 Wet grassland

Agrostis capillaris
Agrostis stolonifera
Ajuga reptans
Alnus glutinosa
Angelica sylvestris
Anthoxanthum odoratum
Betula pubescens
Blechnum spicant
Calluna vulgaris
Cardamine pratensis
Carex binervis
Carex demissa

Carex echinata
Carex flacca
Carex hirsuta
Carex nigra
Carex ovalis
Carex panicea
Carex pulicaris
Carex vesicaria
Centaurea nigra
Cerastium fontanum
Chrysosplenium oppositifolium
Cirsium arvense
Cirsium dissectum
Cirsium palustre
Cirsium vulgare
Conopodium majus
Corylus avellana
Cynosuros cristatus
Cytisus scoparius
Dactylis glomerata
Dactylorhiza maculata
Dactylorhiza sp.
Danthonia decumbens
Deschampsia caespitosia
Deschampsia flexuosa
Drosera rotundifolia
Dryopteris affinis
Dryopteris dilatata
Elatine hydropiper
Eleocharis palustris
Epilobium angustifolium
Epilobium palustre
Epilobium sp.
Equisetum arvense
Equisetum fluviatile
Equisetum palustre
Equisetum sp.
Equisetum sylvaticum
Erica tetralix
Eriophorum angustifolium
Festuca arundinacea
Festuca ovina
Festuca rubra
Festuca sp.
Festuca vivipara
Filipendula ulmaria
Galium palustre
Galium saxatile
Glyceria sp.
Hedera helix
Holcus lanatus
Hydrocotyle vulgaris
Hypericum tetrapterum
Hypochoeris radicata
Ilex aquifolium
Juncus acutiflorus
Juncus articulatus
Juncus bufonius
Juncus conglomeratus
Juncus effusus
Juncus squarrosus
Lathyrus pratensis
Leontodon autumnalis
Leontodon sp.
Lonicera periclymenum
Lotus corniculatus
Lotus uliginosus
Luzula campestris
Luzula multiflora
Luzula sylvatica
Mentha aquatica
Mentha sp.
Molinia caerulea
Narthecium ossifragum
Pedicularis sylvatica
Phalaris arundinacea
Picea sitchensis
Plantago lanceolata
Plantago media
Platanthera bifolia
Poa sp.
Poa trivialis
Polygala serpyllifolia
Polygala vulgaris
Polygonum persicaria
Polygonum sp. possibly *hydropiper*
Polystichum communis
Potamogeton sp.
Potentilla erecta
Prunella vulgaris
Pteridium aquilinum
Ranunculus acris
Ranunculus flammula
Ranunculus repens
Rhinanthus minor
*Rubus fruticosus a*gg.
Rumex acetosa
Rumex crispus
Rumex obtusifolius
Salix aurita
Salix cinerea
Senecio aquaticus
Senecio jacobaea
Silene dioica
Sorbus aucuparia
Stellaria palustre
Stellaria sp.
Succisa pratensis

Taraxacum officinale
Trifolium pratensis
Trifolium repens
Ulex europaeus
Urtica dioica
Vaccinium myrtillus
Veronica beccabunga
Veronica chamaedrys
Veronica montana
Vicia cracca
Viola palustre

GM1 Marsh
Equisetum fluviatile

HH1 Dry siliceous heath
Agrostis capillaris
Agrostis sp.
Agrostis stolonifera
Alnus glutinosa
Anagallis tenella
Anemone nemorosa
Anthoxanthum odoratum
Betula pubescens
Blechnum spicant
Calluna vulgaris,
Carex binervis
Carex echinata
Carex flacca
Carex hostiana
Carex nigra
Carex pulicaris
Carex rostrata
Cerastium fontanum
Cirsium dissectum
Cirsium palustre
Cladonia portentosa
Dactylis glomerata
Dactylorhiza sp.
Deschampsia flexuosa
Digitalis purpurea
Drosera rotundifolia
Epilobium palustre
Erica tetralix
Eriophorum angustifolium
Eriophorum vaginatum
Euphrasia sp.
Festuca ovina
Festuca rubra
Galium palustre
Galium sp.
Hieracium sp.
Hypericum pulchrum
Hypochoeris radicata
Juncus acutiflorus
Juncus articulatus
Juncus bufonius
Juncus effusus
Juncus squarrosus
Luzula campestris
Luzula multiflora
Luzula sylvestris
Lychnis flos-cuculi
Mentha aquatica
Mentha sp.
Molinia caerulea
Molinia caerulea
Myrica gale
Narthecium ossifragum
Pedicularis sylvatica
Picea sitchensis
Pinus sp.
Polygala serpyllifolia
Polytrichum commune
Potentilla erecta
Potentilla erecta
Potentilla reptans
Prunella vulgaris
Pteridium aquilinum
Ranunculus acris
Ranunculus flammula
Rubus fruticosus agg.
Rumex acetosella
Salix aurita
Salix cinerea
Senecio aquatica
Solidago virgaurea
Sphagnum caprifolium
Sphagnum papillosum
Succisa pratensis
Trichcophorum caespitosum
Ulex europaeus
Vaccinium myrtillus
Viola palustre

HH3 Wet heath
Agrostis stolonifera
Anagallis tenella
Anemone nemorosa
Anthoxanthum odoratum
Blechnum spicant
Calluna vulgaris
Carex echinata
Carex flacca
Carex nigra
Carex rostrata
Cirsium dissectum

Cirsium palustre
Dactylis glomerata
Dactylorhiza sp.
Deschampsia flexuosa
Drosera rotundifolia
Empetrum nigrum
Epilobium palustre
Erica tetralix
Eriophorum vaginatum
Galium palustre
Galium saxatile
Hypericum pulchrum
Hypochoeris radicata
Juncus acutiflorus
Juncus articulatus
Juncus effusus
Juncus squarrosus
Luzula multiflora
Luzula sylvestris
Lychnis flos-cuculi
Mentha aquatica
Mentha sp.
Molinia caerulea
Myrica gale
Narthecium ossifragum
Picea sitchensis
Polygala serpyllifolia
Polytrichum commune
Potentilla erecta
Prunella vulgaris
Ranunculus acris
Ranunculus flammula
Salix aurita
Senecio aquatica
Sphagnum papillosum
Vaccinium myrtillus
Vaccinium oxycoccos
Viola palustre

HD1 Dense bracken

Anthoxanthum odoratum
Potentilla erecta
Pteridium aquilinum
Rubus fruticosus agg.
Salix cinerea
Sorbus aucuparia
Uex europaeus

PB2 Upland Blanket Bog

Agrostis capillaris
Agrostis stolonifera
Andromeda polifolia
Calluna vulgaris
Carex echinata
Cladonia sp.
Deschampsia flexuosa
Dryopteris dilatata
Empetrum nigrum
Erica tetralix
Eriophorum angustifolium
Eriophorum vaginatum
Juncus acutiflorus
Juncus bufonius
Juncus effusus
Luzula sylvatica
Molinia caerulea
Narthecium ossifragum
Potentilla erecta
Rhynchospora alba
Sphagnum caprifolium
Trichophorum caespitosum
Vaccinium myrtillus
Vaccinium oxycoccos

PB4 Cutover bog

Agrostis capillaris
Agrostis stolonifera
Anthoxanthum odoratum
Betula pubescens
Calluna vulgaris
Carex binervis
Carex panicea
Cerastium fontanum
Deschampsia flexuosa
Dryopteris dilatata
Epilobium angustifolium
Erica tetralix
Eriophorum angustifolium
Eriophorum vaginatum
Festuca rubra
Galium palustre
Glyceria sp.
Holcus lanatus
Hydrocotyle vulgaris
Juncus articulatus
Juncus bufonius
Juncus effusus
Juncus squarrosus
Luzula multiflora
Matricaria discoidea
Molinia caerulea
Narthecium ossifragum
Plantago lanceolata
Polygala vulgaris
Polystichum setiferum
Potentilla anserina
Potentilla erecta
Potentilla palustris

