

# ECOLOGICAL ASSESSMENT

## Waterways Corridor Study:

The Upper Shannon Navigation – Boyle River Navigation to Roosky including Lough Allen, Lough Key and the Carnaode Waters

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# 1. Introduction

This report aims to amalgamate the available information on various rare, important or protected habitats and species known to occur within the waterway corridor study area which extends from Roosky to Lough Allen and includes the Carnaode Waters, along with Lough Key and Drumharlow. Staff and files of The National Parks and Wildlife provided most of the information for the project although individual ecologists also provided reports and records for specific areas. Field work was carried out to familiarise the ecologist with the area and to gather further species lists from potentially important areas. Fisheries information was derived from publications, websites of the Shannon Regional Fisheries Board and information from CFB and SRFB staff.

Parts of the survey area are covered by conservation designations such as Lough Boderg and Bofin proposed Natural Heritage Area (pNHA), however, large sections of this part of the Shannon waterway are not included in any designation. While, in some respects, this reflects the lesser extent of floodplain habitat (callows) and intact raised bog compared with further downstream it is also a reflection of the hitherto lack of systematic ecological survey of the area, compared with other floodplain / bogland areas further south.

## 1.1 Overview of survey area

The survey area covers parts of two counties – Leitrim and Roscommon. The study area has been broken down in to five sub-areas.

### 1. Lough Allen (Dowra to Drumshanbo)

The Shannon enters Lough Allen south of Dowra. Lough Allen is a large lake with relatively steep sided slopes rising from its shores. Small sections of Lough Allen's shoreline or islands are included in the Lough Allen South End and Parts proposed Natural Heritage Area (pNHA) conservation designation. Kilgarriff Marsh is an additional pNHA conservation designation close to the northern shore of Lough Allen along with Owengar Wood which is a wooded glen near Drumkeeran.

### 2. Drumshanbo to Carrick-on-Shannon to Cootehall

Between Drumshanbo and Carrick-on-Shannon the Shannon meanders through relatively flat land with occasional small, cutover bogs. The floodplain area is not extensive although there are areas of wet grassland and callows (on the northern shore of Drumharlow, for example). Part of the Shannon is canalised between Drumshanbo and Leitrim Village. The main conservation designated area within this section is Drumharlow Lough (within the Boyle River Catchment) the shoreline of which is entirely included as a pNHA. Additionally, some areas of cutover raised bog and Hughestown Wood are included in the designation. Part of the floodplain on the River Shannon is also included in the same designation, north of Carrick-on-Shannon town.

### 3. Lough Key including Boyle to Cootehall

Lough Key is included in the Boyle River catchment. The lake is surrounded by rolling hills. There are a number of small islands on the lake. A number of islands and small stretches of Lough Key's shoreline (Drum Bridge, Drumman's Island, Hogs Island, Corrigeenroe Marsh, Tawnytaskin Wood) including marsh, fen and woodland vegetation are included in pNHA designations. Fin Lough is an additional pNHA which is situated south of Knockvicar.

### 4. Carrick-on-Shannon to Roosky

Here the Shannon meanders through low-lying countryside with some low hills and large lakes. Loughs Bofin and Boderg are the major lakes but Loughs Tap and Corry are also present. There are some floodplain areas here which are characterised by callows vegetation although these are not as extensive as the callows further south at Lough Ree or the River Suck. Part of the Shannon is canalised at Jamestown. Extensive areas of reed bed are found in places. Loughs Boderg and Bofin are included in a pNHA designation.

## 5. Carnadoe Waters

These relatively deep lakes have very extensive reed beds and some areas of marsh and callows grassland. The lakes are designated as a pNHA.

### **I.2 Secondary Corridor**

A secondary corridor area has been defined around Lough Allen to take into account the visual zone of influence in the area. This zone partly includes three natural heritage designations within its boundaries – none of which bound the Lough Allen or the River Shannon. These are the Cuilcagh – Anierin Uplands, Barleart and Lackagh Bogs (to the North of Lough Allen), and Tullytawen Bog situated to the west of Lough Allen.

## 2. Methodology

The methods for this survey followed the approach taken in the Pilot Waterways Corridor Study (White Young Green 2002).

The assessment is mainly desk based but field work was also carried out in August and October, on land and by boat, to determine more fully the extent of callows vegetation close to Carrick-on-Shannon and habitat types and species assemblages at various other locations.

Habitats are categorised according to Fossitt (2000).

During desk studies and field work particular attention was paid to the presence of rare, protected or Red Data Book species or habitats. The main domestic legislation providing protection for wildlife are the Wildlife Act (1976) and Wildlife Amendment Act (2000), which provide protection for species of national importance and the framework for designation of Natural Heritage Areas (NHA). All NHAs are described as proposed NHAs (pNHA). The EU Habitats Directive provides protection for species and habitats that are rare or important in an EU context. Habitats requiring the designation of Special Areas of Conservation (SAC) to ensure their protection are listed in Annex I of the Directive. A number of these habitats are prioritised for conservation (\* priority habitats). Species requiring designation of Special Areas of Conservation are listed in Annex II of the Directive and a number of these are also priority(\*) species. The remaining Annexes of the Directive outline species and habitats requiring strict protection measures. The EU Birds Directive lists a number of species in Annex I that require similar conservation designations (Special Protection Areas - SPA).

The Red Data Books for Ireland list species that are vulnerable or threatened along with IUCN threat categories.

### 3. Sites Designated for Nature Conservation

Since floodplain vegetation has not been studied in detail in this part of the Shannon corridor, lake designations extend mainly to the shoreline or high water mark. However, some woodlands or wetlands of known conservation importance are included in these designations. Designations within the study are listed in Table 3.1 below.

Table 3.1: Nature conservation designations in the Upper Shannon project area. Sites from each county are grouped together and are listed from north to south.

Site Name	Site Code	Designations	Counties
Kilgarraiff Marsh	426	pNHA	Leitrim
Lough Allen South End and Parts	427	pNHA	Leitrim
Owengar Wood	1419	pNHA	Leitrim
Drumhierney Wood	1412	pNHA	Leitrim
Drumharlow Lough	1643	pNHA	Leitrim/Roscommon
Lough Boderg and Lough Bofin	1642	pNHA	Leitrim
Aghnamona Bog	422	pNHA	Leitrim
Corrigeenroe Marsh	596	pNHA	Roscommon
Hog's Island	1638	pNHA	Roscommon
Tawnytaskin Wood	1651	pNHA	Roscommon
Drum Bridge	1631	pNHA	Roscommon
Drumman's Island	1633	pNHA	Roscommon
Fin Lough	1636	pNHA	Roscommon
Carnadoe Waters	608	pNHA	Roscommon

A number of other designations are present adjacent to the study area or within the secondary zone of visual influence around Lough Allen. These are the Cuilcagh-Anierin Uplands (pNHA and candidate SAC site code 584), Barleart and Lackagh Bogs (to the North of Lough Allen, pNHA site code 2032) and Tullytawen Bog situated to the west of Lough Allen (pNHA site code 617).

The site synopses for all designated areas within the study area are included in Appendix II. The presence of a number of designated areas is a reflection of the conservation importance of some areas in the waterway corridor. However, a number of important areas are also situated outside of the designation boundaries.

## 4. Habitats

Habitats throughout the study area are classified with reference to the 'A Guide to the habitats of Ireland' (Fossitt 2000). This publication provides the means to categorise all habitats in Ireland. A total of 25 habitat types have been identified from the study area and these are listed in the following table. However, this total does not include urban habitats such as Built Land or Amenity Grassland. No attempt was made to categorise the urban habitats that exist in the study area.

Of the 25 rural habitat types that occur in the study area, 12 potentially correspond to Annex I habitats (under the EU Habitats Directive). In order to qualify for SAC designation Annex I habitats must conform to certain criteria regarding quality, species complement and ecological processes. For example, within Ireland, some oligotrophic lakes correspond to the Annex I habitat 'Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) (3110)' or 'Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea (3130)' and are of sufficient quality and interest to require designation as SACs. The Annex I habitats are highlighted in italics in the following table. Where a habitat is denoted with an \* this indicates that certain types of the habitat are prioritised for protection under the Directive (priority habitats).

Habitat Type	Code	EU Annex I Habitat
Oligotrophic lake	FL2	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) (3110). Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea (3130).
Mesotrophic lake	FL4	
Eutrophic lake	FL5	Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation (3150).
Eroding / upland rivers	FW1	Watercourses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation (3260)
Depositing /lowland river	FW2	Rivers with muddy banks with Chenopodion rubri p.p. and Bidention p.p. vegetation (3270)
Canal	FW3	
Drainage ditches	FW4	
Reed and large sedge swamp	FS1	
Improved agricultural grassland	GAI	
Dry calcareous and neutral grassland	GS1(*)	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometea) (*important orchid sites) (6210)
Wet grassland	GS4	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) (6410).
Marsh	GMI	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430).
Wet heath	HH3	Northern Atlantic wet heaths with <i>Erica tetralix</i> (4010).
Cutover bog	PB4	
Rich fen and flush	PF1 (*)	Alkaline fens (7230). (*Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion davallianae (7210)).
Poor fen and flush	PF2	
Transition mire and quaking bog	PF3	Transition mire and quaking bog (7140).
Oak-ash-hazel woodland	WN2	
Wet pedunculate oak-ash woodland	WN4 (*)	*Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-padion, Alnion incanae, Salicion

		albae) (91E0).
Wet willow-ash-alder woodland	WN6	
Bog woodland	WN7 (*)	* Bog woodland (91D0).
(Mixed) Broadleaf woodland	WD1	
Conifer plantation	WD4	
Scrub	WS1	
Hedgerows	WLI	

## Lakes and Ponds

### *Oligotrophic lake FL2*

Lough Allen is categorised as an oligotrophic lake (EPA 2002) which means that it has low nutrient inputs and relatively acid waters. Lough Allen's shoreline is generally rocky although peat, mud and sandy shoreline areas are also present. The water has a dark colour on account of input from peaty soils in the surrounding uplands. Lough Allen lacks the large areas of reed swamp that are found in other lakes lower in the Shannon catchment. This may be due to a combination of factors such as its low nutrient status, fluctuating water levels and/or its relatively steep shoreline. Small submerged aquatics are present such as shoreweed (*Littorella uniflora*). Occasional areas with common reed (*Phragmites australis*) are also present. The surface area of Lough Allen is 35km<sup>2</sup> (EPA 2002).

The Electricity Supply Board controls water levels in Lough Allen by way of sluices at Bellantra (Cullen 2002). Prior to 1996 levels were controlled to increase the utilisable storage of Lough Allen for electricity generation purposes. However, since the lake was re-opened to navigation in 1996 the primary aim has been to maintain the level of the lake above minimum navigation level between mid-March and mid-September. To allow for navigation, water is typically retained during the spring and summer. During flood conditions Lough Allen reaches a maximum level and no control is exercised in discharge (Cullen 2002).

No studies have been conducted to document the impact of controlled lake levels on vegetation or general lake ecology.

The Annex I bird species, the kingfisher (*Alcedo atthis*), is found in various locations at Lough Allen.

### *Mesotrophic Lakes FL4*

Mesotrophic lakes are moderately rich in nutrients and the water is sometimes discoloured by algae (Fossitt, 2000). Aquatic plants that are typically found in mesotrophic lakes include water lilies (*Nymphaea alba*, *Nuphar lutea*) and pondweeds (*Potamogeton* spp.). Marginal vegetation, such as a reed fringe, is more well developed in these lakes than oligotrophic lakes. A number of lakes within the study area have been categorised by the EPA (2002) as mesotrophic. These include Loughs Key, Drumharlow, Oakport, Boderg and Bofin. However, this classification has been based mainly on chlorophyll levels and according to the EPA report 'a higher trophic status, in line with phosphorous concentrations, might be more appropriate for some of these waters'. Low chlorophyll levels are probably a reflection of the fact that the invasive bivalve, the zebra mussel (see Section 12.1.2), controls the size of populations of planktonic algae and Cyanobacteria in these lakes.

The rare plant - elongated sedge *Carex elongata*, which is listed in the Red Data Book (Curtis and McGough 1988) has been recorded from Corrigenroe Marsh and Drum Bridge on Lough Key (NPWS Files). The rare plant species floating water plantain (*Luronium natans*) that was only recently confirmed as native was found at Inchmurrin Island (a.k.a. Rabbit Island) at Lough Bofin in 1871 (Rich *et al.* 1995). Its present status there is unknown. Another rarity, water germander *Teucrium scordium*, has been recorded from a stony shore of Lough Bofin (Heery 1994).

Mesotrophic lakes, in particular smaller lakes, can support populations of white clawed crayfish (*Austropotamobius pallipes*), an Annex II species of the EU Habitats Directive. A number of the mesotrophic lakes within the study area also support large number of overwintering wildfowl.

### *Eutrophic lakes FL5*

This habitat category includes lakes and ponds that are high in nutrients and base-rich (Fossitt 2000). The water in such environments is often discoloured or turbid from algae or suspended sediments. Polluted waters are included in this category. Aquatic plants that are typical of eutrophic lakes include duckweeds (*Lemna* spp.) and pondweeds (*Potamogeton* spp.). Acres Lake near Drumshanbo is categorised as strongly eutrophic (EPA 2002), maximum concentrations of chlorophyll here are consistent with pollution.

## Watercourses

### *Eroding / Upland Rivers (FW1)*

This category includes natural, fast flowing rivers and streams that are actively eroding and where there is no deposition of fine sediment (Fossitt 2000). This habitat rarely supports much vegetation cover but submerged rocks and boulders may be colonised by aquatic mosses. Where sediment is deposited, water-tolerant plants such as water dropwort (*Oenanthe crocata*), angelica (*Angelica sylvestris*) and remote sedge (*Carex remota*) may be found. Eroding rivers are found within the study area around Lough Allen where streams and rivers flow into the lake from the steep mountain-sides. In places where streams and rivers flow through steep-sided glens, semi-natural woodland may be present along river banks. Eroding rivers are important spawning grounds for salmonid fish (trout and salmon).

### *Depositing River (FW2)*

This habitat type includes watercourses where fine sediments are deposited on the river bed (Fossitt 2000). Generally, these occur in low-lying areas throughout the study area and the Shannon and Boyle Rivers are both included in this category. Floating and submerged aquatic plants may be present. Floating aquatics include lilies (*Nymphaea alba*, *Nuphar lutea*), pondweeds (*Potamogeton* spp.) and unbranched bur-reed (*Sparganium emersum*). Tall fringing vegetation may also be present and can include common club rush (*Schoenoplectus lacustris*), common reed and iris (*Iris pseudacorus*).

The rare sedge *Carex acuta* has been found along the Shannon river bank at Drumsna (Browne Dunne Roche 2002 citing D. Cotton *pers.comm.*). The greater spearwort *Ranunculus lingua* is frequent in along rivers and lakes in the centre of Ireland but rare elsewhere in Ireland (Webb *et al.* 1996) and rare in Leitrim (Browne Dunne Roche 2002 citing D. Cotton *pers.comm.*). It has been recorded at Lough Allen but may occur further south along the Shannon within the study area.

### *Canal (FW3)*

Artificially constructed bodies of water that are used for navigation are included in this category. Canals are found at Lough Allen and Jamestown and a third canalised section is found at Kilglass Lough – the Carrigeen Cut.

### *Drainage Ditches (FW4)*

Linear water bodies that are also artificial in origin but that are not used for navigation. Drainage ditches can be found throughout Leitrim and Roscommon in association with farmland.

## Swamps

### *Reed and large sedge swamp (FS1)*

This habitat occurs in shallows of lakes and rivers and occasionally along drainage ditches. It is generally species poor and is often dominated by reeds such as common reed (*Phragmites australis*). Other species that may be present include grasses (e.g. reed canary grass *Phalaris arundinacea*, reed sweet grass *Glyceria maxima*), bulrush (*Typha latifolia*), water horsetail (*Equisetum fluvatile*). More rarely within the study area the vegetation may be dominated by greater tussock sedge (*Carex paniculata*).

Particularly large reed beds are found at Kilglass Lough pNHA.

Reed beds and swamps are important areas for supporting wildfowl and wetland birds.

