

**EAST
DUNBARTONSHIRE
LOCAL
BIODIVERSITY
ACTION PLAN**

2017 - 2021





FOREWORD

Welcome to the new East Dunbartonshire Local Biodiversity Action Plan.

Biodiversity is a very important part of all our lives - even if we may not realise it. It enriches our surroundings, improves our quality of life, relieves stress and provides us with fundamental resources such as the food we eat and the air we breathe.

The natural environment is at the core of what makes East Dunbartonshire a special place to live, visit and work. Yet our biodiversity is under unprecedented threat from a variety of sources - including urban expansion, climate change, unsympathetic management and, critically, a lack of understanding of its importance.

The purpose of this plan is to help guide and support biodiversity action in East Dunbartonshire over the next four years. The plan has been produced by the East Dunbartonshire Biodiversity Partnership, which includes the local Council, national organisations, non-Government organisations, conservation interest groups, local communities and individuals - working together to help reverse declines in biodiversity.

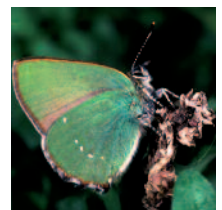
It is only by working together that we can overcome the challenges our biodiversity faces. By doing so we have already seen some successes, with our parks and greenspaces now increasingly being managed to incorporate biodiversity.

If you are interested in finding out more about biodiversity action in East Dunbartonshire or would like to contribute to the Action Plan, please contact the Biodiversity Partnership at sustainability@eastdunbarton.gov.uk

FOREWORD

Councillor Jim Gibbons

Convenor of Place, Neighbourhood & Corporate Assets



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WHAT IS BIODIVERSITY?

Biological diversity or 'biodiversity' simply means the variety of all forms of life on earth. Humans are an integral part of biodiversity and increasingly influence it in both positive and negative ways. We depend on biodiversity for essentials, such as food and medicine that we can't live without, and it is a key aspect of the vital services that nature provides to human society.

Biodiversity is all around us. It is in our parks and gardens, on our road verges, in our window boxes, high up in the Campsie Fells and all through our lowland grasslands, river valleys and woodlands. Biodiversity encompasses all of the natural world. It includes rare and threatened species, such as the elusive water vole and common species such as the blackbird so often seen feeding in our gardens and public parks. It includes the amazing diversity of all species and habitats found in nature.

This East Dunbartonshire Local Biodiversity Action Plan (LBAP) has been developed with a number of partner organisations to help conserve and enhance the natural environment of the area. The plan builds on the actions of the previous LBAP and sets out the targets and projects for priority habitats and species to 2021 and beyond.

BENEFITS OF BIODIVERSITY

Biodiversity is important in its own right and we have a moral obligation and a duty to protect it and not over exploit our natural resources.

A healthy, biologically diverse environment can have wide ranging and far reaching additional benefits to society and the economy as well as inherent benefits for nature. These benefits, vital to our survival, are collectively called ecosystem services and can be classified into four types.

Supporting Services

These are the services necessary for the production of all other ecosystem services and include soil formation, nutrient and water cycling and photosynthesis.

Provisioning Services

This refers to the products we obtain from the environment such as water, food, fuel and pharmaceuticals.

Regulating Services

These are the benefits obtained from natural processes such as flood management, pollination, carbon sequestration and pest control.

Cultural Services

This includes the non-material benefits we obtain from the environment such as recreation and improved health and wellbeing.





GEODIVERSITY

The biodiversity we can see and enjoy, and upon which we ultimately depend, is fundamentally linked to the underlying geology. Geodiversity (or geological diversity) encompasses the rocks, minerals, soils, sediments, landforms and geological processes which are the foundation for the habitats and ecosystems which support biodiversity. Geodiversity underpins ecosystem services and it is therefore important we protect it and increase our knowledge of its connection with biodiversity.

The conservation of geodiversity is also recognised for its own sake. Sites of Special Scientific Interest (SSSI) are sites of national importance that best represent our natural heritage and can be statutorily designated for their geological value. Locally important geological sites can be designated as part of the Council's non-statutory Local Nature Conservation Site (LNCS) system. An audit of geodiversity sites was conducted for East Dunbartonshire in 2009 and has led to the designation of 34 LNCS for geodiversity in the Local Development Plan. The audit is available to download on the Council website.

East Dunbartonshire has some fascinating geodiversity features including the Auld Wives' Lift at Craigmaddie Muir, and Blairskaith Quarry which is an excellent site to find fossils. It is important that geodiversity sites are not only protected through the planning process but that they are also promoted to facilitate their enjoyment and an understanding of their value. It is therefore proposed that a geodiversity action plan is developed to take forward recommendations within the Geodiversity Audit and to also promote geodiversity in East Dunbartonshire.

Supporting Action

Action	Delivery Lead	Timescale	Associated LBAP aim
Produce a Local Geodiversity Action Plan for East Dunbartonshire	EDC (Sustainability Policy, Streetscene) SNH	Long (By 2021)	3, 4, 5



KEY PRESSURES ON BIODIVERSITY

Biodiversity is under increasing pressure and many of our valuable natural habitats are suffering degradation, fragmentation and loss, with whole ecosystems facing increasing risks of collapse. Most of the causes for the decline of biodiversity are due to human activity and our over exploitation of natural resources. These pressures have been identified as related to biodiversity loss on a global scale. However they are just as applicable to the local scale of East Dunbartonshire.

Pollution from industry, agriculture and road traffic, which impacts on waterways, uplands, air quality and sensitive habitats.

Land use intensification and modification has led to a reduction in diversity, quality and connectivity of our landscapes and habitats. Across upland areas this results from increased grazing pressure and commercial forestry. In the lowlands it is primarily due to agricultural intensification and housing development.

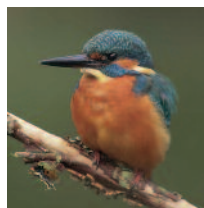
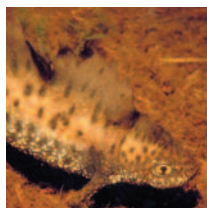
Spread of invasive species and wildlife disease arising from the growing global trade in plants and animals.

Lack of recognition for the value of nature means the vital benefits of a healthy environment are not fully appreciated and therefore not sufficiently considered in decision making.

Many people in society have a **disconnection with nature** and therefore undervalue its contribution to their well-being and prosperity, and to wider society.

Climate change is causing a shift in weather patterns which are affecting nature across Scotland. In the seas, warming, acidification and sea level rise are becoming evident, and wetter conditions on land, especially in the west of the UK are predicted.

From all of these pressures the most critical are the lack of recognition of the value of nature and the disconnection with nature. If these pressures could be reversed then greater consideration would be given to the value of the environment and biodiversity by organisations and individuals. Raising awareness of the benefits of biodiversity and integrating the value of our natural environment into the decisions we make at all levels of society is therefore key to successfully conserving biodiversity and to the aims of this LBAP.





BIODIVERSITY IN CONTEXT

The actions within this LBAP are part of a global effort to conserve and enhance biodiversity. This section sets out the international, national and local policy context for this effort. To fully appreciate the importance of biodiversity conservation it is essential to also know the scale of the problem these policies are trying to resolve.

Globally nearly a quarter of plant species are estimated to be threatened with extinction. The abundance of vertebrate populations has fallen by a third since 1970 with amphibian species showing the greatest risk of extinction¹. In the UK 60% of species (that there is data available for) have declined in the past 50 years and 31% of these show strong declines². It is therefore clear we need to continue to take targeted action to reverse these declines. This LBAP is East Dunbartonshire's tool to do this at the local level.

Figure 1 depicts the timeline of strategies, action plans and other documents that have informed the conservation of biodiversity from the local to the global scale.

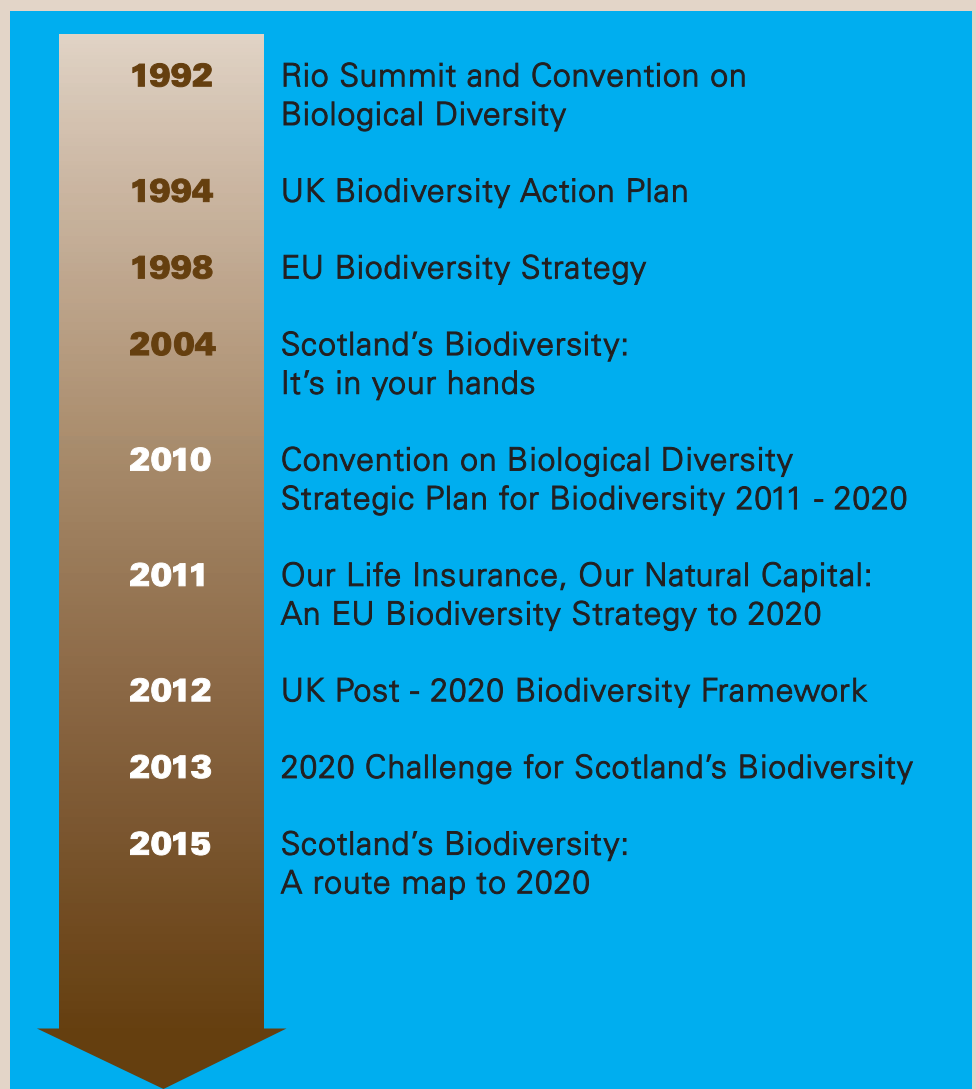


Figure 1: Timeline of International and National Biodiversity Strategies

¹ Convention on Biological Diversity (2010) Global Biodiversity Outlook 3

² Burns F, Eaton MA, Gregory RD, et al. (2013) State of Nature report. The State of Nature partnership



International and UK

In 1992, the Convention on Biological Diversity (CBD) was signed at the Earth Summit in Rio de Janeiro, by 159 world leaders including the UK. By doing so they committed to halting the loss of biodiversity at national and local levels through targeted action of species and habitats. To help fulfil this commitment the UK Government produced the first UK Biodiversity Action Plan in 1994 which identified our rarest and most threatened species and habitats and outlined conservation targets for them. This plan was replaced in 2012 by the UK Post-2010 Biodiversity Framework.

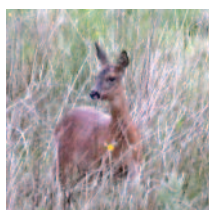
This Framework was a response to the updated CBD Strategic Plan for Biodiversity (2011-2020) which was adopted in 2010 in Nagoya, Aichi Prefecture, Japan, and reflects the revised direction for nature conservation. This strategy takes a more holistic approach, aiming to consider the management of the environment on an ecosystem scale and take into account the value of nature and ecosystem services when making decisions. It contains 20 aspirational targets, called the Aichi Targets, which set out what we need to do globally by 2020 to conserve biodiversity and significantly reduce the current rate of loss. The EU Biodiversity Strategy - Our life insurance, our natural capital: an EU biodiversity strategy to 2020, was released in 2011, to capture the content and targets within the Strategic Plan on an European Union level.

Scotland

The Scottish Biodiversity Group was established in 1996 to co-ordinate the implementation of the UK BAP in Scotland. The group has evolved since then and is now called the Scottish Biodiversity Forum. The forum is chaired by the Scottish Government and includes representatives from statutory conservation agencies, non-governmental organisations, land owners and land managers, commerce and industries, academics and recreational interests.

In 2004 'Scotland's Biodiversity: It's In Your Hands' was published by the then Scottish Executive. This document drew together Scotland's obligations under the CBD as they were at that time and the UK BAP. In response to the Aichi targets from the CBD the Scottish Government produced the '2020 challenge for Scotland's Biodiversity' in 2013. Together with the 2004 publication these documents make up the Scottish Biodiversity Strategy (SBS). The work needed to deliver the Scottish Biodiversity Strategy is complex and challenging. In 2015 a Route Map to meeting the 2020 Challenge was produced which set out six big steps that would help deliver the 2020 challenge and improve the state of nature in Scotland. Of these six big steps, five are relevant to East Dunbartonshire.

The six big steps are as follows:



Ecosystem restoration To reverse historical losses of habitats and ecosystems to meet the Aichi target of restoring 15% of degraded ecosystems.



Investment in natural capital To ensure the benefits which nature provides are better understood and appreciated, leading to better management of our renewable and non-renewable assets.

Quality greenspace for health and educational benefits To ensure that the majority of people derive increased benefits from contact with nature where they live and work.

Conserving wildlife in Scotland To secure the future of priority habitats and species.

Sustainable management of land and freshwater To ensure that environmental, social and economic elements are well balanced



Sustainable management of marine and coastal ecosystems (not directly applicable to East Dunbartonshire) To secure a healthy balance between environmental, social and economic elements.



Land Use Strategy

Although not specifically about biodiversity the Land Use Strategy for Scotland is a very important national plan for how we sustainably use our land and natural resources. It therefore can have implications for biodiversity and its protection and exploitation. The strategic vision of the plan should allow Scotland to realise the full potential of the land but use it in ways that result in multiple benefits to both people and the environment. The production of the Land Use Strategy is a requirement under the Climate Change (Scotland) Act 2009. A new Land Use Strategy for 2016 - 2021 is currently under development. This updated strategy has a greater emphasis on ecosystem services and ensuring these are protected and their value incorporated into the decisions made on land use and land use change.

Biodiversity Duty

In addition to the policy framework set out above, the Nature Conservation (Scotland) Act 2004 also for the first time placed a statutory duty on public bodies to conserve biodiversity while carrying out their normal functions. The legislation is not prescriptive in how a public body may carry out this duty but does state they must have regard to the Scottish Biodiversity Strategy when doing so. The Wildlife and Natural Environment (Scotland) Act 2011 further requires public bodies to provide a publicly available report every three years on their actions to meet this duty.

Scottish Biodiversity List

The Scottish Biodiversity List is a list of species and habitats considered by Scottish Ministers to be of particular importance for the conservation of biodiversity in Scotland. The development of the list involved many different stakeholders and was overseen by the Scottish Biodiversity Forum. This list was taken into account when determining the priority habitats and species for this plan.

Local

At a local level there are a number of plans and strategies which interact with the LBAP and that support the protection and further enhancement of biodiversity within East Dunbartonshire.

Local Development Plan 2017 - 2022

Open Space Strategy 2015 - 2020

Green Network Strategy 2017 - 2022

Sustainability and Climate Change Framework

Local Outcome Improvement Plan

Appendix A provides a full list of relevant legislation and policy documents.

How can you help?

Anyone can get involved in the protection and enhancement of biodiversity. You don't need to be an expert. The more people that get involved, the bigger the difference we can make. Whatever your interest we'd be delighted to hear from you. Contact the Biodiversity Partnership on sustainability@eastdunbarton.gov.uk

Here are a few examples of people helping biodiversity in East Dunbartonshire from the Countryside Rangers, Caledonian Properties and the Cairnhill Woods Group.



Mugdock Country Park, where the Countryside Rangers Service is based, is an important greenspace for East Dunbartonshire. It is a 260 hectare site with an interesting mix of cultural and natural heritage features. The Rangers play a very important role in safeguarding our biodiversity. Countryside Ranger Stuart MacFarlane provides a bit more detail on the team's activities.

