Tayside Local Biodiversity Action Plan

2nd Edition 2016-2026

Incorporating the local authority areas of Angus and Perth & Kinross









Every Action Counts!

Tayside Biodiversity Partnership

BIODIVERSITY
THE VARIETY OF LIFE

Scottish Wildcat © Scottish Wildcat Action

Chairman's Message

Anyone glancing at this latest Biodiversity Action Plan for Tayside could be forgiven for feeling a little daunted at the scale of the tasks identified in the Actions. Indeed, the scale of what we need to do over the years ahead is large if we are to pass on to our future generations a land that is as rich and varied in all its forms of life as the one that we have inherited. The hope that we can rise to this challenge comes from the sheer goodwill of so many people and organisations willing to give their time and effort to look after our wildlife, whether it be found in the remoter hills or closer to home in our towns and villages. Great examples of what can be achieved when we work together with a little direction and thought applied can be found throughout the following pages.

This Action Plan arrives at a time of great uncertainty, particularly in rural areas which have been so dependent on public funding for so much of our land use. Following the Brexit vote, we have to take the view that this must be an opportunity to improve on our delivery of so many of the tasks identified in this Plan and others which, if achieved, will improve the life of all of us along with all the many forms of life that we share this country with. That is what this Biodiversity Action Plan is about and I am delighted to give it a very warm welcome!

Andrew Barbour
Chair - Tayside Biodiversity Partnership

TAYSIDE VISION

By 2030 Tayside will have a fully functioning ecosystem network "from summit to sand" - reaching from the Angus Glens and Highland Perthshire to the Tay Estuary, the Angus coast and beyond to the marine environment. Visitors and residents alike will be able to learn about the area's rich biodiversity and will be keen to protect and enhance it. Both the rural and urban environment will be delivering benefits essential for everyone, from helping to reduce flooding, assisting species to adapt to climate change, and ensuring there is no further loss of biodiversity.

Contents

What Is Biodiversity?

It simply means "the variety of all living things". It includes the tiniest insects and the largest trees – and us.

We depend on biodiversity for our health, our well-being, and our economy. We benefit from pollination, natural flood prevention, soil creation, and the raw materials for our food and water, clothing, medicines, buildings, and roads.

In Tayside, particularly, we depend on our landscape and iconic species for tourism; plants and animals are key components of our cultural heritage.

Biodiversity enriches all our lives, whether it's a butterfly visiting our garden or a blackbird heard from a hospital window.

What Is The Tayside Biodiversity Action Plan?

The Tayside Local Biodiversity Action Plan (TLBAP) was first published in 2002 to focus attention on the conservation and enhancement of the region's natural heritage and to address its decline. Much has changed in the intervening years and now, although the First Edition and its core objectives are still highly relevant, we need to consider the ecosystem approach being taken forward by the Scottish Government's 2020 Challenge for Scotland's Biodiversity, as well as update legislation, policy and actions.

Who Is It For?

In answering the **"who is it for"** question, we need look no further than Magnus Magnusson's Foreword to the first edition of the Tayside Biodiversity Action Plan when he pointed out that "biodiversity starts on our own doorstep".

"There is no point in publishing Biodiversity Action Plans, however all-encompassing, and then sitting back to admire them. They have to be dynamic. They have to evolve. It depends on us – all of us, not just the statutory bodies, local authorities and agencies charged with safeguarding Tayside's biodiversity – farmers and foresters, land managers and business entrepreneurs, hoteliers and tourist operators, pupils and students of our schools and colleges. We all have a vital part to play in taking care of Scotland's natural heritage and to passing on our inheritance to future generations in even better shape than when it was bequeathed to us.

Magnus Magnusson, KBE - 2002

How Can I Get Involved?

It is all about scale – everyone can make a space for nature in their garden, school grounds or workplace surroundings. Community groups often aim to achieve one goal but then encompass new people, new projects. Land managers can work together to achieve a landscape-scale project. Local authorities can mainstream key biodiversity tasks in their day-to-day work and collaborate across boundaries to integrate larger-scale projects. The Tayside Biodiversity Partnership's Working Groups oversee a very wide range of projects and help set up new ones; new members are always welcome. There are many volunteer groups needing help with wildlife surveys or small-scale projects – and importantly, there are many organisations working locally needing help to clean up our beaches, plant new trees or make wildlife-friendly gardens.

Introduction

The Nature Conservation (Scotland) Act 2004 places a biodiversity duty on all public bodies to further the conservation of biodiversity and to have regard to the Scottish Biodiversity Strategy's 2020 Challenge. This is helping to mainstream the biodiversity process in many organisations, including local authority services. The latter's 2012-2014 reporting on their Biodiversity Duty showed just how much progress has been made to date, but also how much there is still to achieve.

