

An Chomhairle Oidhreachta
The Heritage Council



County Wicklow

BIOdiversity

Action Plan 2010-2015



AN ACTION OF THE COUNTY WICKLOW HERITAGE PLAN (2009–2014)



Acknowledgements

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Spring Migrant Workshop at East Coast Nature Reserve. Photo: Birdwatch Ireland (BWI)

Wicklow Deer. Photo: Dick Coombes

Oak Tree. Photo: D. Burns

Shingle ridge at the Murrough. Photo: Birdwatch Ireland

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Epiphytic Fern. Photo: D. Burns



Badger. Photo: Faith Wilson



Waterfall at Devil's Glen. Photo: D. Burns

Address from the Cathaoirleach

As chairman of Wicklow County Council I am delighted to welcome the first Biodiversity Action Plan for County Wicklow. This Plan offers an integrated, partnership approach to protecting and managing the natural heritage of Wicklow over a five year period.

As a county, Wicklow is richly endowed with a beautiful natural landscape, encompassing coastline, mountains, rivers lakes and fields. This landscape brings many benefits for both residents and visitors, but is something that needs to be carefully managed to insure that these benefits can be enjoyed into the future.

The production of this Biodiversity Plan is the result of a consultative process involving the County Wicklow Heritage Forum, agencies and organisations charged with the protection of natural heritage, and the local community. I would like to acknowledge and commend the role of the Heritage Forum and the Heritage Officer in co-ordinating the production of this Plan, and the many individuals and groups who inputted to it. The support of the Heritage Council to this process is also much appreciated.

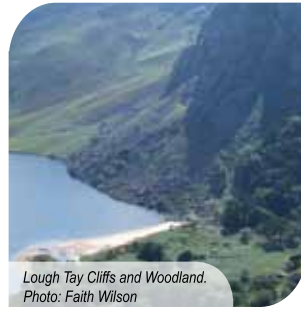
The Biodiversity Plan has been approved by the elected members of Wicklow County Council. On behalf of that council, I look forward to the implementation of this plan over the next five years.

Cllr. Tom Fortune

Cathaoirleach, Wicklow County Council



Pyramidal Orchid. Photo: D. Burns



Lough Tay Cliffs and Woodland.
Photo: Faith Wilson



Silver Washed Fritillary Butterfly.
Photo: Richard Naim, Naturaconsultants.com

Address from the County Manager

The biodiversity of County Wicklow contributes enormously to the local economy, particularly in sectors such as agriculture and forestry, but also in less apparent ways such as flooding abatement and erosion control. While often taken for granted, the maintenance of good biodiversity in County Wicklow is crucial also to the protection of our scenic landscape, and to ensuring the continuation of the associated benefits for our quality of life, recreation and tourism.

I therefore welcome the production of the first County Wicklow Biodiversity Plan. I believe that Wicklow Local Authorities, through this plan, can play an important part in addressing global and national biodiversity issues at local level, and in transposing global and national policy into local action. This Plan will assist the Council in achieving our objectives as set out in the County Development Plan and in the County Heritage Plan.

This Plan offers a framework through which actions to improve our biodiversity can be progressed. It was prepared following a consultative process which involved a wide range of individuals and organisations, including the staff of Wicklow Local Authorities and outside organisations. There is a practical focus in the Plan on improving our day to day practices, and in working with partner organisations to achieve common goals.

I would like to commend all those involved in the production of this Plan, in particular the Heritage Council for their support to the Plan process, and their ongoing support to the Heritage Office of Wicklow County Council.

I look forward to continuing to work with our partners to meet our obligations for the protection and sustainable management of our natural resources for the benefit of all.

Mr. Eddie Sheehy
County Manager, Wicklow County Council

1. Introduction to Biodiversity

1.1 What is Biodiversity?

Biodiversity, simply put, is the wealth and diversity of all living things. There is an 'official' definition of biodiversity which is "The variety of life in all its forms, levels and combinations, including ecosystem diversity, species diversity and genetic diversity". In order to understand the definition it is worth thinking about what *ecosystem diversity*, *species diversity* and *genetic diversity* mean.

Ecosystem Diversity

An ecosystem is a group of organisms and the physical environment on which they depend. Ecosystems can include a wide range of species of plants and animals and can include a variety of habitats. The actual make-up of ecosystems is influenced by many factors including landscape, geology, rainfall, elevation and many others. While we may talk about habitats such as lakes, for example, the many factors acting on the lake such as size, location, whether it is fed by rainwater coming through a bog or by underground springs, will affect important qualities such as water chemistry and nutrient levels. This, in turn, will affect the suitability of the lakes for certain species. If you add to this factors such as whether the lake is surrounded by bog or fen or woodland habitat, you will again change the suitability for suites of different species, including invertebrates, birds and mammals. Add in more factors such as elevation, then that brings in issues such as exposure, temperature and length of summer season, further affecting suitability for different species. Ecosystems are shaped by many issues and biodiversity conservation efforts need to be aimed at securing the diversity of them.



Photo: Richard Nairn, NaturaConsultants.com

Species Diversity

In general terms, where two organisms coming together are able to make viable offspring, they are considered to be a species. While some species are very adaptable,

many species have evolved with very particular needs. Where their needs can be met, those species are able to out-compete the more 'generalist' species diversity.

Habitats such as bogs and dune grasslands, for example, because of their particular conditions (bogs – wet, acidic, low available nutrients; dune grasslands – free draining, low nutrients, high calcium content from shell fragments) they support particular, often rare, species and communities. However, if you drain a bog or put fertiliser on dune grassland, then you start to remove the conditions that make those habitats unique and favour the important associated species. The balance gets tipped in favour of the more generalist species which can then out-compete the specialist ones. This may mean that your bog now has more species, but they will often be the same ones that are associated with many habitats in the wider countryside. Because you have lost the bog and dune-grassland specialist species, species diversity for the wider area decreases.



Great Spotted Woodpecker has been confirmed to be once more breeding in County Wicklow following an absence from Ireland for several centuries. Photo: Birdwatch Ireland

Genetic Diversity

Genetic diversity takes account of the difference between populations of the same species. It recognises that that different races, types or sub-species often develop either because populations of a species become separated or simply because they evolve to exploit different aspects of an ecosystem. A good example in Ireland is brown trout, where there are a number of types that are distinct from the more widespread variety of brown trout including *ferox*, *sonaghen*, *croneen* and *gillaroo*. These have all developed particular needs including what they feed on and how they breed. Some of them, such as *sonaghen*, only exist at a single site in the country. Others exist across Ireland, but at a limited number of sites. This includes *ferox* trout which exist in Lough Dan, for example. Discussions will always be ongoing as to whether these are different *varieties* or *sub-species* or even *species* of trout and at the end of the day this is an academic issue, based on the level of genetic and behavioural differences. What is clear is that, in common with all biodiversity, their survival will depend on an understanding of what they need knowledge of where they exist, and the use of conservation measures to ensure that their habitat is secure and in good condition.



Slaney river at Tomnafinnogue Woods.
Photo: D. Burns



Sphagnum moss. Photo: Faith Wilson

Biodiversity conservation then, is more than just looking after a few green areas. It is about knowing what we have, what shaped it and making sure that we do not have a negative effect on all these factors that give us biological diversity in the environment.

The Convention on Biological Diversity

The term *biodiversity* is the coming together of two words *biological diversity*, and became commonly used during the United Nations Conference on Environment and Development (UNCED) at Rio de Janeiro in 1992, also known as the 'Earth Summit'.

One of the most important things to come out of the Earth Summit was the Convention on Biological Diversity. This recognised that biodiversity is about *more* than plants, animals and their habitats. Instead it is about people and their need for medicines, food, clean water, fresh air, shelter and a healthy environment to live in. As a result of this understanding, our reliance on a healthy biodiversity has become seen as increasingly important. Biodiversity is now widely considered to be a "key test" of sustainable development, meaning that the conservation of biodiversity is an integral part of meeting sustainable development objectives.

After the Earth Summit, nations were encouraged to develop national strategies, plans or programmes for the conservation or sustainable use of biological diversity or adapt existing strategies plans or programmes for this purpose.



Photo: Richard Nairn, NaturaConsultants.com



Scots Pine Trees at Glendalough. Photo: D. Burns

The National Biodiversity Plan

Ireland produced its own National Biodiversity Plan in April 2002 which sets out actions for the promotion and delivery of biodiversity conservation at both national and local levels. Included in the Plan are two specific actions for local authorities:

- ▶ Each Local Authority to prepare a local biodiversity plan in consultation with relevant stakeholders;
- ▶ Each Local Authority to designate a contact officer for natural heritage conservation matters in its area.

The Plan also emphasises the important role of Local Authorities in promoting and delivering biodiversity conservation through local plans and programmes. At the time of writing, the second National Biodiversity Plan 2010-15 is in draft form and is at consultation stage.

The Wicklow Biodiversity Action Plan

The Wicklow Biodiversity Action Plan takes biodiversity action to the next local level. Primarily a Local Authority-led Action Plan, it is intended to provide a focussed approach for the county, identifying priority habitats and species in need of attention and the action required to secure their future. It also identifies opportunities and needs for partnership work and, essentially, is the start of a targeted and coordinated approach to biodiversity conservation in the county. It turns the aims and agreements of the 1992 Earth Summit to action at a local level.

1.2 Why is Biodiversity Important?

All living organisms are part of an intricate web of life which has evolved over millions of years. Plants and animals depend on each other for survival and are each uniquely adapted to their own role in their natural environment. When we damage biodiversity, we can upset the delicate balance of nature, which may have long-lasting and far-reaching consequences not just for ourselves, but for the living world around us.

It is only when we stop to ask this question that we realise just how important biodiversity is to us and our future on this planet. So much of what we take for granted is only possible with a healthy environment and associated biodiversity. A recent report on the economic and social aspects of biodiversity made a conservative estimate that the contribution of biodiversity to 'productive output and human utility' in Ireland is worth over €2.6 billion every year. So what are the benefits that biodiversity can offer?

Biodiversity and Ecosystem Services

Some of the most obvious benefits of biodiversity are termed Ecosystem Services. This is the name given to a variety of functions that healthy ecosystems perform 'for free', from the wide-scale regulation of climatic processes right through to site specific issues such as buffering against flooding, maintenance of soil fertility, pollination of crops, breakdown of wastes (including toxic waste), recycling of nutrients and filtering of water. Because these are all functions that we would otherwise have to undertake at a cost, they give biodiversity a solid economic value.

The value of natural wetlands, for example in reducing downstream flooding, purifying water and helping the recharge of underground aquifers, can be viewed in financial terms since these functions would all have to be dealt with if the wetland was removed. Studies on this issue have shown that, for example, if a wetland is removed or drained, while it may result in short term financial gain for a private individual, it usually results in a larger long-term financial loss for the wider community. It therefore makes financial, as well as ecological sense, not to lose these important areas in the first place.

Wetlands are increasingly important at a time when we are concerned about climate change and its impacts.

Peatlands are 'carbon sinks' storing carbon and thereby reducing the amount of the greenhouse gas CO₂ in the atmosphere. It is estimated that peatlands in Europe, Siberia and North America hold the carbon equivalent of 70 years worth of global industrial carbon emissions at current rates!¹ Wetlands in general help to ameliorate the impacts of climate change such as flash flooding, by soaking up excess rainfall and gradually releasing it back into watercourses. However, the drainage of peatlands turn them into carbon 'sources' releasing carbon dioxide into the atmosphere as the peat decays and oxidises, and the removal of wetlands will increase the likelihood of flooding further downstream.

Other roles that our habitats and species play in helping our daily lives include:

- ▶ Maintenance of soil fertility, and the recycling of nutrients;
- ▶ Purification of air and water;
- ▶ Pollination of plants, including many crops and natural agricultural 'pest' control.

Biodiversity and Quality of Life

Another benefit of biodiversity is the role that it plays in our health and quality of life. Biodiversity is important for the production of medicines. This does not just mean 'alternative' medicine, but many mainstream medicines are derived from species, for treatments of illnesses from depression (eg St. John's Wort) through to breast cancer (eg Yew tree).

A straw poll of what people like about Wicklow is likely to highlight the importance of the natural environment, whether that means access to the beach, a walk in the woods or looking at the scenery in the uplands. In some cases, however, we are so used to biodiversity around us such as singing birds, that we hardly notice it until it is no longer there.

In addition, biodiversity conservation can have direct economic benefits. The natural environment plays an important part in encouraging tourism, and tourism in turn plays an important role in the county economy. It is therefore clear that there is an economic benefit to maintaining features such as clean, healthy rivers for angling-related tourism as well as for wildlife. Various

studies around the world have shown that the protection and maintenance of wildlife areas, by attracting tourism, can provide economic benefit directly to rural communities.

Biodiversity as an Indicator

Another important benefit of biodiversity comes from the interdependence of the different species and ecosystems that make up our biodiversity – the ‘web of life’.

Because many different species are dependent on each other and the environmental conditions in which they live, many of them can be considered to be ‘indicators’ of environmental quality and biodiversity health. For example, if a monitored bird population is seen to be in decline, it can indicate a wider issue of environmental decline that is affecting the species and habitats on which they are dependent. Also we know that certain species are indicators of quality of different habitats, and their existence shows us that the habitat is still healthy and of high quality. We can also use biodiversity as an indicator of the quality of our natural resources that we need for our continued existence at the most basic level, such as air (eg lichens) and water (eg invertebrates). Again, it is important to consider that the decline of any such ‘indicator’ species points not only to a loss of biodiversity, but also a potential loss of the ecosystem services and economic benefits that are associated with our biodiversity.

Our biodiversity is not only important to us, but in many ways its conservation is essential to our way of life.

Biodiversity and Economics

Economic values have been put on some of these benefits in a recent report in Ireland², these include:

Benefits to Agriculture

- ▶ Nutrient assimilation and recycling by soil biota worth around €1 billion per year.
- ▶ Baseline pest control around €20 million per year.



Freshwater Pearl Mussel, a sensitive indicator of water quality. Photo: Evelyn Morkens

- ▶ It is estimated that a move to agriculture with an increased reliance on pollination (eg biofuel crops) could increase biodiversity benefits by up to €500 million per year.

Benefits to Forestry

- ▶ All benefits including nutrient recycling and pest control are currently valued at around €55 million per year, but would increase if more environmentally sensitive forestry is practiced, and if more broadleaf forestry is expanded, to around €80 million per year.

Benefits from the Water Environment

- ▶ Benefits including provision of clean water and flood mitigation are estimated at up to €385 million per year.

Benefits for Human Welfare

- ▶ Benefits including the general contribution of biodiversity to quality of life, recreation (such as angling and water sports), and eco-tourism are estimated as at least €330 million per year.

Benefits to Health

- ▶ There are many potential benefits that derive from factors such as clean water, good quality food and natural control of diseases, though this is yet to be quantified.



Lichen, an indicator species for air quality. Photo: Faith Wilson

²Bullock, C *et al* (2008) *The Economic and Social Aspects of Biodiversity. Benefits and Costs of Biodiversity in Ireland.* The Stationery Office, Government of Ireland.

1.3 Why Produce a Biodiversity Action Plan?

This Biodiversity Action Plan is not the culmination of Biodiversity Action in the county, but more the start of a more co-ordinated approach to it. It is also important to see it as a continuing process rather than just a document. For example, many interested and motivated individuals have been collecting information on the county's biodiversity for many years, this Action Plan does not seek to change this or start anew, but starts to put in place mechanisms needed to store and use that data better at a county level.

The actions have been developed in consultation with a number of organisations in the county. These consultations developed many suggested actions and not all can be undertaken in this first Biodiversity Action Plan. However, an attempt has been made to ensure that priority has been given to those that will enable Local Authority action on issues that are of shared concern, will enable a better appreciation of biodiversity and the issues facing it, or have been identified as urgently needed to ensure the future of Wicklow's most important biodiversity.

Links to the Wicklow Heritage Plan

Action 2.5 of the County Wicklow Heritage Plan 2009-2014 is 'Produce a Local Biodiversity Action Plan for County Wicklow to set out an agreed and prioritised set of actions to enhance the protection, management and appreciation of biodiversity'. There is a clear link, therefore, between the County Wicklow Biodiversity Action Plan and the County Wicklow Heritage Plan. The Biodiversity Action Plan will be overseen by the Wicklow County Council Heritage Office and is intended to provide focus and detail to a commitment to biodiversity action that already exists in the county, laid out in the County Wicklow Heritage Plan and guided by the Heritage Forum.

Consultation in Writing the Wicklow Biodiversity Action Plan

Consultation was an important part of writing the County Wicklow Biodiversity Action Plan, and was essential in identifying some of the important biodiversity features and issues in the county. Consultees included statutory agencies, state companies, Non-Government Organisations and different sections of Wicklow Local Authorities. Written submissions were received as part of the public consultation process, which assisted greatly in finalising the content of the Plan. A list of consultees can be found in Appendix 1.



The Murrough is an important coastal wetland complex containing woodland, fen, freshwater and brackish marshes and shingle beach habitats. Photo: Birdwatch Ireland

2. Introduction to the Biodiversity of Wicklow



Lough Ouler. Photo: Faith Wilson

2.1 The Landscape of Wicklow

County Wicklow, described as the 'Garden of Ireland', holds diverse landscapes from the peaks of the Wicklow Mountains down to the shores of the Irish Sea. Not only is there a wide array of landscapes and habitats in the county, but also much of it is accessible from Dublin and therefore by a large part of the country's population. Indeed, a short drive from Dublin down the N11, the rocky slopes of the Sugar Loafs giving way to the steep and steeply wooded Glen of the Downs hints at a diverse and interesting landscape.

The uplands, shaped by the last Ice Age provide a dramatic backdrop of high peaks, sharp cliffs and wide 'U-shaped' valleys. Habitats in the more exposed areas include bare rock and scree slopes, blanket bog, heather moorland and acid grassland, while the valleys hold fast-flowing rivers, lakes and woodlands. From these upland habitats, the land falls to the west into Kildare and to the east to the Wicklow lowlands and the coast.

Much of the Wicklow lowland areas comprise farmed areas, largely used for grazing and silage. These fields, however, are often separated by hedgerows and interspersed with woodlands and small wetland areas. The amount of woodland in Wicklow is noticeable, including broadleaf woodlands, demesnes and conifer plantations, and adds a particular character to the landscape.

The coastal areas include rocky headlands, shingle beaches and sand dune systems. The proximity of these areas to the main urban populations in Wicklow means that people may be most familiar with coastal habitats. The high wildlife value of the coastal areas is not always fully realised, however.

Rivers connect the upland areas to other parts of the county, with river valleys running east, south, west and north forming wildlife corridors around the county. Often appearing as wooded valleys, these corridors form an important part of the Wicklow landscape.

2.2 Some Important Habitats and Species in Wicklow

The biodiversity of Wicklow is well studied in comparison to other counties, though there are still some important gaps in our knowledge. This section outlines some of the most important biodiversity in Wicklow. The information is set out by habitat type or group and provides a description of the habitat in the county, covers issues, associated species and gaps in knowledge.

Upland Habitats

Description

The Wicklow uplands are an important and prominent aspect of biodiversity in the county. They form the largest unbroken area of high ground in Ireland, made up of granite and metamorphic rock and shaped by glaciation during the last Ice Age. The highest point is Lugnaquilla at 925 metres. Much of the habitat within this upland area is a 'matrix' of blanket bog, heath, acidic grassland, rocky cliffs and scree slopes, and woodland.

Blanket bog is a dominant habitat in the wetter parts of the uplands, where deep peat has accumulated. It is characterised by a mix of pools and vegetation. Plant species include bog cotton; bog mosses (*Sphagnum*), the carnivorous sundews, and heather species. Species such as the meadow pipit are likely to be the most commonly seen birds, while red grouse, merlin and hen harrier also exist in these areas. Day-flying moths can be found, including those such as the impressive looking emperor moth, the larvae of which feed on heather species.

Drier parts of the uplands may hold a higher proportion of heather species, especially ling and bell heather, and bilberry. This is often on the steeper, free-draining, slopes with soils characterised by a thinner peat layer. Management in some areas has resulted in a dominance of grass species.

Scree slopes occur on the slopes of the glacial U-shaped valleys in the county such as at Glendalough, the valleys above Loughs Tay, Dan and the Bray Loughs, as well as on the slopes of the Sugar Loafs. Exposed cliffs can be found in a number of sites within the county, including the higher slopes of the glacial valleys and also at man-made quarries at various sites.

Biodiversity interest of these habitats includes breeding birds such as ring ouzel and wheatear on the scree slopes, and peregrine falcon, raven and kestrel on the cliffs. Rare plant species include lanceolate spleenwort and parsley fern which are both protected under the Flora protection order. Other rare plant species include alpine lady's mantle and alpine saw wort, both of which are known to occur in less than 10 sites in the country.

Status

A significant part of the uplands (over 17,000 hectares) in County Wicklow are designated as a National Park and managed by the National Parks and Wildlife Service (NPWS).

NPWS have produced a management plan for the Wicklow Mountains National Park that covers these issues. Some existing biodiversity projects in the uplands include bog restoration at Liffey Head, control of erosion on sensitive habitats, and the establishment of sustainable grazing regimes by NPWS through the management plan. Work by organisations such as the Wicklow Uplands Council includes the promotion of sustainable outdoor recreation.

The Wicklow Uplands are covered by a number of conservation designations. These include the Wicklow Mountains Special Area of Conservation (SAC), the Wicklow Mountains Special Protection Area (SPA), the Wicklow Uplands National Park, and Glendalough and Glenealo Valley state owned Nature Reserves.

Issues

There are a number of issues facing the biodiversity of the Wicklow uplands. One of the issues relates to the need for active management in order to keep the habitats in good condition. Although good active blanket bog needs little intervention, habitats such as heathland can suffer from either a lack of, or inappropriate, management. Management measures such as burning and grazing can be used to the benefit of these habitats, but if used inappropriately, they can result in wide-scale habitat damage. Species like the red grouse, which are highly dependent on good quality upland habitat, have undergone a large decline nationally due to habitat mismanagement.

Other threats to the uplands include habitat damage and erosion due to recreational pressure, such as through the use of off-road vehicles. While some such recreation is undertaken in a controlled way, much is not. Alien

invasive species can be a considerable problem in the uplands, including species such as rhododendron and also deer and goats. These species can cause problems in competing with native plants and also by overgrazing of habitats.



Restharrow. Photo: Faith Wilson



Dune system at Buckronev, formed by the accumulation of shifting sand in the roots of marram grass and sea couch. Photo: Faith Wilson

Coastal Habitats

Coastal habitats in county Wicklow include sand dunes, shingle beaches, coastal headlands, coastal heaths and grasslands and wetland complexes. Biodiversity interest often exists hand in hand with Wicklow's largest towns. Because of the draw of coastal areas, there is often a need for a fine balance to be struck between access to the coast and protection of important biodiversity features.