'The Rangers role is diverse. Regular teams of conservation volunteers assist us to carry out a diverse array of conservation work ranging from footpath creation to the removal of non-native invasive species. We work within the curriculum for excellence when working with schools and also work with community groups such as Brownies and Cubs. One Ranger recently gained level 3 in Forest School training and we now offer Forest School themed events and activities. Other areas of input include themed talks, wildlife monitoring, park maintenance, a yearlong program of Ranger led events and management of East Dunbartonshire's Local Nature Reserves.'



Caledonian Properties have been working with the Council and volunteers to restore valuable lowland raised bog habitat on their land at Low Moss, Bishopbriggs. Through grants from the Peatland Action Fund, trees have been removed and dams installed to hold water on the site. Peatlands are very important habitats not just as the home of special and unique wildlife but also as carbon stores and for flood management. In addition, Caledonian Properties have created over 100 acres of amenity woodland plantations. The plantations follow a voluntary standard known as the Woodland Carbon Code to capture carbon dioxide from the atmosphere helping to combat the effects of climate change.

Richard Oliver of Caledonian Properties added 'As Landowner, we have responsibilities for managing land sustainably and see these projects as a successful example of what can be done not only through the creation of additional habitat but as a recognition that peatland and woodland are important on a national scale. We saw these as an opportunity to make a difference in the local area and to contribute to Scotland's approach to climate change mitigation and halting biodiversity loss.'



The Cairnhill Woods Group do an amazing job of promoting the value of Cairnhill Woods and its biodiversity to the local community. Since 2008 they have been working hard to improve the woodlands for wildlife and people through a combination of practical tasks, creating a nature trail leaflet and smartphone app, wildlife recording and organising community events and activities. The group are keen to continue building on their successes with plans for an archaeology project, wetland habitat creation and even working up to achieving Local Nature Reserve status.

Alan Fraser of the Group said 'Since coming together our hard-working volunteers have transformed this overgrown and largely ignored corner of Westerton into an inviting resource where plants, wildlife and local residents all find room to breathe. The Group can be proud that Cairnhill Woods is now recognised as a valuable natural resource. Hard-working locals come to run the routes to de-stress, the RSPB offer expert-led walks identifying the wide range of birds to be found in the trees, and mothers on EDC-organised buggy walks come to introduce their toddlers to the joys of nature.'



BIODIVERSITY IN EAST DUNBARTONSHIRE

The natural landscape of East Dunbartonshire is composed of a rich mix of upland, peatland, wetland and grassland areas with a modest number of woodland sites. Lowland areas run through the valleys of the Glazert Water, lower parts of the Allander Water and the River Kelvin. Rugged moorland hills are represented by the distinctive Campsie Fells and Kilpatrick Hills which bound the area to the north and north west.

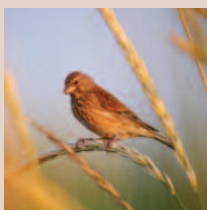
The area is well known for its series of lochs, marshes and floodplain areas that are often associated with the main watercourses running through the region, namely the River Kelvin, Allander Water, Glazert Water, Luggie Water, Bothlin Burn, Pow Burn and the Forth and Clyde Canal. Such areas are very important wildlife corridors and are of prime importance for waders and wildfowl.

Generally woodland habitat is poorly represented, but significant areas of broadleaved woodland and/or conifer plantations can be found at Cadder Wilderness SSSI, Bar Hill, Cawder Golf Course Woods and Lennox Forest. Recently extensive planting at Clachan of Campsie has been carried out by Forestry Commission covering some 550 hectares. Ancient and semi-natural woodland of note are represented at Mugdock Wood along with small remnants found along Fin Glen and Campsie Glen. Extensive deciduous woodland can also be found near Mugdock Reservoir, in particular Mugdock Wood SSSI and the southern woodland along Baldernock Road. The former is a relatively large undisturbed ancient deciduous woodland. Here a number of woodland habitats are represented, ranging from dry acidic oakwood to wet alderwood. The plant communities at Mugdock Wood are fairly distinct, with a number of locally rare vascular plants that support a rare invertebrate assemblage. Some areas edging the River Kelvin around Killermont Golf Course, along with parts of the woods at Auldmurroch Burn and along the Glazert and Allander Waters (near Milngavie Golf Club House and Dougalston) are shown on maps as woodland from 1750 onwards. Mains Plantation has an extensive and diverse ground flora and scrub layer, and holds modest areas of oak and birch woodland. In the gorges and valleys of East Dunbartonshire, alder, willow, holly, birch and some elm are commonly found. Upland areas support a number of small areas of native woodland, while commercial conifer plantations can often dominate.

The great mansion plantings of the 18th Century has added character to many areas such as Dougalston, Killermont, Kilmardinny, Lennox Castle, Kincaid, Glorat, Gartshore, Cadder estates, Schoenstatt at Haughhead, and much of Milngavie. Urban woodland sites such as Templehill Woods, Merkland Local Nature Reserve and Cairnhill Woods also hold a great variety of woodland species and offer a high quality recreational resource. Unfortunately, rhododendron planted extensively in Policy woodlands and other invasive non-native species such as Japanese knotweed and Himalayan balsam, have grown to such an extent that they now dominate the shrub layer in many woodlands, thus suppressing the growth of native ground flora.

The Campsie Fells and Kilpatrick Hills, comprised mainly of blanket bog and rough grazing with sections of conifer plantation, form a spectacular landscape feature of the countryside. Native broadleaved woodland can be found in small patches in the foothills or confined to narrow glens.

Neutral grassland is one of the most common habitat types in East Dunbartonshire. There are a number of species-rich grasslands to the south and east of Lennox Forest that have arisen from a combination of acid and base-rich soils, and low intensity grazing management. Examples of important grassland areas include South Braes SSSI, Sculliongour Limestone Quarry SSSI (calcareous grassland), South Brae Marsh, Barraston Quarry Grasslands and Fanniescroft.





There are a number of marshy grasslands in East Dunbartonshire that range from species poor rush dominated pastures to floristically diverse marshes such as West Balgrochan Marsh and Springfield Marsh South, that have a colourful array of wildflowers, grasses, sedges, rushes, and mosses.

Floodplain fen with associated pools, wet flushes and marshes provide important semi-natural habitat along the valleys of the River Kelvin and Glazert Water. These floods can be viewed as stepping stones allowing movement of waders such as lapwing, redshank and other wetland birds. They can also provide habitat for amphibians, dragonflies and damselflies and the uncommon water vole.

Lenzie Moss, Low Moss, High Moss, Barbeth Moss and Gartshore Moss represent a significant amount of lowland raised bog habitat in central western Scotland. Unfortunately much of these sites have been degraded in the past. Recent restoration work has been carried out at Lenzie Moss and Low Moss. Specific plants linked to such areas include cotton grass, cross-leaved heath, bog rosemary, sphagnum mosses and the carnivorous plant round-leaved sundew.

Parts of East Dunbartonshire are also urban in nature interspersed with areas of open space and connected via the strategic wildlife corridor network of large watercourses and the main railway lines. These urban areas are still important for biodiversity and are where most people encounter wildlife on a daily basis. The urban environment is therefore included within this plan.





MUGDOCK COUNTRY PARK

Although the majority of Mugdock Country Park is within the Stirling Council boundary, most of the visitors to the park are residents of East Dunbartonshire and the park is managed jointly by East Dunbartonshire and Stirling Councils. It is therefore included within the scope of this plan. Mugdock represents an important biodiversity and greenspace asset for East Dunbartonshire and is home to the Mugdock Countryside Rangers who look after the park, deliver environmental education throughout East Dunbartonshire and run a number of volunteer groups involved in practical nature conservation tasks.

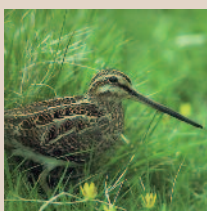
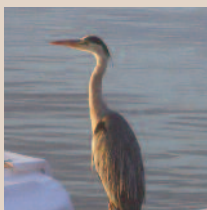
PROTECTED AREAS

Over a quarter of East Dunbartonshire is protected through a network of statutory and non-statutory environmental designations.

Sites of Special Scientific Interest (SSSIs) are of national significance and are notified by Scottish Natural Heritage under the Nature Conservation (Scotland) Act 2004. Previously designation was under the Wildlife and Countryside Act 1981 and all those notified under this Act have been carried forward under the 2004 Act. East Dunbartonshire has six SSSIs - Cadder Wilderness, Corrie Burn, Manse Burn, Mugdock Wood, Sculliongour Limestone Quarry and South Braes.

Local Nature Reserves (LNRs) are designated by Local Authorities under Section 21 of the National Parks and Access to the Countryside Act 1949. There are three LNRs within East Dunbartonshire - Kilmardinny Loch, Lenzie Moss and Merkland.






Local Nature Conservation Sites (LNCSs) are non-statutory sites designated via the Local Development Plan. There are currently 110 LNCS, 76 are designated for biodiversity and the remainder are designated for their geodiversity features. These sites are considered to be the best areas locally with ecological and / or geological, scientific, recreational and educational value. There are eight proposed LNCS covering the main watercourses and railway corridors at Allander Water, Bothlin Burn, Forth and Clyde Canal, Glasgow to Edinburgh railway line, Glazert Water, Luggie Water, Milngavie to Glasgow railway line and the River Kelvin.

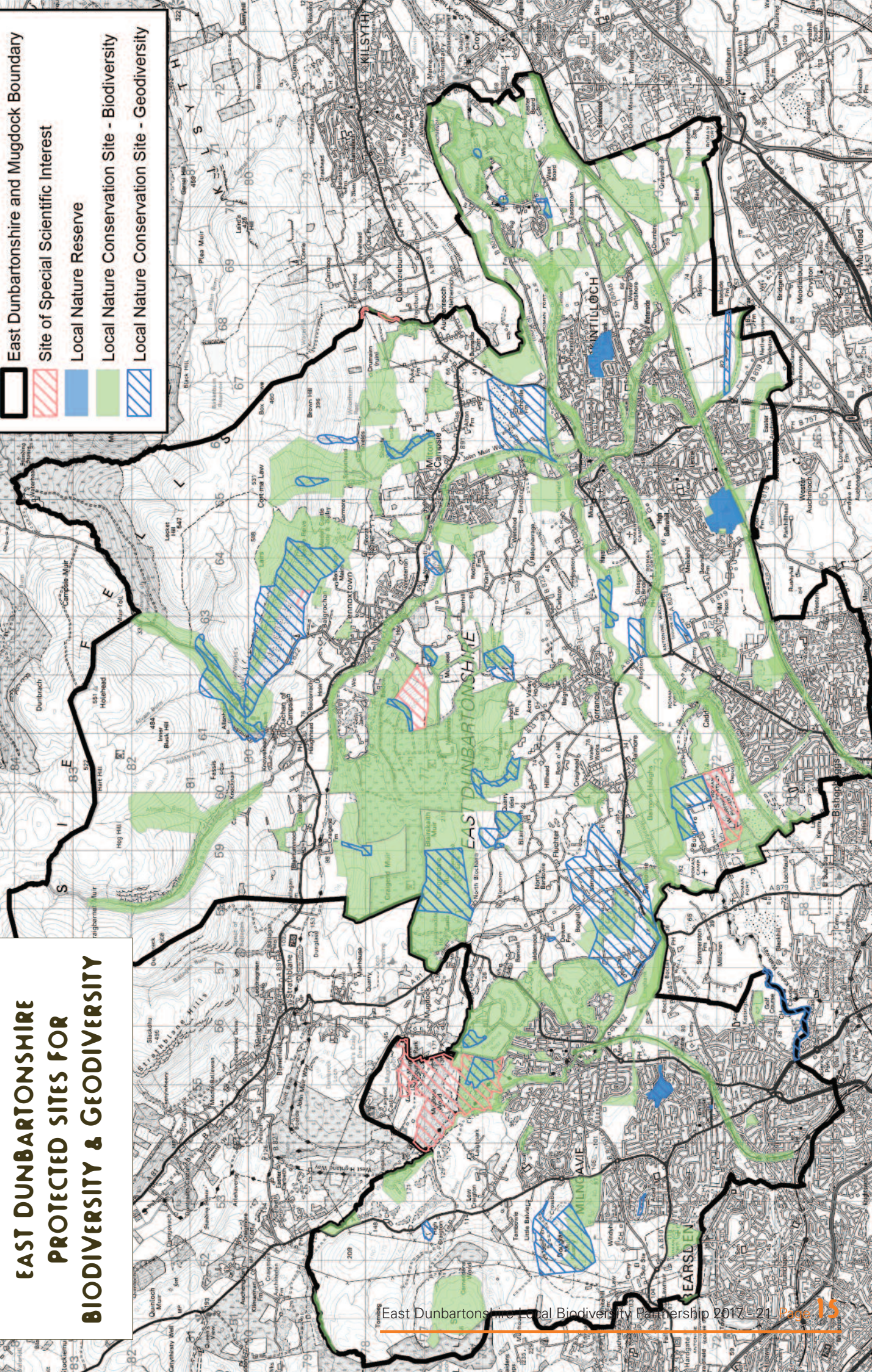


Protected sites are a valuable means of not just protecting the species and habitats they contain but they can also provide a focus for allocating resources to maintain their quality. However, the importance to biodiversity of the wider landscape in which these sites sit should not be discounted. Often protected sites can be small, isolated and fragmented areas of habitat within a wider environment which offers little opportunity for wildlife. Good quality habitat networks and stepping stones between protected sites through the wider landscape need to be maintained or re-established where they have been lost to enable wildlife to move and re-colonise new (and old) territories. In addition the overall environmental quality of our rural and urban environments needs to be enhanced to enable such species movement and re-colonisation to occur. Nature conservation over a larger, landscape scale rather than solely at the protected site level is necessary if we are to be successful in halting biodiversity loss.

Maps and further information on these protected sites can be found on SNH (SSSI) and East Dunbartonshire (LNR and LNCS) websites.

EAST DUNBARTONSHIRE PROTECTED SITES FOR BIODIVERSITY & GEODIVERSITY

-  East Dunbartonshire and Muggdock Boundary
-  Site of Special Scientific Interest
-  Local Nature Reserve
-  Local Nature Conservation Site - Biodiversity
-  Local Nature Conservation Site - Geodiversity





GREEN NETWORKS

Green networks consist of high quality, multifunctional spaces and habitats, linked by walking and cycling routes and habitat corridors or stepping stones. Green networks can provide a number of benefits to biodiversity and also wider associated benefits for people such as improved health and wellbeing.

Landscape-scale conservation is an approach that can deliver these multiple benefits, not just for wildlife, but also for people, communities and the wider economy. Wildlife is dependent upon a complex and interconnected environment where ecological processes that we all depend on occur over the scale of landscapes rather than protected sites or habitat types. Additional benefits to people, society and the economy flow from biodiversity in the form of ecosystem services.

East Dunbartonshire Council is producing a Green Network Strategy that will complement the actions within this plan and help to improve connectivity between protected sites. Through the development of the Green Network Strategy five areas have been identified where there is the opportunity to deliver strategic improvements to East Dunbartonshire's green network including significant biodiversity benefits on a landscape scale. These are:

- Mugdock Country Park**
- The Campsie Fells**
- The Forth and Clyde Canal**
- The River Kelvin**
- The Glazert Valley**

As part of the Green Network Strategy detailed action plans will be developed for each of these areas and it is anticipated that the Biodiversity Partnership will play a role in developing and delivering these action plans, either through actions within this LBAP or additional actions following from the Green Network Strategy.





AMBITION

East Dunbartonshire has a fully functioning, connected network of robust habitats. Consequently the area will be richer in biodiversity and more resilient to change with healthy ecosystems delivering benefits to people and nature. Everyone will have access to the natural environment and understand its importance.

AIMS

1. *Protect, restore and expand East Dunbartonshire's natural and semi-natural habitats to create a robust and connected natural environment*
2. *Avoid local extinctions by increasing the range and population health of our most vulnerable species*
3. *Connect people to the natural environment, raise awareness of the importance of biodiversity and increase the involvement of local communities in conservation projects*
4. *Integrate the conservation of biodiversity into decision making processes and all aspects of land management*
5. *Increase the knowledge of East Dunbartonshire's biodiversity through data collection, collation and sharing.*



ECOSYSTEM PLANS

The actions in the LBAP to meet the aims are laid out within four Ecosystem Plans - **Rural**, **Urban**, **Freshwater** and **Woodland**. An ecosystem can be defined as a 'dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit'³. However the borders of ecosystems can be diffuse and it is often unclear where one ecosystem ends and another begins. There is also interaction between ecosystems and the species found in them and some species are dependent on more than one ecosystem type throughout their lifecycle. Because of this there is inevitably some overlap and synergies and even occasional conflicts between the ecosystem plans may arise. Together the actions within the ecosystem plans provide the basis to move forward with a more biodiverse and sustainable East Dunbartonshire over the next four years.