Working in Partnership
It was not so obvious at the time of the publication of the 1st Edition, but there are two very important elements to the Tayside Biodiversity Action Plan – the fruitful partnership working that brings people and organisations together in safeguarding our habitats and species - and the increasing community involvement. Tayside has many committed volunteers working tirelessly to improve their local area – and at the same time, they are contributing to not just local targets, but national and international targets too.

For instance, what started as a simple Town Swift Survey in 2005 now takes in much of Tayside, including the glens and coastal areas. Surveys in specific towns have enhanced our understanding on where swifts are nesting – and with the ongoing threat of exclusion from renovated and restored buildings why their numbers are declining. Mapping Swift Priority Zones helps to highlight where best to suggest planning conditions on newbuilds and renovated buildings. The pilot Carse of Gowrie Swift Conservation Project involved schools, businesses and local groups to pave the way for a sustainable and ongoing project. This led to a three year project advising property owners within the Kirriemuir Conservation Area Regeneration Scheme how best to safeguard their swift nest sites. Many community swift projects are following suit, with the Stanley Swift Project being highlighted in the Action Plan.

One project often leads to another. The success of the Zoom Bumblebee Survey (which shared sightings of our six most common bumblebees in Tayside with the Bumblebee Conservation Trust) led to the Tayside BeeWild Initiative. A growing need to encourage pollinating insects in urban areas has shown that care homes, businesses and schools can all play their part. The pilot project in Angus is providing a suite of wildlife kits to eleven sites to encourage the number of urban pollinators.

Our Biodiversity is Threatened

The Scottish Government publishes official biodiversity indicators, which are used, together with others, to describe the state of the environment in Scotland. In 2013 the long-term trends showed that there is a decrease in both breeding seabirds and wintering water birds, as well as a decrease in flowering plant diversity. There is overall little change where butterflies and moths are concerned and a long-term increase in terrestrial breeding birds and freshwater invertebrates.

Puffin @ SNH

Our native water vole has taken to the hills, but is nearly extinct elsewhere in the region

Water vole © Alan Ross

However, the State of Nature report also published in 2013 outlined some alarming conclusions – one being that our marine ecosystems are in trouble where climate change is concerned. Small changes in sea temperature seem to be disrupting populations of phytoplankton which in turn are affecting entire food webs. The end result is fewer sand eels and this means less food for our iconic seabirds of which five out of twelve species are declining strongly.

Our flowering plants are demonstrating similar patterns of change - 54% of species are declining and 28% are strongly declining. Populations of Mountain hare have started to decline more recently, whereas Red squirrel numbers remain at suppressed levels.

Yet there is huge will amongst most of us to turn this round. The loss of our ancient woodlands and raised bogs is galvanising us into landscape-scale action, and our need to prevent flooding is encouraging widespread discussion amongst many partners on the best way forward where natural flood management is concerned. Taking into account the future impacts of climate change at a landscape scale, an ecosystems approach will help many of our species which find themselves at a critical level.

Local Biodiversity Action Plans In Context: From Rio To Tayside

International

A generation ago in 1992 at Rio de Janeiro's "United Nations Earth Summit", 168 countries, including Britain, ratified the Convention on Biological Diversity (the CBD). The document required each signatory to develop national strategies, plans or programmes for the conservation and sustainable use of biodiversity.

Two years later the UK Government published its UK Biodiversity Action Plan which prioritised the habitats and species that needed most conservation. Nearly 400 Species Action Plans and 45 Habitat Action Plans were also published, each with time-limited targets to measure their success.

National

The Scottish Biodiversity Group (later, Forum) was set up in 1996 to oversee the implementation of the relevant UK Action Plans in Scotland. As we go to publication we find ourselves in 2016 celebrating Twenty Years of Local Biodiversity Partnerships.

The first Scottish Biodiversity Strategy: "It's in Your Hands" was revised and a supplementary document 'The 2020 Challenge for Scotland's Biodiversity' was ratified by the Scottish Government cabinet in 2013 to take into account the international Aichi goals and targets agreed by the United Nations General Assembly. The two documents are collectively known as the Scottish Biodiversity Strategy which aims to "protect and restore biodiversity on land and in our seas, and

Lichens are used as bio-indicators of air quality © CAG Lloyd

to support healthier ecosystems". This echoes the mission of the EU Strategic Plan for Biodiversity 2011-20 "to take effective and urgent action to halt the loss of biodiversity in order to ensure that by 2020 ecosystems are resilient and continue to provide essential services".

