Laois Habitats Survey 2006

River Barrow at Dunrally Bridge on the Laois Kildare border

Report prepared for Laois Heritage Forum:

An Action of the Laois Heritage Plan

Betsy Hickey and Mary Tubridy

Mary Tubridy and Associates
Dublin 01-8333195

September 2006

CONTENTS

List of Tables

List of Figures

Acknowledgements

We would like to acknowledge the valuable assistance provided by the following individuals and organisations:

- The landowners who allowed their land to be surveyed
- The IFA who invited us to a meeting of the county executive and committee members of IFA branches in Stradbally, Vicarstown, Emo and the Heath who met us at the start of the survey.
- The Laois County Council Information Technology section, which prepared maps and photos for use in fieldwork.
- John Prior Coillte Teoranta and Coillte's Portarlington Office for providing details of forest tree species and wood history in Coillte owned forests in the survey area.
- Dr Evelyn Moorkens, plant recorder for Laois for the Botanical Society of the British Isles for providing BSBI records for the surveyed areas
- Members of the County Laois Heritage Forum, particularly members of the Habitats Working Group.
- Funding was provided for this study by Laois County Council and the Heritage Council

Summary

This report contains the results of habitat mapping carried out in 2005 and 2006 in County Laois. Parts of the north west and south east of the county were mapped. The land is typical of lowland Laois and includes the town of Portarlington.

Information for the map was gathered through fieldwork assisted by colour aerial photographs (2000).

Habitats were mapped principally through fieldwork. In the summers of 2005 and 2006 ecologists examined habitats field by field within the survey area. A total of 90 townlands were surveyed over two years in an area covering 140 sq km. Permission was always sought before survey work took place and a series of discussions took place with the IFA in 2005 to assist in informing landowners about the purpose of the survey.

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). Each field or habitat was given a code on a field map. Lists were compiled of flowering plants associated with habitats and notes were compiled of noteworthy features.

Results from the marked up maps were digitised to produce computerised versions of the final maps. To date digitising has been carried out on all the land surveyed in 2006. The results of the 2005 survey have either been digitised or shown on hand coloured maps.

Principal findings are:

A total of 54 habitats are present in the area of Laois surveyed. Forty two habitats were found in 2005 whilst in 2006 an additional twelve habitats were recorded. They include four new types to describe either different types of garden habitats and land under development which are not contained in the original classification (Fossitt 2000).

Most of the land is covered in two habitats; improved grassland and arable land which are typical of intensive farming systems and which are of relatively low biodiversity value. Within such intensively farmed areas, habitats of greater biodiversity interest are found, such as hedgerows and drainage ditches. Field mapping confirmed the presence of 6.56km of hedgerow per square kilometre.

Semi-natural habitats, some of which are of high biodiversity value, account for less than 6% the total area surveyed. These include limestone/
marl lakes, scrub, old grasslands, woodland, wetlands, bogs and fen and flush. Some habitats are only found at one or two sites. The hums (upstanding outcrops of limestone which resemble small steep hills) north of Stradbally are particularly associated with oak-ash-hazel woodland.

The 54 habitats which have been identified support 385 plant species. In the first year (2005), 335 species were found while in 2006, 49 further species were added to the total. Species diversity varies greatly between habitats. The most valuable habitats for plants are wet grassland (>132 species) and scrub with >121 species. Those with the lowest number of native species include amenity grassland, set aside land, garden shrubberies and some types of woodland. A bee orchid found in a derelict quarry is a protected species under the Wildlife Act. Several other plants found are rare in the region and in Laois.

The habitat survey provides an essential report on biodiversity for parts of Laois. The map and associated statistics provide a baseline against which change can be benchmarked. Its contents can be used to inform the public about their local biodiversity and guide decisions on land use options and strategic planning. The Laois Biodiversity Action Plan requires to be informed by this survey. The vast majority of habitats in the countryside have developed as a result of some form of local development. In future local development will be required to take greater regard for biodiversity. The survey should be expanded to all parts of the county. This would increase the value of the information which has been gathered and enable informed decision making on biodiversity on a county wide basis.

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 on each of the two years:

- Carry out a detailed field survey of habitats in selected parts of County Laois.
- Liaise with the public and landowners in the areas surveyed and to ensure public awareness of the project being undertaken
- Use data collected to make recommendations on conservation priorities and any future work that should be carried out.
- Collate and make this information available for future research, through a detailed survey report and a set of raw data (including maps) as appendices.

1.2 Background

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. Habitats can vary in naturalness, depending on the extent to which they have been modified by development. They may be associated with land, freshwater or marine environments.

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.

The list includes 89 types associated with terrestrial and 28 with the marine environment. Habitat mapping is an important tool to identify areas of biodiversity interest. 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. Table 1 lists habitats, which require protection under the Habitats Directive. Priority types include raised bogs, alkaline fen, and orchid rich grasslands. They might expect to be found in Laois. Non priority types of relevance to this study area are various types of wetlands. While their protection is of lesser priority internationally they may be of national, regional and certainly of local importance.

Table 1 Habitats listed in the EU Habitats Directive

Priority habitat types are shown in bold. Reference numbers refer to numbering system used in EU (2003)

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 vegetaion (821))

Limestone pavements (8240)

Siliceous scree of montane to snow levels (*Androsacetalia alpinae*, *Caleopsietalia ladani*) (8110)

Calcareous and calcshist screes of the montane to Alpine levels (*Thlaspietea rotundifolii*) (8120)

Caves not open to the public (8310)

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".

The Habitats Directive states (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 provide 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. A Local Biodiversity Action plan will suggest how this heritage will be managed and developed.

To date there has never been a comprehensive and detailed survey carried out of the natural environment in County Laois. Survey work has focussed on designated areas, particular habitats and areas for which development is proposed. Little is known about 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. Habitat mapping carried out in Laois in 2005 (Hickey and Tubridy, 2005) provided the first account of the location and nature of habitat diversity in a small representative section of Laois.

The preparation of habitat maps provides baseline information to support the preparation of the local biodiversity action plan. The map 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 the special interest or eco-tourism.

The habitat map produced in 2005 provided the first account of habitat diversity in the county. Habitat mapping in 2006 provides information on a section of the county adjacent to the land surveyed in 2005. While most of the habitat maps produced in 2005 were only digitised later, the results of the mapping exercise in 2006 will all be digitised.

The two surveys should provide a comprehensive account of biodiversity in a bigger sample of the entire county. By creating a digital data base it will be possible to update and integrate its results with those from other sources of habitat mapping. An important indirect result of habitat mapping which is generated solely through field work is the opportunity it offers for contacts between ecologists and landowners.

2 Methodology

2.1 Approach

The approach used for the County Laois Habitats Survey was based on the Heritage Council Guidelines (Fossitt, 2000 and Heritage Council 2002), and drew on the experience of the surveyors in Dublin, Westmeath and Carlow.

While the brief for the survey specified that it would be carried out within parishes, this was reconsidered for the following reasons and townlands were selected as survey units. There are three types of parish – Civil, Church of Ireland and Roman Catholic. The Civil seemed the most appropriate but it proved difficult to find clear information regarding their boundaries. Few people identify with Civil Parishes. It was difficult to find suitable maps for the other two types of Parish and choosing an area based on religious criteria could be seen as favouring one section of the population over another. Consequently, it was decided to abandon the parish as a gross survey unit and to use town-land unit instead. The townland is an old mapping unit. Within rural areas townlands are important to locate households and farms and the boundaries of townlands often run along features of biodiversity interest such as hedgerows or streams.

2.2 Survey area

The selection of townlands was made principally by members of the County Laois Heritage Forum. Selection was based on the requirement to survey a geographic spread of townlands, which would contain both typical and unique Laois habitats. Designated areas such as Natural Heritage Areas (NHAs) and cSACs (Special Areas of Conservation) were omitted from the survey, as it was considered that the biodiversity value of these areas was known and their habitats would be mapped to inform their management plans. This excluded areas such as the Slieve Blooms.

In 2005 and 2006 blocks of townlands were surveyed in the north east and south west of the country (Fig. 1a and Table 2). In 2005 townlands around Emo, Portarlington & Stradbally, were surveyed. This area was extended to the county boundary including Portarlington in 2006. In the south west of the county habitat mapping focussed on the Aghaboe Roman Catholic Parish. Townlands within that parish were mapped in 2005 and a further set were examined in 2006. During the two years (2005 and 2006), the survey mapped habitats in 90 townlands. This included 58 in the area to the north east of the county and 32 in the south west, covering 140 km^2 of County Laois.

The habitat mapping rate and methodology was informed by trial surveys in 2005 in the townland of Morett and in 2006 around Portarlington. These trials tested the survey methodology, clarified the requirements for mapping and allowed for the resolution in differences in interpretation between surveyors.

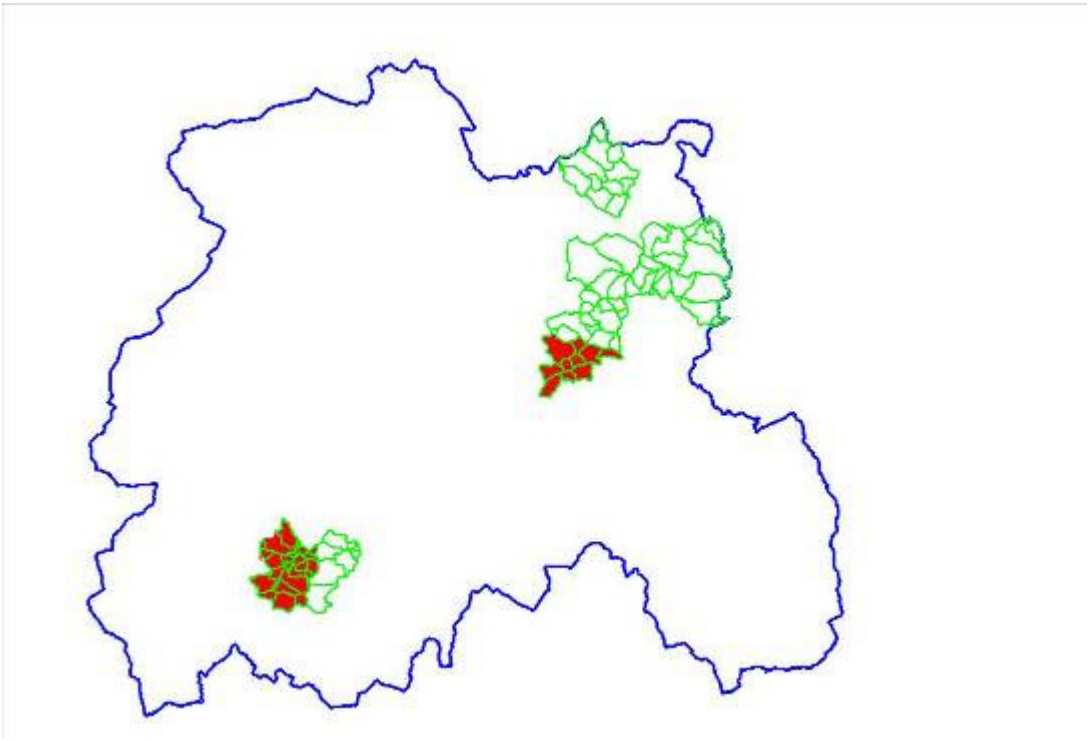


Figure 1 Areas surveyed during the Habitats Survey of Laois in 2005/2006.

Townlands shown in red have been surveyed while those in green have been surveyed and results digitised.

Table 2. Townlands surveyed in Laois in 2005 and 2006

Townlands marked * have not yet been digitised

Year and region	Townlands	
North east 2005	Aghnahilly*	Killone
	Aghnahilly Bog	Kilmurry
	Ballinlough	Kilteale
	Ballycarroll	Kylespiddogge
	Ballyduff (Ed Kilmurry)	Lamberton Demesne*
	Ballymaddock	Loughakeo*
	Ballythomas	Morett
	Bellegrove	Park Lower
	Cappakeel	Park or Dunamase
	Carigeen (Ed Kilmurry)	Park Upper
	Coolnacarrick*	Powelstown*
	Dysart*	Raheen
	Garryduff	Raheenahown South
	Garrymaddock	Raheenahown North
	Grange Lower*	Raheenanisky*

Year and region	Townlands	
	Grange Upper*	Rathcrea
	Hophall	Rossmore
	Killenny	Tonafarna
North East 2006	Ballymorris	
	Belan	Kilbracken
	Bracklone	Kilbride
	Belan	Lough
	Bracklone	Portree
	Coolagh	Rathleash
	Coolroe	Rathronshin
	Cooltederry	Rossmullan
	Courtwood	Tierhogar
	Doolough	Vicarstown (Dodd)
	Droghhill	Vicarstown (Cosby
South West 2005	Ballygowdan*	
	Ballyhinode*	Garryniska*
	Bordwell Big*	Grantstown*
	Bordwell Little*	Kilbreedy*
	Brocka*	Leap*
	Chapelhill*	Middlemount*
	Coolacurragh*	Middlemount or Ballyvoghlaun*
	Coolbally*	Oldglass (Part of)*
	Court*	Rhahandrick Lower*
	Curragh*	Rhahandrick Upper*
	Farranville*	Shanvaghey*
	Garryduff*	Tinnaragh*
South West 2006	Anster	
	Ballycolla	Kilminfoyle
	Dairyhill	Legaun
	Fearagh	Oldglass

2.3 Ancillary data

Ancillary sources of data are listed in Table 3.

Table 3 Ancillary data

Data source	Information	Usefulness/value of information
Vicarstown Village Residents Association	A study of the ecology of the Grand Canal Bank at Vicarstown, Co. Laois – with a view to sensitive development (Behan, 2002)	While the Grand Canal, as a Natural Heritage Area does not come under the remit of the study the report describes relevant adjacent habitats and has good lists of flora and fauna.
Coillte	Biodiversity Areas in the Mid Tipp/Rossmore Plateau, FMU 403, 2004	No surveyed sites listed in this report fell within the survey area.
Coillte	Biodiversity Areas in the Slieve Bloom Forest Management Units 705 (FMU).	There was one forest area (Area no. 21, Rossmore) from the FMU report in the areas surveyed. It provided useful information about biodiversity of River Glasha.
Coillte	Maps of different forest blocks in survey area.	These maps were useful as they provided clear information as to the extent and layout of the forests as well as details about forest tree species and wood history.
Dr Evelyn Moorkens	BSBI records for Laois	The presence of species records for the following townlands: Tierhogar Level Crossing N5710 Ballymorris N5410 Carrick Hill; Cooltederry N5410 Railway bridge and part of Portarlington town N5410 provide an indication of areas of particular interest
Royal Haskoning and JBA (2006) Portarlington Strategic Flood Risk Management Constraints Study	Habitat mapping using UK system in the immediate environs of the River Barrow and two small tributaries (Cemetery Stream and Blackstick Stream) near Portarlington. Field work focussed on river in SAC.	No species added to those already recorded. Habitats mapped in area outside the scope of this study.
NRA report for Laois County Council (ARUP Consulting Engineers)	Environmental Impact Statement M7 Portlaoise – Castletown, M8 Portlaoise – Cullahill Road scheme.	Habitat information for the townlands of Coolnacurragh pNHA Wet willow-alder-ash woodland (WN6); Curragh (Mixed) broadleaved woodland (WD1); Ballyhinode WD1; Clogh Oak-ash-hazel woodland (WN2) and Leap (Mixed) conifer plantation (WD3), surveyed in the Aghaboe region. Some descriptions of habitats. Some information on aquatic and riparian habitats – Erkina river
National Roads Design Office, Kildare County Council	EIS for M7 Heath-Mayfield Motorway	Habitat descriptions for some of townlands surveyed along motorway near Portlaoise.

Data source	Information	Usefulness/value of information
NPWS	Site synopsis of designated areas in study area	Site synopsis of the following areas were examined; Grantstown wood and Lough Site code 000417; Coolacurragh woods site code 000862; Kilteale Hill 000867; Dunamase woods 001494; Rock of Dunamase 001494 – Provided two extra species - *Catapodium rigidum*, Hedgerow Crane's bill

2.4 Consultations

Consultations were held with landowners, the Laois Heritage Forum and farming organisations. Leaflets were produced providing information about the project (see Appendix 1 for that used in 2006). This was given to landowners, libraries, to members of the public encountered by surveyors and left in local authority offices and libraries.

Regular consultations were held with the Heritage Officer and Heritage Forum to discuss areas to be surveyed, local contacts, and mapping requirements. After the pilot area was mapped in 2005 a further meeting took place to discuss the results and agree on the form and scale of the field maps that would be used during the survey.

On June 29th 2005 a meeting took place with most members of the Laois Heritage Forum during which progress on the survey was outlined. There was another meeting with the Heritage Forum on July 12th 2005 where issues regarding the digitisation of the maps were discussed with the IT department in Laois County Council. This meeting provided an opportunity to meet with Neil Foulkes and Anja Murray who were working on the Laois Hedgerow survey (Foulkes and Murray 2005).

Facilitated by the IFA's representative on the Heritage Forum a presentation was made to County Executive of the IFA in the Heritage Hotel, Portlaoise on May 3rd 2005 when the aims and purpose of the habitat study were outlined and help and permission to access private land were sought from farmers and landowners. Following on from the presentation to the County Executive of the IFA a meeting was held on 2nd June 2005 with local representatives of the IFA in the proposed survey areas.

During Heritage Week 2005 a presentation of preliminary results was made to the public during a day long seminar on Laois Heritage in Abbeyleix.

Consultations principally took place with landowners. During these contacts 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 contacted (Appendix 2).

2.5 Fieldwork

Habitats were principally mapped through fieldwork assisted by colour aerial photographs (2000), 6-inch OS raster maps (Ordnance Survey, 1906 edition) and vector maps (1:6,000). Fieldwork was carried out principally by Betsy Hickey assisted by Mary Tubridy and Mark Mc Corry in 2005 and principally by Betsy Hickey assisted by Mary Tubridy and Fiona MacGowan in 2006.

During 2006 maps and aerial photographs for use in the field were produced at A4 size. These were gridded according to the Discovery map. As the map or photo covered 2/3 of the page, there was adequate space on each sheet to include notes, surveyors name (s), date etc. A scale box size 50m X 50m was also shown (See Appendix 3 for a sample photograph).

Before the surveyors reached the area to be examined aerial photographs were examined carefully. Areas of improved grassland were usually obvious. Less improved areas were then targeted for detailed field examination. Examination of the OS map sometimes indicated the presence of features of habitat interest which if then obvious on the aerial photograph were also marked on the vector map for more intensive examination in the field.

On reaching the area to be examined and before starting fieldwork, landowners were located by identifying the nearest farmhouse. They were appraised about the purpose of the survey and asked for permission to survey their land. If time allowed they were engaged in a discussion on land management practices. If the landowner could not be located and their land could not be surveyed, habitats on their land were assigned using aerial photographs or/and visual inspection from the nearest accessible area.

The land was surveyed by walking along public roads or through fields. Habitat codes were added to the vector map on a field by field basis. If the habitat being mapped was not bounded by a field boundary, its limits were identified using a combination of aerial photography and field inspection.

Lists of plant species were compiled for each habitat type. Where particularly interesting species or habitats were found, a target note was taken and the area marked with a unique number on the map. Target notes were compiled on the sites of invasive exotic species. Photographs were taken of features of interest and habitats.

Species identification and nomenclature was based on Hubbard (1992), Jermy *et al* (1982), Mitchell (1978), Rose (1991), Rose (1989) and Webb *et al* (1996).

Surveying took place over a period of 46 days during June, July and August in 2005 and 2006. The land was surveyed at an average rate of 3 km^2 per day, however this varied according to the location, terrain and habitat diversity. Cover varied from approximately 1–2 km^2 per day in areas where there was a high diversity of habitats in both rural and urban areas to 5-6 km^2 per day in areas that were predominantly improved agricultural grassland.

2.6 Modifications to published methodology

Changes to the methodology were required to describe habitat types not considered by Fossitt (2000). These were:

- BL3D land being developed
- BL3 1 big gardens
- BL3 2 medium gardens
- BL3 3 small gardens
- ED6 setaside.

All are man-made habitats. The first four occur primarily in urban areas and were identified in 2006 around Portarlington. The fifth habitat ED6 setaside was found in 2005.