Each Ecosystem Plan has its own set of objectives, provides information on associated priority habitats and lists its priority species. The actions within the plan tend to take a habitat focused approach to conserving biodiversity but some species that need an additional helping hand or for which more survey information is required may also have specific actions.

³ SNH (2009) Applying an Ecosystem Approach in Scotland: a Framework for Action



PRIORITY HABITATS AND SPECIES

Priority habitats and species are those that are considered to be of particular importance within the East Dunbartonshire area. They may be species or habitat types that have declined in numbers or range in recent years and many will also be listed on the Scottish Biodiversity list or the UK BAP, but not all of them. Some may be common in other areas across the country yet have experienced declines in East Dunbartonshire or they may be species that have recently moved into the area and we need more information on where they are and the populations they have spread from.

Some priority species may even be common in East Dunbartonshire and have become iconic of this area and well known to residents and visitors. These flagship species are important to environmental education and in making information on biodiversity conservation accessible and relevant to all. Table 1 provides a summary of the priority species and habitats.

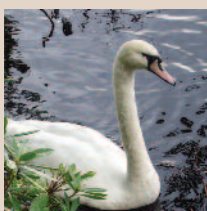
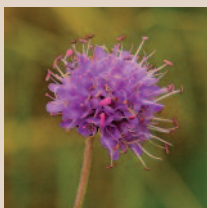
A full list of East Dunbartonshire LBAP species and their associated protection status can be found in Appendix B.

The priority habitats and species lists were devised with the best information at the time of writing the LBAP. A biological audit of the area was conducted by the Glasgow Museums Biological Records Centre to inform the LBAP. It is essential we continue to improve our knowledge of the biodiversity found in East Dunbartonshire and GMBRC will update the biological audit annually.

There are a number of under recorded species groups in the area, such as invertebrates and lower plants, and it is likely there will be species here that we don't even know we have. Species may have moved into the area, for example, through northern migration in response to the changing climate. All flora and fauna records, even of common species, can be of tremendous value to the biodiversity process.

Supporting Action

Action	Delivery Lead	Timescale	Associated LBAP aim
Update biological audit annually to ensure relevance of priority species and habitats	GMBRC	Ongoing	5



Biological records for East Dunbartonshire are held by the Glasgow Museums Biological Records Centre. Everyone is encouraged to send their records to the Records Centre so the information can be used for environmental decision-making, education, research and other public benefits.

Records can be sent to:

Glasgow Museums Biological Records Centre
Glasgow Museums Resource Centre
200 Woodhead Road
South Nitshill Industrial Estate
Glasgow
G53 7NN
 Or
biological.records@glasgowlife.org.uk

Table 1: Summary of Priority Habitats and Species

Ecosystem	East Dunbartonshire Priority Habitat	Associated Scottish Biodiversity List Habitat	East Dunbartonshire Priority Species
Rural	Blanket bog	Blanket bog	Badger, Mountain hare, Pink-footed goose, Skylark, Tree sparrow, Reed bunting, Redwing, Fieldfare, Lapwing, Bumblebee (all species), Small pearl-bordered fritillary, Green hairstreak, Greater butterfly orchid, Lesser butterfly orchid, Adder's tongue fern
	Farmland incl. floodplain	Lowland fen, Floodplain grazing marsh, ponds, reedbeds, Lowland heathland	
	Semi-natural grassland	Lowland meadows	
	Boundary features	Arable field margins, Hedgerows	
Urban	Parks and greenspaces	Ponds, Lowland mixed deciduous woodland	Bats (all species), House sparrow, Swift, Bumblebee (all species)
	Previously developed land	Open mosaic habitat on previously developed land	
	Built environment		
Freshwater	River and streams including canal	Rivers	Otter, Water vole, Kingfisher, Atlantic salmon, Brown trout Great crested newt, Green hairstreak, Pond mud snail, Damselfly and dragonfly (all species), Tufted loosestrife Round-leaved sundew, Bog-rosemary, Cranberry
	Ponds, lochs and reservoirs	Ponds, Eutrophic standing waters, mesotrophic lakes	
	Lowland Raised Bog	Lowland Raised Bog	
Woodland	Woodland	Lowland mixed deciduous Woodland, Wet woodland, Upland birchwoods, Upland oakwood and upland mixed ashwood	Pine marten, Bats (all species), Badger, Black grouse, Bluebell
	Scrub		
	Veteran trees		

FUNDING

Not all of the actions within this Plan have immediate funds available for their delivery, with the delivery of some being dependent on successfully securing funding. The position in relation to this is uncertain at present with the potential loss of European funding streams but the Partnership will review and respond to new funding opportunities on an ongoing basis and update the ecosystem action plans accordingly on an annual basis.

Generally actions that are ongoing or that are scheduled for delivery within the first 1-2 years of the LBAP have funding available, at least in part. Those actions that are to be delivered in the latter half of the plan, and some may extend beyond this LBAP, generally do not have funding available at present and work still needs to be done to secure funding to deliver these. In some cases actions may be aspirational and so further work to assess the feasibility of the action and how it can be delivered may also be required.



MONITORING

Monitoring of action delivery

The ecosystem action plans will be reviewed annually to ensure projects remain on target and to allow the partnership to take advantage of opportunities as they may arise such as additional funding sources and new projects or partners.

Monitoring of overall biodiversity health

In addition to measuring actions, or inputs, it is important to consider outcomes. There is not a nationally agreed progress monitoring system for LBAPs and it would not be possible or meaningful to monitor all changes in our local biodiversity over the lifetime of the plan. It would be beneficial, however, to use indicators to inform and provide guidance on biodiversity trends in East Dunbartonshire. Scottish Natural Heritage has developed indicators for monitoring national progress towards improving biodiversity, some of which will be relevant for East Dunbartonshire, but it may be necessary to develop indicators using more local datasets such as condition monitoring for Local Nature Conservation Sites or proportion of our parks and greenspaces that are under positive management for wildlife.

In addition to the Biodiversity Partnership developing indicators for monitoring local biodiversity trends the Community Planning Partnership will be producing a Local Outcome Improvement Plan (LOIP) for East Dunbartonshire which will take into account local environmental priorities. Consideration will be given as to how the LBAP links to these priorities.

Supporting Action

Action	Delivery Lead	Timescale	Associated LBAP aim
Develop a monitoring framework for the LBAP to include indicators on biodiversity trends to potentially be incorporated into the LOIP.	EDC (Sustainability Policy, Streetscene), GMBRC, SNH	Short	4, 5

The LBAP has also been subject to a Strategic Environmental Assessment and the recommendations within this assessment have been incorporated into the plan where appropriate.

THE BIODIVERSITY PARTNERSHIP

The East Dunbartonshire Biodiversity Partnership covers a wide range of organisations interested in biodiversity in East Dunbartonshire. The partnership is dynamic and always open to new members.

The East Dunbartonshire Biodiversity Partnership:

Buglife
 Bumblebee Conservation Trust
 Central Scotland Green Network Trust
 East Dunbartonshire Council
 Forestry Commission Scotland
 Friends of Lenzie Moss
 Glasgow Museums Biological Records Centre
 Mugdock Ranger Service
 Scottish Canals
 Scottish Environment Protection Agency
 Scottish Natural Heritage
 Scottish Wildlife Trust
 Stirling Council (Mugdock)



RURAL ECOSYSTEM



RURAL ECOSYSTEM

Associated Priority Habitats

Semi-natural grassland
Blanket bog
Farmland incl floodplain
Boundary features

Associated Priority Species

Mammals: Badger, Mountain hare
Birds: Tree sparrow, Reed bunting, Skylark, Pink-footed goose, Redwing, Fieldfare, Lapwing
Invertebrates: Small pearl-bordered Fritillary, Green hairstreak, Bumblebee (all species)
Plants: Greater butterfly orchid, Lesser butterfly orchid, Adder's tongue fern

Objectives	Associated LBAP aims
R1. Improve knowledge of priority species and habitats found within rural areas	5
R2. Maintain and, where possible, increase the quality and extent of grassland habitats	1, 2
R3. Encourage sustainable management of rural land and promote biodiversity friendly working practices on farmland	1, 2, 3, 4
R4. Protect and where possible enhance areas of blanket bog	1, 2
R5. Retain and enhance boundary features to increase functional connectivity across the landscape	1, 2, 4

RURAL

East Dunbartonshire is fortunate to have a substantial amount of countryside designated as Greenbelt. The rural environment in East Dunbartonshire is largely composed of lowland farming habitats and the upland areas of the Campsie Fells and Kilpatrick Hills.

Much of the countryside has a long history of farming and for many centuries farmers and land owners have worked earnestly to provide communities with high quality produce at competitive prices. Due to increased competition, changes in requirements from statutory bodies and financial strain, the landscape has become fragmented as a result of intensification of farming and forestry practices, urban development and commercial industry. Hedgerows in particular have suffered tremendously from neglect, with many ripped up and replaced by easily maintained fencing and the increased use of pesticides and herbicides to achieve optimal rates of productivity has had a devastating effect on species diversity. The survival of many species is closely associated to the way in which the land is managed and the sustainable, biodiversity-friendly management of the rural environment is therefore essential to ensure we continue to benefit from the services provided by this ecosystem.



Over the last few decades, grant aid for farmers has gone some way towards addressing biodiversity loss in farmland, and today the Scottish Rural Development Programme (SRDP) offers financial assistance to anyone with an interest in managing their land to carry out biodiversity enhancements. Specifically the Agri-Environment Climate Scheme under SRDP supports appropriate management for vulnerable and iconic species and habitats, activities which strengthen ecological networks, control invasive non-native species and enhance the condition of protected nature sites. It is important improvements for biodiversity made through this grant scheme are retained and continue to be managed appropriately by landowners even when grant payments may have ceased.

Upland habitats are characterised by distinct patches of different habitats across the landscape. Heath, moorland, bogs and areas of relic ancient woodland particularly within glens form habitat mosaic across the upland area. In many parts of East Dunbartonshire however the land has been altered for agriculture and large swathes are now managed for sheep and forestry. The exact composition of the mosaic of habitats actually present in the upland areas of East Dunbartonshire is to some degree unknown and further resources need to be diverted to establish a baseline of upland habitat type and quality.

Lowland Farmland

Much of the agricultural farmland in East Dunbartonshire relates to grassland (both improved and semi-natural) and to a lesser extent arable land, which are both vital habitats for wildlife. Key habitats often found within or bordering farmland include heath (wet and dry), hedgerows, ponds, woodland shelter belts, lochs, reservoirs and mires. The main areas of arable/mixed arable cropping lie along the Kelvin floodplain between Milton of Campsie and Summerston, and northwards into Bardowie, and in the Allander floodplain, east of Milngavie to the Allander Toll and Temple of Boclair area.

Mixed farming can offer a diverse range of habitats, and such heterogeneity can provide a suitable home for a variety of flora and fauna, if managed in a sustainable way. There are some species that are very much linked to specific agricultural practices, such as tree sparrow and yellowhammer which rely on mixed arable areas with overwinter stubble fields, some hedgerow trees and rough field margins.

In summer, perennial grassy strips along edges of fields and beetle banks through arable fields can provide excellent habitat for mammals, invertebrates and amphibians. During winter, berries and overwinter crop stubbles can provide food, while boundary features such as hedgerows provide cover from predators and harsh weather.



Beetle Banks are grass mounds about 2m wide that run through the middle of arable fields. They provide essential over-wintering habitat for many insects, spiders and amphibians and habitat for small mammals and some ground nesting birds such as skylarks. In addition insects within the beetle banks will feed on crop-pests such as aphids and may reduce the need for insecticides.

Overwinter crop stubble provides an important winter food source for seed-eating birds and can be vital for the survival of birds such as tree sparrow and yellowhammer. It can be provided on rotational set-aside, left preceding a spring crop or within an area specifically managed for wildlife. It is estimated if 10% of arable land was left as stubble over the winter it could help reverse the decline of farmland birds⁴. It is therefore important crop stubble is not sprayed in the autumn removing this vital food resource.

⁴ RSPB Farming for Wildlife Advisory Sheets. Over-wintered stubble

Floodplain

Floodplains are low lying areas found alongside a river or stream that are subject to periodic flooding. Both the River Kelvin and the Glazert Water have floodplains associated with them.

Floodplains often contain rich and fertile soil due to silt deposited during periods of flooding. This has led to many associated pools being drained to support arable crops or grassland leys. Although these grasslands are important to wintering geese and while autumn stubble supports flocks of wintering skylark, the loss of wetland results in a startling drop in overall biodiversity.

The drainage of floods and pools not only destroys a vibrant and dynamic habitat but also raises the probability of downstream flooding. Despite the historical loss of flood plain habitat within East Dunbartonshire, there are still areas of more natural floodplain extending from Barbeth Flood, in Kirkintilloch, east to Twechar Marsh.

These floods can be viewed as stepping stones allowing movement of waders and other wetland birds along the floodplain. Barbeth flood is a very important wetland, supporting roosting flocks of geese and wintering lapwing, teal and mallard. Breeding waders such as lapwing and redshank are present while black tailed godwit and ruff are common passage migrants. Swallow and house martin utilise the fens associated with Barbeth Flood as autumn roosts prior to migration.

Floodplain and its associated fen wetlands, marshes and wet grasslands are not only important for birds but also provide vital habitat for amphibians while the now uncommon water vole finds refuge from American mink within the pools and marshes. Dragonflies and damselflies, important indicators of good water quality, breed within the shallow waters of the floods.

Semi-natural grassland

Grasslands are often categorised by their soil type. All three types (neutral, acid and calcareous) are found in East Dunbartonshire; however neutral grasslands are by far the most dominant type.

Similar to woodlands, grasslands can also act as carbon sinks. It is estimated a hectare of grazed grassland can sequester 0.6 tons of carbon a year⁵. The management regime of the grassland will affect its capacity to sequester carbon and degraded, intensively managed grassland will instead release carbon into the atmosphere

Calcareous grassland

Calcareous grassland is very rare in the west of Scotland. However East Dunbartonshire does contain a few small examples, the most notable of which is Sculliongour Limestone Quarry SSSI on the Campsie Fells. In addition to typical calcareous grassland species such as wild thyme and fairy flax the grassland also contains an unusual range of mosses including the nationally scarce wrinkle-leaved feather moss. The site is currently used for rough grazing by sheep which is crucial to the maintenance of the habitat so as to prevent other more competitive grass species becoming dominant.

⁵ Rothero, E., Lake, S. and Gowing, D. (eds) (2016) Floodplain Meadows - Beauty and Utility. A Technical Handbook.

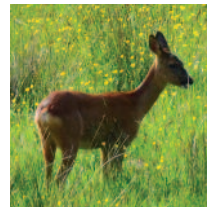
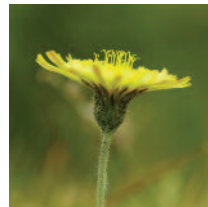
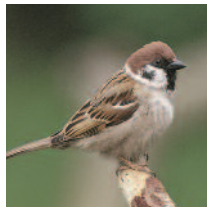


Neutral grassland

Neutral grasslands occur on soils that are neither strongly acid nor very alkaline. They can be defined as being improved, semi-improved or unimproved depending on the degree of agricultural intensification. Semi-natural grasslands on neutral soils that have not been ploughed or fertilised are most important for wildlife because of their diversity of plant species. In the UK, traditionally managed unimproved, neutral grasslands are now very rare with an estimated 2000 – 3000ha in Scotland. Within East Dunbartonshire, neutral grasslands are of two main types: those on roadside verges dominated by False Oat Grass, which are generally ungrazed; and those on fields, such as old hay meadows, typically very species-rich with Crested Dog's-tail grass as a major part of the sward. Such meadows can be very diverse and colourful during the summer with herbs such as Tufted Vetch, Common Spotted Orchid and Common Knapweed present. The diversity in plant species in turn supports a rich associated fauna.

Acid grassland

Acid grassland is dominated by fine-leaved grasses, typically Common Bent, Sheep's Fescue and Red Fescue. They are often found in association with dwarf shrub heath and generally develop on low nutrient, free-draining acid soils. Acid grassland occurs on both high and low elevations within East Dunbartonshire. Most of the upland acid grassland forms part of the rough grazing of the Campsie Fells and is therefore managed as part of the moorland. Upland grassland is fairly well represented in East Dunbartonshire but acid grassland areas within the lowlands are somewhat restricted. Acid grassland (and associated vegetation mosaics such as heaths), provide important habitats for many species including skylark, meadow pipit, kestrel and field vole. They also support large invertebrate populations, bryophytes and many species of fungi.