Pteridium aquilinum
Rubus fruticosus
Rumex acetosa
Rumex acetosella
Rumex obtusifolius
Sagina sp.
Salix aurita
Scrophularia nodosa
Senecio jacobaea
Succisa pratensis
Trichophorum cespitosum
Trifolium repens
Vaccinium myrtillus
Viola palustris

PF2 Poor fen and flush
Agrostis canina
Agrostis sp.
Agrostis stolonifera
Angelica sylvestris
Anthoxanthum odoratum
Athyrium filix-femina
Betula pubescens
Blechnum spicant
Calluna vulgaris
Carex aquatica
Carex echinata
Carex laevigata
Carex limosa
Carex nigra
Carex panicea
Carex paniculata
Carex pulicaris
Carex rostrata
Chrysosplenium oppositifolium
Cirsium palustre
Cirsium vulgare
Crepis paludosa
Dactylorhiza maculata
Deschampsia flexuosa
Dryopteris carthusiana
Dryopteris dilatata
Epilobium angustifolium
Epilobium palustre
Equisetum palustre
Equisetum sp.
Erica tetralix
Eriophorum angustifolium
Filipendula ulmaria
Galium palustre
Holcus lanatus
Hydrocotyle vulgaris
Hypericum pulchrum
Hypochaeris radicata
Juncus acutiflorus
Juncus articulatus
Juncus effusus
Luzula multiflora
Luzula sylvatica
Mentha aquatica
Menyanthes trifoliata
Molinia caerulea
Myrica gale
Nardus stricta
Narthecium ossifragum
Osmunda regalis
Pedicularis sylvatica
Pinus sp.
Poa trivialis
Polygala serpyllifolia
Polytrichum commune
Potentilla erecta
Potentilla palustris
Prunella vulgaris
Pteridium aquilinum
Ranunculus acris
Ranunculus flammula
Ranunculus repens
Rubus fruticosus agg.
Rumex acetosa
Salix aurita
Salix cinerea
Silene dioica
Sorbus aucuparia
Sphagnum sp.
Stellaria uliginosa
Succisa pratensis
Trichophorum caespitosum
Trifolium repens
Vaccinum myrtillus
Vaccinum oxycoccus
Valeriana officinalis
Veronica chamaedrys
Viola palustris

WN1 Oak-birch-holly woodland
Acer pseudoplatanus
Agrostis capillaris
Agrostis stolonifera
Ajuga reptans
Alnus glutinosa
Angelica sylvestris
Anthoxanthum odoratum
Betula pubescens
Blechnum spicant
Calluna vulgaris
Caltha palustre
Cardamine flexuosa

Carex binervis
Carex panicea
Carex paniculata.
Carex remota
Carex sp. *(tussocky)*
Carex sylvatica
Chrysosplenium oppositifolium
Circaea lutetiana
Cirsium vulgare
Corylus avellana
Crataegus monogyna
Deschampsia caespitosa
Deschampsia flexuosa
Digitalis purpurea
Dryopteris affinis
Dryopteris dilatata
Filipendula ulmaria
Fraxinus excelsior
Galium palustre
Geranium robertianum
Hedera helix
Holcus lanatus
Hyacinthoides non-scriptus
Hypericum androsaenum
Ilex aquilinum
Juncus effusus
Lonicera periclymenum
Luzula sylvatica
Lycopus europaeus
Lysimachia nemorum
Melampyrum arvense
Mentha aquatica
Molinia caerulea
Oxalis acetosella
Picea sitchensis
Polypodium vulgare
Polystichum setiferum
Potentilla sterilis
Pteridium aquilinum
Quercus robur
Ranunculus flammula
Ranunculus repens
Rubus fruticosus agg.
Salix aurita
Salix cinerea
*Salix s*p.
Senecio aquaticus
Sorbus aucuparia
Stachys sylvatica
Stellaria holostea
Succisa pratensis
Ulex europaeus
Vaccinium myrtillus
Vicia sepium
Viola sp.

WN2 Oak-ash-hazel woodland

Acer pseudoplatanus
Achillea millefolium
Agrostis capillaris
Agrostis sp.
Agrostis stolonifera
Ajuga reptans
Alnus glutinosa
Amanita sp.
Anemone nemorosa
Angelica sylvestris
Anthoxanthum odoratum
Arrhenatherum elatius
Arum maculatum
Athyrium filix-femina
Betula pubescens
Blechnum spicant
Brachypodium sylvaticum
Bromus sp.
Caltha palustris
Cardamine flexuosa
Carex flacca
Carex pendula
Carex sylvatica
Centaurea nigra
Chrysosplenium oppositifolium
Circaea lutetiana
Cirsium vulgare
Conopodium majus
Corylus avellana
Cynosurus cristatus
Cytisus scoparius
Dactylis glomerata
Deschampsia caespitosia
Digitalis purpurea
Dryopteris dilatata
Dryopteris felix-mas
Epilobium montanum
Equisetum arvense
Equisetum hymale
Equisetum sylvaticum
Equisetum telmateia
Fagus sylvatica
Filipendula ulmaria
Fissidens sp.
Fraxinus excelsior
Galium aparine
Galium odoratum
Galium palustris
Geranium robertianum
Geum urbanum
Glechoma hederacea

Glyceria fluitans
Hedera helix
Heracleum sphondylium
Holcus lanatus
Hyacinthoides non-scriptus
Hypericum androsaenum
Ilex aquifolium
Juncus effusus
Laccaria amethystina
Lapsana communis
Lonicera periclymenum
Lotus corniculatus
Luzula sylvatica
Lysimachia nemorum
Mentha aquatica
Molinia caerulea
Oudemansiella mucida
Oxalis acetosella
Phyllitis scolopendrium
Picea abies
Picea sitchensis
Plantago lanceolata
Poa sp.
Polystichum setiferum
Polytrichum commune
Potentilla sterilis
Primula vulgaris
Prunella vulgaris
Prunus spinosa
Pteridium aquilinum
Quercus robur
Ranunculus acris
Ranunculus flammula
Ranunculus repens
Rosa sp.
Rubus fruticosus
Rumex acetosa
Rumex obtusifolius
Rumex sangineus
Russula sp.
Salix caprea
Salix cinerea
Sambucus nigra
Sanicula europaea
Senecio aquaticus
Senecio jacobaea
Sonchus oleraceus
Sorbus aucuparia
Stachys sylvatica
Stellaria holostea
Symophoricarpos albus
Taraxacum officinale
Thuidium tamariscinum
Ulex europaeus
Urtica dioica
Vaccinum myrtillus
Veronica chamaedrys
Vicia cracca
Vicia sepium
Viola palustris
Viola sp.

WN6 Wet willow-alder-ash woodland

Achillea millefolium
Agrostis capillaris
Agrostis stolonifera
Ajuga reptans
Alnus glutinosa
Anemone nemorosa
Angelica sylvestris
Anthoxanthum odoratum
Arctium sp.
Arrhenatherum elatius
Athyrium filix-femina
Betula pubescens
Blechnum spicant
Brachypodium sylvaticum
Carex flacca
Carex paniculata
Carex remota
Carex rostrata
Carex sylvatica
Centaurea nigra
Chrysosplenium oppositifolium
Circaea lutetiana
Cirsium palustre
Conopodium majus
Corylus avellana
Crataegus monogyna
Cynosurus cristatus
Cytisus scoparius
Deschampsia caespitosa
Digitalis purpurea
Dryopteris affinis
Dryopteris dilatata
Dryopteris felix-mas
Epilobium montanum
Epilobium palustre
Equisetum sylvaticum
Equisetum telemateia
Fagus sylvatica
Filipendula ulmaria
Fraxinus excelsior
Galium aparine
Galium palustre
Geranium robertianum
Glyceria fluitans
Glyceria maxima

Hedera helix
Heracleum sphondylium
Holcus lanatus
Hyacinthoides non-scriptus
Hypericum androsaenum
Hypericum pulchrum
Ilex aquifolium
Juncus articulatus
Juncus effusus
Lonicera periclymenum
Lotus corniculatus
Luzula sylvatica
Lycopus europaeus
Lysimachia nemorum
Mentha aquatica
Mentha sp.
Molinia caerulea
Oxalis acetosella
Pinus sylvestris
Plantago lanceolata
Polypodium vulgare
Polystichum setiferum
Potentilla erecta
Potentilla sterilis
Prunella vulgaris
Prunus laurocerasus
Prunus spinosa
Pteridium aquilinum
Ranunculus acris
Ranunculus flammula
Ranunculus repens
Rubus fruticosus agg.
Rumex acetosa
Rumex obtusifolius
Salix aurita
Salix cinerea
Senecio aquaticus
Senecio jacobaea
Sonchus oleraceus
Sorbus aucuparia
Stachys sylvatica
Stellaria holostea
Taraxacum officinale
Teucrium scorodonia
Tussilago farfara
Ulex europaeus
Urtica dioica
Veronica chamaedrys
Vicia sepium
Viola palustre
Viola sp.