## Improved Grassland

### *Improved agricultural grassland (GA1)*

This is one of the most abundant habitat types within the study area. Where agricultural land has undergone intensification, re-seeding and inputs of fertiliser there is generally a monodominant stand of perennial rye-grass (*Lolium perenne*). Other plants such as meadow buttercup (*Ranunculus acris*), cocksfoot grass (*Dactylis glomerata*) and thistles (*Cirsium* sp.) may also be present. There is a relative increase in abundance of improved agricultural grassland from north to south within the study area since much of the

heavy gley soil around Lough Allen has not been sufficiently drained to allow intensive agriculture (Browne Dunne Roche 2002).

### **Semi-natural grassland**

#### *Dry calcareous grassland (GS1)*

This habitat type is uncommon in the study area but has been recorded within Lough Allen South End and Parts pNHA. At Mahanagh, on the western shore of the lake, a limestone outcrop has a number of typical calcareous grassland species including quaking grass (*Briza media*), yellow oat grass (*Trisetum flavescens*) and blue moor grass (*Sesleria albicans*) (NPWS file).

#### *Wet grassland (GS4)*

This habitat type occurs throughout the study area and includes both the wet, soft-rush (*Juncus effusus*) dominated fields of drumlin country around Lough Allen, and the floodplain areas further south along the Shannon and at Drumharlow. South of Athlone, much of the callows grassland along the Shannon floodplain occurs on fen peat substrate (Heery 1993). Fen peat has been mapped in Co. Leitrim (An Foras Talúntais 1973) and field work in August 2004 confirmed that the grasslands present on this substrate, within the Shannon floodplain in Co. Leitrim, are highly diverse but less extensive than those south of Athlone.

The following species were recorded from wet grassland at Rinnacurreen south-east of Carrick-on-Shannon. Common valerian (*Valeriana officinalis*), meadowsweet (*Filipendula ulmaria*), purple moor grass (*Molinia caerulea*), tufted vetch (*Vicia cracca*), devil's bit scabious (*Succisa pratensis*), angelica (*Angelica sylvestris*), purple loosestrife (*Lythrum salicaria*), flag iris (*Iris pseudacorus*), lesser spearwort (*Ranunculus flammula*), marsh marigold (*Caltha palustris*), marsh lousewort (*Pedicularis palustris*), sneezewort (*Achillea ptarmica*), jointed rush (*Juncus articulatus*), meadow vetchling (*Lathyrus pratensis*), marsh pennywort (*Hydrocotyle vulgaris*), tall fescue (*Festuca arundinacea*), water mint (*Mentha aquatica*), reed sweet grass (*Glyceria maxima*), grasses (*Agrostis* and *Poa* spp.), cats ear (*Hypochoeris radicata*), sedges (*Carex* spp. including *Carex rostrata*). At Rinnacurreen this callows vegetation occurs on fen peat (An Foras Talúntais 1973).

At the northern shore of Drumharlow, within the pNHA designation, a similar vegetation was recorded but includes drier grassland areas and species such as clovers (*Trifolium repens* and *T. pratense*), self heal (*Prunella vulgaris*), ragged robin (*Lychnis flos-cuculi*), sorrel (*Rumex acetosa*), ribbed plantain (*Plantago lanceolata*), lesser stitchwort (*Stellaria graminea*), sweet vernal grass (*Anthoxanthum odoratum*), soft rush (*Juncus effusus*), star sedge (*Carex echinata*), birdsfoot trefoil (*Lotus corniculatus*), timothy grass (*Phleum pratense*), marsh bedstraw (*Galium palustre*).

At various locations along the shore of Lough Allen, in periodically flooded grassland, the rare and protected orchid Irish Lady's Tresses (*Spiranthes romanzoffiana*) has been recorded (J. Matthews, E. Mayes and T. Curtis pers.comm.).

Issues regarding the continued management of floodplain grassland have arisen within the study area where a general trend towards farm extensification appears to have led to abandonment or partial abandonment of former wet meadows. Should this trend continue unabated these most northerly examples of Shannon callows will be lost through scrub invasion. Additionally, traditional Greenland White Fronted Goose feeding grounds may be lost.

### **Freshwater Marsh**

#### *Marsh (GM1)*

Marsh habitat is found close to river banks or lake shores and is characterised by a year round high water table but where there is little standing water (Fossitt 2000). Marsh often forms a habitat mosaic with wet grassland (above) hence a similar complement of species can be found there. However the proportional cover of sedges and grasses is lower than 50% and broadleaved herbs include very water tolerant species such as water mint (*Mentha aquatica*), flag iris (*Iris pseudacorus*), marsh thistle (*Cirsium palustre*) and

meadowsweet (*Filipendula ulmaria*). Marsh is found in small pockets throughout the study area extensive areas of marsh are found at Corrigeenroe Marsh (pNHA - Lough Key), Carnadoe Waters (pNHA), Kilgarriff Marsh (pNHA) and Drum Bridge (pNHA – Lough Key). Marsh typically occurs in mosaic with other wet habitats such as wet grassland, reed swamp.

The rare species meadow rue (*Thalictrum flavum*) has been recorded from a wet area at Drum Bridge at Lough Key (NPWS Site file) and at Cloonglasny Beg near Grange Lough (Browne Dunne Roche 2002 citing D. Cotton *pers. comm.*).

## Heath

### *Wet heath (HH3)*

Heath communities are uncommon in the study area but they do occur on shallow peaty soils. Wet heath with cross-leaved heather (*Erica tetralix*) has been identified from the Rossmore area at the northern shore of Lough Allen (E. Mayes and T. Curtis *pers. comm.*).

## Bogs

### *Cutover bog PB4*

This habitat is relatively common in the study area. None of the cutover bogs can be categorised as industrial cutover but all have undergone drainage and cutting to a lesser extent. In most bogs, revegetation has occurred and allowed the development of a dry or wet heath vegetation type. Typical species include ling heather (*Calluna vulgaris*), cross leaved heather (*Erica tetralix*), purple moor grass (*Molinia caerulea*), and gorse (*Ulex europeaus*). Some areas of cutover have been planted with trees.

Main areas of cutover bog, within the study area, lie to the west of the Shannon between Drumshanbo and Carrick-on-Shannon, however a couple of notable examples are found north-west of Drumshanbo, to the west of Lough Allen. A large cutaway, much of which is planted with conifers is situated east of Lough Key, and an additional cutover bog is found north east of Drumharlow. The cutover bog at Drumharlow is partly included in the pNHA designation.

A very good example of cutover bog that was rated by Browne Dunne Roche (2002) as Regionally Important is located at Bodorragha – west of Drumshanbo.

## Fens and Flushes

### *Rich fen and flush (PF1)*

This habitat is fed by groundwater or flowing surface water that is at least mildly base-rich or calcareous. The substrate is waterlogged peat with a high mineral content (Fossitt 2000). This habitat has been recorded within the study area at Fin Lough pNHA (NPWS site file). At Corrigeenroe Marsh pNHA (also at Lough Key) a vegetation community described as 'species rich fen' is present (NHA site file), although it is unclear whether this habitat is extensive or the whether the reference is to poor or rich fen.

### *Poor fen and flush (PF2)*

This category includes peat forming fens and flushes that are fed by groundwater or flowing surface waters that are acid. Vegetation is typically dominated by sedges and or rushes (Fossitt 2000). This habitat type has been recorded at Kilgarriff and Rossmore at the northern end of Lough Allen (E. Mayes and T. Curtis *pers. comm.*).

### *Transition mire and quaking bog (PF3)*

These are extremely wet, peat forming systems with a vegetation that is intermediate between poor and rich fens. This habitat is usually found in wet hollows and infilling depressions or at the transition to open water (Fossitt 2000). This habitat type has been recorded at Kilgarriff and Rossmore at the northern end of Lough Allen (E. Mayes and T. Curtis *pers. comm.*). Some quaking areas have also been recorded from Corrigeenroe Marsh at Lough Key (NPWS file).

## Semi-natural woodland

### *Oak-ash-hazel woodland WN2*

This woodland type, with a canopy dominated by pedunculate oak (*Quercus robur*), and/or ash (*Fraxinus excelsior*) is situated in well drained areas. Shrub layer plants typically include hazel (*Corylus avellana*), hawthorn (*Crataegus monogyna*) and sometimes spindle tree (*Euonymus europaeus*). Field layer is usually diverse and may include pignut (*Conopodium majus*), bluebell (*Hyacinthoides non-scripta*), herb bennet (*Geum urbanum*) and wood sedge (*Carex sylvatica*).

Within the study area this vegetation type can be found at Drumman's Island and Hogs Island (NPWS files), Lough Key, although non-natives such as beech and sycamore (*Fagus sylvatica* and *Acer pseudoplatanus*) are also present in the canopy. Drumhierny Wood, near Leitrim village, also consists of this woodland type (NPWS File).

As part of the Native Woodland Survey some woodland areas in County Leitrim were surveyed in 2004. Among the sites that have been surveyed within the present study area Derrycarne Demesne South was found to be composed mainly of WN2 woodland type and described as 'exceptional' within the context of other woodlands surveyed in the area (BEC Consulting: Jim Martin *pers.comm.*). Very little of this wood is included in the Lough Bofin/Boderg pNHA conservation designation. Other sites within the study area that have been surveyed by BEC in 2004 and which include WN2 woodland type are Mount Campbell Wood South (north west of Drumsna), Derrycarne North (also beside Lough Bofin), and Hughestown (which lies within Drumharlow pNHA).

### *Wet pedunculate oak-ash woodland (WN4)*

This woodland type is associated with areas that are flooded or waterlogged in winter but which dry out in summer. It also occurs on drumlins and other sites with heavy, poorly drained clay soils that are subject to waterlogging. Owengar Wood pNHA (north west Lough Allen) is likely to be categorised as wet pedunculate-oak-ash woodland. However, at Owengar the canopy is dominated by alder (*Alnus glutinosa*) and with some beech and grey willow (*Salix cinerea*). At Owengar the shrub layer includes hazel (*Corylus avellana*) and hawthorn (*Crataegus monogyna*) and the field layer contains various ferns (*Polystichum setiferum*, *Dryopteris filix-mas*), lesser celandine (*Ranunculus ficaria*), wood sorrel (*Oxalis acetosella*), primrose (*Primula vulgaris*), wood sanicle (*Sanicula europaea*) (NPWS site file) and goldilocks buttercup (*Ranunculus auricomus*) (John Matthews *pers.comm.*). This woodland type is likely to occur elsewhere in the study area but has not been documented.

### *Wet willow-ash-alder woodland (WN6)*

This woodland type is relatively common throughout the study area where it occurs on permanently waterlogged areas including fen peat (the extent of which has been mapped in Co. Leitrim, An Foras Talúntais 1973). It also includes woodlands of lakeshores and stagnant waters. The canopy may be dominated by alder (*Alnus glutinosa*), ash (*Fraxinus excelsior*) and / or grey willow (*Salix cinerea*). On the shores of Lough Allen the rare native tree – black poplar (*Populus nigra*) is also found in this woodland type.

From one WN6 site near Cleighran More on the shore of Lough Allen the following species were recorded: alder, hazel, ash, hawthorn (*Crataegus monogyna*), black poplar (*Populus nigra*), water horsetail (*Equisetum fluviatile*), meadowsweet (*Filipendula ulmaria*), herb robert (*Geranium robertianum*), creeping cinquefoil (*Potentilla reptans*), primrose (*Primula vulgaris*), broadleaved willowherb (*Epilobium montanum*), blackthorn (*Prunus spinosa*), angelica (*Angelica sylvestris*), tufted hairgrass (*Deschampsia cespitosa*), holly (*Ilex aquifolium*), wild strawberry (*Fragaria vesca*), germander speedwell (*Veronica chamaedrys*), enchanter's nightshade (*Circaea lutetiana*), bramble (*Rubus fruticosus*), wood sorrel (*Oxalis acetosella*), false brome (*Brachypodium sylvaticum*), ivy (*Hedera helix*), marsh thistle (*Cirsium palustre*), reed canary grass (*Phalaris arundinacea*), western polypody (*Polypodium interjectum*), marsh ragwort (*Senecio aquatica*), grey willow (*Salix cinerea*), marsh woundwort (*Stachys palustre*), silverweed (*Potentilla anserina*), tufted vetch (*Vicia cracca*), broad buckler fern (*Dryopteris dilatata*), marsh bedstraw (*Galium palustre*). Sedges (*Carex* sp.) and rushes (*Juncus* sp.) were also present. Mosses include *Thuidium tamariscinum*, *Hypnum* sp., *Climacium dendroides*. Beech was present in drier parts of the woodland strip.

Another WN6 site, categorised as fen carr, was also surveyed at Rinnacurreen (south-east of Carrick-on-Shannon) in 2004 and the following species were recorded there: alder, grey willow, eared willow (*Salix aurita*), remote sedge (*Carex remota*), iris (*Iris pseudacorus*), meadowsweet, tufted hairgrass, marsh bedstraw, hawthorn, mint (*Mentha aquatica*), royal fern (*Osmunda regalis*), lady fern (*Athyrium filix-femina*), marsh horsetail (*Equisetum palustre*), soft rush (*Juncus effusus*), bryophytes (*Climacium dendroides*, *Rhizomnium punctatum*, *Eurhynchium striatum*).

BEC Consulting recorded this woodland type in the 2004 Native Woodland Survey at a number of sites in the study area. Mount Campbell Woods South (north west of Drumsna), Derrycarne Demesne South (at Lough Bofin), Inisfale Wood (at Lough Allen), Derrymacstur (at Lough Bofin) (BEC Consulting, Jim Martin pers.comm.).

#### *Bog Woodland (WN7)*

This category includes woodland on intact bogs, bog margins and cutover bogs (Fossitt 2000). It generally refers to woodland with a birch (*Betula pubescens*) dominated canopy but other species may include holly (*Ilex aquifolium*), and rowan (*Sorbus aucuparia*). This habitat type was recorded as part of the Native Woodland Survey in one site within the survey area Danesfort, south of Carrick-on-Shannon (BEC Consulting, Jim Martin pers.comm.). Birch woodland also occurs on cutover bogs close to Lough Allen and also regenerates naturally within areas of clearfelled conifer forestry, for example in Oakport Demesne

### **Highly Modified/Non-Native Woodland**

#### *Mixed Broadleaved Woodland (WD1)*

This category includes woodlands with a canopy dominated by non-native trees, mainly broadleaved. Sycamore (*Acer pseudoplatanus*) and beech (*Fagus sylvatica*) are the main canopy formers although ash (*Fraxinus excelsior*), pedunculate oak (*Quercus robur*) and conifer species may also be present. The field layer and shrub layer species may be typical of a semi-natural woodland type, provided canopy cover is not too dense (as may occur under beech). Rhododendron (*Rhododendron ponticum*) and cherry laurel (*Prunus laurocerasus*) are among the non-native invasive shrubs that are often found in broadleaved woodlands of demesne origin.

The more extensive areas of broadleaved woodland are found at Lough Key Forest Park, Rockingham Demesne (Lough Key) and Derrymacstur (Lough Bofin – Native Woodland Survey, BEC Consulting, Jim Martin pers.comm.).

#### *Conifer plantation WD4*

Commercial plantations are relatively common, particularly around Lough Allen and on some of the cutover bogs. There are extensive areas of plantation to the south and east of Lough Key, at Lough Key Forest Park and Rockingham Demesne (Browne Dunne Roche 2002).

### **Scrub/Transitional Woodland**

#### *Scrub (WS1)*

This category includes areas dominated by at least 50% cover of shrubs, stunted trees or brambles (*Rubus fruticosus*) (Fossitt 2000). Occasional areas of hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) or gorse (*Ulex europaeus*) scrub occur in the study area. Birch (*Betula pubescens*) and gorse scrub, in particular, occurs on the edges of cutover bogs.

This habitat type may increase with farm extensification because grassland areas will revert to scrub (and afterwards to woodland) where grazing or mowing regimes are removed.

### **Linear woodland/scrub**

#### *Hedgerows (WLI)*

Hedgerows are common throughout the study area. The species present usually reflect the climax woodland vegetation for the soil type. In wet gley soil areas for example, around Lough Allen, willow species are often present (Browne Dunne Roche 2002).