Issues

Coastal habitats and species are particularly sensitive to the effects of climate change in terms of increased storm incidents, flooding, erosion and rising sea levels. Further study of the Wicklow coastline is warranted to inform actions that may be needed in the future to prioritise areas for protection against negative climate change effects.

Sand Dunes

Sand dunes are a complex collection of habitats that, by their nature and position, attract a number of issues. Firstly, they are dynamic systems, the temporary result of constantly shifting sediment systems along our coasts. Secondly, they are associated with sandy beaches which, themselves, are associated with recreational pressure. Added to this is that they are of high ecological importance for a wide variety of species and have, for a number of years, been the area of choice for new golf course and caravan



Common Blue Butterfly. Photo: Faith Wilson



Sea Holly. Photo: Faith Wilson

park developments. Sand dunes play an important, and often forgotten, role in coastal flood defence.

Sand dune systems can actually be made up of a number of different habitats including different sand dune types (eg embryonic dunes, marram dunes, wet dune slacks, stable fixed dunes and decalcified dune heath), and even wetland habitats such as fens. Stable or “fixed” dune systems are a particularly rare habitat and are therefore listed as a priority habitat in Annex I of the EU Habitats Directive.

The high proportion of shell fragments in dune systems can result in an abundance of plants that are also associated with limestone areas. Sand dune systems can often have well developed plant communities, including rare species. In Wicklow species associated with dunes include pyramidal orchid, common milkwort, wild pansy, carline thistle, with burnet rose in the more stable dune systems and sharp rush in the saline-influenced dune slacks. Rarer species include wild asparagus and meadow saxifrage, both protected under the 1999 Flora Protection Order as well as green-flowered helleborine, bird’s-foot and spring vetch, which are all Red Data Book species.

Status

Important dune systems in the county include the Buckroneys to Brittas Dunes, and those at Magherabeg and Arklow. Buckroneys-Brittas Dunes and Fen and Magherabeg Dunes are both designated as SACs, and Arklow Sand Dunes is designated as a proposed Natural Heritage Area (pNHA).

Issues

Main threats to this habitat include overgrazing and under grazing, land claim (eg. for golf courses) and erosion. The erosion of these dunes is often the result of recreational pressure destroying the vegetation ‘matrix’ that stabilises them. This is sometimes exacerbated by a lack of natural replenishment by sand, maybe from changes to coastal processes elsewhere. Supplementary feeding of livestock is also an issue, affecting native plant species at the site. Some work has been carried out in the county, such as at

Brittas Bay to stabilise sand dunes by planting of marram grass and control of access.

Shingle Habitats

Possibly one of the most important habitats in Wicklow is the shingle ridge that runs from Wicklow Town for 15 kilometres north along the coast. Called The Murrough, this is not only important as a habitat in its own right, but also for the role that it has in forming and protecting the habitats lying immediately inland.

The sand and shingle ridge itself offers a home for those plants species that have adapted to cope with its shifting nature and high salt conditions. Sea rocket, sea sandwort and yellow-horned poppy can be found. At the widest part of the shingle ridge, at ‘The Breaches’ south of Kilcoole is a colony of up to 80 pairs of little terns that return to breed every year. Tiny seabirds, they are vulnerable to disturbance during the breeding season and wardens are employed by BirdWatch Ireland and National Parks and Wildlife Service to protect them and provide information to visitors.

Inland from the shingle ridge is a complex of sand hills, reedbed, fen, wet grassland, saltmarsh, mudflat, fresh and brackish marsh, wet woodland and lagoons. These areas make up the Murrough Wetlands, an area of outstanding biodiversity importance.

Status

The Murrough is designated as an SAC, pNHA and SPA.

Issues

Recreational pressure is a potential issue, not only in terms of impacting on nesting birds, but also in causing erosion in the sand hills (where visitor tracks are provided to reduce the impact).

Another potential impact is erosion. Works have been carried out north of Wicklow Town to protect the railway line running along the shingle ridge where it is threatened by erosion. This highlights the fact that The Murrough is a naturally dynamic system which will be expected to change over time. It also highlights how fragile these habitats are and it should be remembered that impacts on the shingle ridge are likely to have wide-ranging impacts on the habitats that it currently protects just inland.



Wicklow's rocky headlands and cliffs typically support heath plants such as ling and bell heather and sea pink, and mammals such as the Grey Seal. Photo: D. Burns

Coastal Headlands

The main coastal headlands in the county are Bray Head, Wicklow Head and Arklow Rock.



Bray Head, designated as an SAC and pNHA, holds a number of important habitats including dry heath, vegetated sea cliffs, rocky sea cliffs, exposed rocky shores, dry calcareous and neutral grassland and mixed woodland. Important plant species include greater broomrape, spring vetch and bee orchid. Wicklow Head is designated as a pNHA and SPA. Habitats at this site include heath, coastal grassland and steep rocky cliffs. Both Bray and Wicklow Heads hold important populations of kittiwake and black guillemot as well as nesting peregrine.

Arklow Rock and Arklow Head include a mixture of habitats from coastal heath and grassland mosaic to steep rocky cliffs. The area supports a number of rare plant species and breeding seabirds.

Issues

There are a number of threats to these habitats, some of which are the result of how close the sites are to urban areas. Bray Head, for example, lies adjacent to an urban

area and is naturally subject to associated development and recreational pressures. Uncontrolled or inappropriate recreation can lead to habitat destruction, erosion and species disturbance. A notable issue at Arklow Rock is the existence of a quarry, the continued working of which threatens maritime heath or habitat.

One of the big issues with these habitats that, as well as being important for biodiversity, are also important for recreation, is a lack of understanding of how recreation damages biodiversity. This may include types of recreation, as well as levels and timing of access. While public access to biodiversity is important, it is equally important not to damage the features that make the areas special.

Rivers and Lakes

Rivers

The linear and flowing nature of rivers gives rise to a number of specific attributes and threats. They are highly important for migratory and ranging species such as salmon and otter, they also act as conduits for pollutants and their linear nature means that it is difficult not to impact on them through human infrastructure. Many human settlements are placed near rivers since there has always been an important reliance on them in terms of providing drinking water and for transport. In addition to this, our rivers carry water and, in times of flood, overspill

onto floodplains and then naturally take the water back from the floodplain as the water level in the channel falls. Stress on this function is increasing due to development on floodplains, climate change (resulting in more extreme rainfall events), and drainage in the upland catchment (meaning water moves to the rivers and streams faster). This issue has become very apparent with resultant flood events in Wicklow in recent years. Despite the apparent need to rely on rivers, many human activities impact on them negatively, including changes to flooding regimes and pollution.

Main rivers in the county include the Slaney and Derry Rivers, flowing out to the south west of the county, King's River, flowing north west from the uplands to Poulaphouca Reservoir, the River Dargle flowing out to Bray in the north east, the Vartry which meets the sea just north of Wicklow Town and the various rivers that make up that large catchment of the Aughrim and Avoca Rivers, flowing out to sea in Arklow.

Rivers in the county hold important species including freshwater pearl mussel, white-clawed crayfish and lamprey species, all listed under Annex 2 of the EU Habitats Directive. Salmonid fisheries in Wicklow include the Rivers Slaney, Avoca (Avonmore, Aughrim, Avonbeg) Potters, Redcross, Three Mile Water, Liffey, Vartry, Dargle, Three Trout's and the associated lakes and Reservoirs. All these systems hold populations of brown trout with salmon and sea trout in the Avoca, Slaney, Liffey, Dargle and Vartry catchments. A number of these river systems also support populations of both white-clawed crayfish and lamprey species (listed under Annex II of the EU Habitats Directive).

It is not only the fully aquatic species that are important in rivers, however, bird species such as kingfisher, dipper and grey wagtail are also reliant on rivers and riverbanks to provide their food sources and nesting sites.

Status

The Slaney River Valley is designated as an SAC under the EU Habitats Directive for, among other things, freshwater pearl mussel and otter. Many of the rivers in the county are undesignated (though some of those may hold rare and important species, including freshwater pearl mussel, white-clawed crayfish, lamprey species and Atlantic salmon). The Slaney, Dargle and Vartry Rivers are

designated Salmonid Rivers in accordance with the EU Freshwater Fish Directive.

Issues

Rivers are affected by a number of issues in the county. Historic deterioration in water quality of many rivers in across the country is related to land use change, including more septic tanks, agriculture, forestry and loss of protective riparian vegetation, and this is every bit as true in Wicklow as in other parts of the country.

The Avoca River has historically suffered from heavy metal toxic pollution downstream of the now disused Avoca Mines, a problem which persists to this day due to ongoing leaching into local watercourses. Extensive studies on the causes and sources of the pollution have been conducted in recent years, and there is now a concentrated effort among local relevant stakeholders to remediating the local water quality, preventing ongoing pollution and restoring biodiversity.

Loss of riparian habitat, as a result of development and agriculture can have a considerable impact on important species (such as salmon and otter for example), due to loss of cover, increased disturbance and deterioration of water quality.

Introduction of invasive species (such as zebra mussels and aquatic weeds) to waters is an issue across the country. Works adjacent to or across rivers (such as on bridges and weirs) have a high potential for impact on fish spawning sites, movement and bat roosts.

The current regime of periodically cutting vegetation along the banks of the Dargle River is operated to ensure unimpeded conveyance of the river channel, for the purposes of controlling flooding incidents. Such operations however appear to be exacerbating the spread of invasive Japanese knotweed and would benefit from a more informed management approach.

Other issues include the increased nutrient levels that can accompany forestry clear-felling operations and the impacts of abstraction (from rivers and nearby aquifers) for drinking water supply.

In addition to the above issues, it is likely that some important and protected species occur in undesignated river sites in the county.

Lakes

Covering around 1.3% of Wicklow's surface area, the lakes across the county differ in their character, ecological importance and in the threats that face them. They range from the large reservoirs, such as Poulaphouca that are used for water supply to the upland corries with their low nutrient levels, upland bog pools and small farm lakes.

The main reservoirs of Poulaphouca and Vartry provide water to large populations of the eastern counties and the City of Dublin. At the same time they host important wildlife. Poulaphouca is designated as an SPA for its internationally important population of greylag geese and other wildfowl species. Vartry is a pNHA and supports wintering waterfowl and a variety of interesting wetland / woodland habitats. Poulaphouca is also an important coarse fishery particularly for roach, perch and pike.

Three of Wicklow's mountain lakes previously supported populations of Arctic char (Lough Tay, Lough Dan and Glendalough) which have now been lost due to acidification. Arctic char, a species that has been left in some of the deeper lakes in Ireland after the last Ice Age, now has a very patchy distribution in Ireland and is under threat in many areas. Potential for reintroduction of the species into Wicklow is being considered.

Some Wicklow lakes harbour species that are very rare in an all-Ireland context, for example Glendalough and Lugala, where upland lakes and rivers exist together with woodland, are the only breeding sites for goosander in the country.



The Upper Lake Glendalough, part of a glaciated valley flanked by woodland supports a diversity of life and is one of the few breeding sites for goosander in Ireland. Photo: D. Burns

Status

A number of lakes in Wicklow are designated for their conservation importance including two of the large reservoirs. Also most of the upland lakes are included within the Wicklow Uplands SAC or SPA designations.

Issues

One of the biggest issues in all modern lake catchments is eutrophication – the build up of nutrients such as phosphorus and nitrates from agriculture, forestry and domestic sources. Eutrophication and other changes to water quality (such as acidification) give rise to algal blooms and oxygen depletion and can have a dramatic impact on the ability of lakes to support the species that have evolved to cope with the particular conditions at each site. In the case of Wicklow, the large area of planted forestry, including throughout the uplands, highlights the need to adhere to best practice guidelines in clear-felling and replanting in order to avoid impacts on water quality.

The county's lakes also need to be safeguarded against contamination by alien invasive species. Zebra mussels are a particular threat, existing in the Grand Canal, relatively near to Poulaphouca reservoir, and contamination could result from movements of boats or angling equipment. As well as affecting the invertebrate, fish and designated bird interests of the lake, zebra mussels are well documented in their impact on water intake and treatment infrastructure, resulting in considerable costs incurred simply to keep the infrastructure operational.

Fens, Flushes, Reedbed, Marshes and Wet Grassland

This is a collection of habitats that are often associated with rivers and lakes where they may form a fringe of wetland vegetation. All dependent on a high water table, differentiation between these habitats depends on both substrate (such as peat or mineral soils) and historic management.

Fens and flushes require a permanently high water table, usually on peat, and get their nutrients from surrounding mineral soils and ground water. This means that they have



Photo: Richard Naim, NaturaConsultants.com

slightly higher nutrient levels than bogs, for example, and as a result often have a good diversity of plant species. They also often support a vast array of invertebrate life, including dragonflies and aquatic beetles. The Murrough Wetlands is one of the largest fens in the country.

Reedbed is also associated with a permanent high water table and is characterised by a dominance of common reed. Often growing in standing water, reedbed can blending in with other habitats such as tall herb swamp and fen habitats with a move from open water to waterlogged terrestrial habitats.

Marsh and **wet grassland** tend to exist on mineral soils with a high water table or seasonal flooding. Where traditional farming such as low level grazing or late season cutting is practiced, they can have high plant diversity and support breeding wading birds. Marshes and wet grassland can often be found associated with river floodplains or lake fringes.

These habitats often occur together as a transition between open water and land. A typical pattern may be open water giving way to reedbed and tall herb swamp, then to fen as the water level meets the vegetation and to marsh or wet grassland as the land rises.

Important wetland sites in the county include The Murrough and Arklow Town Marsh. The Murrough hosts a wealth of wetland habitats, including reedbeds, fen, wet grassland, saltmarsh, mudflat, fresh and brackish marsh, wet woodland and lagoons.

There are many important species associated with these wetland habitats. As well as specialist plants, even the smallest sites can hold smooth newt, common frog and a variety of dragonfly species. Bird species such as reed bunting and sedge warbler occur in more densely vegetated sites, while breeding waders such as lapwing and snipe and wintering whooper swans can be found at the larger wet grassland sites such as The Murrough.

Status

Some areas of these habitats will fall within designated conservation sites. These include The Murrough SAC and pNHA (various wetland habitats including reedbed), Arklow Town Marsh pNHA (reedbed, marsh and wet grassland) and Ballyman Glen SAC (alkaline fen). Many



Goosander. Photo: C. Clarke, Birdwatch Ireland

other areas are not designated for nature conservation and may occur as very small sites adjoining rivers or lakes in the farmed landscape.

Issues

Threats to these habitats are particularly those that affect water level, but also those that affect nutrient levels. Drainage and infilling are among the biggest threats that would result in total loss or rapid change to these habitats. However, increased nutrient levels from agricultural and domestic sources can also have a big impact, notably resulting in reduction of plant diversity, and floodplain development can lead to direct loss or changes in natural flooding patterns. In addition to all these, some wetland habitats need management, such as grazing, to maintain their conservation value, and impacts through neglect or inappropriate management are common.

Possibly one of the biggest threats facing these habitats is a lack of appreciation of the role they play in managing floods and water quality.

Woodland and Forestry

Wicklow is the most wooded county in Ireland, with almost 20% of the county covered by woodland and forestry. Woodland types in the county vary from upland oak woodlands to birch dominated woodland and wet woodland dominated by willow and alder. The planted woodlands of the demesnes in the county are also significant for biodiversity. Commercial forestry has a large holding in the county as well. Coillte has a considerable interest in the county, owning or managing over 30,000 hectares and there are many private forestry owners.

While Biodiversity issues have been integrated steadily into national forestry policy and practices in the last decade, more advanced silvicultural methods and the integration of such practices as Continuous Cover Forestry offer the opportunity for woodlands managed for timber production to be of higher value for biodiversity.

One of the important types of woodland in the county is the oak woods, dominated by sessile oak, ash and hazel. Undersorey species include hazel, holly and rowan. These can be highly species diverse habitats and are ablaze with colour particularly in the spring when so-called 'vernal' species such as bluebells, celandines and wood anemones flower before the leaves are fully out and close the canopy, taking much of the summer sunlight.



Eyed Hawkmoth, a woodland species. Photo: Christian Osthoff

Wet woodland occurs alongside rivers and the edges of wetland areas. It contains willows, alder and birch, with ash dominant in older woodlands. It is not a common habitat in Wicklow but can be found at sites such as Blackditch Wood near Newcastle, Knocksink Wood near Bray and Glen of the Downs near Greystones.

Demesne woodlands tend to have a number of non-native tree species that have been under-planted within the native woodlands. Species in these woodlands include native species plus others such as beech, horse and sweet chestnut, holm oak and conifer species. Although not native, these woodlands tend to have been protected since the exotic trees were introduced in the 18th and 19th centuries and carry a fairly high biodiversity interest because of that.

Commercial forestry plantations are dominated by non-native conifer species and are not as biodiversity rich as

our native woodlands. In addition, they have often been planted in areas that would previously have had a good biodiversity value. However, they do have some biodiversity value, notably breeding birds such as coal tit, goldcrest and song thrush. With the move towards more sustainable forestry in recent years has come a greater emphasis on management for biodiversity, Coillte has undertaken biodiversity audits of its forests and has biodiversity management plans for a number areas.



Woodlands are home to many important species in Wicklow. These range from the well known red squirrel to the tiny insects and fungi that help recycle nutrients and keep the whole ecosystem going. The red squirrel is threatened by the introduced grey squirrel which both competes for food and habitat and carries a virus that can be fatal to the red. Other mammals in Wicklow's woodlands include the pine marten, badger and deer. The deer tend to be hybrids between red and sika deer and can cause considerable damage to woodland understorey by overgrazing. Woodlands are important for bat species, including some that are particularly associated with this habitat, such as brown long-eared and whiskered bats.

Important bird species include some that are rare in an Irish context, such as redstart, pied flycatcher and wood warbler. It has been confirmed that great-spotted woodpeckers have bred in the county in 2008, a first for Ireland.

Woodlands in Wicklow provide a fantastic and accessible biodiversity resource in the county with good trails and facilities at a number of sites. Coillte has one Forest Park and 15 recreation sites in Wicklow. Information on woodlands to visit in the county can be found in section 2.4. Woodlands are also one of the easier habitats to create and new woodlands have been encouraged in recent years through initiatives such as the NeighbourWood Scheme.

Status

A good number of woodland sites in Wicklow are designated for their biodiversity interest. Internationally important woodland sites include Deputy's Pass and Knocksink Wood SACs. There are also important

woodland elements to other SACs including the Wicklow Uplands and Slaney River Valley SACs. A number of woods are designated as pNHAs and further details of these are provided in section 3.3 and Appendix 2.



Wood Sorrel. Photo: Faith Wilson

Issues

Issues facing woodland in the county include clearance for development, neglect and impacts from alien invasive species.

Woodlands are often not seen as assets and so are often cleared to make way for new developments, are grazed by stock to the point where natural regeneration in the form of new seedlings is curtailed, or simply left unmanaged. Standing and fallen dead timber is important for biodiversity, so woodlands should not be 'over-managed'. However, well-managed woodland can be great for biodiversity, provides an income in the form of timber production and, ultimately, gives woodlands a long-term value.



Photo: Richard Nairn, NaturaConsultants.com

Invasive alien species can be a particular problem in woodlands. The main culprits include grey squirrels, deer species and rhododendron. Not easy to control, there needs to be a concerted effort to deal with this issue in the county and nationwide.



Bluebells flower early in the Spring before the full canopy of trees develops. Photo: Faith Wilson

Farmland

Farmland in Wicklow varies from the upland moorland habitats to the grasslands of the low-lying land in the east. There is no doubt that significant biodiversity benefit can be achieved through environmentally sensitive farming methods. It could even be argued that, outside protected areas, farmed areas have the potential to be one of our greatest biodiversity assets. At the same time, farming has a great potential for biodiversity impact through direct changes to habitats (such as through inappropriate grazing or nutrient enrichment) or through indirect impacts (such as water quality impacts resulting from activities such as upland grazing and slurry spreading). The biodiversity value of farmland is strongly dependent on the existence and best practice implementation of schemes such as the Rural Environmental Protection Scheme (REPS). As of 2007, nearly 30,000 hectares of farmland in the county was entered into REPS.

Many of the habitats mentioned above occur in Wicklow farmland, often as small pockets dotted around the

county. These habitats can include wetlands, small lakes, woodlands, riparian zones and dune grasslands. Recognising and managing these biodiversity 'stepping stones' is of great importance. Species associated with these habitats includes some that are protected and threatened. These include common newt, bat species and badger. Some bird species associated with farmlands, such as yellowhammer, have undergone dramatic declines over recent decades as the general farming approach has changed.

Upland farms can include large areas of important habitat. Management of these areas has a large impact on important species such as Irish hare and even highly specialised species such as red grouse.

Status

Most farmland areas will be undesignated.

Issues

Farmland, by its nature, is managed primarily for food production and the only real mechanism aimed at pushing land management more in favour of the environment is REPS. REPS is a national scheme and may not always be suited to local biodiversity needs. More locally focussed measures and programmes are likely to be needed for some species.

Because of the private ownership of farmland, knowledge of species and habitat distribution in Wicklow's farmland is likely to be limited.



Rivers, Hedges and roadside verges act as wildlife corridors allowing wild plants and animals to disperse throughout the countryside. Photo: D. Burns



Buildings on the landscape can provide important nesting and roosting habitat for bats and birds.

Hedgerows and Verges

Hedgerows and verges are an important part of the network that connects habitats around the county. In such a highly wooded county as Wicklow, hedgerows can really enhance the county's biodiversity by providing important routes for species movement between woodland sites. Hedgerows are also an important habitat in their own right, providing refuge for important plants, invertebrate and bird species. The combination of a good hedgerow, a wide verge and neighbouring farmland can enhance the value of each of these habitats. Birds that nest in the hedgerows can find food in the form of insects and seeds that occur in the neighbouring habitats, insects can benefit from the shelter of the hedgerow while exploiting the nectar and pollen sources of flower-rich verges.

Status

Hedgerows and verges largely fall outside designated areas.

Key Issues

The biodiversity value of both hedgerows and verges is extremely closely linked to their management although the current management approaches tend not to consider biodiversity to any great extent, excepting for the timing of some hedgerow cutting to avoid damage to nesting birds. They are affected by a continual need to update and widen the road network in Wicklow to cope with increased traffic and to improve traffic flow.



Man made pond used for education purposes at Glendalough Information office. Photo: D. Burns

Invasive species can have a significant effect on reducing biodiversity in hedges and on verges. Japanese knotweed is recorded throughout Wicklow and there is currently little control carried out. Current approaches to verge and hedge management will be spreading the problem rather than controlling it. There is a need to undertake a survey of alien invasive species in the county to direct action.

Infrastructure and Artificial Habitats

As well as the natural habitats described above, it is important to remember that many of our buildings, infrastructure and worked areas can hold important biodiversity as well.