WN7 Bog woodland
Sorbus aucuparia
Betula pubescens
Ulex europaeus
Calluna vulgaris
Blechnum spicant
Pteridium aquilinum
Molinia caerulea
Ilex aquilfolium

WD1 (Mixed) broadleaved woodland
Abies alba
Acer pseudoplatanus
Aesculus hippocastanum
Ajuga reptans
Alnus glutinosa
Angelica sylvestris
Anthoxanthum odoratum
Athyrium filix-femina
Betula pubescens
Blechnum spicant
Brachypodium sylvaticum
Briza media
Calluna vulgaris
Cantharellus cibarius
Carex sp.
Carex sylvatica
Castanea sativa
Chrysosplenium oppositifolium
Circaea lutetiana
Corylus avellana
Crataegus monogyna
Cynosurus cristatus
Dactylis glomerata
Deschampsia caespitosa
Digitalis purpurea
Dryopteris affinis
Dryopteris dilatata
Dryopteris filix-mas
Epilobium angustifolium
Equisetum arvense
Equisetum sylvaticum
Fagus sylvatica
Filipendula ulmaria
Fraxinus excelsior
Galium palustre
Geranium robertianum
Geum urbanum
Holcus lanatus
Hyacinthoides-non-scriptus
Hypericum androsaenum
Hypericum pulchrum
Hypochoeris radicata
Ilex aquifolium
Juncus effusus
Laccaria laccata

Lapsana communis
Larix decidua
Lonicera periclymenum
Luzula sylvatica
Lysimachia nemorum
Oxalis acetosella
Phyllitis scolopendrium
Picea abies
Picea sitchensis
Pinus sp.
Poa trivialis
Polypodium vulgare
Polystichum setiferum
Potentilla sterilis
Prunella vulgaris
Prunus laurocerasus
Pteridium aquilinum
Quercus robur
Ranunculus repens
Rhododendron ponticum
Rubus fruticosus agg.
Rubus idaeus
Rumex acetosa
Rumex sanguineus
Salix cinerea
Sanicula europaeus
Senecio vulgaris
Sorbus aucuparia
Stachys sylvatica
Stellaria holostea
Succisa pratensis
Thuja plicata
Ulex europaeus
Ulmus glabra
Urtica dioica
Vaccinium myrtillus
Veronica chamaedrys
Veronica montana
Vicia sepium
Viola sp.

WD2 Mixed broadleaved/conifer woodland

Acer platanoides
Acer pseudoplatanus
Betula pubescens
Blechnum spicant
Digitalis purpurea
Dryopteris affinis
Fagus sylvatica
Hedera helix
Ilex aquifolium
Larix decidua
Picea abies
Picea sitchensis
Pinus sp.
Prunus laurocerasus
Quercus robor
Rhododendron ponticum
Rubus fruticosus agg.
Salix cinerea
Thuja plicata

WD3 (Mixed) conifer woodland

No species recorded

WD4 Conifer plantation

Agrostis capillaris
Agrostis stolonifera
Betula pubescens
Blechnum spicant
Calluna vulgaris
Carex binervis
Carex remota
Carex sp.
Cirsium sp.
Deschampsia caespitosia
Digitalis purpurea
Dryopteris affinis
Dryopteris dilatata
Dryopteris felix-mas
Epilobium angustifolium
Erica tetralix
Galium palustre
Hypericum pulchrum
Juncus effusus
Luzula sylvatica
Molinia caerulea
Picea abies
Picea sitchensis
Poa sp.
Pteridium aquilinum
Ranunculus flammula
Rhododendron ponticum
Rubus fruticosus agg.
Sorbus aucuparia
Vaccinium myrtillus

WD5 Scattered trees and parkland

Acer pseudoplatanus
Aesculus hippocastanum
Castanea sativa
Fagus sylvatica
Fraxinus excelsior
Fraxinus excelsior pendula
Pinus sp.
Pinus sylvestris
Quercus robur

Tilia sp.

WS1 Scrub

Acer pseudoplatanus
Agrostis capillaris
Agrostis stolonifera
Alnus glutinosa
Angelica sylvestris
Anthoxanthum odoratum
Arctium sp.
Arrhenatherum elatius
Bellis perennis
Betula pubescens
Blechnum spicant
Calluna vulgaris
Carex binervis
Carex echinata
Carex panicea
Centaurea nigra
Cerastium fontanum
Chrysosplenium oppositifolium
Cirsium arvense
Cirsium dissectum
Cirsium palustre
Cirsium vulgare
Corylus avellana
Crataegus monogyna
Cynosurus cristatus
Cytisus scoparius
Dactylis glomerata
Deschampsia caespitosa
Dryopteris affinis
Dryopteris dilatata
Elymus repens
Epilobium angustifolium
Epilobium palustre
Equisetum arvense
Equisetum sylvaticum
Eriophorum angustifolium
Festuca ovina
Festuca rubra
Galium palustre
Galium saxatile
Hedera helix
Holcus lanatus
Hydrocotyle vulgaris
Hypericum pulchrum
Hypochoeris radicata
Ilex aquifolium
Juncus acutiflorus
Juncus articulatus
Juncus effusus
Juncus squarrosus
Lathyrus montanus
Lathyrus pratensis
Leontodon sp.
Lonicera periclymenum
Lotus corniculatus
Luzula multiflora
Luzula sylvatica
Luzula sylvatica
Lysimachia nemorum
Mentha aquatica
Menyanthes trifoliata
Molinia caerulea
Myrica gale
Narthecium ossifragum
Pedicularis sylvatica
Picea sitchensis
Plantago lanceolata
Poa sp.
Polygala serpyllifolia
Polygonum persicaria
Potentilla erecta
Potentilla palustris
Prunella vulgaris
Prunus spinosa
Pteridium aquilinum
Quercus robur
Ranunculus acris
Ranunculus flammula
Rubus fruticosus agg.
Rumex acetosa
Rumex acetosella
Rumex crispus
Rumex obtusifolius
Salix aurita
Salix cinerea
Sambucus nigra
Scrophularia nodosa
Senecio aquaticus
Senecio jacobaea
Sorbus aucuparia
Stachys palustris
Stellaria graminea
Stellaria sp.
Succisa pratensis
Teucrium scorodonia
Trifolium repens
Ulex europaeus
Urtica dioica
Vaccinium myrtillus
Veronica chamaedrys
Vicia cracca
Vicia sepium
Viola palustris

WS2 Immature woodland

Acer pseudoplatanus
Alnus glutinosa
Betula pubescens
Cirsium arvense
Cirsium vulgare
Corylus avellana
Epilobium angustifolium
Holcus lanatus
Juncus effusus
Pteridium aquilinum
Rubus fruticosus
Rumex obtusifolius
Salix caprea
Salix cinerea
Sambucus nigra
Ulex europaeus
Urtica dioica

WS3B Ornamental/non-native shrub

Gaultheria sp.
Prnus laurocerasus
Berberis darwinii
Camellia sinensis
Rhododendron ponticum
Laburnum x vosii
Prunus pissardi nigra
Phyllostachys sp.