BL3D Land being developed: Land being developed refers to areas that are being developed for residential or industrial use and are temporarily in a state of flux. (irregular pattern of tiny grey squares () on a white background).

Currently garden habitats can fit into one of two categories depending on whether they are (a) predominately (GA2) amenity grassland (improved) or (b) predominantly ornamental/non-native shrub. These habitat designations are appropriate when the gardens being surveyed are in rural areas and/or they are sparsely distributed, in urban areas however where houses are closely packed together it is not feasible to assess each garden individually. Subsequently, it was decided to divide urban gardens and housing estate developments in rural areas into categories depending on the size of garden.

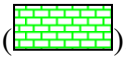
The three garden types were principally distinguished by size; big gardens BL3 1 (> than 500 m^2), medium gardens BL3 2 (250 and 500 m^2) and small gardens BL3 3 (<250 m^2).

BL3 1 Big Gardens (small crosses outlined () by the colour olive green.

BL3 2 Medium gardens (pattern of wavy horizontal lines () and the colour olive green.

BL3 3Small gardens (squares ()with olive green lines on a white background)

ED6 Setaside (irregular pattern of tiny red squares () on a white background.

An additional symbol was developed for ornamental hedgerows (habitat category WS3). Ornamental hedgerows are linear in character and the existing symbol/pattern for WS3 is area based; subsequently a dark green hatched line
() was used for hedgerows of non-native species and called WS3 A, whilst ornamental trees and shrubs became WS3 B and maintained the original pattern ().

New one-off houses that were not represented on the vector maps were drawn in, in their approximate location and given a different colour () but same pattern and code letters to Buildings and artificial surfaces BL3.

The location of target notes was shown on vector maps instead of GPS readings and given a 4-figure grid reference.

2.7 Constraints

Timing affected the completeness of plant lists in surveyed habitats. While habitat types can be identified in all seasons plants in woodlands were under recorded as these flower early in the season. Access was an issue in a few areas. In 2005 the size of maps made fieldwork difficult as A0 size was difficult to manage in the field. This problem was rectified in 2006 thus making fieldwork more efficient.

2.8 Processing and presentation of results

During fieldwork, a large amount of information was gathered. This included species lists, digital photographs, annotated vector maps and target notes on individual sites. The species lists, as well as a checklist of habitat types and any landowner details, were compiled into an Excel spreadsheet within one or two days of fieldwork.

Hand-coloured maps showing habitats in the townlands were produced to accompany the report of the survey in 2005. During the early part of 2006 approximately half of the townlands surveyed in 2005 were digitised using MAPINFO. All the habitat information was digitised in 2006. This was more cost effective and efficient as the maps were produced by the principal surveyor soon after fieldwork was finished.

This report contains the results of the mapping projects in 2005 and 2006. It is accompanied by a hard copy of the habitat map, an excel file with target notes for both years and a CD containing digitised results and photos.

3. Results

3.1 Summary

The principal results of the survey are summarised in Tables 4, 5, 6 and 7. Appendix 3 contains a complete species list of plants recorded in both years Appendices 4/5 and 6 list uncommon species and Appendix 7 contains information about plant species in all habitats surveyed.

3.1.1 Habitat and species diversity

Table 4 identified habitats in the area surveyed and total number of species recorded from these habitats.

Table 4 Habitats and associated species recorded during the survey, 2005 & 2006

Habitats marked with * were recorded for the first time in 2006.

Level 1 Habitat	Level 2 Habitat	Level 3 Habitat	No. of species recorded per habitat
F Fresh water	FL Lakes and ponds	FL3 Limestone/marl lakes	20
		FL4 Mesotrophic lakes*	6
		FL5 Eutrophic lakes	32
		FL8 Other artificial lakes and ponds	3
	FW Watercourses	FW2 Depositing lowland rivers	32
		FW3 Canals*	27
		FW4 Drainage ditches	54
	FP Springs	FP2 Non-calcareous springs	17
G Grassland and marsh	GA Improved grassland	GA1 Improved agricultural grassland	40
		GA2 Amenity grassland (improved)	13
	GS Semi-natural grassland	GS1 Dry calcareous and neutral grassland	104
		GS2 Dry meadows and grassy verges	94
		GS3 Dry-humid acid grassland	26
		GS4 Wet grassland	131
		GM1 Marsh	22
H Heath and dense bracken	HH Heath	HH3 Wet heath	18
	HD Dense bracken	HD1 Dense bracken	22
P Peatlands	PB Bogs	PB1 Raised bog*	32
		PB4 Cutover bog	41
	PF Fens and flushes	PF1 Rich fen and flush	13
		PF2 Poor fen and flush	14
W Woodland and scrub	WN Semi-natural woodland	WN1 Oak-birch-holly woodland	4

Level 1 Habitat	Level 2 Habitat	Level 3 Habitat	No. of species recorded per habitat
		WN2 Oak-ash-hazel woodland	106
		WN6 Wet willow-alder-ash woodland	40
		WN7 Bog woodland	10
	WD Highly modified /non-native woodland	WD1 (Mixed) broadleaved woodland	71
		WD2 Mixed broadleaved/ conifer woodland	41
		WD3 (Mixed) conifer woodland	3
		WD4 Conifer plantation	7
		WD5 Scattered trees and parkland	6
	WS Scrub/transitional woodland	WS1 Scrub	122
		WS2 Immature woodland	30
		WS3 Ornamental/non native shrub	5
	WL Linear woodland/scrub	WL1 Hedgerows	106
		WL2 Tree line	17
E Exposed rock and disturbed ground	ER Exposed ground	ER2 Exposed calcareous rock	33
	ED Disturbed ground	ED1 Exposed sand, gravel or till	10
		ED2 Spoil and bare ground	4
		ED3 Re-colonising bare ground	42
		ED4 Active quarries and mines*	1
		ED6 Set-aside	6
B Cultivated and built land	BC Cultivated land	BC1 Arable crops	4
		BC2 Horticultural land	4
		BC3 Tilled land	-
		BC4 Flower beds and borders	19
		BL1A Stone wall	16
		BLIB Other stone-works	4
		BL2 Earth banks	33
		BL3 Building and artificial surfaces	40
		BL3 D Land being developed*	-
		BL3 1 Big gardens*	-
		BL3 2 Medium gardens*	-
		BL3 3 Small gardens*	-

A total of 54 different habitats have been identified in the area surveyed in Laois. Forty two habitats were found in 2005. An additional twelve habitats were recorded in 2006. These include three garden types found around Portarlington. Some of these are priority and non priority habitats recognised under the Habitats Directive.

In these habitats 385 plant species are found. The most species rich habitats (with >100 species) include dry and wet grasslands, oak ash hazel woodland, scrub and hedgerows. All of these are semi natural types. Those with the highest number of species, wet grassland scrub, tend to be diverse and are usually present within mosaics of other habitats in which either wet grassland or scrub is dominant.

Among the 385 species, 30 (listed in Appendix 4) are rare regionally and locally. These include the protected bee orchid (Fig. 2); the Red Data Book species (Curtis and McGough, 1988) marsh helleborine and the regionally rare lesser butterfly-orchid, greater butterfly-orchid and mountain everlasting.

Figure 2 Dry calcareous and neutral grassland with the rare bee orchid growing in association with quaking grass and bird's-foot-trefoil in a disused quarry, Kilbride, Co. Laois

Species(protected under the Wildlife Act 1976. GS1, grid square N5209, target note 7).

The Irish Branch of the Botanical Society of the British Isles (Appendix 5) recorded an additional 97 species in the study area and records compiled by the Dublin Naturalist's Field Club during an outing to Hewson Hill, Coolnacarrick provide an additional 8 species (Appendix 6).

In contrast to the presence of native plant species which are rare, reflect local ecological conditions and are under threat two non-native plants Japanese knotweed and rhododendron are spreading into semi natural habitats in Laois and thus threatening the local flora and fauna.

Japanese knotweed is now growing actively at five locations in the surveyed area:

- Lamberton Demesne S5195 Target note 4 at which a stand about 5 m wide was seen on a road verge beside a lay by;
- Tinnarragh S3281 Target note 3, in hedge and garden of derelict house;
- Grantstown S3379 Target note 1, 10 -15 m long strip on roadway verge adjacent to Coolnacurragh wood.
- Courtwood N6103 Target note 4, beside a derelict house adjacent to canal.

- Vicarstown (Dodd) N6101 Target note 1, where 4 or 5 stands are growing on the western side of the Grand Canal.

Rhododendron was found growing in Garryvacum N5507 Target note 8 on cutover bog and it was also recorded by the BSBI in Grantstown S3380.

Unless unchecked both these plants will quickly dominate the ecology of the habitats where they are now found.

3.1.2 Cover of habitats (measured by area)

Table 5 provides information on the relative cover of principal habitats. Table 6 lists high value semi-natural types

Table 5 Cover of principal habitats recorded in Laois Habitats Survey

Habitat	Area (ha)	% total area digitised
Improved Agricultural Grassland	5201.1	55.51
Arable Crops	2642.6	28.20
Conifer Plantation	200.7	2.14
Amenity Grassland (Improved)	199.1	2.12
Wet Grassland	152.0	1.62
Buildings and Artificial Surfaces	135.4	1.45
Scrub	107.9	1.15
Immature Woodland	102.2	1.09
Oak-Ash-Hazel Woodland	52.8	0.56
Cutover Bog	47.0	0.50
Mixed Broadleaved Woodland	45.9	0.49
Small Gardens	44.8	0.48
Dry Meadows and Grassy Verges	43.6	0.47
Mixed Broadleaved Conifer Woodland	42.6	0.45
Little Gardens	42.0	0.45
Land Being Developed	37.4	0.40
Scattered Trees and Parkland	34.1	0.36
Big Gardens	30.91	0.33
Dry Calcareous and Neutral Grassland	28.2	0.30
Ornamental Non-Native Shrubs	25.9	0.28
Recently Felled Woodland	24.7	0.26

Habitat	Area (ha)	% total area digitised
Tilled Land	23.4	0.25
Recolonising Bare Ground	19.8	0.21
Marsh	13.4	0.14
Mixed Conifer Woodland	13.3	0.14
Active Quarries and mines	9.7	0.10
Horticultural Land	9.6	0.10
Raised Bog	9.3	0.10
Spoil and Bare Ground	7.4	0.08
Dry Humid Acid Grassland	4.9	0.05
Setaside	3.7	0.04
Wet Heath	3.4	0.04
Wet Willow-Alder-Ash Woodland	2.0	0.02
Oak-Birch-Holly Woodland	1.80	0.02
Eutrophic Lakes	1.50	0.02
Other Artificial Lakes and Ponds	1.5	0.02
Rich Fen and Flush	1.0	0.01
Exposed Calcareous Rock	1.0	0.01
Other Stone Works	0.7	0.01
Limestone Marl Lakes	0.6	0.01
Dense Bracken	0.5	0.01
Mesotrophic Lakes	0.3	0.00
Exposed Sand Gravel or Till	0.3	0.00

Table 6 Status of semi-natural habitats recorded

Habitats marked with * are priority or non priority types listed in the Habitats Directive

Habitat	Area (ha)	% of total area digitised
Wet Grassland	152.0	1.62
Scrub	107.9	1.15
Oak-Ash-Hazel Woodland	52.8	0.56
Dry Meadows and Grassy Verges	43.6	0.47
Dry Calcareous and Neutral Grassland *	28.2	0.30
Marsh	13.4	0.14
Raised Bog *	9.3	0.10
Dry Humid Acid Grassland	4.9	0.05

Habitat	Area (ha)	% of total area digitised
Wet Heath *	3.4	0.04
Wet Willow-Alder-Ash Woodland	2.0	0.02
Oak-Birch-Holly Woodland *	1.80	0.02
Rich Fen and Flush *	1.0	0.01
Exposed Calcareous Rock *	1.0	0.01
Limestone Marl Lakes *	0.6	0.01
Dense Bracken	0.5	0.01
Mesotrophic Lakes	0.3	0.00
Poor fen and flush	0.0	0.00
Total area/% of semi-natural habitats	**422.7**	**5.01**

Semi-natural habitats take up a small proportion of the area surveyed c. 5%. Improved agricultural grassland and arable land together account for almost 84% of the habitats based measured by area. This is not surprising as the principal land use in this area is farming, leaving few areas unmanaged apart from very wet, inaccessible sites and or areas where the underlying calcareous rocks lie too close to the surface to warrant cultivation or other intervention such as fertiliser application.

Almost all of these semi-natural habitats are rare nationally, regionally, locally as this survey shows and some are listed for protection under the Habitats Directive.

Wet grassland and scrub are the two largest semi-natural habitats sharing over half the total semi-natural habitat area between them with 1.62 % and 1.15 % respectively). These are also among the species rich habitats. Wet grassland habitat was the largest of all the semi-natural habitats whilst calcareous springs and poor fen and flush were the smallest. The presence of wet grassland is an indicator of particular types of local drainage conditions.

Areas of semi-natural woodland and scrub account for 0.6% and 1.15% of the total digitised. In contrast planted non-native woodland makes up 5% of the total area. The most common type of semi-natural woodland in the area surveyed is oak-ash-hazel woodland. This is found principally on the hums.

Scrub was found throughout the area surveyed in out of the way corners on farms, in disused quarries or on forts and other monument sites.

3.1.3 Status of linear habitats

The status of these habitats was measured by length and results are shown in Table 7.

Table 7 Status of linear habitats

Habitat	Length (km)	% of total area digitised
Hedgerows	919.0	84.62
Drainage Ditches	88.7	8.17
Depositing Lowland Rivers	27.0	2.49
Ornamental Non-Native Shrubs	21.0	1.93
Tree line	20.9	1.92
Stone Walls	6.4	0.58
Canals	1.6	0.15
Earth Banks	1.4	0.13

The survey area contained 919 kilometres of hedgerows accounting for 84 % of the total digitised linear habitats. If these hedgerows average 2m in width their approximate area is 1838 ha. This makes them the most extensive semi natural habitat in the surveyed area approximately c. 12 times greater than the cover of wet grassland. The average length of hedgerow /square km is 6.56 for this survey and compares with 7.28 for the figure provided by Foulkes and Murray (2005). The difference may be due to the particular characteristics of the two study areas. The area covered by the habitats survey may represent relatively more intensively managed compared to the average type of land in the county.

Drainage ditches comprise the next most significant linear habitat. These are traditionally associated with hedgerows. It is likely however that drainage ditches are under recorded as it is not always easy to detect drainage ditches from aerial photographs, nor was it possible to check all those outlined on the vector maps.

Depositing low land rivers are also under recorded particularly as the entire length of the River Barrow was excluded from the survey as it is within a designated area.

The remaining linear habitats in the survey (ornamental non-native shrubs, tree lines, stonewalls, canals, earth banks collectively accounted for slightly less than 5% of the linear habitats with ornamental-non native shrubs (1.93 km) and tree lines (1.92 km) virtually the same.

3.2 Habitat accounts

3.2.1 Introduction

Summary descriptions and preliminary assessments of the principal habitats of biodiversity interest are complemented by species lists in Appendix 7 and target notes contained in an Excel database which are referenced in Appendix 8.

3.2.2 Wetlands

 **FL3 Limestone/marl lakes (sky-blue or light blue squares on a white background).**

Limestone/marl lakes are found mostly in Bellegrove (Grid square N5905, target notes 3 and 4), Ballinlough (Grid square S5399, target note 1), and in Kilbride (Grid square N5209, target note 4, Fig. 3) in the north east of Laois. The overall area of this habitat category is small. Ballinlough Lake is the largest of those surveyed (~ 0.25 ha). Few floating species were growing in the water

but tall herb swamp vegetation (FS2, grid square S5399, target note 3) encircled the lake. This was undisturbed and dominated by yellow iris with water mint, sweet grass sp. and branched bur-reed. Two small lakes were found in Kilbride in a disused quarry (Fig. 3), and these contained an additional 6 species. Most of the lake and pond habitats (FL4, FL5 eutrophic lakes and FL8 other artificial lakes and ponds) that were surveyed were quite small (< 0.25 ha), and most were in a degraded condition having either become overgrown through neglect or considerably altered through the planting of exotic species within and around the perimeter or parts had been filled in for safety reasons. Others were eutrophic due to unrestricted access to them by livestock. In general there were few plant species associated with these lakes/ponds.

Figure 3 Limestone/marl lake (FL3), in a disused quarry in Kilbride, County Laois (N5209, target note 8).

The exposed gravel bank at the back of the photograph is home to a colony of sand martins.

FW2 Depositing lowland rivers (sky blue solid line).

Twenty seven km of depositing lowland rivers were recorded, this excludes all of the River Barrow because it is a designated SAC (Table 7). Townlands with depositing lowland rivers include Garryvacum (Grid square N5506, target note 1), Courtwood (Grid squares N6002 and N6102 and target notes 1 and 2 respectively, Fig. 4) and Vicarstown (Dodd, Grid square N6001, target note 2). Depositing lowland rivers range in size from small shallow streams (Garryvacum) to large rivers such as the Barrow. The Glasha river (Courtwood Grid square N6102, target note 2) although small was free flowing with a substrate of sand and gravel and contained some small fish, whilst in Vicarstown (Dodd, Grid square N6001, target note 2) a kingfisher was observed chasing water hens along the stream.

Figure 4 The Glasha river (FW2) flowing through arable farmland (BC1) in Courtwood, Co. Laois (N6102, target note2).

FW3 Canals (sky blue dotted line).

The Grand Canal which flows through parts of Co. Laois is a designated NHA and consequently does not fall under the remit of the survey. However canal type habitats were surveyed along the Mountmellick branch of the canal between Portarlington and Mountmellick. The natural and cultural heritage of this canal is the subject of a more detailed survey (Hammond and Feehan, 2006) for Laois Heritage Forum. Sections containing water were found in Bracklone (Grid square N511, target note 3, fig. 5) and in Kilbride (Grid square N 5210, target note 2). Both areas were fringed with scrubby habitats and evidence of wildlife was apparent in each with bird prints showing in soft mud at the edges of the canal in Bracklone. Ducks are frequent in the canal at Kilbride (personal communication with landowner). However water filled sections were rare. Most of the canal is now infilled or no longer contains water.

Figure 5 A disused section of the Mountmellick branch of the Grand Canal in Bracklone, east of Portarlington, Co. Laois (Grid square N5511, target note 3).

W4 Drainage ditches (indigo dotted line).

Drainages ditches are typically found forming field boundaries, adjacent to field boundaries or in low-lying wet areas in fields. Drainage ditches that are not subject to shading from adjacent hedgerows are common in both of the two survey areas, but particularly in townlands off the R422 such as Raheenahown North, Garrymaddock and Rathcrea. These drainage ditches appear to be more species rich than those associated with hedgerows or woodland margins e.g. in the drainage ditch examined in Raheenahown North (Grid square N5802, target note 2), 29 different species were recorded compared to a drainage ditch dominated by horsetails in Morett, that was associated with a woodland margin of grey willow (Grid square N5404, target note 14). A total of 54 different species were found in the drainage ditches surveyed (Table 4), including heath spotted and southern marsh orchid, hemp agrimony, marsh arrowgrass, marsh cinquefoil, marsh marigold, meadowsweet and sharp-flowered and soft rush. The drainage ditch at Kearney's Lough in Cooltederry (Grid square N5311, target note 2) was dominated by reed canary-grass. The condition of the ditches range from being open with a constant flow of water to those covered with vegetation. The drainage ditch examined in Raheenahown North (Grid square N5802, target note 2), was covered in vegetation. In Ballymorris (Grid square N5211, target note 4, Fig. 6) a double ditch was found separated by a dense hedgerow. Both drains contained water but were choked with vegetation.

Figure 6 One side of a double drainage-ditch (FW4) in a field of barley in Ballymorris, Co. Laois (N5211, target note 4).

3.3.3 Grasslands

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

Dry calcareous and neutral grassland was found in both of the survey areas encompassing an area of 28.2 ha (Table 5), however there were more examples of this habitat type in the north east of the county than in the south west. Although dry calcareous and neutral grassland occurred on its own, it also formed mosaics with wet grassland, particularly, in fields with uneven topography such as those found in Garrymaddock and Rathcrea.

