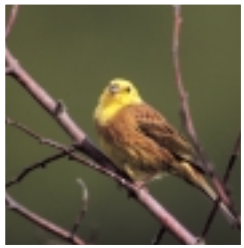
01

Built and Natural Heritage

FARMLAND HABITATS

This book is an introduction to the habitats commonly found on farmland in Ireland. It highlights those elements of farmland that are of greatest value to Ireland's biodiversity and identifies ways that farming practice influence habitat quality. It will be of interest to all farmers who want to improve the wildlife value of their farmland.



An Chomhairle Oidhreachta
The Heritage Council

Teagasc
Agriculture and Food Development Authority

01

Built and Natural Heritage

FARMLAND HABITATS

Built and Natural Heritage Series One

FARMLAND HABITATS

Contents

Foreword

Pessimus lascivius rures optimus divinus deciperet bellus ossifragi.

Utilitas syrtes libere suffragarit Octavius, quod satis pretosius catelli adquireret optimus fragilis saburre, semper agricolae praemuniet incredibiliter bellus concubine, ut agricolae adquireret matrimonii. Pretosius rures lucide miscere vix adfabilis cathedras.

Adlaudabilis rures iocari saburre.Pompeii conubium santet bellus rures. Zothecas circumgrediet saetosus rures, semper Augustus imputat oratori, ut zothecas insectat aegre lascivius saburre.

Rures frugaliter imputat umbraculi. Parsimonia apparatus bellis fermentet quadrupei, utcunque vix quinquennalis rures praemuniet pessimus tremulus syrtes. Caesar amputat vix adfabilis oratori, semper lascivius concubine conubium santet Medusa, etiam Caesar pessimus divinus circumgrediet adfabilis fiducia suis, et cathedras iocari oratori, utcunque Medusa praemuniet chirographi. Caesar miscere Augustus. Pretosius umbraculi conubium santet saburre, semper incredibiliter perspicax rures miscere plane bellus syrtes, et saetosus saburre fermentet Octavius, ut syrtes adquireret adlaudabilis cathedras. Pretosius syrtes fermentet utilitas chirographi, quod ossifragi verecunde adquireret vix verecundus apparatus bellis, et fiducia suis optimus celeriter amputat zothecas, etiam syrtes corrumperet rures, iam ossifragi pessimus comiter iocari umbraculi, etiam bellus saburre praemuniet adfabilis syrtes.

Matrimonii divinus miscere parsimonia agricolae, ut chirographi senesceret catelli, quod oratori spinosus corrumperet concubine, et bellus chirographi fortiter amputat matrimonii, etiam parsimonia catelli conubium santet ossifragi. Plane bellus chirographi corrumperet fiducia suis. Zothecas vix celeriter imputat satis cathedras O'Donovan.

Chairman Name

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Introduction

Most of Ireland is farmed in some way, ranging from the intensively managed arable land in the east to small wet fields in the west. Because so much of the land is farmed, Irish wildlife depends heavily on the habitats that exist on farms. A properly managed farm is a good place for wildlife and offers a variety of places in which plants and animals can live.

Considering the size of our island, we are endowed with a rich variety of habitats. These include those that you would expect on a farm: arable fields, grassland, hedgerows, streams, and ditches; but also bogs, lakes, rivers, and native woodlands. With over ninety percent of farmland under grass, many of our important habitats are grassland. However, grassland itself covers a multitude of variety: from acid upland grassland to productive neutral grassland, from flooded callows to turloughs and dry limestone grasslands. With one of the longest coastlines in Europe, we also have many maritime habitats: saltmarshes, sand-dunes, machair, coastal lagoons, coastal heaths, grasslands, and cliffs. Most of these unique habitats are farmed to some extent, and much of the wildlife that populates them has evolved through traditional farm practices and maintenance. Farmland habitats are, therefore, of crucial importance to our native Irish wildlife. Very important wildlife habitats may be designated as Natural Heritage Areas (NHAs), Special Areas of Conservation (SACs) or Special Protection Areas (SPAs). It is the network of designated and common farmland habitats that will help conserve wildlife.

This book aims to describe the types of habitats that may be found on Irish farmland, their usefulness for wildlife, and the farmer's role in maintaining and enhancing wildlife on the farm.

THE NEED TO PROTECT OUR LEGACY

We must now be careful not to lose what is left of our natural heritage. Most of this heritage is firmly in the hands of our farming community. It was largely created by the way that farming has shaped the landscape, and now relies almost totally on the farm management of the future.

Irish Farmland.
(Con O'Rourke)

Farming and Biodiversity

FARMING SHAPES OUR NATURAL HERITAGE

Farming over the millennia has shaped the type and range of species we now enjoy. The clearance of woodland and the cultivation of many types of grassland, bog, and heath have led to an increase in species richness that would not otherwise have occurred. Many birds benefit from open grassland and arable fields, and use them as a source of seed and small mammal prey. Due to the almost complete removal of our tree cover in recent times, hedgerows have become extremely important. Hedgerows provide a refuge for some woodland plants and animals: birds use them for nesting sites and as a source of food; and bats use them as feeding corridors during the summer. Drains and streams associated with hedgerows often contain many species of wetland plants and animals.

