Draft North Tipperary Local Biodiversity Action Plan

North Tipperary County Council

November 2007

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Dr Amanda Browne
Trellick
Kinvara
Co. Galway
091-638191/086-8547822
ambrowne@indigo.ie

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1. Vision statement/ overall aims and objectives

The aim of the North Tipperary Action Plan is to promote, protect and enhance the biodiversity of the county.

1.1. Objectives

The general objectives of this Biodiversity Action Plan are:

1. To help conserve the habitat and species diversity of North Tipperary in conjunction with Partners and Stakeholders throughout the County.
2. To encourage an enjoyment of the county's biodiversity, through increased knowledge of its richness and variety.
3. To support projects and initiatives, facilitating the gathering and distribution of biodiversity information.
4. To promote greater awareness and participation in biodiversity issues throughout all sectors of the community.

1.2. Loss of Biodiversity

Species, habitats and ecosystems are under ever increasing threat both in a national and international context. Many species and habitats are in decline and in some cases their future is endangered. In certain cases irreversible losses have already occurred. Many species have become extinct and it is considered that impending extinction rates are many times greater than those of the past. The extinction of one species results in the irreversible loss of a unique suite of genetic adaptations that have been acquired typically over very long time scales of hundreds and thousands of years (National Biodiversity Plan 2002). In North Tipperary, examples of biodiversity losses include (a) loss of semi-natural habitats through development, (b) near loss of species, e.g. Irish Fleabane, and (c) reduction of population sizes, e.g. Pollan in Lough Derg. In addition, worldwide, the spread of invasive non-native species of plants and animals has been identified as the greatest threat to biodiversity after habitat destruction and species loss.

2. Introduction

2.1. How this plan was produced?

In May 2007, consultants were contracted by The Heritage Council to produce Biodiversity Action Plans for 18 local authorities including North Tipperary. The Plan was funded by the Department of Environment, Heritage and Local Government. The production of the Action Plans was initiated by a consultation process which involved contacting and interviewing interested parties. Consultees were invited to respond to a questionnaire or to discuss the biodiversity issues relating to the county in a less formal way such as over the phone. The consultees were selected because they were on the Heritage Forum or were known by the consultant or

Heritage Officer to have an interest in the biodiversity of North Tipperary. A full list of consultees is provided in the Appendix I.

The questionnaire sought information on the following issues or topics:

- Special habitats, species or sites in North Tipperary
- Specific projects or actions relating to biodiversity
- Threats to biodiversity within county

This Biodiversity Action Plan has been based on the responses from the consultees as well as a literature survey. Any gaps in the plan or weightings in favour of one area over another, may be due to the fact that some parties were willing to give more specific information relating to the county than others. Given time constraints and workloads some consultees were unable to provide as much assistance as they would have liked. This plan was produced in conjunction with the Heritage Officer for North Tipperary, Siobhán Geraghty. The participation of all consultees in the process of producing this Biodiversity Action Plan is gratefully acknowledged.

While this document is not intended to be biological audit of the county it provides some basis for a more comprehensive data collection project. A biodiversity audit that will collate all available information on biodiversity in North Tipperary is a key action of this plan.

Fundamental to the implementation of this plan is the appointment of a Biodiversity Officer as well as the setting up of a 'Biodiversity Working Group', to oversee the implementation of this plan.

2.2. Background to the biodiversity resource of North Tipperary

North Tipperary is located on the eastern shores of Lough Derg in the River Shannon system. Neighbouring counties include Clare, Galway, Offaly, Laois and South Tipperary.

Lough Derg is an alkaline lake with the longest dimensions of 30km by 8km and a shoreline of 118km^2. The main rivers within the county include the Shannon, Nenagh River, Mulkear River, Little Brosna River, and the Clodiagh, the Suir and the Nore.

The centre of the county is spanned by a series of low mountains with acidic substrates. The Arra Mountains are located in the south west of the county beside Lough Derg (Tountinna 460m is the highest point). South and east of them are the Silvermine and Slieve Felim mountains (Keeper Hill 694m is the highest point). The Borrisnoe (442m)/Kilduff (445m)/Devils Bit Mountains (480m) are located further east.

North of Nenagh, the county is high quality, relatively intensively cultivated limestone farmland. The extreme north, east and south-east of the county is dominated by raised bog over limestone.

North Tipperary is approximately 2,046km^2 and has a population of 65,998 (2006 figures). The main towns in the county are Nenagh, Thurles, Roscrea, Templemore, Ballina, Newport and Borrisokane.

The juxtaposition of the uplands in the county along with the lowlands of the Shannon and Lough Derg, confer considerable habitat diversity within the county. A wide range of habitats are present, including lakes, rivers, peatlands, grasslands, turloughs, heaths and woodlands.

2.3. What is biodiversity?

Biodiversity is a term used to describe the variety of living things on the Earth. Biodiversity is fundamental to our daily lives providing us with all our food, much of our raw materials and many of our medicines. Ireland is a land of varied habitats, a patchwork of farmland, woodland, cliff and marsh, sand dunes, caves, heath, bracken, grassland, bog, fens and flushes, turloughs, lakes, ponds, springs and swamps. We have over 7,800 kilometres of coastline. All of these habitats contain a host of species, some common, some rare, and some unique to Ireland (www.NPWS.ie) .

North Tipperary is a county rich in biodiversity. Habitat diversity ranges from lakes, rivers, grasslands, limestone pavement, turloughs, heaths and peatlands. Some areas and species are protected in the 9 Natural Heritage Areas (NHAs), 15 Special Areas of Conservation (SACs) and 4 Special Protection Areaa (SPAs) that have been designated to date because of the presence of nationally and internationally important species and habitats. There are 35 proposed Natural Heritage Areas (pNHA) that have not been fully designated and these are not as yet protected in the legislation (pers comm. S. Jones). Natural heritage hotspots within the county include the Shannon Callows and Little Brosna Callows which are important breeding and feeding sites for many wetland birds as well as supporting a rich diversity of plants. Lough Derg is home to the endangered fish species Pollan (*Coregonus pollan)*, one of only three sites in Ireland and in western Europe (Ireland is the only country in which Pollan occurs in Western Europe) (Igoe 2004). Pollan is listed on Annex V of the EU Habitats Directive. Also in Lough Derg, a morphologically and genetically distinct trout known as Croneen occur . The Croneen trout runs the Little Brosna and Camcor Rivers to spawn and is believed to feed in Lough Derg. The conservation of genetic diversity such as found in the Croneen trout, is an important objective of this Biodiversity Action Plan.

2.4. Why is biodiversity important?

All the living organisms on this planet have evolved over millions of years and each of them is adapted to their own role in their natural environment. Plants and animals depend on each other for survival. We depend on biodiversity to provide us with all the necessities of life including food, shelter, oxygen, medicine and services such as air and water purification.

When we damage biodiversity, we can upset this delicate balance of nature which may have long-lasting and far-reaching consequences for ourselves and the living world around us. It is important that we use the products of nature wisely to ensure that future generations may also have enough natural resources to meet their needs.

In North Tipperary as in other parts of the country, some of the threats to biodiversity include loss of habitat through development, intensification of agricultural practices, eutrophication of waterways (via sewage discharge) afforestation (coniferous and deciduous), mining and quarrying, road construction, fragmentation of habitat, recreational pressures on land and water.

The conservation of biodiversity through the implementation of this Action Plan will benefit the wider community by maintaining healthy air and water, stable ecosystems, and the protection of non-renewable resources, and improving the quality of life for those that live and work in the area

It is vital that we act now to preserve our unique biodiversity and prevent further loss of this valuable natural heritage.

2.5. Why a biodiversity action plan?

The Biodiversity Action Plan is designed as a framework for conserving biodiversity at a local level. It will ensure that national and international targets for the conservation of biodiversity can be achieved while at the same time addressing local priorities. Raising public awareness is an important element of the plan. The production of this Action Plan is an action of the North Tipperary Heritage Plan (2004-2008) and many of the natural heritage actions of the Heritage plan are developed further in this Biodiversity Action Plan.

3. Overview of Biodiversity of County North Tipperary

3.1. Special biodiversity features of the county

North Tipperary has a wide range of habitats from lakes and rivers in the lowlands in mosaic with species-rich callows grassland, limestone pavement and raised bog, to blanket bog and heaths in the uplands. Some of these habitats are protected under cSACs (Special Areas of Conservation) or NHAs (Natural Heritage Areas). There are 15 cSACs (candidates SACs), 9 NHAs and 35 pNHAs (proposed NHAs) and 4 SPAs in North Tipperary. As yet pNHAs have no legal protection. A list of the sites that have been designated as cSACs or NHAs/pNHAs and SPAs owing to the presence of Annex I habitats or Annex II species (as listed in the EU Habitats Directive and EU Birds Directive) is provided in the Appendix II.

The identification and designation of these areas will not result in the protection of the species and habitats unless all parties to the planning process respect the relevant guidelines. Appropriate referral to the wildlife service, and enforcement of recommendations are vital. In particular, applications for windfarm, forestry or turf cutting developments and any actions in or adjacent to SACs should be forwarded to the NPWS for comment (pers com. S.Jones).

A Key Action of this plan is to Protect SACs, NHAs and SPAs, through the correct implementation of the EC (Natural Habitats) Regulations, 1997 and the EC Directive on the Conservation of Wildbirds 1979, and Wildlife (Amendment) Act 2000 by the Statutory Bodies that have direct responsibilities under said legislation.

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Many habitats throughout North Tipperary are rich in species (plant, bird, other animals, invertebrate, etc) diversity; provide important roosting or feeding sites as well as being valuable wildlife corridors. These habitats however, do not have the theoretical protection afforded to them as in designated sites. As a consequence, these habitats are under threat from a wide range of sources.

A Key Action of the biodiversity plan is to provide protection to sites that support high levels of biodiversity. . This will be achieved by (a) developing a map of local biodiversity areas that planners can consult during the decision making process and (b) developing further the on-line database developed by Tipperary Institute for county biodiversity information.

3.2. Key habitats in North Tipperary

Habitats are basic building blocks of the environment that are inhabited by animals and plants, and which are important as units for site description and conservation management. A habitat is described as the area in which an organism or group of organisms live, and is defined by the living (biotic) and non-living (abiotic) components of the environment. The later includes physical, chemical and geographical factors in addition to human impact or management (Fossitt 2000).

The publication, 'A Guide to the Habitats of Ireland' (Fossitt 2000), provides a standard scheme for describing habitats in Ireland. This classification scheme covers natural, semi-natural and artificial habitats of terrestrial, freshwater and marine environments and of rural and urban areas. The scheme identifies 11 broad habitat groups at level 1, seven of which are represented in North Tipperary:

1. F Freshwater
2. G Grassland and Marsh
3. H Heath and dense bracken
4. P Peatlands,
5. W Woodland and scrub,
6. E Exposed rock and disturbed ground,
7. B Cultivated and built land.

The following text describes the key habitats types in North Tipperary as highlighted by the consultation process. A more comprehensive study of all habitats in North Tipperary will be an element of the biodiversity audit, a key action of this plan. The habitats are listed according to the sequence of Fossitt (2000).

F Freshwater

FL Lakes and ponds

FL4 Mesotrophic Lakes

Lough Derg

Lough Derg is the largest of the River Shannon lakes covering 13,000 ha and measuring 33km from Portumna to Killaloe. The lake is relatively shallow at the northern end being mostly 6m in depth, while the narrow southern end has the greatest average depth, with a maximum of 34m. The extensive shoreline encompasses several sheltered bays and numerous islands (White Young and Green 2006). The lake is classified as Mesotrophic Lake FL4 (Fossitt 2000).

Threats

Threats to the lake include (a) development such as one-off marinas and housing along the lakeshore, and (b) agricultural practices that facilitate the run-off in to the lake causing eutrophication, and (c) eutrophication from sewage from settlements along the lake and river basin, and from sediments carried downstream. Significant threats to the ecology of the lake also include invasive species such as Zebra mussel *Dreissena polymorpha,* the Eel swim bladder nematode *Anguillicola crassus* and Nuttall's pondweed *Elodea nuttalllii* :

Zebra mussel *Dreissena polymorpha*

Zebra mussel *Dreissena polymorpha*, is likely to have been introduced to Ireland on the hulls of pleasure craft between 1993 and 1994 (Minchin *et al.* 2002) and has now spread throughout the Shannon and Erne systems and is found in all parts of Lough Derg to depths of 18m. The mussels attach to firm substrates that include bed rock, boulders, gravels, shells and plant materials. The populations of zebra mussels have fluctuated over time. Densities are now at lower levels than during the period of maximum expansion (Lough Derg Science Group 2007). Transmission vectors include hulls of pleasure craft, wet nets (angling keep nets, landing nets, eel fyke nets etc) angling boats and boat engine cooling water. Zebra mussel populations create a number of biological problems for fish species: they colonise lake shorelines and spawning substrates that could be used by certain fish species and their presence results in changes to the nutrient dynamics in standing and slowly moving water bodies and changes to littoral substrates, with consequent alterations in the associated macroinvertebrate community and food availability for fish. (Fitzsimons and Igoe 2004)

Zebra mussels are ubiquitous in Lough Derg and have major environmental impacts that include the extirpation of freshwater mussels *Anodonta* species, of which there are no known surviving specimens in the lough. Water transparency has increased as a result of the filtration capacity of the zebra mussel population. This entails significant grazing of planktonic organisms and increased enrichment of the benthos with zebra mussel wastes. Sediment enrichment and increased water clarity provides rooting aquatic plants with an opportunity to flourish. The establishment of Nuttall's pond weed may have been greatly facilitated by the activities of zebra mussels (Lough Derg Science Group 2007)

Banks of dead Zebra mussel shells are building up on the lakeshore. In time these will develop into a shelly sand unlike any of the local soils. This will cause changes in the local vegetation and wider ecology which cannot be predicted.