## 5. The Floodplain

The identification of the Shannon floodplain within some of the study area was carried in one instance by the OPW. Floodplain maps from January 2000 were used to determine the extent of flooding at that time. Additional flooded areas were roughly mapped by Browne Dunne Roche (2002) in February of that year. However, neither sources of information reflect the greatest extent of possible flooding within the study area. In addition, continued building and development within floodplain areas means that flooding regimes further downstream may be less predictable.

Certain parts of the floodplain that are not included in any conservation designation but which may have areas of sufficient interest to warrant designation include:

- Flood zones of Lough Allen
- Cloongownagh (additional floodplain area of Drumharlow)
- Inishmucker/Rinnacurreen/Cloonfeacle (Shannon floodplain areas on fen peat south of Carrick-on-Shannon)
- Coraughrim
- The Doon at Corgullion/Cuiltyconway
- Gillstown Bridge/Corgowan/Drumagissaun/Clooneen (Floodplain of the Mountain/Scramoge River)

## 6. Plant Species of Interest

A number of terrestrial and aquatic vascular plants have been recorded from within the study area that are rare in a national or regional context. The following Table 6.1 summarises the protected and rare vascular plants that are known from the study area.

Table 6.1 Protected and rare vascular plants in the study area.

Species	Common name	Protection	Status	Habitat	Status Upper Shannon
<i>Bromus racemosus</i>	Smooth brome	None	Listed in Red Data Book <sup>1</sup> , Rare <sup>2</sup>	Water meadows, hay fields, arable and waste land	Formerly known at Drumshanbo but current dist. unknown
<i>Carex acuta</i>	Slender tufted sedge	None	Rather rare <sup>2</sup>	Along rivers and lake margins	Occurs on bank of Shannon at Drumsna <sup>3</sup>
<i>Carex elongata</i>	Elongated sedge	None	Listed in Red Data Book. Rare but not threatened <sup>1</sup>	Wet meadows, lake shores, ditch margins and swamp woodlands	Corrigeenroe Marsh Lough Key <sup>4</sup> , Drum Bridge Lough Key <sup>4</sup>
<i>Carex pallescens</i>	Pale sedge	None	Local in parts of north and west but rare elsewhere <sup>2</sup>	Damp grassland, moorland and open woodland <sup>2</sup>	Recorded from Lough Boderg Shoreline in 1993 <sup>5</sup>
<i>Leucojum aestivum</i>	Summer snowflake	None	Rare, possibly introduced in places <sup>2</sup>	Marshes and damp meadows <sup>2</sup>	Has been recorded from Shannon river bank at Carrick-on-Shannon <sup>6</sup>
<i>Luronium natans</i>	Floating water plantain	None	Rare, recently described as native <sup>7</sup>	Found in acid ponds and along canals <sup>8</sup>	In 1871 it was found at Inchmurrin Island (Rabbit Island), Lough Bofin <sup>7</sup> Current distribution unknown.
<i>Orobancha hederæ</i>	Ivy broomrape	Northern Ireland	Listed in Red Data Book	Habitat of host plant	Present at Auhry Wood

<sup>1</sup> Curtis and McGough (1988)

<sup>2</sup> Webb *et al.* (1996)

<sup>3</sup> D.Cotton cited in Browne Dunne Roche (2002).

<sup>4</sup> NPWS site file

<sup>5</sup> Heery (1994)

<sup>6</sup> J. Matthews *pers.comm.*

<sup>7</sup> Stace (2001)

<sup>8</sup> Rich *et al.* (1995)

Species	Common name	Protection	Status	Habitat	Status Upper Shannon
		scheduled species	due to rarity in Northern Ireland <sup>1</sup>	(ivy) includes woodland, hedgebanks, open quarries <sup>9</sup>	near Dromod <sup>3</sup>
<i>Neottia nidus-avis</i>	Bird's nest orchid	Northern Ireland scheduled species	Listed in Red Data Book due to rarity in Northern Ireland <sup>1</sup>	Occurs in shady woods, notably on calcareous soils <sup>1</sup>	Recorded from Hughestown Wood, Drumharlow <sup>12</sup> , and Drumman's Island, Lough Key <sup>4</sup>
<i>Populus nigra</i>	Black poplar	None	Considered as native, native population very important <sup>10</sup>	Distribution closely follows flood plains and lakes of Shannon, found in wet woodland	A number of locations for the species around the shores of Lough Allen <sup>6</sup>
<i>Prunus padus</i>	Bird cherry	None	Listed in Red Data Book <sup>1</sup>	Moist woodland and scrub, shaded rocky places and streamsides <sup>9</sup>	Recorded from Drumharlow in 1970s <sup>11</sup>
<i>Ranunculus lingua</i>	Greater spearwort	None	Frequent in centre of Ireland but rare elsewhere <sup>2</sup> , rare in Leitrim <sup>3</sup>	Marshes, fens reed-beds <sup>2</sup>	Holly Island, Lough Allen <sup>3</sup> and Drum Bridge Lough Key <sup>4</sup>
<i>Sisyrinchium bermudiana</i>	Blue-eyed grass	Northern Ireland scheduled species	Listed in Red Data Book due to rarity in Northern Ireland <sup>1</sup>	Damp meadows, ditches and lake shores <sup>1</sup>	Recorded at Rossmore, Lough Allen <sup>6</sup>
<i>Spiranthes romanzoffiana</i>	Irish Lady's Tresses	Rep. of Ireland Flora Protection Order, NI scheduled species	Apparently declining <sup>1</sup>	Damp meadows, lake shores, seasonally flooded pastures <sup>1</sup>	Recorded from 5 locations on shore of Lough Allen <sup>6</sup> (none of which are within pNHA)
<i>Stellaria palustris</i>	Marsh stitchwort	None	Rather rare <sup>2</sup>	Fens and calcareous marshes	Recorded at Lough Bofin around Rabbit/Otter Islands <sup>5</sup>

<sup>9</sup> Preston *et al.* (2002)

<sup>12</sup> P. O'Donnell *pers.comm.*

<sup>10</sup> Hobson (1993)

<sup>11</sup> Browne Dunne Roche (2002)

<i>Teucrium scordium</i>	Water germander	None	Frequent on shores of Loughs Derg and Ree but rare elsewhere <sup>2</sup>	Wetland habitats with fluctuating water levels, turloughs, reed-fens, clay pits etc. <sup>9</sup>	Recorded from stony lakeshore of Lough Boderg <sup>5</sup>
<i>Thalictrum flavum</i>	Common meadow rue	None	Frequent in some places (such as central Ireland) but rare elsewhere <sup>2</sup> , declining since 1930s <sup>9</sup>	Fens ditches and streamsides, tall vegetation in wet meadows <sup>9</sup>	Recorded at Drum Bridge, Lough Key <sup>4</sup> and Clooglasny Beg, Garrymona <sup>3</sup>

Among the species listed in Table 6.1 a number are of particular importance. Irish Lady's Tresses (*Spiranthes romanoffiana*), an orchid of base pool, periodically flooded areas is listed in the Flora Protection Order (1999). It has been recorded from 5 sites along the shoreline of Lough Allen and none of the sites where it has been found are included in the Lough Allen or Kilgarriff Marsh pNHA designations.

Another species of particular interest is black poplar (*Populus nigra*) a tree which is found along the storm water zone along the shores of Lough Allen, Lough Ree and some other areas in Ireland (Hobson 1993). Although its native distribution is relatively obscure, many of the 373 trees that were recorded in Ireland in 1990 are considered native and of particular significance are the populations at Lough Ree and Allen where the tree reproduces naturally (Hobson 1993). Although regeneration of this species was previously assumed to take place by vegetative suckering, it has been discovered that the species is likely to reproduce by seed along the shoreline of Lough Allen (J. Matthews, pers.comm.).

## 7. Invertebrates

### 7.1 Beetles - Coleoptera

A species of water boatman *Corixa fallenoides*, that was found to be abundant at Kilglass lake in the 1970s has restricted distribution in Ireland (NPWS file). It is not listed for protection under the Wildlife Acts or EU Habitats Directive.

At Lough Boderg the rare beetle *Helophorus griseus* was recorded during survey work for an Environmental Impact Assessment of a proposed marina development at Roosky. This species is known from only a small number of sites in the country. It is found in fens and grassy pools (Aughney *et al.* 2003). It is not listed for protection under the Wildlife Acts or the EU Habitats Directive.

### 7.2 True Bugs - Hemiptera

An additional invertebrate species found during the same survey – a hemipteran *Sigara fallenoidea* has restricted distribution in Ireland and is not found in Britain (Aughney *et al.* 2003). It is not listed for protection under the Wildlife Acts or EU Habitats Directive.

### 7.3 Dragonflies and Damselflies – Odonata

The Irish Damselfly *Coenagrion lunulatum* is an uncommon species confined to the midlands and south (Nelson and Thompson 2004). It is found around sheltered mesotrophic lakes and pools. It has been recorded from within the study area (Nelson and Thompson 2004). It is not listed for protection under the Wildlife Acts or EU Habitats Directive.

Scarce emerald damselfly *Lestes dryas* is a rare species, although it can be abundant in suitable sites. It is a characteristic turlough species and has been recorded from a turlough situated adjacent to the study area near Leitrim village – Carrickslavan (J. Matthews *pers.comm.*). It is not listed for protection under the Wildlife Acts or EU Habitats Directive.

### 7.4 White clawed crayfish: *Austropotamobius pallipes*

This species is listed in Annex II of the Habitats Directive as requiring designation of Special Areas of Conservation for its protection. The white-clawed crayfish has been recorded within the survey area by Lucey and McGarrigle (1987) at Dowra Bridge, and at Kilgariff Lake (J. Matthews *pers.comm.*). Browne Dunne Roche (2002) noted that water chemistry of Loughs Boderg and Bofin and of the Boyle River, all within the present survey area, could be considered suitable for supporting populations of crayfish, although crayfish do not favour large lakes (Reynolds 1982).

## 8. Vertebrates – Native Mammals

For details on American mink see Section 12.1.3

### 8.1 Red Squirrel *Sciurus vulgaris*

This species is found along woodlands on the northern shore of Lough Allen (J. Matthews *pers.comm.*). The species is listed for protection under the Wildlife Acts. It is likely to occur in other woodlands within the study area but its status and the relative abundance of its potential competitor the grey squirrel *Sciurus carolinensis* is unknown.

### 8.2 Pinemarten *Martes martes*

This species also found in woodlands lining the shores of Lough Allen (J. Matthews *pers.comm.*). The pine marten was quite rare until relatively recently but is now extending its range in Ireland (Hayden and Harrington 2000). The species is listed for protection under the Wildlife Acts.

### 8.3 Otter *Lutra lutra*

Otter is listed in Annex II of the EU Habitats Directive as requiring the designation of Special Areas of Conservation for its protection. Otter is, however, relatively abundant in Ireland compared with other EU countries and it is known to occur throughout the study area. J. Matthews and E. Mayes have recent records for otter at Kilgarraff and Rossmore (*pers.comm.*).

### 8.4 Bats - Chiroptera

There are a number of bat records from the study area. At Lough Key Forest Park Leisler's (*Nyctalus leisleri*), soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared (*Plecotus auritus*), Natterer's (*Myotis nattereri*) and Daubenton's bats (*Myotis daubentonii*) have been recorded (Aughney 2003). Whiskered bats have also been found here. A single specimen of the Annex II species the lesser horseshoe bat was recorded in the demesne in winter 2004 (Brian Keeley *pers.comm.*). This is a highly unusual record since Lough Key is located well outside the range of its current known distribution in Ireland. At various locations in Leitrim Shiel carried out a survey of bridges (1999). Some of the bridges surveyed were within 3 or 4km from Lough Allen, within or adjacent to the primary study area. Among the species recorded roosting under bridges near Lough Allen were Natterer's, Daubenton's and whiskered (*Myotis mystacinus*) bats (Shiel 1999). Unusually high levels of common and soprano pipistrelle, Daubenton's and Leisler's bat activity were observed by the author at Gortinty Lough on one survey evening in the summer of 2000, perhaps coinciding with emergence of aquatic insects at that location.

All bats are listed for protection under the Wildlife Acts but all Irish species are also listed in Annex IV of the EU Habitats Directive as requiring strict protection. All Irish bats species are also listed in the Red Data Book (Whilde 1993). Of particular importance is the Leisler's bat, which is relatively frequent in Ireland but which is uncommon or rare in the rest of Europe. The Irish population of this species is of International Importance. It has been recorded at Lough Key Forest Park and Gortinty Lough but is probably under-recorded and may be expected to occur throughout the study area.

All bat species are likely to be under-recorded from the study area.

## 9. Vertebrates - Birds

### 9.1 Introduction

A number of sites within the study area are included for survey every winter as part of the Irish Wetland Bird Survey. As a result of this ongoing survey work, considerable information is available on numbers of overwintering wildfowl (I-WeBS data 1994-2003). Otherwise, information has been derived from J. Matthews (*pers.comm.*), Dempsey and O'Clery (2002), Browne Dunne Roche (2002), and review of other literature (e.g. Hillis 2001; Newton *et al.* 1999).

### 9.2 Designations

Within the study area there are no Special Protection Areas (SPAs), i.e. designations to protect important birds (under the EU Birds Directive). The presence of Annex I species under this Directive does not automatically result in SPA designation of a site since a certain percentage of the known population is usually required to be present before the site qualifies for SPA status. Within the present corridor study area there are no SPA designations for Greenland white-fronted geese or whooper swans, for example, because flock numbers do not typically reach the required levels. However, a number of the proposed Natural Heritage Areas within the study region do include habitats that are important for birds.

### 9.3 Priority Bird Species

A number of bird species that have undergone drastic decline, in either range or population, in the past 25 years have been placed in the Red List - i.e. are of high conservation concern (Newton *et al.* 1999).

The following Red Listed species occur in the study area:

Table 9.1 Red Listed bird species occurring in the study area. \* Indicates that the species is also listed in Annex I of the EU Birds Directive. Annex I bird species are 'the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution'.

Species	Comments
Common Scoter <i>Melanitta nigra</i>	This species has been recorded on Lough Scannal <sup>1</sup>
*Hen Harrier <i>Circus cyaneus</i> <sup>2</sup>	Recorded at Derreenanagh, Cloonmaan <sup>3</sup> and Mountallen <sup>1</sup> Possible nesting pairs at Mountallen and Derreenanagh.
Lapwing <i>Vanellus vanellus</i>	Widespread winter visitor, breeding numbers have decreased <sup>4</sup> .
Curlew <i>Numenius arquata</i>	Widespread – 20-30 individuals use Mountallen (not for breeding at present) <sup>1</sup>
Barn owl <i>Tyto alba</i>	Widespread but scarce <sup>4</sup>

### 9.4 Amber List species

Seventy seven bird species are named in the Amber list. These species are of medium conservation concern and placed in the Amber List for one or several of a number of reasons, for example, they may have undergone a decline of 20-49% in the past 25 years, or over 50% of the Irish breeding population is

<sup>1</sup> J. Matthews *pers.comm.*

<sup>2</sup> Also listed in Annex I of the Birds Directive

<sup>3</sup> Browne Dunne Roche (2002)

<sup>4</sup> Dempsey and O'Clery (2002)

found in 10 or fewer sites (Newton *et al.* 1999). Of the 77 Amber Listed species, at least 27 are known to occur within the present study area.

Table 9.2 Amber List Species. \* Indicates that the species is also listed in Annex I of the EU Birds Directive. Annex I bird species are 'the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution'.

