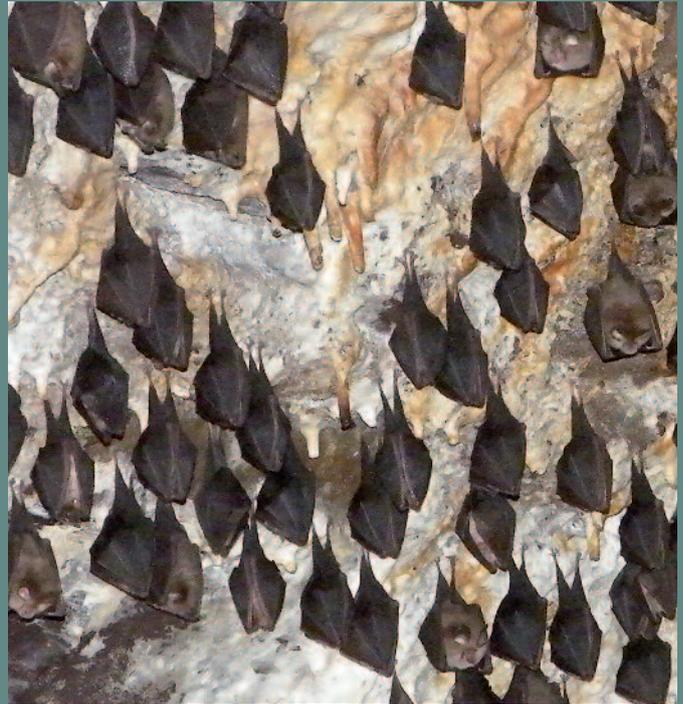




Goldfinch at feeder. Bird feeders attract a variety of wild birds to the garden. Photo Tom Cuffe



Lesser Horseshoe bats in cave. Photo Conor Kelleher.

Introduction

Biodiversity is the term used to describe the variety of life on earth. It includes all the plants, animals and micro-organisms to be found as well as their habitats and all the ways in which living things interact with each other and the world around them.

Biodiversity

A healthy functioning environment is vital to support life. Humans too are part of biodiversity and are reliant on a massive variety of plants, animals, microbes and ecosystem processes to survive. We encounter the products of biodiversity every day in our food, clothes, fuel, medicine, raw materials even the very air we breathe.

Through our interactions with the environment and our exploitation of natural resources, we can have a significant effect on biodiversity and the wellbeing of other living things. Our actions can have far reaching consequences for biodiversity locally and in distant places. Biodiversity is declining rapidly worldwide and we must act quickly and responsibly to ensure the future of our natural heritage for future generations.

Galway is a large county with an abundance of biodiversity. Its varied geology, climate and historical land use have formed a range of rare and interesting habitats including species rich grasslands, turloughs, eskers, and raised and blanket bogs. These habitats support a great diversity of flora and fauna. The landscape has been heavily influenced by people since the earliest times and has itself influenced our culture and heritage. The natural heritage of County Galway continues to be one of our greatest assets so there is a strong desire from all parts of the community to preserve it and to ensure the sustainable use of our local environment.



Lady-birds are natural pest controllers as they eat destructive aphids. Photo Elaine O’Riordan

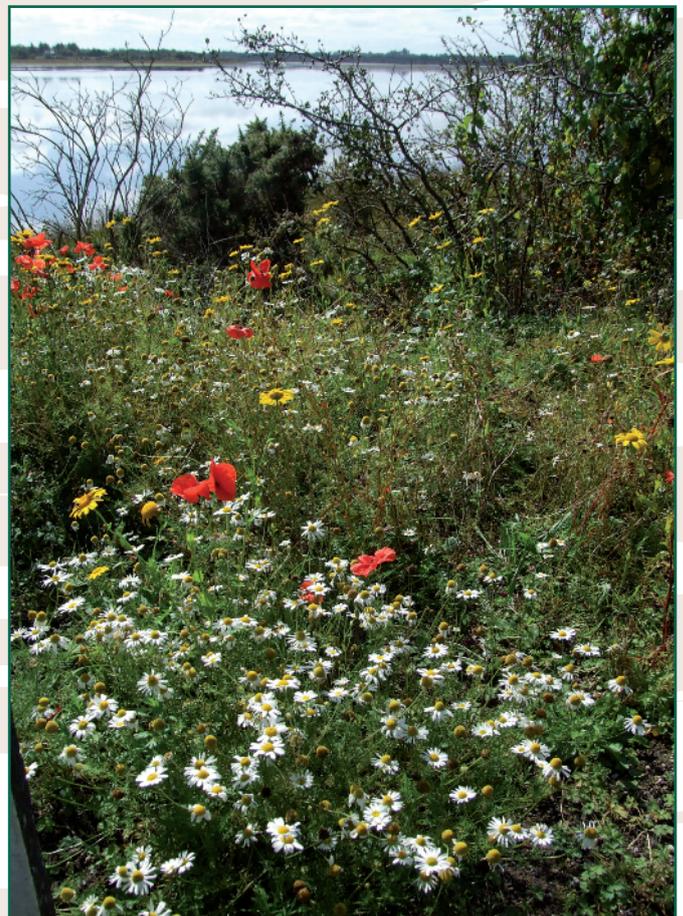


Giant Rhubarb (*Gunnera tinctoria*) is an invasive alien species which has become a problem in parts of Connemara. Photo Nick Marchant

Biodiversity Guidelines

These guidelines are intended to give householders and community groups advice on conserving and enhancing biodiversity in their own part of County Galway.