Brown Long Eared bat roost, such habitats are vulnerable to accidental disturbance. Photo: Faith Wilson

Bridges are particularly important in this respect. Many of our older bridges have gaps and crevices in the mortar that are ideal nesting sites for birds and nursery or roost sites for bats. Bird species such as the dipper and grey wagtail are dependent on our rivers, with the dipper actually feeding under the water. They need secure protected ledges and holes to build their nests and, because many of the historically suitable sites along rivers have been lost, artificial ones such as bridges become increasingly important. The same is true of bat species. Some bats, such as Daubenton's bat, are closely linked with rivers, feeding low over the water on insects. They need places to breed and roost close to their food source and, with the loss of many old trees on rivers banks, they have turned

to using holes in bridges. Old walls and buildings, such as mills, next to rivers can be every bit as important in these respects.



Status

Much of our infrastructure is undesignated, although some of its inhabitants, such as bats, are protected by law. Avondale House is designated as a pNHA because of its importance as a roost for whiskered bats.

Issues

It is important that, in recognising the role that these structures provide for our biodiversity, we manage them appropriately and don't lose the small holes and crevices that are so useful for these species. Of course, buildings and structures need maintenance. But this can be done in such a way as to keep the features that these species need. Pointing around a known bat roost crevice rather than filling it in can both keep the structural integrity of a bridge and keep the home for the bats. Timing any works to happen when the bats are not using the roost is obviously crucial. Leaving small crevices or ledges for breeding birds is an easy way to benefit biodiversity.

Biodiversity often occurs hand-in-hand with our built or worked environment, whether it is swifts nesting in our roof spaces in towns, peregrine falcons breeding or rare plant species occurring on quarry faces, we need to incorporate them into the decisions we make.

Important Species in Wicklow

A number of species have been referred to in the habitat descriptions above. However, this is only scratching the surface of Wicklow's important species. Lists of protected and important species can be found in appendices 3-7.

2.3 The Main Issues facing Biodiversity in Wicklow

Despite the values of biodiversity, biodiversity has faced problems for generations and is being lost. These problems are the result of the changes that we have effected on the natural environment over the last few thousand years in our approach to settlement, lifestyle and land management. These impacts have increased dramatically in recent decades with increased infrastructure, transport and more intensive land management. Our native species and habitats are now being affected by a wide variety of impacts, from direct loss due to development through to land use changes and recreational pressure. This has resulted in habitats being lost and species becoming extinct.

Impacts on our species and habitats include those resulting from fragmentation and degradation of habitats, direct loss of habitats, and decline and loss of species through land use change.

Fragmentation and degradation of habitats result from the many occurrences impacts that, together, make large impacts. Actually, most of our wildlife habitats only now remain as fragments of the original areas, separated by settlements, roads and agriculture. This fragmentation has opened them up to an increase in pressure from disturbance from recreational activities, road noise and many other factors. It has also opened up the specialist species that are so important to many of our habitats to competition from other, sometimes, non-native species. Fragmentation also results in a reduced ability of species to move from one area to another, since the area between habitats may not be suitable for them, creating 'islands' of wildlife habitat in our landscape. In Wicklow, the loss of hedgerows as a result of new houses and road schemes is an issue. This has an impact on a number of species including birds and bats.

Degradation of habitats results from a number of factors, including the constant low-level pollution that comes from our domestic sewage, and industrial, agricultural and forestry sources. It can also result from drainage and erosion due to agriculture or recreational use. These issues can result in a considerable loss of habitat quality, often to the extent that the features that made a site special can be lost. Rivers and lakes are particularly affected in Wicklow, with acidification of some of our upland lakes being responsible for the loss of Arctic charr in the county.

Loss of habitats is still resulting as a result of developments or land use changes. This is particularly true of smaller sites, such as wetlands and small woodland areas, which are not perceived as important on their own. However, it is rarely thought that they make up an important network or 'chain' of sites, and that the overall impact of losing more and more links is considerable.



Elephant Hawkmoth. Photo: Faith Wilson

Decline and extinction of species is not something that just happens in the rainforests of South America. We have lost species from Ireland in the last few decades, including the corn bunting, which now no longer breeds here. Many more species are being lost on a county, local or site basis. Other species have undergone considerable declines, such as the corncrake. Birds are often the ones listed as in decline, not because they are more affected than other species by what we are doing to our biodiversity, but simply because they are better studied and monitored. For many species we simply don't know what the situation is. In Wicklow, national species declines are mirrored at a local level with species such as yellowhammers, a farmland bird that has declined as a result of changes in land use, becoming increasingly scarce in the county.

Invasive alien species are worthy of a particular mention in this section. Our environment holds a vast number of species that have been introduced by us from other parts of the world. Most of these species are not a problem at all, but some of them become invasive, and they can be a serious problem. These 'invasive alien species' compete with our native wildlife and result in a poorer biodiversity. However, it can be much more serious than that, some of them result in damage to our buildings and structures, or affect our fisheries and, ultimately, damage tourism and local economies. Species such as Japanese Knotweed, Giant Hogweed and Grey Squirrel are present in County Wicklow and pose problems for biodiversity, health and safety and/or agriculture and forestry production. The National Invasive Species Database was established by the National Biodiversity Data Centre (NBDC) in 2008 to provide a centralised database to assist the recording, monitoring and surveillance of invasive species in Ireland. The NBDC has identified the 'Dirty Dozen' top 12 invasive species of concern for County Wicklow (see Appendix 9); however outside of this no other study has been undertaken to assess the size and impact of the problem in Wicklow.



Bird observatory hide at Blackditch. Photo: Birdwatch Ireland



Kerry Bog Ponies are part of the grazing regime at the East Coast Nature Reserve. Photo: Birdwatch Ireland

Ability to adapt to climate Change. For all species, an ability to adapt in the face of changing environmental conditions is an important survival technique. One of the big issues facing us at the moment is climate change. It is not only humans who have to adapt to climate change, however, it is the whole environment and associated biodiversity around us as well. A degraded and fragmented environment makes it harder for this to happen. Considering our reliance on biodiversity that has been outlined in section 1.2 above, this is something we should be concerned about and take action on.



Moore's Horsetail, County Wicklow is a stronghold for this otherwise rare species. Photo: Faith Wilson

Lack of knowledge. Even in a county as well studied as Wicklow there is a lack of information on some species and issues. For example there is a lack of information on the status of some of the scarcer bird species in the county such as ring ouzel, whinchat, redstart, wood warbler and pied flycatcher.

Some gaps in knowledge are only being plugged because of the interests of individuals living in the county.

There is a lack of baseline information on the habitats and species at most risk from climate change in county Wicklow. Such information is essential to inform the development of priorities for action needed to protect these biodiversity resources, and to plan adaptation measures as necessary to deal with climate change effects.

While habitat mapping has been undertaken in some areas, such as within some of the coastal towns, the National Park and the designated SACs, we have very little knowledge of the extent or quality of habitats such as wetlands in the wider Wicklow landscape.

There is also a need for further information on such issues as the status of alien invasive species in the county to identify which are of most concern and where they are, so that targeted action can be taken.

On the other hand, the amount of work by individuals on studying some species groups in Wicklow simply goes

to show the general lack of knowledge that still exists throughout Ireland. For example, looking at the diversity of moth species in different parts of Ireland, Wicklow comes out as one of the most diverse places. While the varied number of habitats means that the county will indeed hold a high number of species, as well as being well positioned for migrant moths, there is little doubt that it is also due to the fact that the county has some of the most dedicated people in the country studying moths. Really this goes to highlight the importance of encouraging data collection and sharing on all our biodiversity since we frequently don't know what is out there.

Photo: Richard Nairn, NaturaConsultants.com



Buzzard chicks in nest. Photo: Mark Lewis



2.4 Seeing Biodiversity in Wicklow

Not only is it easy to see biodiversity in Wicklow, but it is possible to see a range of habitats and species within fairly easy reach of the main towns and villages. Whether visiting the coast, the upland areas or any of the rivers and lakes, there will be plenty of biodiversity to be seen. The secret is often simply to slow down, make sure you don't make too much noise and look around you. In the summer time, even the smallest ponds can be home to damselflies, hedges and verges can harbour butterflies and birds, and the sand dunes are home to a host of flowering plants. Winter can bring interesting birds to the coast, lakes and river valleys. Wicklow County council has produced some information leaflets on the biodiversity of the county and where best to see it.



Sea Kale, a plant considered extinct in Wicklow until recently discovered along the coast. Photo: Faith Wilson



Boardwalk at Brittas Bay. Photo: D. Burns

Wicklow's Coast

There are many places to see biodiversity along Wicklow's coast. A colony of little terns, a tiny and threatened seabird, breeds at Kilcoole. Although little terns are very vulnerable to disturbance, wardens are around during the breeding season to protect the birds and provide

information to visitors. The birds can also be seen diving to catch small fish in the coastal shallows. Walks out to Bray or Wicklow Heads in the summer can reveal the sight and smell of seabird colonies, including nesting kittiwakes, guillemots and black guillemots as well as the possibility of a peregrine falcon. It's not just birds that can be seen though. Visits to the dune systems in the south of the county can reveal a wide variety of plant species and butterflies. Visitor access facilities are in place at the BirdWatch Ireland East Coast Nature Reserve at Blackditch, near Newcastle.

Great places to visit Wicklow's Coast include:

- ▶ Bray Head and Cliff Walk – accessible from Bray Head or Greystones.
- ▶ The Murrough and Kilcoole – accessible from car parks at Kilcoole or north of Wicklow Town.
- ▶ Brittas Bay and Dunes – accessible from two public car parks.



Peacock Butterfly. Photo: Faith Wilson

Wicklow's Woodlands

A number of woodlands up and down the county have public access. These include woodlands owned by the State and those in private ownership. State owned woodlands with public access include Tomnafinnoge Wood near Shillelagh, Cronybyrne Wood in the Vale of Clara, Knocksink Wood near Enniskerry and the Glen of the Downs near Kilmacanogue.

The National Botanic Gardens' Kilmacurragh Arboretum near Glenealy is a great place to see a collection of specimen trees.

There are also two People's Millennium Forests in the county, one at Shelton Abbey near Arklow and one at Ballygannon Wood near Rathdrum. Both of these are open to public access.

Coillte has a Forest Park at Avondale and 15 recreation sites in Wicklow. These are: Avoca Wood, Ballinafunshoge Wood, Baravore Wood, Ballinastoe Wood, Ballymoyle Hill, Ballygannon Millennium Forest, Cloon Wood, Crone Wood, Devil's Glen, Djouce Woods, Glenart Wood, Kindlestown, Lugnagroagh, Meetings Wood, Trooperstown Wood.

Wicklow's Uplands

The Wicklow Mountains National Park opens up a significant area for access to upland biodiversity. As well as walking trails around Glendalough, there is open access for hill walking over much of the park, although good map reading is a must. Information can be obtained at the Information Office at the Upper Lake in Glendalough or on the website (see section 3.2).

The Wicklow Way runs from the south to the north of the county and has a number of car parks along its route.

Access to upland areas is also possible by visiting some of Coillte's recreation sites such as Ballinafunshoge and Baravore woods.



Wood Warbler. Photo: Dick Coombes



3. What is Currently done for Biodiversity?

3.1 Biodiversity and the Law

Designation and Protection of Sites

Current legislation allows for important biodiversity sites to be designated on two different levels – European Importance and National Importance.

Sites of European Importance – SPAs and SACs

Sites of European importance includes Special Protection Areas (SPAs) and Special Areas of Conservation (SACs).

Special Protection Areas (**SPAs**) are areas that are of European importance specifically for bird species under the 1979 EU Directive on the Conservation of Wild Birds, otherwise known as the **Birds Directive**. As a member of the EU, it is required that Ireland designates any site that meets the ecological criteria laid out. The network of SPAs in Ireland includes important wintering waterfowl sites and sites supporting rare species (e.g. hen harrier).

Special Areas of Conservation (**SACs**) are areas that are of European Importance for important **habitats, plants** and **animals** other than birds. These are designated under the 1992 EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, otherwise known as the **Habitats Directive**. Again, they are selected on a specific set of criteria that relate to habitats and species that are considered to be particularly important, rare or vulnerable in Europe. Animals listed for protection by the designation of SACs include otter, salmon, marsh fritillary butterfly, fresh water pearl mussel and whorl snails (3 species). Candidate SACs (cSACs) are given the same level of protection as fully designated SACs.

Together, SPAs and SACs make up a European network of sites known as the Natura 2000 network. They are protected in Irish legislation through the European Communities (Natural Habitats) Regulations 1997. These regulations lay out rigorous tests that are designed to ensure that SACs and SPAs are not impacted on by any proposals, excepting those with the highest levels of justification. Even if such a proposal is allowed, it is necessary to ensure that compensation is required to maintain the coherence of the **Natura 2000** network. This would usually require habitat creation and/or designation.

Ireland is required to take appropriate steps to avoid the

deterioration of these areas and Management Plans are being drawn up for them by the National Parks and Wildlife Service (NPWS). Some have already been completed (see table in section 3.3).

Sites of National Importance

Apart from the Natura 2000 sites, there are a range of other sites of importance for nature conservation. The most important of these are identified as **Natural Heritage Areas (NHAs)**. The Wildlife (Amendment) Act 2000 provides a statutory basis for these NHAs.

Protection of Biodiversity outside Designated Sites

It is important to remember that most of our biodiversity occurs outside designated areas. There are a number of mechanisms for protecting wildlife and their habitats outside special sites. **The Wildlife Acts (The Wildlife Act 1976 and Wildlife (Amendment) Act 2000)**, for example, protect wild birds, animals and plants from wilful damage and disturbance.

The Wildlife Acts

Protection of Birds

All wild birds, their nests and eggs are protected by law. It is illegal to remove the nests of swifts, swallows and house martins, for example, when there are eggs or chicks in the nest. It is also illegal to cut hedges between 1st March and 31st August, in order to protect nesting birds except for certain exemptions.

However there are a number of exemptions including:

- ▶ Where a protected species is unintentionally killed or injured during agricultural, aquaculture, turbary, forestry or fishery activities;
- ▶ Where an injured or disabled bird is captured or humanely killed.
- ▶ Where a species (other than a bird of prey) is causing damage.
- ▶ Quarry species such as certain wildfowl and game birds.



Wicklow's Mountain Cliffs support specialised plant communities. Photo: Dick Coombes

Protection of Wild Animals

The Wildlife Acts contain a list of species which cannot be wilfully killed or injured without a special licence, and subject to similar exemptions to those covering wild birds. The legislation protects their breeding places from wilful interference or destruction, and the **Wildlife (Amendment) Act 2000** extends this protection to include resting places also. Most species on the protected list are mammals including bats, marine mammals, otter, badger and red squirrel.

Protection of Wild Plants

It is an offence to cut, pick, uproot or take the flowers of any species protected by a Flora Protection Order. The **1999 Flora Protection Order** lists 68 vascular plant species which are protected along with mosses, liverworts and lichens.



Alpine Lady's Mantle. Photo: Faith Wilson

Protection was strengthened by the **Wildlife (Amendment) Act 2000**, which extended the offence to injuring, damaging or destroying any specimen, which also applies to the seeds and spores of the plants.

Trees and Hedgerows

Apart from the cutting date restrictions for hedgerows in the Wildlife Acts, there are two main tree protection measures. These are:

- ▶ Tree Preservation Orders (TPOs), and
- ▶ Tree Felling Licences.

Tree Preservation Orders are a planning mechanism whereby individual trees or groups of trees can be identified as important and protected by a TPO.



Bog Bean. Photo: Faith Wilson



Active Blanket Bog is a priority habitat, protected under Annex 1 of the EU Habitats Directive. Photo: Faith Wilson

Felling licences are obtained through the Department of Agriculture, Fisheries & Food – Forestry Section, with initial contact made through any local Garda station. Licences must be obtained for felling trees (> than 10 years old) outside urban areas.

As well as the Wildlife Acts, the Habitats Directive is also relevant to the protection of certain species outside designated areas. For example otters and all bat species are provided special protection under the Directive.

3.2 Current Work for Biodiversity in Wicklow

There are many agencies, organisations and individuals that already do a great deal to help biodiversity in the county and across Ireland. It would not be possible to list all of these and the work that they do. However, information on a number of them is given below in alphabetical order.

Agency/Organisation	What they do	Contacts
An Taisce	<p>An Taisce, the National Trust for Ireland, is concerned with conserving the best of Ireland's heritage, both built and natural. It runs a number of projects that support its objectives to protect the environment through education, conservation and participation.</p> <p>An Taisce runs the Green Schools Programme with an aim of increasing students' and participants' awareness of Environmental Issues through classroom studies and to transfer this knowledge into positive environmental action in the school and also in the wider community. There are 66 schools with Green Flags in the county.</p> <p>An Taisce also administers the Blue Flag Programme for beaches and marinas with excellent environmental management. Two beaches in County Wicklow received Blue Flags in 2010.</p>	<p>Tel 01 4541786</p> <p>Web www.antaisce.org</p>
BirdWatch Ireland	<p>BirdWatch Ireland is a conservation organisation aiming to conserve wild birds and their natural habitats.</p> <p>It is involved in a number of conservation projects which aim to protect Ireland's birds and their habitats, including management of reserves, national surveys and advocacy. BirdWatch Ireland has a particular interest in Wicklow, being based in the county and managing reserves at Kilcoole and The East Coast Nature Reserve (Blackditch/The Murrough).</p>	<p>Tel 01 2819878</p> <p>Web www.birdwatchireland.ie</p>



Agency/Organisation	What they do	Contacts
Bat Conservation Ireland	<p>Bat Conservation Ireland is a charity dedicated to the conservation of Ireland’s bats. The group promotes the conservation of bats by disseminating educational materials, giving talks and leading bat walks, carrying out nationwide surveys and monitoring of bats, acting as an umbrella group for the local bat groups and providing a central repository for bat records. The group is active in County Wicklow and holds records generated from various surveys, including the annual Daubentons Waterways survey.</p>	<p>Tel 046 9242882</p> <p>Web www.batconservationireland.org</p>
Coastcare	<p>Coastcare comprises voluntary groups around the Irish and Welsh coasts which adopt their favourite beach or stretch of coastline to focus on its on-going care. These groups form a local network engaged in coastal management environmental actions and education. In county Wicklow there are Coastcare groups at Brittas Bay, Greystones, Six Mile Point and at Arklow.</p>	<p>Web www.cleancoastproject.org</p>



Brittas Bay. Photo: Richard Nairn, NaturaConsultants.com



Bladderwrack. Photo: Richard Nairn, NaturaConsultants.com



Cormorant. Photo: Richard Nairn, NaturaConsultants.com

Agency/Organisation	What they do	Contacts
Coillte	<p>Coillte is a semi-State owned company operating primarily in forestry, and has responsibility for over 30,000ha in Wicklow, around 26,500ha of which is commercial forested area. Coillte is committed to the Forestry Stewardship Council (FSC) certificate, which means that the timber it produces can be guaranteed to be from sustainable sources. In order to maintain this certificate, Coillte has committed to manage 15% of its properties for biodiversity.</p> <p>Coillte has 1 Forest Park (Avondale house and Forest park, Rathdrum) and 15 recreation sites in County Wicklow.</p>	<p>Tel 01 2011111</p> <p>Web www.coillte.ie</p>
County Wicklow Partnership (LEADER)	<p>LEADER Plus is an EU programme aimed at promoting the long term sustainable development of rural areas. The Department of Community, Rural & Gaeltacht Affairs are the National Authority responsible for the programme in Ireland. The theme for LEADER Plus selected by County Wicklow Partnership in consultation with local development stakeholders is “to support integrated communities and sustainable local environments and economies through enhancing quality of life and promoting sustainable development”.</p> <p>Grant themes through LEADER Plus include Enhancement of the Natural Environment.</p>	<p>Tel 0402 20955</p> <p>Web www.wicklowleader.ie</p>

Agency/Organisation	What they do	Contact
Irish Whale and Dolphin Group	The Irish Whale and Dolphin Group is dedicated to the conservation and better understanding of whales, dolphins and porpoise in Irish waters. The group maintains a database of sightings of cetaceans, which is updated regularly as new sightings are validated and logged on the website. The group holds records of several hundred whale, dolphin and porpoise species from the Wicklow coast.	Web www.iwdg.ie
Eastern Regional Fisheries Board	The ERFB is the statutory body responsible for the conservation, protection, development, management, promotion and marketing of inland fisheries and sea angling resources in Ireland's eastern fisheries region. Its responsibility includes some of our most threatened species, including Atlantic salmon. The Central Fisheries Board also has a particular interest in combating alien species in Ireland.	Tel 01 2787022 Web www.fishingireland.net
The Forest Service	The Forest Service is responsible for ensuring the development of forestry within Ireland in a manner and to a scale that maximises its contribution to national socio-economic well-being on a sustainable basis that is compatible with the protection of the environment. It is responsible for grant aid for and regulation of private forestry, the development of FEPS (Forest Environment Protection Scheme), and implementation of forestry guidelines to protect biodiversity. The Native Woodland Scheme operated by The Forest Service offers grant aid to encourage the conservation, enhancement and establishment of native woodland by land owners.	Tel 053 9176002 Web www.agriculture.gov.ie
National Trails Office	The National Trails Office implements projects to harmonise trail standards in Ireland, an important issue for a county such as Wicklow with a high potential for trails to show people biodiversity.	Tel 01 8608800 Web www.walkireland.ie

Agency/Organisation	What they do	Contact
<p>National Parks and Wildlife Service (NPWS)</p> <p>Wicklow Mountains National Park</p>	<p>Part of the Department of the Environment Heritage and Local Government, the NPWS is responsible for the conservation of a range of habitats and species in Ireland, including through the appropriate designation and protection of NHAs, SPAs and SACs. NPWS also has responsibility for the management of Statutory Nature Reserves. Details on designated areas and Statutory Nature Reserves in Wicklow are given in the table in section 3.3.</p> <p>The National Parks and Wildlife Service Manages the Wicklow Mountains National Park. With an information office and education centre at Glendalough, the National Park covers an area of 17,000ha and provides many opportunities for walking and viewing biodiversity. The NPWS also operates an education centre at Knocksink Nature Reserve.</p>	<p>Tel Headquarters 0404 45800</p> <p>Information Office 0404 45425</p> <p>Education Centre 0404 45656</p> <p>Web www.wicklownationalpark.ie</p>
<p>Teagasc</p>	<p>Teagasc is the national body providing research, advisory and training to the agriculture and food industry and rural communities. The main impact of Teagasc on biodiversity in Wicklow is through the management of the Rural Environment Protection Scheme (REPS), and also the Forest Environment Protection Scheme (FEPS). These enable farmers to be paid for environmental options in managing farmland and private forestry. Around 42,500 hectares of land is currently entered into REPS agreements in County Wicklow.</p>	<p>Tel 059 9170200</p> <p>Web www.teagasc.ie</p>

Agency/Organisation	What they do	Contacts
Wicklow Private Woodland Owners Group	The Wicklow Private Woodland Owners Group was established in 2008 to organise local woodland owners and exchange information with the statutory sector. It is supported in its activities by the Forest Service (Department of Agriculture, Fisheries and Food), County Wicklow Partnership(LEADER), Teagasc (The Agricultural Research Institute), Wicklow County Council, Woodlands of Ireland, Coillte and the timber industry.	Tel Web
Wicklow Uplands Council	Wicklow Uplands Council is an independent, voluntary organisation with charitable status which represents the views and interests of over 40 member groups and individuals, that takes a partnership approach to sustainable development. The Council promotes programmes and projects which bring value to people who live and work in the Uplands area and those who use it for recreational purposes.	Tel 0404 43958 Web www.wicklowuplands.ie
Wicklow County Council	<p>Wicklow County Council has a key role in delivering biodiversity in the county through its many roles and functions. The planning system has a particularly important role in the protection of important sites, landscapes and habitats, especially through County Development Plans. Other functions have a role in leading by example to ensure that operations, including capital schemes and maintenance programmes, are undertaken from a best practice perspective in conserving and enhancing biodiversity.</p> <p>The Wicklow County Development Plan 2010-2016 includes a number of policies aimed at protecting and enhancing biodiversity.</p> <p>The development of a Biodiversity Action Plan for the county is an explicit action of the Wicklow County Development plan 2010-2016 and the County Wicklow Heritage Plan2009-2014.</p> <p>Wicklow County Council, in partnership with the Heritage Council, employs a Heritage Officer. The Heritage Officer’s role includes promotion of biodiversity and related projects in the county.</p>	Tel Main Number 0404 20100 Heritage Office 0404 20191 Web www.wicklow.ie

The network of trees, woodlands and field boundaries in the landscape contributes greatly to its biodiversity value, providing feeding, breeding and nesting habitat for wildlife. Photo: Richard Nairn, NaturaConsultants.com



Red Kite chicks discovered in a nest in County Wicklow after an absence of over 200 years represent a significant milestone for biodiversity in Ireland. Evidence of the Red Kite's mixed diet of invertebrates, carrion and rodents can commonly be found in their nests. Photo: Golden Eagle Trust

3.3 Protected and Managed Areas

Wicklow has a good number of designated conservation sites including 14 Special Areas of Conservation (SAC), 4 Special Protection Areas (SPA), and 37 proposed Natural Heritage Areas (NHAs). There is also one National Park and 6 Statutory Nature Reserves. NPWS is currently writing management plans for SACs and SPAs. The status of these plans is noted below.