The Eel swim bladder nematode *Anguillicola crassus*

The swim bladder nematode causes extensive damage to the air bladder and other organs of the freshwater eel. This parasite occurs in Lough Derg and is now widespread in Europe. Adult eels that descend to sea as silver eels are believed to spawn in the south-eastern region of the North Atlantic and this requires an ability to swim mid-water. The parasite can compromise this ability. The North Atlantic Eel stock has declined since 1970's and this has been attributed to climate change, reduced habitat and exploitation. There are concerns that the nematode parasite may reduce eel stocks further (Lough Derg Science Group 2007).

Alien Aquatic plants

With the arrival and expansion of various aquatic plants that grow profusely under Irish conditions, urgent consideration should be given to controls on the importation and sale of potentially invasive species. Early detection of their release to the wild would enable consideration of options for their elimination where practical (Lough Derg Science Group 2007).

Nuttall's pondweed *Elodea nuttallii*

Nuttall's pondweed was found for the first time in Lough Derg in 2005, in the southern part of the Lough. It is a highly invasive plant undergoing rapid expansion within Lough Derg. It now occurs in most harbours and in some shallow isolated bays to a maximum depth of 3.2m (determined by light levels). The plant is a nuisance species because it grows prolifically and can clog sheltered shallow areas. The plants may grow to the surface and spread to form tangled masses that impede boat traffic. Chopped strands can accumulate on beaches and foul bathing areas. This species reproduces vegetatively and fragmentation provides the only basis for range extension. Dispersion is through drifting fragments. In wintertime, coots and swans feed on this pondweed. This results in further fragmentation as not all of the retrieved plant matter is consumed. In summertime, during the plants vertical growth phase, boat propellers cut plants and result in significant fragmentation. These fragments, together with those that have been produced by natural means can concentrate on bathing beaches to form foul smelling accumulations. Nuttall's pondweed forms sufficiently dense stands to arrest propeller driven outboard craft and encumber all other power driven craft. Anglers who have fished for many years about Lough Derg stated that 2006 was the first year that some areas could not be fished on account of the extent of the weed present (Lough Derg Science Group 2007).

Recommendations

Surveillance surveys should be conducted in areas of Lough Derg frequented by boats, so that new infestations can be identified. Early identification would allow for mitigative action (isolation, removal, chemical treatment, etc) and in certain cases eradication. Areas already colonised by invasive weed species should be surveyed to determine precise areas and densities of infestation, their impact on water-based recreation and ecological significance. Surveys to identify new introductions of invertebrate species should be conducted at least every 3-5 years. Efforts need to be made by the responsible government agencies to develop an implement controls on the importation of ornamental aquatic plants that have serious impacts on our waterways (Lough Derg Science Group 2007).

A key Action of this Plan is to develop an alien species strategy for North Tipperary in conjunction with Clare, Galway and South Tipperary. This will involve (a) continued support to groups such as the Lough Derg Science Group, (b) establish an alien species awareness programme for council staff, general public, target groups, (c) publish information material with advice on recognising problematic alien species and how to deal with them, (d) develop and implement council policy for dealing with invasive species (i.e. direct action, planning control, by-laws etc.)

Lough Eorna

Lough Eorna is a small freshwater lake situated within Ashley Park and close to the N52 between Nenagh and Borrisokane. It is fringed by a mosaic of reedbeds and contains one single island. The lake is fed by an underground stream, which drains a series of small lakes to the north. The water level fluctuates considerably throughout the year, but generally remains shallow. Lough Eorna is of significant importance for wintering Little Grebe and Moorhen. Nationally important numbers of Shoveler have also been recorded (pers comm. S.Heery, Crowe 2006). This lake supports a wide variety of pondweeds *Potamogeton* species and Golden dock *Rumex maritimus,* a very rare species (Webb *et al.* 1996), occurs along its shores (pers. comm. D.Nash).

Threats

Small scale boating and angling occurs mostly during the summer. There is also occasional disturbance by walkers and dogs. Predator control of foxes has been attempted. There has been a recent proposal for the construction of a house in the vicinity of the lake (Crowe 2006).

Pat Reddan's Lake

Pat Reddans Lake is located 3km north west of the town of Borrisokane, in North Tipperary and regularly support nationally important numbers of Gadwall (pers comm. S.Heery, Crowe 2006).

Other Lakes

There is a large lake, associated with the River Suir in Templemore Town Park, and clusters of small lakes in the blanket bog uplands at Curreeny and on Tountinna in the Arra Mountains

FL6 Turloughs

Turloughs are ephemeral lakes that occupy basins or depressions in limestone areas and where water levels fluctuate markedly during the year. They are virtually unique to Ireland and their greatest concentration is in counties Clare, Galway and Roscommon. The general pattern is to flood in winter and dry out in summer, but there may be other sporadic rises in response to rainfall. Turloughs normally fill through underground passages and sinkholes but some also have inflowing rivers or streams (Fossitt 2000).

There are eleven turloughs in North Tipperary and only one is designated at NHA level (Newchapel Turlough 653) (Table 1). Turloughs support species that are suited to fluctuating water levels, such as the rare Water germander *Teucrium scordium*, which apart from the shore of Lough Derg and Lough Ree is restricted to turloughs in East Clare and North Tipperary.

Table 1. List of Turloughs in North Tipperary (Kimberly 2006).

TOWNLAND	COUNTY	EASTING	NORTHING	Turlough_NAME	NHA
DOWNAMONA	Tipperary	185600	176050	N/A	
DRUM	Tipperary	190300	198000	Spring Park Wetlands	
FIRGROVE	Tipperary	185370	192520	Newchapel Turlough	Newchapel Turlough 653
GORTEEN	Tipperary	199400	198050	Ballingarry	
KILGASK	Tipperary	195420	202560	Sluggary Pool	
LISMACRORY	Tipperary	196620	198360	Liskeenan	
LISMALINE	Tipperary	196180	195700	N/A	
RAHINANE	Tipperary	196850	196400	N/A	
Carney Commons	Tipperary	187000	191900	Firgrove	
Kyleomadaun	Tipperary	187600	191400	Kyleomadaun	
Rodeen	Tipperary	188000	193400	Rodeen Turlough	

Threats

Turloughs are fed by ground water that is characteristically nutrient poor. Turloughs usually occur in a farmed landscape and their conservation is intimately tied up with this land use. The intensification of agricultural practices such as increased fertiliser applications, ploughing and reseeding and runoff from surrounding land all contribute to decreasing the plant diversity that turloughs support. Turloughs also continue to be drained (Goodwillie & Reynolds 2003).

A key action of this Plan is to increase the knowledge of Turloughs in the county by identifying, surveying and mapping the turlough sites and investigating practical means to conserve and enhance non-designated turlough sites in the county.

FW Watercourses

FW2 Depositing/lowland rivers

The river systems in the county divide into two main groups: those in the northern part which drain into the Shannon – these include the Little Brosna, Ballyfinboy, Nenagh, Kilmastulla and Mulkear systems; and those in the south which drain into the Suir, including the Clodiagh and the Drish systems. The River Nore, like the Suir, rises in North Tipperary; it supports an important population of Pearl mussels *Margaritifera margaritifera.* Rehabilitation projects have been carried out by the Shannon Regional Fisheries Board on the Nenagh and Mulkear Rivers.

The morphologically and genetically distinct trout known as 'Croneen' runs the Little Brosna and Camcor Rivers (Offaly) to spawn and is believed to feed in Lough Derg (FIN 2003, Lough Derg NFB Project).

The Kilmastulla River had salmon, sea lamprey, trout in the past, but was damaged by drainage and mining in the Silvermines (pers. comm. F. Igoe). The passage of salmon, lamprey, eel and trout within the Shannon Catchment were seriously affected by the construction of the Ardnacrusha dam in 1929 (pers comm. F.Igoe)

Threats

The pollution of fresh waters is probably the single most significant factor in causing major declines in the populations of many fish species in Europe (Maitland 2004). Mining, forestry, agriculture, peat abstraction, over grazing, municipal and urban development have all had deleterious effects on river habitats (Fitzsimmons and Igoe 2004).

River drainage schemes for flood relief have removed riparian vegetation, widened and deepened channel bases that have altered hydraulic regimes and resulting in loss of spawning substrate and fish habitat. Invasive weeds are also a serious threat to the ecology of rivers. River drainage and pollution pose a threat to instream vegetation such as Water crowfoot *Ranunculus penicillatus* .

River and lake engineering has been responsible for the elimination of fish species in fresh waters all over the world. Migratory species are particularly threatened by dams and other obstructions and, if they are unable to reach their spawning grounds may become extinct in a few years.

Land management practices have had a negative impact on many of our rivers and lakes. Re routing of channels, changing their natural shape and the removal of bankside vegetation have all impacted on their capacity to support fish and other forms of wildlife. It is essential that rivers and channels are maintained or rehabilitated to include the typical physical and ecological features which accommodate salmonids throughout their life (FIN 2002).

Larger catchments should contain a wide variety of channel types. Clean and well oxygenated water is essential for salmonids along with clean loose gravels for spawning. In upland valleys, boulder strewn riffle/pool sequences are important as spawning and nursery areas and are also likely to support resident stocks of small adult trout. The deep water of pools provide shelter and refuge. Lower down, rivers tend to be slower and more sinuous. Riffles tend to form on either side of a bend, providing an area for salmon and trout to spawn. On river banks, bankside vegetation will vary depending on altitude, soil rainfall and other climatic conditions. Vegetation needs to be maintained to prevent excessive bank erosion, to provide cover, food and shade for fish, to reduce high summer temperatures and to limit silt and fertiliser run-off (FIN 2002).

A key action of this plan is to enhance riparian corridors by (a) Restoring stream habitats and recreating stream habitat variability, (b) Protecting and enhancing riparian zones with balanced ecology approach incorporating open breaks and shady areas and (c) to address the fish passage issues at Ardnacrusha and other dams, in conjunction with other County Councils.

FP Springs

Springs are usually very small local features that are maintained by a more or less continual supply of water from upwelling groundwater sources, or along seepage zones. There are two main types of springs:

	EU Annex I habitats (Natura 2000 code) (*=priority type)
FP1 Calcareous springs	*Petrifying springs with Tufa Formation (Cratoneurion) (7220)
FP2 Non Calcareous springs	-

Calcareous springs are fed by water that is calcareous and oligotrophic (i.e. nutrient poor). There may be some marl or tufa formation. Non-calcareous springs are those that are fed by acidic to neutral water that is base-poor and typically oligotrophic.

There are no cSAC sites within the county are designated for Calcareous or Tufa Springs. In the recent study on the 'Extent and Conservation Status of Springs, Fens and Flushes in Ireland' (Foss 2007), there are an estimated eleven sites supporting Springs in Tipperary many of which are likely to be in North Tipperary.

Key Actions of this Biodiversity Plan are surveys of 'Fens and Springs' and 'Cutover bogs', as the consultation process highlighted that there is a lack of information on these habitats in the County.

FS Swamps

Swamps include reed beds (Reedbeds and large sedge swamps FS1) and swamps (Tall herb swamps FW2). These areas frequently occur outside designated areas such as in the flood plain of rivers or areas where water levels are seasonally high but where permanent inundation does not occur. They usually occur in mosaic with other wetland habitat types. They are species-rich and support a wide range of plants and animals. These marginal habitats are under threat from land reclamation and building, from improvement schemes, drainage and intensification of agricultural processes. There is little information on these habitats in North Tipperary.

G Grassland and Marsh

GS Semi-natural grassland

Two categories of semi-natural grassland occur in North Tipperary, Dry grassland and wet grassland (Table 2). These grassland types often occur in mosaic with other habitat types.

Table 2. Grassland habitats that occur in North Tipperary.

Habitat Categories (Fossitt 2000)	**EU Annex I habitats (Natura 2000 code) (*=priority type)**
Dry Calcareous and neutral grassland GS1	Semi-natural grasslands and scrubland facies on calcareous substrates (*important orchid sites) (6210) *Juniperus communis* formations on heaths or calcareous grasslands (5130) Calaminarian grasslands of the Violetalia calaminariae (6130)
Dry meadows and grassy verges GS2	Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) (6510)
Dry-humid acid grassland GS3	*Species-rich *Nardus* grasslands on siliceous substrates in mountain areas (6230) Calaminarian grasslands of the Violetalia calaminariae (6130)
Wet grassland GS4	*Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)

Grassland is a significant habitat type in the county. Upland grassland is widespread on the lower mountain slopes, in many of the upper fields and on the steep south facing slopes of the Silvermines mountain (NPWS site synopsis).

Large areas of species-rich lowland grasslands occur in large SACs within the County such as River Shannon Callows and Little Brosna Callows.

The Shannon Callows

The Shannon Callows has by far the largest area of lowland semi-natural grassland and associated aquatic habitats in Ireland and one in which there is least disturbance of natural wetland processes (NPWS site synopsis). The Shannon Callows that have developed in the flood plain of the River Shannon, are a unique

wetland resource in the Irish midlands. Their name comes from the Irish word 'Calladh', which means river meadow. The fields are flooded through the winter and farmed as meadow and pasture when flood retreats in the spring. The flooding ensures that the ground on the callows remains soft, even in the summer, and the farming has remained relatively extensive. This combination of seasonal flooding and largely traditional agriculture has helped to preserve a unique ecosystem and a distinct wildlife assemblage, with a wealth of birds, mammals, insects and plant-life, including the globally threatened Corncrake and internationally important numbers of wintering Greenland White fronted Geese, depending on the callows.