The guidelines are supported by an online biodiversity resource which can be found at www.galway.ie/biodiversityguidelines. This site has in depth detail on biodiversity legislation, protected habitats and species, and other useful information. If you cannot use the website, the Biodiversity Project Manager or the Heritage Officer of Galway County Council will be happy to assist you.



Wildflower seed mixes can be used in school or home gardens, but not in the wild. Photo Corina Colleran



Galway coastline.
Photo Caitriona Carlin.



Galway coastline.
Photo Caitriona Carlin.

Biodiversity in County Galway

Some of the main habitats of interest in County Galway are described here.

Coastal Habitats

The Galway coastline encompasses the entire western border of County Galway from Aughinish Bay to Killary harbour as well as the Aran Islands, Inishbofin and several small uninhabited islands around coast . There are many different types of coastal habitats including:

- habitats below the high tide line: shore - mud flats, sand flats, and gravel and shingle beaches;
- habitats subject to periodic inundation by sea water including salt marshes and lagoons;
- terrestrial coastal habitats: sea cliffs, sand dunes, machair. Many of these habitats are internationally important for nature conservation and several support important bird colonies and fish nursery grounds around the Galway coast.

Limestone pavement

Limestone pavement is an internationally important habitat found almost exclusively in Counties Galway, Clare and Mayo. It consists of exposed areas of limestone bedrock that has been fissured, broken or weathered to produce characteristic 'clint and gryke' features. Pockets of thin soil around the rocks support ferns, flowers and low shrubs. It is found in the Burren region of South Galway, the Aran Islands and in isolated patches between Kilcolgan and Tuam and around the shores of Lough Corrib.



Limestone pavement habitat.
Photo Micheline Sheehy Skeffington



Bloody cranesbill on limestone.
Photo Caitriona Carlin.



Woodland habitat. Photo Elaine O’Riordan

Semi-Natural Woodland

Semi-natural woodland is dominated by native, broadleaf trees or native conifers (Yew, Scots Pine, Juniper). It includes scrub woodland dominated by hazel or other scrub; riparian woodland close to waterways; wet woodland in wetland areas and some demesne woodlands. Significant areas of oak-birch-holly woodland occur around Woodford. An extensive area of oak-ash woodland and yew woodland is found in Coole and Garryland. Large demesne woodlands are found at Portumna Forest Park and Kilcornan Woods in Clarinbridge. In Connemara, Derryclare and Ballinahinch are important native woodland sites. Native woodland is a relatively uncommon habitat in County Galway. It is very important habitat for wildlife as it supports several birds, small mammals and invertebrates and a huge diversity of plant species.

Hedgerows

Hedgerows are linear habitats of trees, shrubs and ground flora associated with field boundaries and roadsides. There is an estimated 23,000km network of hedges in Co Galway with most of these concentrated in the east of the county. Hedgerows are very important habitats for wildlife. They support several birds, small mammals and invertebrates and a huge diversity of plant species. Hedges also function as ecological corridors to facilitate movement of plants and animals through the landscape.

Freshwater Habitats

A variety of freshwater habitats are found throughout County Galway including lakes, ponds, turloughs

streams, rivers, canals, springs and flushes. Freshwater habitats are extremely important for the communities of plants and animals they support. Most of our freshwater habitats are relatively good quality and unpolluted which is important for many rare and important species such as Pollan, Arctic Char, Atlantic Salmon, Sea Lamprey, Brook Lamprey, White-clawed Crayfish, Freshwater Pearl Mussel and Otter all of which require very high water quality.



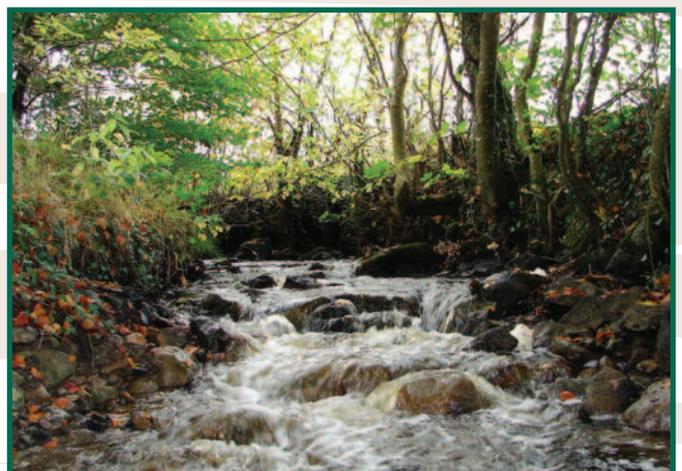
Raised bog habitat. Photo Elaine O’ Riordan

Peatlands

Peatland are wetlands where the substrate is predominantly peat including bogs which are fed by rain and fens which are fed by ground or surface water. Actively growing, intact raised bog is an extremely rare habitat. Irish raised bogs are of international importance representing 50% of all the conservation-worthy raised bogs remaining in Europe. Most have some damage due to harvesting of peat or agriculture. In County Galway, upland blanket bog is found in mountainous regions and lowland/atlantic blanket bog is found in the Connemara lowlands and coastal areas. Raised bogs are found in the lowlands of north and east County Galway.

Buildings and Bridges

Man-made, built structures in the urban or rural environment (eg. houses, farm buildings, bridges, walls, ruins and graveyards) can provide important habitat for a host of plants and animal communities. Houses and other buildings are mostly important as nesting or roosting sites for birds or bats. Ten species of bat are found in Ireland and all are protected. Many roost in attics of houses or other buildings during the summer months. Barn owls nest in farm buildings and old abandoned castles or houses. Several mosses, lichens and other plants also grow on built surfaces.