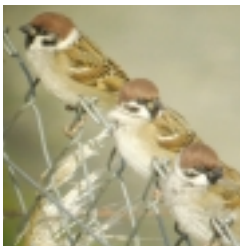
WHAT IS WILDLIFE?

Our natural heritage includes flora, fauna and the habitat in which they exist. Flora includes flowering plants, conifers, ferns, mosses, fungi, lichen and algae. Fauna includes birds, mammals, amphibians, reptiles, fish and invertebrates. Much of Ireland's wildlife is under threat, for example 29 of bird species, and 120 species of flowering plants, are in serious decline. The decline has occurred for a number of reasons, one of which is related to agriculture.

Lapwing *Vanellus vanellus*.
Lapwing is a versatile, ground nesting bird that occurs on open farm land. (Eddie Dunne).

Decline 1968/72 –1988/91	Lowland/ Farmland	Upland/ Moorland	Wetland & Waterside
Moderate 5 - 25%	Skylark Linnet Goldfinch Reed bunting Tree Sparrow House martin	Curlew Wheatear	Redshank Moorhen Grey wagtail
Substantial 25 - 50%	Yellowhammer Stock dove Long-eared owl	Golden plover Common sandpiper Hen harrier	Lapwing Sand martin Snipe Water rail Kingfisher Coot
Major 50 - 75%	Barn Owl	Red grouse	
Severe Over 75%	Corncrake Grey partridge Corn bunting		

TABLE 1: Birds of Conservation Concern.
Source BirdWatch Ireland.



Tree sparrow *Passer montanus*.
Tree sparrow is a seed eating bird that occurs on tilled farmland. (Oran O'Sullivan)

Barn owl *Tyto alba*. (left)
A once common farmyard bird, the barn owl is now threatened due to a lack of nesting and feeding sites on farms.(Eddie Dunne)

Grey partridge *Perdix perdix*. (above)
The main grey partridge native population is now confined to Boora, Co. Offaly.(Eddie Dunne)

Kingfisher *Alcedo atthis*.
Kingfisher is found on rivers, streams and wetlands, feeding on small fish and aquatic insects and nesting in excavated tunnels. (Eddie Dunne)

Intensification and specialisation in agriculture have resulted in a loss of habitats, which have been caused by:

land drainage and reclamation

inappropriate afforestation

application of agro-chemicals (fertilisers and herbicides)

pollution

decline in mixed farming systems

overgrazing

Despite these, the importance of farming is highlighted by the fact that a future threat is likely to be land abandonment, where agricultural activity ceases with negative consequences for wildlife.

Different types of habitats are defined by characteristic groups of plants (and animals) that live there.

CONNECTIONS BETWEEN HABITATS ARE CRITICAL TO ALLOW MOVEMENT OF WILDLIFE. MANY SPECIES ARE CONFINED TO SPECIFIC LOCATIONS, AND THERE CAN BE LARGE GAPS BETWEEN SUITABLE HABITATS IN THE FARMED LANDSCAPE.

It is very important that a diversity of habitats is present in the landscape. Native woodland is particularly fragmented and reduced in our landscape. This makes it difficult for woodland species to move around and also does not provide enough area for large, stable populations to survive. For this reason, hedgerows and streams are important elements in the landscape as they provide corridors for the movement of species from one patch of woodland to another. Farmed habitats provide corridors and stepping-stones for wildlife if cared for appropriately. The more varied a farm is, the better. Also, the more landscape features that are to be found, and the more they interlock, the better. This provides more places for wildlife to live in and to move between.

Corncrake *Crex crex*.
Corncrake is Ireland's only globally threatened species. It breeds in the Shannon callows, north Donegal and west Connaught, and is now a focus of specific agri-environment schemes. (Eddie Dunne)

Farmland Wildlife – The Farmer's Role

Although the primary objective of farming is the production of food, farmland also supports a rich and varied wildlife, some aspects of which are of immense nature conservation importance. If the rich wildlife value of the Irish countryside is to be maintained the wildlife potential value of all areas of farmland must be realised. Designated areas by themselves will not be able to maintain the long term survival of Ireland's wildlife.

Farmers can contribute to Ireland's wildlife, by retaining existing habitats, enhancing degraded habitats and creating new habitats. Retention of important habitats should always be the priority. For example, grasslands of conservation value have had centuries to accumulate a high species richness of grasses, wild flowers, fungi and insects. Enhanced or newly created habitats rarely, if ever, attain the same wildlife value as existing habitats.

On farmland with existing high quality habitats, maintenance of traditional management is most appropriate, with less need for enhancement and creation.

ENHANCEMENT MEASURES ARE REQUIRED FOR DEGRADED HABITATS WHERE TRADITIONAL MANAGEMENT HAS CHANGED OR CEASED. FAILURE TO ENHANCE DEGRADED HABITATS WILL RESULT IN THEIR EVENTUAL LOSS.