The wet grasslands of the Shannon callows provide an ideal nesting place for Lapwing, Snipe, Curlew and Redshank. Although these species are relatively widespread in Ireland, their preferred nesting habitats are threatened and numbers particularly of Lapwing, have declined in recent years. The presence in relatively large numbers of these four species makes the Shannon Callows one of the most important in Ireland for breeding waders (WWW.birdwatchireland.ie) . The Shannon Callows are used for summer dry-stock grazing (mostly cattle with some sheep and a few horses), and a permanent haw meadow (Crowe 2005).

Threats

Over-deepening of drains and peat silt deposition, recreational activities (water skiing), ploughing and neglect of hay meadows (or reversion to pasture) have all resulted in intermittent and scattered damage to some of the habitat in the Shannon Callows. Threats to the quality of the callows include nutrient enrichment due to the use of fertilisers and run off from herbicides used on adjacent lands. The River Shannon is used increasingly for coarse angling and boating and occasional disturbance is caused by recreational activities (Crowe 2005).

Little Brosna Callows

The Little Brosna River is approximately 40km long, rises near Shinrone in southwest Offaly and follows a north then a north westerly direction to where it meets the Shannon near Meelick. It follows the county boundary with Tipperary throughout most of its length. The western most gradient along the river between New Bridge (Co. Tipperary) and Meelick (Co. Galway) is slight and the adjacent semi-natural grassland floods between October and April each Year (Heery 1993), thereby forming the Little Brosna Callows. The vegetation of the callows is highly diverse and is much influenced by the exact flooding regime and the peat content of the soil (Crowe 2005)

Birdwatch Ireland has a hide overlooking the little Brosna callows at Ashton's Callow. This area is best visited in winter, when the hide provides a good viewing point over the floods, with views of Wigeon, Teal, Pintail, Shoveler, Golden Plover, Black-tailed Godwit, Lapwing and Dunlin (WWW.birdwatchireland.ie). Dunlin (WWW.birdwatchireland.ie). The adjacent bog contains Large Heath butterfly *Coenonympha tullia* and the sedge *Carex pseudocyperus* (pers. comm. D.Nash).

Areas supporting Wet grassland GS4 frequently occur outside designated areas such as in the flood plain of rivers or areas where water levels are seasonally high but where permanent inundation does not occur. They usually occur in mosaic with other wetland habitat types. They may be species-rich and support a wide range of plants and animals. These marginal habitats are under threat from land reclamation and building, from improvement schemes, drainage and intensification of agricultural processes

Threats

Some recreational activities that cause occasional disturbance in the Little Brosna Callows include angling and boating. Even though over 50% of this site is part of a Wildfowl Sanctuary, disturbance is caused by wildfowling carried out in the surrounding areas. Control of shooting and fishing within the Little Brosna Sanctuary depends largely on the goodwill of local landowners, while pressures for increased access continue (Crowe 2005). The intensification of agriculture, with earlier mowing and the replacement of hay with silage threatens the callows, as well as further drainage attempts to reduce the extent of winter flooding (http://NPWS.ie). The Marsh pea *Lathyrus palustris* is an important plant in this type of habitat (pers. comm. D.Nash).

GM Freshwater marsh

Marshes (Marsh GM1) are found on level ground near river banks, lakeshores, and in other places where mineral or shallow peaty soils are waterlogged, and where the water table is close to ground level for most of the year. Standing water is not a characteristic feature except, perhaps, during very wet periods or in winter months (Fossitt 2000). Marshes are usually species-rich habitats. Pockets of marsh habitat frequently occur outside designated areas. Marshes, like other marginal habitats, are frequently under threat from land reclamation and building, from improvement schemes, infilling, drainage and intensification of agricultural processes.

H Heath and dense bracken

HH Heaths

Heaths include areas where vegetation is open and there is at least 25% cover of dwarf shrubs, or where mosses dominate in the case of montane areas (Fossitt 2000). Three types of heath occur in North Tipperary, Dry siliceous heath HH1, Dry calcareous heath HH2 and Wet heath HH3 (Table 3).

Table 3.Heath habitats that occur in North Tipperary.

Habitat Categories (Fossitt 2000)	**EU Annex I habitats (Natura 2000 code) (*=priority type)**
HH1 Dry siliceous heath	European dry heaths (4030) *Juniperus communis* formations on heaths or calcareous grasslands (5130)
HH2 Dry calcareous heath	European dry heaths (4030) *Juniperus communis* formations on heaths or calcareous grasslands (5130)

HH3 Wet heath	Northern Atlantic wet heaths with *Erica tetralix* (4010)

Dry siliceous heath HH1 and Wet heath HH3 occur in the Silvermine mountains. These habitats are burned frequently and this practise threatens the biodiversity of the habitat (pers. comm. S. Heery). Keeper Hill has a very large area of intact wet heath, dry heath, blanket bog and sandstone cliffs on its 700 m summit (Heery 2004). Heaths and peatlands in upland areas provide potential feeding and nesting areas for important bird species such as the Hen Harrier.

Juniper heath/scrub occurs in mosaic with calcareous grassland and Limestone pavement on the shores of Lough Derg (NPWS site synopsis, pers comm. J. Madden). Juniper *Juniperus communis* a key species in the county, and is frequent on the shores and islands of Lough Derg (Nash 1993). It occurs on Carney Commons, Scarragh Lough (R8393) and in many sites around the lakeshore, often in an unusual upright form. Juniper has also been recorded in the Moyne-Templetuohy area, though this site needs further survey (pers. comm. D.Nash, S Geraghty).

Threats

Threats to heaths include overgrazing, burning, peat cutting and afforestation.

A key action of this Biodiversity Action Plan is a 'Heath Survey' as there is a lack of information on the distribution and quality of heath habitats in North Tipperary.

P Peatlands

PB Bogs and PF Fens and flushes

The peatlands in North Tipperary are a priority for conservation action. Peatlands include raised bogs, blanket bogs, fens and cutaway or cutover bogs (Table 4). There are 15 SACs and 44 pNHAs in the county (www.NPWS.ie) and many of them have been listed for peatland habitats. According to the IPCC (Irish Peatland Conservancy Council), there is 14% (4,842ha) of the original area of relatively intact peatland remaining in North Tipperary (pers comm. IPCC).

Table 4. Peatland habitats that occur in North Tipperary.

Habitat Categories	**EU Annex I habitats (Natura 2000 code)**

(Fossitt 2000)	**(*=priority type)**
PB1 Raised Bog	*Active Raised Bogs (7110) Degraded Raised bogs still capable of natural regeneration (7120) Depressions on peat substrates of the Rhynchosporion (7150)
PB2 Upland Blanket Bog	Blanket Bog (*if active bog) (7130) Depressions on peat substrates of the Rhynchosporion (7150)
PB4 Cutover Bog	Depressions on peat substrates of the Rhynchosporion (7150)
PF1 Rich fen and Flush	*Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae (7210) Alkaline Fens
PF2 Poor Fen and Flush	
PF3 Transition Mires	

The IPCC have 31 peatland sites in North Tipperary on their database, 25 of which are, in theory, protected within cSACs and NHAs (as yet pNHAs have no legal protection). The remaining 6 peatland sites are undesignated. Fens have been identified during the consultation process as a habitat that requires some attention as there is a lack of information on their distribution, and conservation status. There are only two cSACs in the county that have been designated for fens, Lough Derg, North East Shore cSAC 2241 and Liskeenan Fen cSAC 1683.

The remaining peatlands in North Tipperary need to be conserved to maximise biodiversity in the county. Unprotected sites in North Tipperary include:

Shower Bog (Annacotty), Grid Ref: R690 660

A remnant raised bog that supports typical raised bog vegetation. The cutaway area is extensive with birch woodland occupying some of it. The endangered Annex II species in The EU Habitats Directive, Marsh Fritillary *Euphydryas aurinia* was recorded on the site in 2001 by Michael Quirke. The site is also of archaeological interest (pers. comm. IPCC). This site also contains the Large Heath butterfly *Coenonympha tullia.* (pers comm. D.Nash)

Carney Commons, Grid Ref M873 922.

The site is located in North Tipperary, 7km west of Borrisokane. It has a variety of flora representing scrub woodland and dry fen habitats. There is also a turlough at this site supporting a mosaic of wetland habitats (pers comm. IPCC). There are records of a variety of plants including *Juniperus communis*, *Sesleria caerulea* and a range of orchids form this site including fly orchid *Ophrys insectifera* The butterflies Brown Hairstreak *Thecla betulae*, Dingy Skipper *Erynnis tages* and Brimstone *Gonepteryx rhamni* have been recorded here. This is the only site for Brown Hairstreak east of the Shannon (pers. comm. D. Nash).

Templetouhy, Grid Ref; S207 720

This is an area of raised bog that has been drained in preparation for peat production which has not yet occurred yet. This site is adjacent to a large area of cutaway bog. Access is from the road to Rathdowney. The area has not yet been surveyed (pers. comm. IPCC).

Longford Pass- Littleton Bog, Grid ref: S 232 595

This is an IPCC education site adjacent to the Bord na Móna railway line. The bog is being colonised by Bog myrtle *Myrica gale*, Gorse *Ulex europaeus*, Downy birch *Betula pubescens*, Rowan *Sorbus aucuparia* and Eared willow *Salix aurita* . The bog surface is soft underfoot with a hummock and hollow topography. There is a good cover of mosses and lichens (pers. comm. IPCC).

Threats

Loss of peatland diversity is a major issue in North Tipperary and continues through the destruction and fragmentation of habitats. Activities that threaten peatland biodiversity include development, overgrazing, afforestation (particularly on upland blanket bog), private and industrial peat extraction, horticultural peat extraction, illegal dumping, heavy recreational use by mountain bikers and quad bikes, and the spread of invasive species (pers. comm. IPCC, S. Jones and S. Geraghty).

W Woodlands and scrub

WN Semi-natural Woodland

Semi-natural woodlands occur throughout the county, often in mosaic with other habitats such as scrub, heath and bog. There are few designated woodland sites in North Tipperary. The 'National Woodland Survey' is in its last year of field survey and Tipperary was part of this years survey work. Results of this survey will highlight woodlands of conservation importance within the County. There are a number of pockets of Native woodland within Coillte properties throughout the County. These areas were identified as part of a biodiversity survey of the Coillte estate within the county (Heery 2003, 2004) (Appendix 4).

Yew woods (WN3) in Ireland are mostly confined to the west of the country, however a substantial area of Yew is located on Limestone at Cornalack, where Yew forms a scrub woodland along the east shore of Lough Derg. Yew is found in association with small amounts of Juniper *Juniperus communis*, Hazel *Corylus avellana*, Hawthorn *Crataegus monogyna* and Holly *Ilex aquifolium*.

Place name evidence, including Youghalarra, hint that Yew may once have been more widespread in the county. Occasional specimens are found in woods along the Lough Derg shoreline.

Deciduous woodlands dominated by Oak *Quercus* species are a notable feature of the north east shore of Lough Derg, such as at Bellevue, and inland. Ivy Broomrape *Orobanche hederae* is found where overgrazing

does not occur. Ash-hazel woods (WN2) are also present in this area (NPWS site synopsis, pers. comm. D.Nash).

In the river Shannon Callows cSAC, Alluvial woodland occurs in islands dominated by Ash *Fraxinus excelsior* and willows *Salix* spp.

On the edge of the callows, wet broadleaved semi-natural woodland dominated by Birch *Betula* species and Alder *Alnus glutinosa* occur along with dry broadleaved wood dominated by Hazel *Corylus avellana*.

Bog Woodland (WN7), The Annex I priority woodland in the EU Habitats Directive occurs at BallyDuff Bog which is South west of Birr. Scots pine *Pinus sylvestris* forms the canopy over a sub-canopy of Rowan *Sorbus aucuparia*, Holly *Ilex aquifolium*, and Downy birch *Betula pubescens*. The ground cover is formed by dwarf shrubs (NPWS site synopsis). Early purple orchid *Orchis mascula* is present in profusion at this site as is the hairy wood rush *Luzula pilosa.*

WL Linear woodland/scrub

WL1 Hedgerows

Linear features such hedgerows, as well as being wildlife habitats in themselves, provide links between other habitats which are sometimes of higher ecological value. Though they may not be designated sites, the significance of such features is recognised by the EU Habitats Directive (92/43/EEC), which obliges member states to maintain them in order to improve the ecological coherence of the Natura 2000 network of protected sites. In addition, hedgerows are specifically mentioned in the National Biodiversity Plan for Ireland (2002) as habitats to be appropriately managed for biodiversity. Remnant hedgerows can support a good woodland-type flora, provide habitat for birds and foraging areas for bats.

Hedgerows that form links between blocks of semi-natural habitats should be identified and labelled as 'typical high nature value' hedges These hedges have a notable historical, structural or species composition characteristics as well as forming important links between larger blocks of semi-natural habitats.

All hedges have an important wildlife value. Work done by Catherine Keena of Teagasc stresses the need for a variety of hedge types within a REPs farm and the wider landscape. Relict hedges (i.e. hedgerows where the shrubs have grown into mature trees with a full canopy, while others have died out and have not been replaced, leaving large gaps), New hedges, hedges with mature trees, tall hedges with a triangular profile and escaped hedges all require different forms of management.

The importance of all hedges should be recognised in the planning process. There is an information gap in the existing knowledge of hedges in the County. Appropriate management of hedges is vital for their maintenance as wildlife corridors as well as their functions as stock proof barriers. Hedgerows should be managed giving

consideration to invertebrates and other fauna. Plants, alien to the locality should not be introduced to hedgerows.