Table 1 – Designated sites and status of NPWS management plans in Wicklow

Site Name	SAC	SPA	pNHA	Management Plan Status (SACs/SPAs)
Ballyman Glen	•		•	No current plan
Bray Head	•		•	Plan in re-draft – consultation not complete
Buckrone-y-Brittass Dunes & Fen	•		•	Consultation completed – due to be published
Carriggower Bog	•		•	Plan in re-draft – consultation not complete
Deputy’s Pass Nature Reserve	•			Plan in re-draft – consultation not complete
Glen of the Downs	•		•	New format plan in progress
Holdenstown Bog	•		•	Plan in re-draft – consultation not complete
Knocksink Wood	•		•	New format plan in progress
Magherabeg Dunes	•		•	Consultation completed – due to be published
The Murrough Wetlands (incorporating Kilcoole Marshes and Broadlough)	•	•	•	Exists in old format – not published
Slaney River Valley	•			<i>Unknown</i>
Vale of Clara (Rathdrum Wood)	•		•	Plan in re-draft – consultation not complete
Wicklow Mountains	•	•	•	New format plan in progress*
Wicklow Reef	•			Plan in re-draft – consultation not complete
Poulaphouca Reservoir		•	•	<i>Unknown</i>
Wicklow Head		•	•	No current plan
Wicklow Town Sites			•	
Great Sugar Loaf			•	
Hollywood Glen			•	
Dunlavin Marshes			•	
Powerscourt Woodland			•	
Arklow Town Marsh			•	
Vartry Reservoir			•	
Powerscourt Waterfall			•	
Lowtown Fen			•	
Newtown Marshes			•	
Glenealey Woods			•	
Glencree Valley			•	
Dargle River Valley			•	

*A management plan exists for the Wicklow Mountains National Park

Site Name	SAC	SPA	pNHA	Management Plan Status (SACs/SPAs)
Ballycore Rath			•	
Ballinagee Wood			•	
Ballinacor Wood			•	
Avoca River Ralley			•	
Arklow Sand Dunes			•	
Arklow Rock - Askintinney			•	
Kilmacanoge Marsh			•	
Devil's Glen			•	
Avondale			•	
Tomnafinnoge Wood	•**		•	

**Part of Slaney River Valley SAC

Statutory Nature Reserves in Wicklow (all state owned)

- ▶ Deputy's Pass Nature Reserve, near Glenealy.
- ▶ Glendalough Nature Reserve.
- ▶ Glenealo Valley Nature Reserve. Lies above and to the west of Glendalough.
- ▶ Glen of the Downs Nature Reserve, About 8km south of Bray.
- ▶ Knocksink Wood Nature Reserve, In the Glencullen river valley just north of Enniskerry.
- ▶ Vale of Clara Nature Reserve, Mostly on the eastern side of the Avonmore River.



Photo: Richard Nairn, NaturaConsultants.com

4. A Biodiversity Action Plan (BAP) for Wicklow

4.1 Wicklow BAP Objectives

It is important that the Wicklow BAP is framed in appropriate objectives that give an overview of what we want to achieve for biodiversity in the county. There are four primary objectives given here, and they are based on acknowledgement of the following issues:

- ▶ We are aware of many aspects of biodiversity and its potential value for us, as outlined in section 1.2. However we often know fairly little about what we actually have in our local areas, what its value may be (for example as indicator species) and what we need to do to ensure its conservation;
- ▶ Biodiversity is important not only on its own merits but also because it performs many functions that provide our basic needs and enhance our quality of life. Yet it seems that this beneficial role of biodiversity is often not widely appreciated or understood;
- ▶ Over the years we have had a damaging effect on biodiversity, and this continues to the present day. There is a need to take positive action to put right historic and current impacts as well as ensuring that we don't impact on biodiversity in the future;
- ▶ Many people, communities and organisations are already working for biodiversity, others want to do something but are unsure how best to make a difference.

Taking account of the above issues, the objectives for the Wicklow BAP are:

- 1. To better understand the biodiversity of Wicklow.**
- 2. To raise awareness of biodiversity in Wicklow, its value and the issues facing it.**
- 3. To conserve and enhance habitats and species in Wicklow, taking account of national and local priorities.**
- 4. To foster active participation to help biodiversity in Wicklow, encouraging a partnership approach to help our species and habitats.**

4.2 Developing Priority Actions for Wicklow

There are many issues that need to be addressed and many actions that need to be taken in order to ensure the conservation and enhancement of biodiversity. Issues range from those that need to be addressed at a national level to those that will only have a benefit to a few species in a specific location. The County Wicklow Biodiversity Action Plan needs to make the best impact it can at a county level. This involves selecting challenging and achievable actions that make best use of the current organisations to address the most important issues in the county.

Consultation was an important part of developing actions for the BAP, allowing organisations and agencies in the county to outline what they considered to be the main issues that needed to be addressed. Results of the consultation and further detailed audit of the needs of important habitats and species in the county led to a long list of potential actions. In order to develop a workable number of actions and ensure that they were of the highest priority, they were all assessed against specific criteria. The actions in this BAP are those that scored highest with respect to:

- ▶ Specific relevance to Wicklow's biodiversity.
- ▶ Urgency of need for action.
- ▶ Benefit to nationally or internationally important species and habitats in Wicklow.
- ▶ Achievability of actions and the ability to complete them with the lifetime of the BAP.
- ▶ Promoting biodiversity in the county, including public and community awareness.
- ▶ Facilitating public participation and enjoyment of biodiversity.
- ▶ The ability for their success to be monitored.
- ▶ Supporting Local Authorities in conserving and enhancing biodiversity through the execution of their normal responsibilities.

4.3 Wicklow BAP Actions

- Objective 1:** To better understand the biodiversity of Wicklow .
- Objective 2:** To raise awareness of biodiversity in Wicklow, its value and the issues facing it.
- Objective 3:** To Conserve and enhance habitats and species in Wicklow, taking account of national and local priorities.
- Objective 4:** To foster active participation to help biodiversity in Wicklow, encouraging a partnership approach to help our species and habitats.

Action	Objective				Timescale	Measurement	Resources
	1	2	3	4			
Actions with a primary aim of better understanding the biodiversity of Wicklow							
1. Explore the possibility of compiling and operating a Wicklow County Biodiversity GIS Database to hold and make available biodiversity information relating to the county.	✓	✓	✓	✓	Short to medium term	GIS operational. Number of records received and interrogations of database.	Outsourced
2. Encourage and facilitate the collection of data on important species in the county ³ , and the sharing of information between agencies.	✓	✓		✓	Ongoing	Number of new datasets on important species/groups in Wicklow.	Heritage Officer
3. In cooperation with other Heritage Offices, consider undertaking a project to identify the economic and ecological service benefits of biodiversity. Studies should include value for tourism, flood defence, climate change off-set and adaptation, and should recommend future actions for County Wicklow.	✓	✓	✓		Short to medium term	Project undertaken, recommendations adopted.	Outsourced and Heritage Officer
4. Undertake a survey of bat and bird usage of bridges in County Wicklow to better facilitate council decisions and works.	✓		✓		Medium term	Survey undertaken and adopted into work programme.	Outsourced
5. Collect and store data on EU Habitats Directive Annex II and Annex IV species ⁴ , and other important species, in Wicklow's rivers to inform council decision making and activities.	✓		✓		Short to medium term – Ongoing	Good knowledge of status of target species.	Outsourced Heritage Officer

³List provided at Appendix 7 – to be updated and developed during the lifetime of the BAP.

6.	Building on Urban Habitat Mapping, explore the possibility of undertaking partnership projects with community interests in Bray, Wicklow and Arklow Towns, to identify, develop and promote aspects of local urban biodiversity.	✓	✓	✓	✓	✓	Medium to long term	Number of projects identified and undertaken with communities	Heritage Officer Staff time	
7.	Undertake a survey of wetlands in County Wicklow in order to inform council decisions including strategic planning, development control and waste permit decisions. Ensure the protection of wetland habitats of county importance through appropriate policies.	✓	✓	✓	✓	✓	Medium term	Survey undertaken and recommendations adopted as appropriate	Outsourced Staff time	
8.	Explore the possibility of carrying out habitat mapping as part of Local Area Plans in order to inform strategy and decisions.	✓	✓	✓	✓	✓	Ongoing	All LAPs incorporating habitat mapping	Outsourced Staff time	
9.	Compile information on the biodiversity value of Historic Demesnes in Wicklow.	✓	✓	✓	✓	✓	Medium to long term	Survey undertaken and recommendations adopted as appropriate	Outsourced Heritage Officer	
Actions with a primary aim of raising awareness of biodiversity in Wicklow, its value and the issues facing it										
10.	Undertake a campaign to develop and promote a sustainable wildlife tourism initiative in Wicklow. Such a project could be undertaken with Wicklow County Tourism, BirdWatch Ireland, The Red Kite reintroduction programme around Avoca, the Wicklow Mountains National Park and local businesses.	✓	✓	✓	✓	✓	Medium term	Project undertaken, recommendations adopted	Outsourced and Heritage Officer	
11.	Develop a Biodiversity Reference resource for County Wicklow for the general public and council staff. To include a public reference section in the County Library and on the Council website providing advice on species and habitats, biodiversity management, access and education providers. Also to include technical guidance for staff on the council intranet.	✓	✓	✓	✓	✓	Short to medium term	Resource in place. Amount of use by staff and public	Heritage Officer Staff time Material outsourced as necessary	

⁴Species listed in Appendix 3.

12.	In partnership with NPWS, BirdWatch Ireland, Coillte, Wicklow Uplands Council and others, develop a shared approach to biodiversity awareness and interpretation through existing and new facilities and trails.	✓	✓	✓	✓	Medium term	Number of facilities and trails with new interpretation	Partnership organisations and Heritage Officer
13.	In partnership with Teagasc and Department of Agriculture, formulate and deliver training for farmers on important issues in the county, such as wetlands, water quality and upland management.	✓	✓	✓	✓	Medium term	Number of issues and training events undertaken	Staff time Outsourced if necessary
14.	Explore the possibility of developing a biodiversity project for schools in Wicklow, in line with the green schools programme, including exploring Wicklow's biodiversity, wildlife recording, simple fieldwork and connections between biodiversity and other environmental issues, such as climate change.	✓	✓	✓	✓	Medium term	Programme devised. Number of schools using programme	Design outsourced Delivered by Heritage and Environmental Awareness Officers
15.	Produce and promote guidelines as necessary on individual issues, such as bats and buildings	✓	✓	✓	✓	Ongoing	Number of guidelines produced in response to need	Heritage Officer Outsourced if necessary
Actions with a primary aim of conserving and enhancing habitats and species in Wicklow, taking account of national and local priorities								
16.	In partnership with others, initiate a project to assess, agree and promote appropriate upland management measures for the county, taking account of biodiversity targets and statutory obligations to maintain good conservation status of designated areas.	✓	✓	✓	✓	Short term	Measures agreed and incorporated into land use plans, schemes and advice etc	Partnership organisations. Possibly part-outsourced
17.	Undertake a campaign on alien invasive species in the county, taking account of national priorities, benefits of taking action, the need to ascertain the current status in County Wicklow and the role of various agencies and groups in reporting and controlling them.	✓	✓	✓	✓	Short term	Awareness of issue and action needed among agencies and general public	Outsourced

18.	Undertake targeted biodiversity training for Council staff to ensure compliance with statutory obligations and application of best practice in all strategies, plans and decisions. Follow up with a review of council operations and incorporation of best practice into strategies and policies.	✓	✓	✓	Short term	Training undertaken and effectiveness monitored	Outsourced Heritage Officer support
19.	Promote the sustainable use of Wicklow's coast, incorporating the needs of tourism, wildlife and local populations. Include promotion of wildlife and economic value of habitats, assessment and control of recreational pressures, involvement of local populations in guardianship.	✓	✓	✓	Medium term	Project undertaken, recommendations adopted	Outsourced and Heritage Officer
20.	Support the development of a 'Green Corridors' strategy for the council, underpinned by Article 10 of the EU Habitats Directive and identification of 'Biodiversity Hotspots', to encourage integrity and connectivity between important sites and habitats. Including policy protection approaches for river corridors and hedges / verges.	✓	✓	✓	Medium term	Strategy developed and adopted, including identification of sites, corridors and adoption of policies	Staff time Possible part-outsourced
21.	Ensure the Wicklow County Council uses its powers of enforcement under the Waste Management Acts, bye laws and other relevant legislation, to control illegal dumping, pollution and inappropriate recreational activities.	✓	✓	✓	Ongoing	Number of enforcement actions undertaken compared to reported incidents	Staff time
22.	Provide guidance for public and council staff on incorporation of biodiversity into developments, infrastructure and land management. Including minimising biodiversity impact, biodiversity in landscaping projects and management for biodiversity.	✓	✓	✓	Short to medium term	Guidance produced. Feedback on use	Part- outsourced Heritage Officer

23.	Provide training and guidance on hedgerow management, verge management, and hedgerow planting, including cutting techniques and timing, aimed at council staff, contractors and landowners. In cooperation with Teagasc and the Hedgelaying Association of Ireland, where appropriate.	✓	✓	✓	Short to medium term	Guidance produced. Feedback on use	Outsourced Heritage Officer Staff time
24.	Support appropriate re-introduction programmes in the county, undertaking appropriate council action is taken to ensure environmental conditions are maintained.	✓	✓	✓	Ongoing		Heritage Officer Staff time
25.	Support the development of Special Amenity Area Orders as a mechanism for protecting sensitive natural landscapes under development and recreational pressure, ensuring that biodiversity management guidelines are produced for SAAOs.	✓	✓	✓	Ongoing	SAAOs in place where appropriate	Staff time
26.	Encourage and facilitate targeted management or study projects for important species, habitats and ecosystems where appropriate. Priority should be placed on facilitating studies relating to coastal biodiversity and to species, habitats and ecosystems most vulnerable to the effects of climate change.	✓	✓	✓	Ongoing	Number of management schemes/studies undertaken	Outsourced
Actions with a primary aim of fostering active participation to help biodiversity in Wicklow, encouraging a partnership approach to help our species and habitats							
27.	Undertake annual involvement in Biodiversity Day, organising and promoting events in partnership with partner groups in the county.	✓	✓	✓	Annual	Involvement by staff and public	Heritage Officer

28.	In partnership with others, promote community involvement in biodiversity schemes, by promoting biodiversity elements of national schemes such as Tidy Towns, Corrin Hill Biodiversity Gardens Award, and the introduction of a Golden Mile Competition for County Wicklow, ensuring a strong biodiversity emphasis.	✓	✓	✓	Short to medium term	Number of community biodiversity projects undertaken. Amount of community involvement in biodiversity projects	Heritage Officer Staff time
Actions necessary for the effective implementation of the County Wicklow Biodiversity Action Plan							
29.	Support the appointment of a Biodiversity Officer.	✓	✓	✓	Short term	Biodiversity Officer in post	Staff time (dependant on resources from DOEHLG)
30.	Set up a County Biodiversity Forum to oversee and guide the implementation of the Wicklow Biodiversity Action Plan.	✓	✓	✓	Short term	Biodiversity Forum in post	Heritage Officer Staff time

4.4 Proposed Monitoring, Review & Resourcing

The first Wicklow BAP is intended to be a 5-year working document. While it will stand in the same form from the point of adoption, it must be acknowledged that priorities and issues will be continually changing. In order to be successful, therefore, the Wicklow BAP will need to be reviewed in a systematic way. It is suggested that the following approach is taken to monitoring and review of the BAP.

Issue	Action needed	Review period
Monitoring of Actions	Summary report from partners	Annual
Review of Actions	Audit of achievement of objectives and current issues	5 years
Review of Species Lists	Full review of lists ensuring compliance with national guidance and local status changes	5 years
	Update of lists in response to known issues	Annual
Review of Action Plan	Full audit of plan, actions achieved and formulation of new plan	5 years

The National Biodiversity Action Plan is currently under review. It is important that the Wicklow Action plan takes account of national changes in strategy and approach for biodiversity action that arise from the review.

Resources

The appointment of a biodiversity officer and the availability of adequate resources are considered essential to the success of this plan. While many actions can be carried out within the Local Authorities existing remit and resources, many other actions will rely upon the availability of external funding either through the Department of the Environment, Heritage and Local government or other sources.

Appendix 1

Consultees for the Wicklow BAP

Consultation responses or information were received from the following as part of the initial plan preparation process:

- ▶ Wicklow County Council
- ▶ Wicklow County Council
- ▶ Wicklow County Council
- ▶ Wicklow County Council
- ▶ Wicklow County Council
- ▶ Arklow and Wicklow Town Councils
- ▶ Bray Town Council
- ▶ National Parks and Wildlife Service
- ▶ Eastern Regional Fisheries Board
- ▶ Forest Service
- ▶ BirdWatch Ireland
- ▶ Wicklow Uplands Council
- ▶ Coillte
- ▶ Teagasc
- ▶ Heritage Office
- ▶ Forward Planning and Development Control
- ▶ Environmental Awareness
- ▶ Roads and Area Engineers
- ▶ Waste and Waste Permitting

Submissions were received from the following as part of the public consultation process Sept-Oct 2010

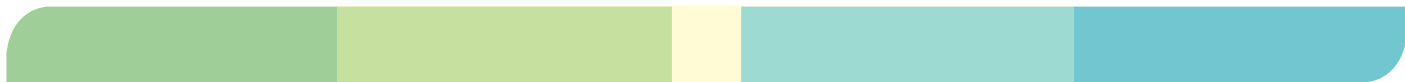
- ▶ Department of Communications, Energy and Natural Resources
- ▶ Department of Education & Science
- ▶ An Taisce
- ▶ Electricity Supply Board
- ▶ Jane Stout & Prof. John Farrell, Botany School of Natural Sciences, Trinity College, Dublin.
- ▶ Clive Dalby, Delgany
- ▶ National Roads Authority



Appendix 2

EU Habitats Directive Annex 1 Habitats and Associated SACs in Wicklow.

Name of SAC	EU Habitats Directive Annex 1 Habitats (*- Priority Habitats)
Ballyman Glen	7230 Alkaline fen 7220 Petrifying springs*
Bray Head	4030 European dry heath 1230 Vegetated sea cliffs of the Atlantic coasts
Buckronev-Brittis Dunes & Fen	2130 Fixed coastal dunes with herbaceous vegetation ('grey dunes')* 2150 Atlantic decalcified fixed dunes* 7230 Alkaline Fens 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) 2190 Wet/humid dune slacks 2110 Embryonic shifting dunes 2170 Dunes with <i>Salix repens</i> ssp. <i>Argentea</i> (<i>Salicion arenariae</i>) 1410 Mediterranean salt meadows 1210 Annual vegetation of drift lines 1220 Perennial vegetation of stony banks
Carriggower Bog	7140 Transition mire and quaking bog
Deputy's Pass Nature Reserve	91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles
Glen of the Downs	91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles
Holdenstown Bog	7140 Transition mire and quaking bogs
Knocksink Wood	91E0 Wet alluvial forest* 7220 Petrifying springs*
Magherabeg Dunes	2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)? 2130 Fixed coastal dunes with herbaceous vegetation ('grey dunes')* ? 2150 Atlantic decalcified fixed dunes* ? 7220 Petrifying springs* ? 1210 Annual Vegetation of Drift Lines There is no draft management plan for this site and the site synopsis is somewhat unspecific about Annex 1 habitats present.
The Murrough Wetlands	1210 Annual Vegetation of Drift Lines 1220 Perennial Vegetation of Stony Banks 1330 Atlantic Salt Meadows (<i>Glauco-Puccinellietalia</i>) 1410 Mediterranean Salt Meadows (<i>Juncetalia maritimi</i>) 7230 Alkaline Fen
Vale of Clara (Rathdrum Wood)	91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles



Name of SAC	EU Habitats Directive Annex 1 Habitats (*- Priority Habitats)
Wicklow Mountains	7130 Active blanket bog* 6230 Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas in continental Europe)* 4010 Northern Atlantic wet heaths with <i>Erica tetralix</i> 4030 European dry heaths 4060 Alpine and Boreal heaths 91A0 Old sessile oak woods with Ilex and <i>Blechnum</i> in the British Isles 8110 Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsetalia ladani</i>) 8210 Calcareous rocky slopes with chasmophytic vegetation 8220 Siliceous rocky slopes with chasmophytic vegetation 3130 Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> 3160 Natural dystrophic lakes and ponds
Wicklow Reef 002274	1170 Reef



Marram Grass vegetation. Photo: Richard Nairn, NaturaConsultants.com

Appendix 3

Species recorded in County Wicklow given Protection under the 1992 EU Habitats Directive.