Species	Comments
Great crested grebe <i>Podiceps cristatus</i>	Local resident. Recorded from numerous I-WeBS sites within study area. 5 = max. no. recorded with I-WeBS at Lough Scannal in winter <sup>a</sup>
Cormorant <i>Phalacrocorax carbo</i>	Colony bred at Gortinty Lough 2000. Recorded from numerous I-WeBS sites within study area <sup>a</sup>
*Bewick's swan <i>Cygnus bewickii</i>	Winter visitor. Large flock (50/60) recorded at Oakport Lough prior to 2002 <sup>b</sup>
*Whooper swan	Winter visitor. Widespread. Counts within study area do not normally exceed National or International thresholds. Found at most I-WeBS sites in study area <sup>a</sup>
*Greenland white-fronted goose <i>Anser albifrons flavirostris</i>	Discussed in greater detail below.
Wigeon <i>Anas penelope</i>	Found throughout study area in winter. Largest numbers recorded at Lough Scannal 2000/01 – 262 <sup>a</sup> . Counts within study area do not exceed National or International thresholds.
Teal <i>Anas crecca</i>	Found throughout study area in winter. Largest number recorded at Lough Bofin 1999/00 – 255 <sup>a</sup> . Does not exceed National or International thresholds.
Pochard <i>Aythya fuligula</i>	Found throughout study area in winter. May also breed in area. Largest number recorded at Grange Lough 2002-03 – 114 <sup>a</sup> . Does not exceed National or International thresholds.
Tufted duck <i>Aythya fuligula</i>	Found throughout study area in winter. May also breed in area. Largest number recorded at Kilglass 1999/00 – 102 <sup>a</sup> . Does not exceed National or International thresholds.
Golden eye <i>Bucephala clangula</i>	Found throughout study area in winter. Largest number recorded at Drumharlow 1998/99 – 33 <sup>a</sup> . Does not exceed National or International thresholds.
Red breasted merganser <i>Mergus serrator</i>	Not recorded in winter with I-WeBS, but 2-3 pairs breed at Lough Allen in summer <sup>c</sup>
*Merlin <i>Falco columbarius</i>	Scarce resident <sup>d</sup> . Recorded from Drumharlow/Derreennagh Bog <sup>e</sup> .
Coot <i>Fulica atra</i>	Common summer and winter resident <sup>d</sup> . Largest number recorded at Grange Lough 2002/03 – 58 <sup>a</sup> . Does not exceed National or International thresholds.

<sup>a</sup> I-WeBS data 1994-2003

<sup>b</sup> B. O'Connor *pers.comm.* cited in Browne Dunne Roche (2002)

<sup>c</sup> J. Matthews *pers.comm.*

<sup>d</sup> Dempsey and O'Clery (2002)

*Golden plover <i>Pluvialis apricaria</i>	Widespread winter visitor and passage migrant <sup>d</sup> . Largest number recorded at Gortinty Lake 2002/03 – 350 <sup>a</sup> . Does not exceed National or International thresholds. Also small numbers breed at Gortinty <sup>c</sup> .
*Knot <i>Calidris canutus</i>	Autumn and winter visitor <sup>d</sup> . Largest numbers recorded at Gortinty Lake 2001/02 – 120 <sup>a</sup> . Does not exceed National or International thresholds.
Snipe <i>Gallinago gallinago</i>	Common resident breeding species <sup>d</sup> .
Common tern <i>Sterna hirunda</i>	Widespread summer visitor <sup>d</sup> .
Cuckoo <i>Cuculus canorus</i>	Common summer visitor <sup>d</sup> .
*Kingfisher <i>Alcedo atthis</i>	Common resident <sup>d</sup> . A number of nesting pairs have been recorded around Lough Allen <sup>c</sup> .
Skylark <i>Alauda arvensis</i>	Common resident breeding species <sup>d</sup> .
Sand martin <i>Riparia riparia</i>	Common summer visitor <sup>d</sup> .
Swallow <i>Hirundo rustica</i>	Very common summer visitor <sup>d</sup> .
Whinchat <i>Saxicola rubetra</i>	Local summer visitor <sup>d</sup> .
Stonechat <i>Saxicola torquata</i>	Common resident <sup>d</sup> .
Grasshopper warbler <i>Locustella naevia</i>	Common breeding species <sup>d</sup> .
Spotted flycatcher <i>Muscicapa striata</i>	Widespread summer visitor <sup>d</sup> . Recorded at Killadiskert, Lough Allen <sup>c</sup> .

### 9.5 Greenland White-fronted Goose: Anser albifrons flavirostris

The Greenland White-fronted Goose is a winter migrant. The Irish population was estimated at c.14,600 in 1994 (Fox *et al.* 1994) but had declined to c. 11,400 in 2001-02 (A. Walsh *pers. comm.* cited in Browne Dunne Roche (2002)). In 1997-98 there were seven Internationally Important sites for this species in the Republic, but this had declined to six following the 1998-99 I-WeBS counts (Colhoun 2000; 2001). While yearly fluctuations may be expected for any population of wild animals, that of the Greenland white-fronted goose is considered in decline at the moment. The main overwintering site for the species in Ireland is at the Wexford slobbs but the remainder are distributed in the north-west of the country (Fox *et al.* 1994).

Two separate flocks overwinter in the present study area. Flock 21 is based at Drumharlow. The Drumharlow shoreline and surrounding bog habitats were formerly used by nationally important numbers of the species but these have since declined (NPWS site file). Counts have been conducted in the Drumharlow area when no birds have been found (e.g. March 2002), however, in March 2004, 55 geese were counted at the Drumharlow Bog area (J. Matthews *pers.comm.*). Also, at Lough Allen, 11-15 individuals were counted in February – March 2004 mainly at the northern end of Lough Allen between the Diffagher River and Corry, and at Kilgarriiff (J. Matthews *pers.comm.*).

The second flock (Flock 22) that is found in the study area is based at Lough Kilglass and Lough Forbes. The flock numbered 240 in 1994 (Fox *et al.* 1994). However, it subsequently split into numerous smaller flocks resulting in increased difficulty obtaining accurate counts. By 2002 this flock had been found to use the Rinn River for foraging and only numbered 41 in March 2002. The Rinn River and Lough Forbes are situated outside the present study area.

Browne Dunne Roche (2002) noted that there has been an estimated 85% decline in the number of geese overwintering in the two flocks on the Upper Shannon. However, population trends in the Upper Shannon are difficult to ascertain accurately given that there are a number of small, highly mobile, feeding groups and insufficient NPWS staff available to carry out counts. More, detailed counts and assessment of disturbance and possible habitat loss are necessary to determine conservation potential for the flocks of the Upper Shannon.

Current farming trends towards neglect of hay meadows and pasture on the Upper Shannon floodplain (e.g. at Drumharlow) will result in abandonment of traditional goose feeding sites since the species requires open ground where potential predators are visible from a distance.

## 9.6 Wetland Birds

The Irish Wetland Bird Survey (I-WeBS) is a joint scheme of BirdWatch Ireland, National Parks and Wildlife and the Wildfowl and Wetlands Trust (WWT) with additional funding from the Heritage Council and The World Wide Fund for Nature (UK). The aim is to monitor numbers and distribution of water birds in the Republic of Ireland in the non-breeding season. Monthly counts of water birds are carried out at wetlands throughout the winter months in the ROI and concurrently in Northern Ireland (as part of the UK-WeBS scheme) (Colhoun 2001).

The following I-WeBS sites and sub-sites are included in the study area.

<b>SITE</b>	<b>SUBSITE</b>	<b>GRID REF</b>
<b>Leitrim</b>		
Lough Bofin	Lough Bofin	N040885
Lough Scannal	Lough Scannal	N041907
Rinn Lough Lakes	Gortconnellan Lough	N004979
Rinn Lough Lakes	Gortinty Lough	N015959
River Shannon (Upper)	Lough Corry	M953972
<b>Roscommon</b>		
Boyle River	Knockvicar Bridge – Cootehall	G880040
Grange Lough	Grange Lough	M980870
Kilglass Lough	Kilglass Lough	M980860
Lough Boderg	Eastern Bay (Killyfad)	N020920
Lough Boderg	North End (Lough Tap)	N008945
Lough Drumharlow	Lough Eidin (Drumharlow)	G910020

Mean and peak numbers of wetland birds did not exceed national or international thresholds at any of the above sites during the counts, which have been carried out at most sites since the winter of 1994/95. However, large numbers of different species have been recorded at Lough Scannal, Lough Bofin, the Carnadoe Waters and Gortinty Lake.

# 10 Vertebrates - Fish

## 10.1 Fish species in the Upper Shannon

A number of fish species are known to occur in the Upper Shannon. These include:

- Bream – *Abramis brama*
- Eel – *Anguilla anguilla*
- Perch – *Perca fluviatilis*
- Pike - *Esox lucius*
- Roach – *Rutilus rutilus*
- Rudd – *Scardinius erythrophthaimus*
- Salmon – *Salmo salar*
- Tench – *Tinca tinca*
- Trout (including Ferox trout) – *Salmo trutta*

Rare species such as arctic char (*Salvelinus alpinus*) and the Annex II listed pollan (*Coregonus autumnalis*) are not known to occur in the present study area (Joe Caffrey, *pers.comm.*).

The Annex II listed lamprey species (sea lamprey - *Petromyzon marinus*, brook lamprey *Lampetra planeri* and river lamprey *L. fluviatilis*) – although present in lower reaches of the Shannon, have not been confirmed from the Upper Shannon (Kelly and King 2001). Populations of brook or river lamprey, may however, be present and there are unconfirmed reports of an unidentified lamprey species from the Shannon south of Lough Allen.

Ferox trout is a large predatory race of the brown trout. However, new DNA research may confirm that it is an entirely different species of trout (e.g. Wildireland 2003). The ferox trout has been recorded at the northern end of Lough Allen (Joe Caffrey, *pers.comm.*). The present status of the ferox trout in Lough Allen/Upper Shannon is unknown.

## 10.2 Fishery classification

The Upper Shannon is mainly classified as a coarse fishery, which means that populations of fish suited to slow flowing water and relatively low oxygen levels are present. Some trout and salmon (game or salmonid) fishing is promoted at Lough Allen and in Upper reaches of the Shannon. Salmon and trout typically require well oxygenated, clean rivers and lakes. Pike, a large predatory fish that is widespread throughout Ireland is an additional fishing attraction in the area.

## 10.3 Notable fishing areas

The following list of fishing areas has been summarised from the Shannon Regional Fisheries Board website ([www.shannon-fishery-board.ie](http://www.shannon-fishery-board.ie)). Licensing requirements, size and bag limits are not specified in this report which merely condenses some of the information provided by the Fisheries Board.

### 10.3.1 Game Fishing

#### 1. River Shannon: Dowra

The area north of Dowra is listed as a salmonid fishery and brown trout averaging 1-2lbs may be expected here.

#### 2. Lough Allen

Lough Allen is additionally described as a wild brown trout fishery where brown trout averaging 1-2lbs may be caught.

#### 3. Lough Key & Boyle River

Brown trout averaging close to 1lb may be expected from Lough Key and Boyle River.

#### 4. The Shannon at Jamestown

Brown trout averaging 1lbs or larger.

### *10.3.2 Coarse Fishing*

The following locations for coarse fishing have been summarised from the Shannon Fisheries Board website. Only fisheries rating 'very good' or 'excellent' are reported, along with those species for which the fishery assigned the rating. A number of additional fishing areas are reported in the website but are not listed here, some of these have 'good' stocks of fish. Bream, roach and hybrids are the species for which most of the areas are rated highly although a number of other species are typically present such as rudd, tench, perch and eels.

1. Lough Allen. Very good bream and roach fisheries are found at Heron's Shore, very good bream at Barney's Point (Holly Island) and Johnny Wynne's Bay.
2. Battle Bridge. Very good area for bream.
3. Hartley Bridge. Very good area for bream, roach and hybrids.
4. Drumharlow has very good bream stocks.
5. Boyle River at Cootehall has very good bream, roach and hybrid stocks.
6. Lough Key. This fishery has very good bream and hybrid stocks. The largest lake dwelling pike caught in Ireland was caught here in 1993 – the specimen weighed over 39lbs.
7. Boyle River at Drumbridge has very good bream, roach and hybrid stocks.
8. Finlough Lake, east of Lough Key, has very good bream stocks.
9. Derreen Lake (near Knockvicar) has very good bream, roach and hybrids.
10. Boyle River at Knockvicar has very good bream, roach and hybrid stocks.
11. Oakport Lake has very good bream stocks.
12. Mudflats (this may correspond to Cordrehid but it is not specified) – area south of Carrick-on-Shannon is very good for bream and hybrids.
13. Jamestown Weir. Very good for bream, roach and hybrids.
14. Drumsna. Bream stocks are very good.
15. Gortinty Lough. Very good bream stocks.
16. Lough Boderg. Very good for bream, roach and hybrids.
17. Upstream of Roosky (e.g. at Pigeon Island) very good hybrid stocks.

### *10.3.3 Pike Fishing*

Pike is found throughout the study area, and many locations have 'good' pike stocks (Shannon Fisheries Board website). However, two in particular are rated as excellent for pike fishing: Lough Key and Lough Boderg.

## **10.4 Status of fisheries in the Upper Shannon**

Fishing on the Upper Shannon is currently subject to much debate due to a fall-off in visiting angler numbers and a perceived decline in fish stocks. The current state of the Upper Shannon fishery was one of the issues most frequently raised at public consultations during the present project.

The Central Fisheries Board has conducted two studies within the present corridor area to determine whether there is any basis to the perceived decline in fish stocks.

The first study was conducted in 2003 between Roosky and Drumsna. A report on the study was published in 2004 (Caffrey 2004).

The areas upstream and downstream of the Masonite plant were particularly targeted to determine whether the factory had had any impact on the fisheries. Fish were caught using gill and fyke nets at numerous locations including Drumsna, Lough Tap, Lough Boderg, Lough Scannel, Lough Bofin and upstream of Roosky (Caffrey 2004).

In total, nine fish species were recorded, including eels. Roach x bream hybrids, roach, perch and bream were the most numerous species present. Pike, trout, rudd and tench were recorded in relatively small

numbers. The fish did not show abnormal parasite levels and roach and hybrids were considered of large average size. A large biomass of eels was caught. Additional electric fishing revealed numerous, very large shoals of cyprinid and perch fry and yearling fish – an indication that the population is self-sustaining. The study confirmed the presence of large and healthy fish stocks throughout the area surveyed. Also, the community structure and relative abundance of fish in the surveyed section closely corresponded with that which could be expected in a natural coarse fish river or lake complex and showed no evidence of adverse affects of pollution. The report surmised that a decline in angler catches could be explained, at least in part, by fish moving from intensively fished areas to locations less accessible to anglers. Such movements of fish populations have been recorded downstream on the Shannon at Tarmonbarry (Caffrey 2004).

An additional study has been carried out in 2004, upstream, to north of Carrick-on-Shannon. The results have not yet been published but initial findings have also confirmed the presence of a healthy, sustainable coarse fishery in this area (Joe Caffrey *pers. comm.*).

There has been no evidence derived from either of these thorough studies, to confirm a depletion in fish stocks. Instead it has been hypothesised that fish are moving relatively short distances away from intensively fished areas to areas with less disturbance (Joe Caffrey *pers. comm.*).

Increased water pollution, zebra mussel (the invasive exotic bivalve), or the American mink have not resulted in a depletion of fish stocks in the Upper Shannon to-date.

## 11. Areas of particular interest

The study area is divided into 5 sections: (1) Lough Allen; (2) Drumshanbo to Cootehall to Carrick-on-Shannon; (3) Lough Key; (4) Carrick-on-Shannon to Roosky; (5) Carnadoe Waters. Areas of interest are identified by means of literature review, consultations and limited field survey. A total of 68 sites have been identified and including those that support interesting habitats, areas of importance to birds, and areas requiring further investigation with a view to confirming the presence of important habitats or species. Locations of areas of particular interest are indicated in Figure 1.

### SECTION 1. LOUGH ALLEN (DOWRA TO DRUMSHANBO)

Lough Allen is a large lake with relatively steep sided slopes rising from its shores. It is categorised as an oligotrophic lake which means that it has low nutrient inputs and relatively acid waters. Lough Allen's shoreline is generally rocky, although peat, mud and sandy shoreline areas are also present. Lough Allen lacks the large areas of reed swamp that are found in other lakes lower in the Shannon catchment. This may be due to a combination of factors such as its low nutrient status, fluctuating water levels and/or its relatively steep shoreline. Small sections of Lough Allen's shoreline or islands are included in the Lough Allen South End and Parts proposed Natural Heritage Area (pNHA) conservation designation. Kilgarriff Marsh is an additional pNHA conservation designation close to the northern shore of Lough Allen. Owengar Wood, a wooded glen near Drumkeeran, is also a pNHA. The non-native, invasive, zebra mussel has only been recorded from the southern end of Lough Allen. Lough Allen is promoted as a game fishery.

A number of sites along the shoreline of Lough Allen and further inland, have been identified as of ecological interest. These sites support a number of interesting and important habitats and a number of rare and protected plants and animals.