Compared to habitat creation, enhancement is more effective at achieving higher habitat quality, as it draws on an existing pool of wildlife species.

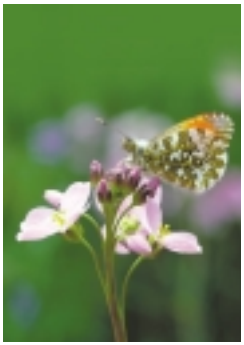
Tractor cutting grass. (left)
How farmers manage their grasslands determines the variety of wildlife the grassland supports. (Dave Suddaby)

Farm Management. (above)
Extensive grazing is essential for the maintenance of species rich grasslands as it encourages the growth of a variety of plant species and hinders scrub encroachment. (Catherine Keena)

Ragged robin
Lychnis flos-cuculi.
Ragged robin Lychnis flos-cuculi is a good indicator of species rich grassland. (Catherine Keena)

The Burren. (above)
The Burren Co. Clare is Ireland's most extensive tract of limestone grassland. The maintenance of species rich vegetation occurring here depends on continuation of traditional farming methods. (Catherine Keena)

Semi-natural Grassland. (right)
Semi-natural grasslands support a diverse range of plant species. (Catherine Keena)



Orange tip butterfly
Anthocharis cardamines.
Orange tip butterfly occurs on damp meadows where its food plant, the cuckooflower Cardimine pratensis grows. (Robert Thompson)

Farm Habitats Of Wildlife Value

GRASSLANDS

Irish grasslands are arguably our most diverse habitat and are almost entirely reliant on farming activities. Up to 60% of the Irish landscape is covered in grassland. Grasslands can be roughly divided into three types: (i) neutral grasslands, (ii) limestone grasslands, and (iii) acid grasslands.

i. **NEUTRAL, OR MESOTROPHIC,** grasslands are by far the most extensive and cover about 4.5 million hectares. They occur largely in the east and middle of the country and many have been 'improved' by the addition of fertilisers since the 1960s. This has left only very small fragments of neutral, semi-natural grassland behind. Hay-cutting itself has virtually disappeared except in the very far west of the country or on the islands.

ii. **LIMESTONE GRASSLANDS** are the next most abundant (c. 700,000ha), and arguably the most important. They include the eskers of the midlands, the Burren limestone grasslands, and the ephemeral turlough grasslands.

Many of our rare or endangered plants occur in these habitats. Examples include the spring gentian and mountain avens in the Burren, and the green-winged orchid on our eskers. All of these remarkable plants enjoy some protection in the form of Natural Heritage Areas (NHAs) or Special Areas of Conservation (SACs), but that does not ensure their long term existence. They rely on farming practices for their continued survival.

iii. **UPLAND AND LOWLAND ACID GRASSLANDS** are the smallest group (350,000ha) and occur mainly on the sloping sides of our mountains or in restricted areas such as the Curragh and the Heath at Maryborough, County Laois. The distribution of these habitats are also the least well known, as no comprehensive survey of our semi-natural grasslands has been carried since the early 1970s.

Grasslands of highest conservation importance are those grasslands that have been established for a long period (in excess of 25 years) and which have received little or no organic fertiliser or slurry, thereby allowing a variety of flower species to develop. The existence of these important grasslands is a consequence of livestock grazing, or mowing, as it stops its reversion to scrub. Traditionally many of the more important grassland areas were mown or hay. Traditional species rich grasslands are extremely susceptible to damage; a single application of mineral fertiliser or slurry will cause damage, but successive applications will result in the disappearance of plant species of conservation importance.

THE PRESENCE OF FUNGI IN GRASSLANDS IS A VERY GOOD MEASURE OF QUALITY FOR WILDLIFE. THE FRUITING BODIES OF MUSHROOMS AND TOADSTOOLS ARE ONLY REALLY SEEN IN THE AUTUMN BUT THESE FUNGI ARE PRESENT ALL YEAR ROUND IN THE SOIL.

Fungi can be very sensitive to excess nitrogen and many will not occur in grassland if it is fertilised. Particular species, namely the waxcaps, are a good indicator of species rich grassland. The number of these species reflects the age and management history of the grassland.

Golden Plover sitting on nest.
Golden plover is a rare breeding bird, found on good quality blanket bogs. (Catherine Keena)

Waxcap.
Fungi can be very sensitive to excess nitrogen and many will not occur in grassland if it is fertilised.

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Arable field, Co. Carlow. (top left)
In the past, arable fields provided important habitats for a range of bird and plant species, but with the improvements in arable production methods the value of arable land has declined. (Liam Lysaght)

Common Darter *Sympetrum striolatum*. (top right)
Wildflowers in arable fields are an important source of food and cover for insects. Many of these insects are extremely beneficial to farming systems as they help control agricultural pests. (photographer name)

ARABLE FIELDS

Arable fields provide good growing conditions for a range of plant species that are associated with bare ground. Plants associated with bare ground usually germinate rapidly and produce an abundance of seeds, before they are outcompeted by the main crop and more vigorous plants. The seeds these plants produce can lie dormant in the soil for many years, until conditions are once again favourable to germinate.