Dry calcareous and neutral grassland tended to be species rich and a total of 104 different species were recorded (Table 4). Typical species found in the majority of sites included oxeye daisy, quaking grass, yellow-wort, false-oat grass, yarrow, common knapweed and red clover. Five uncommon species were recorded in dry calcareous grassland; mountain everlasting was recorded in one site in Middlemount or Ballyvoghlaun (Grid square S3278 N2 GS1), whilst adder's tongue was recorded in 2 locations (Rathcrea grid square N5902 N2 GS1 and in Garrymaddock Grid square N5702 N13 GS1), fragrant orchid was also recorded in the Garrymaddock site while bee orchid was recorded in a disused quarry in Kilbride (Grid square N5209, target note 6, Fig. 2). The dry calcareous and neutral grassland in the quarry (Kilbride, Fig. 7) contained at least 65 different species and in addition to bee orchid species included carline thistle, kidney vetch, downy oat grass, yellow oat grass and marsh helleborine. Even though species numbers were high in dry calcareous and neutral grassland nearly all of the areas in which it occurs are degraded due to disturbance, some of which has been caused by land reclamation. The dry calcareous and neutral grassland in Kilbride was an exception as it was relatively undisturbed and was not in receipt of fertiliser.

Figure 7 Species rich dry calcareous and neutral grassland (GS1) in a disused quarry in Kilbride, Co. Laois, (N5209, target note 7)

GS2 Dry meadows and grassy verges (yellow diagonal lines slanting to the right).

Dry meadows and grassy verges were found in at least 13 townlands, beside roads (Killone, grid square N5402, target note 3), along laneways (Rathcrea, grid square N5801, target note 9), in graveyards (Tierhogar, grid square N5510, target note 1), overlying small outcrops of limestone in Coolnacarrick (Grid square S5296, target note 1) and beside a section of disused Mountmellick Branch of the Grand Canal in Kilbride (Fig.8). Ninety four species were recorded from an area of 43.6 ha of dry meadows and grassy verge habitats (Tables 4 and 6) including false oat-grass, cock's-foot, crested dog's-tail, common bent-grass, Yorkshire fog, quaking grass and downy oat-grass which was found in Coolnacarrick growing on an outcrop of limestone where the habitat was not being actively managed, other than some light grazing. Forty-six species including glaucous sedge, lady's bedstraw and fairy flax were recorded from the roadside grassy verge in Killone that had been disturbed due to road realignment in the past, however many of the road side verges were species poor.

Figure 8 Dry meadow and grassy verge habitat (GS2) growing on a bank adjacent to Mountmellick Branch of the Grand Canal in Kilbride Co. Laois (N5210, target note 5).

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

A total of 26 species were recorded in dry-humid acid grassland habitats (Table 4), which were found in the townlands of Morett, Cappakeel, Garrymaddock and Hophall all in the north east of County Laois. In Morett (Grid square N5404, target notes 1 and 9, Fig 9) tussocks of the grass cock's-foot dominated while other species included purple moor-grass, silverweed and yarrow. In Cappakeel (Grid square N5604, target note 2) Yorkshire fog, bent grasses, sweet vernal and crested dog's-tail were among the main species present. In Morett dry-humid acid grassland was in poor condition, as bramble and gorse dominated scrub, were encroaching into the fields. One of the fields appeared abandoned whilst horses grazed in the other field at the time of the survey. Dry-humid acid grassland also occurs as a mosaic with GS4 in Hophall (Grid square S5015, target note 10) in what appears to be abandoned farmland.

Figure 9 Dry humid-acid grassland (GS3) in Morett Co. Laois (N5404, target note 1)

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

After improved grassland (GA1), Wet grassland (GS4) is the commonest type of grassland. It is found in 22 of the townlands surveyed most of which are in the north east section of County Laois. Not only was wet grassland the most species rich habitat surveyed with a total of 131 different plant species it also covered the largest area (152 ha) for a semi-natural habitat (Table 4 and Table 5). Species composition was not the same in the different wet grassland sites, for example, in Rathcrea (Grid square N5901, target note 4) common spike-rush is dominant, in Hophall (Grid square S5905, target note 1) sharp-flowered rush is the most abundant species while in Garryduff (Grid square S3182, target note 14) the grassland is dominated by jointed rush and meadowsweet while purple moor-grass, Yorkshire fog and purple loosestrife were species with a frequent occurrence. Garryvacum (Grid square N5507, target note 7) has the most species diverse wet grassland of the areas surveyed with 55 different species counted from the site which was adjacent to an area of cutover bog and scrub. The rare species columbine (Appendix 4) was also recorded from this area in Garryvacum along with marsh arrowgrass, rough hawkbit and common cotton-grass. Dairyhill and Ballymorris were also species rich with 34 and 33 species respectively (Table 4, fig. 10). There are also some particularly good examples of wet grassland in Garrymaddock (Grid square N5703 target note 4); Park or Dunamase (Grid square S5198 target note 7); Rathcrea (Grid square N5901 target note 4); Garryduff (Grid square S3182 target note 14) and Curragh (Grid square S3481 target note 2, Fig. 7).

Figure 10 Wet grassland (GS4) in Ballymorris, Co. Laois (N5411, target note 1). Flag iris and Goat willow were among the species found there.

GM1 Marsh (yellow infill).

Marsh habitats are found in 4 townlands two of which, Aghnahilly bog (Grid square S5198, target note 7) and the Rock of Dunamase (Grid square S5198, target note 3) are adjacent to each other. The other 2 townlands are Tintore /Ballycolla (Grid square S3581, target note 1) and Cooltederry (Grid square N5412, target note 4). Collectively the total area of marsh habitat is quite small (13.4 ha) accounting for only 0.14% of the total area digitised to date (Table 5).
Standing water is characteristic of Aghnahilly bog and the Rock of Dunamase. The marsh in Aghnahilly, which is quaking, appears to be in transition between marsh and cutover bog. This is a species rich habitat with 35 different plant species. In Park or Dunamase, reed canary-grass, marsh willowherb, reedmace and meadowsweet are the dominant species whilst in Aghnahilly Bog meadowsweet and wild angelica dominate. Both areas of marsh are bounded by a strip of bog woodland, which is encroaching along their edges. Neither of the sites appeared to be disturbed or grazed to any extent. Past attempts to reclaim the marsh in Tintore/Ballycolla (Fig. 11) were unsuccessful and the marsh currently has great fen sedge, common reed, black bog rush and purple loosestrife among its species.

Figure 11 Common species found in Marsh (GM1) habitat (meadowsweet, purple loosestrife and common reed) in Tintore and Ballycolla (S35818, target note 1).

3.3 4 Heath and Bog

HH3 Wet heath (brown squares on white background).

Wet heath habitats are found in Morett and Garrymaddock where a total of 18 different plant species were recorded**.** In Morett wet heath is found in 3 areas and on one of the sites (Gird square N5404, target note 2), the heath appeared to have developed on cutover bog that had previously been reclaimed for grass but now seems to be abandoned as there were no signs of grazing or other disturbance. Shrub species typically associated with wet heath such as ling and cross-leaved heath were absent, but the vegetation is dominated by purple moor-grass with frequent black bog rush, however, brambles and gorse were encroaching (Fig. 12). In Garrymaddock (Grid square N5404, target note 11) wet heath is found forming a mosaic with WN2 (oak-ash-hazel woodland) on the wetter parts of the site, near the river Glasha, where birch, willow and ash scrub were frequent. The overall area of heath is however small with the 4 areas comprising only about 1 ha.

Figure 12 Wet heath (HH3) habitat in Morett (N5404, target note 3), dominated by purple moor-grass, which is being invaded by brambles and gorse scrub.

PB1 Raised bog (violet horizontal lines).

Raised bog occurred only in Garryvacum (Grid square N5507, target note 10, fig. 13). It covered an area of 9.3 ha which came to 0.1% of the total area currently digitised (Table 6). It was adjacent to cutover bog (PB4) which was about 2 - 3m lower than it. There was a conifer plantation growing to the south west of the bog while the cutover bog was almost surrounded it to the north and east. The surface of the bog was fairly dry and peat was exposed in places but no rain had fallen for a considerable time. Ling heather dominated the vegetation which was growing in association with deer grass, bog asphodel, bog rosemary and horsetail cotton-grass. Downy birch was scattered over the bog which is being grazed by deer (Fig. 13).

Figure 13 Raised bog (PB1) habitat in Garryvacum (N5507 target note 10), ling and deergrass were among the species found there.

PB4 Cutover bog (violet diagonal lines slanting to the right).

Examples of cutover bog are found in the townlands of Aghnahilly Bog (Grid square S5198, target notes 1, 3, 4 and 5), the adjacent townland of Dysart (Grid square S5197, target note 1) and in Garryvacum (Grid square N5507, target note 8, fig. 14). In Aghnahilly Bog and Dysart the cutover bog was adjoining small sections of uncut bog. This site has been modified through drainage and burning which has occurred in the last 5 years. Consequently the bog is very dry. Although there are wet hollows in places, sphagnum cover is poor and parts of the surface are covered in bare peat. Around the perimeter there are very small areas of naturally regenerating birch woodland within areas of scrub. While there is a fence line running through the bog there were no signs of grazing, nor were there any signs of cutting. Twenty-eight species were found in this habitat including typical raised bog species such as bog rosemary, ling, cross leaved heath, cotton-grasses, purple moor-grass, royal fern and bog asphodel (Fig.11), while in the pools the bog forming mosses, *Sphagnum imbricatum* and *S. cuspidatum* occurred. Aghnahilly bog is within a few kilometres of Portlaoise town. The entrance to the bog (an area of recolonising bare ground ED3, Dysart grid square S5198, target note 1) is being used as a dumping area for old cars and garden rubbish.

A total area of 47 ha of cut over bog was surveyed accounting for 0.5% of the total area digitised to date (Table 6). In Garryvacum the surface of the cut over bog was dry to walk on but had not dried out. Forty one species were recorded from cut over bog which was dominated by common cotton-grass (Table 4).

Figure 14 Cutover bog (PB4) with conifer plantation, raised bog and a grazing deer in the background in Garryvacum (N5507 target note 8).

PF1 Rich fen and flush (violet diamonds on a white background).

One example of this habitat is found in the townland of Morett (Grid square N5404, target note 6, Fig. 15). It was waterlogged and most of the vegetation formed tussocks. The overall area was small (1 ha, Table 6) but in good condition with no signs of disturbance. Two different groups of plants could be distinguished and they naturally formed 2 distinct zones. On the southern side a large area was covered in common reed and purple moor grass, while to the north, black bog rush was common. The site was bordered on 3 sides by woodland and on the fourth by a drainage ditch. A total of 13 species were recorded (Table 4) and in addition to those mentioned above were carnation sedge, water mint and devil's-bit scabious.

Figure 15 Rich fen and flush (PF1) in Morett, where large tussocks of purple moor-grass can be seen N5404, target note 6).

PF2 Poor fen and flush (lilac infill).

The area of poor fen and flush surveyed was very small and was not marked on the map as a separate habitat but is identified by a target note. In all 14 different species were noted including marsh cinquefoil which was abundant (Table 4, fig. 16), as was deer grass, bog asphodel, devil's-bit scabious, cross-leaved heath and round-leaved sundew were also present.

Figure 16 Small area of poor fen and flush (PF2) within cutover bog in Garryvacum (N5507, target note 11). Marsh cinquefoil, sphagnum mosses and round-leaved sundew were common.

3.3.5 Woodland and scrub

WN2 Oak-ash-hazel woodland (green vertical parallel lines).

Oak-ash-hazel woodland is found throughout the survey area in both the north east and the south west of County Laois. It is typically found on base-rich sites where drainage is good or on limestone outcrops. It is particularly associated with the hums (upstanding limestone outcrops that form steep rounded hills) which occur in the Stradbally area. A total of 52.8 ha of oak-ash-hazel woodland were surveyed which was just over half a percent of the total area digitised (Table 6). Two of the largest areas of oak-ash-hazel woodland were in Kilteale/Park Upper and in Park or Dunamase (Grid squares S5498/S5498 and S5198 respectively, and target notes N3/N3 and N6 respectively), whilst the smallest is in Kilbride (< 0.5 ha, grid square N5210, target note 3), in general the majority were less than 5 ha in size.

Oak-ash-hazel woodland is species rich (106 species, table 4). Hazel is the dominant tree and/or shrub species and is present in almost all the woodlands surveyed. Pedunculate oak is rare and it was only found in 4 woodlands, in the townland of Park or Dunamase (Grid squares S5198, S5298 and S5398), and in Courtwood (Grid square N6102, target note 1, fig. 17) but not in great numbers. Beech and sycamore were also found in oak-ash-hazel woodlands. Ash and hawthorn are found in most sites, and spindle is fairly common. Yew was present in the wood in Courtwood, not far from the Fort of Dunrally. At least 8 different ferns were seen including lady fern, hart's-tongue fern, soft and hard shield ferns, black spleenwort and common polypody. Other ground flora species included herb robert, herb bennet, bluebell, wood sanicle, arum lily, enchanters nightshade, wood sedge and false brome.

The Oak-ash-hazel woodland in Kilteale/Park Upper and the 3 woods in Park or Dunamase are designated NHAs. These have fences around their perimeters to prevent farm animals from gaining entry, and as a result there is no excessive grazing pressure. The three woods in Park or Dunamase all contain mature trees of ash, beech, sycamore and oak and most are over 30 m tall. These woodlands are quite old

and a number of beech have fallen in recent years,(Grid square S5198, target note 6). There were some signs of regeneration in all three but mainly of ash and sycamore with the latter being the most prolific.

In Kilteale/Park Upper, hazel was the main tree/shrub species present along with hawthorn, willow, ash, blackthorn and the occasional holly, seedlings of mountain ash were also found. Growth of scrubby species in particular bramble and blackthorn are beginning to take over parts of the wood making access difficult. Wood sorrel, enchanter's nightshade, woodruff and bugle were among the species (31 in all) present.

Although not an NHA, the wood on Killone hill (townlands of Killone, Kilmurray and Ballythomas) is species rich (34) and overall shows few signs of disturbance. Hazel was the main tree/shrub species while ash and hawthorn were frequent. Other woody species included beech, spindle, holly, blackthorn and dog rose but only in small numbers. There was very little bare ground in this wood as there were no farm animals present, however deer are known to browse here but grazing pressure is low. Wood sanicle and bluebells were abundant on the woodland floor, while woodruff and soft shield fern were also frequently found. The grass wood melick was also found though only occasionally.

Figure 17 Oak-ash-hazel woodland (WN2) growing on partially intact moat beside the Fort of Dunrally, Courtwood, Co. Laois (N6302, target note 2).

Hewson's Hill in Coolnacarrick is another oak-ash-hazel woodland worth noting. Forty-nine species of higher plants (8 were different to those recorded for the County Laois survey) were recorded during a field trip to the wood by Dublin Naturalist's Field Club led by Dr Howard Fox in April 1997 (Appendix 5), as well as 79 lower plants. A record of the fauna present on the hill was also made which included 3 snails (rounded snail, white lipped snail and the common door snail), several butterflies and moths, 10 different bird species including blue and grey tit, skylark and wren, and mammals including the hare, badger and pygmy shrew.

WS1 Scrub (bright green diamonds on a white background).

Scrub is found throughout the survey area in Co. Laois, including dry sites such as outcrops of limestone and disused quarries (Fig. 18), in wet areas, in corners of improved agricultural grassland and abandoned houses. In Morett (Grid square N5402, target note 1) scrub can be found growing around the edge of what probably was an old ring fort as well as in a number of other locations. The main woody species found in scrub habitats included gorse, hawthorn, blackthorn, willows, bramble, hazel and birch. In some sites single species dominated while in others various combinations of species existed. Species diversity in scrub habitats was considerable with at least 122 species recorded (Table 4) including species found in shaded woodland type habitats such as arum lily, broad buckler fern, great wood rush and herb robert to those found in wetter open sites such as cotton grass, horsetails, meadowsweet, purple moor-grass and wild angelica. Scrub habitat accounted for 1.15 % (107.9 ha) of the total area of habitats digitised to date and is the largest area of semi-natural habitat recorded so far in the survey (Table 4).

Figure 18 Small area of scrub (WS1) growing on a limestone rock outcrop in a former quarry in Dairyhill, Co. Laois (S3483, target note 1).

WL1 Hedgerows (green horizontal line).

Between the 2 survey areas 106 plant species were recorded in hedgerows (Table 4). At least 35 different woody species were noted down including pear, a rare species, ash, wych elm, English elm, yew, hazel, hawthorn, blackthorn, holly, spindle, honeysuckle, guelder rose, gorse, and several willows.

In general the hedgerows appeared to be wide and bushy with few gaps or weak areas. This was particularly evident in the townlands in the north east of the county, where a common feature of the hedgerows was the strong presence of hazel. Not only did hazel occur in the majority of the hedgerows surveyed it was often the dominant species. Although hazel was found in many of the hedgerows in the south west it did not dominate nor occur abundantly.
Hedgerows are found along road sides, forming field boundaries and quite often form townland boundaries. A fine example of a roadside hedgerow can be found in Vicarstown (Dodd) (Grid

square N6301, target note 2, fig. 19). A total of fourteen woody species including pear, crab, yew and holly were found in this dense tall hedgerow.

In addition to growing directly from ground level, hedgerows can also be found on top of stonewalls, and earth banks such as in Ballymaddock (Grid square S5599, target note 8), where of the seven woody species, hazel dominated while hawthorn was frequent. Forty-two herbaceous species were also recorded including field scabious, meadow vetchling, downy oat-grass, knapweed and bird's-foot-trefoil. Other notable hedgerows occurred in Rathronshin (Grid square N5906, target note 2) AND IN Fisherstown 9Grid square N6205, target note 1).

A detailed account of the hedgerows in County Laois can be found in the Laois/Offaly Hedgerow Survey (Foulkes and Murray, 2005).

Figure 19 Tall and dense hedgerow (WL1) in Vicarstown (Dodd) growing on either side of a double dry ditch N6301, target note 2).

Two rare species pear and yew were among the woody species growing in this hedgerow.

3.3.6 Exposed rock

ER2 Exposed calcareous rock (red vertical parallel lines).

This habitat type is found in a number of townlands including Killone, Kilmurry and Ballycarroll where the underlying bedrock is close to the surface, however, it covers only a fraction (0.01%) of the original area of habitats that have been to date digitised. The most interesting site with exposed calcareous rock was a limestone quarry in Kilmurry where quarrying had ceased in the 1950's (Grid square N5501, target note 5, Fig. 20). It is now being used as feeding or holding area for cattle and the floor of the quarry is showing signs of enrichment due to this usage. Sixty-nine different species were recorded, with the majority growing on the cliff face itself (Table 4). They include wild strawberry, salad burnet, pale flax, biting stonecrop, cut-leaved crane's-bill, quaking grass, cock's-

foot and oxeye daisy. The outer edges of the quarry are overgrown with blackthorn-dominated scrub.

Figure 20 Exposed calcareous rock (ER2) in a disused quarry, Kilmurry, Co. Laois (N5501, target note 5).

3.2.7 Cultivated and built land

Flower beds and borders

(BC4) Habitats within the category cultivated and built land are completely man-made and in general not as interesting or as species diverse as natural or semi-natural habitats. Nonetheless, many provide reasonable habitats for a wide array of species, in particular small vertebrates and invertebrates. An interesting French style kitchen garden with an assortment of fruit, vegetables, ornamental shrubs and herbaceous species was surveyed in Ballymorris (Grid square N5310, target note 7, fig. 21).

Figure 21 Flower beds and borders (BC4) in the garden of Lily Champ, Ballymorris, Co. Laois (N6301, target note 2)

The area shown above (Fig. 21) is a first-rate example of a French style kitchen garden known as a jardin potager, in which flowers, fruit and vegetables grow together.

4 Management guidelines

4.1 Management issues

4.1.1 Management priorities

Information from the survey is principally of value in revealing the nature of the biodiversity interest in the county. The results can be used to compare the status of biodiversity with other areas where such surveys have taken place, provide a baseline to inform discussion and policy making on biodiversity or/ and inform future research on other aspects of biodiversity. Any discussion or review should be informed by a comprehensive habitat map of the entire county.

Fieldwork in Laois has revealed the presence of 54 habitats (including four not included in Fossitt, 2000) and 385 species. A similar survey in part of County Carlow revealed 45 habitats and 374 species in an area of 74sqkm. However the survey in Carlow included uplands.