Boundary features

Hedgerows

Farmland hedgerows are found throughout the lower and mid elevation areas of East Dunbartonshire and are generally absent from upland marginal farmland and muirs where they are replaced by drystone walls and fences. The highest conservation interest is normally found in ancient hedgerows which are normally species rich and may form relic strips of former woodland. Most farm hedgerows are species poor, usually consisting of 90% hawthorn. However where they also comprise other shrubs and climbers, a diverse herbaceous hedgebank flora and occasional emergent trees they can still be of great value for biodiversity. Even those species poor hedgerows can provide a winter berry crop for birds and shelter for nesting in the summer. Hedgerows also act as important feeding corridors or migratory routes between fragmented areas of habitat as well as providing essential habitat for key rural species. The dramatic loss of hedgerows in recent times has therefore had a profound negative effect on biodiversity in rural areas.

Stone walls

Stone walls are most commonly found in upland areas and were traditionally used as boundaries where soils were too poor for hedge planting or where there was a plentiful local supply of stones. The geology of the stones used can influence the plants and lichens that subsequently colonise them. Stone walls provide a habitat for various plants, notably mosses and lichens. Botanical interest can also be high on adjacent earthbanks, which may have escaped intensive agricultural management. A wide range of animals exploit the shelter and niches provided by walls and they are of additional value as basking places for invertebrates and reptiles.

Ditches

Ditches may serve as field boundaries within lowland areas. They provide important habitat for many aquatic plants and animals. Emergent and bank side vegetation also provide linear areas of marshland and, in the absence of overgrazing there may also be a marginal strip of species rich grassland above the banks. Ditches such as this would be very important for water vole in East Dunbartonshire as well as other small mammals and amphibians.

Blanket bog

Blanket Bog is a layer of peat usually less than 5m deep and averaging 0.5-3m covering upland areas. In East Dunbartonshire it is found on the Campsie Fells and Kilpatrick Hills. Blanket bog forms on flat land, hill slopes up to 30 degrees and hollows, as opposed to raised bog which only forms in hollows. It forms a thin 'blanket' that covers the landscape. The habitat is considered important at a European level and is listed on Annex 1 of the EU Habitats Directive.

Blanket bogs can support a wide range of terrestrial and aquatic species. In East Dunbartonshire, the habitat is very variable in quality, having been damaged by fires and overgrazed by livestock. In addition peat is a significant store of carbon as well as having an important carbon sequestration role when it is in its active state. There is also evidence that blanket bog in good condition can slow water run-off downstream and reduce the extent of flooding events.

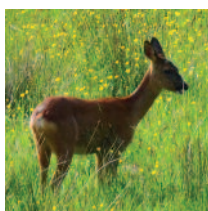
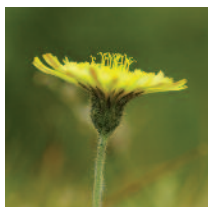


Pressures on the rural ecosystem

- Agricultural improvements and intensification
- Inappropriate management such as over/under grazing, removal of hedgerows
- Pollution and nutrient enrichment from use of herbicides and pesticides
- Afforestation of upland areas with non-native conifer plantations
- Drainage of wet pasture and flood areas
- Canalisation of watercourses
- Quarrying operations and other industrial development
- Urban expansion
- Recreational activity resulting in disturbance and erosion

Ecosystem services

- Support:** Water and nutrient cycling
Flood mitigation
Carbon storage
Soil formation
- Provisioning:** Food and livestock production
Domestic water supply
- Regulating:** Flood management and reduced flood risk
Climate change adaptation
Carbon sequestration
- Cultural:** Amenity and recreation
Aesthetic/sense of place
Tourism and employment
Health benefits



Key sites

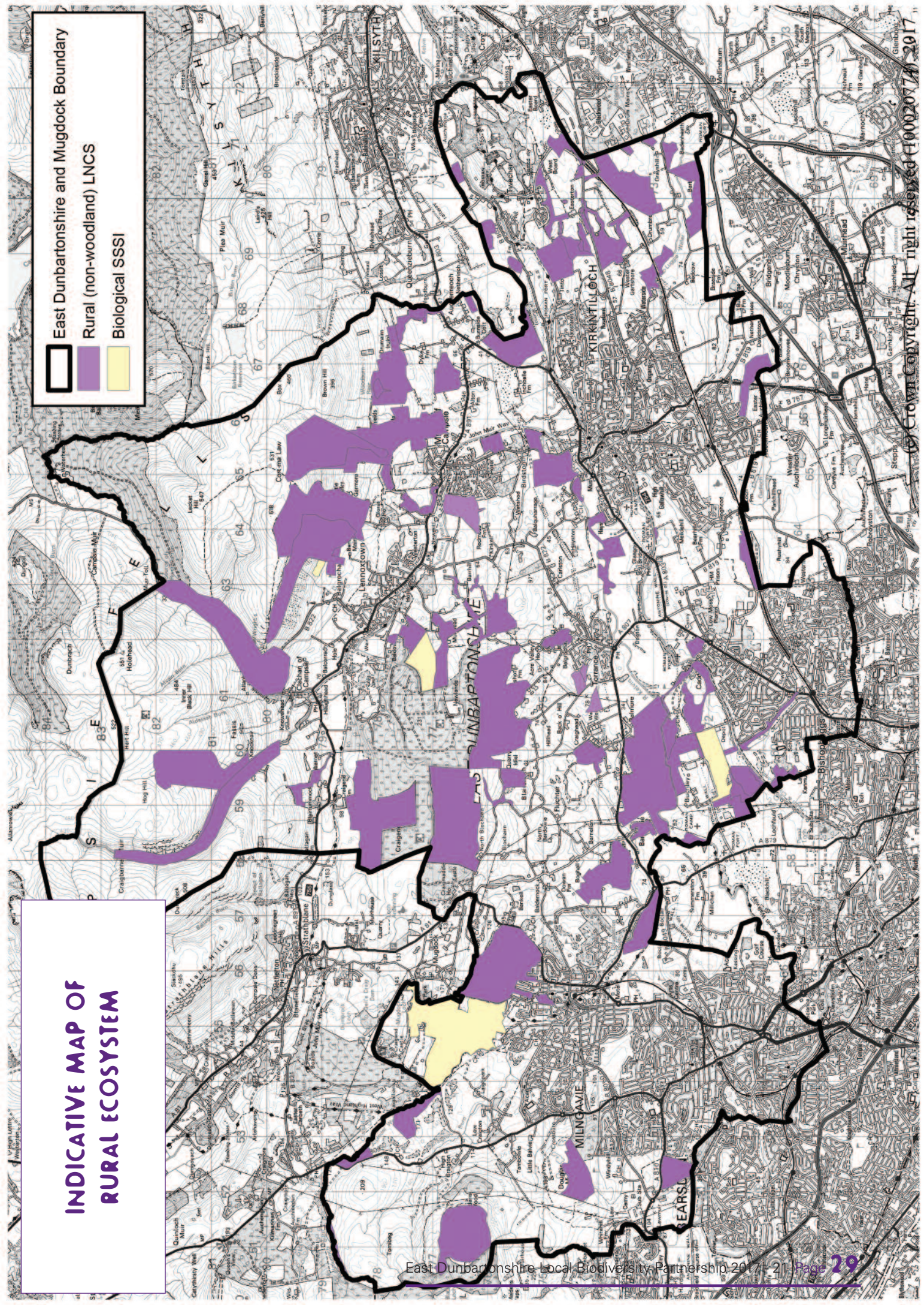
- SSSI: Sculliongour Limestone Quarry, South Braes, Mugdock Wood (Heathland)
- LNCS: Barraston Quarry Grassland, Buchley Farm, Cadder, Campsie Glen Golf Course, Castle Hill Grassland, Craigmaddie Muir/Craigend Muir/Blairskaith Muir, Craigmore Mire, Douglas Muir, Langbank, Lenzie, Mugdock Woods and Drumclog Redmoss Grasslands (north), Southbrae Marsh, South East Part of Hilton Park Golf Course.
- Proposed LNCS: Bargeny Hill, Redmoss Grasslands (south), Tower Burn/Tower Farm
LNCS: West Balgrochan Grassland

No.	Action	Delivery Lead	Timescale	Associated Priority Habitat and Species	Associated Ecosystem Objective
1	Carry out an audit to map the locations and quality of boundary features. Investigate where connectivity and quality can be improved by creating new features and changing management regimes.	EDC (Sustainability Policy, Streetscene)	Long	Boundary features, Tree sparrow, Reed bunting, Skylark, Yellowhammer	R1, R5
2	Ensure biodiversity potential is maximised in development or upgrade of rural paths and tracks	EDC (Sustainability Policy, Streetscene, Strategic Development & Regeneration, Traffic and Transport)	Ongoing	Boundary features, Semi-natural grassland	R2, R5
3	Ensure new developments on the edge of urban areas effectively and sensitively integrate with the rural landscape	EDC (Sustainability Policy, Strategic Development & Regeneration)	Ongoing	Boundary features	R2, R5
4	Ensure areas of important open rural habitat e.g. semi-natural grassland, floodplain and grazing marsh is protected from afforestation	EDC (Sustainability Policy, Land Planning Policy)	Ongoing	Semi-natural grassland, Farmland	R2
5	Implement the Campsie Fells Peatland Management Plan 2016 in collaboration with statutory bodies and landowners and monitor success of habitat restoration actions.	EDC (Streetscene Sustainability Policy) FCS, SNH	Long	Blanket bog, Semi-natural grassland Dragonfly and damselfly	R1, R2, R4
6	Increase area of heath and grassland at Mugdock Wood SSSI through the control of bracken and removal of birch trees	EDC (Mugdock Rangers)	Ongoing	Semi-natural grassland	R2
7	Bring Council owned rural LNCS into active management prioritising those within moderate to poor quality categories. Determine opportunities to encourage volunteering.	EDC (Streetscene)	Medium	Boundary features, Blanket bog, Semi-natural grassland	R2, R4, R5
8	Work with landowners of rural LNCS within moderate to poor quality categories to improve habitat	EDC (Sustainability Policy, Streetscene)	Long	Boundary features, Blanket bog, Semi-natural grassland, Farmland	R2, R3, R4, R5
9	Investigate opportunities for contributions to be made to the John Muir Pollinator Way through East Dunbartonshire.	Buglife	Medium	Semi-natural grassland, Bumblebee	R2, R3
10	Conduct meadow creation and pollinator awareness raising and training sessions with local school children and the general public	Buglife, Bumblebee Conservation Trust	Medium	Semi-natural grassland, Bumblebee	R1, R3
11	Carry out Small Pearl-bordered Fritillary surveys at Drumclog Moor and Lennox Forest	EDC (Mugdock Rangers)	Short	Small pearl-bordered fritillary	R1
12	Support monitoring of bird populations at Bridgend Marshes LNCS by local volunteers	EDC (Streetscene)	Ongoing	Farmland incl. floodplain, Pink-footed goose	R1
13	Work with landowners to re-instate wetland habitat at Balmore Flood	EDC (Streetscene)	Long	Farmland incl. floodplain, Pink-footed goose, Water Vole, Dragonfly and Damselfly	R3

Acronyms - EDC – East Dunbartonshire Council FCS – Forestry Commission Scotland SNH – Scottish Natural Heritage
Action Plan Timescales :Short - first year of plan Medium - years 2-3 of the plan Long - year 4 and beyond the plan Ongoing - continues throughout the plan

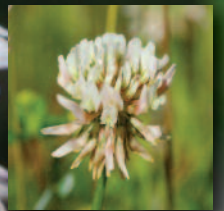
INDICATIVE MAP OF RURAL ECOSYSTEM

- East Dunbartonshire and Mugdock Boundary
- Rural (non-woodland) LNCS
- Biological SSSI





URBAN ECOSYSTEM



URBAN ECOSYSTEM

Associated Priority Habitats

Parks and greenspace
Built environment
Previously developed land

Associated Priority Species

Mammals: Bats (all species)
Birds: Swift, House sparrow
Invertebrates: Bumblebee (all species)

Objectives	Associated LBAP aims
U1. Protect biodiversity features on designated sites and encourage the inclusion of biodiversity friendly practices in the management of parks and other open spaces	1, 2
U2. Raise awareness and improve knowledge of biodiversity through environmental education, events, targeted surveys and training	3, 5
U3. Promote the importance of biodiversity throughout Council Services and incorporate biodiversity projects into work programmes to aid delivery of the statutory biodiversity duty	3, 4
U4. Ensure good design and placemaking within new developments and encourage the inclusion of biodiversity enhancements in open space provision and within the built environment	1, 2, 3, 4
U5. Increase participation in environmental community projects and volunteering activities including citizen science	3, 5

It is often assumed that biodiversity is very much linked to the countryside however urban areas are also home to a variety of different species and habitat, some of which, such as swifts, are almost entirely dependent on the urban environment. Brownfield sites, burial grounds, parks and other greenspaces, school grounds, business parks, road verges, roundabouts, allotments and private gardens can all contain biodiversity. Collectively they provide a valuable habitat resource for wildlife, contributing to the conservation of biodiversity.

More than 80% of people in Scotland live in settlements. This is no different in East Dunbartonshire where the vast majority of people live and work within a settlement. Built up areas in East Dunbartonshire constitute less than 20% of the total land area meaning space for all the facilities we expect our urban areas to offer is at a premium. As human populations increase, the amount of greenspace and therefore biodiversity within urban areas would be expected to decline. Despite our increasingly urban lifestyles we are still very much dependent on nature and the services it provides. Urban biodiversity makes it possible for people to maintain contact with nature as part of their daily lives and this is significantly important for our physical health and mental wellbeing and also the future of biodiversity. As much as we need nature, nature also needs us to ensure it is protected and its importance is communicated to the next generation. Only by providing the opportunity for people and particularly children to experience nature will this be possible. Urban greenspaces provide a mosaic of habitats for wildlife and the opportunity for people to appreciate and enjoy wildlife on their doorsteps.

In addition, for some species, habitats within urban areas are becoming increasingly important when the loss of other suitable habitat has occurred in the wider countryside. For example ponds in gardens and parks or biodiversity friendly sustainable drainage systems (SuDS) may provide valuable urban refuges for common frogs and toads. Water voles are also reported to be increasingly re-colonising small urban streams and wetlands.

Parks and greenspace

Good quality public greenspace provides many environmental, social and economic benefits. They offer opportunities for recreation, sport and play, social interaction, encourage healthy lifestyles, contribute to a sustainable natural environment and visually enhance the general attractiveness of an area. For wildlife semi-natural features within parks and greenspaces such as woodland and watercourses are the most valuable but even less suitable habitat can act as important corridors for species to move through an otherwise sterile concrete environment.

East Dunbartonshire has nearly 950ha designated as open space within or adjacent to urban areas and most settlements have major watercourses running through or adjacent. These open spaces (excluding watercourses) cover 30% of the total settlement area and therefore have the opportunity to greatly contribute to biodiversity. The manner in which these spaces are managed and used has a large impact on how much biodiversity they are able to support. Most publically accessible open space is owned and managed by the local authority. Although there are a handful of sites in East Dunbartonshire owned privately or by other public bodies such as Mugdock Reservoir which is owned and managed by Scottish Water.

Parks and greenspaces have to fulfil a variety of functions and many provide space for sport, recreation and relaxation as well as habitats for wildlife. It is therefore necessary to balance this multifunctional nature of parks and greenspaces. The best parks for wildlife will be those that integrate biodiversity within their management regime across the whole park area rather than having an isolated nature area in an out of the way corner no-one tends to visit. This not only limits species to a small area and limits movement through the whole greenspace area but it can also further perpetuate the perception that biodiverse areas are untidy or uncared for.

The East Dunbartonshire Council Open Space Strategy (2015 - 2020) has a number of actions which seek to improve the biodiversity within parks and greenspaces mainly through habitat creation projects. The Council's Streetscene team and the Mugdock Countryside Rangers work together and with local community groups to carry out these projects and the sensitive management of many of these valuable sites.

Built environment

The built elements of the urban environment have a limited capacity to support wildlife but some bird species such as swifts and house sparrows and many species of bats rely on buildings for nesting and roosting. For these species, particularly bats, the surrounding space and how it is managed can also make a difference, together with the condition of the building, as to whether it is suitable or not. Bats often commute through the landscape using linear features such as hedgerows, woodland edges or even rows of street trees. The suitability of a building for bats therefore can depend on the context of its surrounding environment.

Many nesting or roosting sites within buildings are lost due to building renovations, demolitions and roof repairs, while new and modern buildings often have limited scope to accommodate nesting or roosting. Swift populations have declined dramatically over the last 10 years and these birds are now listed as Amber on the Birds of Conservation Concern⁶ due to declines of more than 25% of the breeding population. It is therefore important that as far as possible through the planning process spaces for wildlife such as bats and birds are designed into plans for new buildings, renovations and conversions. New buildings can easily be designed to provide swift and bat nesting or roosting space and boxes can also be retrofitted onto existing buildings.