River habitat, Glinsk. Photo Jimmy Green

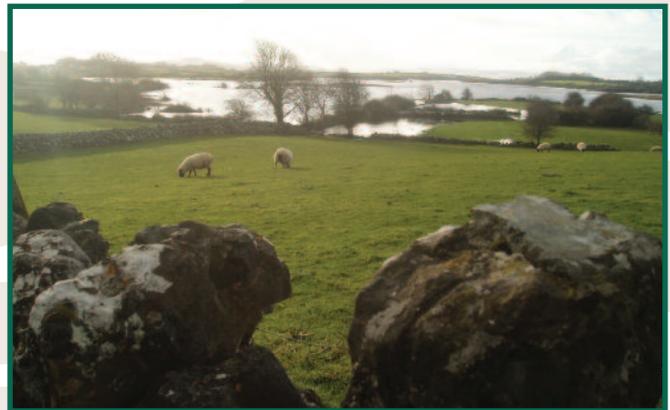


Esker grassland. Photo Elaine O’Riordan

Grassland Habitats

Semi-natural grassland habitats that are not highly modified or improved for agriculture are becoming increasingly rare in the modern Irish landscape. They are characterised by a diversity of grass and sedge species and rushes in wet areas with a high proportion of broad-leaved herbs (wildflowers).

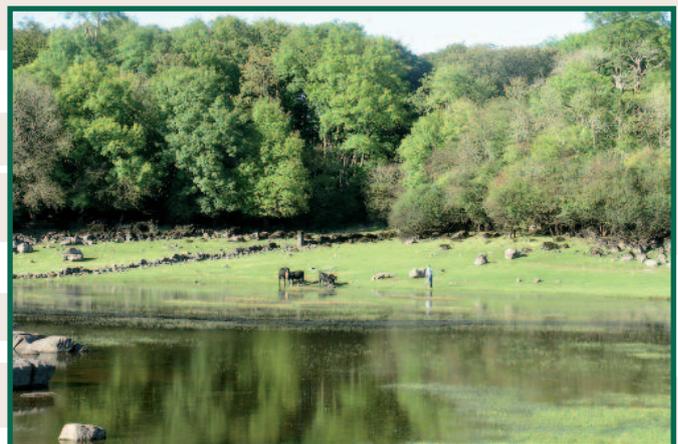
Calcareous grasslands are found especially around the Burren region of South Galway, the Aran Islands and around Lough Corrib and on Esker ridges in the east and north of county. Wet grasslands occur all over the county, especially in Connemara but important sites include flood plains (callows) of the Shannon and Suck Rivers. Many road verges and graveyards also have flower-rich grassy habitats akin to hay meadows.



**Ballinacourty turlough, spring.
Photo Micheline Sheehy Skeffington**

Turloughs

Turloughs are seasonal lakes of limestone regions. Fed by groundwater through swallow holes, they support distinctive plant and animal communities characteristic for their flooding regime. Turloughs are an internationally important habitat almost unique to the west of Ireland in Counties Clare, Galway, Mayo and Roscommon. In Galway, turloughs are found mainly in the Burren region of South Galway and lowlands of north-east Co. Galway. Many turloughs are very important for rare plants and animals including over-wintering birds such as the Whooper Swan and rare invertebrates which only occur in turloughs such as the Fairy Shrimp.



**When turloughs partially flood, they provide water for stock. Garryland turlough SE Galway.
Photo Micheline Sheehy Skeffington**

Biodiversity at home and in the community

Before embarking on any biodiversity project, it is suggested that the following steps are followed when considering how you might benefit your local biodiversity:

- Identify existing or potential biodiversity areas
- Find ways to enhance, create and manage nature areas
- Raise awareness and get involved
- Investigate available resources and support

Biodiversity Management Plans

Biodiversity management plans can be incorporated into many community projects and are especially beneficial for groups involved in schemes such as the Tidy Towns, Pride of Place or Local Environment Awards.

The plans should set out realistic actions for each year under the headings of creating, enhancing and managing biodiversity as appropriate.

Biodiversity on your doorstep

Identify what Biodiversity is found around your home or community

- Identify what kinds of habitats are present in your local area. Pay particular attention to the presence of trees, hedgerows and any water bodies or wetlands on or near the site. Other potentially important features include old buildings, bridges and limestone pavement or cave areas.

Take note of any nature designations

- Is your area part of a site designated for nature conservation such as a SAC, SPA or NHA?
- Are there any special plants or animals in your local area?
- Further information on this can be found at www.NPWS.ie or www.galway.ie/biodiversityguidelines or by contacting your local conservation ranger (NPWS) or the biodiversity project manager (details at back of guidelines).

First Steps

Here are some simple steps you can take at home, at work, in school and in the local community that can help biodiversity in your local area and around the world. As the saying goes 'Think Global – Act Local'

Be accommodating to nature

- Consider what biodiversity might be in your own home and garden and how you can improve the environment in your immediate area.



Even very small areas can be used to create habitats for birds and insects. Photo Kay Synnott

For example:

- Dim the lights – Cut down on unnecessary outdoor lighting which disturbs nocturnal animals such as bats, owls and other mammals.
- Keep the noise down – Machinery, household appliances, vehicles and domestic animals can make quite a bit of noise which can potentially disturb wild animals especially at night and in rural areas.
- Get rid of the bug spray and the weed killer - avoid using herbicides, pesticides and fertilisers. If unavoidable, use biodegradable systemic herbicides and apply by spot treatment
- Cats kill a large number of garden birds every year. To prevent this, you can keep the cat indoors especially during the bird breeding season or put a bell on it to warn garden birds of approaching danger.
- Leave some areas undisturbed if possible, leave the wilderness take over and see what happens!
- Wildlife hazards – Identify areas in your home or garden that might pose a threat to wildlife and see if you can remedy it. For example
 - Put a plank of wood to make a ramp out of the garden pond or cattle grid to prevent animals like hedgehogs and frogs from falling in or drowning
 - Put stickers on the windows if birds crash in to them
 - Put covers on the chimney pots to prevent birds nesting in there.