The best time to cut hedges is in the winter when the plants are dormant and the bird nesting season is over. Hedges provide the nesting habitat for many of our countryside birds. The Wildlife (Amendment) Act 2000 prohibits the cutting of hedgerows during the critical bird-nesting period in spring and summer (1st March to 31st August) because of the devastating impact on nesting birds and other wildlife (Fuller 2007). North Tipperary County Council must balance the requirements of wildlife legislation, as well as, ensuring hedgerows on public roads are not a danger to road safety. While every effort should be made to avoid hedgerow cutting during the bird-nesting season, in some occasions it may be necessary. Where North Tipperary's Area Engineer deems it necessary to undertake hedge cutting within the bird nesting season for road safety reasons, then he/she should provide written notification to the National Parks and Wildlife Service, giving them an opportunity to comment (Fuller 2007).

A key action in this Action Plan is to further the knowledge of hedgerows in the County by conducting a Hedgerow survey and to investigate how best to identify 'typical high nature value hedges' that can be given greater consideration in the planning process.

A key action of this Biodiversity Plan is the provision of demonstration projects for positive land management to enhance biodiversity. This will include showcase sites exhibiting best practice in hedgerow managements as well as different aspects of conservation management.

The provision of hedgerow conservation management training to council personnel is a key Action of the Action Plan

3.3. Key species in North Tipperary

The Irish biological vice-county boundaries were defined by Praeger (1901). Tipperary is divided in two vice counties, H10 in the north and H7 in the south. The vice county boundaries differs some what from the administrative one between the north and south riding, because Praeger used the railway line from Portlaoise through Limerick Junction as the boundary (Nash 1993). This means that parts of the North Tipperary County Council area lie in both North Tipperary and South Tipperary Vice-Counties.

Plants

Irelands National Strategy for Plant Conservation (http://www.botanicgardens.ie/gspc/inspc.htm) comprises a set of 16 targets modelled on the GSPC (Global Strategy for Plant Conservation) through which we can bring about

better conservation and comprehension of our native plants and fungi. This strategy should be adopted by all county councils, government departments and stakeholders that have a responsibility for plant conservation.

The following species were identified from the consultations and the literature as being rare and occurring in North Tipperary:

The Water germander *Teucrium scordium*, is recorded from Newchapel Turlough pNHA. This species is rare and apart form the shores of Lough Derg and Lough Ree it is restricted to turloughs in East Clare and North Tipperary (pers comm. D.Nash).

Marsh pea *Lathyrus palustris* is a Red Data Book Species is a Red Data Book Species that occurs along the shores of Lough Derg and in the Shannon Callows

Ivy broomrape *Orobanche hederae* is a Red Data Book Species that occurs along the shores of Lough Derg.

Opposite leaved pondweed *Groenlandia densa* occurs in drainage ditches in the Shannon Callows. This species is listed in the Flora Protection Order 1999.

The green winged orchid *Orchis morio* occurs in dry calcareous grassland at Liskeenan Fen cSAC (NPWS site synopsis). It has also been recorded at Carney Commons along with fly orchid *Ophrys insectifera and* Autumn lady's tresses *Spiranthes spirallis* (*pers. comm.* D.Nash*)*

The Small white orchid *Pseudorchis albida* occurs at the Silvermine Mountains and Kilduff/Devil'sbit Mountain, and is a Red Data Book Species.

Killarney fern *Trichomanes speciosum,* the Annex II species in the EU Habitats Directive, is recorded from the Clare Glen.

Other important plant species include Marsh stitchwort *Stellaria palustris*, Cypress sedge *Carex pseudocyperus*, Alder buckthorn *Frangula alnus*, Marsh helleborine *Epipactis palustris*, Brown beak sedge *Rhynchospora fusca* and Great fen sedge *Cladium mariscus* (pers comm. D.Nash). These species are rare and are indicators of wetland habitats that are under threat in North Tipperary from land improvement schemes and development.

Irish fleabane *Inula salicina* occurs along the lakeshore at Lough Derg at its only known site, and was seriously threatened with extinction in Ireland. This plant is legally protected under the Flora Protection Order 1999 (NPWS site synopsis). A project was set up in 2006 to ensure the conservation of Irish fleabane at Lough Derg (BEC 2006). This project aimed to ensure the continued existence of Irish fleabane on the shores of Lough Derg through an initiative that involved the local community. An *ex situ* population was used to provide plants of *I. salicina* which were planted at four new locations along the shore of Lough Derg. Management and monitoring of

these new populations has been put in place and agreements made with local landowners. A new *ex situ* population has been established at the National Botanic Gardens, Glasnevin. A further aim of this project was to use Irish fleabane as a 'flagship species' to raise awareness in the local community and beyond of the loss of biodiversity in Ireland. This was accomplished through a series of workshops at local schools, the production of posters by the local community, and organisation of an exhibition.

There are a number of alien plants both terrestrial and aquatic in North Tipperary that are threatening the biodiversity of the county. These alien plants include the following and have been referred to in more detail in other sections (c.f. Lough Derg page 9 and Threats to Biodiversity page 35):

Terrestrial	**Aquatic**
Japanese knotweed *Polygonum. cuspidatum*	Nuttall's pondweed *Elodea nuttallii*
Giant knotweed *Polygonum sachalinense*	
Himalayan knotweed *Polygonum polystachyum*	
Rhododendron *Rhododendron ponticum*	
Cherry laurel *Prunus laurocerasus*	
Giant hogweed *Heracleum mantegazzianum*	
Himalayan balsam *Impatiens glandulifera*	

Bryophytes

The British Bryological Society have a species list for the North Tipperary vice county (www.rbg-web2.rbge.org.uk/bbs/Recording/vcmappage.htm) and although it is not complete (North Tipperary was last visited in 1979 and there is currently no recorder) provides a basis for a more complete list that will be drawn up as part of a biological audit.

Stoneworts

The Red Data Book stonewort, *Chara tomentosa*, has not been reported recently but possibly still survives in Lough Derg (pers. comm.. D.Nash).

Algae

No information on Algae was collected as part of this plan. This data should be collected as part of a biodiversity audit of the county.

Lichens

No information on Lichens was collected as part of this plan. This data should be collected as part of a biodiversity audit of the county.

Fungi

No information on fungi was collected as part of this plan. This data should be collected as part of a biodiversity audit of the county.

Invertebrates

In general there is an under-recording of invertebrates nationwide, and this should be addressed in North Tipperary in any future survey plans.

The main butterfly of interest within the county is the Marsh Fritillary, an Annex II species in The EU Habitats Directive, which has been recorded at Carney Commons (pers comm. IPCC). Other butterflies of interest in the county include Brown Hairstreak, Dingy Skipper, Large heath and Grayling (pers comm. D.Nash).

Brown Hairstreak *Thecla betulae* breeds on young growth of Blackthorn *Prunus spinosa* and occasionally other *Prunus* species (Asher *et al*. 2001) and is likely to occur in other sites in North Tipperary, as well as Carney Commons. As consequence, the appropriate management of hedges and scrub (ie. not intensively managed) in the vicinity of known breeding grounds such as at Carney commons is essential for the continued survival of this species in the county.

Many other butterfly species have also been recorded in North Tipperary such as Brimstone *Gonepteryx rhamni* whose larvae feed on the leaves of Buckthorn *Rhamnus cathartica*, which occurs mainly on calcareous soils, and Alder buckthorn *Frangula alnus*, which is found on moist soils and wetlands in North Tipperary. This species was recorded at Redwood bog and Friars Lough Redwood bog (Nash 1993), subsequent site visits witnessed the removal of significant areas of alder buckthorn (pers. comm. D.Nash).

Dragonflies have not been extensively studied in the county but areas such as Redwood bog, Lough Nahinch and Monaincha, Roscrea have a range of species. The Turlough species of scarce damselfly, Green Emerald *Lestes dryas* occurs at both Newchapel and Kyleomadaun and the Keeled Skimmer *Orethetrum coerulescens* occurs at Lough Nahinch and Derryhogan (pers comm. D.Nash).

A key action of this plan is to address the information gap regarding Dragonflies in the county by: (a) Identifying important dragonfly sites, (b) Investigating practical ways to protect important sites, and (c) Raise awareness of the importance of the species.

Kelly-Quinn and Bracken (2000) have reported 11-15 species of Mayflies (Ephemeroptera) from Lough Derg area.

There were old sites for the Annex II snail species, *Vertigo geyeri* and *Vertigo moulinsiana* in North Tipperary but these sites have all been lost in the major bog drainages of the early 1970's. Important sites were Fiagh Bog and Roscrea Bog. There may be some lagg habitat with fen/bog interface habitats and active spring seepages at these sites that provide some remnant habitats for *Vertigo* species (pers comm. E.Moorkens).

Five species of waterbeetles that are listed in the Red data list (Foster and Nelson 2007) occur in North Tipperary and are detailed in Appendix V.

Birds

There is an active Birdwatch Ireland group in the county. Getting members of the public including children involved in garden bird surveys and providing accessible bird hides such as the one at Cabragh Wetlands and Ashtown Callows is a good way of introducing them to wildlife observation and recording.

One of the most significant areas for birds in Ireland is the Shannon and the Little Brosna Callows, which host internationally important numbers of wintering wildfowl and breeding waders. There are four Special Protection Areas within North Tipperary:

Lough Derg (Shannon) SPA 4058
Middle Shannon Callows SPA 4096
River Little Brosna SPA 4086
Slievefelim to Silvermines Mountains SPA 4165

These SPAs occur in North Tipperary as well as in adjacent counties.

The Middle Shannon Callows SPA supports internationally important numbers of wildfowl as well as Whooper Swan which is listed in Annex I of the EU Birds Directive. Fifteen wintering species use the site in internationally important numbers. Breeding species include Corncrake, Redshank, Shoveler, Quail, Snipe, and Curlew. Five further species occur in numbers of national importance; Mute swan, Wigeon, Lapwing, Black tailed godwit and Golden plover which is listed in Annex I of the EU Birds Directive.

A wide range of other species occur in numbers of regional or local importance, including Bewicks swan which is an Annex I species in the EU Habitats Directive. Other species include Teal, Tufted duck, Dunlin, Curlew, Redshank and Black headed gulls. Small numbers of Greenland White Fronted Geese (Annex I species in the EU Birds Directive) use the Shannon Callows and are associated with larger flocks that use the adjacent Little Brosna and River Suck callows .

The Shannon callows is a stronghold for the Corncrake. This species is of global concern and is listed in Annex I of the EU Birds Directive (Heery 2005). The Corncrake population appeared to be more or less stable in the Shannon Callows until severe summer flooding in 2002 disrupted breeding. Only 20 singing male Corncrakes were recorded that year, a decline of 63% from the previous year. Following intensive conservation efforts and the operation of emergency grant schemes to protect this fragile population, small increases were recorded over the following few years with 23 males counted during the 2005 census. A further blow, however, was delivered to the conservation efforts with another summer flood on the Shannon Callows in 2006. When the already vulnerable population fell to an all time low of just 17 calling males (www.birdwatchireland.ie).

Other bird species that are recorded in the region include Wigeon, Whimbrel, Bewick Swan, Pintail, Mallard, Coot, Little Grebe, Cormorant, Pochard and Goldeneye.

A range of breeding species associated with grassland and swamp vegetation, including Sedge warbler, Grasshopper warbler, Skylark and Reed bunting. Whinchat, an uncommon breeding species also occurs in small numbers (Crowe 2005, Heery 2005, White Young and Green 2006). Whinchats are locally common in the Arra mountains (pers. comm. S. Geraghty).

The mixed farming area in the north of the county supports a breeding population of Yellow hammers and other seed eating songbirds.

Kingfisher, an Annex I species in The EU Birds Directive, occurs in the region and has been identified as a species for which there is a lack of information on their distribution within the county (pers comm. S.Jones).

A key Action of this plan is to address the information gap regarding Kingfisher in the county by: (a) Identifying important kingfisher rivers within the county, (b) Investigating practical ways to protect nest sites along rivers that are not designated, and (c) Raise awareness of the importance of the species.

The Annex I species, Hen Harrier, Merlin and Peregrine falcon have all been recorded in North Tipperary. Merlin and Hen Harrier are regularly reported hunting over the Shannon callows during the breeding season and in autumn and winter. Hen harriers use the uplands of Silvermine mountains as a foraging area, as part of a wider range between Silvermines and Slieve Felim to the south (NPWS site synopsis) and hunt over the Arra mountains (pers. comm. S. Geraghty). Peregrine Falcon breeds at Keeper Hill (NPWS Site synopsis, Heery 2004) and for some years nested on the spire of St Mary's of the Rosary RC church in Nenagh. A new SPA has just been designated for Hen Harrier, Slievefelim to Silvermines Mountains SPA (site code 4165). This is an extensive SPA that covers part of Counties Tipperary and Limerick. This area is a stronghold for Hen Harrier in the country. Hen Harriers have also been recorded in the Arramore and Devils bit Mountains but there is little information available on these populations.

A key action of this plan is to address the information gap regarding Hen Harrier outside designated areas in the county by: (a) Identifying important Hen Harrier sites within the county, (b) Investigating practical ways to protect nest sites that are not designated, and (c) Raise awareness of the importance of the species.

Red grouse have been recorded amongst the tall heather east of the summit at Keeper Hill as well as the Silvermine mountains (NPWS site synopses, Heery 2004).

Fish

Irish native fish include the Lamprey, Salmon, Trout, Pollan, Stickleback and Eels. The remaining freshwater fish were introduced by man, including Carp, Tench, Minnow, Gudgeon, Rudd, Stone Loach, Dace, Roach, Pike, and Perch. Many of these introductions have led to serious reductions in numbers of the native fish (NPWS.ie).