⁶ Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708 - 746



Previously developed land

The terms previously developed land or brownfield sites describes areas of land that have previously been built on or used in association with buildings but that are no longer used for this purpose. Examples include areas of demolished buildings, disused factories and warehouses, quarries and abandoned railway lines. These sites are most often found in urban areas but some may be present in rural areas too. The sites are extremely variable in character and some may still contain remnant derelict building, the demolition waste from previous buildings, areas of hardstanding and bare soil. These substrates and structures can provide many different niches, some perhaps mimicking environments that would be found in nature.

Due to the levels of disturbance and abandonment they are also extremely variable in their biodiversity value but often nature can re-establish itself quite quickly on such sites, representing natural early successional habitats. In addition, as these sites are often not publicly accessible, they can provide an undisturbed haven for wildlife within the otherwise busy and sometimes hostile urban landscape.

Early successional and transitional habitats are rare within East Dunbartonshire and the UK in general. The UK BAP and Scottish Biodiversity List contain a habitat type unique to brownfield land. The 'Open Mosaic Habitat on Previously Developed Land' is typically characterised by a mosaic of bare ground and other habitat types such as florally diverse ruderal vegetation, scrub and wet areas. It can contain unique plant communities and often provides excellent habitat for invertebrates, including some very rare species.

Environmental education and volunteering

Developing our understanding of biodiversity and the natural world is essential to its conservation and protection. Through this Urban Ecosystem Plan we hope to enhance not just habitat for biodiversity within settlement areas but also to enrich the opportunities for people to experience nature and its diversity locally, increasing their contact with biodiversity through their daily lives. People will not value biodiversity if they do not understand or experience it.

The Mugdock Country Park rangers provide an invaluable service working with people of all ages and abilities to enable them to learn more about the natural world and engage with it in a positive way. A number of environmental charities and organisations also carry out important educational and awareness raising work, such as RSPB, Scottish Wildlife Trust, Forestry Commission Scotland, Clyde River Foundation and Central Scotland Green Network Trust.

In addition there are a great number of local residents who already play a key role in the enhancement and protection of local habitats in parks, local nature reserves and other greenspaces, through the voluntary activities of 'Friends of' groups and other local community groups.

It is important this environmental education and volunteering work continues but it is equally important we try and increase the number of people and communities involved.



URBAN

Pressures on the urban ecosystem

Habitat loss and fragmentation as a result of new development

Inappropriate management of open space or semi-natural habitat, particularly the use of herbicides and the over use of fertiliser

Public perception of biodiversity features being untidy resulting in unnecessary over maintenance

Disturbance to wildlife from recreational activities

Anti-social behaviour such as fly-tipping, litter and vandalism

Escape of non-native invasive species from urban gardens and facilitation of movement to wider countryside via road verges and watercourses

Climate change could have a disproportionately strong effect on urban areas which tend to be 1 - 2°C warmer than the surrounding countryside

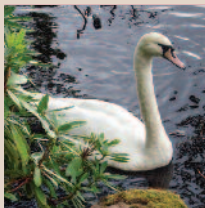
Ecosystem Services

Support: Soil formation
Carbon storage
Air filtration

Provisioning: Local food production

Regulating: Micro-climate regulation
Noise reduction
Rainwater drainage

Cultural: Amenity and recreation
Aesthetic/sense of place
Tourism and employment
Health benefits
Education



Key sites

LNR: Lenzie Moss, Kilmardinny Loch, Merkland Nature Park

LNCS: Balgrochan Marsh, Broomhill Ox-bow Lake and Broomhill Hospital Marsh
Craigdhu Wedge, Craigton Wood, Douglaston Estate and Loch, Glazert Wood
Harestanes, High Moss Plantation, Low Moss, Mains Plantation
Oxgang (Woodilee Hospital Woodlands), St. Germain's Loch, Templehill Woods
Torrance Marsh

Proposed LNCS: Bishopbriggs to Croy railway, Milngavie railway

No.	Action	Delivery Lead	Timescale	Associated Priority Habitat and Species	Associated Ecosystem Objective
14	Investigate the designation of at least one Local Nature Reserve per settlement area.	EDC (Sustainability Policy, Streetscene)	Long	Parks and greenspace	U1
15	Progress with designation of West Balgrochan Marsh and Millersneuk Wetland as Local Nature Reserves	EDC (Sustainability Policy, Streetscene)	Medium	Parks and greenspace	U1, U2
16	Produce at least one park management plan per year with a biodiversity focus.	EDC (Streetscene)	Ongoing	Parks and greenspace	U1
17	Deliver the biodiversity actions of the Open Space Strategy	EDC (Streetscene)	Long	Parks and greenspace	U1
	Bearsden: King George the V Park - Wildflower meadow creation Cluny Park - Meadow creation Templehill Woods - Woodland management and wetland creation Cairnhill Woods - Woodland management and wetland creation St. Germain's Loch (part) - Broadleaved woodland and wetland habitat creation				
	Milngavie: Allander Park - Meadow and wetland habitat creation Mains Park - Woodland management and wildflower planting				
	Bishopbriggs: Hilton Park - Biodiversity improvements Meadowburn Park - Biodiversity improvements				
	Kirkintilloch: Luggie Park - Broadleaved woodland habitat creation Waterside Park - Broadleaved woodland habitat creation Langmuir Park - Woodland creation Westermains scrub and grass - Woodland expansion and wetland habitat creation				
	Lenzie: Christine's Way (Glenwood to Park Burn) - Woodland expansion and wetland habitat creation Park Burn OS - Broadleaved woodland and wetland habitat creation				
	Twechar: Gartshore Public Park - Broadleaved woodland and wetland habitat creation Twechar Public Park - Woodland and wetland habitat expansion Shirva Glen - Broadleaved woodland and wetland habitat creation				
	Lennoxtown: Station Road Playing Fields - Broadleaved woodland creation Redhills View Grassland - Grassland habitat enhancement Balgrochan Marsh - Habitat restoration and enhancement				
	Milton of Campsie: Redmoss Grassland - management of grassland habitat and woodland expansion				

No.	Action	Delivery Lead	Timescale	Associated Priority Habitat and Species	Associated Ecosystem Objective
18	Improve biodiversity on Fields in Trust designated sites	EDC (Streetscene)	Long	Parks and Greenspace	U1
19	Ensure spaces for swifts and bats are incorporated into plans for new development and building renovations	EDC (Sustainability Policy, Strategic Development and Regeneration, Development Management)	Ongoing	Built Environment, Bats, Swift	U4
20	Investigate biodiversity improvements such as hedgerows and meadows to road verges	EDC (Sustainability Policy, Traffic and Transport)	Long	Bumblebees	U1, U3
21	Bring all Council owned urban LNCS into active management and determine opportunities to encourage volunteering	EDC (Streetscene)	Medium	Parks and Greenspace	U1
22	Work with landowners of urban LNCS within moderate to poor quality categories to improve habitat value	EDC (Sustainability Policy, Streetscene)	Long	Parks and Greenspace	U1, U2
23	Determine the feasibility of biodiversity improvements to Vacant and Derelict Land with the aim to improve at least 3 sites	CSGNT, Buglife	Long	Previously Developed Land	U1
24	Continue to conduct bat transects at Kirkintilloch and Milngavie as part of national surveys	EDC (Mugdock Rangers)	Ongoing	Bats	U2
25	Develop a framework to guide the implementation and monitoring of the statutory biodiversity duty across East Dunbartonshire Council	EDC (Sustainability Policy)	Short		U3
26	Hold a series of biodiversity training workshops and talks for planners on protected species and incorporating biodiversity into development with reference to British Standard for Biodiversity	EDC (Sustainability Policy)	Short - Medium		U3
27	Ensure environmental education is provided to all nursery, primary and secondary schools which request it.	EDC (Mugdock Rangers)	Ongoing		U2
28	Work with local community and volunteer groups to deliver practical conservation tasks at Local Nature Reserves	EDC (Mugdock Rangers, Streetscene)	Ongoing		U2, U5
29	Continue to run the Junior Nature Club at Mugdock Country Parks and support local friends of groups across the area	EDC (Mugdock Rangers, Streetscene)	Ongoing		U1, U2, U5
30	Deliver the Mugdock Park environmental events programme	EDC (Mugdock Rangers)	Ongoing		U2, U5

Acronyms :CSGNT - Central Scotland Green Network Trust EDC - East Dunbartonshire Council
Action Plan Timescales :Short - first year of plan Medium - years 2-3 of the plan Long - year 4 and beyond the plan Ongoing - continues throughout the plan

INDICATIVE MAP OF URBAN ECOSYSTEM

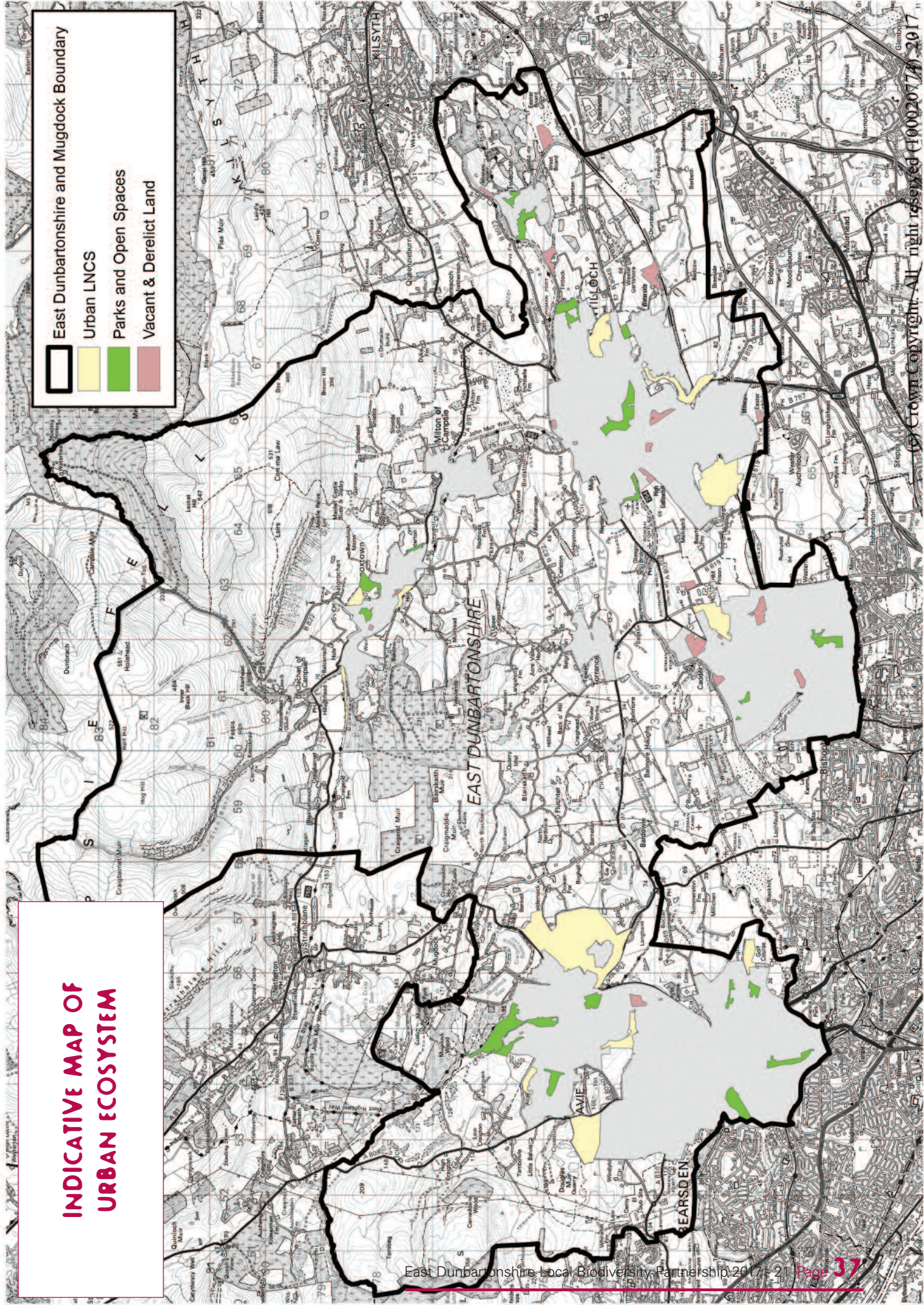
East Dunbartonshire and Mugdock Boundary



Urban LNCS

Parks and Open Spaces

Vacant & Derelict Land





FRESHWATER ECOSYSTEM





FRESH WATER ECOSYSTEM

Associated Priority Habitats

Rivers and streams (incl. Forth and Clyde canal)
Ponds, lochs and reservoirs
Lowland raised bog

Associated Priority Species

Mammals: Otter, Water vole
Birds: Kingfisher
Fish: Atlantic salmon, Brown trout
Amphibians: Great crested newt
Invertebrates: Pond mud snail, Dragonfly and damselfly (all species), Green hairstreak
Plants: Round-leaved sundew, Bog-rosemary, Cranberry, Tufted loosestrife

Objectives

Associated LBAP aims

F1.	Restore lowland raised bog condition and function on a further 5 ha	1, 2
F2.	Contribute to the delivery of the Scotland River Basin Management Plan ecological water quality objectives	1, 2, 3
F3.	Improve the function of river valleys as wildlife corridors	1, 2
F4.	Improve quality and extent of the pond resource and knowledge of associated priority species	1, 2, 5
F5.	Ensure sustainable management of the water environment	1, 2, 3, 4, 5

The freshwater environment is a significant natural resource providing valuable ecosystem services to humans and habitat to a huge diversity of wildlife. Freshwater is vital to all life on earth and freshwater habitats are estimated to be home to 10% of species in the UK⁷. River valleys can also act as corridors for the movement of species, providing important linkages to other ecosystems. This is particularly important in an area such as East Dunbartonshire where the landscape is fragmented in places by concentrated areas of urban development, agriculture and commercial forestry.

There are very few water bodies that have not been affected by man at some point through urbanisation, industrialisation or agriculture resulting in the complete loss of some sites through draining, modification of structure such as canalisation of river banks or reduced water quality through pollution input. The results of this manipulation are seen in the landscape we have today and can have a large impact on the diversity of species it can support. Fortunately the value of the freshwater ecosystem is widely recognised and it is now afforded high levels of protection as a result of European and national legislation.

⁷ Burns F, Eaton MA, Gregory RD, et al. (2013) State of Nature report. The State of Nature partnership.



River Basin Management Planning

The river basin management process aims to improve the condition of the water environment and protect it from further deterioration. It is driven by requirements from the European Union Water Framework Directive which was introduced in 2000 and establishes a legal framework for the protection, improvement and sustainable use of all water bodies across Europe. This includes rivers, canals, lochs, estuaries, coastal waters, wetlands and groundwater. The Directive became law in Scotland in 2003 through the Water Environment and Water Services (Scotland) Act 2003 and is further supported via the Water Environment (Controlled Activities) (Scotland) Regulations 2011 which provides restrictions and controls on potentially harmful activities such as water abstraction, engineering works beside watercourses and the release of pollutants into the environments.

The first River Basin Management Plan for Scotland was produced in 2009 and an update for the next six year period is currently being developed. The overall objective of the Plan is to bring 97% of water bodies in Scotland to good ecological status by 2027. The closer a water body is to natural conditions the higher its ecological status.

Rivers and streams

Rivers and streams are flowing watercourses which move water from uplands to the sea. A wide variety of riverine habitats occur in East Dunbartonshire, from the small unnamed upland streams of the Campsie Fells to the large River Kelvin which flows across the lowland valley floor. The corridor of land bordering such watercourses is as important for biodiversity as the water itself. Diverse riparian habitat, such as woodland, wetland and grassland provides valuable habitat and foraging opportunities for a number of species such as water voles.

Several watercourses travel through East Dunbartonshire as they make their way to their eventual destination of the Firth of Clyde. How these watercourses are managed has great implications for their biodiversity.

Forth and Clyde canal

The Forth and Clyde canal was built between 1768 and 1790 and stretches from the Firth of Forth to the River Clyde. Running 15.5km across southern East Dunbartonshire from Twechar to Bishopbriggs (with an additional small section at Westerton in Bearsden), the canal represents a considerable proportion of the area's total standing water habitat. The narrow strip of land occupied by this waterway contains a number of wildlife habitats, including slow moving freshwater in the canal channel, emergent fringing vegetation, towpath grasslands, hedgerows, woodland and scrub, and reedbeds. Although not a natural feature of the landscape, canals can provide an important link with adjacent habitats. Much of the nature conservation value of the canal lies in the wildlife diversity, rather than the presence of particularly rare species. However a number of nationally scarce and protected species can be found such as bats, otter and tufted loosestrife.