Now – spread the word and get the whole family and community involved!

Purchasing Power

When sourcing products and raw materials, be conscious of their wider ecological impacts and opt for:

- sustainable natural materials e.g. FSC standard for wood, peat-free compost, Green cement/concrete
- Irish made products
- Local produce especially food
- Recycled materials and products
- Eco-friendly products
- Products with less packaging
- Products and packaging that can be recycled locally
- Durable products that will last longer and need to be replaced less often.



Wildflower seed mixes can be used in school or home gardens, but not in the wild. Photo Corina Colleran



Traditional low intensity farming maintains wildflower-rich grasslands. Photo David Bourke

Enhancing nature at home or in your local area

Nature areas can be enhanced by a number of means such as by planting trees, shrubs or flowers or by creating new habitats for wildlife.

Trees and Planting schemes

- Ensure that the landscaping fits in with the local ecology. Aim to keep it as natural as possible in keeping with the habitats of the surrounding area.
- Where possible, retain existing habitats especially trees, hedges, ponds, wetlands
- Use native trees and shrubs suitable to the local conditions see table pg 11 (in rural areas use only native species)
- Urban planting schemes can use some more ornamental or exotic varieties of flowers and plants but try to use species that encourage wildlife by providing shelter, berries, seeds or nectar see www.galway.ie/biodiversityguidelines for more information
- Plant trees, shrubs and flowers of different sizes and density to create some structural diversity to encourage a range birds, insects and other animals.
- Plant varieties of shrubs and flowers in clumps (e.g. a few heathers together or a couple of hawthorns together) rather than spacing out or mixing up individual plants of different varieties
- Ensure that large trees are allowed ample clearance from buildings, paths etc. to allow for growth of roots and branches
- Plant new hedges using native species
- Use climbing plants to cover bare walls and fences.

Wildflower Meadows

Many people are keen to cultivate wildflower gardens or meadows. These can be a great asset to biodiversity but remember they are not just areas left to go wild and they do require some management. Wildflowers can be encouraged by being aware of the following:

- Wildflower meadows require poor, thin soil conditions, so it's best to remove the topsoil and not to add fertilizer.
- In rural areas especially, it's best to use seed from existing wildflowers in the surrounding landscapes and to assist this, fresh hay from a local meadow can be strewn on the ground which is a very effective way to seed a wildflower meadow.
- Commercial seed mixes are only suitable in urban/semi urban areas such as gardens. ONLY use seed that has been sourced and grown in Ireland and use species suitable to the local area (a list of suppliers is available on www.galway.ie/biodiversityguidelines).
- Ensure appropriate management to maintain the wildflowers (i.e. for a hay meadow): cut the area after the flowers have gone to seed (usually July/August). Allow the cuttings to sit for a few days for the seeds to fall out, and then remove the hay.



A 'bug hotel' to encourage insects and other small animals in the garden. Photo Kay Synnott

Creating new areas for wildlife:

- Bird feeders, bird baths, nesting boxes for birds and bats, hibernation boxes for hedgehogs, frogs, insects and more can all be incorporated into the home garden or the community landscaping plan. (see www.galway.ie/biodiversityguidelines for advice on appropriate siting and care)
- A pile of logs or dead leaves in a quiet corner can provide food and shelter for many small creatures or even a hibernation area for hedgehogs.
- In building design, incorporate features to support biodiversity such as: access points for bats or birds e.g. swifts, house martins
- Encourage habitat diversity. Where possible, create a range of habitats such as ponds, scrub, hedges, grassland, stone, walls etc.
- Create living bird tables or butterfly or bee patches by using plants specifically to provide food or shelter for these animals.



Dead hedges make effective barriers and wind breaks as well as habitats for insects, hedgehogs and other animals, plants and fungi. Photo Kay Synnott

Traditional Breeds, varieties

You can help to conserve our farming and genetic heritage by cultivating traditional, local or rare varieties of crops such as fruit or vegetables or by keeping traditional or rare breeds of farm animals such as cattle, sheep, horses, fowl or even honey bees. Community groups could develop an organic garden with local vegetables or a heritage orchard project by planting old style fruit trees. The Irish Seed Savers Association (www.irishseedsavers.ie) and the Irish Genetic Resources Conservation Trust (www.tcd.ie/Botany/GHI/igrct) will be able to offer more information.

- Dredging or periodic cutting of vegetation may be needed for channels, drains or streams. This should be done in sections, on a 3-4 year rotation. Always get specialist advice from Fisheries/NPWS before undertaking any works near water courses.
- Ensure bird feeders are kept clean to avoid spreading disease or food poisoning.
- Avoid inappropriate or excessive use of fertiliser, pesticides, etc

(see www.galway.ie/biodiversityguidelines for more detailed information)

Managing Nature Areas

Ireland's landscape has been modified and managed by humans for thousands of years so many of our important habitats are actually semi-natural and require appropriate management to maintain and conserve them. If you are creating or enhancing habitats, ensure that you have an appropriate management regime in place for example:

Cutting regimes: Hedges should be lightly trimmed in rotation every few years to maintain vigour. This is best done in late winter/early spring

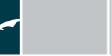
- Note the Law – No hedge cutting during bird nesting season (1 Mar – 31 Aug inclusive)
- Rejuvenate old hedges by planting up, coppicing or laying.
- Mowing: Grasslands and wildflower meadows should be mown once or twice a year according to instructions.
- Planting times: For most trees the best planting times are in the autumn or the spring. Potted trees can be planted at any time of the year.