#### 1. Kilgarriff Marsh/Rossmore/Mahanagh

*Grid Reference: various G 964 256 to 984 235*

Partly included in Kilgarriff Marsh pNHA this area includes a variety of habitat types including wet grassland, poor fen and flush, quaking mire and transition bog and wet heath (with *Erica tetralix*). Freshwater crayfish and otter, both Annex II species, have recently been confirmed from the area. The protected orchid – Irish lady's tresses has been recorded from the shoreline of Kilgarriff Lake, the shoreline of Lough Allen at Dead Man's Point and two locations at Rossmore. The rare plant – blue-eyed grass – has been recorded from Rossmore. Quaking mire and transition bog, and wet heath, are both habitats listed in Annex I of the EU Habitats Directive. Mahanagh Lough, a small narrow lake to the north of Rossmore has well developed reed beds that grade into wet grassland dominated by rushes, scrub and wet willow-alder-ash woodland. The reed beds contrast to much of Lough Allen's shoreline which does not have extensive reed-bed systems. It is therefore of local importance as a refuge for wetland birds and overwintering wildfowl. At Kiltyfeenaghty Glebe, on low-lying land south of Mahanagh Lough, wet willow-alder-ash woodland is also present. Species include birch, willow, yellow flag, bramble, sedges, lesser celandine, wavy bittercress, common polypody. Inishmagrath Island is included in the Kilgarriff Marsh pNHA designation. The Annex I Greenland white-fronted goose has been recorded from Inishmagrath Island.

#### 2. Lough Allen South End and Parts (Fahy, Cornashamoge, Gubcormongan and Mahanagh)

*Grid Reference: various G 981 224; G 973 146; G 975 166; G 965 121.*

This is a proposed Natural Heritage Area that has been designated to protect good examples of Lough Allen's shoreline vegetation and woodland. At Fahy and Cornashamsoge wet marginal woodland is situated on a rocky shoreline. At Gubcormongan a relatively large area of semi-natural woodland where the rare black poplar is present. There is some swamp woodland on sandy soil. In addition to the wooded areas, a limestone exposure at Mahanagh is included in the designation. This habitat includes the Annex I habitat calcareous grassland with some blackthorn scrub.

The remaining sites around Lough Allen are described following in an anti-clockwise direction around the shore from Rossmore/Kilgarriff.

### **3. Corry**

*Grid Reference: G 963 234*

Marginal wet willow-ash-alder woodland with black poplar.

### **4. Cavan**

*Grid Reference: G 953 234*

Marginal wet willow-ash-alder woodland with black poplar.

### **5. Derrinvoney Lower**

*Grid Reference: G 940 238 to 950 238*

This is a foraging site for Greenland white-fronted goose (Annex I species under the EU Birds Directive). The strip of marginal, wet woodland along the lake shore is also a site for black poplar.

### **6. Derrinvoney Upper**

*Grid Reference: G 943 249*

Small strip of semi-natural, alder dominated woodland along a river valley.

### **7. Owengar Wood**

*Grid Reference: G 925 238*

Owengar Wood is a pNHA. Owengar Wood pNHA (north west Lough Allen) is categorised as wet pedunculate-oak-ash woodland. The canopy is dominated by alder and with some beech and grey willow. The shrub layer includes hazel and hawthorn and the field layer contains various ferns, lesser celandine, wood sorrel, primrose, wood sanicle and goldilocks buttercup.

### **8. Drummanfaughnan**

*Grid Reference: G 925 222*

Small broadleaf woodland on a ridge beside the R280 just south of Drumkeeran. The woodland has abundant ash and birch with some exotics. Understorey species include alder and hazel with bramble and furze.

### **9. Drummans Upper/Gubb**

*Grid Reference: G 938 215*

Narrow strip of marginal wet woodland. Black poplar has been recorded at Gubb. Kingfisher (Annex I) has been recorded at this area.

### **10. Cartronbeg**

*Grid Reference: G 955 175*

Strip of semi-natural wet willow-ash-alder woodland lining the lake shore.

### **11. Srabangan**

*Grid Reference: G 951 148*

Strip of semi-natural wet willow-ash-alder woodland lining the lake shore. Black poplar also present.

### **12. Mountallen**

*Grid Reference: G 953 135*

The protected orchid species Irish lady's tresses occurs along the lake shoreline here. The cutover bog at Mountallen has been used as a feeding site by the Annex I species, Greenland white-fronted goose, in the

past. Mountallen is a winter feeding site for Annex I species hen harrier and a large number of the Amber Listed curlew. This area is undergoing conservation management at present.

### **13. Derrygallion Bog**

*Grid Reference: G 946 136*

An extensive area of cutaway bog north of Mount Allen Bridge. The bog consists of a central raised mound of peat surrounded by a series of smaller mounds and flushed, waterlogged depressions left after turf cutting. The depressions are very wet and are dominated by large hummocks of *Sphagna* with purple moor grass and bog cottons. Bog myrtle and cranberry are abundant. Cross leaved heath and ling heather are occasional. Other species present include bog rosemary, bog asphodel, milkwort, tormentil and mosses. The central raised peat mound has been burned recently and 75% vegetation cover remains. Even though the peat has been compacted it has retained some wetness. On the central mound purple moor grass is dominant. Ling heather is abundant but not conspicuous. Bog asphodel and bog myrtle are also common. The bog is surrounded by encroaching birch scrub. Despite draining and turf cutting, it is fairly extensive.

### **14. Inisfale Island, Bellantra and Holly Island**

*Grid References: G 965 135, G 962 124 and G 962 126*

Semi-natural wet willow-ash-alder woodland occurs along Inisfale peninsula and much of this woodland is flooded in winter. Strips of this vegetation type occur at Bellantra, another site for black poplar, and Holly Island. The shoreline at Holly Island is used by anglers and is categorised as a very good bream and roach fishery.

### **15. Bodorragha**

*Grid Reference: G 950 120*

An extensive cutover raised bog. The bog is surrounded by birch scrub and there is conifer plantation on the south eastern edge of the bog.

### **16. Derrintober**

*Grid Reference: G 966 128*

A site along the shoreline for Irish lady's tresses, a protected orchid.

### **17. Cleighran More**

*Grid Reference: G 984 197*

A strip of wet willow-ash-alder woodland with black poplar, alder, hazel, ash, hawthorn, water horsetail, meadowsweet, herb robert, creeping cinquefoil, primrose, broadleaved willowherb, blackthorn, angelica, tufted hairgrass, holly, wild strawberry, germander speedwell and a number of other wet woodland species.

### **18. Derrynahona**

*Grid Reference: G 986 235*

Foraging areas for Greenland white-fronted geese have been recorded close to the lake at Derrynahona.

## SECTION 2. DRUMSHANBO TO CARRICK-ON-SHANNON TO COOTEHALL

Sites are described in the following order: from North to South to the Boyle River, Drumharlow and Boyle River sites, then Shannon sites from Boyle River to Carrick-on-Shannon.

### 1. Acres Lake

*Grid Reference: G 967 100*

A small lake connected via canal to Lough Allen (north) and the Shannon (south). The lake is fringed by common reed and bulrush but the reedbeds are not extensive. There is a zonation of vegetation from reedbeds to wet grassland. Wet grassland dominated by purple moor grass is situated on the eastern shore and fields dominated by soft rush along other shores. Six whooper swans (Annex I of EU Birds Directive) and two mute swans were recorded here in February 2002. The first Irish record for the freshwater snail *Viviparus viviparus* was from here and the lake is considered to have high education value.

### 2. River Shannon south of Lough Allen

*Grid Reference: Various G 961 124 to 943 110*

Unconfirmed reports of Annex II listed fish - lamprey. This area is recommended for further investigation.

### 3. Dromore/Dereenasoo Bog Complex

*Grid Reference: G 936 090*

This is an extensive cutaway bog complex divided by a small road. The complex extends to the Feorish River (to the west) and is divided into two distinct peat masses connected by a small area of damaged bog. Dereenasoo bog is north of the road, Dromore to the south. Dromore bog is relatively small and is bordered by birch woodland to the south west and coniferous forestry to the south. It is still reasonably wet, with good vegetation cover. Ling heather, bog cotton and purple moor grass provide most vegetation cover, although certain areas are solely dominated by purple moor grass. There are some hummocks and hollows but these are not very pronounced. Other species include bog rosemary, bog asphodel, cross-leaved heath, bog myrtle, carnation sedge, deergrass and white beaked sedge. Dereenasoo Bog is more extensive. In the main peat area *Sphagna* are abundant and there are well developed hummocks, hollows and lawns. Ericoids, bog cottons and *Sphagna* provide the dominant plant cover. Ling heather, cross-leaved heath, bog rosemary and a number of *Sphagna* spp. have been recorded.

### 4. Drumhierney Wood

*Grid Reference: G 951 055*

This is a proposed Natural Heritage Area with oak-ash-hazel woodland. The canopy is dominated by pedunculate oak. Beech, sycamore, wych elm and sessile oak are also present. The shrub layer includes hazel, blackthorn and young ash. The field layer is relatively diverse and includes wood sedge, broad buckler fern, male fern, primrose and herb bennett.

### 5. Lough Drumharlow

*Grid Reference: Various*

Drumharlow is the lower part of the River Boyle, which opens out into a large lake before it joins the River Shannon, 5km south of Leitrim village. Drumharlow is categorised as a mesotrophic lake. The entire lake is included in the Lough Drumharlow proposed Natural Heritage Area. This designation also includes parts of the Shannon upstream of Drumharlow. Vegetation within the designation includes callows (wet grassland and marsh mosaics) and cutover raised bog. The designation also includes feeding areas for Greenland white-fronted goose (Annex I EU Birds Directive). Included within the designation are Lough Naseer, Shannon floodplain areas at Caldragh, Corryolus (fen peat is the underlying substrate in both areas) and Annaghbeg. The main Drumharlow floodplain area is at Cleaheen (south of the road). A large area of raised bog, partly cutaway, is included at Derreenannagh, and semi-natural woodland at Hughestown. The rare plant bird's nest orchid has been recorded from Hughestown Wood along with a rare fungus *Paradiacheopsis rigida*. A diverse list of plant species are present in the callows. Floodplain vegetation at Cleaheen includes purple moor grass, marsh pennywort, devil's bit scabious, water mint, star

sedge, bottle sedge, tufted hair grass, angelica, marsh bedstraw and flag iris. At Derreenannagh Bog a possible nesting pair of the Annex I bird species, hen harrier, has been recorded. If nesting, the pair are likely to use young conifer plantation which is not included in the pNHA designation. In addition, the Annex I bird species, merlin, has been recorded from the bog. Lough Drumharlow is an I-WeBS count site. Species that have been recorded there include teal, wigeon, cormorant, great crested grebe, little grebe, mute and whooper swans (Annex I of EU Birds Directive), heron and curlew. Large numbers of golden eye have been recorded here (winter 1998-99), although numbers have not been known to exceed national or international thresholds. Drumharlow is described as having very good stocks of bream for coarse angling. Within the pNHA designation along the Shannon at Hartley Bridge, very good coarse angling is available, in particular for bream, roach and hybrids.

The Drumharlow flock of Greenland white-fronted geese has undergone serious decline in the past 10 years. The decline may be attributable to a number of factors including problems at summer breeding sites in Greenland, over-hunting of the bird in Iceland, and/or habitat loss in traditional wintering areas in Ireland. At Drumharlow, there may be an underlying trend towards abandonment of marginal floodplain areas for agriculture. This leads to the development of tall grasses and, eventually, succession to scrub. If floodplain areas are not grazed or mowed they will cease to be of use to the Greenland white-fronted goose which prefers open ground to forage.

The favoured route for the proposed N4 Carrick-on-Shannon Bypass is intended to go through the pNHA designation at Corryolus.

#### **6. Carrigeen**

*Grid Reference: G 936 037*

Additional Greenland white-fronted goose grazing site that is not included in the pNHA designation. The area includes a mosaic of wet grassland, marsh and cutover raised bog habitats.

#### **7. Dergrow**

*Grid Reference: G 921 042*

Additional feeding site of Greenland white-fronted goose that is not included in the pNHA designation.

#### **8. Cloongownagh**

*Grid Reference: G 913 000*

Additional floodplain area on south side of N4 where large numbers of whooper swans (Annex I of EU Birds Directive) have been observed in winter (97 observed February 2002, does not exceed national or international thresholds).

#### **9. Cloonybrien**

*Grid Reference: G 893 025*

Limestone exposure at water level along the Boyle River.

#### **10. Cootehall Lough**

*Grid Reference: G 895 030*

Floodplain area, situated directly south of Cootehall Bridge, with extensive reed-bed and swamp vegetation.

#### **11. Cloonmaan/Cloonskeeveen (Shannon)**

*Grid Reference: G 931 000*

Additional Shannon floodplain areas with rough pasture/wet grassland/marsh vegetation. The N4 Carrick-on-Shannon Bypass, favoured route, may cut through this floodplain area.

Additional site adjacent to study area

#### **Carrickslavan (east of Leitrim village)**

*Grid Reference: G 976 044*

Small turlough that does not fully drain in summer. The scarce emerald damselfly is a rare damselfly species that has been recorded here.

### **SECTION 3. LOUGH KEY INCLUDING BOYLE TO COOTEHALL**

Lough Key is a large mesotrophic lake on the Boyle River system. Parts of its shoreline and one of the lake's islands are included in different pNHA designations. The pNHAs are described in an anti-clockwise direction around the lake shore from Corrigeenroe Marsh in the north-west corner.

#### **1. Corrigeenroe Marsh**

*Grid Reference: G 817 085*

This area is described as 'A series of marsh communities ranging from Reedswamp to wet meadows and swamp woodland. Some quaking areas are present. The species-rich fens and lake edge communities include elongated sedge *Carex elongata*'. Elongated sedge is listed in the Red Data Book. Transition mire and quaking bog are listed in Annex I of the EU Habitats Directive, along with rich fen and flush. It is not entirely clear whether the habitats described conform to the EU criteria.

#### **2. Hog's Island**

*Grid Reference: G 830 055*

This is a wooded island off the western shore of Lough Key. Ash is the dominant canopy former. Other canopy species include sycamore and beech. The field layer includes ivy, cow parsley, bluebell and hogweed. The presence of goats may be detrimental to natural regeneration of tree and shrub species on the island. Several species of warbler and other songbirds nest on the island.

#### **3. Tawnytaskin Wood**

*Grid Reference: G 824 050*

This is a semi-natural woodland with pedunculate oak, ash, grey willow and beech. Sessile oak and downy birch are also present. Shrub species include hazel and spindle. Areas of wet woodland (willow-ash-alder) can be found around the lake shore. In and around these areas is a diverse field layer with herb bennett, marsh bedstraw, hedge woundwort, remote sedge and sanicle. Some reed beds and marsh are included in the designation.

#### **4. Drum Bridge**

*Grid Reference: G 820 043*

This site is situated in a shallow inlet of Lough Key. It includes a low lying marshy area partly derived from cutover bog but it mainly occurs on mineral soil. In deep water in the inlet there is common club-rush and common reed with great water dock and other species. The rare plant species, common meadow-rue, has been recorded here, along with the rare sedge – elongated sedge. Along the margins, rushes, marsh horsetail and marsh willowherb are present. Additional species on the site include marsh bedstraw, fen bedstraw, long-stalked yellow-sedge, marsh cinquefoil and marsh pennywort.

#### **5. Drummans Island**

*Grid Reference: G 840 047*

This is an additional proposed National Heritage Area along the shores of Lough Key. It includes some semi-natural oak-ash-hazel woodland along with some conifer and non-native broadleaved woodland areas. Pedunculate oak and ash are the main canopy species. Sycamore is also present. The shrub layer includes hazel, holly and hawthorn. The non-native, invasive shrub, cherry laurel is also present in parts of the site. A number of field layer species are present and include bluebells, wood sorrel, enchanter's nightshade, male fern, broad buckler fern and dog violet. The rare and Red Data Listed bird's nest orchid has been recorded from the wood, along with the uncommon shrub species – buckthorn. Reed beds with common reed are situated along parts of the site.

#### **6. Fin Lough**

*Grid Reference: G 865 039*

This proposed Natural heritage Area is located east of Lough Key, close to the R285 road. It is a shallow lake that is surrounded by extensive reed beds and fen. Common reed is the main species present in reed beds. Fen areas are dominated by black bog-rush and various sedges. Bog bean, marsh cinquefoil,

gipsywort and common cotton grass are among the other species present, particularly in wet areas. In dry areas purple moor grass and silverweed may be found, along with yellow rattle. The site is important for nesting wildfowl and reed buntings. It is also used as a coarse fishery.