WS5 Recently felled woodland

Acer pseudoplatanus
Agrostis capillaris
Agrostis stolonifera
Alnus glutinosa
Angelica sylvestris
Anthoxanthum odoratum
Athyrium filix-femina
Betula pubescens
Calluna vulgaris
Carex binervis
Carex echinata
Carex remota
Cirsium arvensis
Cirsium palustre
Cirsium sp.
Cirsium vulgare
Corylus avellana
Deschampsia caespitosia
Digitalis purpurea
Dryopteris affinis
Dryopteris dilatata
Epilobium angustifolium
Erica tetralix
Fagus sylvatica
Fraxinus excelsior
Geranium robertianum
Hedera helix
Holcus lanatus
Hypericum pulchrum
Ilex aquifolium
Juncus effusus
Luzula sylvatica
Lysimachia nemorum
Molinia caerulea
Oxalis acetosella
Potentilla erecta
Prunella vulgaris
Prunus laurocerasus
Pteridium aquilinum
Quercus robur
Ranunculus acris
Ranunculus flammula
Ranunculus repens
Rhododendron ponticum
Rubus fruticosus agg.
Rubus idaeus
Rumex obtusifolius
Salix caprea
Salix cinerea
Sambucus nigra
Senecio aquatica
Sorbus aucuparia
Ulex europaeus
Urtica dioica
Vaccinium myrtillus
Viola sp.

WL1 Hedgerows

Acer pseudoplatanus
Alnus glutinosa
Athyrium felix femina
Betula pubescens
Blechnum spicant
Carex cinerea
Corylus avellana
Crataegus monogyna
Fagus sylvatica
Galium aparine
Geranium robertianum
Hedera helix
Ilex aquifolium
Lonicera pericyclemum

Picea sitchensis

Polystichum setiferum
Privet ovalifolium

Prunus spinosa
Rosa arvensis
Rubus fruticosus agg.
Rubus idaeus
Sorbus aucuparia
Sorbus hibernica
Ulmus glabra
Urtica dioica
Vicia sepium

WL2 Treelines

Acer pseudoplatanus
Betula pubescens
Fagus sylvatica
Picea sitchensis
Pinus sylvestris
Salix cinerea
Sorbus aucuparia

ED1 Exposed sand, gravel or till

Arctium sp.
Molinia caerulea
Pteridium aquilinum
Ulex europaeus

ED2 Spoil and bare ground

Dryopteris affinis
Oxalis acetosella
Plantago media
Senecio jacobaea

ED3 Recolonising bare ground

Cytisus scoparius
Molinia caerulea
Pteridium aquilinum
Rubus fruticosus agg.
Ulex europaeus

BC1 Arable crops

Triticum sp.

BC2 Horticultural land

No species recorded

BC4 Flower beds and borders

Crosocmia x crocosmiiflora var.
Canna sp.
Chrysanthemum sp.
Helianthemum nummularium
Lychnis chaledonica

BL1A Stone walls

Asplenium ruta-muraria
Asplenium trichomanes
Rubus fruticosus agg.

BL1B Other stone works

No species recorded

BL2 Earth banks

Agrostis sp.
Agrostis stolonifera
Anthoxanthum odoratum
Arrhenatherum elatius
Blechnum spicant
Centaurea nigra
Cerastium fontanum
Corylus avellana
Crataegus monogyna
Dactylis glomerata
Deschampsia caespitosia
Digitalis purpureum
Dryopteris affinis
Dryopteris dilatata
Dryopteris filix-mas
Epilobium angustifolium
Epilobium sp.
Festuca arundinacea
Festuca pratensis
Festuca rubra
Fragaria vesca
Fraxinus excelsior
Galium aparine
Galium saxatile
Geranium robertianum
Geum urbanum
Hedera helix
Heracleum sphondylium
Holcus lanatus
Hyacinthoides non-scriptus
Hypochaeris radicata
Ilex aquifolium
Juncus effusus
Lapsana communis
Lathyrus pratensis
Ligustrum vulgare
Lolium perenne
Lonicera periclymenum
Lysimachia nemorum
Oxalis acetosella
Phyllitis scolopendrium
Plantago lanceolata
Polygala vulgaris
Polystichum setiferum
Potentilla sterilis
Prunus avium
Prunus spinosa
Pteridium aquilinum

Quercus sp.
Rosa canina
Rubus fruticosus agg.
Rumex acetosa
Rumex acetosella
Rumex obtusifolius
Salix aurita
Sambucus nigra
Saxifraga spathularis
Solidago virgaurea
Stellaria holostea
Syringa vulgaris
Taraxacum officinale
Teucrium scorodonia
Torilis arvensis
Ulex europaeus
Urtica dioica
Vaccinium myrtillus
Veronica chamaedrys
Veronica montana
Vicia cracca
Vicia sepium
Viola sp.

BL3 Buildings and artificial surfaces

No species recorded

Appendix 8. Target notes X habitat X location

Dystrophic lakes (FL1)

Townland	Grid square	Target note number
Gorteenameale	N2501	N1

Calcareous springs (FP1)

Townland	Grid square	Target note number
Ballyfin Upper	N3601	N2
Glennaglass	S2998	N5

Other artificial lakes and ponds (FL8)

Townland	Grid square	Target note number
Ballyfin Demesne	N3800	N3
Baunreagh	N3402	N1
Castleconnor	N2901	N1
Deerpark	S3498	N2
Sconce Upper	N3402	N1
Sconce Upper	S3598	N2

Eroding/Upland rivers (FW1)

Townland	Grid square	Target note number
Ballyfin Upper	N3400	N2
Ballyfin Upper	N3603	N1
Ballyfin Upper	N3702	N4
Ballyhuppahane	N3603	N8
Ballyhuppahane Clonehurk Clonehurk Skerry Clonehurk Skerry Skerry	N3704 N3804 N3805 N3904, N4004	N1
Baunreagh	N2803	N2
Baunreagh	N2803	N2
Baunreagh	N2904	N2
Clonehurk Skerry	N3805	N3
Glennaglass	S2998	N9
Gorteenameale	N2600	N1
Gorteenameale	N2600	N2
Gorteenameale	N2601	N1
Gorteenameale	N2701	N2
Gorteenameale	N2702	N1
Inchanisky Drimhill or Quarryfarm and Glennaglass	S2999 S2998	N1

Sconce Upper	S3559	N1
SconceUpper and BallyfinUpper	S3559	N1

Drainage ditches (FW4)

Townland	Grid square	Target note number
Mountainfarm	N3100	N3
Mountainfarm	N3100	N5
Sconce Upper	N3401	N7

Dry calcareous and neutral grassland (GS1); an asterisk after townland name indicates that it's worth considering as a priority grassland

Townland	Grid square	Target note number
Ballyfin Demesne	N3800	N2
Ballyfin Demesne	N3800	N4
Bordowin	N2903	N1
Clonehurk	N3804	N1
Drim	S3398	N1
Glennaglass	S2998	N5

Dry meadows and grassy verges (GS2)

Townland	Grid square	Target note number
Ballyfin Upper	N3501	N3
Ballyhuppahane	N3503	N2
Baunreagh	N2603	N1
Deerpark	N3702	N2

Dry-humid acid grassland (GS3)

Townland	Grid square	Target note number
Ballyfin Upper	N3500	N1
Ballyfin Upper	N3601	N5
Ballyhuppahane	N3603	N2
Ballyhuppahane	N3603	N6
Baunreagh	N2902	N2
Gorteenameale Moher East	N2801	N4
Sconce Upper	N3402	N2

Wet grassland (GS4)

Townland	Grid square	Target note number
Ballyfin	N3704	N1
Ballyfin Upper	N3402	N3
Ballyfin Upper	N3603	N1
Ballyfin Upper	N3702	N3