Roadside hedges and verges can be maintained to be safe and attractive to road users and still beneficial for wildlife. Photo Elaine O'Riordan

When planning your biodiversity enhancement and management, bear in mind the potential impacts of the project works if carried out during the following times.

Table 1. Sensitive seasons for certain animal groups

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bird nesting season												
Over-wintering wildfowl (wetlands)												
Fish spawning and migration in rivers - especially salmon & eels												
Bats in maternity roosts												
Bats in mating roosts												
Bats hibernating												
Amphibians spawning												
Amphibians hibernating												

Note: information on other mammals can be found on www.galway.ie/biodiversityguidelines.

Create Awareness

If a community biodiversity project or plan is to succeed, it is vital that there is ample awareness of the work that your group is doing. Your nettle patch might be a caterpillar breeding ground, but if they don't know about your biodiversity plans, local residents or Tidy Towns judges might think the site is neglected and weedy!

Use local newsletters and papers to spread the word among the local community about the biodiversity activity in your area. Information boards, interpretive panels or posters and leaflets can also be used to inform locals and visitors about the special nature in your area. Organising events such as talks, walks or workshops are also a great way to get people on board and show off your work.

Getting Involved

Encourage local community involvement from all sectors including school children, local businesses, farmers and sports clubs and other organisations. There are many ways that the different groups can get involved e.g. planting and gardening, litter control, animal and plant surveys, bird feeding duties or even collecting information on local heritage such as land use, traditional cures or place names. There are several activities that you can become involved in on your own or with friends for example:

- The Tidy Towns, local Environment or Golden Mile Awards.
- National surveys organised by organisations such as Bat Conservation Ireland, BirdWatch Ireland and the Irish Wildlife Trust such as the Daubenton's Bat Survey, Garden Bird Survey, National Butterfly survey, Alien Species Surveys, Natures Calendar and several others

(see www.biology.ie or www.biodiversityireland.ie)

- You can help your local school with their Green Flag endeavours.
- You can join a local branch of a nature group such as BirdWatch Ireland Galway, or the Galway Bat Group.



Bird boxes can provide a home for birds in the garden and are fascinating to watch. Photo Tom Cuffe.



Hedge laying is a traditional method of rejuvenating hedges. Photo Elaine O’Riordan



Community efforts to eradicate the invasive alien weed Gunnera from Leenane. Photo John Holmes

Special Considerations

Biodiversity and the Law

Before carrying out any projects or activities that might impact on nature, it is advisable to make sure that you stay within the law! The main laws dealing with biodiversity in Ireland are the EU Birds Directive and the EU Habitats Directive as well as the Wildlife Act, 1976 and the Wildlife (Amendment) Act, 2000. Several other legislative instruments are also important including the EU Water Framework Directive, the EU Environmental Liability Directive, the Planning and Development Act 2000 and Amendments, the Fisheries Acts, and the Forestry Act, 1946. **A comprehensive list of relevant legislation with information on the pertinent sections is presented in www.galway.ie/biodiversityguidelines. Information on protected habitats and species in Co Galway can also be found at [this site](#).**

Galway Policy

In addition, Galway County Council has published a number of plans and policy documents. Many of these have general and specific provisions for the environment and natural heritage. These include The Galway County Development Plan (2009 – 2015), The Galway County Heritage Plan (2010 – 2016) and The Galway County Biodiversity Action Plan (2008-2013).

When to get specialist advice

If you are undertaking work or planning a biodiversity project in an area, it is important to be aware of any sensitive or protected habitats or species in your area that your project might have an impact on. In particular, you may need to get some advice from the Biodiversity Project Manager, the Heritage Officer or your local conservation ranger especially if your project:

- Is in or near (100-300m) an area designated for nature conservation i.e. SAC, SPA, NHA or sites of local natural heritage importance in Local Area Plans (e.g. Frog site in Moycullen).
- Is in a hydrologically sensitive area i.e. close to water bodies, bogs or wetlands or in areas with extensive ground water systems, karst (limestone pavement) areas.
- If a special licence or permission is required e.g. a felling licence from the Forest Service or Foreshore Licence from the Department of Agriculture, Fisheries and Food.
- Is known or likely to support protected habitats especially wetlands, floodplains, woodlands, old buildings, coastal areas, limestone pavement.
- Is known or likely to support protected plants or animals:
- Rare or protected plants are listed in the Habitats Directive, Flora Protection Order or Red List species. Usually an experienced ecologist or botanist would be required to identify rare or protected plant species on site. However, some habitats have a higher likelihood of supporting rare species such as:
 - Semi-natural grasslands, especially on limestone pavement or coastal (dune) areas.
 - Bogs, fens and heaths
 - Lakes, turloughs, springs, wetland margins
 - Semi-natural woodlands



Care should be taken to avoid damage to aquatic habitats during development work. Photo Janice Fuller



Ditches and streams can provide excellent habitat for a variety of wildlife. Photo Caroline Sullivan

- Rare or protected animal species of conservation interest may require special consideration if they are on site including:
 - Birds: Birds directive, Red list and Birds of Conservation Concern in Ireland (BoCCI) listed species especially geese and swans, Hen harrier, Corncrake, Terns, Barn Owl, Kingfisher
 - Fish: Especially Salmon, Trout and Lamprey also Pollan and Char.
 - Invertebrates: (aquatic) Pearl Mussel, White-clawed Crayfish, (terrestrial) Marsh Fritillary Butterfly, Vertigo species Whorl Snails
 - Amphibians: Frogs
 - Mammals: Badgers, Otters, Pine Marten, Squirrel, all bat species and especially the Lesser Horseshoe Bat

A comprehensive list of all protected plants, animals and habitats in County Galway is found in the Appendices of the Galway County Biodiversity Action Plan or online at www.galway.ie/biodiversityguidelines

Useful Reading:

- Galway County Council, 2008. Galway County Biodiversity Action Plan.
- Fuller, J. 2009. Hedgerows of County Galway. Galway County Council.
- Meyen, S. 2004. ABC of Planting Trees. Crann.
- Fuller, J. 2005. ABC of Trees, Hedgerows and Development. Crann.