In 2015 the Scottish Government published "Scotland's Biodiversity: a Route Map to 2020" which acknowledges that much valuable work is underway and planned by public agencies, Local Biodiversity Action Plan Partnerships and local authorities. The Route Map outlines Six Big Steps for Nature:

1 Ecosystem restoration – to meet the Aichi target of restoring 15% of degraded ecosystems;

2 Investment in natural capital – to ensure the benefits which nature provides are better understood and appreciated;

3 Quality greenspace for health and education benefits – to ensure that the majority of people derive increased benefits from contact with nature where they live and work;

4 Conserving wildlife in Scotland – to secure the future of priority habitats and species;

5 Sustainable management of land and freshwater – to ensure that environmental, social and economic elements are well balanced;

6 Sustainable management of marine and coastal ecosystems – to secure a healthy balance between environmental, social and economic elements.

The new targets within the Scottish Biodiversity Strategy are worryingly large and place a great deal of responsibility on the Local Biodiversity Action Plans. The Strategy requests that public bodies, environmental charities, local communities, businesses and landowners/ managers maximise the benefits of a diverse natural environment and engage people with the natural world. All this comes at a time when staffing levels are at an all-time low and funding is increasingly difficult to find. It is now urgent to continue to roll out not just small-scale projects, but to also look at ways to set up larger ecosystem-based initiatives with much greater partnership working. Sharing knowledge and experience will be just as important to prevent any reinventing of the wheel and to inspire landscape-scale thinking with in-built sustainability.

Local

To ensure national biodiversity objectives are delivered at a local level there are some 25 Local Biodiversity Action Plan (LBAP) areas across Scotland. Many LBAPs are based within the local authorities, but there are several Partnerships that reach across boundaries. The North East Scotland LBAP, for instance, covers Moray, Aberdeen City and Aberdeenshire. Until 2011, the Tayside Biodiversity Partnership also covered three local authority areas (Angus, Dundee City, Perth & Kinross).

The Partnership first met in 1998 and a Co-ordinator was appointed in 2000. In Tayside, the biodiversity process was funded for the first 3.5 years by the SITA Trust and then shared between Scottish Natural Heritage and the three local

Foxgloves are commercially grown for pharmaceutical use © CAG Lloyd

authorities. Dundee City Council left the Partnership in 2011 and SNH remains a non-funding Partner. The lead partners are Angus and Perth & Kinross Council, but we regularly collaborate with our neighbours, in particular the Cairngorms National Park Authority and the North East Scotland Biodiversity Partnership. As the Scottish Biodiversity Officers' Network meets twice a year there is also an opportunity to exchange information at a Scotland-wide level.

The 1st Edition of the Tayside Biodiversity Action Plan focussed on the UK Priority Species and Habitats found in Tayside but as our understanding of biodiversity has changed much in the past decade, the 2nd Edition is taking a much wider approach, looking instead at our ecosystem services.

The purpose of the 2nd Edition being a 10 year Action Plan is that we will be reporting on our short and medium-term actions for the 2020 Challenge, but keeping the long-term picture in mind as new international and national targets are set beyond 2020.

A Local Plan for Local People

Without a concerted effort to conserve our local biodiversity nothing will be achieved. Our Tayside Biodiversity Working Groups draw members from as wide an audience as possible; the Actions Schedules identify objectives and targets for the conservation of the ecosystem, habitat and species and then the actions required to achieve them.

The biodiversity process is a dynamic one, involving a vast range of people who can all make a difference. Many of the key players are listed in the individual ecosystems Actions Schedules. They include statutory bodies, local authorities, businesses and non-governmental organisations. They also include local community groups, some of them directly named. As ever, it is often down to individuals working in partnership with others to kick-start projects and in the years to come we will meet new community groups and people keen to take responsibility for their local patch. The Action Plan has to remain flexible because of this to respond to changes in local policy, the environment and the local communities themselves.

The strength of Local Biodiversity Partnerships is that they bring together organisations who are already undertaking tasks, but working together we can widen them or make them more inclusive. Duplication of effort can be avoided and new ideas mooted to an interested audience who can and do make a difference. Collaboration is now becoming ever more important with the need to plan on a landscape-scale. It would be easy to step back and let the larger organisations take this task on, but in fact there are many more opportunities to bring people together and achieve even more.