Invasive non-native species

Non-native species have become an increasingly common feature of our landscapes. Brought into the UK by humans for a number of reasons, a small proportion of non-native species have flourished and are now negatively impacting on local biodiversity by out-competing native species in growth or foraging, spreading disease or through wide-spread predation. Giant hogweed, Japanese knotweed and Himalayan balsam are examples of invasive non-native species that have colonised many of our riverbanks. Although these plants can be thought of as attractive in their own right, they reduce diversity and upset the natural balance of species. Other invasive non-native species found in East Dunbartonshire include American mink, grey squirrel, rhododendron and skunk cabbage.

FRESH WATER

Ponds, lochs and reservoirs (Standing open water)

Standing open water includes natural systems such as lochs and pools as well as man-made water bodies such as reservoirs, ponds and quarry pools. It covers the open water zone which may contain submerged, free floating and floating leaved vegetation as well as emergent fringe vegetation. Standing waters are usually classified according to their nutrient status. Mesotrophic lakes and eutrophic standing waters are considered of national importance for biodiversity. However the distinction between these two habitats can be distorted by nutrient enrichment induced by human activity and so both are considered together for the purposes of this LBAP.

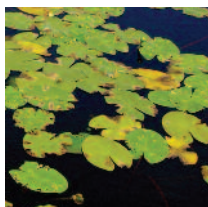
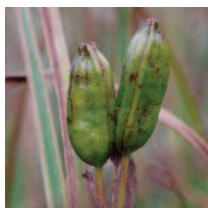
Mesotrophic waters are relatively uncommon in the UK and are critically dependent on nutrient levels such as inorganic nitrogen and total phosphorous. Such waters never reach very high or low nutrient levels and as such can have the highest levels of biodiversity of any standing waters. Typically they have clear water containing a higher proportion of nationally scarce and rare aquatic plants. Macro invertebrates are well represented including indicator groups such as dragonflies, water beetles, stoneflies and mayflies. Bardowie Loch is one of the few examples in East Dunbartonshire.

Eutrophic waters are naturally rich in plant nutrients, though many receive additional input from agriculture or sewage discharge. They can support a large amount of vegetation and commonly plankton is found in abundance, particularly in mid-summer. Plant communities can vary but typically include fennel-leaved pondweed, broad-leaved pondweed, spiked water-milfoil, yellow water-lily and duckweeds. There may also be marginal and emergent swamp communities. The fauna is a diverse mix of invertebrates, including snails, dragonflies and water beetles. Coarse fish such as roach and pike are typically found in eutrophic waters. Nationally important bird populations may also be supported. Antermony Loch is an example of a eutrophic water body in East Dunbartonshire.

The high nutrient content of eutrophic waters may also derive from artificial sources which can speed up the natural eutrophication process which normally occurs over hundreds of years. When nutrient levels become very high the plant community may become dominated by a few species able to tolerate these conditions such as blue-green algae and blanket weed. The fauna diversity will also suffer being restricted to just a few groups, usually worms.

Oligotrophic waters are poor in plant nutrients and are typical of northern and western Britain. They generally have clear water with low plankton cover and little diversity of flora and fauna. These water bodies tend to be found in geological areas of hard igneous rock and poor soils leading to poor levels of nutrients, such as phosphorous. There are no recognised oligotrophic lochs in East Dunbartonshire.

The life that depends on freshwater lochs and ponds is abundant and varied. However the biodiversity of individual sites can vary greatly depending on its physical characteristics and surrounding land uses. When at their best lochs and ponds can be the most species rich habitats in the UK.





Sustainable Drainage Systems

Sustainable Drainage Systems (SuDS) aim to mimic the natural movement of surface water from areas of development, reducing flood risk, improving water quality and often providing attractive features and habitat for wildlife. In natural environments, when rain falls it soaks into the ground, a process called infiltration. In areas where development has taken place most surfaces, such as paving, are sealed and impermeable to rainfall. In the past drainage systems consisted of pipes and culverts which diverted surface water to local watercourses. This system has increasingly resulting in downstream flooding and deterioration of the water quality of our rivers and lochs. As the volume of development increases more land becomes impermeable leading to reduced natural soil filtration, faster surface water run-off, more localised flooding, overloading of drainage systems and pollution incidents.

SuDS can take the form of ponds, retention basins, swales, infiltration trenches, constructed wetlands or green roofs. Many SuDS have the potential to benefit biodiversity by providing habitat for a number of species. Schemes which incorporate open water within ponds, wetlands and/or drainage channels can provide opportunities for local wildlife. In addition daylighting of culverted systems within local green spaces is increasingly becoming an option adopted by local authorities, and has proved to be successful in urbanised areas subjected to historical flooding.

Lowland raised bog

Lowland raised bogs are areas of peatland that develop on poor draining soils. Peatlands form when waterlogged ground conditions inhibit the microbial breakdown of organic materials. Initially the wet conditions result from mineral enriched ground water. At this stage peatlands are termed fens or mires. In areas such as central and western Scotland, high rainfall allows the waterlogged peat to accumulate above the ground water table. As the surface of the peat grows above the ground water, rainfall, which is very low in minerals and nutrients, becomes the only source of water. This process can continue for thousands of years producing a characteristic dome shape and a great depth of peat. Such peatland systems are called bogs or mosses.

Active bogs are dynamic systems where new peat is continually forming from the organic remains of the highly adapted flora that can tolerate the harsh conditions of waterlogging and nutrient deficiency. Bog-mosses (*Sphagnum spp.*) are crucial to the formation of the acidic conditions characteristic of bogs. The typical flora of bogs consists of a range of bog-mosses, forming colourful thick carpets or characteristic hummocks, generally with other mosses, lichens and liverworts. Vascular plants are limited in number but typically include cotton-grasses, heather and other associated specialist species such as bog rosemary, cranberry and round-leaved sundew.

In addition to the flora interest there is a large number of animals, notably invertebrates, associated with bogs. Raised bogs are internationally important habitats and are listed on Annex 1 of the EC Habitats Directive.

Lenzie Moss, Low Moss, High Moss, Barbeth Moss and Gartshore Moss represent a significant amount of lowland raised bog habitat in central western Scotland. Unfortunately these areas are constantly threatened from dangers such as drainage, agricultural improvements, peat removal and development pressure. Lenzie Moss and Low Moss which had been negatively impacted by birch encroachment have been subject to restoration work over the past few years funded by the Scottish Government's Green Stimulus Peatland Restoration fund and from Developer Contributions.

Peatlands are a rich store of carbon and functioning peatbogs play an important carbon sequestration role within our environment. The destruction of bogs leads to the release of greenhouse gases such as carbon dioxide and methane, and therefore contributes to climate change.



Pressures on the freshwater ecosystem

- Diffuse pollution, including run off from roads and farmland and deposition of pollutants from the air
- Point source pollution, including discharges from sewage system and industry
- Eutrophication (nutrient enrichment) leading to high weed growth, blue-green algae blooms and reduced dissolved oxygen during the summer months
- Morphological changes such as culverts, barriers and canalisation
- Construction, engineering works and waterside development
- Recreational activity causing erosion, trampling of vegetation, litter and disturbance
- Grazing on margin edges causing damage to marginal and floodplain vegetation and can result in siltation
- Invasive non-native species
- Climate change
- Afforestation of peat bogs / cutting and drainage of peat bogs

Ecosystem Services

- Support:** Water cycling
Flood management and reduced flood risk
Transportation and navigation
Pollution dilution
Carbon storage
- Provisioning:** Domestic and industrial water supply
Hydropower generation
Irrigation
Food
- Regulating:** Flood prevention and mitigation
Erosion regulation
Climate change adaptation
- Cultural:** Amenity and recreation
Aesthetic/sense of place
Tourism and employment

Key sites

SSSI: Manse Burn (Geological), Corrie Burn (Geological)
Mugdock Wood (Mesotrophic loch)

LNR: Lenzie Moss, Kilmardiny Loch,

LNCS: Alloch Dam and Mount Dam, Almeel Burn, Antermoney Loch, Ashenwell Dam
Auldmurroch Burn and Woodlands, Balgrochan Marsh, Barbeth Moss
Bardowie Loch and Wetland, Broomhill Ox-Bow Lake and Broomhill Hospital Marsh
Gartshore Moss, Geelong Gardens and Wetlands, Hayston Ox-Bows
High Moss Plantation, Low Moss, Millersneuk, Mugdock Reservoir, Spouthead
St. Germain's Loch, Woodburn Reservoir and Glen

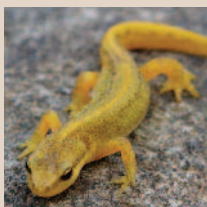
Proposed LNCS: Allander Water, Bothlin Burn, Forth and Clyde Canal,
Glazert Water, Luggie Water, River Kelvin, Tower Burn / Tower Farm

No.	Action	Delivery Lead	Timescale	Associated Priority Habitat and Species	Associated Ecosystem Objective
31	Create at least 2 new ponds per site at Merkland LNR, West Balgrochan Marsh LNCS and Balgrochan Marsh LNCS	EDC (Streetscene)	Short - Medium	Ponds, lochs and reservoirs, Dragonfly and damselfly	F4
32	Assess the status of existing pond resource with the view to improve existing habitat and create new ponds to improve connectivity	EDC (Sustainability Policy, Streetscene)	Medium	Ponds, lochs and reservoirs, Great-crested newt, Dragonfly and damselfly	F4
33	Create two new ponds per year of different shapes and sizes to create a mosaic of niche habitats within Mugdock Park pondscape	EDC (Mugdock Rangers)	Ongoing	Ponds, lochs and reservoirs,	F4
34	Carry out Great-crested Newt surveys where new potential sites are identified	EDC (Mugdock Rangers)	Ongoing	Ponds, lochs and reservoirs, Great-crested newt	F4
35	Continue Lenzie Moss restoration (dam installation, birch removal and boardwalk upgrades)	EDC (Streetscene) Friends of Lenzie Moss	Short	Lowland raised bog, Round-leaved sundew	F1
36	Create glade areas at High Moss through sensitive removal of trees	EDC (Streetscene) Mugdock Rangers) Caledonian Properties	Medium - Long	Lowland raised bog, Round-leaved sundew	F1
37	Continue to monitor previous raised bog restoration work at Low Moss and Lenzie Moss sites including removal of tree seedlings maintenance of dams and monitoring of water levels	EDC (Streetscene) Mugdock Rangers) Friends of Lenzie Moss	Ongoing	Lowland raised bog, Round-leaved sundew	F1
38	Conduct flora surveys of at least 3 raised bog sites for rare plant species (such as Bog-rosemary, Cranberry, Round-leaved Sundew and Blaeberry). Investigate the feasibility of a transplantation programme	EDC (Sustainability Policy) Streetscene) Mugdock Rangers)	Medium - Long	Lowland raised bog, Round-leaved sundew	F1
39	Erect and monitor at least one barn owl box at both Low Moss and High Moss	EDC (Streetscene) Caledonian Properties	Medium		F1
40	Undertake feasibility for restoration work at a further 2 raised bog sites	EDC (Sustainability Policy)	Medium	Lowland raised bog, Round-leaved sundew	F1
41	Design and install signage to discourage inappropriate access to raised bog sites during the bird nesting season	EDC (Streetscene)	Short	Lowland raised bog, Round-leaved sundew	F1
42	Develop a map using existing data outlining the invasive non-native Species present and their spread along major watercourses throughout the area as the first step towards an eradication programme.	EDC (Sustainability Policy) Streetscene, Technical and Engineering)	Short - Medium	Rivers and streams, Otter, Kingfisher	F2, F3, F5
43	Monitor for presence of the invasive non-native species, signal crayfish, within watercourses	SEPA	Ongoing	Rivers and streams	F2, F3, F5
44	Identify sites where biodiversity gains can be met through surface water drainage plans	EDC (Sustainability Policy, Technical and Engineering)	Ongoing	Ponds, lochs and reservoirs	F5

No.	Action	Delivery Lead	Timescale	Associated Priority Habitat and Species	Associated Ecosystem Objective
45	Ensure biodiversity is incorporated into the design of sustainable drainage systems for new development	EDC (Sustainability Policy, Development Applications)	Ongoing	Ponds, lochs and reservoirs	F3
46	Conduct annual bat survey on Allander Water as part of national surveys	EDC (Mugdock Rangers)	Ongoing	Rivers and streams	F3
47	Continue to seek funds to deliver River Basin Management Planning improvements on the Glazert Water including re-meandering at Birdston	SEPA, EDC	Medium - Long	Rivers and streams	F2, F3, F5
48	Investigate the feasibility of projects on the Allander Water to improve River Basin Management Planning status	SEPA, EDC (Sustainability Policy, Streetscene, Technical and Engineering)	Medium - Long	Rivers and streams	F2, F3, F5
49	Improve biodiversity features for fish and invertebrate species at the Allander Water and River Kelvin confluence including planting of native bankside vegetation	EDC (Streetscene)	Long	Rivers and streams, Atlantic salmon, Brown trout, Otter	F2, F5
50	Increase the populations of the pond mud snail <i>Omphiscola glabra</i> by: <ol style="list-style-type: none"> 1. Seeking funding, 2. Creating new pond habitat, 3. Releasing captivity bred individuals from Kinkell Farm, 4. Monitoring released populations, and 5. Involving local communities and schools 	Buglife	Medium - Long	Ponds, lochs and reservoirs, Pond mud snail	F4
51	Extend terrestrial habitat for Great Crested Newt at Lennox Forest through planting of broadleaved trees	FCS	Medium	Great crested newts	
52	Manage vegetation in and around the existing great crested newt ponds at Lennox Forest to maintain the habitat	FCS	Ongoing	Ponds, lochs and reservoirs, Great crested newt	F4
53	Seek to ensure sources of diffuse pollution are dealt with through the Water Framework Directive.	SEPA	Ongoing	Rivers, Streams, Ponds, lochs and reservoirs, Otter Water vole, Kingfisher, Brown trout, Atlantic salmon	F2, F3, F5
54	Seek to ensure that the protection of habitats and species of value in the canal corridor is considered as part of all development on the waterway.	Scottish Canals, EDC (Sustainability Policy, Strategic Development & Regeneration)	Ongoing	River and streams, Water vole	F3, F5
55	Identify opportunities for enhancing wildlife habitats and protected species in the existing canal corridor, through the publication a canal network-wide biodiversity plan.	Scottish Canals	Medium	River and streams	F3, F5
56	Naturalisation of Whitefield Pond and adjacent lade including creation of island for nesting water birds	EDC (Streetscene)	Medium	Ponds, lochs and reservoirs	F4