The following publications by the Heritage Council may be downloaded from:

www.heritagecouncil.ie/wildlife/publications/

- Working with biodiversity - The law and you
- Birds, Bats, Buildings and You
- Conserving Hedgerows
- Conserving and Enhancing Wildlife in Towns and Villages: A Guide for Local Community Groups
- Ni Lamhna, E. 2009. Wild Things at School
- Fossitt, J. 2000. A Guide to Habitats in Ireland

Extensive resource material relating to all aspects of biodiversity is available at www.galway.ie/biodiversityguidelines

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Hedgerows provide wildlife corridors linking habitats in the landscape. Photo Janice Fuller

Native Trees & Shrubs

Adapted from various sources:

Fuller, J. 2009. Hedgerows of County Galway. Galway County Council.

Heritage Council. Conserving and Enhancing Wildlife in Towns and Villages. Free booklet.

Peoples Millennium Forests, 2000. Our Trees – A guide to growing Ireland’s native trees in celebration of a new millennium.

The Peoples Millennium Forests Project

For more information see www.galway.ie/biodiversityguidelines

NAME	Site Suitability				Max Height (m) Growth Rate	Biodiversity Value	Attractive Features
	Public Open Spaces	Streets & Confined Spaces	Tubs Containers Beds	Hedges			
Alder <i>Alnus Glutinosa</i>	✓	✗	✗	✓	20m Fast	Flowers for insects. Seeds for birds. Especially good for red squirrel. Lichens	Cones
	Prefers wet ground and stream banks. Tolerates some flooding. Does not like dry sandy sites						
Ash <i>Fraxinus Excelsior</i>	✓	✗	✗	✓	28m Med	Light shade good for ground flora. Insects. Seeds good for birds, small mammals, red squirrels. Lichens.	Foliage
	Prefers well drained neutral to alkaline soils. Will withstand exposed and coastal sites. Does not like waterlogged sites.						
Aspen <i>Populus tremula</i>	✓	✗	✗	✗	24m Fast	Good for insects.	Autumn Colour
	Damp neutral soils (not acid). Not close to buildings or any services.						
Birch, Downy <i>Betula pubescens</i>	✓	✓	✓	✗	24m Med/ Fast	Ground flora. Seeds good for birds, red squirrels. Dead wood - very good for insects and Fungi.	Catkins, bark, foliage, autumn colour
	Wide variety of soils. Prefers acid to neutral. Does well on poorly drained peat. Does not do well in shade. In natural conditions can be invasive. Fast growing, short lived.						
Birch, Silver <i>Betula pendula</i>	✓	✓	✓	✗	18m Med/ Fast	Ground flora. Seeds good for birds, red squirrels. Dead wood - very good for insects and Fungi.	Catkins, bark, foliage, autumn colour
	Prefers light infertile soils. Acid to neutral. Does not do well in shade. In natural conditions can be invasive. Fast growing, short lived.						
Bird Cherry <i>Prunus padus</i>	✓	✓	✓	✓	6m Med	Early flowering good for insects. Fruit good for birds.	Flowers, berries, autumn colour
	Prefers damp fertile soils. Acid to neutral. Does not like exposed sites.						
Blackthorn <i>Prunus spinosa</i>	✓	✗	✗	✓	4m Med	Insects, nesting cover and berries for birds.	Flowers, berries
	Tolerates a wide range of soils. Can grow in exposed and windswept areas. Can become invasive.						
Bramble <i>Rubus fruticosus</i>	✗	✗	✗	✓	2m Fast	Excellent for insects. Fruit and cover for birds and mammals.	Flowers, berries
	Tolerates a range of soils. Can be invasive.						
Broom <i>Cytisus scoparius</i>	✓	✗	✓	✗	2m Fast	Insects. Food plant of Green Hairstreak butterfly.	Flowers
	Grows best on light, dry, acid soils. Sunny banks. Not wet conditions.						