Additional, undesignated, areas of interest at Lough Key:

### **7. Lough Key Islands**

*Grid Reference: Various*

Ash, Bingham, Bullock, Castle, Church, Green, Hermit, Lahan's, Orchard, Sally, Stag, and Trinity Islands all appear to have good quality broadleaved woodland or marginal scrub habitat. In some cases, non-native conifers and broadleaves such as beech are also evident. However these islands require further detailed survey to evaluate conservation interest.

### **8. Tinnarinnow Peninsula**

*Grid Reference: G 822 071*

An area with semi-natural woodland canopy of ash and oak. Wet willow-ash-alder woodland is present along the shoreline with a canopy of birch, alder and willows.

### **9. Erris Bay**

*Grid Reference: G 830 036*

Erris Bay is an extensive wetland area of rushes and reeds with copses of birch, willow and alder. Common reed, common club rush, water horsetail and bur-reed are among the species present.

### **10. Lough Key Forest Park**

*Grid Ref: G 85 03*

This area was formerly Rockingham Demesne and it presently includes extensive non-native conifer woodland and mixed broadleaved woodland. A number of bat species have been recorded from this park including brown long-eared, soprano pipistrelle, Leisler's, Natterer's and Daubenton's. A single specimen of the Annex II species the lesser horseshoe bat was recorded in the demesne in winter 2004. This is a highly unusual record since it is located outside the range of its current known distribution in Ireland. A number of specimen trees including a horse chestnut, Monterey pine, western red cedar, grand fir and two European larch from Rockingham Demesne are included in the Tree Register of Ireland. A number of developments are planned for this Demesne and several specialists are currently assessing its ecological significance.

### **11. Lough Keel**

*Grid Reference: G 858 033*

A small circular lake with a fringe of reed beds that grade into rushy fields.

### **12. Ballyardan**

*Grid Reference: G 871 027*

A small, narrow area of broadleaf woodland with ash, hawthorn and blackthorn. Beech is also present. Situated along the R285 road from Boyle to Keadew.

### **13. Black Lake**

*Grid Reference: G 865 045*

This is a small circular lake completely surrounded by coniferous plantation in Rockingham Demesne. The lake shows zonation from emergent aquatics such as horsetails, to a fringe of large sedges (*Carex paniculata*) with bulrush and reeds, and finally to a small area of wet woodland with birch, willow and alder around the lake.

### **14. Poteen Hill Bog**

*Grid Reference: G 865 055*

This is a cutover raised bog that is surrounded by conifer plantation. It is a nature reserve. There has been some encroachment of birch and rhododendron onto the bog margins, where the peat has dried out. The hummock and hollow structure is not well developed. The lichen, *Cladonia impexa*, is abundant. Bog cottons, ling heather, cross-leaved heath, deer grass, bog and carnation sedge are present on the north side of the road. South of the road the bog is slightly wetter, with a similar species complement to the other half. However, white beaked sedge is also present.

### **15. Drumcormick Peninsula**

*Grid Reference: G 852 061*

This peninsula is situated on the north eastern shore of Lough Key. It is dominated by broadleaf woodland of ash and oak. Birch is present in the understorey. There is also wet woodland fringing the lake which includes alder, willows and birch.

### **16. Weir at Knockvicar to Oakport**

*Grid Reference: G 87 05 to 88 04*

Fringe of wet woodland with ash, alder, hazel, grey willow. Common reed and water horsetail are present in fringes along woodland. In drier areas away from shoreline beech, sycamore, horsechestnut, and beech are present. Other species include guelder rose and hart's tongue fern.

### **17. Oakport Lake**

*Grid Reference: G 890 036*

This is a small lake to the west of Cootehall with occasional reedbeds and fringing wet woodland of willow and alder. Bewick swans (Annex I on the EU Birds Directive) have been recorded from here. Important buffer zone for nearby pNHA, Lough Drumharlow. This lake has very good bream stocks for coarse fishing.

## **SECTION 4 CARRICK-ON-SHANNON TO ROOSKY**

Sites are described in geographical order from Carrick to Roosky. South from Carrick-on-Shannon the river meanders around low-lying hills and drumlins. The river widens at a number of points to form lake habitats – Lough Corry, Lough Tap, Loughs Boderg and Bofin. Well-developed reed bed vegetation along this stretch of the Shannon means that there is an increased abundance and diversity of wildfowl here compared with more northerly parts of the river.

### **1. Carrick-on-Shannon**

*Grid Reference: M 942 993*

The Shannon River bank at Carrick, in the area located close to the Landmark Hotel has well developed fringe vegetation with common reed, alder and willow woodland. The wetland is bordered by amenity grassland along the roadside which has abundant horsetails. There was formerly a boardwalk on the area that is currently damaged and unsafe to use. The rare plant, summer snowflake, has been recorded from this area.

### **2. Cortober and Cordrehid**

*Grid Reference: M 94 98*

Wet, rush dominated grassland on the flood plain of the Killukin River close to its inflow with the Shannon. A hen harrier was sighted here in February 2002. Occasional willow scrub is also present.

### **3. Inishmucker**

*Grid Reference: M 942 980*

Low lying area south of Carrick-on-Shannon underlain by fen peat. Typical callows, wet grassland and marsh present with some alder carr woodland.

### **4. Rinnacurreen/Cloonfeacle**

*Grid Reference: M 95 97*

Low lying area south of Inishmucker. This site includes a small mesotrophic lake that is incorporated into the Shannon floodlands in winter. Grasslands are mown for hay and some are grazed. Some areas are not managed for agriculture and depending on hydrology have swamp or alder carr vegetation present. Typical species found in wet grassland and marsh include common valerian, meadowsweet, purple moor grass, tufted vetch, devil's bit scabious, angelica, purple loosestrife, flag iris, lesser spearwort, marsh marigold, marsh lousewort, sneezewort, jointed rush, meadow vetchling, marsh pennywort, tall fescue, water mint and reed sweet grass. In alder (fen) carr the following species have been recorded: alder, grey willow, eared willow, remote sedge, iris, meadowsweet, tufted hairgrass, marsh bedstraw, hawthorn, water mint, royal fern, lady fern, marsh horsetail, soft rush and various bryophytes.

### **5. Lough Corry**

*Grid Reference: M 94 96*

This wide bend in the River Shannon includes some reed bed vegetation which provides cover for wildfowl. An I-WeBS count is carried out here. Among the bird species that have been recorded are pochard, tufted duck, golden eye, mute swan, whooper swan (Annex I on EU Birds Directive), teal and wigeon. The floodplain here extends west of the Lough into Cartron Townland and includes some alder and willow carr and wet grassland.

### **6. Coraughrim**

*Grid Reference: M 960 956*

A low-lying floodplain area of the Shannon. Substrate here is fen peat. Wet rushy grassland vegetation is present, along with some willow and alder scrub.

### **7. The Doon at Corgullion/Cultyconway**

*Grid Reference: M 965 957*

Low-lying floodplain area with wet grassland and some alder scrub.

### **8. Jamestown Canal**

*Grid Reference: M 978 966 to N 000 956*

The canal at Jamestown is lined with semi-natural woodland. Species include ash, alder, hawthorn, meadowsweet, gipsywort, blackthorn, hemp agrimony, furze, grey willow spindle. At the bridge there is a small example of calcareous grassland with knapweed and quaking moor grass.

### **9. Charlestown**

*Grid Reference: M 985 980*

The large wooded demesne at Charlestown is mainly composed of conifer plantation. A strip of semi-natural wet willow-ash-alder woodland runs along the river bank and this is of some conservation interest.

### **10. Gortconnellan**

*Grid Reference: N 005 977*

This is a small lake within the study area that is situated across the N4 from the Shannon. This is an important I-WeBS count site and a number of bird species have been recorded here. These include great crested grebe, whooper swan (Annex I of EU Birds Directive), cormorant, heron, mute swan, teal, mallard, wigeon, goldeneye, moor hen and lesser black-backed gull.

### **11. Drumsna**

*Grid Reference: M 998 967*

Directly south east of Drumsna village there is a low-lying area of Shannon floodplain with rush dominated fields.

### **12. Lackagh**

*Grid Reference: M 995 960*

Small area of birch woodland on a former cutover bog.

### **13. Cloontem**

*Grid Reference: N 006 957*

Area of wet grassland, low-lying and occasionally flooded by the Shannon. Also a strip of wet alder woodland is situated north of Lough Nanoge, along the river.

### **14. Gortinty Lough**

*Grid Reference: N 015 959*

This small lake is directly beside the N4 and the Masonite factory at Derryoughter. There are some reedbeds along the southern and western shores. An I-WeBS count is carried out here and very large numbers of the Annex I (Birds Directive) listed golden plover, have been recorded. Wildfowl species that have been recorded here include little grebe, great crested grebe, snipe, tufted duck, goldeneye, moor hen, lapwing, mute swan, whooper swan (Annex I of EU Birds Directive), knot, wigeon and mallard. Bats recorded in flight at Gortinty Lough include common and soprano pipistrelles, Leisler's bats and Daubenton's bats. This site has very good bream stocks for coarse fishing.

### **15. Lough Tap**

*Grid Reference: N 010 946*

Small numbers of the Annex I listed whooper swan have been observed here. There are extensive areas of reed bed.

### **16. Loughs Boderg and Bofin**

*Grid Reference: Various*

These two interconnected, mesotrophic lakes are considered to be little more than widened stretches of the Shannon. They include extensive areas of reed bed and swamp vegetation in sheltered bays, that

provide good cover for a variety of bird species. There are narrow areas of wet woodland around the lake shore with alder, ash and willows. Within the wet woodland strips around the lakes, plants that have been recorded include grass of parnassus and yellow sedge. The rare plant, floating water plantain, was formerly recorded from around Inchurrin Island (in 1871) but its present status is unknown. Dry woodland areas, above the floodplain, are typically categorised as oak-ash-hazel (e.g. Derrygrasten/Derrycarne Wood – only part of which (Inchmurrin Island) is included in the pNHA designation). Ash is often the dominant canopy species with occasional pedunculate oak. Species in the ground flora may include the scarce parasitic plant – toothwort and the relatively rare, pale sedge. Spindle tree, guelder rose and buckthorn (a scarce shrub species) are also present. The rare plant, marsh stitchwort, has been reported here also. The stony lakeshore of Loughs Boderg and Bofin support a typical 'Shannon Flora' with abundant submerged shoreweed, yellow sedge, purple loosestrife, lesser spearwort and water hemlock among the stones. A small patch of the rare plant, water germander, is present on the shore of Lough Boderg. The Annex I listed Greenland White-fronted Goose frequents a number of fields around this site but not all of the known feeding sites are included in the proposed NHA. The rare beetle *Helophorus griseus* was recorded from Lough Bofin during an Environmental Impact Assessment in association with a proposed marina and housing development at Roosky. A number of I-WeBS counts are carried out at Loughs Boderg and Bofin. A variety of wildfowl occur here including great crested grebe, little grebe, mute swan, grey heron, wigeon, lapwing, cormorant, teal, tufted duck, mallard, goldeneye, whooper swan (Annex I of EU Birds Directive), kingfisher (Annex I of EU Birds Directive) and moorhen. The Red-Listed bird, the common scoter, has been recorded at Lough Scannal. Large numbers of wildfowl are supported in this lake complex and highest numbers of wigeon, teal and great crested grebe were noted from Loughs Scannal and Bofin compared with I-WeBS counts from other parts of the present study area. The water chemistry of Loughs Bofin and Boderg could potentially support the freshwater crayfish. However, this species has not been recorded from the area and crayfish do not favour large lakes. Lough Boderg is rated as an excellent pike fishery and has very good stocks of bream, roach and hybrids for coarse fishing.

### **17. Derrywillow**

*Grid Reference: N 038 912*

A known Greenland white-fronted goose feeding site that is not included in the Boderg/Bofin pNHA.

### **18. Derrycarne North and South**

*Grid Reference: N 035 903*

The woods were surveyed in 2004 as part of the Native Woodland Survey, Derrycarne South is of high conservation value with oak-ash-hazel wood, wet willow-ash-alder woodland and some mixed conifer/broadleaved wood. Derrycarne North is composed of oak-ash-hazel woodland. At west Derrycarne, there is a Greenland white-fronted goose feeding site that is not included in the pNHA designation.

### **19. Roosky**

*Grid Reference: N 046 875*

Just north of Roosky Village, in Derryonogh townland, parts of the lake floodplain are proposed for housing developments. Some of the areas included were submerged in winter 2000 and winter 2002.

### **20. Aghnamona Bog**

*Grid Reference: N 065 877*

This proposed Natural Heritage Area mainly lies outside the boundary of the present survey area. It is a cutaway raised bog with considerable damage caused by drainage.

## SECTION 5 CARNADOE WATERS

### 1. Carandoe Waters

*Grid Reference: Various*

This section includes a series of relatively small but deep lakes that are fed by a number of small rivers and streams including Mountain/Scramoge, Owenur and Finlough Rivers. Water from these lakes flows into the Shannon at Lough Boderg, 6km west of Dromod. The entire lake series is included in a large proposed Natural Heritage Area designation. Large areas of reed bed, swamp and marsh vegetation lines the shoreline of these lakes. The lakes are situated on a geological fault-line, hence their relative depth compared with nearby Loughs Boderg and Bofin. Lough Kilglass is very calcareous and has a partly sandy shoreline. Fields surrounding the Carnadoe Waters have been used by feeding Greenland white-fronted geese (Annex I species of EU Birds Directive), although the flock to which these particular geese belong is thought to be in decline and now mainly feeds on the Rinn River (outside the present study area). Among the reed swamp vegetation the following species are present common reed, bulrush, meadowsweet, common valerian, bog bean, hoary willowherb, grey willow (in the shallows), marsh ragwort, bindweed, flag iris and water mint. Marsh and wet grassland areas have abundant giant fescue, tufted hairgrass and some very wet areas have greater tussock sedge. Some of the vegetation is known to occur on peat (probably fen peat). High densities of waterfowl are regularly counted at the Carnadoe Waters as part of the I-WeBS surveys and species present include mute swan, wigeon, teal, tufted duck, goldeneye, lapwing, golden plover (an Annex I species of the EU Birds Directive), coot, moor hen, cormorant, curlew, pochard, great crested grebe, mallard, little grebe and whooper swan (Annex I of EU Birds Directive). Particularly high numbers of pochard, tufted duck and coot have been counted here, compared with other I-WeBS sites on the Upper Shannon. There is an exceptional abundance of the invertebrate *Corixa fallenoides* a type of Water Boatman peculiar to Central and Western Ireland, and the likelihood of other invertebrates of restricted distribution. The Carnadoe Waters have been described as the 'Lungs of the system' with reference to their capacity to absorb the winter Shannon floods.

### 2. Gillstown Bridge/Corgowan/Drumagissaun/Clooneen

*Grid Reference: Various from M 966 833 to M 972 857*

Floodplain of the Mountain /Scramoge River, includes wet rushy grassland and some small areas of willow scrub. This area includes a feeding site for the Annex I listed Greenland white-fronted goose.

## 12 Issues

### 12.1 Non-native species

#### 12.1.1 Plants

Rhododendron: The non-native invasive plant – *Rhododendron ponticum* occurs in various parts of Rockingham Demesne (including the Nature reserve – Poteen Hill Bog) (Section 3). This species regenerates profusely on well-drained acid soils to the detriment of native flora.

Japanese knotweed: This is also a shrub species – *Fallopia japonica*. It was recorded from hedgerows and treelines in the Arigna area. It regenerates profusely from suckers and prevents natural regeneration of native trees and shrubs.

#### 12.1.2 Invertebrates

Zebra mussel: The bivalve *Dreissena polymorpha* was first recorded in Irish waterways in 1997 at Lough Derg (McCarthy *et al.* 1997), although it had probably arrived in 1994 or earlier, attached to the hulls of used pleasure craft imported from England or the Netherlands (Minchin and Moriarty 1998; 1999). By ageing populations of this invertebrate it has been determined that, within the present study area, zebra mussels had spread as far north as Lough Key by 1997, into Acres Lake by 1998 and the mouth of Lough Allen soon afterwards (Minchin *et al.* 2003).