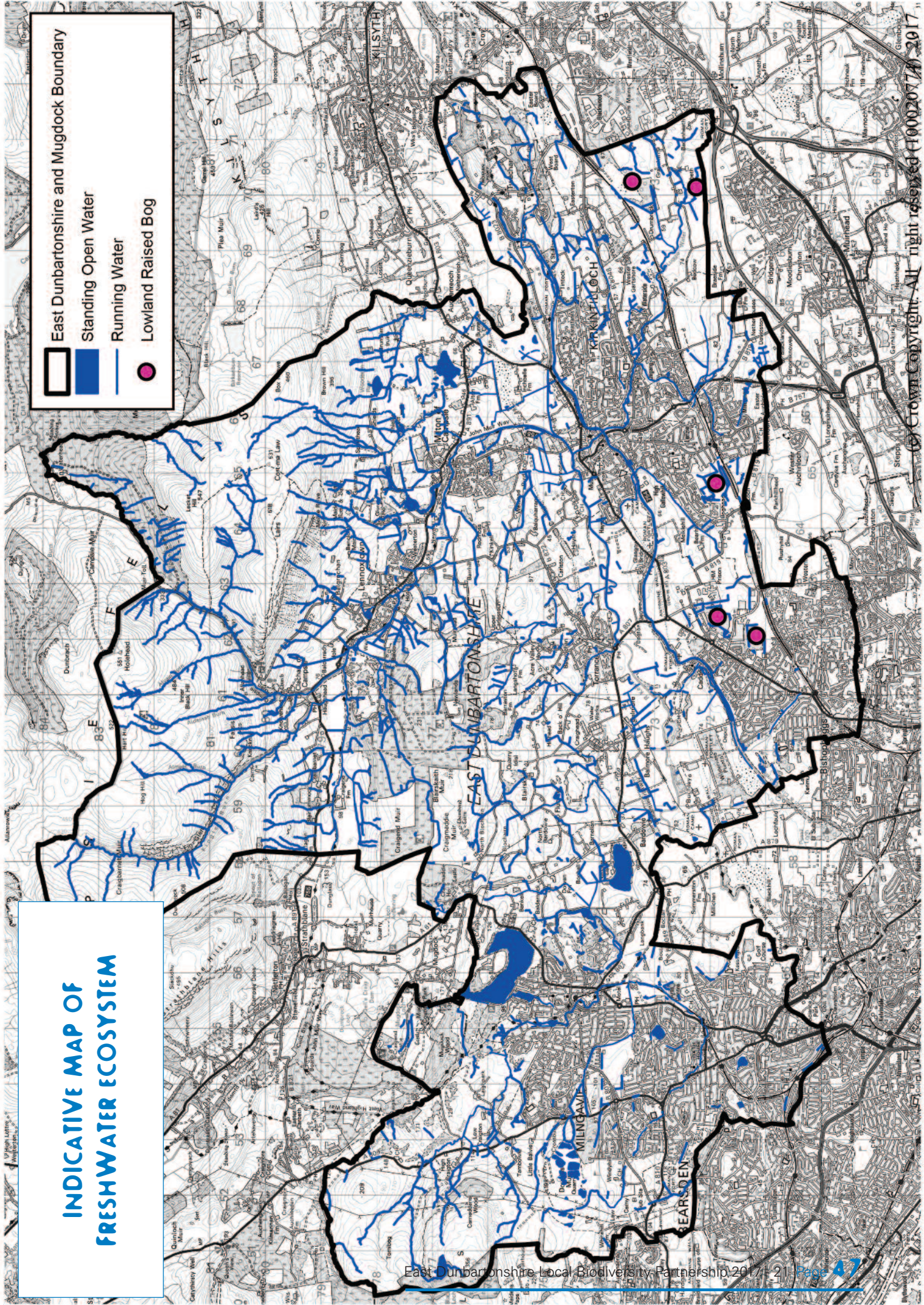
Acronyms :SEPA - Scottish Environment Protection Agency EDC - East Dunbartonshire Council FCS - Forestry Commission Scotland
Action Plan Timescales :Short - first year of plan Medium - years 2-3 of the plan Long - year 4 and beyond the plan Ongoing - continues throughout the plan

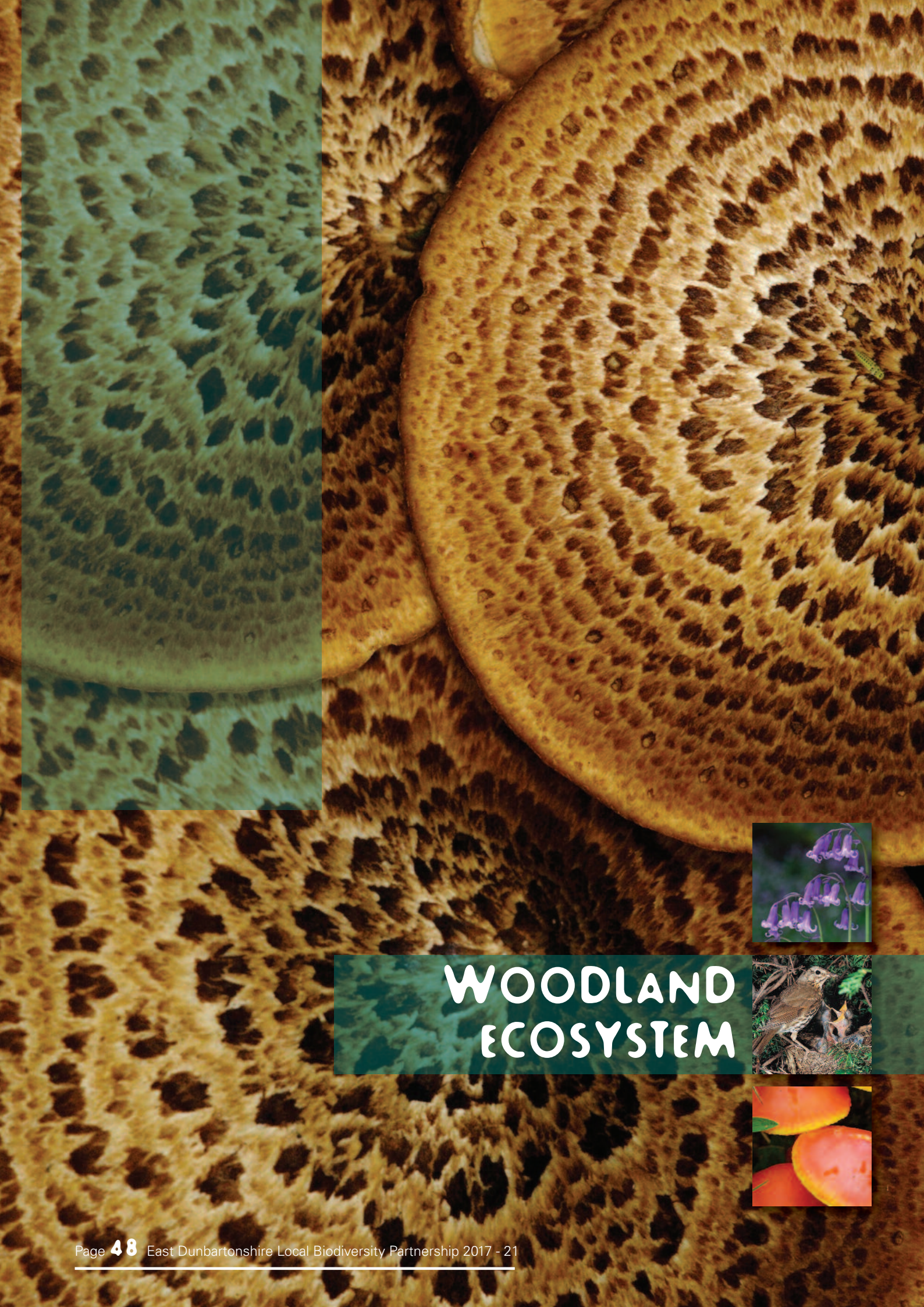
FRESH WATER



INDICATIVE MAP OF FRESHWATER ECOSYSTEM

- East Dunbartonshire and Mugdock Boundary
- Standing Open Water
- Running Water
- Lowland Raised Bog





WOODLAND ECOSYSTEM





WOODLAND ECOSYSTEM

Associated Priority Habitats

Veteran trees
Woodland
Scrub

Associated Priority Species

Mammals: Badger, Bats (all species), Pine marten
Birds: Black grouse
Plants: Bluebell⁸

Objectives

Associated LBAP aims

W1.	Protect and prevent loss of ancient and long established woodland	1, 2
W2.	Encourage the sensitive management of the woodland resource including scrub, to improve the long term ecological value of all woodland habitat	1, 2, 3, 4
W3.	Ensure woodlands, especially those close to urban areas, are accessible and promote awareness of their value to local communities	3
W4.	Encourage natural regeneration, new natural colonisation and native tree planting at new sites to increase the extent of priority woodland habitat, ensuring minimal conflict with other priority habitat types.	1, 2

East Dunbartonshire’s woodlands are a vital part of the physical landscape and complement the other ecosystems found within the area. This action plan covers all types of woodland found in East Dunbartonshire and their associated open and edge habitats. Woodland habitat covers 15% of East Dunbartonshire. This includes 841 hectares of native woodland of which 234.43 hectares is classed as ancient.

The variety, condition and location of trees and woodlands have a significant impact on the landscape and their biodiversity value. Ancient woodlands provide the most valuable woodland habitats for biodiversity as they tend to support the greatest diversity of wildlife. The species and management regime of woodland also play a role in determining the range of wildlife the woodland contains. However, woodlands, of all types, can be home to a vast array of species and in Scotland the woodland ecosystem contains more priority species than any other. Woodland is also valuable for the ecosystem services it provides us with and the pleasure it brings to people, particularly as a visually appealing landscape and for recreational activities such as walking and cycling.

There are five priority woodland habitats from the Scottish Biodiversity List found within East Dunbartonshire. The table over the page outlines their total cover within the area. Lowland mixed deciduous woodland, wet woodland and upland birchwoods make up nearly 80% of East Dunbartonshire’s native woodland.

⁸ Bluebell refers to the native species *Hyacinthoides non-scripta* as opposed to Spanish or Hybrid bluebells



Native Woodland Types	Area (ha)	% of native woodland
Lowland mixed deciduous woodland	285	34
Wet woodland	214	25
Upland birchwoods	177	21
Upland oakwoods	56	7
Upland mixed ashwoods	49	6

Important woodlands in East Dunbartonshire include the ancient woodland sites at Mugdock Wood SSSI and Finglen and long-established plantations at Cadder Wilderness SSSI and Craigmaddie. In addition the veteran trees within parkland areas and scrub or woodland edge habitats can also support a unique and varied flora and fauna.

Woodlands and Climate Change

Woodlands across the UK sequester around 2% of the UK’s annual greenhouse gas emissions⁹. The Scottish Government and Forestry Commission Scotland recognise this important role woodlands can play in climate change mitigation. Scotland has an ambitious target of reducing greenhouse gas emissions by 80% by 2050. It is clear woodland can contribute to reaching this target and to realise this, the Forestry Commission intends to extend woodland cover by an additional 10, 000 hectares every year until 2022, across the whole of Scotland. Restoration and expansion of woodland is needed to ensure ecosystem health and therefore this also helps us meet goals within the Scottish Biodiversity Strategy

Ancient Woodland

Woodland that has existed since at least 1750AD is classed as ancient woodland. This is the date when good maps became available and pre-dates the time when planting became common. Where woodland is indicated on old maps, we can therefore conclude it to be natural. Because these woodlands have developed over such long timescales, they have unique features such as relatively undisturbed soils and distinctive communities of plants and animals, some of which can be rare or vulnerable, that depend on the stable conditions these woodlands provide. Ancient woodlands often provide beautiful wildflower displays in spring with carpets of bluebell, wild garlic and wood anemone.

Woodland planted today will not become ancient woods hundreds of years in the future because the soils on which they have developed have been modified by human activity such as through agricultural practices or industry. The fragmentation of natural habitats in the landscape today also reduces opportunities for species movement and interactions when many species associated with ancient woodland are slow to disperse and do not easily colonise new areas. Ancient woodlands are therefore irreplaceable and we must protect what we have left. It is also important to plant new woodland to reduce fragmentation of the habitat and to buffer the effect of human activity and other land uses from ancient woodland. In Scotland there is a strong presumption against the removal of ancient woodland and removal of any woodland where it would lead to habitat fragmentation¹⁰.

Scrub

Scrub can be considered a transitional or successional habitat which over time, if left unmanaged, will form new woodland. It often forms a component of other habitats such as grassland or existing woodland. However, it is also important in its own right and a number of species utilise this habitat. Scrub provides nectar, seeds, fruits, shelter and nest sites for invertebrates, birds and mammals. It requires periodic maintenance to ensure it retains its character and value to wildlife. Scrub of varied age, species and structure supports the widest range of wildlife, as some species depend on specific growth stages of certain plants.

⁹ Woodland Carbon Code: www.forestry.gov.uk/forestry/infd-883184

¹⁰ The Scottish Government’s Policy on Control of Woodland Removal (2016)



Veteran trees

There is not a precise definition of the term veteran tree but generally trees are often regarded as veteran due to their old age, significant size and/or their ecological, aesthetic or cultural interest. Veteran trees in East Dunbartonshire are generally found as part of old policy planting in Bearsden and Milngavie and in parkland trees, which were planted in the last century to increase the amenity value of open spaces and recreational areas.

Pressures on the woodland ecosystem

Deforestation for housing, transport, business, industry and agriculture leading to direct loss of habitat and fragmentation

Poor management or no management can lead to reduced diversity

Overgrazing by livestock reducing regeneration of trees and ground vegetation

Invasive species

Excessive recreational pressure can disturb wildlife and damage sensitive sites

Anti-social behaviour, particularly in urban woodlands, such as fly tipping, vandalism and fires

Climate change

Disease such as Dutch elm disease or ash dieback and other pathogens and pests can have significant negative impacts

Eutrophication from atmospheric nitrogen deposition as well as diffuse pollution from agriculture can alter the balance of species by encouraging nutrient demanding species instead of more typical ground flora

Ecosystem Services

Support: Flood management and reduced flood risk
Carbon storage

Provisioning: Enhanced water quality
Timber and wood products
Woodfuel and biomass crops
Shelter

Regulating: Food
Flood prevention and mitigation
Erosion regulation
Climate change adaptation

Cultural: Amenity and recreation
Aesthetic/sense of place
Tourism and employment

Key sites

SSSI: Cadder Wilderness, Mugdock Wood





LNR: Merkland Nature Park

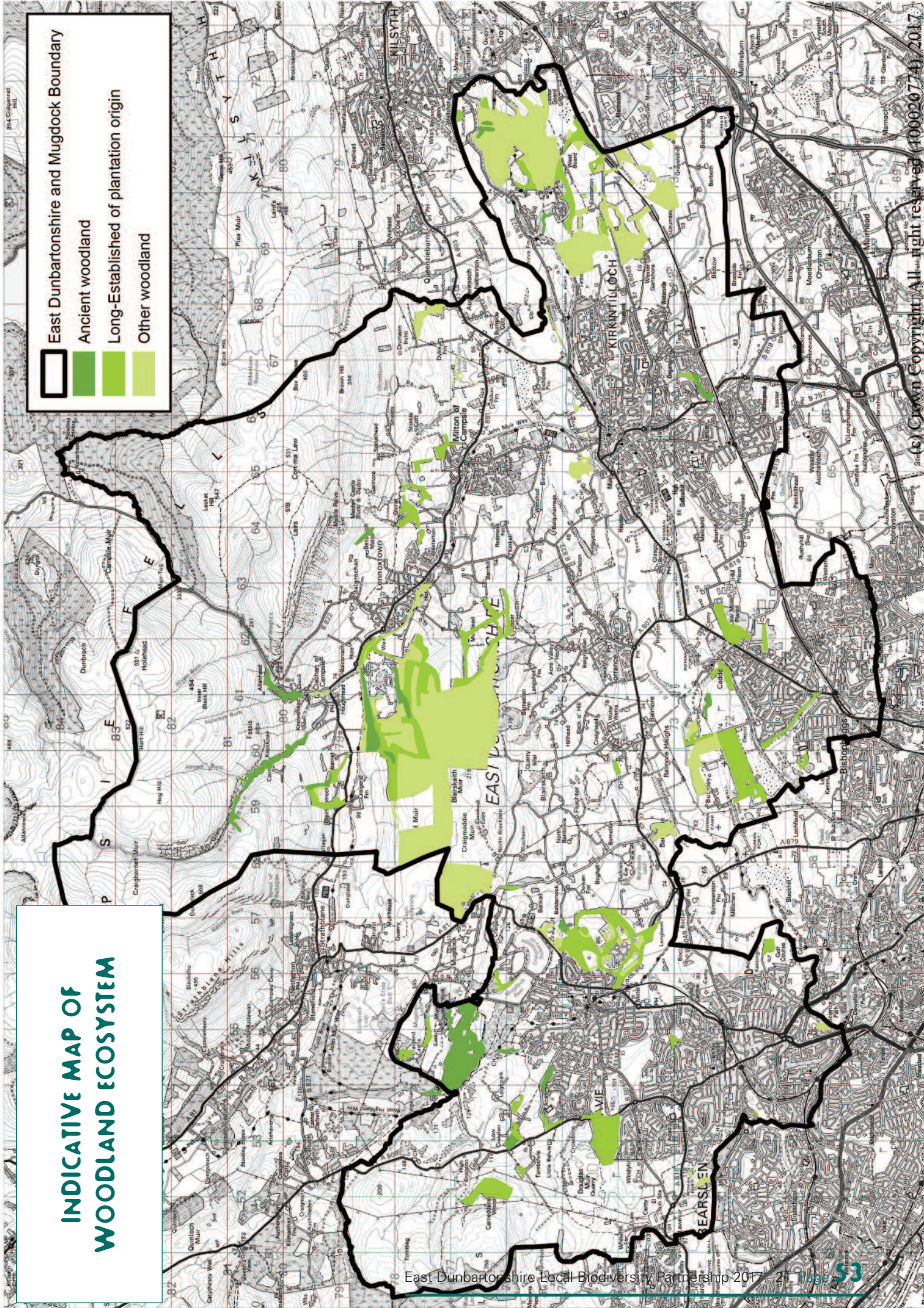
LNCS: Bardowie Woodland, Barhill, Buchley Sand Pit, Cadder Yard, Craigmaddie Plantation, Craigton Wood, Dougalston Estate and Loch Easterton Moss Plantation, Finniescroft, Gartshore Woods, Kennel Plantation, Heronryhill Plantation, Glazert Wood, Glen Orchard/Blairnile Wood Harestanes, Hutchesonhill, Kirhill, Lennox Forest, Meikle Reive Rookery Plantation, Old Ammunition Dump, Templehill Wood