Bringing Biodiversity to the workplace – every action counts! © Kelly Ann Dempsey

Every Action Counts!
A key part of the biodiversity process is the monitoring and review of agreed actions. This is now achieved via the UK Biodiversity Action Recording System (UKBARS). The Working Groups will continue to draw up project proforma from the actions listed in the Actions Schedule and Lead Partners, joint partners and contributors to each action will be included within the web-based UKBARS. Lead Partners will have the opportunity to report back regularly on progress being made and the Partnership will be in a position to report on its overall achievements at the close of the 2020 Challenge.

Links with Other Local Plans
It is essential to link the LBAPs' objectives and targets to other plans in Tayside. Key processes and policies that can play a role in biodiversity include:

- Community Planning
- Local Authority land use development plans (Local Development Plans)
- Local Authority Forestry and Woodland Plans
- Angus Shoreline Management Plan 2 (Angus Council)
- River Catchment Management Plans
- Natural Heritage Zones (SNH)
- Environmental Management Systems
- Business Site Biodiversity Action Plans
- Agri-environment Schemes
- Local Site Management Plans
- Neighbouring LBAPs

Now there is an ecosystem approach, it is important the Plans link across local authority boundaries so that there are shared actions and a greater audience. The Tayside Biodiversity Partnership area is bounded by six other LBAP areas – North-East Scotland, Stirling, Clackmannanshire, Fife and the two National Park Authorities - the Cairngorms, and Loch Lomond & the Trossachs. The Cairngorms National Park Authority overlaps into the Tayside LBAP area, taking in the Angus Glens and Highland Perthshire. The Northern Region Biodiversity Officers meet regularly to discuss links and projects encompassing Tayside, North East Scotland, the Cairngorms National Park Authority and Highland areas. There is further collaboration with the North East Green Network which is looking into the potential of cross-boundary projects.

Natural Capital
Many businesses are including the conservation and restoration of biodiversity into their decision making, not for altruistic reasons, but to limit the potential climate change and biodiversity loss that is likely to affect their bank balance. The United Nations has undertaken a great deal of research on The Economics of Ecosystems and Biodiversity (TEEB).

The term 'natural capital' is seen by many as commodifying biodiversity but is described in Scotland's Natural Capital Asset Index 2015 as 'the elements of nature that directly or indirectly produce value for people, including ecosystems, species, freshwater and land'. In the 2015 report it was noted that coastal, inland surface waters and woodland natural capital stocks have recovered,

Woodland harvest - a provisioning ecosystem service © Kelly Ann Dempsey

but that heathland and bogs natural capital stocks have declined. Inland surface water delivers a wide range of ecosystem services and its recovery is the key reason for Scotland's natural capital to show the recent positive trend. Future threats to our natural capital include invasive non-native species and climate change.

Climate Change

In the Tayside LBAP's 1st Edition the subject of climate change warranted a few lines under the "Wider Issues Outwith the Plan" section. However, we are all now cognisant with the fact that climate change is having a significant effect on our environment and there are likely to be many challenges for our biodiversity in the years to come. Many of these will include negative impacts:

- Sea level rise and increased storms as global climates change may cause foreshore steepening, allowing increased wave attack at the base of the dunes and exacerbating coastal erosion.
- As the intensity of heavy rainfall events increase, flooding severity will have greater impacts on the movement of sediment, invasive species and erosion.
- As sea temperature rises, marine invasive species may also find it easier to colonise new areas.
- Terrestrial species will become more restricted in distribution as their habitats change.
- More robust species are likely to expand and colonise new areas to the detriment of native species. This will include a greater number of pests and diseases affecting our trees and crops.
- There will be local species extinctions as habitats become more fragmented.
- As the seasons change, early or late appearance of prey or forage species may cause population declines in our native wildlife.

Our coasts are vulnerable to climate change@ Kelly Ann Dempsey

With an ecosystems approach, however, there will be many opportunities to plan habitat networks and ensure our greenspaces and farmed land are linked by way of wildlife corridors. New country-wide guidance will suggest how best to cope with weather patterns, new pests and crops and this will be revisited when the 2nd Edition is reviewed in 2020.

Policy Context

The Tayside Biodiversity Action Plan 2016 – 2026 has been developed to contribute to the delivery of Scottish, UK and European policies, plans and strategies. This section will be updated in 2020 but as at publication the following will be taken into consideration:

UK Biodiversity Framework

The UK Biodiversity Framework has succeeded the UK Biodiversity Action Plan (UK BAP) and there is now a strong National level focus. The Scottish Biodiversity List contributes to the overall 'All UK BAP Species' list.