Lamprey

Lamprey are distinguished from other fish by their eel-like bodies, round sucker-like mouths, poorly developed fins and by a row of seven breathing holes instead of gills. Most species have a life cycle of several years duration, involving an adult parasitic feeding phase, an upstream spawning migration of adults and a gradual down stream movement of juvenile stages to silt beds where they burrow. Following metamorphosis, the young adult lampreys migrate downstream. The three species of lamprey recorded in Ireland are designated in the EU Habitats Directive as species requiring conservation within member states: sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis* and the brook lamprey *Lampetra planera*. All three species are known to occur in North Tipperary. The brook lamprey is an entirely freshwater animal. The other two species spend most of their adult life in the sea, but migrate up rivers to spawn. Their resultant larvae live in river sediments (Kurz and Costello 1999, Kelly and King 2001).

There are three important catchments in North Tipperary for Lamprey: Mulkear, Clodiagh and Kilmastulla. To conserve lamprey populations, the known spawning grounds and larvae haunts need to be protected and maintained and lampreys migrating upstream need unhindered access to spawning grounds. Freshwater sites intended to further the protection of Lamprey populations must be characterised by good water quality, clean sediments at spawning grounds and the presence of stable sandy silt beds for the larvae. For *P. marinus and L. fluviatilis* access to spawning areas from the sea must be ensured and the river downstream of spawning grounds and nursery areas must also be managed to avoid pollution episodes, weirs, dams or other barriers disrupting migration. Unlike salmon, lampreys cannot jump big weirs. Riparian vegetation, composed of shrub and tree species which grow naturally along rivers, will help retain both nitrogen and phosphorus and can thus reduce nutrient input from agricultural land to the rivers. Bankside vegetation will also reduce the erosion of river banks.

A considerable decline in lamprey populations has been taking place in many European river systems. The most likely reasons for this decline are water pollution, the erection of barriers across rivers, changes to river and stream channels and alterations in the discharge patterns of rivers and streams due to drainage schemes. Drainage schemes reduce the retention of water on the land and thus increase the occurrence of flash floods following heavy rainfall. Such floods tend to destabilise or wash away siltbanks which constitute the habitat of lamprey larvae.

Pollan *Coregonus pollan*

The endangered fish species Pollan *Coregonus pollan* is recorded from Lough Derg, one of only three sites in Ireland and in western Europe, it is listed on Annex II of the EU Habitats Directive.

The Irish populations of *C. pollan* are glacial relicts from a more southerly distribution of the species during the last Ice Age. As *C. pollan* is found nowhere else in Western Europe except Ireland, it is one of the most important Irish species from a conservation stand point. *C. pollan* is one of the most unique components of the Irish fauna overall, not just the fish fauna. Pollan in the three main catchments where it is found today (Lough Neagh, Lough Erne and Shannon) have been isolated from each other from some time after colonisation, in all probability at least 10,000 years, i.e. several thousand generations (Ferguson 2004). The status of Pollan in Ireland has declined dramatically over the last 30 years in three of the four loughs (including Lough Derg) where it occurs (Igoe 2004). Pollan is now considered to be very rare in Lough Derg. Formerly pollan were very plentiful in Lough Derg and supported a commercial fishery. Anecdotal reports indicate that the construction of the Ardnacrusha Dam had a severe effect on Pollan in Lough Derg. Prior to the 1970's Pollan were relatively common in Lough Derg and often caught in Eel nets particularly at Killaloe. The initial decline in the pollan population coincides with the construction of the Ardnacrusha Dam and the subsequent decline is possibly due to a decrease in water quality and increased competition from non-native fishes such as rudd (Pollan Action Plan for County Clare).

A key action of the Biodiversity Plan is to raise awareness of the importance of Pollan, both nationally and internationally, as well as providing continued support for projects such as **Lough Derg Native Fish Biodiversity Project** (www.loughderganglers.com) and others.

Brown Trout *Salmo trutta*

In Lough Derg, genetically and morphologically distinct trout known as 'Croneen' occur. The Croneen trout runs the Little Brosna and Camcor Rivers to spawn and is believed to feed in Lough Derg (FIN 2003, Lough Derg NFB Project).

In spite of the fact that many native stocks have already been lost, considerable genetic diversity still exists within brown trout in Ireland, and it is vital that appropriate conservation measures are taken to protect this remaining diversity. This diversity is important not just in an Irish context, but also in a European one, as most countries have lost brown trout diversity to an even greater extent than Ireland. Conservation of brown trout diversity is important not only for its own inherent scientific and aesthetic interest, but also for the rational management of the species. Brown trout is increasingly important for angling, which is an important component of the tourist industry. If the genetic diversity of the brown trout is not conserved not only will an important component of biodiversity in Ireland be lost, but fisheries management options for the future will also be considerably reduced. (Ferguson 2004).

Threats to brown trout diversity

Loss of genetically unique brown trout populations in Europe has been widespread in recent times, as a result of habitat destruction, pollution, introductions and over exploitation. Currently, the most under recognised impact is the introduction of non-native species and the introduction of brown trout of non-native or domesticated origin. The introduction of non-native species can upset the balance in native ecosystems. Pike *Esox lucius* and cyprinid fishes such as roach *Rutilus rutilus* and rudd *Scardinius erythrophthalmus* are not native to Ireland and their introduction has undoubtedly led to a reduction in salmonid diversity (Ferguson 2004).

Stocking with hatchery-reared brown trout is widely practised in an attempt to supplement natural stocks for angling. Stocking with such fish can result in competitive exclusion of native fish and/or interbreeding, resulting in the dilution or loss of unique gene combinations (Ferguson 2004).

A key action of the Biodiversity Plan is to raise awareness of the national and international conservation importance of 'Croneen' trout, as well as providing continued support the **Lough Derg Native Fish Biodiversity Project** (www.loughderganglers.com) and others, which aim to address information deficiencies in relation to the status, ecology and conservation of Croneen Trout.

Amphibians

Common Frog *Rana temporaria* occurs in North Tipperary and is in Annex V of the EU Habitats Directive. No information on the distribution of Frogs was collected as part of this plan. Tipperary Institute have recently completed a frog survey of the County (pers comm. M.Maunsell).

Reptiles

No information was collected on reptiles as part of this plan,. This information gap should be addressed as part of a biological audit of the county.

Mammals

Ireland's native or long-established mammals are:
Hedgehog, Pygmy shrew, Nine species of bats, Rabbit, Hare, Red Squirrel, Grey Squirrel, Bank vole, Fox, Pine marten, Irish stoat, American Mink, Badger, Otter, Red Deer, Sika Deer, Fallow Deer and Wild goat.

Of these, Irish hare and Irish stoat have genetically distinct Irish populations. The red squirrel has become extinct in Ireland at least twice. The current population is descended from individuals introduced from Britain during the 19th Century (Hayden and Harrington 2000). Known introductions of long standing include House mouse, Brown rat, Hedgehog, Rabbit and Feral goat. More recent introductions are Grey squirrel, American mink and Bank vole.

The Otter occurs along the lakeshore of Lough Derg as well as in the Shannon callows. Otter are listed in Annex II of the EU Habitats Directive and are listed in the Irish Red Data Book The Badger occurs throughout

North Tipperary. Irish hare is a common site on the callows and is known from the Silvermine Mountains. It is a Red Data Book Species.

Many bat species forage in woodland and over water, and the combination of both habitats within North Tipperary makes the area valuable for bat species. Built structures, such as bridges, that occur close to water are of particular value as roosts. Six of Irelands bat species are known to occur in North Tipperary common pipistrelle *Pipistrellus pipistrellus,* Soprano pipistrelle *Pipistrellus pygmaeus,* Leisler's Bat *Nyctalus leisleri,* Natterer's Bat *Myotis natterrerei (*www.batconservationireland.org) Brown long-eared bat *Plecotus auritus* and Daubenton's bat *Myotis daubentonii* (pers comm. S. Jones, S. Geraghty

A key action of this plan is to address the information gap regarding bat species in the county by: (a) Identifying important bat sites within the county, (b) Investigating practical ways to protect bat roosts that are not designated, and (c) Raise awareness of the importance of the species.

Findings from the recent Squirrel Survey (Carey *et al.* 2007) show that the red squirrel continues to thrive throughout Munster, with large regions containing red squirrels in Clare (contiguous with the east Galway population), south Tipperary/Waterford, east Cork and west Cork/south Kerry. These populations are threatened by the south-western frontier of grey squirrel spread, with grey squirrels now found throughout Tipperary, Waterford, east Limerick and north Cork. This represents considerable spread on the part of the grey squirrels which were almost completely absent from the province in the previous survey during the 1990s. There are a number of areas in Tipperary and Waterford where both species can be found. It is likely that these populations are in the lag period before the replacement of one species by the other; between the arrival of the grey and the disappearance of the red. Findings from Leinster suggest widespread loss of red squirrel populations in Kilkenny in only the last 10 years. Conversely, anecdotal evidence from Laois suggests that pine martens may be controlling grey squirrel numbers to some degree. The red squirrel populations in east Cork, Limerick, Tipperary and Waterford are in much greater danger as the spread of the grey squirrel into these regions can be expected to continue in the same vein as the spread through the east of the country (Carey *et al*. 2007)

Key recommendations (Carey *et al*. 2007)

Control of grey squirrel populations, particularly along the Tipperary-Limerick border will be key to slowing down the further spread of grey squirrels into the southwest of the country, where large numbers of red squirrels are found, together with significant areas of broadleaf woodland. A system should be put into place (in conjunction with appropriate individuals and organisations in Clare) to monitor possible grey squirrel incursions across the River Shannon. Red squirrel populations currently found in Tipperary should be monitored for local extinctions as a result of replacement by grey squirrels – a list of locations from the 2007 survey can be provided. A continued effort should also be made to educate the general public on the issues regarding squirrels in Ireland; i.e. red squirrel conservation and the threat posed to them and broadleaf trees by grey squirrels. Any sick red squirrel found displaying myxomatosis-like symptoms should be reported to the local ranger, as these may be

infected with 'squirrel pox virus'; this is carried by grey squirrels and can wipe out colonies of reds extremely rapidly (Carey *et al*. 2007).

A key Action of this plan is to monitor the status of red and grey squirrel populations following on from the findings of the recent squirrel survey (Carey *et al*. 2007)

3.4 Urban Biodiversity

Towns and villages can support a wide range of wildlife habitats and species of local or even national conservation interest. Birds nest in trees, shrubs or under the eaves of buildings, Hedgerows support mammals, insects and wild flowering plants. Bats roost in buildings, trees and underneath old bridges. Fungi, lichens and mosses grow on both wood and stone, while waterways support otters, frogs, newts, insects, waterfowl and fish. The wildlife in built up area may be well hidden or may inhabit areas at the edge of a town or village. The importance of ecologicaly friendly management of areas in or around towns or villages is recognised in a number of competitions, awards and grants, including the Heritage Council Wildlife and local Heritage Grants and the Tidy Towns Competition, organised by the Department of Environment, Heritage and local Government (The Heritage Council 2004).

The main towns in the county are Nenagh, Roscrea, Thurles, Templemore and Borrisokane. Urban areas rich in biodiversity include the River Walk in Thurles. The river walk is an extremely valuable amenity in the heart of Thurles, and is characterized by some habitats of high conservation importance, particularly the River Suir and its banks, and the hedgerows, which are more akin to linear woodland. The habitats found in the site support a range of native plants, insects and birds which is remarkable in an urban setting (Mullyaert 2004).

Threats to Urban Biodiversity

Threats to Urban biodiversity include, dumping, removal of semi-natural vegetation for development, hedgerow destruction or neglect, and pollution of watercourses. Overplanting of exotic species, use of herbicides, excessive trimming and mowing of vegetation along riverine and canal banks. Species such as nettles and brambles are an important part of local urban biodiversity.

A key action of this Biodiversity Plan is the facilitation of the development of conservation management plans for biodiversity areas in the main towns in North Tipperary

4.0 Initiatives to promote biodiversity in the County

4.1. Lough Derg Native Fish Biodiversity Project (www.loughderganglers.com)

The Lough Derg NFB project was set up in 2006, with the combined efforts of anglers, NGOs, universities in Ireland and Canada and the ShRFB, to try and identify and understand more clearly the native fish biodiversity of Lough Derg. This project aims to answer the following questions:

- Are there different types of trout in Lough Derg and if so how unique are they?
- Are the different types recognised by anglers in Lough Derg really different?
- If they are really different what does it mean? Are they unique?
- Do these different types of trout have different feeding ecologies? i.e. do they depend on different aquatic animals to survive?
- Are Gilaroo trout present in Lough Derg?
- Do Croneen trout use Lough Derg as a feeding ground?
- Do trout compete with other fish species, in particular innovative ones such as roach, bream and rudd? If so are the trout under threat?

The project also aims to determine if the pollan are still present in the Lough and seeks to answer the following:

- Where do Lough Derg Pollan spawn?
- Are Zebra mussel, a non-native new arrival to the lough, a threat to Pollan eggs in the spawning beds?
- Do non-native fish species such as Roach, Bream and Rudd compete with Pollan?

Local angling clubs are collecting trout samples for both genetic and stable isotope analysis. This analysis is carried out in Queen's University Belfast (genetic analysis, team leader Dr Paulo Prodohl) and Canada (stable isotope analysis, team leader, Prof. Mike Power, University of Waterloo).

Results to date

The Lough Derg Pollan have been shown to be genetically different from Pollan in the other three lakes studied.