The mussel is particularly renowned as a fouling organism. It forms large colonies that attach to almost any hard surface such as stonework, locks, water intakes, pipes, boat hulls etc. (EHS, date unknown).

The mussel also causes a change in energy and biomass from pelagic to benthic (e.g. [www.nuigalway.ie/freshwater/zebra](http://www.nuigalway.ie/freshwater/zebra)). An EPA (2002) report stated that a number of lakes on the Shannon including Loughs Boderg, Bofin and Drumharlow are categorised as mesotrophic on the basis of chlorophyll levels, but that zebra mussels probably control the size of populations of planktonic algae and Cyanobacteria in these lakes and a higher trophic status, in line with phosphorous concentrations, may be more appropriate for some of these waters. The ecological implications of the presence of zebra mussels is difficult to predict or quantify. In lower stretches of the Shannon serious concerns have been voiced about the spawning beds of pollan, which have become infested with the bivalve. Pollan does not occur in the present study area.

Another negative impact of the mussel is that it outcompetes the native swan mussel (*Anodonta* sp.) by settling on the shells of the swan mussel in soft sediment. As a result the swan mussel has difficulty in maintaining a vertical position and is outcompeted for food ([www.nuigalway.ie/freshwater/zebra](http://www.nuigalway.ie/freshwater/zebra)).

The implications for the long-term presence of zebra mussels in the Upper Shannon are as yet unknown and the species is not likely to be eradicated.

Current recommendations regarding the zebra mussel focus on controlling the spread, for example, boat owners are requested to thoroughly clean their boats before transferring from one catchment to another.

#### 12.1.3 American Mink *Mustela vison*

This mammal escaped from fur farms and began to establish itself in Ireland in the wild in the 1950s. It is now distributed throughout the country and is particularly abundant along waterways. Minks are solitary and territorial animals. Males and females each defend a stretch of watercourse (Hayden and Harrington 2000). Vagrants are typically young animals that have not yet settled on a territory.

A mink's diet is typically composed of a variety of slow-swimming fish (mainly perch and eels), freshwater crayfish and water birds such as coots and moorhens. Diet varies depending on prey availability.

According to Hayden and Harrington (2000) the impact of mink naturalisation in Ireland has not been as catastrophic as was first feared. It does not directly compete with the otter and does not appear to have caused any reductions in the otter population. There are, however, reports of declining water bird numbers in areas recently colonised by mink (Hayden and Harrington 2000).

Given the nature of the mink's territoriality, it seems unlikely that large numbers of the animal would be present over long periods and it is also likely that, following initial introduction to an area, numbers would stabilise over time. Research at a number of waterways throughout the country by Smal (1991) indicated that populations at many areas were in a state of dynamic equilibrium (i.e. stable but with seasonal fluctuations) and were not numerous (highest average density 1.37 individuals per kilometre of river). Fairley (2001) hypothesises that most Irish prey populations such as frogs, fish, rats etc. are well able to sustain mink predation levels. However, prey populations most likely to be negatively affected by mink include birds that nest on the ground such as rails (moorhens and coots) (Fairley 2001).

One other issue regarding mink is the potential impact of large-scale releases of mink from farms by animal welfare groups, which could potentially have a short term catastrophic effect on wild birds and fish within the immediate area of the release and from which populations could take a long time to recover. One documented case took place in 2003 at Stradbally Co. Laois (see [www.animalrights.net/archives/year/2003](http://www.animalrights.net/archives/year/2003)).

Of the six current, licensed mink farms in Ireland none are situated within the study area so unauthorised releases are unlikely to greatly impact wild bird or fish populations in the study area.

Mink is not considered eradicable from Ireland and extremely large-scale culling efforts would have to be employed to remove mink from an area. Culled breeding animals would quickly be replaced by vagrants which would then breed.

The presence of mink was raised as a conservation issue at several public consultation meetings within the study area in October 2004. It was indicated by consultees that mink are very abundant hypothesised that these animals have caused a decline in fish stocks and water birds. However, it is not considered likely that mink have caused any perceived decline in fish stocks (see Section 10). Instead, their daytime predatory activity and relative fearlessness contrast with other more abundant but shy, nocturnal predators such as fox and otter so they are more easily observed and considered more numerous.

## **12.2 Additional issues**

### *12.2.1 Ecological information*

To date there has been a lack of systematic, field-based ecological survey of the study area – in particular from Lough Boderg north to Lough Allen.

Since there has been a lack of systematic survey it follows that there is insufficient knowledge of the important sites for natural heritage within the study area and, possibly, insufficient conservation designations protecting areas of importance.

The location of fen peat areas within the Shannon floodplain has been mapped for Co. Leitrim and grassland/marsh and woodland habitats present on this substrate are diverse and worthy of further examination with a view to possible designation.

### *12.2.2 Piecemeal designations*

Designation of conservation sites has been piecemeal – particularly around Loughs Key and Allen where very small sections of the lake shores and / or islands are designated. The presence of the rare black poplar and additional sites for the rare orchid – Irish lady's tresses may warrant additional site

designations around Lough Allen. At Lough Key there are a number of woodland areas that could be investigated further with a view to potential designation – particularly on the islands and lakeshore.

#### *12.2.3 Re-survey and upgrading designations*

There may be a requirement for re-survey and possibly upgrading of some designated sites from NHA to SAC. This assertion is based, in some cases, simply on the information provided in NPWS site files which lists as present habitats that correspond to those listed on Annex I of the Habitats Directive (e.g. fen habitat at Fin Lough). New information which has recently come to light regarding Annex I habitats at Kilgarraiff, underlines this requirement.

#### *12.2.4 Abandonment of marginal land*

Extensification of agriculture and abandonment of traditional floodplain meadows and pastures may result in reduction in conservation value, along with habitat succession from semi-natural grassland to scrub/woodland. This issue requires further study to determine the extent of abandonment.

#### *12.2.5 Loss of feeding grounds for Greenland white-fronted geese*

Tied in with 12.2.4 above is the potential loss of traditional Greenland white-fronted goose feeding grounds in areas where agricultural grassland has been abandoned.

#### *12.2.6 Development pressure*

Numerous jetty and small marina developments were noted by the study team. The continued construction of small, unplanned developments causes habitat fragmentation, potentially increases pollution and results in possible loss of spawning grounds. NPWS should be consulted on all proposed developments that potentially impact the river corridor – even outside of current nature conservation designated areas. Thorough independent ecological assessment should be requested for marina and jetty developments since rare and noteworthy species that have not been previously recorded may be impacted by such developments (e.g. see section 7.1).

Development on the floodplain has been noted in areas surrounding Carrick-on-Shannon and Roosky. The floodplain generally supports semi-natural wet grassland, marsh and swamp habitats and development on the floodplain results in loss of these habitats, along with increased flooding pressure further downstream. In general, all developments proposed for floodplain areas should be subject to stringent ecological assessment and passed to NPWS for comment. A policy decision restricting or preventing developments on the Shannon floodplain should be implemented by the relevant Local Authorities.

#### *12.2.7 Waterway traffic*

The busy, water-based tourist industry is of major economic importance in the Upper Shannon. However, no assessment has been carried out to date on the impacts of boating on sensitive habitats such as reed-beds. It is recommended that this matter be investigated. Boats with shallow hulls and other features to prevent unnecessary ecological damage are used in sensitive and protected waterways in the UK (e.g. see [www.broads-authority.gov.uk](http://www.broads-authority.gov.uk)) and could be phased in here if necessary.

#### *12.2.8 Water quality*

This issue falls largely outside the remit of the present study.

#### *12.2.9 Educational Boardwalk*

The former boardwalk at the river bank in Carrick-on-Shannon should be restored as an educational resource. A boardwalk combined with information boards that illustrate the various habitats and species present would be a useful tool to promote awareness of the Shannon ecology.

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# Appendix I: List of Consultees

National Parks and Wildlife Service of Department of the Environment, Heritage and Local Government, Regional Staff:

- Padraig O'Donnell - Deputy Regional Manager
- Kathryn Hannon – Regional Ecologist
- John Matthews – Local Conservation Ranger (Leitrim)
- Miriam Crowley – Local Conservation ranger (North Roscommon)

Research Staff

- David Norriss – Ornithologist
- Alyn Walsh – Research Ranger
- Naomi Kingston

Paula Treacy – Environmental Officer Waterways Ireland

Nollaig McKeown – Heritage Officer, Roscommon County Council

Bernadette Ní Catháin – Shannon River Basin Management Project, Kirk McClure Morton

Mike Fitzsimons – Shannon Regional Fisheries Board

Joe Caffrey – Central Fisheries Board

Caroline Hurley – Irish Peatland Conservation Council

Fiona Dunne – Geological Survey of Ireland, Breffni Upland Project

Eleanor Mayes – Ecologist

Tom Curtis - Botanist

Tina Aughney – Ecologist

Brian Keeley – Mammalogist

Caroline Shiel – Bat records, Leitrim

Roger Goodwillie – Botany

Stephen Heery – General ecology

Jim Martin – BEC re: National Native Woodland Survey

Dept. of Agriculture – re: Mink farm licences

## APPENDIX II: SITE SYNOPSES

Sites are listed in order of Site Code.

**SITE NAME: AGHNAMONA BOG**

**SITE CODE: 000422**

This extensive and rather flat bog lies on the Lonford/Leitrim border just east of the Shannon at Rooskey. The Northeastern lobe is separated from the main dome by a railway line, and because of its presumed hydrological isolation from the rest of the bog, it has not been included in the Natural Heritage Area.

To the north of the site, separated from the main area by a bog road, there is a birch woodland, and to the south a belt of Purple Moor-grass (*Molinia caerulea*) extends into the site following a flush line.

The bog was surveyed in 1985 and then its condition was described as scarred by a number of large drains which had a detrimental effect on the bog, drying out adjacent areas from which no Bog mosses (*Sphagnum* spp.) were to be found. The whole bog had suffered various episodes of burning, however away from the drains, *Sphagnum* cover was regenerating. From recent aerial photography it is apparent the damage recorded in 1985 was not the precedent to further drainage or extraction work, and that the process of recovery has been allowed to continue.

Active raised bogs are vulnerable to drainage and exploitation, and have been recognised by the European Union as a habitat which demand special international efforts to conserve. Aghnamona although damaged in the past, not least by the railway, remains comparatively intact having escaped wholesale exploitation.

**SITE NAME: LOUGH ALLEN SOUTH END AND PARTS**

**SITE CODE: 427**

Site synopsis not available.

## **SITE NAME: KILGARRIFF MARSH**

### **SITE CODE: 426**

This site is situated 4km south west of Dowra on the shores of Lough Allen. The geology of the site is Upper Visean limestone and shale sandstone, although little of this is exposed in the site being covered by heavy clay soils or peat.

An extensive marsh occurs around the mouth of the Shannon River. This appears to be at the fen carr stage of succession but may be being held in check by occasional flooding of the area. Alder (*Alnus glutinosa*) and goat willow (*Salix caprea*) shrubs are abundant here. Large quaking areas occur comprising mostly sedges (*Carex rostrata*, *C. lasiocarpa*, and *C. curta*). Rushes (*Juncus effusus*), bog cotton (*Eriophorum angustifolium*), marsh cinquefoil (*Potentilla palustris*), speedwell (*Veronica scutellata*), bog bean (*Menyanthes trifoliata*), king cup (*Caltha palustris*), water horsetail (*Equisetum fluviatile*) and marsh horsetail (*Equisetum palustre*). An unusual feature of this area are the huge hummocks of royal fern (*Osmundo regalis*). This area includes areas of old cutaway bog which has now been completely recolonised by vegetation.

Much of the area surrounding the marsh is rushy fields and heathy areas surrounded by quaking mires. Purple moor grass (*Molinia caerulea*), bog myrtle (*Myrica gale*) and *Sphagnum* lawns (*S. capillifolium* and *S. recurvum*) are common here.

Scrub occurs along the lough margins and is predominantly alder and goat willow. Ash (*Fraxinus excelsior*) and hawthorn (*Crataegus monogyna*) occur in the drier areas. The bay is enclosed within the site and an island are included within the site to reduce disturbance of the birds.

This site is a feeding area for Greenland white-fronted geese. This site is important because it is suspected that this small flock is distinct from the flock at Drumharlow Lough. Other bird life includes snipe and sedge and grasshopper warblers in summer.

The main land use on the drier parts of the site is grazing for sheep and cattle. Feral goats were also seen within the area. Boating and fishing are frequent activities on Lough Allen. Afforestation and drainage have affected much of the margins of the site.

The site is seasonally important for its flocks of Greenland white-fronted geese and its interesting wetland vegetation. The large tussocks of royal fern are an unusual feature of this fen-carr.

**SITE NAME: CARRIGEENROE MARSH**

**SITE CODE: 000596**

Carrigeenroe Marsh is located 10km north of Boyle. It occurs on the north western shore of Lough Key, a mesotrophic lake with coarse and game fishing.

In 1974, An Foras Forbartha provided the following description for the site. "A series of marsh communities ranging from Reedswamp to wet meadows and swamp woodland. Some quaking areas are present. The species-rich fens and lake edge communities include the sedge *Carex elongata*".

The elongated Sedge (*Carex elongata*) is listed in the Red Data Book as a previously protected but now listed as non-threatened.

There is a little grazing recorded on this site. Main threats come from drainage and eutrophication of the lake from increased nutrient input.

This marshland has a good mix of plant communities and has a good shoreline habitat associated with Lough Key. These habitats are rare due to widespread drainage of wetlands and are of scientific interest.

**SITE NAME: CARNADOE WATERS**

**SITE CODE: 000608**

The Carnaode Waters (Roscommon) is a group of lakes in the River Shannon catchment, joined to the main river by a short channel into Lough Boderg 6km west of Dromod, Co. Leitrim. They are characterised by extensive areas of reedswamps narrowing the lakes and cutting off smaller ones. Lough Kilglass in particular is very calcareous with a sandy shoreline (at least in part) and is separated from Grange Lough by a long cut through infilling marsh. They are the lowest points of the two main tributaries of the Shannon in Roscommon - the Scramogue and Owenur Rivers. They are also situated on what is considered to be the pre-Ice Age course of the River Shannon.

The Loughs were briefly visited in 1993. In addition to the reedswamps and associated freshwater marshes, an extensive area of very wet grassland on peat was visited (2km south of the bridge at Carranadoe) with such plant species as Star Sedge (*Carex echinata*) and Ragged Robin (*Lychnis flos-cuculi*) with large patches of Greater Tussock Sedge (*Carex paniculata*) and scattered Willows (*Salix* spp) which in places become wet woodland and scrubland. Some isolated stretches of shoreline are said to be very botanically rich, throughout the lakes.

The mean of peat counts of winter waterfowl at Kilglass Lough (1984 - 1987) recorded Mute Swan (3), Greenland White-fronted Goose (99), Wigeon (186), Teal (210), Tufted Duck (193), Goldeneye (40), Golden Plover (83), Lapwing (243). This is a very high density for a relatively small lake. These lakes are also part of a group of Roscommon lakes which between them have Nationally important numbers of winter waterfowl and movement between lakes. In 1974 a varied group of breeding birds was reported.

There is an exceptional abundance of the invertebrate *Corixa fallenoides* a type of Water Boatman peculiar to Central and Western Ireland, and the likelihood of other invertebrates of restricted distribution (reported in 1974).

The Carnaode Waters have an unusual ecological and geomorphological position in relation to the main Shannon lakes. There are extensive areas of remote reedbeds. Kilglass Loughs has high numbers of varied winter waterfowl, unusual for a relatively small size and is very calcareous.

**SITE NAME: DRUMHIERNY WOOD**

**SITE CODE: 001412**

A single area of a larger woodland on the eastern edge of the Shannon valley less than a mile north-west of Leitrim town. The site occurs on a west-facing slope on a fine-textured glacial drift soil. The soil is base-rich but with impeded drainage. The woodland is dominated by large Pedunculate Oak (*Quercus robur*) which may be of planted origin as they are even aged. Some large Beech (*Fagus sylvatica*) as well as Sycamore (*Acer pseudoplatanus*), Wych Elm (*Ulmus glabra*) and Sessile Oak (*Quercus petraea*) have also been recorded from this woodland. In a number of places a dense understory of Blackthorn (*Prunus spinosa*), Hazel (*Corylus avellana*), Ash (*Fraxinus excelsior*) and Bramble (*Rubus fruticosus*) have been recorded. The ground flora contains such species as Wood Sedge (*Carex sylvatica*), Broad Buckler-fern (*Dryopteris dilatata*), Male Fern (*Dryopteris filix-mas*), Scaly Male Fern (*Dryopteris affinis*) Lady Fern (*Athyrium filix-femina*), Hard Fern (*Blechnum spicant*), Primrose (*Primula vulgaris*) and Wood Avens (*Geum urbanum*).