No.	Action	Delivery Lead	Timescale	Associated Ecosystem Objective
57	Bring 6 woodlands into active management by: 1. Developing management plans 2. Implementing initial enhancement works 3. Improving access 4. Working with local communities	EDC (Streetscene) CSGNT	Long	W2, W3
58	Investigate the delivery of forest schools at Mugdock Country Park	EDC (Mugdock Rangers and Education)	Short	W3
59	Create new 100ha community woodland including access at Balcarrach Wood (formerly Hole Farm)	FCS	Medium	W3, W4
60	Control <i>Rhododendron ponticum</i> and remove regenerating beech at Mugdock Woods SSSI	EDC (Mugdock Rangers)	Ongoing	W2, W4
61	Develop a local woodland and forestry strategy to guide woodland expansion and protect existing sites	EDC (Land Planning and Development)	Medium	W1
62	Work with Forestry Commission Scotland to support new woodland creation on appropriate sites, to help reach Scottish Government climate change targets and ecosystem restoration goals within the Scottish Biodiversity Strategy	EDC, FCS	Ongoing	W4
63	Carry out annual Black Grouse monitoring (including brood counts) at Campsie Glen	FCS	Ongoing	W2
64	Control <i>Rhododendron ponticum</i> at Barhill and Lennox Forest	FCS	Ongoing	W2, W4
65	Restore PAWS (Plantation on Ancient Woodland Site) area of woodland at Barhill through removal of conifers and non-native broadleaves	FCS	Ongoing	W2, W4
66	Identify and carry out a programme of planting in order to replace both veteran policy and native trees in key public open spaces as part of the Trees for the Future project.	EDC (Streetscene)	Ongoing	W4

Acronyms: CSGNT - Central Scotland Green Network Trust EDC - East Dunbartonshire Council FCS - Forestry Commission Scotland
Action Plan Timescales: Short - first year of plan Medium - years 2-3 of the plan Long - year 4 and beyond the plan Ongoing - continues throughout the plan

INDICATIVE MAP OF WOODLAND ECOSYSTEM

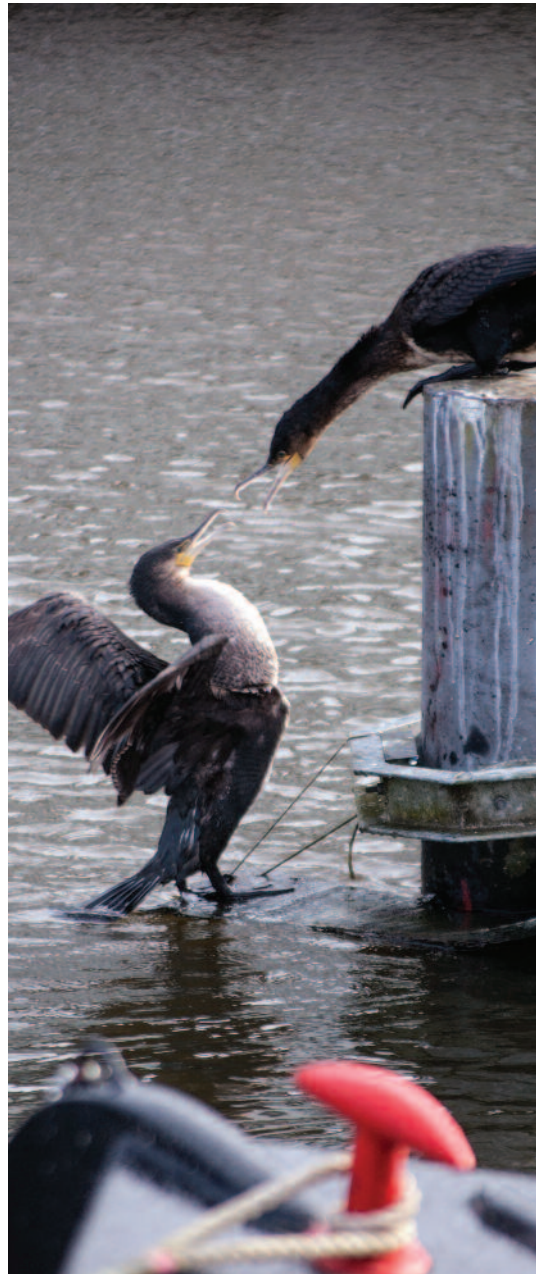
-  East Dunbartonshire and Mugdock Boundary
-  Ancient woodland
-  Long-Established of plantation origin
-  Other woodland





APPENDIX A

Legislation and policies relevant to the East Dunbartonshire LBAP



International legislation and policies

The Convention on Biological Diversity (1992) and its Strategic Plan for Biodiversity (2011-2020)

Kyoto Protocol (1997)

European legislation and policies

Directive 2009/147/EC on the Conservation of Wild Birds, commonly known as the Birds Directive

Directive 92/43/EEC on the Conservation of Natural Habitats of Wild fauna and Flora, commonly known as the Habitats Directive

Directive 92/43/EEC on establishing a framework for community action in the field of water policy, commonly known as the Water Framework Directive

Our life Insurance, Our Natural Capital: An EU Biodiversity Strategy to 2020

UK legislation and policies

Wildlife and Countryside Act 1981 (as amended)

Protection of Badgers Act 1992 (as amended)

UK Post-2010 Biodiversity Framework

National Planning Framework 3

Scottish legislation and policies

The Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland)

Water Environment and Water Services (Scotland) Act 2003

Nature Conservation (Scotland) Act 2004

Climate Change (Scotland) Act 2009

Wildlife and Natural Environment (Scotland) Act 2011

Water Environment (Controlled Activities) (Scotland) Regulations 2011

2020 Challenge for Scotland's Biodiversity (2013)

Scotland's Biodiversity: It's in Your Hands (2004)

Scottish Forestry Strategy

Control of Woodland Removal Policy

River Basin Management Plan for Scotland

Land Use Strategy

Scottish Planning Policy

Regional policies

Glasgow and Clyde Valley Strategic Development Plan

Glasgow and Clyde Valley Forest and Woodland Strategy

Local policies

Local Development Plan

Open Space Strategy 2015 - 2020

Green Network Strategy 2017 - 2022

Sustainability and Climate Change Framework



APPENDIX B

List of Local Biodiversity Action Plan Species



Priority Species

Common Name	Scientific Name	Scottish Biodiversity List	UK BAP	Legal Protection	Relevant Ecosystem Plan
Mammals					
Badger	<i>Meles meles</i>			PBA 1992 WCA 1981 (Schedule 6)	Rural / Woodland
Brown Long-eared Bat	<i>Plecotus auritus</i>	✓		HR 1994 (Schedule 2)	Rural / Woodland
Common Pipistrelle Bat	<i>Pipistrellus pipistrellus</i>	✓	✓	HR 1994 (Schedule 2)	Rural / Woodland
Daubenton's Bat	<i>Myotis daubentonii</i>	✓		HR 1994 (Schedule 2)	Rural / Woodland / Freshwater
Mountain Hare	<i>Lepus timidus</i>	✓		HR 1994 (Schedule 3)	Rural
Otter	<i>Lutra lutra</i>	✓	✓	HR 1994 (Schedule 2)	Freshwater
Pine Marten	<i>Martes martes</i>	✓	✓	HR 1994 (Schedule 3)	Woodland
Soprano Pipistrelle Bat	<i>Pipistrellus pygmaeus</i>	✓	✓	HR 1994 (Schedule 2)	Rural / Woodland
Water Vole	<i>Arvicola amphibius</i>	✓	✓	WCA 1981 (Schedule 5)	Freshwater

Common Name	Scientific Name	Scottish Biodiversity List	UK BAP	Birds of Conservation Concern	Legal Protection	Relevant Ecosystem Plan
Birds						
Black Grouse	<i>Tetrao tetrix</i>	✓	✓	Red		Woodland
Fieldfare	<i>Turdus pilaris</i>			Red	WCA 1981 (Schedule 1 - Part 1)	Rural
House Sparrow	<i>Passer domesticus</i>	✓	✓	Red		Urban
Kingfisher	<i>Alcedo atthis</i>	✓		Amber	WCA 1981 (Schedule 1 - Part 1)	Freshwater
Lapwing	<i>Vanellus vanellus</i>	✓		Red		Rural
Pink-footed Goose	<i>Anser brachyrhynchus</i>			Amber	WCA 1981 (Schedule 2)	Rural
Redwing	<i>Turdus iliacus</i>	✓		Red	WCA 1981 (Schedule 1 - Part 1)	Rural
Reed Bunting	<i>Emberiza schoeniclus</i>	✓	✓	Amber	WCA 1981 (Schedule 3 - Part 1)	Rural
Skylark	<i>Alauda arvensis</i>	✓	✓	Red		Rural
Swift	<i>Apus apus</i>	✓		Amber		Urban
Tree Sparrow	<i>Passer montanus</i>	✓	✓	Red		Rural

Common Name	Scientific Name	Scottish Biodiversity List	UK BAP	Legal Protection	Relevant Ecosystem Plan
Amphibians					
Great Crested Newt	<i>Triturus cristatus</i>	✓	✓	HR 1994 (Schedule 2)	Freshwater
Fish					
Atlantic Salmon	<i>Salmo salar</i>	✓		HR 1994 (Schedule 3)	Freshwater
Brown Trout	<i>Salmo trutta</i>		✓		Freshwater

Priority Species

Common Name	Scientific Name	Scottish Biodiversity List	UK BAP	Legal Protection	Relevant Ecosystem Plan
Invertebrates					
Azure Damselfly	<i>Coenagrion puella</i>				Freshwater
Black Darter dragonfly	<i>Sympetrum danae</i>				Freshwater
Blue-tailed Damselfly	<i>Ischnura elegans</i>				Freshwater
Buff-Tailed Bumblebee	<i>Bombus terrestris</i>				Rural / Urban
Common Carder Bumblebee	<i>Bombus pascuorum</i>				Rural / Urban
Common Blue Damselfly	<i>Enallagma cyathigerum</i>				Freshwater
Common Darter dragonfly	<i>Sympetrum striolatum</i>				Freshwater
Common Hawker dragonfly	<i>Aeshna juncea</i>				Freshwater
Early Bumblebee	<i>Bombus pratorum</i>				Rural / Urban
Emerald Damselfly	<i>Lestes sponsa</i>				Freshwater
Four-spotted Chaser dragonfly	<i>Libellula quadrimaculata</i>				Freshwater
Golden-ringed Dragonfly	<i>Cordulegaster boltonii</i>				Freshwater
Green Hairstreak butterfly	<i>Callophrys rubi</i>				Rural
Large Red Damselfly	<i>Pyrhosoma nymphula</i>				Freshwater
Red-tailed Bumblebee	<i>Bombus lapidarius</i>				Rural / Urban
Pond Mud Snail	<i>Omphiscola glabra</i>	✓			Freshwater
Small Garden Bumblebee	<i>Bombus hortorum</i>				Rural / Urban
Small Pearl-bordered Fritillary butterfly	<i>Boloria selene</i>	✓	✓		Rural
White-Tailed Bumblebee	<i>Bombus lucorum</i>				Rural / Urban
Plants					
Adder's Tongue Fern	<i>Ophioglossum vulgatum</i>				Rural
Bluebell	<i>Hyacinthoides non-scripta</i>	✓		WCA 1981 (Schedule 8)	Woodland
Bog-rosemary	<i>Andromeda polifolia</i>				Freshwater
Cranberry	<i>Vaccinium oxycoccos</i>				Freshwater
Greater Butterfly Orchid	<i>Platanthera chlotantha</i>	✓			Rural
Lesser Butterfly Orchid	<i>Platanthera bifolia</i>	✓			Rural
Round-leaved Sundew	<i>Drosera rotundifolia</i>				Freshwater
Tufted Loosestrife	<i>Lysimachia thyrsoiflora</i>				Freshwater
Additional LBAP Species of Conservation Concern					
Mammals					
Brown Hare	<i>Lepus europaeus</i>	✓	✓		Rural
Common Shrew	<i>Sorex araneus</i>			WCA (Schedule 6)	Rural
Hedgehog	<i>Erinaceus europaeus</i>	✓	✓	WCA (Schedule 6)	Urban
Water Shrew	<i>Neomys fodiens</i>			WCA (Schedule 6)	Rural / Freshwater

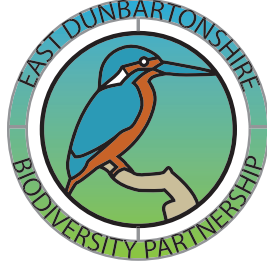
Additional LBAP Species of Conservation Concern

Common Name	Scientific Name	Scottish Biodiversity List	UK BAP	Birds of Conservation Concern	Legal Protection	Relevant Ecosystem Plan
Birds						
Barn Owl	<i>Tyto alba</i>	✓			WCA 1981 (Schedule 1 - Part 1 and Schedule 3 - Part 1)	Rural
Bullfinch	<i>Pyrrhula pyrrhula</i>	✓	✓	Amber	WCA 1981 (Schedule 3 - Part 1)	Rural / Woodland
Curlew	<i>Numenius arquata</i>	✓		Red		Rural
Dipper	<i>Cinclus cinclus</i>			Amber		Freshwater
Grasshopper Warbler	<i>Locustella naevia</i>	✓	✓	Red		Woodland
Great Spotted Woodpecker	<i>Dendrocopos major</i>					Woodland
Green Woodpecker	<i>Picus viridis</i>					Woodland
Grey partridge	<i>Perdix perdix</i>	✓	✓	Red		Rural
Greylag Goose	<i>Anser anser</i>			Amber	WCA 1981 (Schedule 2)	Rural
Hen Harrier	<i>Circus cyaneus</i>	✓		Red	WCA 1981 (Schedule 1 - Part 1 and Schedule 1A)	Rural
House Martin	<i>Delichon urbica</i>			Amber		Urban
Kestrel	<i>Falco tinnunculus</i>	✓		Amber		Rural
Lesser Redpoll	<i>Carduelis cabaret</i>	✓	✓	Red		Rural
Linnet	<i>Carduelis cannabina</i>	✓	✓	Red	WCA 1981 (Schedule 3 - Part 1)	Rural
Merlin	<i>Falco columbarius</i>	✓		Red	WCA 1981 (Schedule 1 - Part 1 and Schedule 4)	Rural
Peregrine	<i>Falco peregrinus</i>	✓			WCA 1981 (Schedule 1 - Part 1 and Schedule 4)	Rural
Short-eared Owl	<i>Asio flammeus</i>	✓		Amber		Rural
Snipe	<i>Gallinago gallinago</i>			Amber	WCA 1981 (Schedule 2 and Schedule 3 Part 3)	Rural
Song Thrush	<i>Turdus philomelos</i>	✓		Red	WCA 1981 (Schedule 3 - Part 1)	Urban
Spotted Flycatcher	<i>Muscicapa striata</i>	✓	✓	Red		Rural
Swallow	<i>Hirundo rustica</i>					Rural / Urban
Tree Pipit	<i>Anthus trivialis</i>	✓		Red		Rural
Twite	<i>Carduelis flavirostris</i>			Red	WCA 1981 (Schedule 3 - Part 1)	Rural
Wigeon	<i>Anas penelope</i>			Amber	WCA 1981 (Schedule 2 and Schedule 3 Part 3)	Freshwater
Woodcock	<i>Scolopax rusticola</i>	✓		Red	WCA 1981 (Schedule 2 and Schedule 3 Part 3)	Rural / Woodland
Yellowhammer	<i>Emberiza citrinella</i>	✓	✓	Red	WCA 1981 (Schedule 3 - Part 1)	Rural

Additional LBAP Species of Conservation Concern

Common Name	Scientific Name	Scottish Biodiversity List	UK BAP	Legal Protection	Relevant Ecosystem Plan
Amphibians					
Common Frog	<i>Rana temporaria</i>			WCA 1981 (Schedule 5)	Freshwater
Common Toad	<i>Bufo bufo</i>	✓		WCA 1981 (Schedule 5)	Freshwater
Palmate Newt	<i>Triturus helveticus</i>			WCA 1981 (Schedule 5)	Freshwater
Smooth Newt	<i>Triturus vulgaris</i>			WCA 1981 (Schedule 5)	Freshwater
Fish					
Brook Lamprey	<i>Lampetra planeri</i>	✓			Freshwater
Plants					
Globeflower	<i>Trollius europaeus</i>				Rural / Woodland



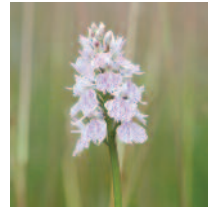


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