4.2. The Cabragh Wetlands Trust

Cabragh Wetlands is a rich area of natural floodplain along the River Suir near Thurles in Co. Tipperary. As well as habitats such as callows grassland, reed swamp, springs and fens it supports important numbers of wintering wildfowl. A number of notable species of flora and fauna are found in the wetlands and the entire site is protected under Irish and European nature conservation designation. Cabragh Wetlands Trust was set up in 1992 to acquire and hold land purchased from Irish Sugar Company for nature conservation, following the infilling of waste filtering lagoons and Cabragh, formerly an important wintering bird area. Since then the Trust

has commissioned reports on the wetlands, their flora, fauna and habitats and cultural heritage as well as recommendations for managing and developing the area for conservation and education. Acting on these reports, the Trust has built a wetlands visitor centre, bird hides and walkways and promoted environmental education and awareness of the wetlands, and biodiversity in general, through the dedication, commitment and hard work of the volunteers (Muyllaert 2006).

In the short term, the trust would like to expand the area of wetlands under their stewardship. As adjacent land has recently come up for sale, the opportunity for this expansion has arisen. Major capital is required for this expansion.

The longterm and ongoing vision for the trust is to become an interpretative centre to promote the unique heritage and environment of the surrounding region. Possible partners for this initiative are local tourism groups. Currently the wetlands centre is a educational resource for local primary schools. Once a month a cultural evening of music and song is held at the centre. Bird ringing courses conducted by BWI are also held at the centre.

5.0. Threats to biodiversity

As mentioned in previous sections there are many threats to specific habitat and species throughout the county. To summarise:

- Destruction and fragmentation of habitats which is particularly damaging for “sedentary” species.
- Illegal dumping
- Spread of invasive terrestrial and aquatic species
- Overgrazing
- Abandonment of habitat, i.e. undergrazing
- Burning
- Peat cutting
- Afforestation in peatland, upland and lowland habitats. Especially on marginal land. In Tipperary the trend is upland habitat loss to coniferous trees and lowland habitat loss mainly to deciduous trees.
- Drainage of wetlands.
- Intensification of agricultural practices.
- Nutrient enrichment of callows due to the use of fertilisers and pollution from run off of herbicides from adjacent lands
- Eutrophication of lakes and water courses due to a variety of effluents.
- Unsustainable development near sites of high conservation value
- One-off marinas and housing along the lakeshore.
- River drainage schemes.
- River and lake engineering
- Mining and quarrying

- Road construction

Other significant threats include alien terrestrial plants and animals:

Alien Terrestrial Plants

The following alien terrestrial plants have been identified as potential threats to biodiversity in North Tipperary, (Coroi 2004):

Japanese knotweed, *Polygonum cuspidatum*

Giant knotweed *Polygonum sachalinense*

Himalayan knotweed *Polygonum polystachyum*

Rhododendron *R ponticum*

Cherry laurel *Prunus laurocerasus*

Giant hogweed *Heracleum* mantegazzianum

Himalayan balsam *Impatiens glandulifera*

The most notorious invasive plants present in County North Tipperary are Japanese knotweed *Polygonum cuspidatum* and giant hogweed *Polygonum sachalinense*. Waterways and road networks enhance the spread of these species by favouring seed dispersal either through flowing water (rivers and streams) or human activities (roads). Himalayan balsam *Impatiens glandulifera* is also dispersed by water, but is less aggressive than Japanese knotweed *Polygonum cuspidatum* and giant hogweed *Heracleum mantegazzianum*. Rhododendron *R ponticum* is less invasive in County North Tipperary in comparison to other parts of Ireland (e.g. Killarney), probably because of the geological substrate (mainly limestone) that is less suitable for this species. Conversely, cherry laurel *Prunus laurocerasus* seems to be widespread in County North Tipperary, both planted in gardens and self-sown in the wild. Therefore, it is important to raise public awareness of the threat that this shrub can pose to wildlife and biodiversity (Coroi 2004). Cotoneaster *Cotoneaster* species also seems to be spreading on Limestone pavement and is spread by birds (pers comm. D.Nash). Giant knotweed *Polygonum sachalinense* appears to be rare and in decline in County North Tipperary, and the threat posed by this species is insignificant in comparison to that of Japanese knotweed *Polygonum cuspidatum*. Himalayan knotweed *Polygonum polystachyum* is very invasive, and is localised within County North Tipperary. Therefore, this species could be the subject of an eradication programme.

It is important also to avoid the planting of 'wild' flower seed mixes on roadsides, etc. These mixtures tend to contain plants that are neither local, regional or national in origin and thus introduce aliens which may superficially resemble native vegetation similarly the planting of alien shrubs and trees on roadsides should be strictly avoided (pers comm. D.Nash).

Alien Animals

The most notable invasive animal species in addition to the zebra mussel (See section 2.2.7) in North Tipperary are American mink, and grey squirrel. Given the present distribution and abundance of these species in Ireland (including County North Tipperary), their eradication is no longer considered feasible. Therefore, all efforts

should concentrate on limiting the negative impacts that these animals may have on the native biodiversity and the Irish economy (Coroi 2004).

Recommendations for the management of alien species in County North Tipperary (from Coroi (2004)).

- Create and maintain a database of alien species in County North Tipperary
- Raise public awareness of the environmental and economic risks involved by invasive alien species. This is essential in order to prevent the accidental or intentional introduction of invasive alien species, and to make control and eradication programmes successful. Measures include educational programmes (e.g. in schools), and information (posters, brochures) available in community centres, tourist centres, anglers clubs, local media, websites etc.
- Monitor and regularly survey invasive and potentially invasive species and the habitats most vulnerable to alien species invasion.
- Produce and implement, control and eradication plans for invasive alien species. Co-funding and concerted efforts of all responsible organisations are required for these programmes to be successful. Control is the only option for most invasive alien species in County North Tipperary. Himalayan knotweed is suitable for an eradication programme as the population is still small and localised within County North Tipperary. Given the development of Himalayan knotweed stands on roadsides, it is likely that the species will spread to new areas in the future if no control measures are taken.

A key Action of this Plan is to develop an alien species strategy for North Tipperary (to include plants and animals, terrestrial and aquatic) in line with the All Ireland Invasive Species Initiative (www.invasivespeciesireland.com). This will involve (a) continued support to groups such as the Lough Derg Science Group, (b) establish an alien species awareness programme for council staff, general public, target groups, (c) Publish information material with advice on recognising problematic alien species and how to deal with them, (d) develop and implement council policy for dealing with invasive species (i.e. direct action, planning control, by-laws etc.). Cooperation between neighbouring counties will be an important element of this action.

6.0. Policies/ legislation

The most important legislation underpinning biodiversity and nature conservation in Ireland is the Wildlife Act, 1976 the Wildlife (Amendment) Act, 2000 and the European Union (Natural Habitats) Regulations, SI 94/1997, which have been amended twice with SI 233/1998 & SI 378/2005 .

The conservation of biodiversity in Ireland has been strengthened and expanded by EU law, most notably by the EU Birds and Habitats Directives and also by the EIA Directive (85/337/EEC) .

In 1997, the Habitats Directive was transposed into Irish national law and the relevant Regulations European Union (Natural Habitats) Regulations, SI 94/1997 represent a fundamental shift in nature conservation policy and law. These Regulations have since been amended by SI 233/1998 & SI 378/2005 (www.npws.ie).

The current list of plant species protected by section 21 of the Wildlife Act, 1976 is set out in the Flora (Protection) Order, 1999, which supercedes orders made in 1980 and 1987. It is illegal to cut, uproot or damage the listed species in any way, or to offer them for sale. This prohibition extends to the taking or sale of seed. In addition, it is illegal to alter, damage or interfere in any way with their habitats. This protection applies wherever the plants are found and is not confined to sites designated for nature conservation (www.npws.ie).

7.0. The Action Plan

There are 6 Objectives and 35 actions in this plan.

The Actions aim to:

- Address information gaps in the county e.g. initiate new surveys and mapping projects,
- Increase understanding and raise awareness of biodiversity at various levels such as training programmes, production of leaflets, talks, and schools initiatives.
- Maintain and/or enhance biodiversity through management practices e.g. propose measures for habitat protection or enhancement, appropriate hedge trimming policies, appropriate management of waterways, best practice guidelines.
- To promote enjoyment of the county's biodiversity, through increased knowledge of its richness and variety by supporting projects and initiatives and facilitating the gathering and distribution of biodiversity information.

These Actions also propose to identify Local Biodiversity Areas and develop policies for their protection.

Objective1: To put in place resources to ensure implementation of the North Tipperary County Biodiversity Action Plan

No.	Key Action Area	Potential Partners
1	Seek resources to enable the appointment of a County Biodiversity Officer. • To implement the Action Plan • To advise the County Council in relation to biodiversity-related issues and the councils legal obligations; • To liaise with NPWS in relation to planning issues.	North Tipperary County Council
2	Set up a Biodiversity Working Group The BWG will assist the Biodiversity Officer in the implementation of the Action Plan and will (a) formulate a set of criteria for prioritising habitats and species for future action; and (b) identify and review priority habitats and species. This group could also oversee the work of the Biodiversity Officer	North Tipperary County Council, NPWS, SRFB, Tipperary Institute, IPCC, BSBI, The Forest Service, Coillte, ENGOs and others

Objective 2: To conserve local, national and internationally important species and habitats in North Tipperary

3	Biodiversity Audit Gather all available information on biodiversity in County North Tipperary	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, ShRFB, IPCC, Tipperary Institute, BWI, NPWS, and others
4	To protect SACs, NHAs and SPAs, through the correct implementation of the EC (Natural Habitats) Regulations, 1997 and the EC Directive on the Conservation of Wildbirds 1979, and the Wildlife (Amendment) Act 2000, by the Statutory Bodies that have direct responsibilities under said legislation.	NPWS, North Tipperary County Council, OPW, the Forest Service
5	To provide protection to sites that support high levels of biodiversity. This will be achieved by (a) developing a map of local biodiversity areas that planners can consult during the decision making process and (b) developing an on-line database for county biodiversity information. Develop criteria for identifying these sites. These sites should be listed and mapped in the County Development Plan in order to afford them some level of protection e.g. ecological assessment should be required for any planning applications that might impact on these areas.	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, Tipperary Institute, ShRFB, IPCC, BWI, NPWS and others
6	To address the information gap regarding 'Fens and Springs' and 'Cutover bogs' in North Tipperary by identifying, surveying and mapping these habitat types in the county	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, Tipperary Institute , Coillte, IPCC, BWI, NPWS
7	To address the information gap regarding 'Heaths' in North Tipperary by identifying, surveying and mapping heath sites in the county	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, SRFB, IPCC, BWI, NPWS, BSBI, Coillte and others
8	To increase the knowledge of 'Turloughs' in the county by identifying, surveying and mapping the turlough sites and investigating practical means to conserve and enhance non-designated turlough sites in the county.	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, SRFB, Tipperary Institute, IPCC, BWI, NPWS, BSBI

		and others
9	To enhance riparian corridors by (a) Restoring stream habitats and recreating stream habitat variability, (b) Protecting and enhancing riparian zones with balanced ecology approach incorporating open breaks and shady areas and (c) to address the fish passage issues at Ardnacrusha and other dams in conjunction with neighbouring county councils.	North Tipperary County Council, Neighbouring County Councils, Biodiversity Officer, Biodiversity Working Group, ShRFB, Tipperary Institute, IPCC, BWI, NPWS, Coillte, The Forest Service, and others
10	To further the knowledge of hedgerows in the County by conducting a Hedgerow survey and to identify 'heritage' hedges that can be given greater consideration in the planning process.	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, ShRFB, IPCC, BWI, NPWS, The Forest Service, and others
11	To develop an alien species strategy for North Tipperary (to include plants and animals, terrestrial and aquatic) in line with the All Ireland Invasive Species Initiative (www.invasivespeciesireland.com). This will involve (a) continued support to groups such as the Lough Derg Science Group, (b) establish an alien species awareness programme for council staff, general public, target groups, (c) Publish information material with advice on recognising problematic alien species and how to deal with them, (d) develop and implement council policy for dealing with invasive species (i.e. direct action, planning control, by-laws etc.). Cooperation between neighbouring counties will be an important element of this action.	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, ShRFB, Lough Derg Science Group, Tipperary Institute, IPCC, BWI, NPWS, The Forest Service, ENGOs and others. In Co-operation with neighbouring Conunty Councils
12	To raise awareness of the importance of Pollan, both nationally and internationally, as well as providing continued support for projects such as Lough Derg Native Fish Biodiversity Project (www.loughderganglers.com) and others.	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, ShRFB
13	To raise awareness of the national and international conservation importance of 'Croneen' trout, as well as providing continued support the Lough Derg Native Fish Biodiversity Project (www.loughderganglers.com) and others, which aim to address information deficiencies in relation to the status, ecology and conservation of Croneen Trout.	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, ShRFB
14	To address the information gap regarding bat species in the county by:	North Tipperary County Council, Biodiversity

	(a) Identifying important bat sites within the county, (b) Investigating practical ways to protect bat roosts that are not designated, and (c) Raise awareness of the importance of the species, e.g. bridges	Officer, Biodiversity Working Group, BCI and others
15	To monitor the status of red and grey squirrel populations following on from information gathered in the recent red squirrel srvey (Carey *et al*. 2007).	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, NPWS and others
16	To address the information gap regarding Kingfisher in the county by: (a) Identifying important kingfisher rivers within the county, (b) Investigating practical ways to protect nest sites along rivers that are not designated, and (c) Raise awareness of the importance of the species.	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, BWI, NPWS, ENGOs and others
17	To address the information gap regarding the Marsh Fritillary in the county by: (a) Identifying important sites within the county for this butterfly, (b) Investigating practical ways to protect breeding sites that are not designated, and (c) Raise awareness of the importance of the species.	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, Tipperary Institute, IPCC, NPWS, ENGOs and others
18	To address the information gap regarding Dragonflies in the county by: (a) Identifying important dragonfly sites, (b) Investigating practical ways to protect important sites, and (c) Raise awareness of the importance of the species.	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, Tipperary Institute, IPCC, NPWS, ENGOs and others
19	Raise awareness of priority species and habitats in the county through the production Leaflets, posters, and the provision of guided walks and talks.	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, Cabragh Wetlands Trust, Tipperary Institute,
20	Seek to Influence local, national, policies and plans to ensure that they address the key factors affecting habitats and species	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, Tipperary Institute,

22	A key action of this Biodiversity Plan is the facilitation of the development of conservation management plans for biodiversity areas in the main towns in North Tipperary	North Tipperary County Council, Biodiversity Officer, Biodiversity Working Group, Tipperary Institute, ShRFB.