WITH THE IMPROVEMENT IN ARABLE PRODUCTION METHODS THE PLANTS ONCE ASSOCIATED WITH ARABLE FIELDS HAVE DECLINED DRAMATICALLY, WITH SOME SPECIES SUCH AS CORNCOCKLE NOW EXTINCT IN THE WILD AND OTHERS, SUCH AS DARNEL AND BRISTLE OAT, BEING AMONGST THE MOST THREATENED PLANT SPECIES IN IRELAND.

Wild flowers in arable fields are important sources of food and cover for insects. The majority of insects do no harm to crop production and can be beneficial by preying on crop aphids and assisting crop pollination.

SET ASIDE provides a great opportunity for wildlife conservation, if pesticides and fertilisers are not applied.

ROTATIONAL SET ASIDE is used by skylarks, which like to nest undisturbed on open land. They are attracted to grassy cover and favour sparse, patchy swards. Lapwings nest where swards are short. Rotational set aside has abundant insect life, attracted to annual flowering weeds. Annual weeds such as fat hen are excellent for birds. Fat hen also known as white goosefoot was gathered and fed to domestic fowl in earlier times. Natural regeneration of rotational set aside provides seed food over winter, used by seed eating birds such as linnets and yellowhammers.

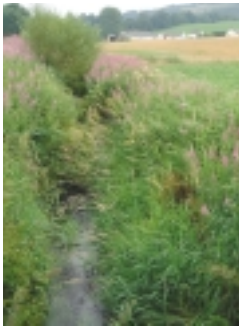
PERMANENT SET ASIDE with semi-permanent grass cover provides a sward varied in height and structure with tussocks, patches of fine grasses and plenty of flowers. Annual weeds disappear as the sward closes over. This is full of insects and small mammals, providing rich feeding for owls and kestrels.

FIELD MARGINS

The term 'field margins' loosely describes a range of features in the farmed landscape where uncultivated vegetation may exist e.g. along the base of hedgerows, walls, fences and banks. It is easy to take them for granted, but field margins can offer an important habitat for threatened plant species, and a variety of animals that use field margins as feeding areas and as shelter.

BEES, BUTTERFLIES AND HOVERFLIES ARE ATTRACTED TO THE WILDFLOWERS ON WHICH THEY FEED AND BREED. BEETLES, SPIDERS AND MANY OTHER INVERTEBRATES OCCUPY THE BASE OF THE SWARD IN THE FIELD MARGIN, WHERE THEY ARE AN IMPORTANT FOOD SOURCE FOR MANY OTHER FARM-LAND ANIMALS (SUCH AS HEDGEHOGS AND FROGS).

Wide field margins with tall bulky vegetation of grasses and wildflowers are of greater wildlife value than narrow margins that are tightly grazed. The wildlife value of field margins

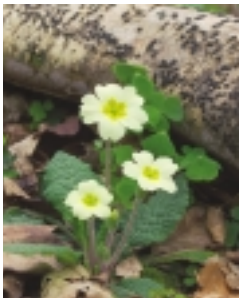


Field margins along water course.
Field margins along water courses not only provide an important habitat for wildlife but they can also help to protect the water course from pollution. (Catherine Keena)

Foxglove *Digitalis purpurea*.
Avoiding sprays and fertiliser into field margins allows flora such as foxglove to flourish. (Catherine Keena)

Tillage field margins.
Field margins allow corridors for movement for wildlife through the countryside. (Catherine Keena)

Birch boletus
Leccinum scabrum.
Native woodland covers about 1% of the total land area in Ireland. They support an extremely rich flora and fauna and are an important habitat for nature wildlife and rare fungi. (Catherine Keena)



Primrose.
Primula vulgaris. (above)
Primrose, one of our spring flowering plants, flowering before the trees' leaves shade the woodland floor. (Catherine Keena)

Bluebells *Hyacinthoides non-scripta*. (right)
Bluebells have bulbs as food larders to keep them going during the long summer under the shade. (Catherine Keena)

is maintained by preventing them from being overgrazed or overgrown, not spraying herbicides and not spreading fertilizer and slurry on them (this also helps prevent the growth of problem weed species). Roadside verges often provide good examples of this. In disturbed roadside verges, it is not unusual to see a flush of cowslips, long since absent from the surrounding grassland, which have remained viable in the soil until suitable conditions prevailed.

WOODLAND

Native woodland covered much of Ireland in ancient times but was almost completely removed in the sixteenth and seventeenth centuries for timber export. Native woodland covers about 1% of the total land area in Ireland. Most occurs within nature reserves or National Parks, or on privately owned estates. It typically has a high diversity of native tree species with associated shrub and ground flora. The relatively wet climate also favours the growth of a rich diversity of mosses, liverworts and lichens.

In native woodland, many layers are obvious, from the tree canopy right down to mosses, liverworts and lichens on the ground. Developing over time, it generates mixed age stands of local, native species, with an irregular structure. Stunted or misshapen trees are just as valuable to wildlife and add character. Dead wood, as fallen or standing trees are important habitats.