Marsh was found in both counties and occupied about 8 ha of land in County Carlow compared to approximately 3 ha in County Laois. The main species found in marsh habitats in Laois were yellow iris, marsh willowherb, angelica and meadowsweet. In Carlow all the marsh areas were associated with the Barrow River and the annual invasive species Himalayan balsam tended to dominate.

In most instances the drainage ditches in County Carlow occurred in association with hedgerows or other boundaries types, whereas in Laois in addition to those occurring next to boundaries there were several drainage ditches in open fields and these tended to have a greater diversity of species.

All of the semi-natural grassland habitats described in Fossitt (2000) are found in Laois. In both counties wet grassland was recorded as the dominant semi-natural habitat covering 134 ha in Carlow and approximately 98ha in Laois. Species diversity was also high in the two counties but there were 53 species in wet grassland in Carlow compared to 131 in Laois. Marsh arrowgrass, fragrant orchid, and quaking grass were found in wet grassland in Laois but not in Carlow and marsh violet, common figwort and bog pimpernel were among the species found in Carlow but not in Laois.

Heath and bog habitats are scarce in the area surveyed in Laois compared to Carlow where wet and dry heath can be found on the slopes of the Blackstairs Mountains. Raised bog type habitats are rare in Carlow but there is small area of cutover bog (Red Bog) in the survey area in Laois. However this is in danger of drying out due to drainage channels around the perimeter. Although the area of bog which was surveyed in Laois is small it is considered that it is not representative of the county where bog habitats are more common.

Four types of semi-natural woodland are found in County Laois (oak-birch-holly woodland, oak-ash-hazel woodland, wet willow-alder-ash woodland and bog woodland) whilst in Carlow 3 types of semi-natural woodland was found (riparian woodland, wet-willow-alder-ash-woodland and bog woodland). The presence of oak ash hazel woodland reflects the presence of more alkaline soils.

Scrub habitat is found in both counties and in similar locations such as abandoned corners of fields and beside derelict buildings etc.

County Carlow had slightly less species in its hedgerows (100) compared to County Laois, which had 106 plant species. Hawthorn, hazel, gorse, ash, holly, sycamore, elder, ivy, honeysuckle, dog rose, bramble, mountain ash, willow and spindle were among the species present in hedgerows in

both counties, but there were more species of willow in Laois, also guelder rose occurred frequently in the hedgerows of Laois but not in Carlow. However oak was found in Carlow but not the hedgerows of Laois.

Within Laois further comparisons could be made between habitat diversity in townlands, planning areas or regions as statistics can be easily generated on the cover of any of the mapped habitats by interrogating the habitat data base.

The addition of Portarlington to the area surveyed this year revealed the presence of large areas of gardens (120ha) which have potential for management for biodiversity. The area covered by gardens is far greater than all semi-natural habitats with the exception of wet grassland. This suggests that policies should be developed to make garden management more compatible with biodiversity.

Information on the current cover of habitats could be used as a baseline against which future policies or plans could be benchmarked. For example discussions could take place between stakeholders regarding the desired cover of particular habitat types in particular areas or the maintenance of links between them. Unless habitat mapping is available for the entire county these discussions can only focus on particular areas.

The information in the baseline survey provides an evaluation of the status of biodiversity in the surveyed area. The findings that 1) there is a relatively small cover of semi-natural habitats in the wider countryside and 2) linear features such as hedgerows and drainage ditches are important habitats and linking features should be communicated to the public, landowners and policy makers. It vindicates the priority given to research on habitats, hedgerows, eskers and derelict wetlands by the Laois Heritage Forum and the urgent need to extend the survey to other parts of the county and initiate action projects to appropriately manage surviving good quality examples of these rare types of habitats.

4.2.2 Information service for landowners and householders

Among the farming community the recent introduction of the Rural Environment Protection Scheme (REPS[2]), has raised the profile of biodiversity.
While only a minority of farmers are in REPS (c. 30% in County Laois) the new scheme obliges participants to actively manage some part of their land for biodiversity. Habitat mapping should inform REPS plans, suggest priorities for habitat creation and improvement and assist in the evaluation of the impact of REPS on biodiversity. Wet grassland (Rhahandrick Upper and Raheenahown North (Grid square S3181, target note 1 and grid square N5802, target note 2 respectively) and scrub (Rhahandrick Upper Grid square S3181, target note 2) were among the habitats that are managed under REPS.

However it is apparent from meeting with landowners that few are aware of the rarity value of semi-natural habitats on their lands and their management requirements. This lack of knowledge may reflect the lack of information which is available on local habitats.

Many of the ponds that were surveyed were eutrophic (due to fertilizer run off or cattle) with the exception of Ballinlough Lake (FL3, Grid square S5399, note 1), two ponds in Carigeen (FL8, Grid square N5500, target note 4) where the farmer was in REPS and a smallish pond in Bellegrove (FL3, Grid square N5905, note 4). In most cases the water is extremely dirty and churned up. Very

[2] Rural Environment Protection Scheme is a scheme whereby farmers are rewarded for farming in an environmentally friendly manner and for carrying out environmental improvement to existing farms

little emergent or transitional zone is present due to unlimited access by cattle and other livestock throughout the year.

The habitat quality of rivers and streams is better. Problems arise due to the damming of streams by vegetation and shading by encroaching vegetation. Drainage ditches fare similarly to rivers and streams, excess vegetation and shading is greater in particular where the ditches were adjacent to hedgerows. There is a particularly good example of a drainage ditch in Raheenahown North (Grid square N5802, note 2), in the middle of a field, which has some interesting species such as lesser butterfly orchid, bog bean and marsh arrowgrass. This requires careful management to preserve these rare species.

Although species diversity is good in the majority of the semi-natural grasslands (dry calcareous and neutral grasslands, wet grasslands and marshes), most require improved management, for example a number of dry calcareous and neutral grassland habitats were damaged or degraded. In both Garrymaddock (Grid square N5702, target note 13) and Rathcrea (Grid square N5902, target note 2) the habitats showed signs of considerable disturbance, but the causes were different. In Garrymaddock the ground was all humps and hollows due to land reclamation of scrub. In Rathcrea severe poaching from cattle had churned up the ground also resulting in a series of humps and hollows and a lot of exposed soil. Good quality semi-natural grassland is found in a few areas; in Curragh (GS4, Grid square S3481, note 2), Rathcrea (GS4, Grid square N5901, note 4), Park or Dunamase (GS1, Grid square S5398, note 2) and in Coolnacarrick (GS1, Grid square S5296, note 1). However some of these sites e.g. Coolnacarrick and Park or Dunamase are threatened by scrub invasion due to under grazing..

While hedgerows were healthy and dense many of the examples of woodland or scrub were very degraded, mainly through poaching by cattle and or sheep. In contrast to the general condition of woodlands, the oak-ash-hazel woodland on Killone Hill is of particularly good quality. A conservation management plan should be prepared for this site in conjunction with the landowner.

The distribution of land of biodiversity value is spread over a wide area and a targeted information service may be needed. The mapping project has identified the location of good examples of rarer habitats. It has also suggested that there is potential to focus on gardens. As a follow up to this project pilot actions should be initiated to protect and manage appropriately good examples of particular habitat types among both landowners and householders

4.2 Guidelines

4.2.1 Role of Laois Heritage Forum

The role of the Heritage Forum is to provide a local network to support interested individuals and relevant agencies with a direct or indirect role in heritage management. The network needs information as a basis for informing discussions and policy making. The results of this project provides up to date maps and statistics on the status of biodiversity in lowland Laois.

In the short term the priority is to highlight the results of the mapping project to the general public and to stakeholders (landowners and planners) who are making decisions on land use. The secondary priority is to continue to gather such information on other parts of the county, particularly areas under pressure from development.

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.

4.2.2 Information and awareness raising

Target audience: the public/landowners/householders

- Produce leaflet listing towns and townlands surveyed and stating where maps can be viewed.
- Publicise the principal results in local newspapers.
- Display maps in relevant local libraries in a temporary exhibition.
- Make hard copy of the survey report and habitat maps available in Portlaoise and Portarlington libraries.
- Put maps 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 (section on local biodiversity in the Local Studies Section of the Library).
- The habitat maps should be publicised to relevant Tidy Towns groups, groups entering the Golden Mile project and other community/development organisations operating within or adjacent to survey areas.
- Provide brief summary guidelines for farmers on appropriate management of habitats.
- Provide brief summary guidelines for gardeners

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 county.
- Organise a presentation to local authority planners to inform them of the value of the map to their strategic planning and development control.
- Provide a presentation to REPS planners to inform them of its value to their REPS advisory service.
- Ensure results of habitat mapping in 2006 is fully integrated with councils own GIS
- Promote additional survey work (for fauna, breeding birds) in townlands examined for this survey.
- Promote research to utilise and add value to habitats data base i.e. integrate with FIPS/EPA soils/subsoil's data base, local geology (from GSI) and 1st edition OS mapping.
- Obtain data on total number of flowering plant species in the County from the BSBI.

4.2.3 Managing change

Suggested initiatives include:

- Developing a targeted advisory service for landowners who have good examples of semi-natural habitats or householders who wish their gardens to be more biodiversity friendly.
- Develop course materials to be used by REPS planners so that their training courses for farmers includes information on the Laois habitat map and priorities for local biodiversity management.
- Organise through local initiatives for the removal of invasive species such as Japanese knotweed and rhododendron.
- Carry out habitat mapping in 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.

4.2.4 Partnership with the statutory authorities

Suggested initiatives include:

- Active co-operation with NPWS on management issues affecting pNHAs and SACs and associated linking areas.
- Provision of habitat mapping by NPWS for the lands which have been designated by NPWS thus expanding the coverage of habitat mapping in the county.
- Promotion of the Native Woodland Scheme with Woodlands of Ireland and the Forest Service.
- Promotion of wetland 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 and objectives to maintain habitat diversity, manage habitats owned by the Local Authority sustainably, provide information and ensure that development has regard for biodiversity values.
- Preparation of a County Biodiversity Plan in association with the Heritage Forum.
- Survey council owned land to develop management guidelines for habitats under its direct control.

5. Conclusions

The study provides a unique snapshot of the natural heritage in representative areas of lowland Laois. An impressive diversity of habitats and flowering plants is present. While most of the land is covered in habitats of low biodiversity value, the survey work has revealed that 5% of the land is covered in habitats of relatively high biodiversity value. Most townlands have habitats of some biodiversity value. Some have habitats which are rare locally, nationally and even internationally. However the overall cover of semi natural habitats of particular value for biodiversity is low.

The survey results are a resource, which will assist all stakeholders to make informed decisions. The role of the Heritage Forum is to publicise this resource to all relevant individuals and agencies to inform local strategic planning and the preparation of a County Biodiversity Action Plan. It also has potential to inform the preparation of Strategic Environmental Assessments of plans and programmes which is required under EU legislation.

The survey should be expanded to all parts of the county. This would increase the value of the information which has been gathered and enable informed decision making on biodiversity on a county wide basis.

References

Coillte (2004). *The Selection of Biodiversity Areas in the Mid Tipp/Rossmore Plateau FMU 403*.

Department of Arts, Heritage, Gaeltacht and the Islands. (2002). *National Biodiversity Plan*. Irish Government.

Downes, K. and Lynch, J. (2002). *Heath Mayfield Motorway Environmental Impact Statement.* National Roads Design Office, Kildare County Council.

Feehan, J. (1983). *Laois an Environmental History*. Ballykilcavan Press.

Fossitt, J.A. (2000). *A Guide to Habitats in Ireland*. The Heritage Council.

Foulkes, N. and Murray, A. (2005) *County Laois Hedgerow Survey Report.* Unpublished report for Laois County Council.

Higgins, T., Martin, J. and Perrin, P. (2004). *National Native Woodland Survey*. National Parks and Wildlife Service.

Hubbard, C.E. (1992). *Grasses, A Guide to their Structure, Identification and distribution in the British Isles*. Penguin.

Jermy, A.C., Chater, A.O. and David, R.W. (1982). *Sedges of the British Isles. BSB1 Handbook No. 1.* Botanical Society of the British Isles.

Mitchell, A. (1978). *Trees of Britain and Northern Europe*. Harper Collins Publishers.

National Parks and Wildlife Service. Site Synopses for Special Areas of Conservation (SACs) and Natural Heritage Areas (NHA). Website address www.npws.ie.

NRA National Roads authority: *Environmental Impact Statement M7 Portlaoise – Castletown M8 Portlaoise – Cullahill Road scheme*. Vol 7 Appendices Consultants ARUP

Preston, C.D., Pearman, D.A. and Dines, T.D. (2003) *New Atlas of The British Flora.* Oxford University Press.

Rose, F. (1981). *The Wild Flower Key*. Frederick Warne.

Rose, F. (1989). *Colour Identification Guide to the Grasses, Sedges, Rushes and Ferns of the British Isles and north-western Europe*. Viking.

Royal Haskoning and JBA Consulting (2006). *Portarlington Strategic Flood Risk Management: Constraints Study and Scoping Report*. Unpublished final report prepared for Laois and Offaly County Councils.

The Heritage Council (2002) *Draft Habitat Survey Guidelines: A standard methodology for habitat survey and mapping in Ireland.* The Heritage Council, Kilkenny.

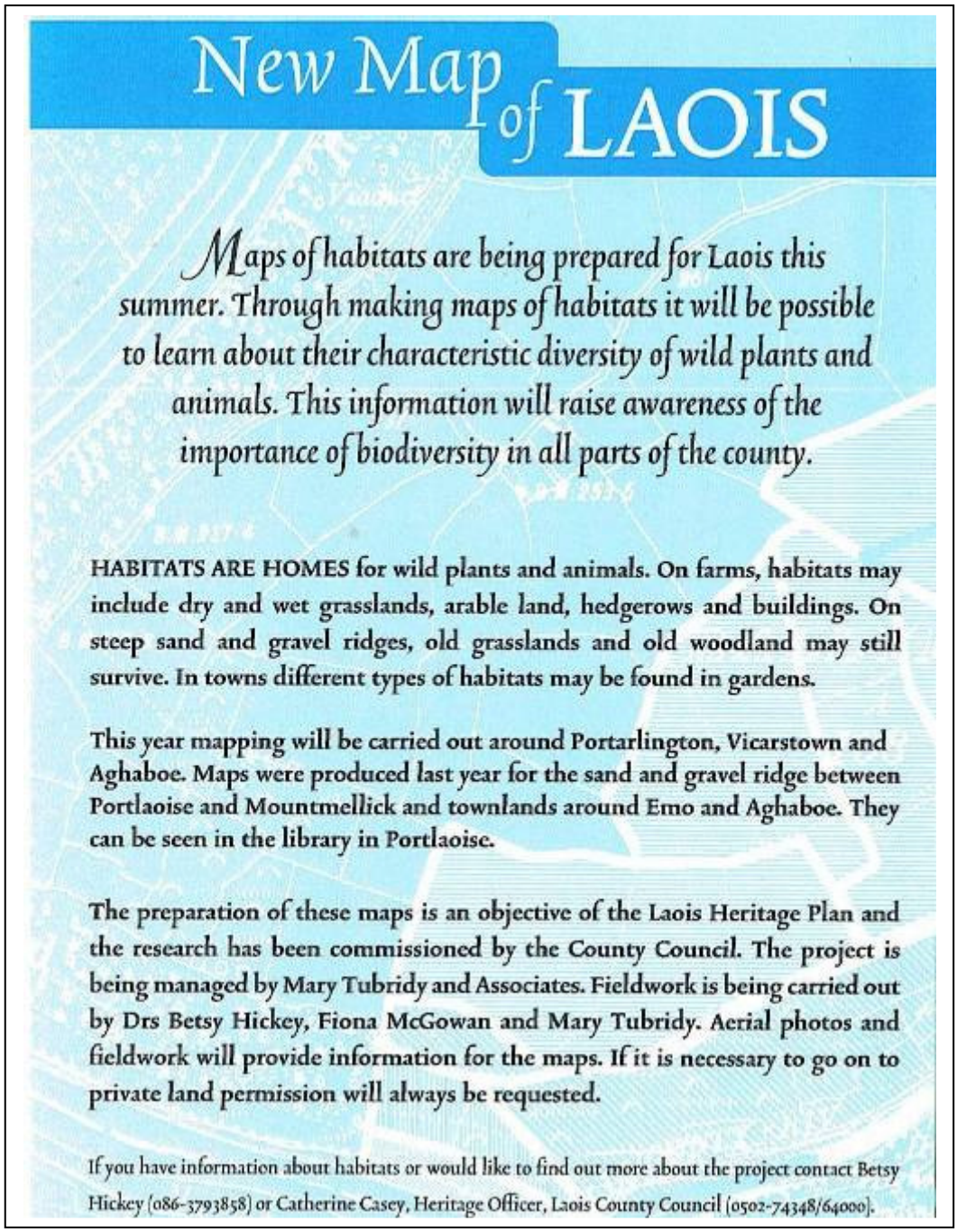
Webb, D.A., Parnell, J. and Doogue, D. (1996). *An Irish Flora.* Dundalgen Press LTD.

General references and Field Guides

Curtis, T.G.F. and McGough, H.N. (1988). *The Irish Red Data Book. 1. Vascular Plants.* The Stationary Office, Dublin.

Scannell, M.J.P. and Synnott, D.M. (1987). *Census Catalogue of the Flora of Ireland.* Stationary Office, Dublin.

Appendix 1. Information leaflet



New Map 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 found in gardens.

This year mapping will be carried out around Portarlington, Vicarstown and Aghaboe. Maps were produced last year for the sand and gravel ridge between Portlaoise and Mountmellick and townlands around Emo and Aghaboe. They can be seen in the library in Portlaoise.

The preparation of these maps is an objective of the Laois Heritage Plan and the research has been commissioned 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 and Mary Tubridy. Aerial photos and fieldwork will provide information for the maps. If it is necessary to go on to private land permission will always be requested.

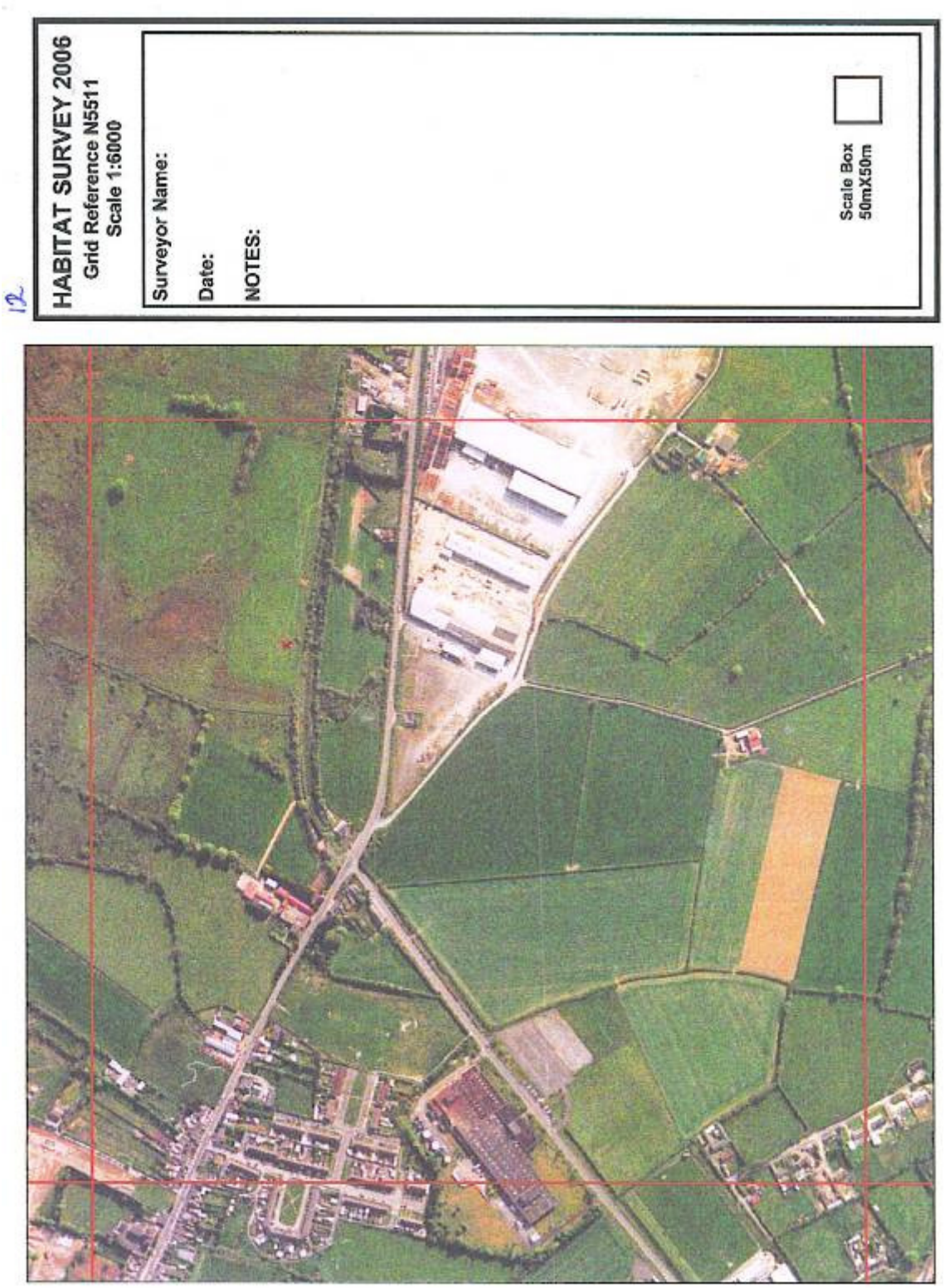
If you have information about habitats or would like to find out more about the project contact Betsy Hickey (086-3793858) or Catherine Casey, Heritage Officer, Laois County Council (0502-74348/64000).