Ballyhuppahane	N3603	N2
Ballyhuppahane	N3603	N6
Ballyhuppahane	N3603	N9
Ballyhuppahane	N3704	N1
Camcloon	N3903	N1
Deerpark	N3702	N7
Deerpark	S3498	N1
Derrylamogue	N4008	N1
Drim	S3399	N3
Drimhill or Quarryfarm	S2998	N5
Glennaglass	S2998	N7
Gorteenameale	N2800	N1
Gorteenameale	N3603	N1
Inchanisky	N2900	N1
Moher East	N2800	N1
Moher East	N2800	N4

Improved agricultural grassland (GA1)

Townland	Grid square	Target note number
Ballyfin demesne	N3801	N3
Ballyhuppahane	N3604	N1
Cappalane	N4008	N1
Deerpark	S3497	N3
Derrycon	N3400	N7
Gorteenameale	N2801	N5
Gorteenameale	N2801	N6
Inchanisky	N3000	N3
Moher East	N2800	N3

Dry siliceous heath (HH1)

Townland	Grid square	Target note number
N3000	Inchanisky	N2
N3100	Mountainfarm	N1
N3100	Mountainfarm	N2
N3400	Ballyfin Upper	N2
N3401	Sconce Upper	N3
N3500	Ballyfin Upper	N5
N3500	Ballyfin Upper	N6
N3501	Ballyfin Upper	N2
N3600	Ballyfin Upper	N1
S1399	Mountainfarm	N1
S3099	Mountainfarm	N2
S3099	Mountainfarm	N3
S3399	Drim	N1
S3399	Drim	N5
S3559	Ballyfin Upper	N1
S3559	Ballyfin Upper	N2

Wet heath (HH3)

Townland	Grid square	Target note number
Inchanisky	N3000	N4
Ballyfin Upper	N3400	N10
Ballyfin Upper	N3400	N4
Ballyfin Upper	N3400	N5
Ballyfin Upper	N3401	N9
Ballyfin Upper	N3402	N3
Ballyfin Upper	N3500	N8
Ballyfin Upper	N3500	N9
Ballyfin Upper	N3501	N1
Ballyfin Upper	N3502	N3
Ballyfin Upper	N3502	N4
Ballyfin Upper	N3601	N11
Ballyfin Upper	N3601	N6
Ballyfin Upper	N3601	N7
Ballyfin Upper	N3602	N1
Ballyfin Upper	N3602	N4
Ballyfin Upper	N3602	N5
Ballyfin Upper	N3603	N3
Baunreagh	N2804	N1
Sconce Upper	N3401	N8

Upland Blanket bog (PB2)

Townland	Grid square	Target note number
Baunreagh	N2404	N1
Baunreagh	N2702	N3
Baunreagh	N2704	
Baunreagh	N2704	N1
Baunreagh	N2704	N3
Baunreagh	N2804	N2
Baunreagh	N2804	N4
Baunreagh	N2904	N1
Gorteenameale	N2501	N1
Gorteenameale	N2501	N2
Gorteenameale	N2501	N4
Gorteenameale	N2601	N2
Gorteenameale	N2601	N3
Gorteenameale	N2601	N3
Gorteenameale	N2602	N1
Gorteenameale	N2602	N3
Gorteenameale	N2602	N4
Gorteenameale	N2602	N5
Gorteenameale	N2700	N2
Gorteenameale	N2701	N2

Cutover bog (PB4)

Townland	Grid square	Target note number
Gorteenameale	N2801	N1
Mountainfarm	N3100	N4

Poor fen and flush (PF2)

Townland	Grid square	Target note number
Ballyfin Upper	N3400	N4
Ballyfin Upper	N3501	N2
Ballyfin Upper	N3501	N5
Ballyfin Upper	N3501	N6
Ballyfin Upper	N3502	N1
Ballyfin Upper	N3602	N2
Baunreagh	N2704	N4
Baunreagh	N2804	2
Baunreagh	N2904	N2
Derrycon	N3400	N8
Gorteenameale	N2602	N1
Sconce Upper	N3400	N1
Sconce upper	N3400	N10
Sconce upper	N3400	N5
Sconce upper	N3400	N9
Sconce upper	N3401	N1
Sconce upper	N3401	N4
Sconce upper	N3401	N4

Oak-birch-holly woodland (WN1)

Inchanisky Moher East	**N2900 S2999 S2999**	**N1**
Ballyfin Upper	N3502	N2
Ballyfin Upper	N3601	N10
Ballyfin Upper	N3601	N4
Ballyhuppahane	N3703	N2
Deerpark	N3802	N1
Derrycon	N3300	N1
Derrylamogue		N1
Drimhill or Quarryfarm	N3906	N1
Gorteenameale	N2700	N1
Gorteenameale	N2700	N3
Knocks	S2999	N1

Oak-ash-hazel woodland (WN2)

Townland	Grid square	Target note number
Ballyhuppahane	N3601	N1
Ballyhuppahane	N3601	N3

Ballyhuppahane	N3702	N4
Ballyhuppahane	S3603	N4
Ballyhuppahane	S3603	N7
Clonehurk Skerry	N3805	N1
Deerpark	N3702	N1
Drim	S3298	N1
Glennaglass	S2998	N4
Sconce Upper Ballyfin Upper	S3559	N2

Wet willow-alder-ash woodland (WN6)

Ballyfin Upper	N3803	N1
Drimhill or Quarryfarm	S2999	N3
Glennaglass	S2998	N9
Glennaglass	S2998	N6
Gorteenameale	N2800	N5
Inchanisky	N3000	N5
Sconce Upper	S3498	N5

(Mixed) broadleaved woodland

Ballyfin Demesne	N3800	N2
Ballyfin Demesne	N3800	N6
Baunreagh	N2802	N1
Drim	S3398	N2
Drimhill or Quarryfarm	S2999	N2
Glennaglass	S2898	N2
Sconce Upper	S3598	N1
Shanavaur	S3499	N1

Scrub (WS1)

Townland	Grid square	Target note number
Ballyfin Upper	N3400	N2
Ballyfin Upper	N3500	N6
Ballyfin Upper	N3500	N7
Ballyfin Upper	N3601	N8
Ballyfin Upper	N3601	N9
Ballyfin Upper	N3601	4
Ballyfin Upper	N3603	N1
Ballyfin Upper	N3603	N3
Ballyfin Upper	N3603	N6
Ballyfin Upper	N3603	N7
Ballyfin Upper	N3702	N3
Camcloon	S2998	N1
Castle Conor Baunreagh	N3802	N1
Deerpark	N3702	N5
Deerpark	N3720	N6
Deerpark	N3903	N2

Derrycon	N3300	N5
Drimhill or Quarryfarm	S2999	N4
Drimhill or Quarryfarm	S3499	N6
Glennaglass	S2999	N3
Gorteenameale	N2600	N1
Gorteenameale	N2600	N2
Gorteenameale	N2601	N1
Gorteenameale	N2700n2902 N2901	N1
Gorteenameale	N2701	N2
Gorteenameale	N2701	N1
Gorteenameale Moher East	N2801	N4
Moher East	N2800	N2
Sconce Upper	N3401	N2
Sconce Upper	N3401	N1
Shanavaur	N3602	N2

Hedgerows (WL1)

Townland	Grid square	Target note number
Ballyfin	N3704	N2
Drim Shanavaur Sconce Upper Ballyfin Upper	S3499	N1

Flower beds and borders (BC3)

Townland	Grid square	Target note number
Glennaglass	S2998	N2

Earth banks (BL2)

Townland	Grid square	Target note number
Clonehurk	N3704	N1
Derrycon	N3300	N2

Appendix 9. Habitats containing abundant *Succisa pratensis*

Townland	Grid square	Habitat	Target note
Inchanisky	N2900	GS4	N1
Ballyhuppahane	N3704	GS4	N1
Glennaglass	S2998	GS4	N7
Mountain Farm	S3199	HH1	N1
Camcloon	N3903	GS4 WS1	N1
Drim	S3399	GS4	N3
Ballyfin Upper	N3702	WS1 GS4	N2
Ballyfin Upper	N3502	GS4	N5
Moher East	N2800	GS4	N1