Common name	Scientific name	Notes	Habitats Directive Annex
Varnished hook-moss (Shining sicklemoss)	<i>Hamatocaulis vernicosus</i> (<i>Drepanocladus vernicosus</i>)		Annex II(b)
Bog mosses	<i>Sphagnum spp.</i>		Annex V
Marsh clubmoss	<i>Lycopodiella inundata</i> (<i>Lepidotis/Lycopodium inundatum</i>)	Described as very rare by Brunker, not re-found in 2007	Annex V
Stag's-horn clubmoss	<i>Lycopodium clavatum</i>	Described as rare and local by Brunker	Annex V
Killarney fern	<i>Trichomanes speciosum</i>	Very rare or possibly extinct. Gametophyte recorded from two sites in 1990s	Annex II(b)
Desmoulins' whorl snail	<i>Vertigo moulinsiana</i>	Record from east of the county (no further data)	Annex II(a)
(no common name) whorl snail	<i>Vertigo geyeri</i>	May occur at sites in the north of the county. Unclear from data	Annex II(a)
Narrow-mouthed whorl snail	<i>Vertigo angustior</i>	May occur at sites in the north of the county. Unclear from data	Annex II(a)
Freshwater pearl mussel	<i>Margaritifera margaritifera</i>	Populations in Derreen River and possibly other sites in the county	Annex II(a) & V
White-clawed crayfish	<i>Austropotamobius pallipes</i>	Populations in Poulaphouca reservoir	Annex II(a) & V
Marsh fritillary	<i>Euphydryas (Eurodryas) aurinia</i>	Last record was from 1986 but re-found in four 10km squares as a breeding species in September 2010 by Osthoff and Wilson	Annex II(a)
Sea lamprey	<i>Petromyzon marinus</i>	Unknown distribution in the county. Unspecified lamprey species have been recorded at various sites in the county	Annex II(a)
River lamprey	<i>Lampetra fluviatilis</i>	Recorded in the Slaney River system. Unspecified lamprey species have been recorded at various sites in the county	Annex II(a) & V
Brook lamprey	<i>Lampetra planeri</i>	Recorded in a number of river systems in the county, including the Liffey, Dargle and Slaney. Unspecified lamprey species have been recorded at various sites in the county including Aughrim River	Annex II(a)

Common name	Scientific name	Notes	Habitats Directive Annex
Atlantic salmon	<i>Salmo salar</i>	Found in the Avoca, Slaney, Liffey, Dargle and Vartry catchments	Annex II(a) only in freshwater & V
Common frog	<i>Rana temporaria</i>	Widespread in the county	Annex V
Whiskered bat	<i>Myotis mystacinus</i>	Several known roosts	Annex IV(a)
Brandt's bat	<i>Myotis brandti</i>	First Irish record was at Glendalough in 2003	Annex IV(a)
Natterer's bat	<i>Myotis nattereri</i>	Recorded at a number of sites	Annex IV(a)
Daubenton's bat	<i>Myotis daubentoni</i>	Common on watercourses in County	Annex IV(a)
Leisler's bat	<i>Nyctalus leisleri</i>	Well distributed throughout the county	Annex IV(a)
Pipistrelle (45kHz)	<i>Pipistrellus pipistrellus</i>	Well distributed throughout the county	Annex IV(a)
Soprano pipistrelle (55kHz)	<i>Pipistrellus pygmaeus</i>	Well distributed throughout the county	Annex IV(a)
Nathusius' pipistrelle	<i>Pipistrellus nathusii</i>	Recorded from at least one site in the county	Annex IV(a)
Brown long-eared bat	<i>Plecotus auritus</i>	Distributed across the county	Annex IV(a)
Irish hare	<i>Lepus timidus hibernicus</i>	Common in uplands	Annex V
Minke (Piked) whale	<i>Balaenoptera acutorostrata</i>	Rare	Annex IV(a)
Common (Harbour) porpoise	<i>Phocoena phocoena</i>	Regular	Annex II(a) & IV(a)
(Great) Killer whale (Orca)	<i>Orcinus orca</i>	Rare	Annex IV(a)
Risso's (Grey) dolphin	<i>Grampus griseus</i>	Seasonal	Annex IV(a)
Common dolphin	<i>Delphinus delphis</i>	Occasional	Annex IV(a)
Bottle-nosed (Bottlenose) dolphin	<i>Tursiops truncatus</i>	Occasional	Annex II(a) & IV(a)
Pine marten	<i>Martes martes</i>	Increasing in range in the county	Annex V
Otter	<i>Lutra lutra</i>		Annex II(a) & IV(a)
Grey seal	<i>Halichoerus grypus</i>		Annex II(a) & V

Annex IIa Animal species of community interest whose conservation requires the designation of special areas of conservation.

Annex IIb Plant species of community interest whose conservation requires the designation of special areas of conservation.

Annex IVa Animal species of community interest in need of strict protection.

Annex IVb Plant species of community interest in need of strict protection.

Annex Va Animal species of community interest whose taking in the wild and exploitation may be subject to management measures.

Annex Vb Plant species of community interest whose taking in the wild and exploitation may be subject to management measures.

Appendix 4

Occurrence in County Wicklow of birds protected under Annex I of the 1979 EU Birds Directive – (not including very rare occurrence – ie vagrancy).

English name	Scientific name	Notes/Wicklow status
Whooper swan	<i>Cygnus cygnus</i>	Wintering
Bewick's swan	<i>Cygnus columbianus bewickii</i>	Wintering
Greenland white-fronted goose	<i>Anser albifrons flavirostris</i>	Local and scarce winter visitor
Barnacle goose	<i>Branta leucopsis</i>	Rare winter visitor
Little egret	<i>Egretta garzetta</i>	Breeding
Red kite	<i>Milvus milvus</i>	Reintroduced species
Hen harrier	<i>Circus cyaneus</i>	Scarce local winter visitor, has bred historically
Osprey	<i>Pandion haliaetus</i>	Regular passage migrant and possible future breeder
Merlin	<i>Falco columbarius</i>	Local resident breeder and winter visitor
Peregrine falcon	<i>Falco peregrinus</i>	Local resident breeder and winter visitor
Corncrake	<i>Crex crex</i>	Rare passage migrant, formerly bred
Wood sandpiper	<i>Tringa glareola</i>	Rare passage migrant, mainly in autumn
Dunlin	<i>Calidris alpina schinzii</i>	Common and widespread winter visitor and passage migrant
Red-necked phalarope	<i>Phalaropus lobatus</i>	Rare passage migrant
Mediterranean gull	<i>Larus melanocephalus</i>	Occasional winter visitor and passage migrant
Little gull	<i>Larus minutus</i>	Local, occasionally common winter visitor
Sandwich tern	<i>Sterna sandvicensis</i>	Common widespread summer visitor and passage migrant
Roseate tern	<i>Sterna dougallii</i>	Rare summer visitor, does not breed in Wicklow
Common tern	<i>Sterna hirundo</i>	Common summer visitor, does not breed in Wicklow
Arctic tern	<i>Sterna paradisaea</i>	Passage migrant
Little tern	<i>Sterna albifrons</i>	Scarce, localised breeder, largest colony on east coast is at Kilcoole
Red-throated diver	<i>Gavia stellata</i>	Widespread winter visitor along coast
Black-throated diver	<i>Gavia arctica</i>	Rare winter visitor
Short-eared owl	<i>Asio flammeus</i>	Rare breeder
Nightjar	<i>Caprimulgus europaeus</i>	Rare passage migrant, possible breeder
Kingfisher	<i>Alcedo atthis</i>	Scarce local resident breeder
Chough	<i>Pyrrhocorax pyrrhocorax</i>	Historic records from Wicklow Head

Appendix 5

Occurrence in County Wicklow of plants protected under the Flora Protection Order 1999.

Species Name	Scientific name	Notes
Slender stonewort	<i>Nitella gracilis</i>	Described as very rare by Brunker ⁵
Varnished hook-moss (Shining sicklemoss)	<i>Hamatocaulis vernicosus</i> (<i>Drepanocladus vernicosus</i>)	
Pale bristle-moss	<i>Orthotrichum pallens</i>	
Wilson's Pottia	<i>Tortula wilsonii</i> (<i>Pottia wilsonii</i>)	
Marsh clubmoss	<i>Lycopodiella inundata</i> (<i>Lepidotis/Lycopodium inundatum</i>)	Described as very rare by Brunker, not re-found by NPWS in 2007 ⁶
Moore's horsetail	<i>Equisetum x moorei</i> (<i>E.hyemale x E.ramosissimum</i>)	Wicklow is one of the strongholds for this species
Parsley fern	<i>Cryptogramma crispa</i>	Described as very rare in Brunker, not re-found by NPWS in 2007, may still survive in North Prison on Lugnaquilla
Killarney fern	<i>Trichomanes speciosum</i>	Described as very rare or extinct in Brunker, not re-found by NPWS in 2007. Gametophyte recorded from 2 sites in 1990s
Lanceolate spleenwort	<i>Asplenium obovatum lanceolatum</i>	Described as very rare by Brunker, population much decreased in 2007
Round prickly-headed poppy (Rough poppy)	<i>Papaver hybridum</i>	Described as very rare by Brunker, population much decreased in 2007
Annual knawel	<i>Scleranthus annuus</i>	Described as very rare by Brunker
Meadow saxifrage	<i>Saxifraga granulata</i>	Described as rare by Brunker, not re-found by NPWS in 2007
Great burnet	<i>Sanguisorba officinalis</i>	Described as rare by Brunker except in District 2 in Wicklow where it is widespread
Bird's-foot	<i>Ornithopus perpusillus</i>	Described as very rare by Brunker; good populations found in 2007
Clustered clover	<i>Trifolium glomeratum</i>	Described as very rare by Brunker, not re-found by NPWS in 2007
Subterranean clover	<i>Trifolium subterraneum</i>	Described as very rare by Brunker, good populations found in 2007, only site in Ireland
Oysterplant	<i>Mertensia maritima</i>	Described as very rare or extinct by Brunker, not re-found in 2007
Red hemp-nettle (Narrow-leaved hemp-nettle)	<i>Galeopsis angustifolia</i>	Described as very rare by Brunker, not re-found by NPWS in 2007
Basil thyme	<i>Clinopodium acinos</i> (<i>Acinos arvensis</i>)	Described as very rare or extinct by Brunker, not re-found in 2007

⁵Brunker J.P. (1950) Flora of the County of Wicklow

⁶NPWS 2007 survey of the rare, scarce and threatened flora of Co. Wicklow

Species Name	Scientific name	Notes
Pennyroyal (Penny Royal)	<i>Mentha pulegium</i>	Historic record, not refound by NPWS in 2007
Small cudweed (Slender cudweed)	<i>Filago minima (Logfia minima)</i>	Described as frequent by Brunner, now very rare in 2007
Heath cudweed (Wood cudweed)	<i>Gnaphalium sylvaticum (Omalotheca sylvatica)</i>	Described as rare by Brunner, now very rare in 2007
Cottonweed	<i>Otanthus maritimus</i>	Last seen in 1964
Meadow barley	<i>Hordeum secalinum</i>	Described as very rare or extinct by Brunner, not re-found by NPWS in 2007
Wild asparagus	<i>Asparagus officinalis</i>	Described as very rare by Brunner, three populations recorded in 2007
Narrow-leaved helleborine	<i>Cephalanthera longifolia</i>	Described as rare by Brunner, not re-found by NPWS in 2007
Bog orchid	<i>Hammarbya paludosa</i>	Described as frequent by Brunner, populations much reduced
Small white orchid	<i>Pseudorchis albida</i>	Described as rare by Brunner, not re-found by NPWS in 2007



Wild Garlic is a woodland plant that can thrive in hedgerow verges where similar conditions prevail. Photo: Richard Nairn, NaturaConsultants.com

Appendix 6

Important bird species in Wicklow, Including species protected under the 1979 EU Birds Directive and Birds of Conservation Concern in Ireland (BOCCI) 2008 (red listed and selected amber listed species). Also including selected species for which Wicklow is important in an Irish context.

English name	Scientific name	Birds Directive Annex 1	BOCCI status	Notes/Wicklow Status
Whooper swan	<i>Cygnus cygnus</i>	✓	Amber	Wintering
Bewick's swan	<i>Cygnus columbianus bewickii</i>	✓	Red (wintering)	Wintering
Greenland white-fronted goose	<i>Anser albifrons flavirostris</i>	✓	Amber	Local and scarce winter visitor
Barnacle goose	<i>Branta leucopsis</i>	✓	Amber	Rare winter visitor
Brent goose	<i>Branta bernicla</i>		Amber	Common and widespread winter visitor
Pintail	<i>Anas acuta</i>		Red (wintering)	Scarce local winter visitor
Shoveler	<i>Anas clypeata</i>		Red (wintering)	Scarce local winter visitor
Common scoter	<i>Melanitta nigra</i>		Red (breeding)	Locally common winter visitor
Goosander	<i>Mergus merganser</i>		Amber	Only breeding site outside of Donegal
Little egret	<i>Egretta garzetta</i>	✓	Amber	Breeding
Red kite	<i>Milvus milvus</i>	✓	Amber	Reintroduced species
Hen harrier	<i>Circus cyaneus</i>	✓	Amber	Scarce local winter visitor, has bred historically
Osprey	<i>Pandion haliaetus</i>	✓		Regular passage migrant and possible future breeder
Hobby	<i>Falco subbuteo</i>			Increasing but rare vagrant and summer visitor. Potential for breeding
Merlin	<i>Falco columbarius</i>	✓	Amber	Local resident breeder and winter visitor
Peregrine falcon	<i>Falco peregrinus</i>	✓	Amber	Local resident breeder and winter visitor
Common quail	<i>Coturnix coturnix</i>		Red (breeding)	Rare
Red grouse	<i>Lagopus lagopus scoticus</i>		Red (breeding)	Local scarce resident breeder
Corncrake	<i>Crex crex</i>	✓	Red (breeding)	Rare passage migrant, formerly bred
Bar-tailed godwit	<i>Limosa lapponica</i>	✓	Amber	Very scarce winter visitor
Woodcock	<i>Scolopax rusticola</i>		Amber	Rare breeder

English name	Scientific name	Birds Directive Annex 1	BOCCI status	Notes/Wicklow Status
Curlew	<i>Numenius arquata</i>		Red (breeding)	Common and widespread winter visitor/migrant. Formerly bred, current status unknown.
Redshank	<i>Tringa totanus</i>		Red (breeding)	Scarce local breeder, common and widespread winter visitor and passage migrant.
Wood sandpiper	<i>Tringa glareola</i>	✓	Amber	Rare passage migrant, mainly in autumn.
Knot	<i>Calidris canutus</i>		Red (wintering)	Rare passage migrant.
Dunlin	<i>Calidris alpina schinzii</i>	✓	Amber	Common and widespread winter visitor and passage migrant.
Red-necked phalarope	<i>Phalaropus lobatus</i>	✓	Red (breeding)	Rare passage migrant.
Golden plover	<i>Pluvialis apricaria</i>	✓	Red (breeding)	Winter visitor and passage migrant, locally common.
Lapwing	<i>Vanellus vanellus</i>		Red (breeding)	Rare resident breeder, common and widespread in winter.
Herring gull	<i>Larus argentatus</i>		Red (breeding)	Common, widespread resident breeder and winter visitor, declining.
Black-headed gull	<i>Larus ridibundus</i>		Red (breeding)	Common winter visitor.
Mediterranean gull	<i>Larus melanocephalus</i>	✓	Amber	Occasional winter visitor and passage migrant.
Little gull	<i>Larus minutus</i>	✓	Amber	Local, occasionally common winter visitor.
Sandwich tern	<i>Sterna sandvicensis</i>	✓	Amber	Common widespread summer visitor and passage migrant.
Roseate tern	<i>Sterna dougallii</i>	✓	Amber	Rare summer visitor, doesn't breed in Wicklow.
Common tern	<i>Sterna hirundo</i>	✓	Amber	Common summer visitor, doesn't breed in Wicklow.
Arctic tern	<i>Sterna paradisaea</i>	✓	Amber	Passage migrant.
Little tern	<i>Sterna albifrons</i>	✓	Amber	Scarce, localised breeder, largest colony on east coast at Kilcoole.
Red-throated diver	<i>Gavia stellata</i>	✓	Amber	Widespread winter visitor along coast.
Black-throated diver	<i>Gavia arctica</i>	✓	Amber	Rare winter visitor.
Barn owl	<i>Tyto alba</i>		Red (breeding)	Very rare resident, no recent breeding records, declining.
Short-eared owl	<i>Asio flammeus</i>		Amber	Rare breeder.
Nightjar	<i>Caprimulgus europaeus</i>	✓	Red (breeding)	Rare passage migrant, possible breeder.
Kingfisher	<i>Alcedo atthis</i>	✓	Amber	Scarce local resident breeder.

English name	Scientific name	Birds Directive Annex 1	BOCCI status	Notes/Wicklow Status
Great spotted woodpecker	<i>Dendrocopus major</i>			Increasing but rare vagrant and summer visitor. Probably bred in 2008.
Chough	<i>Pyrrhocorax pyrrhocorax</i>	✓	Amber	Historic records from Wicklow Head.
Ring ouzel	<i>Turdus torquatus</i>		Red (breeding)	Very rare summer visitor, possible breeder in uplands but very rare.
Whinchat	<i>Saxicola rubetra</i>		Amber	Rare breeder.
Redstart	<i>Phoenicurus phoenicurus</i>		Amber	Rare breeder.
Reed warbler	<i>Acrocephalus scirpaceus</i>		Amber	Rare breeder.
Lesser whitethroat	<i>Sylvia curruca</i>		Amber	Rare breeder - only location outside of Wexford.
Wood warbler	<i>Philoscopus sibilatrix</i>		Amber	Rare Breeder.
Pied flycatcher	<i>Ficedula hypoleuca</i>		Amber	Rare breeder – only attempted breeding location in Ireland.
Yellow wagtail	<i>Motacilla flava</i>		Amber	Rare breeder – only breeding location in Ireland.
Twite	<i>Carduelis flavirostris</i>		Red (breeding)	Rarity.
Yellowhammer	<i>Emberiza citrinella</i>		Red (breeding)	Common, resident, Wicklow remains stronghold for this species which is declining nationally.

Annex 1 species under the EU Birds Directive are those requiring conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution.



Kingfisher, a scarce resident breeding species in County Wicklow. Photo: M. Finn, Birdwatch Ireland

Appendix 7

Important biodiversity species in Wicklow. List to be further developed during the lifetime of the BAP.

The species below include:

- ▶ Species cited by International Conventions
- ▶ Species given protected or other status under EU Directives (Birds and Habitats Directives)
- ▶ Nationally protected species
- ▶ Red Data Book species
- ▶ Species of high concern on shadow lists
- ▶ Species considered by county experts to be of importance in Wicklow

Note that this list is considered to be a work in progress. It currently covers some of the more popular taxa. It is expected that it will grow as status and distribution information becomes available for different species.

Common name	Scientific classification/name	Notes
ALGAE		
Stoneworts	<i>Chara denudata</i>	Possibly – Listed by Brunner ⁷ but not clear which subspecies
	<i>Chara mucosa</i>	Possibly – Listed by Brunner but not clear which subspecies
Slender stonewort	<i>Nitella gracilis</i>	Described as very rare by Brunner
MOSSES		
Varnished hook-moss (Shining sicklemoss)	<i>Hamatocaulis vernicosus</i> (<i>Drepanocladus vernicosus</i>)	
Pale bristle-moss	<i>Orthotrichum pallens</i>	
Wilson’s Pottia	<i>Tortula wilsonii</i> (<i>Pottia wilsonii</i>)	
CLUBMOSES		
Marsh clubmoss	<i>Lycopodiella inundata</i> (<i>Lepidotis/Lycopodium inundatum</i>)	Described as very rare by Brunner, not re-found by NPWS in 2007 ⁸
Stag’s-horn clubmoss	<i>Lycopodium clavatum</i>	Described as rare and local by Brunner
HORSETAILS		
Moore’s horsetail	<i>Equisetum x moorei</i> (<i>E.hyemale x E.ramosissimum</i>)	Wicklow is one of the strongholds for this species
FERNS		
Parsley fern	<i>Cryptogramma crispera</i>	Described as very rare in Brunner, not re-found by NPWS in 2007, may still survive in North Prison on Lugnaquilla

⁷Brunner J.P. (1950) Flora of the County of Wicklow

⁸NPWS 2007 survey of the rare, scarce and threatened flora of Co. Wicklow

Common name	Scientific classification/name	Notes
FERNS		
Killarney fern	<i>Trichomanes speciosum</i>	Described as very rare or extinct in Brunner, not re-found by NPWS in 2007. Gametophyte recorded from 2 sites in 1990s
Lanceolate spleenwort	<i>Asplenium obovatum lanceolatum</i>	Described as very rare by Brunner, population much decreased in 2007
Oak fern	<i>Gymnocarpium dryopteris</i>	Described as very rare or absent by Brunner, not recorded by NPWS in 2007
FLOWERING PLANTS		
Small-flowered buttercup	<i>Ranunculus parviflorus</i>	Considered an alien in Brunner
Ivy-leaved crowfoot	<i>Ranunculus hederaceus</i>	Described as common by Brunner
Round-leaved crowfoot	<i>Ranunculus omiophyllus</i>	Described as common by Brunner
Stream water-crowfoot	<i>Ranunculus penicillatus</i>	Described as abundant by Brunner
Round prickly-headed poppy (Rough poppy)	<i>Papaver hybridum</i>	Described as very rare by Brunner, population much decreased in 2007
Prickly poppy	<i>Papaver argemone</i>	A scarce species in Ireland, there are historic records in Wicklow
Purple ramping-fumitory	<i>Fumaria purpurea</i>	Described as rare by Brunner
Climbing corydalis	<i>Corydalis claviculata</i>	A scarce species in Ireland, this species is common in Wicklow
Annual knawel	<i>Scleranthus annuus</i>	Described as very rare by Brunner
Corncockle	<i>Agrostemma githago</i>	Described as very rare by Brunner
Lesser chickweed	<i>Stellaria pallida</i>	A scarce species in Ireland, there are recent records of this species in Wicklow
Water dock	<i>Rumex hydrolapathum</i>	Described as locally common by Brunner
Fiddle dock	<i>Rumex pulcher</i>	Described as very rare or extinct by Brunner
Rock sea-lavender	<i>Limonium binervosum</i>	Described as locally common by Brunner
Sea-kale	<i>Crambe maritima</i>	Considered extinct by Brunner, however currently three populations, the most recent found at Buckronev by Osthoff and Wilson in 2010
Bog rosemary	<i>Andromeda polifolia</i>	Described as very rare by Brunner
Round-leaved wintergreen	<i>Pyrola rotundifolia</i>	Site destroyed by fertiliser factory
Primrose	<i>Primula vulgaris</i>	Described as common by Brunner
Cowslip	<i>Primula veris</i>	Described as common by Brunner
Meadow saxifrage	<i>Saxifraga granulata</i>	Described as rare by Brunner, not re-found by NPWS in 2007
Great burnet	<i>Sanguisorba officinalis</i>	Described as rare by Brunner except in District 2 in Wicklow where it is widespread