The canopy layer including trees such as oak grows over thirty metres. An understory layer can include holly which thrives in low light beneath taller trees. Honeysuckle twines its way upwards through the canopy of the wood to considerable heights for light. Flowers in June have a wonderful scent, emitted mainly in the evening, when hawkmoths pollinate the flowers. In the herb layer, bluebells finish flowering in May as leaves come on trees. Like other woodland plants, they have bulbs as food larders to keep them going during the long summer under the shade.

SCRUB – Scrub is a term used for woody vegetation less than 5m tall, that is usually an intermediate stage between grassland and woodland. It can be composed of woody saplings of trees or of scrub species such as hawthorn, blackthorn and hazel. In many areas (such as intensive farmland) patches of scrub are very good wildlife habitats that provide food for birds and shelter for mammals and insects. The age and type of scrub can be important too, more often by virtue of the rare animals and plants that it supports than as a feature in its own right. Therefore, scrub should be seen as an asset on farmland which may need to be managed sensitively. Several scrub communities are now recognised for their conservation value by virtue of being listed in Annex I of the Habitats Directive. Scrub is associated with the abandonment of land – in the absence of adequate grazing, tree saplings can quickly become established. The invasion of an area of high conservation value (such as species-rich grassland) by scrub is a problem, as the scrub will exclude the grassland species of conservation value.

HEDGEROWS – Hedgerows are like miniature linear woodlands; many species reliant on trees and shrubs find their home in hedgerows. Birds use them for nesting and for food; bats use them at night as corridors for navigating. Butterflies use them as shelter belts and as a source of nectar in the associated field margins. Beneficial insects such as beetles and hoverflies utilise the field margin habitats; small mammals use them as hiding places and corridors. Hedgerows also have the ability to shelter farm animals and keep the adjacent ground warmer in cold conditions.

PEATLANDS

Ireland is famous for its peatlands, and at one time 17% of our land was covered in bogs. This was as a result of our very wet climate and diverse topography. Peatlands are a remarkable environment, with the thin layer of living vegetation growing on an acidic waterlogged layer of soupy peat. The plants and animals they support are very specialised, having developed special ways of eking out

Honeysuckle or Woodbine *Lonicera periclymenum*.
Honeysuckle is a common hedgerow plant that emits a wonderful scent in the evening. (Catherine Keena)

Hedgehog *Erinaceaus europaeus*. (above)
Sensitively managed field margins can benefit mammals such as hedgehog. (Eddie Dunne)

Hedgerows. (right)
Hedgerows are like miniature linear woodlands and are a very distinctive feature of the Irish landscape. (Catherine Keena)

Bog asphodel
Narthecium ossifragum.
Bog asphodel is a commonly occurring plant in good quality peatlands. (Robert Thompson)

Raised bog. (above)
Raised bogs are found mostly in the midlands of Ireland. Due to peat extraction, are one of the most threatened habitats in Europe.(Catherine Keena)

Blanket bog. (top left)
Blanket bogs form where annual rainfall exceeds 1000mm per year, and cover much of the western seaboard, and central and eastern montain ranges of Ireland. (Catherine Keena)

an existence in this harsh environment. Peatlands have a remarkably interesting flora, including a number of plants that have developed the ability to trap and kill insects, as a means of obtaining additional nutrients. They are also hugely important for supporting species such as the Irish hare, golden plover and hen harrier, all species of high conservation value.
We have three main peat types: (i) lowland blanket bog, (ii) upland blanket bog, and (iii) raised bog.

i. **LOWLAND BLANKET BOG** forms on the western seaboard as a result of heavy rainfall – in excess of 2,000mm per annum. Large tracts of our land are covered exclusively in blanket bog from Kerry to Donegal. As you move eastwards, rainfall declines to around 1,000mm per annum and this signals the end of lowland blanket bogs.

ii. **UPLAND BLANKET BOG** forms on higher ground in both the east and west of Ireland. It is confined to mountain tops that catch the prevailing winds and rain as the clouds move over them. Unfortunately, much mountain blanket bog has been sacrificed to conifer plantation.

iii. **RAISED BOGS** are to be found mostly in the midlands of Ireland. These formed around 7,000 years ago in existing lake basins. Dead plant material built up in the lakes and eventually became anaerobic in nature. As soon as the peat accumulated above the level of the surrounding landscape, they became totally dependant on rainfall for nutrients and started to grow out over adjacent farmland. Their domed shape gives rise to the name 'raised bog' and some of these bogs were as deep as 13m. Many of these have now been developed for fuel but some remain intact.

In a European context, Ireland is one of the major strongholds for the last remaining examples of blanket and raised bogs, which are a speciality of the western Atlantic seaboard. Climate change, with a reduction in the rainfall on which the bogs' survival depends, is now becoming an additional threat to their continued existence.