Objective 2: To incorporate and/or raise the profile of biodiversity issues in local authority policy and planning.

23	Develop and provide biodiversity training for local authority staff including all existing staff and new appointments	Biodiversity Officer, North Tipperary County Council,
24	Promote greater communication between local authority and NPWS in relation to planning issues	Biodiversity Officer, North Tipperary County Council, Biodiversity working group, NPWS
25	Develop guidelines for planners in the conservation importance of local biodiversity areas, e.g. prioritisation of different types of hedgerows, retaining trees in developments, wetlands	Biodiversity Officer, North Tipperary County Council, training providers –as appropriate, consultants

Objective 3: To promote best practice in biodiversity management and protection.

26	Produce and disseminate information regarding best practice (for example, in relation to control of invasive species, timing and cutting of hedgerows, composting, etc), for land owners and the general public	North Tipperary County Council, Teagasc, SRFB, NPWS, IPCC. Neighbouring County councils
27	Support demonstration projects for positive land management to enhance biodiversity. For example, management of species-rich grassland, hedgerow management,	NPWS, Coillte, Teagasc, Birdwatch Ireland, The Forest Service. Cabragh Wildlife Trust

Objective 4: To facilitate the dissemination of biodiversity information.		
28	Continue to update and maintain the Biodiversity Page of the County Heritage Website and have on-line access to all biodiversity reports that have been conducted within the County.	Biodiversity Officer
29	Develop an on-line database for county biodiversity information. GIS referenced where possible	North Tipperary County Council, NPWS, Biodiversity Working Group, Biodiversity Officer, ENGOS, Tipperary Institute, academic institutions

Objective 5: To raise awareness of North Tipperary's biodiversity and encourage people to become involved in its conservation		
30	Develop and Implement biodiversity awareness education program for schools	Biodiversity officer, Cabragh Wetlands Trust, NPWS, Biodiversity Working Group, Tipperary Institute, ENGOs
31	Hold talks and other biodiversity awareness raising events.	Biodiversity officer , Cabragh Wetlands Trust, NPWS, Biodiversity Working Group, Tipperary Institute,
32	Support initiatives to raise awareness of biodiversity.	North Tipperary County Council, Biodiversity Officer, Tipperary Institute, Tourism groups.

33	Develop initiatives to make 'biodiversity' more accessible to the public. (a) Create more bird hides, observation areas, nature trails (b) continued support of Cabragh Wildlife Trust, and other local groups and (c) Signage to highlight the importance of local areas of conservation importance, such as Carney Commons.	Biodiversity officer, Cabragh Wetlands Trust, NPWS, Biodiversity Working Group, North Tipperary County Council, Biodiversity Officer, Tourism groups.

Objective 6: To Monitor and Review the Local Biodiversity Action Plan

34	Establish a long term programme to measure the effectiveness of the LBAP	Biodiversity Officer, Biodiversity Working Group
35	Report on progress in fulfilling the Actions in the Plan	Biodiversity Officer

8.0 References

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Appendices

Appendix I: List of Consultees

Name	Organisation
Rick Boelens	Lough Derg Science Group
Dan Minchin	Lough Derg Science Group
Michael Maunsell	Tipperary Institute, Thurles
Cllr Seamus Hanafin	North Tipperary County Council
Cllr Tom Harrington	North Tipperary County Council,
Mr Brian Beck	North Tipperary County Council, Planning Department
Ms Mary Cahalan	Tipperary Leader Group
Mr Camin O'Brien	Department of Environment, Heritage and local Government, Monuments Service
Mr Michael Somers	Teagasc, Nenagh,.
Mr John Madden	The Forest Service
Mr Brian Keating	Shannon Development
Ms Kathleen Vandenburghe	An Taisce,
Ms Jane Coman	Bird Watch Ireland,
Mr Charles Stanley Smith	Inland Waterways Association,
Mr Cyril Cullen	Chamber of Commerce,
Mr Cormac McCarthy	Waterways Ireland,
Dr Fran Igoe	Shannon Regional Fisheries Board
Mr Stefan Jones	District Conservation Officer, NPWS.,
Mr Bart Venneman	Conservation Ranger, NPWS
Dr David Nash	BSBI recorder
Ms Mieke Muyllaert	Envirionmental Consultant
Kevin Collins	BWI

Mr Pat Neville	Company Ecologist, Coillte,
Dr Tina Aughney	Bat Conservation Ireland
Conor Kelleher	Bat Conservation Ireland
Dr Niamh Roche	Bat Conservation Ireland
Dr Jim Martin	BEC Consultants,
Michael Long	Cabragh Wetlands Trust
Arthur Guest	Tipperary Lakeside.
Angela Quinn	North Tipperary ICA
Stephen Heery	Ecologist
Dr Evelyn Moorkens	Consultant.

Appendix II : List of Designated areas in North Tipperary (www.NPWS.ie)

pNHAs Total: 44

SiteCode	SiteName
11	LOUGH DERG
216	RIVER SHANNON CALLOWS
564	RIVER LITTLE BROSNA CALLOWS; NEW BRIDGE - RIVER SHANNON
583	ROSCREA BOG
585	SHARAVOGUE BOG
640	ARRAGH MORE BOG
641	BALLYDUFF/CLONFINANE BOG
642	BALLYMACEGAN BOG
647	KILCARREN-FIRVILLE BOG
648	KILLEEN BOG
650	LOUGH OURNA
652	MONAINCHA BOG/BALLAGHMORE BOG
653	NEWCHAPEL TURLOUGH
654	REDWOOD BOG
656	ST. ANNE'S, (SEAN ROSS ABBEY), ROSCREA
890	CANGORT BOG
929	CLAREEN LOUGH
930	CLARE GLEN
931	DERRYGAREEN HEATH
932	FIAGH BOG
933	FRIAR'S LOUGH
934	KILDUFF, DEVILSBIT MOUNTAIN
936	LOUGH NAHINCH (TIPPERARY)
937	SCOHABOY BOG
938	SHEEHILLS ESKER
939	SILVERMINE MOUNTAINS
941	SPRING PARK WETLANDS
942	TEMPLEMORE WOOD
943	WILLSBOROUGH ESKER
1133	NENAGH RIVER GORGE
1178	KILLAVALLA WOOD
1197	KEEPER HILL
1683	LISKEENAN FEN
1684	LORRHA BOG
1853	NORE VALLEY BOGS
1934	CABRAGH WETLANDS
1995	LOUGH AVAN
2060	AGHSMEAR HOUSE
2066	ORMOND'S MILL, LOUGHMOE, TEMPLEMORE
2124	BOLINGBROOK HILL
2211	
2385	
2450	

cSACs Total: 15

SiteCode	SiteName
216	River Shannon Callows
585	Sharavogue Bog
641	Ballyduff/Clonfinane Bog
647	Kilcarren-Firville Bog

930	Clare Glen
934	Kilduff, Devilsbit Mountain
939	Silvermine Mountains
1197	Keeper Hill
1683	Liskeenan Fen
2124	Bolingbrook Hill
2137	Lower River Suir
2165	Lower River Shannon
2241	Lough Derg, North-East Shore
2258	Silvermines Mountains West
2353	Redwood Bog

SPAs **Total: 4**

SiteCode	SiteName
4058	Lough Derg (Shannon) SPA
4086	River Little Brosna Callows SPA
4096	Middle Shannon Callows SPA
4165	Slieve felim/Silvermines SPA

APPENDIX III: List of protected species in North Tipperary (www.NPWS.ie)

Key to table

EU HD	**EU Habitats Directive (Council Directive 92/43/EEC)**
II	**Annex II animal and plant species**
IV	**Annex IV animal and plant species**
V	**Annex V animal and plant species**
EU BD	**EU Birds Directive (Council Directive 79/409/EEC)**
I	**Annex I bird species**
WA	**Wildlife Act (1976) & Wildlife (Amendment) Act (2000)**
P	**Protected species**
FPO	**Flora Protection Order (date)**
RDB	**Red Data Book Category**
Ex	**Extinct**
E	**Endangered**
V	**Vulnerable**
R	**Rare**
I	**Indeterminate**
II	**Internationally Important**
-	**Species not listed**

Vascular Plants

		EU HD	**FPO 1999**	**FPO 1980**	**RDB**
Trichomanes speciosum	Killarney fern	**II, IV**	**+**	**+**	**RV**
Inula salicina	Irish fleabane	**-**	**+**	**+**	**V**
Acinos arvensis	Basil thyme	**-**	**+**	**+**	**V**
Pseudorchis albida	Small white orchid	**-**	**+**	**+**	**V**
Eriophorum gracile	Slender cotton grass	**-**	**+**	**+**	**RV**
Hordeum secalinum	Meadow barley	**-**	**+**	**+**	**V**
Orchis morio	Green-winged orchid	**-**	**-**	**+**	**V**
Cephalanthera longifolia	Narrow leaved Helleborine	**-**	**+**	**-**	**V**
Groenlandia densa	Opposite leaved pondweed	**-**	**+**	**+**	**v**
Prunus padus	Bird cherry	**-**	**-**	**-**	**-**
Teucrium scorodium	Water germander	**-**	**-**	**-**	**-**
Ophrys insectifera	Fly orchid	**-**	**-**	**-**	**-**
Lathyrus palustris	Marsh pea	**-**	**-**	**-**	**-**
Orobanche hederae	Ivy broomrape	**-**	**-**	**-**	**-**
Stellaria palustris	Marsh stitchwort	**-**	**-**	**-**	**-**
Spiranthes spiralis	Autumn Lady's tresses	**-**	**-**	**-**	**-**
Carex pseudocyperus	Cyperus sedge	**-**	**-**	**-**	**-**
Frangula alnus	Alder buckthorn	**-**	**-**	**-**	**-**
Epipactis palustris	Marsh helleborine	**-**	**-**	**-**	**-**
Pyrola minor	Common wintergreen				

Stoneworts

Chara tomentosa	Stonewort	**-**	**-**	**-**	**R**

Mammals

		EU HD	**RDB**	**WA**	**Bern**
Pipistrellus pipistrellus	Pipistrelle	**IV**	**II**	**P**	**III**
Nyctalus leisleri	Leisler's Bat	**IV**	**II**	**P**	**II**
Myotis natterrerei	Natterer's Bat	**IV**	**I**	**P**	**II**
Pipistrellus pygmaeus	Soprano pipistrelle	**IV**	**II**	**P**	**II**
Myotis daubentonii	Daubenton's Bat	**IV**	**II**	**P**	**II**
Plecotus auritus	Brown Long Eared Bat	**IV**	**II**	**P**	**II**

Lutra lutra	Otter	**II, IV**	**II**	**P**	**II**
Meles meles	Badger	**-**	**II**	**P**	**III**
Sciurus vulgaris	Red squirrel	**-**	**-**	**P**	**-**
Martes martes	Pine marten	**V**	**II**	**P**	**II**
Lepidicus timidus hibernica	Irish hare	**V**	**II**	**P**	**III**
Erinaceus europaeus	Hedgehog		**II**	**P**	**III**

Insects

		EU HD	**RDB**	**WA**	**Bern**
Euphydryas aurinia	Marsh Fritillary	**II**			

Amphibians

		EU HD	**RDB**	**WA**	**Bern**
Rana temporaria	Common frog	**V**	**II**	**P**	**III**

Fish

		EU HD	**RDB**	**WA**	**Bern**
Petromyzon marinus	Sea Lamprey	**II**	**I**		**III**
Lampetra planeri	Brook Lamprey	**II**	**I**	**-**	**III**
Coregonus pollan	Pollan	**V**	**E**	**-**	**III**
Salmo salar	Atlantic salmon	**II,V**	**II**	**-**	**III**

Birds

		EU BD	**RDB**	**WA**	**Bern**
Crex crex	Corncrake	**I**	**E**	**P**	**II**
Anas clypeata	Shoveler		**R**	**P**	**III**
Limosa limosa	Black tailed godwit		**R**	**P**	**III**
Pluvialis apricaria	Golden plover	**I**	**V**	**P**	**III**
Cygnus columbianus bewickii	Bewicks swan	**I**		**P**	
Calidris alpina	Dunlin		**V**	**P**	**III**
Anser albifrons flavirostris	Greenland White Fronted Geese	**I**	**II**	**P**	**III**
Anas acuta	Pintail		**R**	**P**	**III**
Aythya farina	Pochard		**R**	**P**	**III**
Circus cyaneus	Hen Harrier	**I**	**E**	**P**	**III**
Falco columbarius	Merlin	**I**	**R**	**P**	**II**
Falco peregrinus	Peregrine	**I**	**II**	**P**	**II**

Appendix IV: Summary of Coillte Information for Tipperary

The following site information is from biodiversity surveys of FMU (Forest Management Unit) Mid Tipp/Rossmore Plateau FMU 403 and Slieve Felim/Devil's Bit FMU 404. These sites should be incorporated in to a 'Local biodiversity Areas' dataset for North Tipperary. These FMUs span a number of counties, however, the information specific to North Tipperary has been extracted below.