NAME	Site Suitability				Max Height (m) Growth Rate	Biodiversity Value	Attractive Features
	Public Open Spaces	Streets & Confined Spaces	Tubs Containers Beds	Hedges			
Buckthorn, Alder <i>Frangula alnus</i>	✓	✗	✓	✓	6m Med	Food plant of Brimstone butterfly	Flowers, berries
Grows on wet peaty soils. Restricted distribution, not commonly available.							
Buckthorn, Purging <i>Rhamnus catharticus</i>	✓	✗	✓	✗	5m Med	Food plant of Brimstone butterfly	Berries
Prefers damp, calcareous soils.							
Crab Apple <i>Malus sylvestris</i>	✓	✗	✗	✗	6m Slow	Early flowering good for insects. Fruit good for insects, mammals, birds	Flowers and fruit
Does well in most fertile soils. Prefers neutral to alkaline.							
Dog Rose <i>Rosa canina</i>	✓	✗	✓	✓	2m Fast	Insects, birds, small mammals	Flowers, fruit
Wide range of soils. Prefers calcareous to neutral. Not wet or exposed sites.							
Elder <i>Sambucus nigra</i>	✓	✗	✗	✓	6m Fast	Insects and birds. Important berry crop	Flowers, berries
Prefers nutrient rich soils. Hardy. Suitable for public open spaces when in a hedge.							
Gorse <i>Ulex europaeus</i>	✓	✗	✓	✓	3m Med	Insects. Nesting cover for birds. Food plant of Green Hairstreak butterfly	Flowers
Prefers dry and neutral soils. Tolerates exposed coastal sites.							
Guelder Rose <i>Viburnum opulus</i>	✓	✗	✗	✓	4.5m Med	Insects and birds	Flowers, berries, autumn colour
Prefers alkaline fertile clay to neutral wet soils. Not acid soil.							
Hawthorn <i>Crataegus monogyna</i>	✓	✓	✓	✓	9m Med/ Fast	Excellent food and cover for insects, birds.	Flowers, berries
Tolerates wide range of soils. Very hardy and adaptable. Best hedge species.							
Holly <i>Ilex aquifolium</i>	✓	✓	✓	✓	15m Slow/ Med	Berries important for birds especially Thrush. Food plant of Holly Blue butterfly. Winter roosting for birds.	Evergreen. Berries (female only)
A very hardy species. Tolerant of exposed sites and shade. Prefers neutral to acid peaty soil. Does not like wet poorly drained soil.							
Honeysuckle <i>Lonicera periclymenum</i>	✓	✓	✗	✓	climber	Flowers excellent for big moths. Berries for birds.	Flowers, berries
Prefers neutral to light acid soils.							
Irish Whitebeam <i>Sorbus hibernica</i>	✓	✓	✓	✓	15m Med	Good insect tree. Important berry crop.	Foliage, flowers, berries
Prefers alkaline but will grow in a range of soils. Tolerates coastal exposure, rocky ground and fairly damp sites. Not very wet sites.							

NAME	Site Suitability				Max Height (m) Growth Rate	Biodiversity Value	Attractive Features
	Public Open Spaces	Streets & Confined Spaces	Tubs Containers Beds	Hedges			
Ivy <i>Hedera helix</i>	✓	✓	✓	✓	climber	Food and cover for insects, birds, bats.	Flowers, berries, foliage
Tolerates a range of soils							
Juniper <i>Juniperus communis</i>	✓	✗	✗	✗	6m Med	Birds	Evergreen
Grows in rocky areas and on mountain heath. Very tolerant of exposure.							
Pedunculate Oak <i>Quercus robur</i>	✓	✗	✗	✗	30m Med	Food and cover for birds, squirrels, insects especially moth caterpillars. Lichens. Dead wood. Fungi	Foliage, autumn colour. Acorns
Prefers clay and damp lowlands but generally tolerant. Does not like badly drained infertile soils. Only suitable for large spaces.							
Rowan <i>Sorbus aucuparia</i>	✓	✓	✓	✓	9m Fast	Good insect tree. Important berry crop.	Flowers and berries
Poor thin acid soils. Very hardy. Tolerant of exposed sites. Does not like wet sites.							
Scots Pine <i>Pinus sylvestris</i>	✓	✗	✗	✗	24m Med	Good for nesting and winter roosting birds. Cones excellent for red squirrel.	Cones, evergreen
Prefers dry light sandy soils also peaty acid soils. Does not like limestone soils or exposed coastal sites.							
Sessile Oak <i>Quercus petraea</i>	✓	✗	✗	✗	30m Med	Food and cover for birds, squirrels, insects especially moth caterpillars. Lichens. Dead wood. Fungi	Foliage, autumn colour. Acorns
Tolerant of poorer, lighter acid soils. Does not like badly drained infertile soils. Only suitable for large spaces.							
Spindle <i>Euonymus europaeus</i>	✓	✗	✗	✓	7m Med	Good for insects	Flowers, berries, autumn colour
Prefers damp alkaline soils but tolerates non-acid soils. Poisonous to horses.							
Wild Cherry <i>Prunus avium</i>	✓	✓	✓	✓	15m Med	Early flowering good for insects. Fruit good for birds	Flowers, berries, autumn colour
Prefers fertile woodland (slightly acid) soils. Tolerates clay. Tolerates some shade. Does not like wet sites.							
Willow <i>Salix spp.</i>	✓	✗	✗	✓	6m Fast	Birds, insects, lichens, fungi, dead wood.	Catkins, autumn colour
Prefers damp, wet soils. Some may become invasive.							
Wych Elm <i>Ulmus glabra</i>	✓	✗	✗	✓	30m Med	Early flowers for insects. Seeds for red squirrels. Lichens. Dead wood	Autumn colour
No particular preference but thrives in fertile free draining soil. Tolerates shade. Does not like very dry sites.							
Yew <i>Taxus baccata</i>	✓	✗	✓	✗	14m Slow	Berries good for birds	Evergreen. Berries (female only)
Well drained alkaline soils. Tolerates shade. Seeds and leaves poisonous.							