Common name	Scientific classification/name	Notes
FLOWERING PLANTS		
Alpine lady's-mantle	<i>Alchemilla alpina</i>	Described as very rare by Bruncker
Bird cherry	<i>Prunus padus</i>	Described as rare by Bruncker and in all cases under suspicion as deliberately planted
Bird's-foot	<i>Ornithopus perpusillus</i>	Described as very rare by Bruncker; good populations found in 2007
Spring vetch	<i>Vicia lathyroides</i>	Described as rare by Bruncker, good populations re-found by NPWS in 2007
Marsh pea	<i>Lathyrus palustris</i>	Described as very rare by Bruncker, unable to access site in 2007 due to high water levels
Clustered clover	<i>Trifolium glomeratum</i>	Described as very rare by Bruncker, not re-found by NPWS in 2007
Rough clover	<i>Trifolium scabrum</i>	A scarce species in Ireland, this species is scarce also in Wicklow
Knotted clover	<i>Trifolium striatum</i>	A scarce species in Ireland, this species has a reasonable population in Wicklow
Subterranean clover	<i>Trifolium subterraneum</i>	Described as very rare by Bruncker, good populations found in 2007, only site in Ireland
Bird's-foot clover	<i>Trifolium ornithopodioides</i>	A scarce species in Ireland.
Alder buckthorn	<i>Frangula alnus</i>	Described as very rare by Bruncker
Round-leaved crane's-bill	<i>Geranium rotundifolium</i>	Specimen in Botanic Gardens
Shepherd's needle	<i>Scandix pecten-veneris</i>	Described as rare by Bruncker
Tubular water-dropwort	<i>Oenanthe fistulosa</i>	Described as locally common by Bruncker
Hemlock water-dropwort	<i>Oenanthe crocata</i>	Described as common by Bruncker
Lesser marshwort	<i>Apium inundatum</i>	Described as frequent by Bruncker
Hen-bane	<i>Hyoscyamus niger</i>	Described as very rare and uncertain in it's appearances by Bruncker, not re-found in 2007
Oysterplant	<i>Mertensia maritima</i>	Described as very rare or extinct by Bruncker, not re-found in 2007
Yellow archangel	<i>Lamiaeum galeobdolon</i>	Described as rare and very local by Bruncker, good populations in 2007
Red hemp-nettle (Narrow-leaved hemp-nettle)	<i>Galeopsis angustifolia</i>	Described as very rare by Bruncker, not re-found by NPWS in 2007
Basil thyme	<i>Clinopodium acinos (Acinos arvensis)</i>	Described as very rare or extinct by Bruncker, not re-found in 2007
Pennyroyal (Penny Royal)	<i>Mentha pulegium</i>	Historic record, not re-found by NPWS in 2007
Wild clary	<i>Salvia verbenaca</i>	Historic record 1866
Blunt-fruited water-starwort	<i>Callitriche obtusangula</i>	Described as common by Bruncker

Common name	Scientific classification/name	Notes
FLOWERING PLANTS		
Pale toadflax	<i>Linaria repens</i>	A scarce species in Ireland, it occurs at a handful of sites in Wicklow
Greater broomrape	<i>Orobanche rapum-genistae</i>	Described as frequent by Brunker, healthy populations recorded in 2007
Ivy broomrape	<i>Orobanche hederace</i>	Described as rare by Brunker
Nettle-leaved bellflower (Bats-in-the-belfry)	<i>Campanula trachelium</i>	Described as alien (casual only) by Brunker
Ivy leaved bellflower	<i>Wahlenbergia hederacea</i>	A scarce species in Ireland, it has undergone considerable decline in Wicklow
Alpine saw-wort	<i>Saussurea alpina</i>	Described as very rare by Brunker, small population present in 2007
Musk thistle	<i>Carduus nutans</i>	Described as alien (casual only) by Brunker
Cornflower	<i>Centaurea cyanus</i>	Described as alien (casual only) by Brunker, not re-found in 2007
Small cudweed (Slender cudweed)	<i>Filago minima (Logfia minima)</i>	Described as frequent by Brunker, now very rare in 2007
Heath cudweed (Wood cudweed)	<i>Gnaphalium sylvaticum (Omalotheca sylvatica)</i>	Described as rare by Brunker, now very rare in 2007
Blue fleabane	<i>Erigeron acer</i>	Described as rare by Brunker, now very rare in 2007
Cottonweed	<i>Otanthus maritimus</i>	Last seen in 1964
Corn chamomile	<i>Anthemis arvensis</i>	Last seen in 1897
Bog pondweed	<i>Potamogeton polygonifolius</i>	Described as common by Brunker
Fen pondweed	<i>Potamogeton coloratus</i>	Described as rare by Brunker
Eelgrasses	<i>Zostera spp.</i>	Described as very rare by Brunker
Bulbous rush	<i>Juncus bulbosus</i>	Described as common by Brunker
Dwarf spike-rush	<i>Eleocharis parvula</i>	Described as very rare by Brunker, not re-found by NPWS in 2007
Darnel	<i>Lolium temulentum</i>	Described as very rare by Brunker
Dune fescue	<i>Vulpia fasciculata</i>	A scarce species in Ireland, there are reasonable populations in Wicklow
Meadow barley	<i>Hordeum secalinum</i>	Described as very rare or extinct by Brunker, not re-found by NPWS in 2007
Wild asparagus	<i>Asparagus officinalis</i>	Described as very rare by Brunker, three populations recorded in 2007
Narrow-leaved helleborine	<i>Cephalanthera longifolia</i>	Described as rare by Brunker, not re-found by NPWS in 2007
Marsh helleborine	<i>Epipactis palustris</i>	Described as locally abundant by Brunker, still recorded in 2007
Green-flowered helleborine	<i>Epipactis phyllanthes</i>	Not recorded by Brunker, not re-found by NPWS in 2007

Common name	Scientific classification/name	Notes
FLOWERING PLANTS		
Bird's-nest orchid	<i>Neottia nidus-avis</i>	Described as rare by Brunker. Refound at former station in 2009 by Wilson and Osthoff
Bog orchid	<i>Hammarbya paludosa</i>	Described as frequent by Brunker, populations much reduced
Small white orchid	<i>Pseudorchis albida</i>	Described as rare by Brunker, not re-found by NPWS in 2007
Narrow-leaved marsh-orchid	<i>Dactylorhiza traunsteineri</i>	Described as very rare by Brunker, still present in 2007
Green-winged orchid	<i>Orchis morio</i>	Described as frequent in the west of the county and very rare elsewhere by Brunker, not recorded by NPWS in 2007
Bee orchid	<i>Ophrys apifera</i>	Described as rare by Brunker
SNAILS & BIVALVES		
Desmoulins' whorl snail	<i>Vertigo moulinsiana</i>	Record from east of the county (no further data)
(No common name) whorl snail	<i>Vertigo geyeri</i>	May occur at sites in the north of the county. Unclear from data
Narrow-mouthed whorl snail	<i>Vertigo angustior</i>	May occur at sites in the north of the county. Unclear from data
Freshwater pearl mussel	<i>Margaritifera margaritifera</i>	Populations in Derreen River and possibly other sites in the county
CRUSTACEANS		
White-clawed crayfish	<i>Austropotamobius pallipes</i>	Populations in Poulaphouca reservoir
DRAGONFLIES		
Scarce emerald damselfly	<i>Lestes dryas</i>	A nationally rare species. Pre-2000 records at a couple of sites in the county
Scarce blue-tailed damselfly	<i>Ischnura pumilio</i>	A nationally scarce species. Recent records of reasonable numbers at a couple of sites in the county
Migrant hawkler	<i>Aeshna mixta</i>	Species with strictly south/east distribution in Ireland. Occurs at a number of sites in Wicklow
Emperor dragonfly	<i>Anax imperator</i>	Species with scarce and strictly south/east distribution in Ireland. Occurs at a few sites in Wicklow
Hairy dragonfly	<i>Brachytron pratense</i>	Limited distribution in the south/east. Occurs at a few sites in Wicklow
Black-tailed skimmer	<i>Orthetrum cancellatum</i>	Very limited distribution in the south/east. Possibly occurs in extreme north west of county

Common name	Scientific classification/name	Notes
DRAGONFLIES		
Keeled skimmer	<i>Orthetrum coerulescens</i>	Patchy distribution in Ireland. Reasonable populations in the uplands, recorded range has declined in the county
Black darter	<i>Sympetrum danae</i>	Limited distribution in south/east of Ireland. Reasonable populations in Wicklow but recorded range declined in recent years
MOTHS & BUTTERFLIES		
Cloaked carpet	<i>Euphyia biangulata</i>	A scarce moth in an Irish context but common in Wicklow
Streak	<i>Chesias legatella</i>	Only recorded from Wicklow and Donegal, it has undergone an 78% decline over 35 years in the UK
Broomtip	<i>Chesias rufata</i>	Only recorded from Wicklow and Wexford, it has undergone an 84% decline over 35 years in the UK
Brown veined wainscot	<i>Archanara dissoluta</i>	A rare moth in an Irish context with a stronghold in Wicklow
Silky wainscot	<i>Chilodes maritimus</i>	A rare moth in an Irish context with a stronghold in Wicklow
Annulet	<i>Charissa obscurata</i>	Only inland site in Ireland is in Wicklow, scarce species
Oblique carpet	<i>Orthonama vittata</i>	Wicklow has good populations. This moth has undergone an 83% decline over 35 years in the UK
Grey birch	<i>Aethalura punctulata</i>	Local species in Ireland, good populations in Wicklow
Hedge rustic	<i>Tholera cespitis</i>	Local species in Ireland, it has undergone a 97% decline over 35 years in the UK
Olive	<i>Ipimorpha subtusa</i>	A very rare moth in Ireland with a stronghold in Wicklow
Dingy skipper	<i>Erynnis tages</i>	Species with very limited distribution in Ireland, mainly in west. Possibly only a single recent record in the county
Brimstone	<i>Gonepteryx rhamni</i>	Species with a limited distribution in Ireland, mainly central. A few recent records in the county
Green hairstreak		Very limited distribution in east of Ireland. A few recent records in the county
Purple hairstreak	<i>Neozephyrus (Quercusia) quercus</i>	Very limited distribution in Ireland. Wicklow is a stronghold for this woodland specialist

Common name	Scientific classification/name	Notes
MOTHS & BUTTERFLIES		
Small blue	<i>Cupido minimus</i>	Very patchy distribution in Ireland. A few, mainly coastal, records in Wicklow
Holly blue	<i>Celastrina argiolus</i>	Mainly south east distribution in Ireland. Fairly well recorded in Wicklow
Marsh fritillary	<i>Euphydryas (Eurodryas) aurinia</i>	Very limited distribution in south/east Ireland. Last record was from 1986 but re-found in four 10km squares as a breeding species in September 2010 by Osthoff and Wilson
Grayling	<i>Hipparchia semele</i>	Patchy distribution in Ireland. Reasonable populations in Wicklow
Large heath	<i>Coenonympha tullia</i>	Very limited distribution in south/east Ireland. Record in north west Wicklow
BEEES		
	<i>Andrena coitana</i>	Vulnerable. Wicklow is a stronghold for this species
	<i>Andrena fuscipes</i>	Vulnerable. Wicklow is a stronghold for this species that has only been recorded in a few sites outside the county
	<i>Andrena marginata</i>	Critically endangered. Rare and patchy distribution. Recorded at a few sites in Wicklow
	<i>Andrena trimmerana</i>	Critically endangered. Only recorded from a couple of sites in Ireland. Possibly in the north of the county
	<i>Bombus barbutellus</i>	Endangered. Patchy but widespread distribution in Ireland. Recorded at a few sites in Wicklow
	<i>Bombus distinguendus</i>	Endangered. Patchy but widespread distribution in Ireland. Recorded at a few sites in Wicklow
	<i>Bombus ruderarius</i>	Vulnerable. A scarce species in Ireland. Recorded at a number of sites in Wicklow
	<i>Bombus rupestris</i>	Endangered. Patchy distribution in Ireland. Recorded at a few sites in Wicklow
	<i>Bombus sylvarum</i>	Endangered. Patchy distribution in Ireland. Recorded at one of more sites in Wicklow
	<i>Bombus monticola</i>	<i>Species with a very limited distribution in Ireland, stronghold in Wicklow Mountains</i>

Common name	Scientific classification/name	Notes
BEEES		
	<i>Coelioxys elongata</i>	Endangered. Very scarce in Ireland. Recorded at two or three sites in Wicklow
	<i>Colletes floralis</i>	Vulnerable. Largely coastal distribution in Ireland. Recorded at a few sites in Wicklow
	<i>Lasioglossum nitidisculum</i>	Vulnerable. Patchy distribution in Ireland, mainly south and east. Wicklow appears to be a stronghold
	<i>Nomada argentata</i>	Critically endangered. Recorded in only a few sites in Ireland. Possibly recorded in south west of Wicklow
	<i>Nomada goodeniana</i>	Endangered. Patchy distribution in Ireland, mainly south and east. Recorded at a few sites in Wicklow
	<i>Nomada obtusifrons</i>	Endangered. Patchy distribution in Ireland. Wicklow appears to be a stronghold
	<i>Sphecodes ferruginatus</i>	Endangered. Recorded at very few sites in Ireland. Recorded at one or more sites in Wicklow
SEA URCHINS	ECHINODERMATA	
European edible sea urchin	<i>Echinus esculentus</i>	
FISH	PISCES	
Sea lamprey	<i>Petromyzon marinus</i>	Unknown distribution in the county. Unspecified lamprey species have been recorded at various sites in the county
River lamprey	<i>Lampetra fluviatilis</i>	Recorded in the Slaney River system. Unspecified lamprey species have been recorded at various sites in the county
Brook lamprey	<i>Lampetra planeri</i>	Recorded in a number of river systems in the county, including the Liffey, Dargle and Slaney. Unspecified lamprey species have been recorded at various sites in the county including Aughrim River
Basking shark	<i>Cetorhinus maximus</i>	Possibly very rare occurrence
Atlantic salmon	<i>Salmo salar</i>	Found in the Avoca, Slaney, Liffey, Dargle and Vartry catchments
Sea trout	<i>Salmo trutta</i>	Found in the Avoca, Slaney, Liffey, Dargle and Vartry catchments
Arctic char	<i>Salvelinus alpinus</i>	Now deemed extinct in main Wicklow Lakes

Common name	Scientific classification/name	Notes
AMPHIBIANS	AMPHIBIA	
Smooth newt	<i>Triturus vulgaris</i>	
Common frog	<i>Rana temporaria</i>	Widespread in the county
REPTILES	REPTILIA	
Common lizard	<i>Lacerta vivipara</i>	Fairly common in the uplands at least
BIRDS	AVES	
Whooper swan	<i>Cygnus cygnus</i>	Wintering
(Bewick's) Tundra swan	<i>Cygnus columbianus bewickii</i>	Wintering
Greater white-fronted goose (Greenland race)	<i>Anser albifrons flavirostris</i>	Local and scarce winter visitor
Barnacle goose	<i>Branta leucopsis</i>	Rare winter visitor
Brent goose	<i>Branta bernicla</i>	Common and widespread winter visitor
Northern pintail	<i>Anas acuta</i>	Scarce local winter visitor
Northern shoveler	<i>Anas clypeata</i>	Scarce local winter visitor
Common (Black) scoter	<i>Melanitta nigra</i>	Locally common winter visitor
Little egret	<i>Egretta garzetta</i>	Breeding
Red kite	<i>Milvus milvus</i>	Reintroduction
(Hen harrier) Northern harrier	<i>Circus cyaneus</i>	Scarce local winter visitor, has bred historically
Merlin	<i>Falco columbarius</i>	Local resident breeder and winter visitor
Peregrine falcon	<i>Falco peregrinus</i>	Local resident breeder and winter visitor
Common quail	<i>Coturnix coturnix</i>	Rarity
Red grouse	<i>Lagopus lagopus scoticus</i>	Local scarce resident breeder
Corncrake	<i>Crex crex</i>	Rare passage migrant, formerly bred
Bar-tailed godwit	<i>Limosa lapponica</i>	Very scarce winter visitor
Eurasian curlew	<i>Numenius arquata</i>	Common and widespread winter visitor and passage migrant, formerly bred in area, current breeding status unknown
Common redshank	<i>Tringa totanus</i>	Scarce local breeder, common and widespread winter visitor and passage migrant
Wood sandpiper	<i>Tringa glareola</i>	Rare passage migrant, mainly in autumn
Red knot	<i>Calidris canutus</i>	Rare passage migrant
Sanderling	<i>Calidris alba</i>	Scarce local winter visitor and passage migrant
Dunlin	<i>Calidris alpina schinzii</i>	Common and widespread winter visitor and passage migrant
Red-necked phalarope	<i>Phalaropus lobatus</i>	Rare passage migrant
European golden plover	<i>Pluvialis apricaria</i>	Winter visitor and passage migrant, locally common

Common name	Scientific classification/name	Notes
BIRDS	AVES	
Northern lapwing	<i>Vanellus vanellus</i>	Rare resident breeder, common and widespread in winter
Herring gull	<i>Larus argentatus</i>	Common, widespread resident breeder and winter visitor, declining.
Black-headed gull	<i>Larus ridibundus</i>	Common winter visitor
Mediterranean gull	<i>Larus melanocephalus</i>	Occasional winter visitor and passage migrant
Little gull	<i>Larus minutus</i>	Local, occasionally common winter visitor
Sandwich tern	<i>Sterna sandvicensis</i>	Common widespread summer visitor and passage migrant
Roseate tern	<i>Sterna dougallii</i>	Rare summer visitor, doesn't breed in Wicklow
Common tern	<i>Sterna hirundo</i>	Common summer visitor, doesn't breed in Wicklow
Arctic tern	<i>Sterna paradisaea</i>	Passage migrant
Little tern	<i>Sterna albifrons</i>	Scarce, localised breeder, largest colony on east coast at Kilcoole
Red-throated diver (loon)	<i>Gavia stellata</i>	Widespread winter visitor along coast
Black-throated diver (Arctic Loon)	<i>Gavia arctica</i>	Rare winter visitor
Barn owl	<i>Tyto alba</i>	Very rare resident, no recent breeding records, declining
Short-eared owl	<i>Asio flammeus</i>	Widespread resident breeder
Eurasian nightjar	<i>Caprimulgus europaeus</i>	Rare passage migrant, possible breeder
Common kingfisher	<i>Alcedo atthis</i>	Scarce local resident breeder
Red-billed chough	<i>Pyrrhocorax pyrrhocorax</i>	Historic records from Wicklow Head
Ring ouzel	<i>Turdus torquatus</i>	Very rare summer visitor, possible breeder in uplands but very rare
Twite	<i>Carduelis flavirostris</i>	Rarity
Yellowhammer	<i>Emberiza citrinella</i>	Common, resident, Wicklow remains stronghold for this species which is declining nationally
MAMMALS	MAMMALIA	
Hedgehog	<i>Erinaceus europaeus</i>	Under recorded
Whiskered bat	<i>Myotis mystacinus</i>	Several known roosts
Brandt's bat	<i>Myotis brandti</i>	First Irish record was at Glendalough in 2003
Natterer's bat	<i>Myotis nattereri</i>	Recorded at a number of sites
Daubenton's bat	<i>Myotis daubentoni</i>	Common on watercourses in County
Leisler's bat	<i>Nyctalus leisleri</i>	Well distributed throughout the county

Common name	Scientific classification/name	Notes
MAMMALS	MAMMALIA	
Pipistrelle (45kHz)	<i>Pipistrellus pipistrellus</i>	Well distributed throughout the county
Soprano pipistrelle (55kHz)	<i>Pipistrellus pygmaeus</i>	Well distributed throughout the county
Nathusius' pipistrelle	<i>Pipistrellus nathusii</i>	Recorded from at least one site in the county
Brown long-eared bat	<i>Plecotus auritus</i>	Distributed across the county
Irish hare	<i>Lepus timidus hibernicus</i>	Common in uplands
Red squirrel	<i>Sciurus vulgaris</i>	
Harbour porpoise	<i>Phocoena phocoena</i>	Regular
Minke (Piked) whale	<i>Balaenoptera acutorostrata</i>	Rare
(Great) Killer whale (Orca)	<i>Orcinus orca</i>	Rare
Risso's (Grey) dolphin	<i>Grampus griseus</i>	Seasonal
Common dolphin	<i>Delphinus delphis</i>	Occasional
Bottle-nosed (Bottlenose) dolphin	<i>Tursiops truncatus</i>	Occasional
Pine marten	<i>Martes martes</i>	Increasing in range in County
Stoat	<i>Mustela erminea</i>	Under recorded
Badger	<i>Meles meles</i>	
Otter	<i>Lutra lutra</i>	
Grey seal	<i>Halichoerus grypus</i>	
Red deer	<i>Cervus elaphus</i>	Most are now hybridised with Sika in Wicklow



Garden Tiger Moth. Photo: Faith Wilson



Bluebell. Photo: Faith Wilson



Irish Hare. Photo: Faith Wilson

Appendix 8

Native Trees & Shrubs – A list of suitable species for planting

Extract from “Conserving and Enhancing Wildlife in Towns and Villages – A Guide for Local Community Groups”. The Heritage Council/Local Authority Heritage Officers. www.heritagecouncil.ie/wildlife/publications/ NOTE: Tree stock should be checked to ensure that seed is of Irish and where possible local provenance, thus helping to preserve genetic biodiversity.