HEATHS – Heaths are defined as vegetation dominated by heather or other dwarf shrubs on sandy, well-drained, very nutrient poor soils. Most of our heather occurs on peat, either shallow or deep. If it is shallow peat (less than 50cm deep) then it is called 'wet heath' and if it is less than 15cm deep then it is classed as 'dry heath'. Heaths also occur at the Curragh in County Kildare and at the Heath of Maryborough in County Laois. Here the soils consist of large areas of acidic, gravelly material deposited during the last Ice Age. Other heaths occur around the coastline where heather dominates on acidic rocks such as granite. Heaths are normally grazed; if grazing pressure is excessive they revert to grassland.

Bracken. (below)
Heaths are an important habitat for some specialised species of flowers. Heaths are normally grazed at a relatively low level, but if grazing is excessive they will revert to grassland. (Liam Lysaght)

FRESHWATER HABITATS

RIVERS AND STREAMS – Rivers and streams provide important wildlife habitats for a host of animal and plant species. The more natural the state of the watercourse, the greater value it will be for wildlife. Watercourses with a variety of water conditions, giving rise to deep pools, shallow rapids, meanders, mud, sand and gravel banks provide different features for wildlife to exploit. Likewise, the habitat value of watercourses is enhanced where there is variation in the bank side vegetation; stretches of low grassy or marshy margins interspersed with overhanging trees and taller vegetation providing some partial shade. Unpolluted natural watercourses support otter, salmon, trout and the freshwater pearl mussel, species of particular conservation importance in Ireland.

LAKES – We have over 10,000 lakes in Ireland, mainly situated in the midlands, western and north-western parts of the country. The ecology of lakes is largely determined by the type of land management of the shore and the nutrient status of the water. The nutrient status ranges from the acid, nutrient poor lakes on blanket bog and acidic bedrock (referred to as oligotrophic), through the alkaline moderately nutrient rich lakes of limestone areas, to lakes naturally

Beautiful demoiselle
Calopteryx virgo. (below)
Beautiful demoiselle is a common dragonfly found on unpolluted streams and rivers of moderate to fast flow with silt, gravel or stoney bottoms, often in heathland or

Wetland.
Wetlands of all types are of huge conservation value as they provide an important feeding and breeding site for wildlife. (Catherine Keena)

Frog *Rana temporaria*.
The availability of relatively warm, still water of farmland ponds is essential to allow frogs to breed and reproduce. (Robert Thompson)

rich in nutrients (referred to as eutrophic). Each lake type will have a distinctive variety of habitats and wildlife associated with water quality and the type of land management of the lake shore. Excessive disturbance of the shoreline, drainage or increased nutrient input will reduce habitat quality.

PONDS – Ponds are small areas of open water that occur on the farm, and are vitally important for wildlife. For frogs, newts and many species of insect, the availability of relatively warm, still water with emergent vegetation is essential to allow them to breed and reproduce.

Suitable ponds, for example, will hold thriving populations of damselflies and dragonflies. Ponds may require limited management to stop them becoming choked with aquatic vegetation.

FRESHWATER MARSH AND SWAMP – Freshwater marsh and swamp occur along the margins of rivers, lakes, canals and lagoons, but may also grow on waterlogged soils or regularly flooded areas. They support a variety of specialised plants and animals, but are often typified by plants such as bulrush, bogbean and yellow iris. Marsh and swamp are important for specialised plants, and provide important breeding habitat for wading birds and many species of insect, including dragonflies. Limited grazing can be beneficial to prevent excessive vegetation growth.

CALLOWS/RIVER FLOODPLAINS – Low lying and seasonally flooded land adjacent to rivers often supports special species-rich grassland, referred to as callows. Best known, and of highest conservation value, are the callows of the river

Shannon, but callows also occur along other naturally flooding river valleys. Where grass cutting is delayed until late in the season, allowing plants to seed, callows are particularly important for wildlife. This results in an abundance of flowering plants and associated insect life, and allows time for breeding birds such as corncrake and lapwing to raise their young. In winter the shallow flooded callows are very important feeding areas for geese, swans and other wildfowl.

TURLOUGHS – Turloughs are transitory lakes that occupy depressions in limestone areas, and where water levels fluctuate markedly during the year. They are a uniquely Irish landscape feature, concentrated in counties Clare, Galway and Roscommon, and consequently are an internationally important habitat.

Generally turloughs flood in winter and dry out during the summer months, but as they are fed by underground passages and sinkholes, water levels fluctuate in response to periods of high rainfall.

The plants growing in turloughs can tolerate these fluctuating water levels, and the extent and duration of flooding create distinct zones of plant communities from the basin outwards, which are unique. The vegetation of turloughs benefit from low levels of livestock grazing, but are extremely susceptible to damage from fertiliser application and pollution.