Identification & Control of Invasive Species

Certain plants and animals that have been introduced to Ireland from other countries, whether intentionally or not, have the potential to become pests. In the absence of competition and of natural controls such as predators or disease, alien species can grow and reproduce and spread unchecked. Invasive alien species have a detrimental effect on native biodiversity as they out compete native flora and fauna and alter the functioning of natural ecosystems. Many invasive plants can alter the appearance of the landscape e.g. Rhododendron while others also cause significant financial costs as they damage industry or infrastructure e.g. Zebra Mussels, Japanese Knotweed. General good practice guidelines would recommend:

- All sites should be surveyed for the presence of aquatic and terrestrial invasive species
- Do not move soil from sites infested with invasive plant species as it may contain fragments or seeds of the pest that can spread the infestation to new sites.
- Ensure that plant refuse from invasive species is properly disposed of.
- Ensure that vehicles, machinery and tools are kept clean to prevent spreading animals, eggs, plant fragments, or seeds.
- If invasive species are found on site or nearby, develop and implement a control strategy.
- If herbicide other than Glyphosate is used, waste plant material should be disposed of at a licensed facility

Species	Status	Control Measures
Japanese Knotweed <i>Fallopia japonica</i> 	<ul style="list-style-type: none"> • Widespread in Galway • Especially near roads, rivers, railways, derelict sites • Extremely invasive • Spreads by underground rhizome and plant fragments • Forms large monocultures • Supplants native vegetation, damages walls, buildings etc. Extremely difficult to eradicate 	<ul style="list-style-type: none"> • Herbicide (glyphosate) treatment (mid-late summer) for several years is preferred option. • Deep excavation, encapsulate in membrane and burial (under min 5m soil) or dispose of in licensed landfill. • Do not move or dig soil within 7m of plant • Do not flail cut
Giant Rhubarb <i>Gunnera tinctoria</i> 	<ul style="list-style-type: none"> • Widespread in parts of Connemara • Especially in acid sandy and disturbed soils by roads, rivers, gardens, dump sites • Spread by seeds (birds), rhizome and plant fragments especially from movement of soil • Forms dense stands and supplants native vegetation 	<ul style="list-style-type: none"> • Herbicide treatment in late summer (Glyphosate or 2-4 D). Spray or cut and paint stumps. • Remove flower heads before seeds come on. • Monitor: Seeds remain viable in soil for up to 6 years. • Do not move soil until at least six years after last plant has been eradicated from the site.
Rhododendron <i>Rhododendron ponticum</i>  <p>Mike Guiry, NUI Galway</p>	<ul style="list-style-type: none"> • Prefers peaty, sandy and acidic soils Abundant in Connemara. • Spreads by seed and suckers. • Forms dense stands, outcompetes native flora. Carries fungus that causes 'sudden oak death'. • Does not produce seed until 10-12 years old. 	<ul style="list-style-type: none"> • Extremely difficult to eradicate • Uprooting • Cut and immediately paint stumps with herbicide (2,4-D, glyphosate, dicamba or triclopyr) • Inject stems with herbicide

Species	Status	Control Measures
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Giant Hogweed *Heracleum mantegazzianum*



Joe Caffrey, CFB

- Not widespread in County Galway, but found around rivers, wasteland and roadsides in the Tuam area.
- Spreads by seed.
- Contact with skin causes severe and painful blistering of the skin on exposure to sunlight. Which may persist for several years.

- **Full protective clothing including masks or safety glasses and hood should be worn when undertaking any type of control.**
- Pull out by roots.
- Do not mow.
- Spray (mid spring) or inject with herbicide (glyphosate)
- Monitor: Seed may remain viable for 15 years. Soil from infested sites should not be moved for at least that long after the last plant has been eradicated.

Himalayan balsam *Impatiens glandulifera*



Joe Caffrey, CFB

- Found throughout County Galway.
- Spreads prolifically by seed.
- Forms dense stands along waterways and in damp places

- Cut, mow or strim in June before flowering.
- Pull by hand.
- Herbicide (glyphosate or 2-4-amine) in late spring.
- Monitor site for seedlings for 3 years.

Zebra Mussel *Dreissena polymorpha*

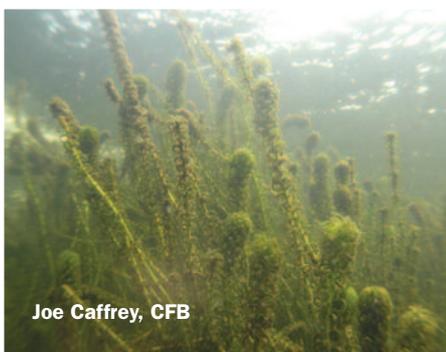


Photo: CFB

- Freshwater species well established in River Shannon and now in parts of the Corrib.
- Causes irreversible ecological changes in lakes
- Large costs incurred from boat fouling and blocking pipes
- Transported by boats, bilge water, fishing gear, plants, currents

- Thoroughly clean boat, trailer and engine with hot water and allow to dry after every trip.
- Disinfect fishing gear and boots with when leaving waterway

African curly leaved pondweed *Lagorasiphon major*



Joe Caffrey, CFB

- Oxygenating plant from garden ponds
- A major threat to the ecology and recreational use of waterways
- Forming very dense stands up to 6m deep in Lough Corrib
- Spread by fragmentation via wind dispersal, boat movement, angling gear

- Thoroughly clean boat, trailer, engine and fishing gear and boots when leaving waterway.
- Do not drive through stands of weed
- Do not dump weed in or near any watercourse
- Dispose of plants by drying thoroughly then burning.

Note: This table is intended solely as a guide to the recommended treatments for invasive species. It is strongly advised that further information and assistance is acquired before undertaking any large scale control projects. See www.galway.ie/biodiversityguidelines for contacts and further information.

The Wildlife (Amendment) Act 2000 states that anyone who plants or otherwise causes to grow in a wild state in any place in the State any species of (exotic) flora, or the flowers, roots, seeds or spores of (exotic) flora shall be guilty of an offence.