Appendix 10. Location of exotic invasives

Japanese knotweed

Townland	Grid square	Habitat	Target note
Baunreagh	N2902	Beside road	N1
Deerpark	S3498	WD2	N3
Ballyfin Demesne	N3800	WS3B	N5
Glennaglass	S2998	WD4	N8
Deerpark	S3498		N3
Baunreagh	N2801	ED3	N3

Gunnera tinctoria

Townland	Grid square	Habitat	Target note
Sconce Upper	N3402	FL8	N1

Appendix 11. Accounts of (Potential) Local Biodiversity Areas

Site 1: Delour River Valley
Surveyed on: 22nd and 24th July 2009
Grid square
S2998GleannaglassFP1GS1N5
S2998 Glennaglass BC4 N2

Target notes

Photographs
Glennaglass S2998bank01
Glennaglass S2998bank02
Glennaglass S2998bank03
Glennaglass S2998bankGS101
Glennaglass S2998BC4BL1A01
Glennaglass S2998beehives01
Glennaglass S2998beehives02

Description
All of the areas next to the Delour River are within designated areas. Most of this entire region is protected by the Slieve Blooms SPA, while the Delour River south from Dooley's Bridge to the southern boundary of the study area is an SAC (Special Area of Conservation).

There are some noteworthy areas adjacent to the designated areas including tufa forming calcareous springs, dry calcareous and neutral grassland, scrub, wet grassland and dense bracken. Two man-made habitats that are being developed with wildlife in mind are also included. These are BC4 (flower beds and borders) and BC1 (arable land). The arable land has several newly installed bee hives and crops have been planted specifically for bees. Similarly, the BC4 habitat has several plant species in particular, herbaceous ones that are grown for their wildlife value. This habitat is completely enclosed within a high natural stone walled garden, which had been abandoned but which is currently being restored.
The tufa forming calcareous spring was seeping from a bank excavated to form a driveway for a new house. The soils were mineral and species included red clover, red fescue and *Cladonia* (lichen). It is damaged. Dry calcareous and neutral grassland has invaded on the footprint and adjacent areas of the proposed house and over thirty species were recorded. It is also found in the area surrounding the spring.

Core sites and ecological network of regional importance.
Tufa springs are ecologically important and are EU Annex 1 habitats.

Requires recognition in local plan?
Yes

Vulnerability
The calcareous spring and dry grassland are both vulnerable as it is likely that the house will be built in the future. This will probably result in the removal of the semi-natural grassland in favour of amenity grassland (GA2) and the spring further damaged or destroyed by ground works.

Preferred management to protect biodiversity
Protect the bank where the spring has formed and encourage the retention of the grassland instead of planting the site with GA2.

Site 2: Deerpark estate

Surveyed on: 11th of August 2009
Td. Deerpark
Grid square S3497, S3498

Target notes
S3498 Deerpark GS4 N1
S3498DeerparkGM1/GS4N6

Photographs:
S3498DeerparkGS407 shows *Elatine hydropiper*
S3498DeerparkGS402
S3498DeerparkGS404
S3498DeerparkGS406
S3498DeerparkGS409
S3498DeerparkGS402
S3498DeerparkGS404
S3498DeerparkGS406
S3498DeerparkGS409
S3498DeerparkGM1GS410

Description
While most of the Deerpark estate is within the Slieve Bloom SPA (Special Protected Area) there is a small area of oak-ash-hazel woodland and an even smaller area of wet grassland adjacent to the SPA situated to the north and east of the lower pond.

This wet grassland contains the rare species *Elatine hydropiper* which was creeping on mud. Other species included ladies smock, bladder sedge and common spike rush. The entire grassland area is good habitat for a range of butterflies including small coppers and painted ladies. Bumble bees and small grasshoppers were also abundant. A muddy area between the wet grassland and the pond was completely dominated by water horsetail. The oak ash-hazel woodland can be found to the east, north and northwest side of the pond, marsh and wet grassland, forming a buffer between it and the man-made habitats of improved agricultural grassland to the east and conifer plantation to the west. Hazel, mountain ash, oak and willow were present in the woodland. Broadleaved woodland can be found at the main gates and behind and to the side of the farmyard and mature conifer wood which flanks either side of the driveway. The farmyard buildings are made almost exclusively from natural stone and are possible habitat for bats and possibly owls and the adjacent woodland provides a continuation of habitat from the buildings to the lake and its environs.

Core sites and ecological network of regional importance.
As the main part of the estate is within the SPA the additional sections of grassland and woodland increase its value helping to extend these habitats in an area dominated by farmland and or conifer plantation.

Requires recognition in local plan.
Yes

Vulnerability
These habitats are unlikely to be in danger as owners recognize their value.

Preferred management to protect biodiversity
Leave as is.

Site 3: Area south and east of Conlawn hill

Surveyed on: 6th of August 2009
Td. Ballyfin upper Briscula, Cavansheath, Knocks, Sconce Upper
Grid square S3598, S3599, S3698, S3699, N3600

Target notes
BrisculaS3599WN2N1
N3600KnocksHD1N1
S3699 Knocks WN1 N1
S3699 Knocks WD4 N2

Photographs:
KnocksN3600AngelicaonlanenexttoFW101
KnocksN3600downlanenearroad01
KnocksN3600FW1downlanenearroad01
KnocksN3600FW1offtrackinminivalley01
KnocksN3600GA101
KnocksN3600GS101
KnocksN3600HD1WN102
KnocksN3600HD1WN101
KnocksN3600HD1WN103
KnocksS3699WN101
BallyfinUpperS3599WN201
CavansheathS3559WN101
CavansheathS6399WN101
CavansheathS6399WN102
CavansheathS6399WN103

Description
This potential LBA has several continuous semi natural habitats south of Conlawn Hill between Deerpark and Ballyfin Demesne. They include scrub, wet grassland, oak-birch-holly woodland, oak-ash-hazel woodland and wet and dry heath. Tributaries of the Mountrath river pass through or are adjacent to most of these habitats. In Ballyfin Upper and Briscula oak-ash-hazel woodland (WN2) occurs on both sides of one of its tributaries. Oak is the dominant woody species along with rowan, downy birch, holly and bramble. Wet grassland, a small area of scrub and an area of wet heath provide continuity of habitat to the south east connecting the river to Deer park estate. The wet heath habitat is degraded and quite grassy.

The river section in Ballyfin Upper and Briscula is connected to wet grassland, scrub, oak-birch-holly woodland and a smaller stream in the north east via a series of hedgerows and drainage ditches. These in turn are connected via more hedgerows and/or earth banks and small lanes to pockets of dry and wet heath, and to more wet grassland and scrub to the north east in Knocks.

Core sites and ecological network of regional importance.
This series of habitats provides a continuous link between habitats over a sizable area, adding value to the SPA and SAC of Conlawn hill and environs.
These habitats that are outside the designated areas are important at least locally.

Requires recognition in local plan.
Yes

Vulnerability
Some of these habitats are likely to be in danger, in particular those away from the rivers. Within the adjacent SAC and SPA in Ballyfin Upper (Grid square S3599) considerable damage has been done to the

heath and scrub habitats with burning, quad tracks, small scale quarrying and dumping of household and farm rubbish.

Preferred management to protect biodiversity
Leave the woodlands areas as they area, allow scrub to develop into woodland and continue grazing of wet meadows. Reduce grazing pressure on heath habitats.