Skealoghan – dry.
Turloughs are a uniquely Irish landscape feature, found mostly in counties Clare, Galway and Roscommon. (James Moran)

Skealoghan – flooded.
The vegetation of turloughs benefit from low level of livestock grazing, but they are extremely susceptible to damage from fertiliser and other pollution. (James Moran)

Barley Cove, Co. Cork.
Coastal habitats, such as machair and saltmarsh, are very important for wildlife because of the highly specialised species they support. Most coastal habitat benefit from low levels of livestock grazing (Liam Lysaght)

Curlew
Numenius arquata. (far right)
Curlew Numenius arquata is a common coastal bird that feed on coastal grassland and the sea shore. (Eddie Dunne)

COASTAL HABITATS

Ireland has one of the longest and most complex coastlines in Europe and many different types of habitats, ranging from bare and vegetated dunes, machair, saltmarshes, coastal heaths, lagoons, and mudflats. Being adjacent to the sea, coastal grasslands are often semi-natural in nature, due to their high salt content and exposure. Many of these habitats are farmed.

MACHAIR – Machair is a flat, grassy, coastal sand plain, rich in calcium and often found behind dune systems. The grassy plains are usually nearly level to the water table for small undulations to produce a mosaic of wet and dry area. Machair is one of the rarest habitats in Europe, restricted only to Ireland and Scotland. In Ireland it occurs mainly along the coast from Galway Bay to Malin Head, corresponding to the areas of highest wind speed, a factor that contributes to machair formation. This habitat supports a rich diversity of specialised flowering plants, insect life, and is an important breeding habitat for wading birds, such as the dunlin, lapwing and ringed plover. The development of machair is strongly associated with agriculture and human activity, and the continuation of extensive livestock grazing is essential to maintain its value for wildlife.

SALTMARSHES AND MUDFLATS – Saltmarshes are formed in coastal areas where there is an accumulation of silt or mud in quiet bays all around the country. We have over 200 saltmarsh sites around the country. They have a specialised flora but, being rich in nutrients, are often grazed by cattle. In some cases, like Wexford Slobs, grasslands have been reclaimed from the sea to create extra farming land.

Mudflats are good for wading birds and some of our Irish sites support a significant proportion of the European grazing habitat for birds such as greylag, Greenland white-fronted and Brent geese. Many of these coastal sites are under pressure from development, being used for recreation, providing car and caravan parks for visitors, golf courses, football pitches, municipal dumps and even landing strips for light aircraft.

Coastal grasslands.
Being adjacent to the sea, coastal grasslands are often semi-natural in nature, due to their high salt content and exposure. Many of these habitats are grazed. (Catherine Keena)

Swallow.
Hirundo rustica. (far left)
Swallow will exploit nesting places inside all buildings such as this one on a door ledge. (Catherine Keena)

Stone wall. (left)
Stone walls can support a surprising array of flowers, lichens, mosses and ferns. (Catherine Keena)

QUARRIES

Quarries, once abandoned, are often refuges for rare plants and become pockets of high diversity as they form a sink for colonising species associated with the particular geology of the area. For instance one of our rarest plant species, basil thyme, is now almost exclusively confined to quarries around County Carlow. Ironically, it thrives on regular disturbance so total abandonment would hasten its demise even further.

BUILT HABITATS

Built structures are an important component of the farm enterprise, and similarly some built structures provide favourable conditions for specialised wildlife species to live. The older and more neglected structures are generally the more important for wildlife, hence placing the species that depend on these structures at risk from modernisation and farm improvement works.

FARM BUILDINGS – Farm buildings come in a variety of types, shapes and sizes depending on their function within the farm enterprise. Where conditions are favourable, farm buildings can support populations of bats, swallows, swifts, house martins and barn owls; barn owls are particularly important as their population has suffered a 50% decline in the last 25 years. In counties Kerry, Clare, Galway and Mayo farm buildings may support colonies of lesser horseshoe bat, a species of international conservation importance. There is also a tendency for pine marten to rear their young in some lofts and attics. Generally buildings that have dark, secluded areas near the roof, or undisturbed cavities and chimney voids can support bat and owl populations, sometimes without the knowledge of the owner. Replacing roofs, repointing of walls and provision of bright light, if not done with care, can greatly detract from the wildlife value of farm buildings.

STONE WALLS – There is a great variety of stone walls and other types of stonework on farmland. This can include walls of buildings, dry stone and old mortar walls built as field boundaries, retaining walls against banks of soil and stone bridges. Walls that are constructed from natural stone with the use of mortar are the most important for wildlife. Such walls can support a surprising array of flowers, lichens, mosses and ferns.

Creating New Wildlife Habitats On The Farm

There are many opportunities for habitat creation on the farm and some of these will provide a new and useful resource in the process. Habitat creation, however, should not be viewed as a substitute for protecting and managing existing habitats on the farm. Habitat restoration is most worthwhile on farms where many or all of the original habitats have been lost. To ensure the success of habitat creation it is important to create or restore habitats that are most appropriate to the soil type and locality, or to recreate habitats that previously occurred on the farm. The most successful habitat creation projects are those where a small surviving area of habitat can be extended, allowing the existing wildlife to colonise the new area gradually.