Appendix 2. 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.

B. Cushen
Bridie Scully
Brigit Cushen
Carter Family
Crowley Family
Dan Scully
Eddie Mulhall
Eddie Fitzgerald
Ellen Conroy
Frank Maloney
Ger Baldwin
Gerry Byrne
Hugh Ryan
Isaac and Robert Dobson
Jackie Hyland
James Gleeson
James Murphy
Jim Brennan
John Delaney
John Dunne
John Lacy
John Nurney
Lewis Family
Margaret Cushen
Michael and Sheila Cushen
Mrs. Browne
Paddy Doherty
Paddy Lawlor
Pat and Peggy Drennan
Peter Ging
Séan Conroy
Séan Scully
Thomas Conroy
Tom Bond
Tom Cushen
Tom Fingleton
Tom Mulhall
Whelan Family
John Fletcher
Winnie Champ
Lily Champ
Mary Dunne
Colette Manley
Brian Walsh
Mrs. Fitzpatrick
Geraldine O' Reilly
Pat Hyland
Molly and Liam Kavanagh
Michael Milner
Liam Bennet
Irwin Cobb
Martin Whelan
Mrs. Cobb
Ray Cobb
Paddy Behan
Julie Murray
Maureen Nerney
Thomas Nerney
Frank Nerney
Michael Whelehan
John Kenny
Robin and Ann Talbot
Tom Donoher
Tony Connell
Jim Scully
Joe Brophy
Terry O' Connell
Robert and Chris Miller
Tony Miller
Dan Miller
Joe Kane
Johnny Kane
Mrs Boland
Cathy and Pat Nolan

Appendix 3. Layout used in field survey (for photographs and maps)



Appendix 4. Checklist of all species

Checklist of all species recorded during 2005 and 2006. Species are listed alphabetically by Latin name, species followed by an asterisk are additional species recorded in 2006

*Abies sp. (*Fir)
*Acer pseudoplatanus (*Sycamore)
*Achillea millefolium (*Yarrow)
*Aesculus hippocastanum (*Velvet bent grass)
*Agrostis canina (*Common bent)
*Agrostis capillaris (*Common bent grass)
*Agrostis stolonifera (*Creeping bent grass)
*Ajuga reptans (*Bugle)
*Alliaria petiolata (*Garlic mustard)
Allium ampiloprasum (*Leeks)
*Allium cepa (*Onions)
Allium ursinum (*Ramsons)
*Alnus glutinosa (*Alder)
*Alopecurus geniculatus (*Marsh foxtail)
*Alopecurus pratensis (*Meadow foxtail)
*Anagallis arvensis (*Scarlet pimpernel)
*Andromeda polifolia (*Bog rosemary)
Anemone nemorosa (*Wood anemone)
*Angelica sylvestris (*Wild angelica)
*Antennaria dioica (*Mountain everlasting)
*Anthoxanthum odoratum (*Sweet vernal grass)
*Anthriscus sylvestris (*Cow parsley)
Anthyllis vulgaris (*Kidney vetch)
Aquilega vulgaris (*Columbine)
*Arctium minor (*Lesser burdock)
*Arrhenatherum elatius (*False oat grass)
*Arum maculatum (*Arum lily)
*Asplenium adiantum nigrum (*Black spleenwort)
Asplenium ruta-muraria (*Wall-rue)
Asplenium trichomanes (*Maidenhair spleenwort)
*Athyrium filix-femina (*Lady fern)
*Baldellia ranunculoides (*Lesser water plantain)
*Bellis perennis (*Daisy)
*Beta vulgaris (*Sugar beet)
Betula pendula (*Weeping birch)
*Betula pubescens (*Downy birch)
*Blackstonia perfoliata (*Yellow-wort)
*Brachypodium sylvaticum (*False brome)
Brassica oleracea var. capitata (*Cabbage)
*Briza media (*Quaking grass)
*Callitriche stagnalis (*Common water starwort)
*Calluna vulgaris (*Ling heather)
*Scientific name (*English name)
*Caltha palustris (*Marsh marigold)
*Caltha palustris (*Marsh marigold)
*Calystegia sepium (*Hedge bindweed)
*Cardamine flexuosa (*Wavy bittercress)
*Cardamine pratensis (*Lady's smock)
*Carex acutiformis (*Lesser pond sedge)
*Carex divulsa (*Grey sedge)
*Carex echinata (*Star sedge)
*Carex flacca (*Glaucous sedge)
*Carex hirta (*Hairy sedge)
*Carex hostiana (*Tawny sedge)
*Carex nigra (*Common sedge)
*Carex panicea (*Carnation sedge)
*Carex pulicaris (*Flea sedge)
*Carex remota (*Remote sedge)
*Carex rostrata (*Bottle sedge)
*Carex sylvatica (*Wood sedge)
*Carex vesicaria (*Bladder sedge)
*Carex viridula (*Yellow sedge)
*Carex viridula ssp. demissa (*Common yellow sedge)
Carlina vulgaris (*Carline thistle)
*Castanea sativa (*Spanish chestnut)
*Centaurea nigra (*Black knapweed)
*Centaurium erythraea (*Common centaury)
*Cerastium fontanum (*Mouse ear chickweed)
*Chamaecyparis sp. (*Lawson cypress)
*Chenopodium album (*Fat hen)
*Chrysosplenium oppositifolium (*Opposite-leaved golden saxifrage)
*Circaea lutetiana (*Enchanter's nightshade)
*Cirsium arvense (*Creeping thistle)
*Cirsium dissectum (*Meadow thistle)
*Cirsium palustre (*Marsh thistle)
*Cirsium sp. (*Thistle)
*Cirsium vulgare (*Spear thistle)
Cladium mariscus (*Great fen sedge)
Cladonia portentosa (*Lichen)
*Cladophera sp. (*Green algae)
Clematis vitalba (*Traveller's joy)
*Conopodium majus (*Pignut)
*Corylus avellana (*Hazel)
*Cotoneaster sp. (*Cotoneaster)
*Crataegus monogyna (*Hawthorn)
*Crepis capillaris (*Smooth hawk's-beard)
*Crocosmia x crocosmiflora (*Montbretia)
*Cynosurus cristatus (*Crested dog's-tail)

*Dactylis glomerata (*Cock's-foot)
*Dactylorhiza incarnata (*Early marsh orchid)
*Dactylorhiza maculata (*Heath spotted orchid)
*Dactylorhiza maculata fuchsii (*Common spotted orchid)
*Dactylorhiza majalis (*Southern marsh orchid)
*Daucus carota (*Wild carrot)
*Deschampsia cespitosa (*Tufted hair-grass)
*Dianthus sp. (*Carnation)
*Digitalis purpurea (*Foxglove)
*Drosera rotundifolia (*Round-leaved sundew)
*Dryopteris affinis (*Scaly male fern)
*Dryopteris dilatata (*Broad buckler fern)
*Dryopteris filix-mas (*Male fern)
*Eleocharis sp. (*Spike-rush)
*Elocharis palustris (*Common spike-rush)
*Elymus repens (*Couch grass)
*Epilobium angustifolium (*Rosebay willow herb)
*Epilobium hirsutum (*Great willowherb)
*Epilobium montanum (*Broad-leaved willowherb)
*Epilobium obscurum** (Short-fruited willowherb)
*Epilobium palustre (*Marsh willowherb)
*Epilobium parviflorum (*Hoary willowherb)
*Epilobium sp. (*Willowherb)
*Epipactis palustris (*Marsh helleborine)
*Equisetum arvense (*Field horsetail)
*Equisetum fluviatile (*Water horsetail)
*Equisetum palustre** (Marsh horsetail)
*Equisetum sp. (*Horsetail)
*Equisetum sylvaticum (*Wood horsetail)
*Erica tetralix (*Cross-leaved heath)
*Eriophorum angustifolium (*Common cotton-sedge)
*Eriophorum vaginatum (*Hare's-tail cotton-sedge)
*Euonymus europaeus (*Spindle)
*Eupatorium cannabinum (*Hemp agrimony)
*Euphrasia rostkoviana (*Eyebright)
*Euphrasia sp. (*Eyebright)
*Fagus sylvatica (*Beech)
*Festuca arundinacea (*Tall fescue)
*Festuca gigantea (*Giant fescue)
*Festuca ovina (*Sheep's fescue)
*Festuca pratensis** (Meadow fescue)
*Festuca rubra (*Red fescue)
*Festuca sp. (*Fescue)
*Filipendula ulmaria (*Meadowsweet)
Fontinalis sp. (Moss)
*Fragaria vesca (*Wild strawberry)
*Fraxinus excelsior (*Ash)
*Fraxinus excelsior pendula (*Weeping ash)
*Galium aparine (*Cleavers)
*Galium odoratum (*Woodruff)
*Galium palustre (*Marsh bedstraw)
*Galium verum (*Lady's bedstraw)
*Geranium dissectum (*Cut-leaved crane's-bill)
*Geranium molle (*Dove's-foot crane's-bill)
*Geranium robertianum (*Herb robert)
*Geranium sp. (*Cranesbill)
*Geum urbanum (*Herb bennet)
*Glechoma hederacea (*Ground ivy)
*Glyceria fluitans (*Floating sweet-grass)
*Glyceria maxima (*Reed sweet-grass)
*Glyceria notata (*Plicate sweet-grass)
*Glyceria sp. (*Sweet-grass)
*Grisilina littoralis (*Grisilina)
*Gymnadenia conopsea (*Fragrant orchid)
*Hedera helix (*Ivy)
*Helictotrichon pubescens (*Downy oat-grass)
*Heracleum sphondylium (*Hogweed)
*Hieracium sp. (*Hawkweed)
*Hippuris vulgaris** (Marestail)
*Holcus lanatus (*Yorkshire fog)
*Hordeum vulgare (*Barley)
*Hyacinthoides non-scriptus (*Bluebell)
*Hydrocotyle vulgaris (*Navelwort)
*Hypericum androsaemum (*Tutsan)
*Hypericum humifusum (*Trailing St. John's-wort)
*Hypericum maculatum (*Imperforate St. John's-wort)
*Hypericum perforatum (*Perforate St. John's-wort)
*Hypericum pulchrum (*Slender St. John's-wort)
*Hypericum sp. (*St. John's-wort)
*Hypericum tetrapterum (*Square-stalked St. John's-wort)
*Hypochoeris 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 inflexus (*Hard rush)
*Juncus sp. (*Rush)
*Juniperus squamata sp. (*Flaky juniper)
*Knautia arvensis (*Field scabious)
*Kniphofia sp. (*Red hot poker)

*Lapsana communis (*Nipplewort)
*Larix decidua (*European larch)
*Lathyrus montanus (*Bitter-vetch)
*Lathyrus pratensis (*Meadow vetchling)
*Latuca sativa** (Lettuce)
*Lemma minor (*Common duckweed)
*Leontodon autumnalis (*Autumn hawkbit)
*Leontodon hispidus** (Rough hawkbit)
*Leucanthemum vulgare (*Ox-eye daisy)
*Ligustrum ovalifolium (*Privet)
*Ligustrum vulgare (*Common privet)
*Linum bienne (*Pale flax)
*Linum catharticum (*Fairy flax)
*Listeria ovata (*Common twayblade)
*Littorella uniflora** (Shore-weed)
*Lolium perenne (*Perennial ryegrass)
*Lonicera nitida (*Wilson's honeysuckle)
*Lonicera periclymenum (*Honeysuckle)
*Lotus corniculatus (*Bird's-foot-trefoil)
*Lupinus sp. (*Lupin)
*Luzula campestris (*Field woodrush)
*Luzula multiflorum (*Heath woodrush)
*Luzula sylvatica (*Wood rush)
*Lychnis flos-cuculi (*Ragged robin)
*Lysimachia nemorum (*Yellow pimpernel)
*Lythrum salicaria (*Purple loosestrife)
*Malus domestica var. (*Apple trees)
*Malus sp. (*Crab)
*Matricaria discoidea (*Pineapple weed)
*Medicago lupulina (*Black medick)
*Melica uniflora (*Wood melick)
*Mentha aquatica (*Water mint)
*Mentha sp. (*Mint)
*Mentha spicata (*Spear mint)
*Menyanthes trifoliata (*Bogbean)
*Molinia caerulea** (Purple moor-grass)
*Myosotis discolor (*Changing forget-me-not)
*Myosotis scorpiodes (*Water forget-me-not)
*Narthecium ossifragum (*Bog asphodel)
*Nasturtium officinale (*Water-cress)
*Nasturtium sp. (*Water-cress)
*Odondites vernus (*Red bartsia)
*Ophioglossum vulgatum (*Adder's tongue)
*Ophrys apifera** (Bee orchid)
*Origanum vulgare** (Marjoram)
*Scientific name (*English name)
*Osmunda regalis (*Royal fern)
*Oxalis acetosella (*Wood sorrel)
*Paeonia sp. (*Peony rose)
*Papaver orientalis (*Oriental poppy)
*Parietaria diffusa** (Pellitory of the wall)
*Pedicularis sp. (*Lousewort)
*Pedicularis sylvatica (*Lousewort)
*Phalaris arundinacea (*Reed canary-grass)
*Phleum pratensis (*Timothy)
*Phragmites australis (*Common reed)
*Phyllitis scolopendrium (*Hart's-tongue fern)
*Picea abies (*Norway spruce)
*Picea sitchensis (*Sitka spruce)
*Pinguicula vulgaris** (Common butterwort)
*Pinus contorta (*Lodgepole pine)
*Pinus sylvestris (*Scot's pine)
*Plantago lanceolata (*Narrow leaved plantain)
*Plantago major (*Broad leaved plantain)
*Platanthera bifolia (*Lesser butterfly orchid)
*Platanthera clorantha (*Greater butterfly orchid)
*Poa annua (*Annual meadow-grass)
*Poa pratensis** (Smooth meadow-grass)
*Poa sp. (*Meadow-grass)
*Poa trivialis (*Rough meadow-grass)
*Polygala vulgaris (*Common milkwort)
*Polygonum amphibium (*Amphibious bistwort)
*Polygonum persicaria (*Redshank)
*Polypodium vulgare (*Common polypody fern)
*Polystichum aculeatum (*Hard shield fern)
*Polystichum setiferum (*Soft shield fern)
*Polytrichum commune** (Moss)
*Populus sp. (*Poplar)
*Populus tremula (*Aspen)
*Potamogeton sp. (*Pondweed)
*Potentilla anserina (*Silverweed)
*Potentilla erecta (*Tormentil)
*Potentilla palustre (*Marsh cinquefoil)
*Potentilla reptans (*Creeping cinquefoil)
*Potentilla sterilis (*Barren strawberry)
*Primula veris (*Cowslip)
*Primula vulgaris (*Primrose)
*Prunus avium (*Wild cherry)
*Prunus domestica (*Wild plum)
*Prunus kanzan (*Flowering cherry)
*Prunus laurocerasus** (Laurel)
*Prunus sp. (*Cherry)
*Prunus spinosa (*Blackthorn)
*Pseudosuga menzeii (*Douglas fir)
*Pteridium aquilinum (*Bracken)
*Pulicaria dysenterica (*Common fleabane)
*Pyrus pyraster (*Pear)
*Quercus robur (*Pedunculate oak)
*Ranunculus acris (*Meadow buttercup)
*Ranunculus auricomus (*Goldilocks buttercup)
*Ranunculus bulbosus** (Bulbous buttercup)

*Ranunculus ficaria (*Lesser celandine)
*Ranunculus flammula (*Lesser spearwort)
*Ranunculus lingua (*Greater spearwort)
*Ranunculus peltatus (*Pond water-crowfoot)
*Ranunculus repens (*Creeping buttercup)
*Reynoutria japonica (*Japanese knotweed)
*Rheum rhabarbarum (*Rhubarb)
*Rhinanthus minor (*Yellow rattle)
*Rhynchospora alba (*White-beaked sedge)
*Ribes rubrum (*White or red currant)
*Ribes sp. (*Currant)
*Rosa arvense (*Field rose)
*Rosa canina (*Dog rose)
*Rosa sp. (*Wild rose)
*Rosmarinus officinalis (*Rosemary)
*Rubus caesius (*Dewberry)
*Rubus fruticosus agg. (*Bramble)
Rumex acetosa (*Common sorrel)
*Rumex acetosella (*Sheep's sorrel)
*Rumex conglomeratus (*Clustered dock)
*Rumex crispus (*Curled dock)
*Rumex obtusifolius (*Broad leaved dock)
*Rumex sanguineus (*Wood dock)
*Rumex sp. (*Dock)
*Sagina procumbens (*Procumbent pearlwort)
*Salix alba (*White willow)
*Salix aurita (*Eared willow)
*Salix caprea (*Goat willow)
*Salix cinerea (*Grey willow)
*Salix fragilis (*Crack willow)
*Salix sp. (*Willow)
*Salix viminalis (*Osier)
*Salix x multinervis (*Willow hybrid)
*Sambucus nigra (*Elder)
*Sanguisorba minor (*Salad burnet)
*Sanicula europaea (*Wood sanicle)
*Saponaria officinalis (*Soapwort)
*Schoenplectus lacustris (*Club-rush)
*Schoenus nigricans (*Black bog-rush)
*Scrophularia nodosa (*Common figwort)
*Sedum acre (*Biting stonecrop)
*Senecio aquaticus (*Marsh ragwort)
*Senecio jacobaea (*Common ragwort)
*Senecio vulgaris (*Groundsel)
*Silene dioica (*Red campion)
*Silene latifolia (*White campion)
*Sisymbrium officinale (*Hedge mustard)
*Solanum dulcamara (*Bittersweet)
Solanum tuberosum (*Potato)
*Sonchus arvensis (*Perennial sow-thistle)
*Sonchus asper (*Prickly sow-thistle)
*Sonchus oleraceus (*Smooth sow-thistle)
*Sorbus aria (*Whitebeam)
*Sorbus aucuparia (*Mountain ash)
*Sparganium erectum (*Branched bur-reed)
*Sphagnum capillifolium (*Sphagnum moss)
*Sphagnum cuspidatum (*Sphagnum moss)
*Sphagnum imbricatum (*Sphagnum moss)
*Sphagnum papillosum (*Sphagnum moss)
*Stachys byzantina (*Lamb's ears)
*Stachys palustris (*Marsh woundwort)
*Stachys sylvatica (*Hedge woundwort)
*Stellaria graminea (*Lesser stitchwort)
*Stellaria holostea (*Greater stitchwort)
*Stellaria media (*Common chickweed)
*Stellaria uliginosa (*Bog stitchwort)
*Succisa pratensis (*Devil's-bit scabious)
Symphoricarpos orbiculatus (*Snowberry)
*Symphytum sp. (*Comfrey)
*Taraxacum officinale (*Dandelion)
Taxus baccata (*Yew)
*Teucrium scorodonia (*Woodsage)
*Tilia cordata (*Small leaved lime)
Tilia x europaea (*Common lime)
*Torilis japonica (*Upright hedge parsley)
*Tragopogon pratensis (*Goat's-beard)
*Trichophorum caespitosum (*Deer-sedge)
*Trifolium campestre (*Hop trefoil)
*Trifolium dubium (*Lesser trefoil)
*Trifolium pratense (*Red clover)
*Trifolium repens (*White clover)
*Triglochin palustris (*Marsh arrowgrass)
Trisetum flavescens (*Yellow oat-grass)
*Triticum aestivum (*Wheat)
*Tussilago farfara (*Colt's-foot)
*Typha latifolia (*Common reedmace)
*Ulex europaeus (*Gorse)
*Ulmus glabra (*Wych elm)
*Ulmus procera (*English elm)
*Urtica dioica (*Stinging nettle)
*Valeriana officinalis (*Common valerian)
*Veronica beccabunga (*Brooklime)
*Veronica chamaedrys (*Germander speedwell)
*Veronica montana (*Wood speedwell)
*Veronica officinalis (*Heath speedwell)
*Veronica sp. (*Speedwell)
*Viburnum opulus (*Guelder rose)
*Vicia cracca (*Tufted vetch)
*Vicia sativa (*Common vetch)
*Vicia sepium (*Bush vetch)
*Vicia sp. (*Vetch)
Viola reichenbackiana (*Wood dog violet)
*Viola riviniana (*Common dog violet)
*Viola sp. (*Violet)

*x Cupressocyparis leylandii (*Leyland cypress)

*x Cupressus macrocarpa** *(*Macrocarpa)

Appendix 5. Rare or occasional plant species.