Wetter areas at the wood margin at the base of the slope contain species such as Great Horsetail (*Equisetum telmateia*), Wood Horsetail (*E. sylvaticum*) and Tufted Hair-grass (*Deschampsia cespitosa*).

This wood is an example of oak woodland on a base-rich soil which is a rare occurrence in Ireland as such areas are usually cleared for agriculture. It is probably one of the best areas of mature oakwood in the county. A number of uncommon bird species have been recorded from the woodlands. Tree clearance and the planting of conifers will continue to threaten the quality of this site.

**SITE NAME: OWENGAR WOOD**

**SITE CODE: 001419**

The Owengar Woods occurs on the steep, north facing bank of the Owengar River, 1 km southeast of Drumkeeran and 4km west of Lough Allen. This site is a good example of a wet, semi-natural deciduous woodland that has developed on the often waterlogged, clay-rich soils which are typical of County Leitrim. Most of the site is intact and has retained its natural character, despite being somewhat damaged from tree felling and grazing on the east side.

Willows (*Salix caprea*, *S. cinerea*) and Ash (*Fraxinus excelsior*) form the dominant species in the canopy with some Birch (*Betula* spp.), Hazel (*Corylus avellana*) and Beech (*Fagus sylvatica*). Alder (*Alnus glutinosa*) is also very common near the river banks. The understory includes Hazel (*Corylus avellana*), Holly (*Ilex aquilinum*), Blackthorn (*Prunus spinosa*) and Hawthorn (*Crataegus monogyna*). In some of the more ungrazed areas, the woods have developed into a very dense thicket which have a very natural character.

This woodland is notable for its excellent diversity of bryophyte and lichen communities which form a lush carpet in some of the more undisturbed parts of the wood. The ground flora also contains a good diversity of flowering herbs, ferns, grasses and sedges which are characteristic of slightly acidic soils. Common species include Lesser Celandine (*Ranunculus ficaria*), Meadowsweet (*Filipendula ulmaria*) with some Golden Saxifrage (*Chrysosplenium oppositifolium*), Angelica (*Angelica sylvestris*), Wood Sanicle (*Sanicula europaea*), Wood Sedge (*Carex sylvatica*) and Early Purple Orchid (*Orchis mascula*). Wet patches and flushed channels running down slope feature Soft Rush (*Juncus effusus*), sedges (*Carex nigra*, *C. laevigata*, *C. remota*), Marsh Horsetail (*Equisetum palustre*), Iris (*Iris pseudocorus*) and Ladies Smock (*Cardamine pratensis*).

Due to widespread afforestation of conifers in this region, Owengar Wood is important as it is one of the few remaining, intact wet woodland sites in this region. Although the eastern half has been damaged by grazing, much of this site is exceptionally undisturbed and contains a good diversity of plant species. The varied age structure and diversity of tree species in the Owengar Woods also creates an important resource for local wildlife species including pheasant and woodcock.

**SITE NAME: DRUM BRIDGE (LOUGH KEY)**

**SITE CODE: 001631**

This site consists of a shallow inlet of Lough Key and a low lying marshy area about two miles north-east of Boyle. The marshy area is partly derived from cutover bog but mostly occurs on mineral soil. The marsh is dissected by numerous drains. The deeper water of the inlet has stands of Common Club-rush (*Scirpus lacustris*) and Common Reed (*Phragmites australis*) with Great Water Dock (*Rumex hydrolapathum*), Bur-reed (*Sparganium ramosum*), Greater Spearwort (*Ranunculus lingua*) and Water Horsetail (*Equisetum fluviatile*). The species Meadow-rue (*Thalictrum flavum*) and Great Yellow-cress (*Rorippa amphibia*) have also been recorded in these areas. In slightly more elevated areas Reed Fescue (*Festuca arundinacea*), Meadow-sweet (*Filipendula ulmaria*) and Creeping Bent (*Agrostis stolonifera*) are prominent.

The margins of the bay have stands of Rush (*Juncus* spp.) with Marsh Horsetail (*Equisetum palustre*), Marsh Willowherb (*Epilobium palustre*) and a moss (*Calliergon cuspidatum*) occurring as associated species. Species associated with fen vegetation such as Marsh Bedstraw (*Galium palustre*), Fen Bedstraw (*Galium uliginosum*), Long-stalked Yellow-sedge (*Carex lepidocarpa*), Marsh Cinquefoil (*Potentilla palustris*), Marsh Pennywort (*Hydrocotyle vulgaris*), Meadow Thistle (*Cirsium dissectum*) and Pearlwort (*Sagina nodosa*) have been recorded in the middle area of the site. Some areas are being colonised by Willows (*Salix aurita* and *S. cinerea*) and Alder (*Alnus glutinosa*).

The integrity of the north-west section of the site is threatened by the proposed development of a highway to bypass Boyle which is due to commence in 1994. This site has been rated as probably the most valuable of the marshes around Lough Key. It is important because of the outstanding diversity of plant species and much of the site is suitable for nesting birds such as Mallard, Coot, Grebes and Water Rail.

**SITE NAME: DRUMMAN'S ISLAND**

**SITE CODE: 001633**

Drumman's Island is a densely wooded drumlin on the south shore of Lough Key within Lough Key Forest Park. The dominant habitat is semi-natural woodland considerably modified by additional planting. The canopy trees are Pedunculate Oak (*Quercus robur*) and Ash (*Fraxinus excelsior*), the latter being the commonest species. The Pedunculate Oaks are large and adjacent trees touch in places. Sycamore (*Acer pseudoplatanus*) has been planted around the margins of the woodland while Firs (*Abies* spp.) have been planted on the north-west side. The shrub species are Hazel (*Corylus avellana*), Holly (*Ilex aquifolium*), Hawthorn (*Crataegus monogyna*) and Cherry Laurel (*Prunus laurocerasus*). The exotic species Cherry Laurel is particularly abundant on the northern part of the island and along the path that encircles the island.

The woodland occurs on a freely drained soil. Such areas are usually clear-felled and put to agricultural use. The ground flora includes Wood Anemone (*Anemone nemorosa*), Bluebells (*Hyacinthoides non-scripta*), Wood Sorrel (*Oxalis acetosella*), Enchanter's Nightshade (*Circaea lutetiana*), Male Fern (*Dryopteris filix-mas*), Buckler Fern (*Dryopteris dilatata*), Scaly Male Fern (*Dryopteris affinis*), Lady Fern (*Athyrium filix-femina*), Dog Violet (*Viola riviniana*), Primrose (*Primula vulgaris*), Ivy (*Hedera helix*), Bugle (*Ajuga reptans*), Cuckoo-pint (*Arum maculatum*), Red Campion (*Silene dioica*) and Wood Speedwell (*Veronica montana*). There is a wide variety of mosses and liver worts growing at ground level and on the bark of trees. The thallose lichen called Lungwort (*Lobaria pulmonaria*) occurs on the branches of tall oak trees. This species is usually confined to oceanic woodlands in Ireland.

The site also includes sections of the reed beds at the southern end of the island. These are dominated by the Common Reed (*Phragmites australis*). Areas of species-rich littoral woodland occur on the lake fringes with tree species such as Willow (*Salix* spp.) forming a canopy. The uncommon shrub Buckthorn (*Rhamnus catharticus*) is particularly abundant in this habitat on the northern side of the island. The rare plant Bird's-nest Orchid (*Neottia nidus-avis*) has been recorded at the south-eastern margin of the island.

The spread of Cherry Laurel and Sycamore should be controlled to maintain the interest of the woodland. In spite of the occurrence of exotic tree and shrub species the woodland is of considerable value as it is one of the only oakwoods on good soil in the country. The diverse nature of the woodlands and the presence of at least two uncommon plant species also enhance the value of the site.

23/11/1995

**SITE NAME: FIN LOUGH (& BLACK LOUGH) (ROSCOMMON)**

**SITE CODE: 001636**

Author: E. Wymer

Fin Lough is a shallow lough situated east of Lough Key and north of the N4 between Boyle and Carrick-on-Shannon. The lough is surrounded by extensive reedbeds and marshes which form the largest area of the site. The species-poor reedbeds are dominated by Common Reed (*Phragmites australis*). The marsh areas which lie to the landward of the reedbeds are species-rich fens dominated by Black Bog-rush (*Schoenus nigricans*) and various Sedge (*Carex*) species. In wetter areas the vegetation frequently contains Bog-bean (*Menyanthes trifoliata*), Marsh Cinquefoil (*Potentilla palustris*), Gipsyworth (*Lycopus europaeus*), Purple Loosestrife (*Lythrum salicaria*), Jointed Rush (*Juncus articulatus*), Common Cottongrass (*Eriophorum angustifolium*), Least Bur-reed (*Sparganium minimum*), Bottle Sedge (*Carex rostrata*) and Marsh Marigold (*Caltha palustris*). There are also areas where the fen grades into drier grassland with typical plants being Purple Moor Grass (*Molinia caerulea*), Quaking Grass (*Briza media*), silverweed (*Potentilla anserina*) and Yellow Rattle (*Rhinanthus minor*).

Damage by commercial forestry was noted around the lake margins in areas to the north and south-east of the site. In spite of the encroachment of forestry this site has considerable ecological interest due to the diversity of habitats and the extent of the fen vegetation within the site. The lake supports populations of nesting wildfowl and reed buntings. The site is also important for breeding stock for coarse fishing.

**SITE NAME: HOG'S ISLAND (LOUGH KEY)**

**SITE CODE: 001638**

Hog's Island is a wooded island off the western shore of Lough Key, north of Boyle. The dominant tree species is Ash (*Fraxinus excelsior*). This is a secondary woodland growing over traces of lazy-beds. Other tree species occurring here are Sycamore (*Acer pseudoplatanus*) and Beech (*Fagus sylvaticus*). The woodland herb layer flora, with Ivy (*Hedera helix*), Cow Parsley (*Anthriscus sylvestris*), Bluebell (*Hyacinthoides non-scripta*) and Hogweed (*Heracleum sphondylium*) as the most abundant species, is being modified by the presence on the island of three feral goats. These goats have been on the island since 1990 and are likely to lead to significant degradation of the woodland quality in terms of the ground flora and tree regeneration. The woodland cover on the island provides a good nesting site for several species of warbler and other songbirds. Ground nesting wildfowl are likely to be disturbed by the large presence of mink in the area. The woodland is a good example of natural regeneration and is significant given the rarity of woodland within the county.

23/11/1995

**SITE NAME: LOUGH BODERG/LOUGH BOFIN**

**SITE CODE: 001642**

**AUTHOR: STEPHEN HEERY**

Lough Boderg/Lough Bofin is a complex of connected Upper Shannon lakes which also includes Lough Scannell, and lie on the border between Co.'s Roscommon and Leitrim. L. Bofin and S. Scannell is close to Dromod, Co. Leitrim and L. Boderg lies about 4km south of Drumsna. It is connected by a short channel to Kilglass/Grange Lough N.H.A. (608).

Apart from the aquatic habitats of the lake itself, the main terrestrial and semi-aquatic habitats are woodland on the lakeshore which grades down to a stony lakeshore with a well developed typical Shannon flora, and reedswamps.

Most of the woodland occurs as a narrow fringe (sometimes widening) around a good deal of the lakes particularly in the Dromod area and the eastern shores of L. Boderg (north and south of its link with L. Bofin). Alder (*Alnus glutinosa*) often predominates with Ash (*Fraxinus excelsior*) and Willows (*Salix* spp.) behind. The limit of flooding occurs well inside this strip indicated by flotsam of dead Reed stems. This woodland has been described from the Dromod lakeshore in 1973 as being quite open with a well-developed rich ground flora dominated by a Black Bog Rush-Glaucous Sedge (*Schoenus nigricans* - *Carex flacca*) sward with such plants as Grass of Parnassus (*Parnassia palustris*) and Yellow Sedge (*Carex flava* agg.). The Spindle Tree (*Euonymus europaeus*) is also recorded. Derrygrasten Wood, on the peninsula between L. Scannell and L. Boffin is described (in 1973) as a managed Ash-Hazel wood with a very rich ground flora which includes the Toothwort (*Lathraea squamaria*) a scarce plant parasitic on the roots of trees in old woodland. It is thus probably part of the original Oak woodland ground flora. Further south on this peninsula (around Rabbit and Otter Islands) where abundant Spindle Tree (*Euonymus europaeus*), Geulder Rose (*Viburnum opulus*) and Buckthorn (*Rhamnus catharticus*) are present. The scarce and localized plant Marsh Stitchwort (*Stellaria palustris*) is reported here also. Vertical aerial photographs taken in 1993 confirm that this woodland fringe is still present.

**SITE NAME: LOUGH DRUMHARLOW**

**SITE CODE: 001643**

Drumharlow Lough is the lower part of the River Boyle, from Cootehall Bridge, which opens out into a many-armed lake before it joins the River Shannon 5km south of the town of Leitrim. The lake and its surroundings are used by a flock of Greenland White-fronted Geese.

Apart from the open water and aquatic habitats of the lake itself, the main habitats of interest are extensive areas of wet grassland (callowland) which flood in winter, and lakeshore. The lakeshore, in keeping with the other River Shannon lakes, has areas of considerable botanical interest.

Hughstown Wood, situated on the shore of the lake is the site of a rare Myxomycete fungus, *Paradiacheopsis rigida*. There is also a raised bog area of interest which directly borders the flooded callows of the Shannon and grades down to Lough Naseer in the far north of the site.

Several areas of callows, wet rough pasture and improved grassland have been included around the lake as these are used for feeding by a flock of Greenland White-fronted Goose. The flock also uses sites around Lough Allen. Formerly of national importance, the three year mean peak number is 111 (up to 1990/91) and does not now regularly reach the qualifying level.

Drumharlow Lough is a large complex of habitats typical of the Shannon Lakes and the lake and surrounding grasslands are an important site for the Internationally Important Goose species.

**SITE NAME: TAWNYTASKIN WOOD (LOUGH KEY)**

**SITE CODE: 001651**

Tawnytaskin Wood lies on the western shore of Lough Key about two miles north-east of Boyle. The site consists of deciduous woodland with a nucleus of scattered Pedunculate Oak (*Quercus robur*) and Sessile Oak (*Quercus petraea*) around which other tree species occur. The northern section of the site has a dense cover of tall Downy Birch (*Betula pubescens*). Other tree species include Ash (*Fraxinus excelsior*) and Willow (*Salix cinerea*). Beech (*Fagus sylvaticus*) has been planted along wall lines. Hazel (*Corylus avellana*) is a common understory species with some Spindle Tree (*Euonymus europaeus*). The ground flora is often poor under the denser areas of woodland.

Towards the lake shore the woodland is dominated by Ash and Hazel. This area has a richer ground flora with species such as Wood Avens (*Geum urbanum*), Bugle (*Ajuga reptans*), Wood Sanicle (*Sanicula europaea*), Wood Sedge (*Carex sylvatica*) occurring there. There are also patches of wet woodland dominated by Alder (*Alnus glutinosa*) with a ground layer of Yellow Iris (*Iris pseudacorus*), Remote Sedge (*Carex remota*), Water Mint (*Mentha aquatica*), Marsh Bedstraw (*Galium palustre*), Creeping Buttercup (*Ranunculus repens*) and occasional Tall Fescue (*Festuca gigantea*) and Hedge Woundwort (*Stachys sylvatica*).

Sherard's Downy Rose (*Rosa sherardii*) occurs in rocky places along the lakeshore. Bog Myrtle (*Myrica gale*) occurs in marsh areas along the shore. The eastern fringe of the site includes areas of reedbeds dominated by Common Reed (*Phragmites australis*).

The woodland is considered of local importance with a varied woodland flora. The wetter woodland along the lake shore seems to be spreading.