From FMU 403 Report (Heery 2004):

Timoney 13 33.0 ha S185 833

This medium-sized Biodiversity Area is a complex mosaic of native woodland, broad-leaved woodland, mixed woodland and conifer plantation. There are many individuals of different pre-Coillte conifer and broad-leaved trees including 100 year old Oaks. A notable feature is the abundance of old Holly trees. The site is situated on terraces of Old Red Sandstone conglomerate and is adjacent to an Ancient Monument site of standing stones.

Sopwell 15 77.0 ha R965 925

Half this Biodiversity Area is very good quality raised bog dome, part of the very much larger, good quality Scrohaboy Bog NHA 937, and contains a good pool system with scarce plant species. Conifer plantation at the junction with mineral soil has some semi-natural features and can be restored to native woodland. Conifer plantation on the dome can also be restored to open habitat.

Oblong-leaved sundew *Drosera intermedia* and Many-stalked spike-rush *Eleocharis multicaulis* are both plants with a western distribution in Ireland, the former very rare east of the Shannon. Both were found (with Great sundew *Drosera anglica*) in the good pool system on Scrohaboy bog at Sopwell 15. If the pools are kept in good condition by the management recommended then the populations should remain.

Knockanacree 16 42.2 ha R975 900

This is a relatively large species-poor Beech woodland which can be restored to a more diverse broad-leaved woodland.

Corville 17 68.9 ha S156 875

This is a large complex of native woodland and conifer plantation based on contrasting substrate of very old cut-over bog cut down close to the mineral sub-soil, and hillocks of glacial sand. Three locations within the site contain significant populations of the rare plant Common wintergreen *Pyrola minor*. Other parts have a fen understorey.

Longorchard 23 15.9 ha S203 695

This is a small 'island' of semi-natural vegetation among industrially harvested bog and conifer plantation. It is an area of dry, old *Calluna*-dominated cut-over bog with scattered mature Scots pines and regenerating birch. An area of damp birch thicket is included.

BNM Derryhogan 24 14.1 ha S213 535

This site has 20 year old Oak, and regenerating grassland, some of it typically species rich, on industrial cut-away bogland. It is an island in industrially harvested peat bog. Wet ditches contain breeding populations of heathland or Keeled Skimmer dragonfly *Orthetrum coerulescens*.

Moyaliffe 25 34.1 ha S052 551

This Biodiversity Area is based on a relatively large, isolated good quality wet Alder-Willow woodland on fen peat. Native woodland is regenerating and can be restored over much of the remainder. The remnant trees of mature wet Oak-Ash woodland occur.

Dovea 27 29.8 ha S080 624

A Native Woodland Scheme site. Clearfell on cut-over peats is to be restored to dry birch woodland by planting and natural regeneration.

Sheehys 28 17.2 ha S156 870

A Native Woodland Scheme site. Clearfell on cut-over peats is to be restored to dry birch woodland by planting and natural regeneration.

Longfordpass South 33 24.25 ha S250 570

This Biodiversity Area is based along 2 kms of the good quality Black River (in the Suir catchment). The existing near riparian zone of tall grass and herbs will be enhanced by the conversion of conifer plantation to semi-natural scrub, creating a significant strip of semi-natural vegetation. This site contains the longest stretch of lowland river in the FMU, with excellent near-riparian semi-natural habitat which can be extended.

Bawnreagh 41 19.4 (on border of North Tipperary) S 247 568

This Biodiversity Area is based on an unplanted degraded raised bog dome and regenerating cut-over adjacent to recolonising industrial cut-away bog. It also includes the Black River, being an extension of Longfordpass South 33.

Emmel 43 19.0 ha R975 840

This is mostly conifer plantation on damp peat, capable of restoration to damp bog woodland. The site includes a species-rich marsh.

From FMU 404 report (Heery 2003):

1. Coneen (Nenagh River gorge) 47.6ha **R 910675**

Coneen is situated along a very steep-sided Nenagh River gorge cutting through Ordovician sandstone. The sides are occupied by semi-natural scrub, woodland and dry heath and conifer plantation with restoration potential. The river itself contains a narrow ravine woodland and waterfalls. Poorly established plantation on the southerly watershed are included as hen harrier habitat. The site includes all of Nenagh River Gorge NHA 1133.

2. Castlelough 47.2ha **R740 836**

Castlelough is a mixed and broad-leaved lake-shore woodland with over-mature native and non-native trees and the remains of former parkland stumps. There are also areas of conifer plantation with good potential for restoration to wet Pedunculate oak-Ash woodland. The lake-shore woodland is part of Lough Derg NHA 11.

3. Devil's Bit 51.5ha **S 057 739**

Devil's Bit is based on good quality dry heath on and around a plateau of Ordovician sandstone, 500 m above sea-level. One side of the plateau contains an Old Woodland site with restoration potential. The site is included in the Kilduff/Devil's Bit Mountain SAC 934.

10. Borrisnoe 23.8ha **S 060 770**

Borrisnoe is situated along 1.5 kms of steep sided ravine at the source of the River Suir. A significant amount of semi-natural woodland and scrub exists along the ravine and the remainder is conifer plantation with restoration potential. An unusual feature is a half hectare rich quaking flush with dominant Great horsetail *Equisetum telmateia*.. Borrisnoe 10 is the longest stretch of valley in the FMU. It contains excellent semi-natural ravine and valley habitats and has the potential to expand these three fold by restoration.

11. Crumlin Big 15.7ha **S 098 791**

Crumlin Big is a small semi-natural ravine woodland/scrub at the northern end of the mountains in the FMU.

12. Mauherslieve 91.0ha **R 870 619**

Mauherslieve is a large area of intact wet heath at the 520m summit of Mauherslieve. Sheep's bit *Jasione montana* and Goldenrod *Solidago virgaurea* grow on the summit cairn. A large area of patchy and poorly stocked conifers is included as Hen Harrier habitat. There is also a ravine with restoration potential.

13. Laghile 23.1ha **R 890 593**

Laghile is a conifer plantation which lies along the floodplain of the Bilboa River, an important salmonid river and candidate SAC. Much of the plantation is poorly stocked and has good potential for restoration to floodplain wet grassland and scrub.

14. Lahid/Lisnageenly 87.4ha **R 857 700**

Lahid is partly an Old Woodland site with pockets of semi-natural woodland and restoration potential to broad-leaved along the river and mixed woodland at the wide head of the valley.

Blanket bog, wet heath and poorly stocked conifer plantation on the watershed are included as Hen Harrier habitat.

15. Cureeny 47.8ha **R 912 650**

Cureeny has two sections. One is semi-natural ravine Hazel-Ash woodland/scrub. The other is based on the restoration of a riparian scrub/grassland along one kilometre of stream from a fen on the edge of open moorland. Poorly stocked conifers and small areas of unplanted bog are included as Hen Harrier habitat.

17. Knockane/Glashnaglanna River. 71.1ha R669 847

Knockane/Glashnaglanna has two parts. One is based on the restoration of grassland and scrub along two streams totalling 3 kms in length, one of which has existing semi-natural ash-hazel woodland/scrub. The other is an area of intact wet heath/blanket bog.

19. Doonane/Boolatin50.8ha **R 799 665**

Doonane/Boolatin is a dispersed site containing Larch (with Beech) and Corsican pine woods with semi-natural features and cliff top dry heath. Areas of poorly stocked conifers are included as hen harrier habitat. A riparian and buffer zone along the Doonane River, and important salmonid river and a candidate SAC is also included.

20. Glencroe/Bleanbeg 115.9ha **R788 640**

Glencroe/Bleanbeg is a large site consisting of blanket bog and cut-over bog. The cut-over bog is regenerating to wet heath. The site also includes a small ravine woodland/scrub.

21. Ballyhourigan 54.8ha R790 667

Ballyhourigan centres on a two km stretch of stream in a wide valley whose source is the flanks of Keeper Hill. There is a narrow zone of semi-natural ravine oak-ash woodland along the stream that has extension potential. Wet heath, a large area of dry heath regenerating after clearfell and the restoration of an Old Woodland site with springs are also included.

22. Keeper Hill 303.4ha **R 823 663**

Keeper Hill has a very large area of intact wet heath, dry heath, blanket bog and sandstone cliffs on its 700 m summit. Areas of poorly stocked conifers are included as Hen Harrier habitat and the site is extended down two valleys. The site is included in Keeper Hill SAC 1197.

23. Lateragh 11.7ha S010 714

Lateragh is a small but good quality area of dry heath on the 438m summit of Knockanora Hill.

27. Corbally (Arra Mountains) 66.9ha R750 770

Arra Mountains is a dispersed site. There is a large block of undeveloped Lodge-pole pine on skeletal soils over slate with a developing woodland flora and an abandoned slate quarry and spoil heap. The remainder is scattered areas of unplanted blanket bog, cut-over and heath. These are included as Hen Harrier habitat.

30. Shanballyedmund 31.1ha **R 790 600**

Shanballyedmund has a small but good quality raised bog (with abundant cranberry *Vaccinium oxyccocus*) in a break of slope on a hillside. A small area of blanket bog at the top of the slope and a small area of flood-prone plantation and clearfell are joined by 1.5 km of riparian zone restoration.

31. Castletown13.9ha

Castletown is a small conifer plantation with very good potential for restoration to the woodland type oak-ash woodland, rich in species.

32. Barnane18.7ha **S063 715**

Barnane is a small Old woodland site, including an area of 30 year old planted oak and ash developing semi-natural characteristics. The remainder is a Norway spruce plantation with numerous mature and over-mature, spreading oaks. This has restoration potential.

37. Killeen19.9ha **R800 617**

Killeen is based on a small but unusual stand of beech at relatively high altitude, rich in flowering fungi. This will be expanded by restoration of similar habitat along a steep-sided valley.

38. Bauraglanna (Silvermines) 9.9ha **R838 700**

Bauraglanna has a small area of wet heath on the edge of Silvermines SAC and there is also a stand of damp undeveloped Inland Lodge-pole pine with an epiphytic lichen flora.

Hen harrier *Circus cyaneus*

The hen harrier is a large bird of prey, listed in Annex 1 of the E.U.Birds Directive. In the breeding season it nests and hunts generally above the 300m contour. It will nest in pre-thicket stage forestry (both in afforestation and reforestation), rank heather and scrub. It hunts over the same habitats but especially over unplanted open moorland. Coillte has written an action plan for the species Fuller (2003), and they are in close consultation with the local Conservation Rangers regarding the Hen Harrier's protection.

Norriss et al (2002) conducted a national survey of breeding hen harriers and mapped their distribution in 10 km squares. In the Slieve Felim FMU the following Biodiversity Areas are the ones that lie within the 10km breeding squares and also contain good Hen Harrier breeding habitat: Coneen (Nenagh R. gorge) 1; Slieve Felim 9; Mauherslieve 12; Lahid/Lisnageenly 14; Cureeny15; Knockane/Glashnaglanna 17; Doonane/Boolatin 19; Glencroe/Bleanbeg 20; Keeper Hill 22; Corbally (Arra Mountains) 27 and Baurglanna (Silvermines 38)

All areas, however small, of unplanted ground above the 300m contour line are potential nesting habitat (if they contain lush heather or open scrub) for the Hen Harrier when surrounded by clearfell and pre-thicket reforested plantation. Furthermore, larger blocks of poorly stocked conifers above 300m will provide a relatively good hunting habitat. Again some of these are included in selected Biodiversity Areas but some lie outside.

Red grouse *Lagopus lagopus*

The Red Grouse is a scarce and possibly declining bird of heather and grass rich bog and heath. Grouse were seen at Slieve Felim 9 during the survey and are reported to be present at Lahid 14, Glencroe/Bleanbeg 20, Keeper Hill 22 and Kilmore/Bahagha 25. No special measures need to be taken to conserve this species at these sites.

APPENDIX V: Water beetle records for North Tipperary.

Water Beetle Records

Based on 27,000 records for Ireland, 242 taxa of wetland beetle are evaluated for the conservation status using the world Conservation Union (IUCN) 2001 criteria. Nine species are considered to be regionally extinct, thirteen critically endangered, seven endangered, twenty two vulnerable, twenty one near threatened, and the rest at lower risk and of least concern. The importance of halting losses in brackish and running waters is identified, together with the risks to montane species associated with climate change. The importance of Ireland, however, is recognised in sustaining viable populations of many fen and lake species that are otherwise under threat in Europe. The distribution of rare and threatened species represents the tip of the recording iceberg, and inevitably includes species on which more information would be desirable (Foster and Nelson 2007).

The following list threatened water beetles in North Tipperary has been extracted from the Regional red list of water beetles 2007 (Foster and Nelson 2007). Three species are on the 'Near threatened' list, one species is rated as 'Vulnerable' and one species is 'data deficient'.:

Dryops similaris IUCN Near threatened

A member of the moss edge community associated with turloughs, first discovered in 1986. More frequent than the other members, but nonetheless threatened by loss of this special habitat.

Haliplus variegatus IUCN Vulnerable

This species appears to be doing rather better in Ireland than in other parts of Europe, possibly because of the amount of cutover bog.

Hydroporous scalesianus Mr Scales's Beetle IUCN Near Threatened

This species was discovered in Central Ireland in 1986 and has subsequently been found in many lake fens and in cutover bogs. It would be ordinarily be considered of least concern but it is extremely rare in Scotland, Wales and England, where it is associated with relict fen.

Laccornis oblongus IUCN Near Threatened

This species was first found in Ireland in Meath in 1909 and has been found in many tussocky fens, often those that have been degraded. It is raised from least concern on the basis of its association with relict fen in Scotland and England.

Nebrioporus depressus elegans IUCN Data Deficient

The depressus form in Ireland is almost certainly based on ancient introgression by *elegans*, but there appears to be a new arrival of *elegans* in the east, both forms occurring in the King's River Wicklow. This complex requires re-investigation.