Common Name	Latin name	Height (max)	Suitable for public open spaces	Suitable for streets and confined spaces	Suitable for tubs, containers, raised beds etc	Guide to planting: see key
Alder	<i>Alnus Glutinosa</i>	22m	Yes	No	Yes	ADPS
Alder buckthorn	<i>Frangula alnus</i>	6m	Yes	No	Yes	D Restricted distribution. Not commonly available
Arbutus (Strawberry tree)	<i>Arbutus unedo</i>	8m	Yes	No	Yes	Not frost hardy
Ash	<i>Fraxinus excelsior</i>	28m	Yes	No	No	ADIPS
Aspen	<i>Populus tremula</i>	24m	Yes	No	No	DPSV Not close to Buildings or any services
Bramble	<i>Rubus fruticosus</i>	2m	No	No	No	C/H note: tends to be invasive
Broom	<i>Cytisus scoparius</i>	2m	Yes	No	Yes	*
Burnet rose	<i>Rosa pimpinellifolia</i>	2m	Yes	No	Yes, but vigorous	C/H Restricted distribution. Not commonly available
Common (or European) gorse	<i>Ulex europeus</i>	2.5m	Yes	No	In a rural setting	HV
Crab apple	<i>Malus sylvestris</i>	6m	Yes	No	No	AHIP
Dog rose	<i>Rosa canina</i>	2m	Yes	No	Yes. Vigorous	C/H
Downy birch	<i>Betula pubescens</i>	18m	Yes	Yes	Yes	ADIP
Elder	<i>Sambucus nigra</i>	6m	In hedge	No	No	V
Guelder rose	<i>Viburnum opulus</i>	4.5m	Yes	No	No	DH
Hawthorn	<i>Crataegus monogyna</i>	9m	Yes	Yes	Yes	AHIPS
Hazel	<i>Corylus avellana</i>	6m	Yes	No	No	AHS
Holly	<i>Ilex aquifolium</i>	15m	Yes	Yes	Yes	AHPS
Honeysuckle	<i>Lonicera periclymenum</i>	climber	Yes	On walls	No	C
Ivy	<i>Hedera helix</i>	climber	Yes	Yes	Yes	C
Juniper	<i>Juniperus communis</i>	6m	Yes	No	No	S

Common Name	Latin name	Height (max)	Suitable for public open spaces	Suitable for streets and confined spaces	Suitable for tubs, containers, raised beds etc	Guide to planting: see key
Pedunculate Oak	Quercus robur	30m	Yes	No	No	AI only suitable for large spaces
Privet	Ligustrum Vulgare	3m	Yes	Yes	Yes	No
Rowan or Mountain Ash	Sorbus aucuparia	9m	Yes	Yes	Yes	ADHIP
Scots pine	Pinus sylvestris	24m	Yes	No	No	AI
Sessile Oak	Quercus petraea	30m	Yes	No	No	AI only suitable for large spaces
Silver birch	Betula pendula	18m	Yes	Yes	Yes	ADIP
Sloe, blackthorn	Prunus spinosa	3m	Yes	No	No	AHPV
Spindle	Euonymus europaeus	7.5m	Yes	No	No	H
Western (or mountain) gorse	Ulex gallii	1.5m	Yes	Yes	Yes	*Restricted distribution. Not commonly available
Whitebeam spp.	Sorbus aria	12m	Yes	Yes	Yes	IPS
Wild cherry	Prunus avium	15m	Yes	Yes	Yes	AHI
Willow spp.	Salix spp.	6m	Some	No	No	V Not suitable near buildings or services
Wych elm	Ulmus glabra	30m	Yes	No	No	PS
Yew	Taxus baccata	14m	Yes	Yes	Yes	AIPS

A – Grows in a wide variety of soils

C – Climber

H – Suitable for hedging

I – Suitable as an individual tree

D – Tolerates or prefers damp conditions

P – Tolerates smoke or pollution

S – Tolerates shade

V – Invasive

* – Tolerates dry

Appendix 9

International, European and National Legislation

International Conventions Relevant to the Conservation and Management of Biodiversity in Ireland

- ▶ International Convention for the Regulation of Whaling (1946)
- ▶ Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar) 1971
- ▶ Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1973)
- ▶ The European Network of Biogenetic Reserves (1976)
- ▶ Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) (1979)
- ▶ Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) (1979)
- ▶ Convention on Biological Diversity (1992)
- ▶ UN Framework Convention on Climate Change (1992)
- ▶ Agreement on the Conservation of Bats in Europe (Bonn Convention) (1993)
- ▶ International Tropical Timber Trade Agreement (1994)
- ▶ Pan European Biological and Landscape Diversity Strategy (endorsed 1995)
- ▶ UN agreement on Straddling and Highly Migratory Fish Stocks (1995)
- ▶ UNEP Washington Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (1995)
- ▶ UN and Food & Agriculture Organisation (FAO) Code of Conduct for Sustainable Fisheries (1995)

- ▶ Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) (1996)
- ▶ Convention for the Protection of the Marine Environment of the North East Atlantic (OSPAR) (1997) (including Annex V on marine biodiversity)

European Legislation Relevant to Conservation and Management of Biodiversity

- ▶ 79/409/EEC Council Directive on the Conservation of Wild Birds (Birds Directive)
- ▶ 92/43/EEC Council Directive on the Conservation of Natural Habitats and Wild Flora and Fauna
- ▶ 78/659/EEC Directive on the Quality of Freshwater Needing Protection or Improvement in Order to Support Fish Life
- ▶ 79/923/EEC Directive on the Quality of Shellfish Waters
- ▶ 91/692/EEC Directive on Quality of water for Human Consumption
- ▶ 2000/60/EC Water Framework Directive
- ▶ 75/442/EEC Directive on Waste Disposal
- ▶ 76/464/EEC Directive on other Substances: Protection of the Aquatic Environment of the Community
- ▶ 85/337/EEC Directive on Environmental Impact Assessment and 97/11/EC
- ▶ 91/676/EEC Nitrates Directive
- ▶ 96/61/EC Directive on Integrated Pollution Prevention and Control
- ▶ Strategic Environmental Assessment Directive (2004)

National Legislation Relevant to Conservation and Management of Biodiversity

- ▶ Foreshore Acts, 1933 to 1998
- ▶ Whale Fisheries Act, 1937
- ▶ Fisheries Acts, 1933 -1999
- ▶ The Forestry Act, 1946
- ▶ Sea Fisheries Act, 1952
- ▶ Continental Shelf Act, 1968
- ▶ Local Government (Planning and Development) Acts, 2000-2010
- ▶ Environmental Protection Agency Act, 1992
- ▶ European Communities (Environmental Impact Assessment) Regulations, 1989-1999
- ▶ The Heritage Act, 1995
- ▶ EPA Act, 1992 (Urban Waste Water Treatment) Regulations, 1994
- ▶ Waste Management Act, 1996
- ▶ Whale Fisheries Act, 1937
- ▶ Wildlife Act, 1976 and Amendment, 2000
- ▶ European Communities (Conservation of Wild Birds) Regulations, 1985
- ▶ European Communities (Natural Habitats) Regulations, 1997
- ▶ Flora Protection Order, 1999
- ▶ Salmon and Sea Trout Caught by Rod and Line (Prohibition on Sale) Order, 2001
- ▶ Wild Salmon and Sea Trout Tagging Scheme Regulations, 2005

Appendix 10

Most significant invasive species in County Wicklow

The following list and profile information on the “Dirty Dozen”, the most significant invasive species that occur in County Wicklow was provided by the National Biodiversity Data Centre. Inclusion on the list is informed by data gathered from the EPA and others, along with such criteria as where species are found in designated sites, in close proximity to natural corridors leading to designated sites and at waterbodies. This list may be updated during the lifetime of the Plan as more information becomes available. For further information see <http://invasives.biodiversityireland.ie/>.

“Dirty Dozen” non native invasive species in County Wicklow

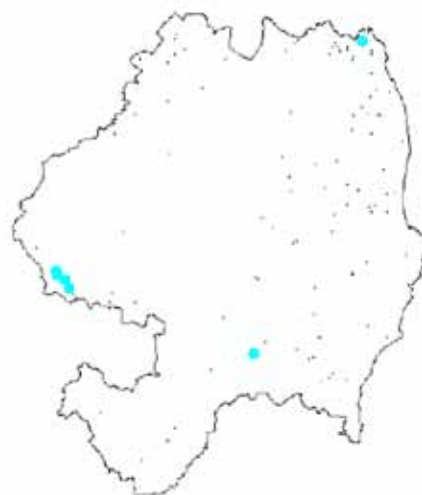
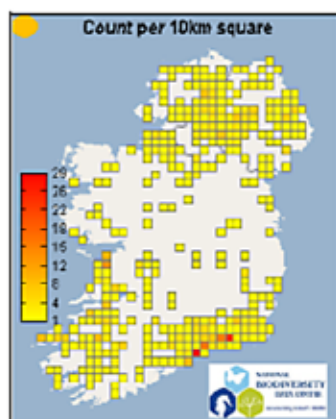
- I. FALLOPIA JAPONICA – JAPANESE KNOTWEED
- II. IMPATIENS GLANDULIFERA – HIMALAYAN BALSAM
- III. HERACLEUM MANTEGAZZIANUM – GIANT HOGWEED
- IV. RHODODENDRON PONTICUM – RHODODENDRON
- V. AZOLLA FILICULOIDES – WATER FERN
- VI. ELODEA NUTTALLII – NUTTALL’S WATERWEED
- VII. GAMMARUS PULEX
- VIII. ARTHURDENDYUS TRINAGULATUS – NEW ZEALAND FLATWORM
- IX. OXYURA JAMAICENSIS – RUDDY DUCK
- X. SCIURUS CAROLINENSIS – GREY SQUIRREL
- XI. MUNTIACUS REEVESI – MUNTJAC DEER
- XII. SUS SCROFA - WILD BOAR

Species distribution and profile – see over.

SPECIES PROFILE

Species Name	Common Name	Irish Name	First Recorded in Ireland	
<i>Fallopia japonica</i>	Japanese Knotweed	Glúineach bhiorach	1902	
Native Distribution	Asia: Japan, Sakhalin Island, the Kurile Islands, Korea, SW China, Taiwan, and Vietnam	Irish Distribution Frequency	Very Common – many sites and many individuals	
No. of records in Wicklow Co. Council	8	No. of 1km² record squares or higher resolution	3	
Priority Tagging	<ul style="list-style-type: none"> • One of the 8 Invasive Species Survey plants • In designated sites • In close proximity to a natural corridor leading to designated sites • High impact invasive species 			
Habitat	Riparian zones, Disturbed areas, Urban areas. Often found growing by riverbanks and roadsides. Also found growing on waste ground, rubbish tips, gardens and parks.	Fossitt (2000) general habitat code	FW,GA,GS,PB,WL,ED,BC,BL,CD	
Impact	Competition and abiotic change impacts. Shading out of native species and destabilization of river banks and man-made structures such as buildings, walls and flood defense structures.			
Identification Features	Herbaceous perennial plant with hollow bamboo-like stems that are speckled red. Grows to 3m in height. Leaves are 10-15cm long and up to 13cm wide, are shield shaped with a flat base and are arranged along zig-zag stems. Roots are bright orange inside. Flowers are very small, white, grouped and hanging. Flowering from July to October. It dies back in winter leaving dead stems. Can be confused with other non-native Knotweed species.			
Photos				

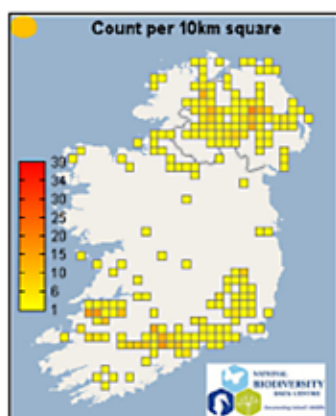
Species Distribution and Profiles
Fallopia Japonica – Japanese Knotweed




SPECIES PROFILE

Species Name	Common Name	Irish Name	First Recorded in Ireland	
<i>Impatiens glandulifera</i>	Himalayan Balsam	Lus no pléisce	1906	
Native Distribution	Asia: Western Himalayas		Irish Distribution Frequency	Very Common – many sites and many individuals
No. of records in Wicklow	Co. Council	5	No. of 1km² record squares or higher resolution	5
Comment	Given the quick growth and excellent dispersal capabilities of this plant, a targeted survey for this species is highly recommended especially along the river corridors where they have been recorded.			
Priority Tagging	<ul style="list-style-type: none"> • Few locations • Recent invader • One of the 8 Invasive Species Survey plants • In close proximity to a natural corridor leading to designated sites • High impact invasive species 			
Habitat	Riparian zones, Disturbed areas, Urban areas. It grows well on moist, nutrient rich ground especially by river, stream and lake margins. Also found growing along hedgerows, roadsides, ditches, damp woodland and grasslands.		Fossitt (2000) general habitat code	FW, GS, GM, PB, PF, WN, WS, WL, ED, BL
Impact	Competition and abiotic change impacts. Shading out of native species and increased soil erosion along river banks.			
Identification Features	Herbaceous annual plant with hollow brittle stems that are pink to red in colour in summer. It grows to 2m in height. Leaves are distinctive with finely serrated edges that can be red tinged and normally arranged in whorls of three. The flowers are 'trumpet' shaped and can vary in colour from white to purple. It flowers from July to October. A distinctive feature is the seed capsule which explodes and ejects the seed when mature. Roots are shallow and plant is easily pulled from the ground.			
Photos				

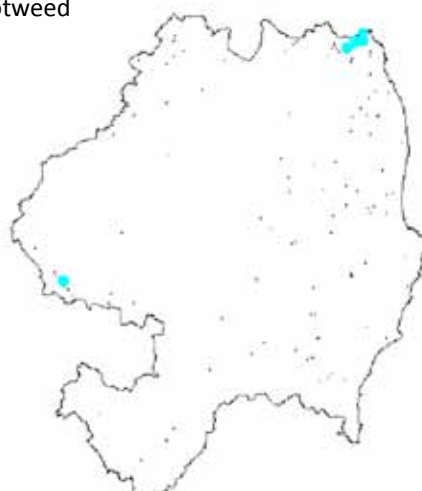
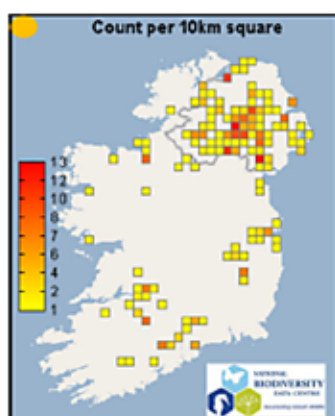
Species Distribution and Profiles
Impatiens Glandulifera – Himalayan Balsam



SPECIES PROFILE

Species Name	Common Name	Irish Name	First Recorded in Ireland	
<i>Heracleum mantegazzianum</i>	Giant Knotweed	Feabhrán capaill	1902	
Native Distribution	Asia: Russian Caucasus		Irish Distribution Frequency	Common – many sites in the country
No. of records in Wicklow Co. Council	2	No. of 1km² record squares or higher resolution	2	
Priority Tagging	<ul style="list-style-type: none"> • Few locations • Recent invader • One of the 8 Invasive Species Survey plants • In close proximity to a natural corridor leading to designated sites • High impact invasive species 			
Habitat	Riparian zones, Disturbed areas, Urban areas. Found on moist ground along river, stream, and lake margins. Also in grassland and roadsides.	Fossitt (2000) general habitat code	FW, GS, WL	
Impact	Competition, abiotic changes and human health impacts. Shading out of native species and increases soil erosion along river banks. It produces a hazardous sap that can cause severe burns and scarring by sensitising the skin to light (UV radiation).			
Identification Features	The feature that distinguishes this Giant Hogweed from other umbel species is its size. It can grow to 5m in height, the flowering head up to 80cm across and the sharply divided leaves can grow to 3m in length and 1.5 m wide. The stem usually has purple blotches, is hollow, can have hairy bristles and be 5-10cm in diameter. Its flowers are white or rarely ink and it flowers from June to August. Can be up to 50,000 (1.5cm long) seeds per plant!			
Photos				

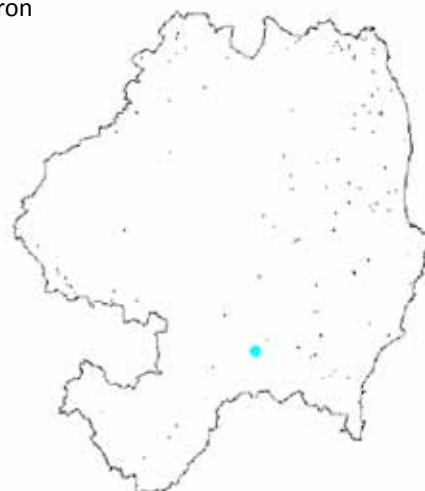
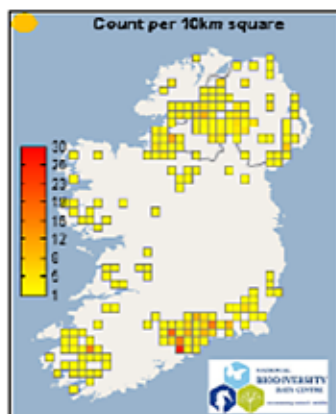
Species Distribution and Profiles
Heracleum Mantegazzianum– Giant Knotweed



SPECIES PROFILE

Species Name	Common Name	Irish Name	First Recorded in Ireland	
<i>Rhododendron ponticum</i>	Rhododendron	Róslabhras	1800	
Native Distribution	South-west Europe and south-west Asia.		Irish Distribution Frequency	Very Common – many sites and many individuals
No. of records in Wicklow Co. Council	1	No. of 1km² record squares or higher resolution		0
Priority Tagging	<ul style="list-style-type: none"> Few locations High impact invasive species 			
Habitat	It thrives in acidic soils in woodlands and also found on heathland, bogs, rocky hillsides, gardens and parks.		Fossitt (2000) general habitat code	GS, HH, PB, ED, BC, WN, WD, WS
Impact	Competition, abiotic change, toxic and socio-economic impacts. Shading out of native species, reduced biodiversity and it is a vector for Sudden Oak Death fungus. It is also costly to infested forest plantations. Hundreds of thousands of Euro are spent each year trying to control it in Ireland.			
Identification Features	Evergreen leathery leaves with dull green leaf with paler underside. Leaves arranged in a spiral at the end of stem. Flowers have 5 petals, grow in 'bunches' and appear May to June. Usually pink/purple, occasionally whiteish. Seeds pods approx 3cm. Woody trunks can be dense and twisted and usually to 5m tall. Can grow to 10m.			
Photos				

Species Distribution and Profiles
Rhododendron Ponticum – Rhododendron

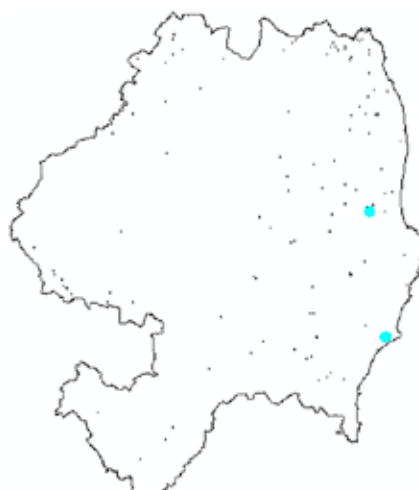
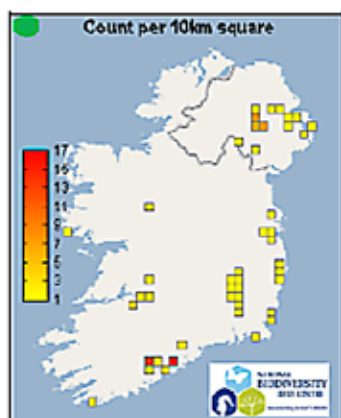


SPECIES PROFILE


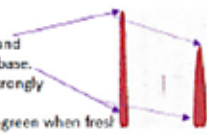
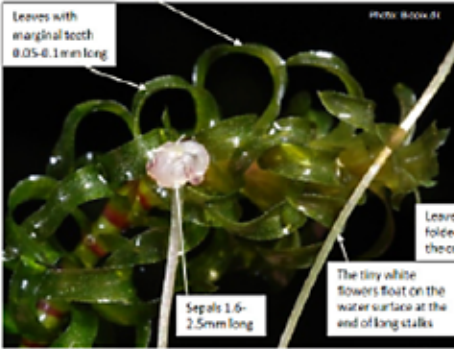
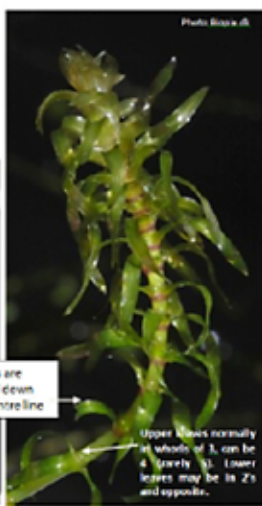
Species Name	Common Name	Irish Name	First recorded in Ireland	
<i>Azolla filiculoides</i>	Water Fern	Raithneach uisce	1907 in wild (1893 in garden pond)	
Native Distribution	North and South America. Warm temperate and subtropical America through Western North America (including Alaska).		Irish Distribution Frequency	Common - many sites in the country
No. of records in Wicklow Co. Council	2	No. of 1km ² record squares or higher resolution	2	
Priority Tagging	<ul style="list-style-type: none"> • One of the 8 Invasive Species Survey plants • Few locations • In designated sites 			
Habitat	Lakes, Watercourses. The preferred habitat is still and slow flowing water bodies such as ponds, ditches, water reservoirs, wetlands, channels, canals and slow moving rivers.	Fossitt (2000) general habitat code	FL, FW, FS	
Impact	Abiotic changes, competition, human health and socio-economic. Water Fern can form large dense monospecific floating mats which outcompete native submerged plants and algae by shading and blocking oxygen diffusion. This can also result in reduced animal life in the water. These dense floating mats can also reduce the recreational value of the waterbodies. In Great Britain there have been reports of impact to human health as children may mistakenly think the surface of a water body is solid and fall through.			
Identification Features	Plants can be present year round but often die back in winter. These floating plants are small up to 2.5cm long and have a fern like shape. Their surface is granular in appearance and non-wettable. The plant can vary in colour from bright to dark green to red. This depends on the intensity of sunlight and time of year. It has multiple dark roots.			
Photos				

Species Distribution and Profiles

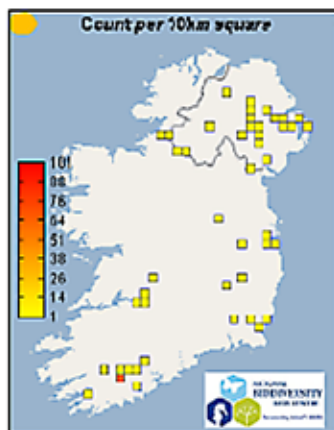
Azolla Filiculoides – Water Fern




SPECIES PROFILE

Species Name	Common Name	Irish Name	First recorded in Ireland	
<i>Elodea nuttallii</i>	Nuttall's Waterweed	Tim uisce chaol	1984	
Native Distribution	North America		Irish Distribution Frequency	Common – many sites in the country
No. of records in Wicklow Co. Council	2	No. of 1km ² record squares or higher resolution	2	
Priority Tagging	<ul style="list-style-type: none"> • One of the 8 Invasive Species Survey plants • Recent invader • High impact invasive species • Few locations (Cashel Lough Upper – priority removal from this habitat suggested) • Connected waterbodies 			
Habitat	Lakes, Watercourses. Nuttall's Waterweed has been found growing in a wide range of water bodies: lakes, reservoirs, ponds, rivers streams, canals and ditches. It favours still or slow flowing eutrophic water.	Fossitt (2000) general habitat code	FL, FW, CW	
Impact	Competition, Socio-economic, Extinction. Nuttall's Waterweed tends to dominate native macrophyte communities which may lead to their local extinction. It is also known to replace other invasive species as the dominant species in an impacted ecosystem. It is tolerant of disturbance, oil pollution and salinity up to 14 parts per thousand (~ half seawater). All <i>Elodea</i> species tend to take up metals from the sediment and release them into the water. Dense growth can impede flow of water can exacerbate flooding. Research on Nuttall's Waterweed by the Central Fisheries Board in Carrigrohid Reservoir has found that hectares of water are un-fishable and are unavailable for any water-based leisure pursuit. In Iri spreads vegetatively.			
Identification Features	Submerged perennial species usually rooted in mud and with very small white or red-tinged flowers that float on the end of a very fine long stalk. Upper leaves normally in whorls of 3, can be 4, rarely 5. Lower leaves may be in 2's and opposite. The leaf tapers to a point and is broadest at the base. Usually some leaves are strongly recurved and/or twisted. The density /closeness of the leaves along the stem can vary depending on its environment.			
Photos	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;">  <p><i>E. nuttallii</i> in Carrigrohid Reservoir, August 2006. © Central Fisheries Board, 2000-2009</p> </div> <div style="width: 65%;"> <p>Key ID Features</p> <ul style="list-style-type: none"> • Leaf tips taper to a point and the leaf is broadest at the base. • Usually some leaves are strongly recurved and/or twisted. • Root tips white to greyish-green when fresh!    <p>Leaves with marginal teeth 8.05-8.1mm long</p> <p>Leaves are folded down the centre line</p> <p>The tiny white flowers float on the water surface at the end of long stalks</p> <p>Upper leaves normally in whorls of 3, can be 4, rarely 5. Lower leaves may be in 2's and opposite.</p> <p>Segals 1.6-2.5mm long</p> </div> </div> <p>There are many species in Ireland that look similar to <i>Elodea nuttallii</i> so caution must be taken when identifying it. Please view a taxonomic key and/or get expert verification if in any doubt.</p>			