Site 4 Ballyfin Demesne

Surveyed on: 12th August 2009
Td. Ballyfin Demesne
Grid square N3700, N3701, N3800, N3801, N3901

Target notes
N3901BallyfinDemesneBL1A N2
N3801 Ballyfin Demesne WS2 N2
N3800 Ballyfin Demesne WD1 Horse chestnut N6
N3800 Ballyfin Demesne Japanese Knotweed N5
N3800 Ballyfin Demesne GS1 N4
N3800 BallyfinDemesneBL1b N7
N3901BallyfinDemenseWD1 N1
N3801 Ballyfin Demesne GA1 N3
N3800 Ballyfin Demesne GS1 N2
N3800 Ballyfin Demesne FS2 N1
N3800 Ballyfin Demesne FL8 N3
N3700 Ballyfin DemenseWD5 N1
N3701 Ballyfin Demesne BL1B N1

Photographs
N3800BallyfinnDemenseWD1Horsechectnut01
N3800BallyfinnDemenseWD1Horsechestnut02
N3800BallyfinnDemenseWD1Horsechectnut03
N3800BallyfinnDemenseAlchemillaGS101
N3800BallyfinnDemenseGS101
N3800BallyfinnDemenseGS102
N3800BallyfinnDemenseGS103
N3800BallyfinnDemenseBL1BGrottormassrock01
N3800BallyfinnDemenseBL1BGrottormassrock02
N3800BallyfinnDemenseBL1BGrottormassrock03
N3800BallyfinnDemenseBL1BGrottormassrock04
N3800BallyfinnDemenseBL1BGrottormassrock05
N3800BallyfinnDemenseBL1BGrottormassrock06
N3800BallyfinnDemenseBL1BGrottormassrock07
N3800BallyfinnDemenseBL1BGrottormassrock08
N3800BallyfinnDemenseBL1BGrottormassrock11
N3800BallyfinnDemenseBL1BGrottormassrock12
N3800BallyfinnDemenseBL1BGrottormassrock13
N3901BallyfinnDemenseFrontgateWD101
N3801 Ballyfin Demesne WS5 N1
N3801BallyfinnDemenseWS501
N3801BallyfinnDemenseWS502
N3801BallyfinnDemenseWS503

N3801BallyfinnDemenseGA101
N3800 Ballyfin Demesne WD1 N2
N3800BallyfinnDemenseWD1Polystichumsetiferum01
N3800BallyfinnDemenseWD104
N3800BallyfinnDemenseWD105
N3800BallyfinnDemenseWD103
N3800BallyfinnDemenseWD101
N3800BallyfinnDemenseWD102
N3800BallyfinnDemenseFS01
N3800BallyfinnDemenseFS02
N3800BallyfinnDemenseFS03
N3800BallyfinnDemenseFS04
N3800BallyfinnDemenseDragonfly03
N3800BallyfinnDemenseFL8FS203
N3800BallyfinnDemenseFL8FS204
N3800BallyfinnDemenseFL8Myriophyllum01
N3800BallyfinnDemenseFL801
N3800BallyfinnDemenseBL1BHouse02
N3800BallyfinnDemenseFL8GA201
N3800BallyfinnDemenseFL8GS01
N3700BallyfinDemenseGA101

Description

Ballyfin Demesne is an estate formerly owned by the Patrician order which was operated as a secondary school until 2009. The house and some adjacent buildings are currently being developed as a hotel. The estate has a total area of just over 2.5 km^2 consisting of woodland, grassland and fresh water habitats. About half of the estate is a designated SPA (Special Protection Area) most of which is dominated by (mixed) broadleaved woodland, along with conifer plantation, mixed confer broadleaved woodland, scattered trees and parkland and immature woodland. Small areas of semi-natural woodland habitats of oak-ash-hazel woodland and scrub, the man made Ballyfin lake and a couple of very small pockets of dry calcareous and neutral grassland and of wet grassland are also part of the designated area.

There are however a number of habitats which are not part of the designated area but which have merit. These include a couple of small areas of scrub, some broadleaved woodland near the ball alley and tennis courts and a few further small areas next to the SPA. There are some fine old trees such as beech, lime, horse chestnut and ash in trees and parkland outside the designated areas. Newer areas of scattered trees and parkland have been recently planted which will provide cover and habitat in time. Omitted from the SPA is a large field of wet grassland that is surrounded by designated broadleaved woodland and an area of dry calcareous and neutral grassland between the house and the lake.

Core sites and ecological network of regional importance.
Local importance
The habitats in the undesignated areas such as the scrub and semi-natural grasslands provide continuity, linkage and increase biodiversity in this predominantly agricultural area.

Requires recognition in local plan.
Yes

Vulnerability
The proposed development of this site as a hotel and sanctuary should afford protection to the existing habitats. EIS prepared? Furthermore the newly planted predominantly native woodland areas will also add to the areas diversity.

Preferred management to protect biodiversity
Continue planting of native broadleaved species in areas where conifers have been or are to be removed. Manage the semi-natural grassland to enhance species diversity. Leave dead standing or fallen trees to provide additional habitat for nesting sites for bats and owls and for insects.

Site 5 Owennahallia River Valley

Surveyed on 15/08/09**,** 16/08/2009, 23/08/09

Td: Ballyfin Upper, Clonehurk, Deerpark,

Grid square: N3601, N3602, N3701, N3702, N3802, N3803, , N3903

Target note No.
BallyfinUpperN3601WN2N1
BallyfinUpperN3601WN1N4
BallyfinUpperN3601WN2N3
BallyfinUpperN3601FP1N2

DeerparkN3702WS1N5
DeerparkN3702WS1N6
DeerparkN3702GS2N2
DeerparkN3702WN2N1
DeerparkN3802WS1N2
DeerparkN3803WN1N1

Photographs
DeerparkN3802GA1rushyView01
DeerparkN3802GA1View01
DeerparkN3802GA1View02
BallyfinUpperN3601WN2
Ballyfin UpperN3601WN2/WN6

Description
This site of biodiversity importance extends along the Owennahallia River Valley. While the majority of the areas of biodiversity importance are designated as part of the Slieve Blooms SPA, there are some small pockets of semi-natural habitats adjacent to or connected to the designated areas.

These are mainly wet grassland (GS4), dry meadows and grassy verges (GS2), scrub (WS1), dense bracken (HD1), oak-birch-holly woodland (WN1) and a small area of wet heath (HH3). Most of these habitats are adjacent to the SPA or are indirectly connected to it via hedgerows.

Scrub and wet grassland are the main habitats of value outside of the designated areas in the upper parts of the Owenahallia River Valley. In places the scrub is almost tall enough to be considered as woodland and is made up of the same species as the scrub within the designated sites and includes species such as hazel, holly, birch and gorse. Ash, rowan, oak and willow are also found.

In the townland of Deerpark (Grid square 3803), the river is bordered by oak-birch-holly scrub/woodland growing in a fairly dry narrow valley that has steep sides in places. Main woody species are oak, downy birch, rowan, alder and some willow. According to owner deer and hares are plentiful and he has noted the occasional woodcock and barn owl. On the north side of the river there is a small area of scrub while a conifer plantation adjoins the oak-birch-holly woodland to the south.

The SPA within the river valley contains some diverse hazel-ash woodland, having developed on more fertile and calcareous glacial drift that has built up in the valley. The woodland type is similar to that found in Glenbarrow and contrasts with the more acidic type woodland that has developed higher up the river on the edge of Conlawn Hill. Further downstream the valley is vegetated by Gorse and mixed scrub and this area has potential to develop into woodland in the future.

The woodland west of the road is dominated by hazel and has developed in a ravine along the upper sections of the Owennahallia River. The scrubby woodland vegetation upstream on Conlawn hill, is dominated by birch, holly, willow and rowan. Parts of this woodland are open where it has encroached into small unmanaged enclosures. The best developed woodland is along the roadside and along the stream channel and are within the Slieve Blooms SPA, where a prominent patch of Dutch Rush, a horsetail whose distribution is rare in Laois. The canopy also contains Holly, Hawthorn and Ash. The species list indicates that this is old woodland that has been established for some time, although it has obviously been managed and there is very little mature ash in this section. The ground cover is quite diverse and there are a range of habitats including some wet sections with impeded drainage along the stream channel with willow as a more common canopy species.