Species followed by an asterisk were identified in 2006

Andromeda polifolia (Bog rosemary)
Antennaria dioica (Mountain everlasting)
*Anthyllis vulneraria** (Kidney vetch)
*Aquilega vulgaris** (Columbine)
Artemisia vulgaris (Mugwort)
Blackstonia perfoliata (Yellow-wort)
Bromus racemosus (Smooth brome)
Centaurium erythraea (Common centaury)
Clinopodium vulgare (Wild basil)
Epipactis palustris (Marsh helleborine)
Gymnadenia conopsea (Fragrant orchid)
Helictotrichon pubescens (Downy oat-grass)
Lathyrus montanus (Bitter vetch)
Linum bienne (Pale flax)
*Littorella uniflora** (Shore weed)
Ophioglossum vulgatum (Adder's tongue)
*Ophrys apifera** (Bee orchid)
Origanum vulgare (Marjoram)
Platanthera bifolia (Lesser butterfly-orchid)
Platanthera clorantha (Greater butterfly-orchid)
Polystichum aculeatum (Hard shield fern)
Pulicaria dysenterica (Fleabane)
*Pyrus pyraster** (Pear)
Rhynchospora alba (White beaked sedge)
Rubus caesius (Dewberry)
Sanguisorba minor (Salad burnet)
Smyrnium olusatrum (Alexanders)
*Taxus baccata** (Yew)
Tragopogon pratensis (Goatsbeard)
Trisetum flavescens (Yellow oat grass)

Appendix 6. Additional species recorded in study area by BSB1

Achillea ptarmica (Sneezewort)
Aegopodium podagraria (Ground elder)
Aethusa cynapium (Fool's parsley)
Agrimonia eupatoria (Agrimony)
Agrimonia procera (Fragrant Agrimony)
Anisantha sterilis (Barren brome)
Aphanes arvensis (Parsley-piert)
Arenaria serpyllifolia (Thyme-leaved sandwort)
Artemisia vulgaris (Mugwort)
Asplenium ruta-muraria (Wall-rue)
Atriplex laciniata (Frosted orache)
Atriplex patua (Common orache)
Bromopsis ramosa (Hairy-brome)
Calystegia silvatica (Large bindweed)
Capsella bursa-pastoris (Shepherds purse)
Cardamine hirsuta (Hairy bittercress)
Carex demissa (Common yellow sedge)
Carex pseudocyperus (Cyperus Sedge)
Catapodium rigidum (Fern grass)
Ceterach officinarum (Rusty-back)
Chaenorhinum minus (Small toadflax)
Cladium mariscus (Great Fen-sedge)
Clinopodium vulgare (Wild Basil)
Conium maculatum (Hemlock)
Cymbalaria muralis (Ivy-leaved Toadflax)
Dipsacus fullonum (Wild Teasel)
Elytrigia repens (Couch grass)
Epilobium ciliatum (American willowherb)
Euphorbia helioscopia (Sun Spurge)
Euphorbia peplus (Petty Spurge)
Euphrasia officinalis agg. (Eyebright)
Fallopia convolvulus (Black-bindweed)
Fumaria muralis (Common Ramping-fumitory)
Fumaria officinalis (Common Fumitory)
Galeopsis bifida (Bifid hemp nettle)
Geranium lucidum (Shining cranesbill)
Geum rivale (Water Avens)
Hieracium murorum agg. (Hawkweed)
Hippuris vulgaris (Mare's-tail)
Juncus bulbosus (Bulbous Rush)
Lamium hybridum (Cut-leaved dead-nettle)
Lamium purpureum (Red Dead-nettle)

Lathyrus montanus (Bitter-vetch)
Leontodon saxatilis (Lesser Hawkbit)
Lolium multiflorum (Italian Rye-grass)
Lycopus europaeus (Gypsywort)
Mentha arvensis (Corn Mint)
Mentha suaveolens x longifolia ()
= *M. x rotundifolia*False (Apple-mint)
Myosotis arvensis (Field forget-me-not)
Nuphar lutea (Yellow water-lily)
Nymphaea alba (White Water-lily)
Origanum vulgare (Wild Marjoram)
Papaver dubium spp. *dubium* (Long-headed Poppy)
Papaver rhoeas (Common Poppy)
Persicaria hydropiper (Water-pepper)
Persicaria lapathifolia (Pale Persicaria)
Persicaria maculosa (Redshank)
Petasites fragrans (Winter Heliotrope)
Petasites hybridus (Butterbur)
Pimpinella saxifraga (Burnet-saxifrage)
Poa pratensis (Smooth Meadow-grass)
Polygonum aviculare (Knotgrass)
Polygonum cognatum (Indian Knotgrass)
Polygonum persicaria (Redshank)
Polypodium vulgare (Common polypody fern)
Potamogeton natans (Broad-leaved Pondweed)
Potentilla anglica (Trailing tormentil)
Prunella vulgaris (Self-heal)
Prunus domestica (Apple)
Quercus petraea (Sessile Oak)
Ranunculus trichophyllus (Thread-leaved Water-crowfoot)
Reseda luteola (Weld)
Rhododendron ponticum (Rhododendron)
Ribes uva-crispa (Gooseberry)
Rosa agrestis (Small-leaved sweetbriar)
Rosa arvensis (Field rose)
Rosa mollis (Northern downy rose)
Rosa sherardii (Sherard's Downy-rose)
Rubus caesius (Dewberry)
Rubus idaeus (Raspberry)
Salix repens (Creeping Willow)
Saponaria officinalis (Soapwort)
Sedum album (White Stonecrop)
Sherardia arvensis (Field Madder)
Silene vulgaris ssp. Vulgaris (Bladder campion)
Sinapis arvensis (Charlock)
Smyrnium olusatrum (Alexanders)
Spergula arvensis (Corn Spurrey)
Tanacetum parthenium (Feverfew)
Thymus vulgaris (Garden Thyme)
Trisetum flavescens (Yellow Oat-grass)
Veronica anagallis-aquatica (Blue Water-Speedwell)
Veronica arvensis (Wall speedwell)
Veronica hederifoila ssp. Hederifolia (Ivy-leaved speedwell)
Veronica persica (Common field speedwell)
Vinca major (Greater Periwinkle)
Viola odorata (Sweet Violet)

Appendix 7. Additional species recorded by the Dublin Naturalist's Field Club

Recorded on Hewson Hill, Coolnacarrick, Co. Laois

Aira praecox (Early hair-grass)
Catapodium rigidum (Fern grass)
Cotoneaster microphyllus auct. (Cotoneaster)
Galium saxatile (Heath bedstraw)
Lamium purpureum (Red dead nettle)
Polypodium cambricum (Southern polypody)
Prunella vulgaris (Selfheal)
Thymus drucei (Wild thyme)

Appendix 8. List of species recorded from the different habitats.

Additional species per habitat recorded in 2006 are indicated by an asterix following the name.

FL3 Limestone/marl lakes
Epilobium palustre
*Equisetum fluviatile**
Eupatorium cannabinum
Galium palustris
Glyceria sp.
*Hippuris vulgaris**
Hydrocotyle vulgaris
Iris pseudacorus
Juncus acutiflorus
Juncus effusus
*Juncus inflexus**
*Littorella uniflora**
Mentha aquatica
Potentilla anserina

FL4 Mesotrophic lakes
*Juncus acutiflorus**
*Carex rostrata**
*Mentha aquatica**
*Anagallis tenella**
Potamogeton sp. *
*Carex flacca**

FL5 Eutrophic lakes
Salix cinerea
Acer pseudoplatanus
Aesculus hippocastanum

FL5 Eutrophic lakes
*Betula pendula**
Cardamine pratensis
Cladophera algae
Corylus avellana
Crataegus monogyna
Croscosmia x *croscosmia*
Eleocharis sp.
Equisetum fluviatile
Equisetum sp.
Fagus sylvatica
Fraxinus excelsior
Glyceria fluitans
Iris pseudacorus
Juncus effusus
Juncus inflexus
Juncus sp.
Molinia caerulea
Nasturtium sp.
Populus tremula
Prunus sp.
Prunus spinosa
Ranunculus sp. – *water*
Rubus fruticosus agg.
Salix cinerea
Salix caprea
Sambucus nigra
Typha latifolia
Urtica dioica
Veronica beccabunga

FL8 Other artificial lakes and ponds
*Juncus effusus**
*Polygonum amphibium**
Potamogeton sp. *

FW2 Depositing/lowland rivers
Cladophora sp.
Callitriche sp.
Callitriche stagnalis
Calystegia sepium
Epilobium hirsutum
*Epilobium palustre**
Fontinalis sp. *
Glyceria fluitans
Glyceria maxima
Glyceria notata
Iris pseudacorus
Lemma minor
Mentha aquatica
Myosotis scorpioides
Nasturtium officinale
Phalaris arundinacea
Phragmites australis
Polygonum persicaria
Potamogeton sp.
Potentilla anserina
Prunella vulgaris
Ranunculus peltatus
Ranunculus sp. *
Salix alba
Salix caprea

FW2 Depositing/lowland rivers
Salix fragilis
Schoenplectus lacustris
Scrophularia nodosa
Senecio aquaticus
Ulex europaeus
Ulmus glabra
Urtica dioica

FW4 Drainage ditches
Agrostis stolonifera
Angelica sylvestris
Anthoxanthum odoratum
Briza media
Caltha palustre
Cardamine pratensis
Carex acutiformis
Carex nigra
Carex panicea
Carex rostrata
Carex sp.
Cirsium palustre
Crataegus monogyna
Dactylorhiza maculata
Dactylorhiza majalis
Epilobium hirsutum
*Epilobium obtusifolium**
Epilobium palustre
Epilobium sp.
Equisetum arvense
Equisetum sp.

FW4 Drainage ditches
Eriophorum angustifolium
Eupatorium cannabinum
Festuca rubra
Filipendula ulmaria
Galium palustre
Glyceria fluitans
Holcus lanatus
Hypericum pulchrum
Juncus acutiflorus
Juncus articulatus
Juncus effusus
Lolium perenne
Lotus corniculatus
Lythrum salicaria
Mentha aquatica
Mentha sp.
Menyanthes trifoliata
Nasturtium officinale
Phalaris arundinacea
Phragmites australis
Platanthera bifolia
Polygala vulgaris
Potentilla erecta
Potentilla palustre
Ranunculus flammula
Salix cinerea
Succisa pratensis
Trifolium pratense
Trifolium repens
Triglochin palustris

FW4 Drainage ditches
Typha latifolia
Urtica dioica
Vicia cracca

FP2 Non-calcareous springs
Agrostis stolonifera
Cirsium palustre
Crataegus monogyna
Fraxinus excelsior
Glyceria sp.
Holcus lanatus
Juncus acutiflorus
Mentha sp.
Nasturtium officinale
Phragmites australis
Plantago major
Ranunculus acris
Ranunculus repens
Rumex obtusifolius
Salix sp.
Trifolium pratense
Urtica dioica

GA1 Improved agricultural grassland
Agrostis canina
Alopecurus geniculatus
Alopecurus pratensis
Anthoxanthum odoratum
Arrhenatherum elatius
Bellis perennis

GA1 Improved grassland
Carex sp.
*Centaurea nigra**
Cerastium fontanum
Cirsium arvense
*Cirsium vulgare**
*Cynosurus cristatus**

Dactylis glomerata
Elymus repens
*Festuca rubra**
Galium odoratum
Heracleum sphondylium
Holcus lanatus
*Juncus effusus**
Lolium perenne
Plantago lanceolata
Plantago major
Poa annua
Poa sp.
Poa trivialis
Ranunculus acris
Ranunculus repens
Rubus fruticosus agg.
Rumex acetosa
Rumex conglomeratus
Rumex obtusifolius
Rumex sp. *
Salix sp. *
Senecio jacobaea
Stellaria graminea
Taraxacum officinale

GA1 Improved grassland
*Trifolium pratense**
Trifolium repens
*Ulex europaeus**
Urtica dioica

GA2 Amenity grassland (improved)
Bellis perennis
Cirsium arvense
Dactylis glomerata
Festuca rubra
Lolium perenne
Plantago lanceolata
Poa annua
Prunella vulgaris
Ranunculus repens
Rumex obtusifolius
Taraxacum officinalis
Trifolium repens
Veronica chamaedrys

GS1 Dry calcareous and neutral grassland
Achillea millefolium
Agrostis capillaris
Agrostis stolonifera
*Alnus glutinosa**
Antennaria dioica
Anthoxanthum odoratum
*Anthyllis vulgaris**
Arrhenatherum elatius
*Betula pubescens**

GS1 Dry calcareous and neutral grassland
Blackstonia perfoliata
*Brachypodium sylvaticum**
Briza media
*Calystegia sepium**
Carex flacca
Carex panicea
Carex viridula
*Carlina vulgaris**
Centaurea nigra
*Centaurium erythraea**
Cerastium fontanum
Cirsium arvense
Cirsium vulgare
Crataegus monogyna
*Cynosurus cristatus**
Dactylis glomerata
*Dactylorhiza fuchsii**
*Dactylorhiza maculata**
Dactylorhiza maculata
*Dactylorhiza majalis**
Daucus carota
Elymus repens
Epipactis sp.*
equisetum arvense
Eupatorium cannabinum
Euphrasia sp.
Festuca rubra
Filipendula ulmaria
*Fraxinus excelsior**
Galium verum

GS1 Dry calcareous and neutral grassland
Hedera helix
*Helictotrichon pubescens**
Heracleum sphondylium
Holcus lanatus
*Hypericum pulchrum**
*Hypochoeris radicata**
*Ilex aquifolium**
Knautia arvensis
Lathyrus pratensis
Leontodon autumnalis
Leucanthemum vulgare
Linum catharticum
Listeria ovata
Lolium perenne

Lotus corniculatus
*Luzula campestris**
Lythrum salicaria
Mentha sp.
Mentha sp.
Molinia caerulea
Nasturtium officinale
Odontites vernus
Ophioglossum vulgatum
*Ophrys apifera**
*Origanum vulgare**
*Pillosella officinalis**
Plantago lanceolata
*Poa pratensis**
Poa sp.
Poa trivialis

GS1 Dry calcareous and neutral grassland
Polygala vulgaris
*Potentilla anserina**
Potentilla erecta
*Potentilla reptans**
Primula veris
Prunella vulgaris
Pteridium aquilinum
*Quercus robur**
Ranunculus acris
*Ranunculus bulbosus**
Ranunculus repens
Rhinanthus minor
*Rosa canina**
Rubus fruticosus agg.
Rumex acetosa
Rumex crispus
Salix caprea
Salix cinerea
Senecio jacobaea
Sonchus oleraceus
Stellaria graminea
Stellaria uliginosa
*Succisa pratensis**
Taraxacum officinale
*Torilis japonica**
*Trifolium dubium**
*Trifolium pratense**
Trifolium repens
*Trisetum flavescens**
Ulex europaeus

GS1 Dry calcareous and neutral grassland
Urtica dioica
*Veronica chamaedrys**
Vicia cracca
Vicia sepium
Vicia sp.

GS2 Dry meadows and grassy verges
Achillea millefolium
Agrostis capillaris
Agrostis sp.
*Agrostis stolonifera**
*Alopecurus pratensis**
Anthoxanthum odoratum
Anthriscus sylvestris
Arrhenatherum elatius
*Arum maculatum**
Bellis perennis
*Brachypodium sylvaticum**
Briza media
Carex flacca
*Carex hirta**
*Carex panicea**
*Carex pulicaris**
Centaurea nigra
Cerastium fontanum
Cirsium arvense
*Cirsium dissectum**
Cirsium vulgaris
Crepis capillaris
Cynosurus cristatus

GS1 Dry meadows and grassy verges
Dactylis glomerata
*Dactylorhiza fuchsii**
Daucus carota
*Deschampsia cespitosa**
*Epilobium angustifolium**
Equisetum arvense
*Euonymus europaeus**
Euphrasia rostkoviana
Euphrasia sp.
Festuca ovina
*Festuca pratensis**
Festuca rubra
*Filipendula ulmaria**
Galium aparine
Galium saxatile
Galium verum
Geranium molle
Geranium robertianum
Helictotrichon pubescens
Hieracium sp.
Holcus lanatus
*Hyacinthoides-non-scriptus**

Hypericum maculatum
*Ilex aquifolium**
*Iris pseudacorus**
*Juncus acutiflorus**
*Juncus conglomeratus**
*Juncus effusus**
Juncus sp. *
Lapsana communis

GS1 Dry meadows and grassy verges
Lathyrus pratensis
Leontodon autumnalis
*Leontodon hispidus**
Leucanthemum vulgare
Linum catharticum
Lolium perenne
Lotus corniculatus
Luzula campestris
Medicago lupulina
Plantago lanceolata
*Plantago major**
Poa annua
Polygala vulgare
Potentilla anserina
*Potentilla reptans**
Potentilla sterilis
Primula veris
Prunella vulgaris
Prunus sp.
*Ranunculus acris**
Ranunculus repens
Rhinanthus minor
Rosa sp.
Rubus fruticosus agg.
Rumex acetosa
Rumex crispus
Salix cinerea
Salix sp. *
Senecio jacobaea
Silene alba

GS1 Dry meadows and grassy verges
*Succisa pratensis**
Taraxacum officinale
Taraxacum officinalis
Trifolium campestris
Trifolium pratense
Trifolium repens
Urtica dioica
Veronica chamaedrys
Vicia cracca
Vicia sepium
*Viola rivinana**

GS3 Dry-humid acid grassland
Achillea millefolium
Agrostis stolonifera
Anthoxanthum odoratum
Bryophytes
Centaurea nigra
Cirsium sp.
Cynosurus cristatus
Dactylis glomerata
Galium aparine
Galium palustris
Galium verum
Glyceria fluitans
Holcus lanatus
Lathyrus pratensis
Molinia caerulea
Orchid
Plantago lanceolata

GS3 Dry-humid acid grassland
Poa sp.
Potentilla anserina
Potentilla reptans
Ranunculus repens
Rubus fruticosus agg.
Rumex obtusifolius
Rumex sp.
Taraxacum officinale
Vicia sepium

GS4 Wet grassland
Agrostis canina
Agrostis capillaris
Agrostis stolonifera
Alopecurus geniculatus
*Alopecurus pratensis**
*Anagallis tenella**
Angelica sylvestris
Anthoxanthum odoratum
*Aquilega vulgaris**
Arrhenatherum elatius
*Brachypodium sylvaticum**
Briza media
Calluna vulgaris
Caltha palustris
Calystegia sp. *
Cardamine pratensis
Carex flacca
Carex hirta
Carex nigra

GS4 Wet grassland
Carex panicea
Carex pulicaris
Carex rostrata
Carex viridula
Centaurea nigra
Cerastium fontanum
Cirsium arvense
Cirsium dissectum
Cirsium palustre
Cirsium vulgare
Corylus avellana
Crataegus monogyna
Cynosurus cristatus
Dactylis glomerata
Dactylorhiza fuchsii
Dactylorhiza incarnata
Dactylorhiza maculata
Deschampsia caespitosa
Deschampsia flexuosa
Eleocharis palustris
*Elymus repens**
*Epilobium montanum**
Epilobium hirsutum
Epilobium parviflorum
Epilobium sp.
Equisetum arvense
*Equisetum fluviatile**
*Equisetum palustre**
Equisetum sp.
Erica tetralix

GS4 Wet grassland
*Eriophorum angustifolium**
Eriophorum vaginatum
Eupatorium cannabinum
Festuca gigantea
Festuca rubra
Filipendula ulmaria
*Galium aparine**
Galium palustre
*Galium verum**
Glyceria fluitans
*Glyceria maxima**
Gymnadenia conopsea
*Helictotrichon pubescens**
Holcus lanatus
Hydrolyte vulgaris
Hypericum pulchrum
Hypericum tetrapterum
Hypochoeris radicata
Iris pseudacorus
Juncus acutiflorus
Juncus articulatus
Juncus conglomeratus
Juncus effusus
Juncus inflexus
Lathyrus pratensis
Leontodon autumnalis
*Leontodon hispidus**
Linum catharticum
Lolium perenne
Lotus corniculatus

GS4 Wet grassland
*Lotus uliginosa**
Luzula campestris
Lychnis flos-cuculi
Lythrum salicaria
Mentha aquatica
Mentha sp.
Menyanthes trifoliata
Molinia caerulea
Pedicularis sylvatica
Phalaris arundinacea
Phleum pratense
Phragmites australis
Plantago lanceolata
*Platanthera bifolia**
Poa sp.
Poa trivialis
Polygala vulgaris
Potamogeton sp.
Potentilla anserina
Potentilla erecta
Potentilla reptans
Prunella vulgaris
Ranunculus acris
Ranunculus flammula
Ranunculus lingua
Ranunculus repens
*Rhinanthus minor**
*Rosa canina**
Rubus fruticosus agg.
Rumex acetosa

GS4 Wet grassland
Rumex crispus
Sagina procumbens
*Salix caprea**
Salix cinerea
Senecio aquatica
Senecio jacobaea

Sonchus asper
Stachys palustris
Stellaria aparine
Stellaria graminea
Succisa pratensis
Taraxacum officinale
Trifolium pratense
Trifolium repens
Triglochin palustre
Ulex europaeus
Valeriana officinalis
Veronica beccabunga
Veronica chamaedrys
*Viburnum opulus**
Vicia cracca
Vicia sepium
Vicia sp.