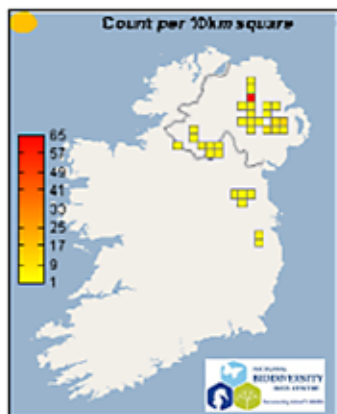
Species Distribution and Profiles
Elodea Nuttallii – Nuttall's Waterweed



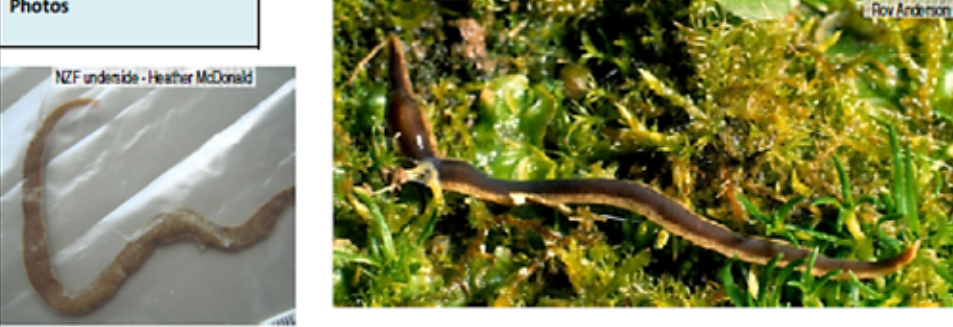
SPECIES PROFILE

Species Name	Common Name	Irish Name	First recorded in Ireland	
<i>Gammarus pulex</i>	None		1988 in Rep of Irl. (1958 Northern Irl.)	
Native Distribution	Europe (mainland Europe and the United Kingdom).	Irish Distribution Frequency	Local - many individuals in some areas of the country	
No. of records in Wicklow Co. Council	4	No. of 1km ² record squares or higher resolution	4	
Distribution Comment	One of the record comments notes their dominance where surveyed. Their proximity and linkages through the river and lakes network may make it possible for their spread. Notice of care not to introduce these species via angling bait buckets, water in boats etc. should be taken.			
Priority Tagging	<ul style="list-style-type: none"> • Few locations (but likely to be widespread) • Connected waterbodies • In designated sites 			
Habitat	Lakes, Watercourses. Freshwater habitat.	Fossitt (2000) general habitat code	FL, FW	
Impact	Predation, disease transmission, extinction. It predates on other invertebrate species including Mayflies and the native <i>Gammarus duebeni celticus</i> which it has also replaced as in some areas. Fish and duck may become infested with a gut-worm parasite if they eat infected <i>Gammarus pulex</i> .			
Identification Features	Adult males reach nearly 2cm in length, females are smaller and the young are miniature versions of the adults. They have two pairs of antennae on their head, five pairs of walking legs and two other pairs of leg-like limbs that have hooks on the end. They have been described as looking like a 'swimming comma'. Males can often be found carrying their mates, and protect them aggressively (Dick, J. 2008).			
Photos				

Species Distribution and Profiles
Gammarus Pulex – No common name

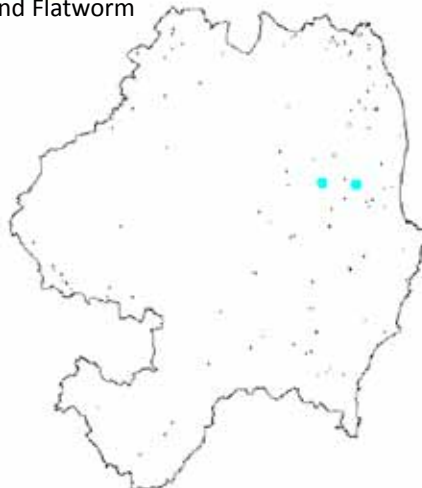
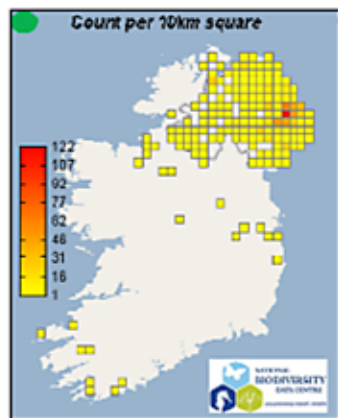


SPECIES PROFILE



Species Name	Common Name	Irish Name	First recorded in Ireland
<i>Arthurdendyus triangulatus</i>	New Zealand Flatworm		1963
Native Distribution	Oceania. Native to New Zealand.		Irish Distribution Frequency Local many individuals in some areas of the country
No. of records in Wicklow Co. Council	1	No. of 1km² record squares or higher resolution	1
Priority Tagging	<ul style="list-style-type: none"> Few locations High impact invasive species 		
Habitat	In forest soils and cultivated soils such as gardens and plant nurseries in its native range. It has been found in gardens, nurseries, garden centres, parks, pasture and wasteland in its introduced range. Found in relatively undisturbed soils near the soil surface under coverage such as stones, tiles, pots and old wood that create damp conditions. Also has been found surviving under lining of garden ponds and hanging baskets. Optimal temperatures 12-15°C, temperatures above 20°C appears to be lethal for the animals.	Fossitt (2000) general habitat code	GA, BC
Impact	Predation, human health. Predation on native earthworms and thus possible secondary impact on reduced soil fertility. Human health concern that mucus that surrounds the flatworm may irritate skin and cause allergic reactions.		
Identification Features	Distinctive. Very flat, not segmented and pointed at both ends. Brown upper body (often dark brown to purplish) with pale speckled edges. Underside, pale buff colour with grey-brown specks. Entire body covered by a sticky mucus. The size of a mature flatworm may vary from 5 to 20cm in length and to 1 cm in width. Coiled when rested.		
Photos			

Species Distribution and Profiles

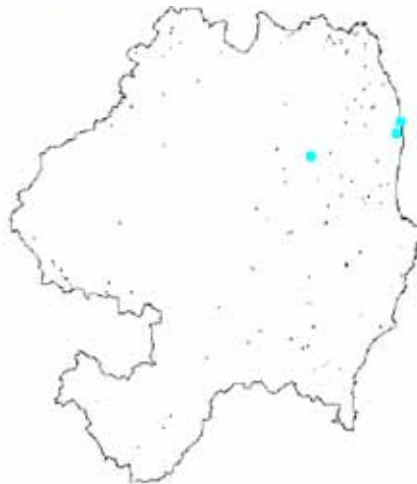
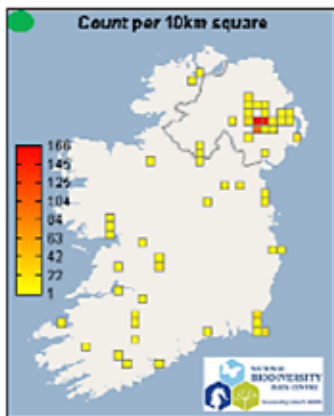
Arthurdendyus triangulatus – New Zealand Flatworm









SPECIES PROFILE

Species Name	Common Name	Irish Name	First recorded in Ireland	
<i>Oxyura jamaicensis</i>	Ruddy Duck	Lacha Rua	1973	
Native Distribution	North and Central America and western South America		Irish Distribution Frequency	Local – many individuals in some areas of the country
No. of records in Wicklow Co. Council	5	No. of 1km ² record squares or higher resolution	5	
Distribution Comment	The cull in Great Britain may be impacting on the numbers of Ruddy Duck entering Ireland.			
Priority Tagging	<ul style="list-style-type: none"> Few locations (but highly mobile species) In designated sites High impact invasive species (see impact) 			
Habitat	Lowland wetlands with lush emergent vegetation and areas of open water.	Fossitt (2000) general habitat code	FL, FS, GS, GM	
Impact	Genetic dilution. Ruddy duck is a serious threat to the IUCN globally endangered and European vulnerable White-headed duck <i>Oxyura leucocephala</i> . Ruddy duck is dominant over this species and it breeds with it to produce first and second generation fertile hybrids. While the White-headed duck is not found in Ireland, Ruddy duck individuals in Ireland may be a source population for spread to the White-headed duck's native range.			
Identification Features	A small compact duck with a long stiff tail that is sometimes erect and characteristic of the stiff tail tribe <i>Oxyurini</i> . The males have a bright blue bill, black crown and nape, reddish-brown body and white cheeks. The females have a dull lighter brown body with a dark cap, grey bill with creamy cheeks that have a distinguishing dark horizontal stripe.			
Photos	 			

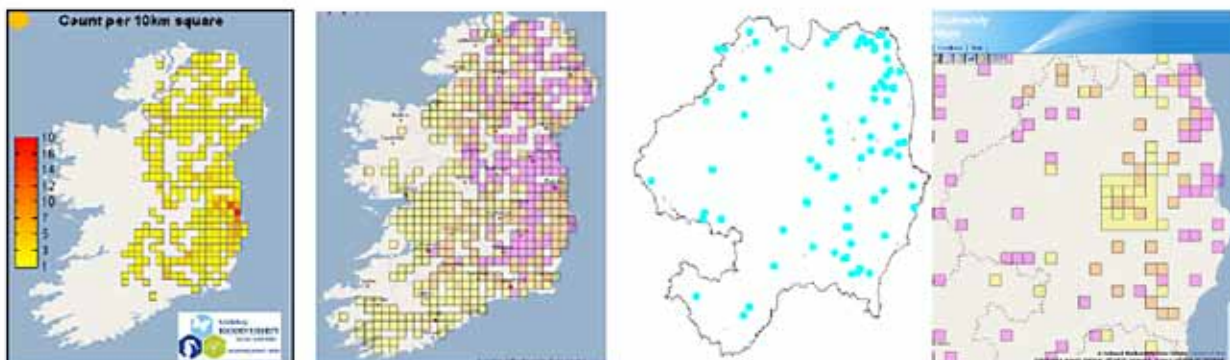
Species Distribution and Profiles
Oxyura jamaicensis – Ruddy Duck



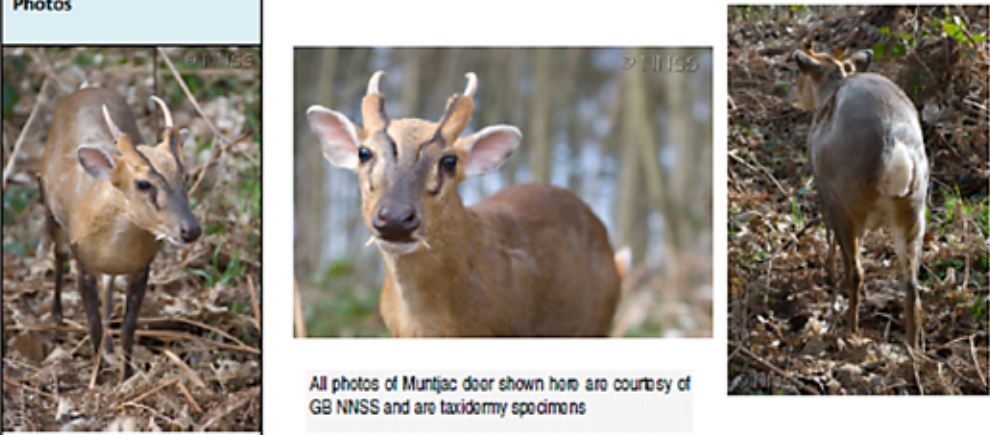
SPECIES PROFILE

Species Name	Common Name	Irish Name	First recorded in Ireland								
<i>Sciurus carolinensis</i>	Grey/American Squirrel	Iora Glas	Introduced in 1911								
Native Distribution	Eastern part of North America, from Mexican gulf to southern part of Quebec and Ontario.		Irish Distribution Frequency Common – many sites in the country								
No. of records in Wicklow Co. Council	12	No. of 1km² record squares or higher resolution	12								
Distribution Comment	There are a good number of sites where the Grey Squirrel has been recorded throughout the county. Priority areas for Grey Squirrel control and the native Red Squirrel (<i>Sciurus vulgaris</i>) protection are clearly seen when these species distribution are coincidence mapped. As a priority protection of the Red Squirrel by surveillance for the Grey Squirrel and its removal if seen is recommend in the areas where no Grey Squirrel has yet been recorded (yellow Squares). Control/eradication is highly recommended in the areas where both Squirrel species have been recorded (orange squares). It is also important to control/eradicate the Grey Squirrel from the areas where it alone has been recorded as these sites can be a source of animals which may invade other areas.										
Priority Tagging	<ul style="list-style-type: none"> • In designated sites • In close proximity to a natural corridor leading to designated sites • High impact invasive species 										
Habitat	Well adapted to live in broadleaved woods. Can colonize conifer and mixed forests. It will travel short distances over open ground to reach woodland areas. Spends most of its time on the ground. They will also inhabit urban areas such as parks and gardens.	Fossitt (2000) general habitat code	WN, WD								
Impact	Competition, disease transmission, socio-economic. The spread of the Grey Squirrel has been associated with a decline in Red Squirrel populations especially in broadleaved woodland. It outcompetes the Red Squirrel in and is a known vector for the parapox virus that can also be fatal to it. At times of food shortages the Grey Squirrel will strip bark from trees which can be detrimental to the trees and have serious economic impacts.										
Identification Features	It is not always easy to distinguish between Grey and Red squirrels by visual appearance alone as fur colour can vary particularly in summer when Grey squirrels can have large patches of red fur. As adults, the Grey Squirrel is about a third larger than the Red and they never develop tufts which the Red has in winter. The Grey squirrel is more likely to be seen on the ground and the Red is more likely to be seen in the trees.										
Photos	<table border="0"> <tr> <td>RED SQUIRREL (SCIURUS VULGARIS)</td> <td>GREY SQUIRREL (SCIURUS CAROLENSIS)</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>Tail: 14-19.5cm Head and Body length: 18-24cm Weight: 240-435g</td> <td>Head and Body length: 24-28.5cm Tail: 19.5-24cm Weight: 400-720g</td> </tr> <tr> <td colspan="2">http://news.bbc.co.uk/1/mediastory/44927000/gf/44927752_red_grey_compare466.gf</td> </tr> </table>			RED SQUIRREL (SCIURUS VULGARIS)	GREY SQUIRREL (SCIURUS CAROLENSIS)			Tail: 14-19.5cm Head and Body length: 18-24cm Weight: 240-435g	Head and Body length: 24-28.5cm Tail: 19.5-24cm Weight: 400-720g	http://news.bbc.co.uk/1/mediastory/44927000/gf/44927752_red_grey_compare466.gf	
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Species Distribution and Profiles
Sciurus carolinensis – Grey/American Squirrel



SPECIES PROFILE

Species Name	Common Name	Irish Name	First recorded in Ireland
<i>Muntiacus reevesi</i>	Muntjac Deer		2008 (2009 for NI but may be as early
Native Distribution	Asia, China and Taiwan.		Irish Distribution Frequency
			Rare
No. of records in Wicklow Co. Council	-	No. of 1km ² record squares or higher resolution	-
Distribution Comment	As yet, unconfirmed reports of Muntjac have been received from neighbouring Co. Fermanagh. High alert for this species amongst field/park staff is recommended.		
Priority Tagging	<ul style="list-style-type: none"> High impact potential invader 		
Habitat	Temperate forests, coniferous and broadleaf. In introduced range it also inhabits scrub and grassland and marginal urban areas.	Fossitt (2000) general habitat code	GA, GS, WN, WD, WS
Impact	Competition, herbivory, socio-economic impact. Muntjac may compete with native deer species for food resources. Muntjac are concentrate feeders selecting buds, leaves, stem tips of woody browse, fungi, flowers and developing seed heads but also graze species mostly avoided by other deer species e.g. Bluebell (British Wildlife, 2010). They have a negative economic impact by bark stripping in forest plantations and by browsing of coppice woodlands.		
Identification Features	Muntjac deer are very small and size is comparable to that of a Red Fox. Males measure approximately 50cm and females 47cm at the shoulder and they have a hunched back. Colour is reddish-brown with buff under parts and white on the inside of the thigh and chin. Winter coat can be a greyer-brown colour. They have distinctive black facial markings, V shaped in males and U shaped in females. Male Muntjac have short antlers which are cast in May and long canines/tusks. Short tail (about 10cm) with white underside.		
Photos	 <p>All photos of Muntjac deer shown here are courtesy of GB NNS and are taxidermy specimens</p>		

Species Distribution and Profiles
Muntiacus reevesi – Muntjac Deer



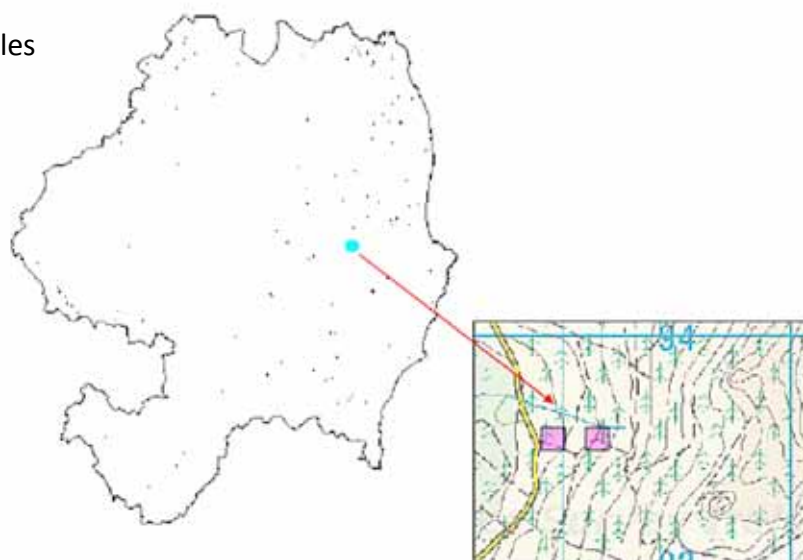
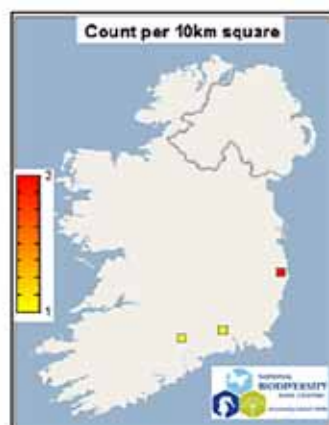
- ◆ Confirmed sightings
- ◆ Unconfirmed sightings



SPECIES PROFILE

Species Name	Common Name	Irish Name	First recorded in Ireland	
<i>Sus scrofa</i>	Wild Boar	-	2009	
Native Distribution	Europe, Asia. <i>Sus scrofa</i> 's native range is throughout Europe and continental Asia. It became extinct in Ireland in pre-historic times.		Irish Distribution Frequency	Rare - few sites where it is found in the country
No. of records in Wicklow Co. Council	2	No. of 1km² record squares or higher resolution		2
Distribution Comment	The two location are in close proximity to each other. These species were removed from the area but it is highly suspected that more still exist in the 'wild' there.			
Priority Tagging	<ul style="list-style-type: none"> Recent invader Few locations (although highly mobile) High impact invasive species 			
Habitat	Uses a range of habitat including woodland, grasslands, agricultural land, riparian areas and scrubland.	Fossitt (2000) general habitat code	GA, GS, WN, WD, WS, BC	
Impact	Rooting disturbs the seed bank, reduces surface vegetation, alters the soil by increasing soil temperature, increasing or decreasing the nitrogen content, increasing oxidation and increasing the leaching of minerals. It damages cultivated crops and the productivity of forest plantations. Acting as a reservoir, source and transmission of diseases such as foot-and-mouth, blue tongue etc also a concern.			
Identification Features	Compact body, large head, the legs relatively short. Hair consists of stiff bristles and usually finer fur. The colour varies from dark grey to black or dark brown. Adult boars average 120–180 cm in length and a shoulder height of 90 cm. Average weight is 50–90kg kilograms although animal culled in Co. Tipperary weighed 180kg. The lower tusks of an adult male measure about 20 cm (rarely 30cm) seldom more than 10 cm protrude out of the mouth. The upper tusks are bent upwards in males, in females they are smaller, and the upper tusks are only slightly bent upwards in older individuals. Wild boar piglets are coloured differently from adults, being a soft brown with longitudinal darker stripes. The stripes fade by the time the piglet is about half-grown when the animal takes on the adult's grizzled grey or brown colour. Sightings of escaped Tamworth species have been received in Ireland. Please use caution in ID.			
Photos				

Species Distribution and Profiles
Sus scrofa – Wild Boar



The colourful Emperor Moth caterpillar can be found in Wicklow's Upland areas where it feeds on heather. Photo: Richard Nairn, NaturaConsultants.com



The spindle tree with distinctive pinkish-red berries is frequently found in hedgerows. Photo: Richard Nairn, NaturaConsultants.com



The return of the Great Spotted Woodpecker to our woodlands is positive news for Biodiversity in County Wicklow and shows that where habitats are maintained, wildlife will flourish.
Photo: Birdwatch Ireland.

An Chomhairle Oidhreachta
The Heritage Council



Produced by Wicklow County Council as an action of the County Wicklow Heritage Plan 2009-14.

For further information please contact:
Heritage Office, Wicklow County Council, County Buildings, Wicklow Town.
www.wicklow.ie