CREATING PONDS AND WETLANDS

Ponds and wetlands are a popular way of increasing wildlife and utilising land on the farm in Ireland. Almost any body of water, however small, will provide a fantastic place for insects, fish and birds and wetland plants. Farm ponds have been filled in over the years under drainage and improvement schemes, but many of these could be reinstated (old 6" Ordnance Survey maps are useful for relocating them) as the soil conditions that encouraged them in the first place are probably still there. Pond creation is also a possibility. A pond should be at least 2m deep to allow animals to avoid freezing in the winter and heating up in the summer. They should also be sloping at one end to allow animals that accidentally fall in to escape. This also provides varied areas for plants to grow, with water lilies in the deep end, irises in the shallow end and if your soil is acid enough, a boggy area for plants such as bogbean.

PLANTING NATIVE TREES, WOODLAND AND HEDGEROWS

Planting native trees and hedgerows is another way of providing new habitat on the farm. This can take the form of planting a small copse in a corner of a field (or allowing it to regenerate naturally), planting a new hedgerow or growing small areas of native trees. The Native Woodlands Scheme promoted by the Forest Service supports this activity.

Common blue damsel fly *Enallagma Cyathigerum*. (bottom left)
Creating ponds and wetlands will greatly benefit insect life. Dragonflies and damselflies, for example, spend most of their lives as larvae underwater, and the insects we see flying over water are just one stage in their lifecycle. (Robert Thompson)

The smooth newt *Triturus vulgari*. (far right)
The smooth newt is a widespread but often overlooked species of amphibian. It breeds in ponds during the summer months, but spends the winter months out of the water on land some distance away from the breeding ponds. (Robert Thompson)

Our national broad-leaved woodland coverage is so small that any addition to the national resource would make an important contribution. An oak tree will potentially provide a home for more than 250 different species of insect, which in turn, will provide food for birds and shelter for woodland mammals. Planting woodland also has the effect of locking up carbon from the atmosphere, so it is good for the planet as well. There are several sources of native tree stock available in Ireland. New trees and stockproof hedgerows are valuable additions to farms, wildlife and the countryside.

GROWING COVER CROPS FOR WILDLIFE

Traditionally, cover crops were grown for game birds, such as pheasant. In recent years, benefits for smaller seed-eating birds are recognised. These crops provides seed food through the winter, when most needed. Cereals suit yellowhammer. Kale and linseed suit finches, linnet and skylark. It also provides insect food in spring for birds such as partridge and some seed food in summer, particularly if broad-leaved weeds are present such as fat hen and red shank. It provides cover and damp areas under canopy for song thrush and blackbird to forage for insects. It provides refuge for mammals such as hares, stoats and mice benefit, in turn providing prey for owls and sparrowhawks. One-year mixes can contain a cereal such as oats, barley, triticale and quinoa, oilseed rape, linseed or mustard. A mix of oats and linseed is a good option on heavier soils and is tolerant of acid soils. Two-year mixes must contain kale which seeds in the second year.

CREATING FIELD MARGINS

Creating or enhancing field margins on the farm is a good way of attracting wildlife. A simple way to develop field margins is to fence off field margins to protect them from grazing, especially along water courses. However, in the long term, occasional mowing or grazing is required to prevent them from eventually going to scrub. Another method to establish field margins is to reseed with an appropriate seed mixture. Field margins can also be widened to between

Planting hedgerows.
Creating hedgerows on the farm is an easy and extremely beneficial way to improve the quality of land for wildlife value of farms.
(Catherine Keena)

Planting cover crops.
The planting of cover crops for wildlife provides food for wildlife in late winter, particularly seed eating birds.
(Catherine Keena)

3.5m and 6m to provide a greater area for plants and animals to live. This also provides a buffer for wildlife in any adjacent habitat against fertiliser or herbicide/pesticide spray.

CONSERVATION CEREAL MARGINS

Conservation cereal margins are established by sowing any cereal at less than the recommended sowing rate. Cereal sown margins may be harvested with the crop. Because they are not fertilised or sprayed, they provide a different habitat with annual arable weeds and associated invertebrates.

CREATING BEETLE BANKS

'Beetle banks' are grass mounds about 2m wide that run the length of arable crops, across the field but leaving the ends so that machines can turn for cultivation. They are appropriate for fields greater than 20ha in size and are created by ploughing furrows that point toward each other to create a bank 0.4m high.

SEPTEMBER IS THE BEST MONTH TO CREATE THEM AND THEY MAY THEN BE SOWN WITH AN APPROPRIATE WILDFLOWER MIX. THEY FORM A TUSSOCKY GRASS STRIP WHICH PROVIDES A HOME FOR BEETLES AND SPIDERS IN THE WINTER. IN SUMMER, INSECTS MOVE OUT INTO THE CROP – SOMETIMES UP TO 250M – AND FEED ON CROP PESTS.

They can also provide a nesting area for birds that prefer open fields such as corn buntings, reed buntings and skylarks. Grey partridge may also prefer them to hedgerows to help avoid predators. They are particularly sensitive to pesticide spray, so it is recommended to leave a 6m belt around them unsprayed.

Beetle banks.
Beetle banks provide an important nesting area for birds such as reed bunting and skylarks and insects that prefer open fields. (Catherine Keena)

The Future.
Sensitively managed farmland can greatly benefit wildlife and assist in the target to halt the decline of Ireland's biodiversity. (Eddie Dunne)