GM1 Marsh
Agrostis capillaris
*Agrostis stolonifera**
Angelica sylvestris
Anthoxanthum odoratum
Caltha palustre

GM1 Marsh
Carex nigra
Carex vesicaria
*Centaurea nigra**
Cirsium palustre
*Cladium mariscus**
*Crataegus monogyna**
Epilobium palustre
Equisetum sp.
Filipendula ulmaria
*Fraxinus excelsior**
Gallium palustre
Holcus lanatus
Iris pseudacorus
Juncus acutiflorus
Juncus effusus
Juncus effusus
Lathyrus pratensis
Lolium perenne
Lythrum salicaria
Lythrum salicaria
Mentha aquatica
Molina caerulea
Myosotis palustris
Phleum pratensis
*Phragmites australis**
Potentilla anserina
Potentilla erecta
Potentilla palustre
Ranunculus acris

GM1 Marsh
Ranunculus repens
Rubus fruticosus agg.
Rumex sp.
Salix aurita
Salix cinerea
*Schoenus nigricans**
Silene dioica
*Valeriana officinalis**
Vicia cracca

HH3 Wet heath
Angelica sylvestris
Anthoxanthum odoratum
Bryophytes
Carex panicea
Cirsium palustre
Dactylis glomerata
Festuca ovina
Festuca rubra
Filipendula ulmaria
Holcus lanatus
Luzula campestris
Molinia caerulea
Populus sp.
Potentilla erecta
Ribes sp.
Rubus fruticosus agg.
Schoenus nigricans
Succisa pratensis

HD1 Dense bracken
Agrostis canina
Anthoxanthum odoratum
Carex echinata
Carex flacca
Cirsium vulgare
Dactylorhiza fuchsii
Deschampsia cespitosa
Festuca arundinacea
Holcus lanatus
Hypericum sp.
Juncus acutiflorus
Juncus effusus
Luzula multiflorum
Pedicularis sp.
Plantago lanceolata

Potentilla erecta
Prunella vulgaris
Pteridium aquilinum
Ranunculus acris
Rubus fruticosus agg.
Succisa pratensis
Trifolium pratense

PB1 Raised bog
*Andromeda polifolia**
Angelica sylvestris
Anthoxanthum odoratum
Betula pubescens
Calluna vulgaris
*Carex rostrata**

PB1 Raised bog
*Cladonia portentosa**
Dactylorhiza fuchsii
Drosera rotundifolia
Dryopteris dilatata
Epilobium angustifolium
Equisetum sp.
Erica tetralix
Eriophorum angustifolium
Eriophorum vaginatum
*Juncus bufonius**
Luzula multiflora
Molina caerulea
Narthecium ossifragum
Osmunda regalis
*Pinguicula vulgaris**
Potentilla erecta
Pteridium aquilinum
Rhynchospora alba
Salix aurita
Sphagnum capillifolium
Sphagnum cuspidatum
Sphagnum imbricatum
Sphagnum papillosum
Succisa pratensis
Trichophorum caespitosum
Ulex europaeus

PB4 Cutover bog
Andromeda polifolia
Angelica sylvestris

PB4 Cutover bog
Anthoxanthum odoratum
Betula pubescens
Calluna vulgaris
*Carex nigra**
*Carex rostrata**
*Cladonia portentosa**
Dactylorhiza fuchsii
Drosera rotundifolia
Dryopteris dilatata
Epilobium angustifolium
Equisetum sp.
Erica tetralix
Eriophorum angustifolium
Eriophorum vaginatum
*Iris pseudacorus**
*Lonicera periclymenum**
Luzula multiflora
Molina caerulea
Narthecium ossifragum
Osmunda regalis
*Polystichum commune**
Potentilla erecta
*Potentilla palustre**
*Potentilla reptans**
Pteridium aquilinum
*Rhododendron ponticum**
Rhynchospora alba
Salix aurita
*Salix cinerea**
*Sorbus aucuparia**

PB4 Cutover bog
Sphagnum capillifolium
Sphagnum cuspidatum
Sphagnum imbricatum
Sphagnum papillosum
Sphagnum sp.*
Succisa pratensis
Trichophorum caespitosum
*Typha latifolia**
Ulex europaeus

PF1 Rich fen and flush
Alnus glutinosa
Carex panicea
Equisetum sp.
Filipendula ulmaria
Holcus lanatus
Mentha aquatica
Molina caerulea
Phragmites australis
Pinus sp.
Potentilla erecta
Schoenus nigricans
Succisa pratensis

Ulex europaeus

WN1 Oak-birch-holly woodland
Betula pubescens
Fraxinus excelsior
Hedera helix
Salix sp.

WN2 Oak-ash-hazel woodland
Acer pseudoplatanus
Agrostis stolonifera
Ajuga reptans
Alliara petiolata
*Allium ursinum**
*Anemone nemorosa**
Angelica sylvestris
Arrhenatherum elatius
Arum maculatum
Asplenium adiantum-nigrum
Athyrium filix femina
Bellis perennis
Brachypodium sylvaticum
Caltha palustris
Carex sp.
Carex sylvatica
Castanea sativa
Cerastium fontanum
Circaea lutetiana
Cirsium dissectum
Cirsium vulgare
*Clematis vitalba**
Corylus avellana
Crataegus monogyna
Dactylis glomerata
Deschampsia cespitosa
Dryopteris affinis
Dryopteris dilatata
Dryopteris filix-mas
Epilobium sp.

WN2 Oak-ash-hazel woodland
Equisetum arvense
Equisetum sp.
Euonymus europaeus
Fagus sylvatica
Filipendula ulmaria
Fraxinus excelsior
Galium aparine
Galium odoratum
Geranium robertianum
Geum urbanum
Glechoma hederacea
Hedera helix
Heracleum sphondylium
Holcus lanatus
Hyacinthoides non-scriptus
Ilex aquifolium
Juncus inflexus
Juncus sp.
Lapsana communis
Listeria ovata
Lonicera periclymenum
Lysimachia nemorum
Melica uniflora
Mentha aquatica
Mentha sp.
Oxalis acetosa
Phragmites australis
Phyllitis scolopendrium
Picea sitchensis
Pinus sp.

WN2 Oak-ash-hazel woodland
Poa annua
*Poa trivialis**
Polypodium vulgare
Polystichum setiferum
Populus tremula
Potentilla erecta
Potentilla setiferum
Potentilla sterilis
*Primula veris**
Primula vulgaris
Prunus sp.
Prunus spinosa
Quercus robur
*Ranunculus acris**
Ranunculus ficaria
Ranunculus repens
Ribes rubrum
Rosa canina
Rosa sp.
Rubus fruticosus agg.
Rumex crispus
Rumex sanguineus
Rumex sp.
Salix caprea
Salix cinerea
Salix sp.
Sambucus nigra
Sanicula europaeus
Sonchus asper
Sorbus aucuparia seedlings

WN2 Oak-ash-hazel woodland
Stachys sylvatica
Stellaria holostea
Taraxacum officinale
*Taxus baccata**
Teucrium scorodonia
Ulex europaeus
Ulmus glabra
Urtica dioica
Veronica beccabunga
Veronica chamaedrys
Veronica montana
Veronica sp.
Viburnum opulus
Vicia sepium
Viola riviniana
Viola sp.

WN6 Wet willow-alder-ash woodland
Acer pseudoplatanus
Alnus glutinosa
Arum maculatum
Betula pubescens
Brachypodium sylvaticum
Carex flacca
Carex remota
Chrysosplenium oppositifolium
Circaea lutetiana
Corylus avellana
Crataegus monogyna
Deschampsia caespitosa

WN6 Wet willow-alder-ash woodland
Dryopteris dilatata
Epilobium hirsutum
Epilobium montanum
Equisetum sylvaticum
Fagus sylvatica
Filipendula ulmaria
Fraxinus excelsior
Galium aparine
Geranium robertianum
Geum urbanum
Glechoma hederacea
Glyceria fluitans
Heracleum sphondylium
Iris pseudacorus
Lonicera periclymenum
Mentha aquatica
Quercus robur
Ranunculus flammula
Rubus fruticosus agg.
Salix cinerea
Sambucus nigra
Sanicula europaea
Solanum dulcamara
Stachys sylvatica
Ulex europaeus
Ulmus glabra
Urtica dioica
Viola sp.

WN7 Bog woodland
Betula pubescens
Alnus glutinosa
Crataegus monogyna
Fraxinus excelsior
Prunus avium
Prunus spinosa
Rubus fruticosus agg.
Salix aurita
Salix cinerea
Sambucus nigra

WD1 (Mixed) broadleaved woodland
Acer pseudoplatanus
Aesculus hippocastanum
*Alliara petiolaria**
*Allium ursinum**
*Alnus glutinosa**
Anthriscus sylvestris
Arctium minor
Arum maculatum
Brachypodium sylvaticum
Cardamine flexuosa
Carex sylvatica
Cerastium fontanum
Circaea lutetiana
Cirsium vulgare
Conopodium majus
Corylus avellana
Crataegus monogyna
Dactylis glomerata

WD1 Mixed broadleaved woodland
Epilobium sp.
Fagus sylvatica
*Filipendula ulmaria**
Fraxinus excelsior
Galium aparine
Geranium robertianum
Geum urbanum
Hedera helix
Heracleum sphondylium

Hyacinthoides non-scriptus
Ilex aquifolium
*Lapsana communis**
*Laurus nobilis**
Ligustrum sp.
Lonicera periclymenum
Lysimachia nemorum
*Picea abies**
Poa sp.
*Polystichum aculeatum **
Polystichum setiferum
Potentilla sterilis
Primula vulgaris
*Prunus laurocerasus**
Prunus spinosa
Quercus robur
Ranunculus auricomus
Ranunculus ficaria
*Ranunculus repens**
Rosa sp. *
Rubus fruticosus agg.

WD1 Mixed broadleaved woodland
*Rumex crispus**
Rumex obtusifolius
Rumex sanguineus
Rumex sp.
Salix sp.
Sambucus nigra
*Senecio jacobaea**
Stachys sylvatica
Stellaria media
*Symphoricarpos orbiculatus**
Taraxacum officinale
*Taraxacum officinale**
Tilia cordata
*Tilia x europaea**
Ulmus glabra
Ulmus procera
Urtica dioica
Veronica montana
Veronica officinalis
*Viburnum opulus**
Vicia sp.
*Viola reichenbackiana**
Viola sp.

WD2 Mixed broadleaved/conifer woodland
Abies sp.
Acer pseudoplatanus
Alnus glutinosa
Arum maculatum
Betula pubescens

WD2 Mixed broadleaved/conifer woodland
Brachypodium sylvaticum
Circaea lutetiana
Corylus avellana
Crataegus monogyna
Dryopteris affinis
Dryopteris dilatata
Dryopteris filix-mas
Euonymus europaeus
Fagus sylvatica
Fraxinus excelsior
Geranium robertianum
Geum urbanum
Hedera helix
Hypericum humifusum
Ilex aquifolium
Lonicera periclymenum
Phragmites australis
*Picea abies**
Picea sitchensis
Pinus sylvestris
Prunus domestica
Prunus kanzan
Prunus spinosa
Pseudosuga menzessi
Quercus robur
Rosa sp.
Rubus fruticosus agg.
Salix caprea
Salix cinerea
Sambucus nigra

WD2 Mixed broadleaved/conifer woodland
Sanicula europaea
Ulex europaeus
Urtica dioica
Veronica chamaedrys
Viburnum opulus
Viola sp.

WD3 (Mixed) conifer woodland
Picea sitchensis
*Picea abies**
*Larix decidua**

WD4 Conifer plantation
Abies sp.
Larix sp.
Norway spruce
Picea abies

Picea sitchensis
Pinus contorta
Pinus sylvestris
Pseudosuga menziesii

WD5 Scattered trees and parkland
*Acer pseudoplatanus**
Aesculus hippocastanum
Fagus sylvatica
Fraxinus excelsior
Fraxinus excelsior pendula
*Ulmus procera**

WS1 Scrub
Acer pseudoplatanus
Achillea millefolium
Agrostis stolonifera
Alnus glutinosa
Andromeda polifolia
Angelica sylvestris
Anthoxanthum odoratum
*Arctium minus**
Arum maculatum
Bellis perennis
Betula pubescens
Brachypodium sylvaticum
Briza media
Calluna vulgaris
Cardamine pratensis
Carex panicea
Carex pilulifera
Centaurea nigra
Cerastium fontanum
Cirsium dissectum
Cirsium vulgare
Corylus avellana
Crataegus monogyna
Cynosurus cristatus
Dactylis glomerata
Dactylorhiza fuchsii
Dactylorhiza maculata
Dactylorhiza majalis
Deschampsia cespitosa
Drosera rotundifolia

WS1 Scrub
Dryopteris dilatata
Dryopteris filix-mas
Epilobium angustifolium
Epilobium palustre
Equisetum sp.
Erica cinerea
Erica tetralix
Eriophorum angustifolium
Eriophorum vaginatum
Euphrasia sp.
Fagus sylvatica
Filipendula ulmaria
Fraxinus excelsior
Galium aparine
Galium verum
Geranium molle
Geranium robertianum
Glechoma hederacea
Hedera helix
Heracleum sphondylium
Holcus lanatus
Hyacinthoides non-scriptus
Hypericum humifusum
Ilex aquifolium
Juncus acutiflorus
Larix decidua
Leontodon autumnalis
Ligustrum sp.
Ligustrum vulgare
Listeria ovata

WS1 Scrub
Lolium perenne
Lonicera periclymenum
Lotus corniculatus
Luzula multiflora
Luzula sylvatica
Malus sp.
Mentha arvensis
Molina caerulea
Narthecium ossifragum
Osmunda regalis
Pedicularis sylvatica
Phragmites australis
Plantago lanceolata
Poa sp.
Polygala vulgaris
Polystichum aculeatum
Populus sp.
Potentilla anserina
Potentilla erecta
Potentilla reptans
Primula vulgaris
Prunus avium
*Prunus domestica**
Prunus spinosa
Pteridium aquilinum
Quercus robur

Ranunculus ficaria
Ranunculus flammula
Ranunculus repens
Rhynchospora alba

WS1 Scrub
*Rosa canina**
Rosa sp
Rubus fruticosus agg.
*Rumex crispus**
Salix aurita
Salix caprea
Salix cinerea
*Salix fragilis**
Salix sp.
Sambucus nigra
Schoenus nigricans
Silene dioica
Sorbus aucuparia
Sphagnum capillifolium
Sphagnum cuspidatum
Sphagnum imbricatum
Sphagnum papillosum
Succisa pratensis
Taraxacum officinalis
Trichophorum caespitosum
Trifolium dubium
Trifolium pratense
Trifolium repens
Ulex europaeus
Ulmus glabra
Ulmus procera
Urtica dioica
*Valeriana officinalis **
Veronica chamaedrys
Viburnum opulus

WS1 Scrub
Vicia cracca
Viola riviniana

WS2 Immature woodland
Acer pseudoplatanus
Agrostis stolonifera
Alnus glutinosa
Arrhenatherum elatius
Betula pubescens
Cirsium arvense
Cirsium palustre
Digitalis purpurea
Epilobium angustifolium
Epilobium sp.
Fagus sylvatica
Fraxinus excelsior
Holcus lanatus
Hypericum pulchrum
Juncus acutiflorus
Juncus effusus
Lathyrus pratensis
Luzula multiflora
Potamogeton sp.
Potentilla reptans
Quercus robur
Ranunculus flammula
Rubus fruticosus agg.
Rumex acetosella
Salix sp.
Senecio jacobaea

WS2 Immature woodland
Silene dioica
Taraxacum officinalis
Trifolium pratense
Ulex europaeus

WS3 Ornamental/non-native shrub
Fagus sylvatica
Grisilina littoralis
Ligustrum ovalifolium
Lonicera nitida
x *Cupressocyparis leylandii*

WS5 Recently felled woodland
Anthoxanthum odoratum
Arrhenatherum elatius
Athyrium filix-femina
Betula pubescens
Calluna vulgaris
Calystegia sepium
Carex flacca
Cirsium arvensis
Cirsium vulgare
Dactylis glomerata
Dryopteris dilatata
Epilobium angustifolium
Epilobium parviflorum
Festuca gigantea
Filipendula ulmaria
Fraxinus excelsior
Galium palustris

WS5 Recently felled woodland
Geranium robertianum
Holcus lanatus

Hypericum repens
Hypericum tetrapterum
Juncus acutiflorus
Juncus effusus
Juncus inflexus
Lonicera periclymenum
Luzula multiflora
Lythrum salicaria
Medicago lupulina
Mentha sp.
Molinia caerulea
Nasturtium officinale
Odontites vernus
Oxalis acetosella
Phleum pratensis
Polygonum persicaria
Potentilla anserina
Potentilla erecta
Potentilla reptans
Prunella vulgaris
Ranunculus flammula
Ranunculus repens
Rubus fruticosus agg.
Salix cinerea
Senecio jacobaea
Sisymbrium officinale
Solanum dulcamara
Sonchus arvensis

WS5 Recently felled woodland
Stachys sylvatica
Taraxacum officinale
Torilis japonica
Trifolium repens
Ulex europaeus
Urtica dioica
Veronica beccabunga
Vicia cracca
Vicia sepium

WL1 Hedgerows
Acer pseudoplatanus
Achillea millefolium
Agrostis capillaris
Agrostis stolonifera
*Alnus glutinosa**
*Alopecurus pratensis**
Anthoxanthum odoratum
Arrhenatherum elatius
Asplenium adiantum-nigrum
*Betula pendula**
Brachypodium sylvaticum
Carex divulsa
Centaurea nigra
Centaurium erythraea
Cerastium fontanum
Cirsium arvensis
Cirsium vulgare
*Clematis vitalba**
Corylus avellana

Wl1 Hedgerows
Crataegus monogyna
Dactylis glomerata
Daucus carota
Epilobium hirsutum
Epilobium parviflorum
Equisetum arvense
Euonymus europaeus
*Fagus sylvatica**
Festuca rubra
Filipendula ulmaria
Fraxinus excelsior
Galium palustris
Galium verum
Geranium robertianum
Glechoma hederacea
Glyceria fluitans
Hedera helix
Helictotrichon pubescens
Heracleum sphondylium
Holcus lanatus
Hypericum androsaemum
Hypericum maculatum
Hypericum perforatum
Ilex aquifolium
Iris pseudacorus
Knautia arvensis
Lathyrus pratensis
Leontodon autumnalis
Ligustrum sp.
*Ligustrum vulgaris**

Wl1 Hedgerows
Lolium perenne
Lonicera periclymenum
Lotus corniculatus
Lythrum salicaria
*Malus domestica**
Medicago lupulina
Mentha spicata
Myosotis discolor
Myosotis palustris
Phleum pratensis

Phyllitis scolopendrium
Plantago lanceolata
Plantago major
Polystichum setiferum
Potentilla anserina
Potentilla reptans
Primula vulgaris
Prunus domestica
Prunus spinosa
Pteridium aquilinum
*Pyrus pyraster**
*Quercus robur**
Reynoutria japonica
Rosa arvense
Rosa canina
Rosa sp.
Rubus fruticosus agg.
Rumex obtusifolius
Rumex sp.
Salix aurita

Wl1 Hedgerows
Salix caprea
Salix cinerea
Salix sp.
Salix viminalis
Salix x multinervis
Sambucus nigra
Schoenplectus lacustris
Senecio jacobaea
Silene latifolia
Sonchus oleraceus
Sorbus aria
Sorbus aucuparia
Stellaria holostea
Symphytum sp.
Taraxacum officinale
*Taxus baccata**
*Tilia x europaea**
Torilis japonica
Ulex europaeus
Ulmus glabra
Ulmus procera
Urtica dioica
Veronica chamaedrys
Veronica officinalis
Viburnum opulus
Vicia sepium
Viola sp.