This woodland is notable for the presence of a small petrifying or Tufa spring flowing into a small branch of the main stream. This spring is not listed in Heery's survey of Petrifying Springs in the Slieve Blooms. The spring is badly damaged by cattle trampling and is in poor condition. It is rather small compared to other examples in the Slieve Blooms. The vegetation on the spring is dominated by Liverworts. Possibility of other springs further down-stream on both sides of the valley should be considered.

The upper reaches of the Owennahallia River on Conlawn Hill display more frequent acidic indicators and hazel is rare. The scrub/woodland is dominated by birch and willow and rowan and holly are present. The scrub is surrounded by dense gorse. Further along the valley there is a natural transition from WN1 to hazel dominated woodland WN2.

The hazel-dominated woodland extends across the road and down the Owennahallia River valley. This section of the woodland is in good condition and contains more frequent mature ash. The species composition is similar to that described in N1.

Further down-stream the woodland is an extension of the woodland that has developed along the Owennahallia River valley on steep slopes. This is some of the most mature woodland with some mature Ash and other tree species present. The woodland is quite variable and there are open patches with scrub and some wet grassland. The age structure of woodland varies considerably with the oldest section along the river deep in the valley. It is notable that this area was mapped as wet ground and pasture in the nineteenth century, so the woodland has developed since then. Patches of the woodland have impeded drainage and are referable to WN6 type wet willow-alder woodland. These sections have mature alder, willow and ash present. The ground cover contains many of the species found in other parts of the wood (See N3601 N2 & N3). Signs of Deer activity. This woodland is not designated as part of the SAC but is included within the SPA. Consideration could be given to extending the SAC or NHA along this valley due to the presence of diverse woodland.

The area lower down in the valley is dominated by gorse scrub with some patches of young birch and willow. Some patches of dense bracken and wet grassland along river. Woodland has potential to extend into this area if there is sensitive management.

Rarity/importance of habitat
This area contains several rare habitats and best examples of habitats found in the local area.
Tufa springs qualify as an Annex I habitat listed in the EU Habitats Directive.

The woodland is a very good example of its type and rivals other WN2 woodlands in Laois for its quality and diversity. It also contains a transition from WN1 to WN2 type woodland (Birch-Holly to Hazel) that is rarely found.

The additional semi-natural habitats outside of the designated areas have value in that they increase the overall area of the designated habitats and provide continuity of habitat particularly in the lower reaches of the river where the pressures from agriculture are increased.

Core sites and ecological network of regional importance.
This valley offers significant value as a wildlife corridor and links Conlawn Hill to the surrounding farmland in the lowlands.

Requires recognition in local plan.
Yes
The woodland is of regional importance due to its diversity and warrants designation as NHA, although it is not extensive.

Vulnerability
Vulnerable to agricultural reclamation, forestry development, and clearance for timber.
Some dumping noted in woodland along roadside.
There has already been significant development of forestry in this area. It is important to maintain the remaining open habitats as unplanted to retain some other semi-natural habitats such as grassland and scrub.

Preferred management to protect biodiversity
Much of this site is presently unmanaged and should be left this way. There is potential to manage as part of an agri-environment scheme or as a Native Woodland Scheme.

Site 6 Owenass and Murglash River Valleys

Surveyed on 15/06/09, 13/08/09, 14/08/2009, 15/08/09

Td: Ballyfin, Ballyhuppahane, Clonehurk, Skerry,

Grid square: N3704, N3705, N3804, N3805, N3904, N3905

Target note No.
BallyfinN3704WL1N2
BallyhuppahaneClonehurkN3704ClonehurkSkerryN3804ClonehurkSkerry N3805SkerryN3904N4004FW1N1
BallyhuppahaneClonehurkN3704FW10
CloneyhurkN3804GS1N1
ClonehurkSkerryN3805WN2N1
ClonehurkSkerryN3805WS5N2
ClonehurkSkerryN3805FW1
CloneyhurkN3904WN4N1

Photographs
BallyfinN3704WL101
BallyfinN3704WL102
BallyhuppahaneN3704Catholefalls01
BallyhuppahaneN3704Catholefalls02
ClonehurkSkerryN3805FW10
ClonehurkSkerryN3805FW1Flaghole02

ClonehurkSkerryN3805FW1sandbank01
ClonehurkSkerryN3805FW1WN201
ClonehurkSkerryN3805FW1WN201
ClonehurkSkerryN3805WN2Amethystdeceiver01
ClonehurkSkerryN3805WN2Amethystdeceiver02
ClonehurkSkerryN3805WN2Badgersett01
ClonehurkSkerryN3805WN2Bracketfungus03
ClonehurkSkerryN3805WN2Bracketfungusonbirch01
ClonehurkSkerryN3805WN2Fungus on dead wood 01
ClonehurkSkerryN3805WN2Fungus04
ClonehurkSkerryN3805WN2Fungus05
ClonehurkSkerryN3805WN2Fungus07
ClonehurkSkerryN3805WN2moss03
ClonehurkSkerryN3805WN2Porcelainfungus01
ClonehurkSkerryN3805WN2Russula06
ClonehurkSkerryN3805WN2Russulasp.03
ClonehurkSkerryN3805WN2WN101
ClonehurkSkerryN3805WN2WN102
ClonehurkSkerryN3805WN2WN105
ClonehurkSkerryN3805WN2WN1slope01
ClonehurkSkerryN3805WN2WNFW101
ClonehurkSkerryN3805WN2WNFW103
ClonehurkSkerryN3805WN2WNFW105
ClonehurkSkerryN3805WS501

Description
This site of biodiversity importance extends along the Owenass River Valley and the Murglash River valley a tributary of the Owenass. The upper reaches of the Owenass River are adjacent to the Conlawn Hill which is within Slieve Blooms SAC (special area of conservation). Further stretches of the Owenass River form part of The Slieve Bloom SPA and/or are included within Coillte Biodiversity Sites.
Very little of the Murglash River Valley lied within a designated site.

Within the upper reaches of the designated areas along the Owenass River the land has been planted with forestry and is managed by Coillte. Some small pockets of semi-natural habitats including scrub and woodland have been left intact beside the river and in adjacent areas Parts of the river flow through a steep ravine that is an important wildlife corridor and is used by deer and badger. The site includes some small pockets of grassland on private land that represent some of the last unplanted patches of this habitat left in the valley. Some of this grassland is semi-natural and contains hot spots of Devil's Bit a food plant for Marsh Fritillary.
Habitats present include scrub (WS1), wet woodland (WN6), oak woodland (WN1), diverse wet grassland (GS4) acid grassland (GS3) and eroding river (FL1).

Over 2 km of the Owenass River (Grid squares N3804, N3805, N3904 and parts of N3704 and N4004), and most of the Murglash River (Grid squares N3705, N3805 and N3905), are not within any of the designated sites. Within theses grid squares both of these two rivers in particular the Owenass have areas of semi-natural habitats on either side of them. Oak-birch-holly woodland (WN1), was found adjacent to the Murglash River while oak-ash-hazel woodland (WN2), was the dominant woodland growing along the Owenass River. Other habitats included wet and dry grassland (GS4 and GS1 respectively) and scrub (WS1). At least six species of fungi including the porcelain fungus and Russula sp. were found within woodland along the Owenass River.

Active badger sets were found in woodland next to the Owenass River.
Wet grassland, scrub, oak-birch-holly woodland, hedgerows and drainage ditches can be found between the two rivers and form a continuous link between them.

Core sites and ecological network of regional importance.
These areas offer significant value as wildlife corridors linking designated areas and non-designated areas to each other and to the surrounding farmland.

Requires recognition in local plan.
Yes

Vulnerability
Vulnerable to agricultural reclamation, inappropriate forestry development.
There has already been significant development of forestry in this area. It is important to maintain the remaining open grassland habitats as unplanted to retain some other semi-natural habitats such as grassland and scrub.

Preferred management to protect biodiversity
Manage private land within agri-environment scheme. Continue grazing of grassland. Retain hedgerows, scrub and wet grassland.