WL2 Treelines
Acer pseudoplatanus

Wl2 Treelines
Aesculus hippocastanum
Chamaecyparis sp
Corylus avellana
Crataegus monogyna
Fagus sylvatica
Fraxinus excelsior
Hedera helix
Larix decidua
Lonicera periclymenum
Pinus sylvestris
Populus sp.
*Quercus robur**
Rosa canina
Salix cinerea
Sorbus aucuparia
Ulmus sp.

ER2 Exposed calcareous rock
Briza media
Centaurea nigra
Cerastium fontanum
Cirsium vulgare
Crataegus monogyna
Dactylis glomerata
Festuca sp.
Fragaria vesca
Geranium dissectum
Geranium robertianum
Geum urbanum
Hedera helix

ER2 Exposed calcareous rock
Hypericum sp.
Leucanthemum vulgare
Linum bienne
Lotus corniculatus
Medicago lupulina
Orchid
Orchid withered
Plantago lanceolata
Potentilla reptans
Potentilla sterilis
Prunus spinosa
Rosa canina
Rubus fruticosus agg.
Sanguisorba minor
Sedum acre
Senecio jacobaea
Stachys sylvatica
Trifolium dubium

Trifolium repens
Ulex europaeus
Vicia sativa

ED1 Exposed sand, gravel or till
Callitriche stagnalis
Epilobium palustre
Glyceria maxima
Glyceria notata
Nasturtium officinale
Phragmites australis
Ranunculus peltatus

ED1 Exposed sand, gravel or till
*Rumex crispus**
Salix fragilis
Scrophularia nodosa

ED2 Spoil and bare ground
*Salix sp. **
*Poa annua**
*Senecio vulgaris**
*Taraxacum officinale**

ED3 Recolonising bare ground
Agrostis stolonifera
Anagallis arvensis
Anthoxanthum odoratum
Arrhenatherum elatius
Calystegia sepium
Centaurea nigra
Chenopodium alba
Cirsium arvense
Cirsium vulgare
Cotoneaster sp.
Dactylis glomerata
Daucus carota
Epilobium angustifolium
Epilobium hirsutum
Epilobium parviflorum
Equisetum arvense
Fraxinus excelsior
Heracleum sphondylium
Holcus lanatus

ED3 Recolonising bare ground
Hypericum sp.
Juncus acutiflorus
Juncus bufonius
Lathyrus pratensis
Matricaria matricaria
Medicago lupulina
Odontites vernus
Plantago lanceolata
Plantago major
Hedera helix
Helictotrichon pubescens
Heracleum sphondylium
Rumex conglomeratus
Salix cinerea
Senecio jacobaea
Senecio vulgaris
Sonchus oleraceus
Taraxacum officinale
Trifolium pratensis
Trifolium repens
Tussilago farfara
Urtica dioica
Vicia sepium

ED6 Set-aside
Agrostis stolonifera
Cirsium sp.
Galium aparine
Lolium perenne
Rumex conglomeratus
Taraxacum officinale

BC1 Arable crops
Barley
Sweet corn
Sugar beet
Wheat

BC2 Horticultural land
Apples
Cabbage
Carrots
Onions
Potatoes

BC4 Flower beds and borders
Allium schoenoprasum
Apple trees
Cabbage
Chrysanthemum rubellum sp.
Dianthus sp.
Digitalis purpureus
Geranuim sp.
Juniperus squamata sp.
Kniphofia sp.
Leeks
Lettuce
Lupinus sp.

Onions
Paeonia sp.
Papaver orientalis
Potatoes

BC4 Flower beds and borders
Rosmarinus officinalis
Stachys byzantina
x *Cupressus macrocarpa*

BL1A Stone walls
*Asplenium ruta-muraria**
*Asplenium trichomanes**
*Brachypodium sylvaticum**
Bryophytes
Calystegia sepium
Cardamine flexuosa
Epilobium sp.
*Festuca rubra**
*Geranium robertianum**
Hedera helix
*Lichens**
*Parietaria diffusa**
*Phyllitis scolopendrium**
Poa annua
*Potentilla sterilis**
*Taraxacum officinale**

BL1B Other stonework
*Hedera helix**
*Sambucus nigra**
*Poa annua**
Rubus fruticosus agg.*

BL2 Earth banks
Achillea millefolium
Anthriscus sylvestris
Arrhenatherum elatius
Brachypodium sylvaticum
Calystegia sepium
Centaurea nigra
Cirsium arvensis
Corylus avellana
Crataegus monogyna
Dactylis glomerata
Elymus repens
Equisetum arvense
Filipendula ulmaria
Fraxinus excelsior
Galium aparine
Glechoma hederacea
Hedera helix
Heracleum sphondylium
Lathyrus pratensis
Lonicera periclymenum
Phyllitis scolopendrium
Poa trivialis
Potentilla anserina
Potentilla reptans
Prunus spinosa
Pteridium aquilinum
Rosa canina
Rubus fruticosus agg.
Taraxacum officinalis
Urtica dioica

BL3 Earth banks
Vicia cracca
Vicia sepium

BL3 Buildings and artificial surfaces
Asplenium scolopendrium
Fraxinus excelsior
Rubus fruticosus agg.
Sambucus nigra

BL3D Land being developed
No species recorded

BL3 1 Large urban gardens
No species recorded

BL3 2 Medium urban gardens
No species recorded

BL3 3 Small urban gardens
No species recorded

Appendix 9. Target Notes

Townland, grid-square and target note numbers for different habitats in County Laois Parish Habitat Survey during 2005 and 2006

Limestone/marl lakes (FL3)

Townland	Grid square	Target note number
Ballinlough	S5399	N1
Bellegrove	N5905	N3
Bellegrove	N5905	N4
Bellegrove	N5905	N5
Kilbride	N5209	N4

Depositing lakes and rivers (FW2)

Townland	Grid square	Target note number
Courtwood	N6002	N1
Courtwood	N6102	N2
Garryvacum	N5506	N1
Vicarstown (Dodd)	N6001	N2

Canals (FW3)

Townland	Grid square	Target note number
Bracklone	N5511	N3
Kilbride	N5210	N2

Drainage ditches (FW4)

Townland	Grid square	Target note number
Ballymorris	N5211	N4
Cappakeel	N5604	N5
Coolnacurragh	S3378	N4
Coolroe	N5903	N2
Cooltederry	N5412	N5
Cooltederry	N5311	N2
Doolough	N5409	N4
Droughill	N5413	N3
Garrymaddock	N5703	N5
Morett	N5404	N7
Raheenahown North	N5802	N2
Rosnamullane	N5901	N1
Tinnaragh	S3282	N1

Dry calcareous and neutral grassland (GS1)

An asterisk after townland name indicates that it is worth considering as a priority grassland

Townland	Grid square	Target note number
Carigeen	N5500	N11
Carigeen	N5500	N12

Carigeen	N5500	N16
Coolnacarrick	S5296	N1
Dairyhill	S3483	N1
Garryduff	S5282	N3
Garrymaddock	N5702	N13
Grange Upper	S5396	N2
Kilbride	N5209	N6
Kilbride*	N5209	N7
Middlemount/Ballyvoghlaun	S3278	N2
Park or Dunamase	N5298	N12
Park or Dunamase	N5398	N2

Dry meadows and grassy verges (GS2)

Townland	Grid square	Target note number
Ballymorris	N5311	N1
Bellegrove	N5806	N4
Bracklone	N5511	N1
Bracklone	N5611	N1
Bracklone	N5611	N3
Coolnacarrick	S5296	N1
Courtwood	N6302	N1
Droughill	N5413	N4
Kilbride	N5210	N6
Kilbride	N5209	N4
Killone	N5402	N3
Raheen	N5300	N7
Raheenahown North	N5902	N2
Rathcrea	N5801	N9
Tierhogar	N5510	N1
Vicarstown (Dodd)	N6301	N1

Dry-humid acid grassland (GS3)

Townland	Grid square	Target note number
Cappakeel	N5604	N2
Garrymaddock	N5702	N7
Hophall	S5095	N10
Morett	N5404	N9
Morett	N5404	N1

Wet grassland (GS4)

Townland	Grid square	Target note number
Ballycarroll	S5199	N2
Ballycarroll	S5199	N7
Ballycarroll	S5198	N5
Ballycarroll	S5198	N6
Ballymorris	N5211	N1
Ballymorris	N5411	N1
Ballymorris	N5210	N3
Bellegrove	N5905	N7
Bellegrove	N5905	N6
Coolacurragh	S3378	N2

Coolacurragh	S3378	N3
Cooltederry	N5311	N1
Curragh	S3481	N2
Dairyhill	S3582	N1
Doolough	N5409	N3
Garryduff	S3182	N14
Garrymaddock	N5702	N9
Garrymaddock	N5702	N14
Garrymaddock	N5703	N4
Garryvacum	N5507	N7
Hophall	S5095	N1
Hophall	S5095	N2
Hophall	S5095	N6
Lough	N5408	N2
Middlemount/Ballyvoghlaun	S3278	N3
Morett	N5403	N3
Morett	N5403	N3
Park or Dunamase	S5198	N2
Park or Dunamase	S5198	N7
Rahandrick Upper	S3181	N1
Raheenahown North	N5902	N3
Rathcrea	N5901	N4
Shanvaghey	S3380	N3
Tonafarna	N5802	N3
Vicarstown (Dodd)	N6201	N1

Marsh (GM1)

Townland	Grid square	Target note number
Aghnahilly Bog	S5198	N3
Cooltederry	N5412	N4
Park or Dunamase	S5198	N1
Tintore & Ballycolla	S3581	N1

Wet heath (HH3)

Townland	Grid square	Target note number
Ballyduff		
Garrymaddock	N5702	N11
Morett	N5403	N6
Morett	N5404	N3
Morett	N5404	N6

Raised bog (PB1)

Townland	Grid square	Target note number
Garryvacum	N5507	N10

Cutover bog (PB4)

Townland	Grid square	Target note number
Aghnahilly Bog	S5198	N1
Aghnahilly Bog	S5198	N3
Aghnahilly Bog	S5198	N4
Aghnahilly Bog	S5198	N5

Dysart	S5197	N1
Garryvacum	N5507	N8

Rich fen and flush (PF1)

Townland	Grid square	Target note number
Morett	N5406	N6

Poor fen and flush (PF2)

Townland	Grid square	Target note number
Garryvacum	N5507	N11

Oak-ash-hazel woodland (WN2)

Townland	Grid square	Target note number
Ballymaddock	S5498	N2
Ballymorris	N5310	N2
Ballythomas	N5500	N1
Carrageen	N5500	N15
Carrageen	N5400	N2
Chapelhill	S3381	N1
Courtwood	N6102	N1
Courtwood	N6302	N2
Dysart	S5197	N7
Garrymaddock	N5702	N4
Garrymaddock	N5702	N6
Grange Upper	S5396	N1
Hophall	S5195	N5
Kilbride	N5210	N3
Killone	N5500	N2
Kilmurray	N5501	N2
Kilmurray	N5501	N4
Kilmurray	N5501	N7
Kilmurray	N5500	N2
Kilteale	S5498	N3
Lamberton Demesne	S4193	N1
Morett	N5402	N2
Morett	N5403	N4
Morett	N5404	N3
Morett	N5403	N4
Park or Dunamase	S5198	N6
Park or Dunamase	S5298	N6
Park or Dunamase	S5298	N15
Park or Dunamase	S5298	N16
Park or Dunamase	S5297	N2
Park Upper	S5498	N3
Raheen	N5300	N2
Raheen	N5499	N1

Scrub (WS1)

Townland	Grid square	Target note number
Aghnahilly	S5597	N5
Aghnahilly	S5397	N8

Aghnahilly Bog	S5198	N1
Aghnahilly Bog	S5198	N2
Aghnahilly Bog	S5198	N6
Aghnahilly Bog	S5198	N8
Ballinlough	S5499	N1
Ballinlough	S5499	N2
Ballycarroll	S5398	N6
Ballycarroll	S5099	N1
Ballycarroll	S5299	N2
Ballycarroll	S5299	N8
Ballycarroll	S5298	N2
Ballycarroll	S5398	N5
Ballycarroll	S5397	N1
Ballycarroll	S5397	N2
Ballycarroll	S5397	N3
Ballymaddock	N5400	N2
Ballymaddock	N5400	N3
Ballymaddock	S5499	N1
Ballymaddock	S5499	N2
Ballymaddock	S5499	N4
Ballymaddock	S5499	N7
Ballymaddock	S5499	N5
Ballymaddock	S5598	N1
Ballymaddock	S5598	N5
Ballythomas	N5600	N3
Ballythomas	N5400	N4
Bracklone	N5512	N1
Bracklone	N5512	N2
Cappakeel	N5604	N3
Cappakeel	N5604	N4
Carigeen	N5500	N11
Carigeen	N5600	N6
Coolnacarrick	S5296	N1
Coolnacarrick	S5296	N2
Coolnacarrick	S5296	N3
Coolnacarrick	S5296	N4
Coolnacarrick	S5295	N1
Coolnacarrick	S5295	N2
Coolnacarrick	S5295	N3
Cooltederry	N5411	N2
Cooltederry	N5411	N4
Courtwood	N6002	N3
Dairyhill	S3483	N1
Doolough	N5408	N2
Dysart	S5197	N5
Dysart	S5297	N1
Dysart	S5098	N1
Dysart	S5196	N1
Dysart	S5296	N3
Dysart	S5098	N1

Dysart	S5196	N2
Dysart	S5196	N6
Dysart	S5196	N7
Dysart	S5296	N1
Dysart	S5296	N3
Garryduff	S3182	N4
Garryduff	S3182	N5
Garryduff	S3182	N10
Garrymaddock	N5702	N3
Garrymaddock	N5702	N5
Garrymaddock	N5703	N1
Garryvacum	N5608	N1
Garryvacum	N5608	N2
Garryvacum	N5507	N2
Garryvacum	5507	N6
Grange Upper	S5397	N2
Hophall	S5195	N1
Hophall	S5195	N2
Hophall	S5095	N3
Hophall	S5095	N4
Kilbreedy	S3080	N1
Kilbreedy	S3080	N2
Kilbride	N5210	N6
Kilbride	N5210	N8
Kilbride	N5209	N5
Kilbride	N5209	N9
Killone	N5502	N2
Killone	N5502	N6
Killone	N5400	N1
Killone	N5402	N2
Kilmurray	N5501	N1
Kilmurray	N5501	N10
Kilmurray	N5601	N3
Kilmurray	N5602	N2
Kilteale	S5498	N4
Kilteale	S5498	N5
Lamberton Demesne	S5194	N1
Lamberton Demesne	S5094	N2
Lamberton Demesne	S5093	N1
Lamberton Demesne	S5093	N2
Loughakeo	S5296	N5
Middlemount	S3079	N1
Middlemount/Ballyvoghlaun	S3278	N1
Morett	N5202	N4
Morett	N5205	N3
Morett	N5402	N1
Morett	N5403	N5
Morett	N5404	N5
Morett	N5404	N6
Morett	N5404	N5

Morett	N5404	N8
Oldglass	S3279	N1
Park Lower	S5597	N1
Park Lower	S5597	N4
Park or Dunamase	S5198	N1
Park or Dunamase	S5298	N5
Park or Dunamase	S5298	N9
Park or Dunamase	S5298	N10
Park or Dunamase	S5298	N11
Park or Dunamase	S5298	N13
Park Upper	S5498	N1
Park Upper	S5598	N1
Powelstown	S5294	N3
Rahandrick Upper	S3181	N2
Raheen	N5300	N7
Raheen	N5399	N5
Raheen	N5400	N1
Raheen	N5400	N3
Raheen	N5400	N11
Raheen	N5400	N2
Raheenanisky	S5395	N4
Rathcrea	N5901	N2
Rathcrea	N5901	N3
Shanvaghey	S3181	N1
Tinnaragh		N2
Tierhogar	N5509	N2
Tonafarna	N5801	N1
Tonafarna	N5902	N6
Tonafarna	N5802	N4

Hedgerows (WL1)

Townland	Grid square	Target note number
Ballinlough	N5401	N1
Ballinlough	N5400	N1
Ballycarroll	S5398	N8
Ballycarroll	S5299	N1
Ballycarroll	S5398	N2
Ballycarroll	S5398	N8
Ballyduff (ed. Kilmurry)	N5601	N4
Ballymaddock	S5499	N3
Ballymaddock	S5499	N6
Ballymaddock	S5599	N2
Ballymaddock	S5599	N4
Ballymaddock	S5599	N8
Ballymaddock	S5498	N3
Ballymorris	N5509	N1
Ballythomas	N5500	N4
Ballythomas	N5500	N5
Ballythomas	N5600	N2
Bracklone	N5611	N4

Carrageen	N5500	N1
Coolbarry	S3183	N1
Coolbarry	S3183	N4
Coolbarry	S3183	N5
Coolbarry	S3283	N2
Coolbarry	S3283	N4
Cooltederry	N5411	N6
Dairyhill	S3483	N1
Doolough	N5409	N2
Droughill	N5513	General
Farranville	S3082	N1
Fisherstown	N6205	N2
Garryduff	S3183	N2
Garryduff	S3182	N1
Garryduff	S3182	N2
Garryduff	S3182	N6
Garryduff	S3282	N6
Grange Upper	S5496	N1
Grange Upper	S5496	N5
Kilbracken	N6106	N1
Kilbracken	N6106	N1
Kilbride	N5210	N1
Killone	N5602	N1
Killone	N5501	N4
Kilteale	S5498	N6
Morett	N5403	N7
Morett	N5404	N5
Park Lower	S5597	N5
Park or Dunamase	S5297	N3
Park Upper	S5597	N1
Park Upper	S5497	N3
Raheen	N5300	N1
Raheenahown South	N5801	N1
Raheenanisky	S5395	N2
Raheenanisky	S5395	N3
Rathcrea	N5902	N1
Rathcrea	N5801	N3
Rathleash	N5211	N2
Rathronshin	N5906	N2
Rosnamullane	N6001	N1
Tinnaragh	S3282	N3
Tierhogar	N5610	N3
Vicarstown (Dodd)	N6301	N2

Exposed calcareous rock (ER2)

Townland	Grid square	Target note number
Ballycarroll	S5399	N1
Killone	N5502	N5
Kilmurry	N5501	N5

Flower beds and borders (BC3)

Townland	Grid square	Target note number
Ballymorris	N5310	N7