Scottish Biodiversity Strategy – The 2020 Challenge

Aichi Targets set in 2011 by the United Nations Convention on Biological Diversity aim to halt the loss of biodiversity and to restore the essential services that healthy ecosystems provide. Scotland's response to the EU's Biodiversity Strategy for 2020 is the Scottish Biodiversity Strategy '2020 Challenge for Scotland's Biodiversity'.

The Nature Conservation (Scotland) Act 2004

The Nature Conservation (Scotland) Act 2004 places a duty on public bodies to further the conservation of biodiversity, not just in specific protected sites, but connecting people with the environment and managing biodiversity in the wider environment around us. The Act also increased protection for Sites of Special Scientific Interest (SSSI), amended legislation on Nature Conservation Orders, required the preparation of a Scottish Fossil Code (published 2008) and strengthened wildlife enforcement legislation.

The Tayside Biodiversity Action Plan is a means to fulfilling the statutory duty placed by the Act on all public bodies in encouraging staff to further the conservation of biodiversity by positively managing their environment and interaction with biodiversity.

Wildlife and Natural Environment (Scotland) Act 2011

The Scottish Government enacted the WANE Act to make the law on wildlife and the natural environment more efficient, effective and proportionate. The Act supports animal welfare issues, the management of invasive non-native species, the administration of species licensing, and sustainable economic activity, particularly in the countryside.

The WANE Act also introduced a requirement for all public bodies to make publicly available a report on their compliance with the Biodiversity Duty which was enshrined in the Nature Conservation (Scotland) Act 2004. The reports are to be prepared every three years; the first reports were made available online in January 2015.

The Marine (Scotland) Act 2010

Competing demands on Scotland's seas led to the enactment of the Marine (Scotland) Act which places a duty to protect and enhance the marine environment. Marine conservation is a key measure which aims to improve marine nature and historic conservation with new powers to protect and manage areas of importance for marine wildlife and habitats.

Statutory Designated Sites

Tayside is home to many designated sites. Qualifying features, which can be habitats or species, are protected through a range of Sites of Special Scientific Interest (SSSI) and Natura sites which are a network of European protected areas – Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

Water Framework Directive

The EU legislative Water Framework Directive (WFD) came into force in 2000 to improve and protect the water environment with a focus on catchment-scale systems. The WFD required the production of River Basin Management Plans (RBMPs) covering all types of water body. The Tay RBMP is integral to the area covered by the Tayside Biodiversity Action Plan and a second, and possibly third RBMP will come into force during the lifetime of this Plan.

Climate Change (Scotland) Act 2009

Climate change is a recognised threat to biodiversity and the Climate Change (Scotland) Act has set Scotland's targets to reduce emissions of greenhouse gases by 80 per cent by 2050. There is an interim target of 42 per cent by 2020. Adaptation is central to the delivery of strategies to limit biodiversity loss.

Scottish Land Use Strategy

The Scottish Land Use Strategy 2016-2021 is a key commitment of Section 57 of the Climate Change (Scotland) Act 2009. It will be reviewed every five years and provides a strategic framework that addresses how we can sustainably manage land in Scotland. Public sector bodies are expected to take a leading role by developing and

implementing plans and strategies that utilise its core principles. Partnership working is seen as key and the Tayside Biodiversity Action Plan will be the main driver of biodiversity action in relation to the Strategy.

Scottish Forestry Strategy

The core principles of the Scottish Forestry Strategy are based on sustainable development and social inclusion, achieved through a culture of 'forestry for and with people' and delivered in well-managed forests and woodlands that integrate effectively with other land uses and businesses. The Scottish Forestry Strategy Implementation Plan 2015-18 includes background details to the Forestry Indicators and their progress.

Scotland Rural Development Programme and Agricultural Policy

Funding opportunities identified in the 2014-2020 SRDP and any subsequent programmes may provide opportunities to deliver Tayside Biodiversity Action Plan project work - particularly in upland and farmland settings. The Common Agricultural Policy (CAP) has wide-ranging benefits to Scotland and our rural communities, and may support habitat creation and enhancement as well as species conservation.

National Outcomes – The Scottish Government

There are a series of National Outcomes which help sharpen the focus of government and provide a clear structure for delivery. Three Outcomes relevant to the Tayside Biodiversity Action Plan include the built and natural environment, local and global environmental impact, and strong, resilient and supportive communities. Many of the 55 National Indicators are also relevant. Delivering the Tayside Biodiversity Action Plan will directly contribute to the delivery of Scottish Government and Local Outcome Improvement Plans (currently being developed to supersede local Single Outcome Agreement).

The Scottish Biodiversity List

The Scottish Biodiversity List is a spreadsheet of species and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. It has been updated to take into account the review of the original UKBAP Priorities list. The purpose of the list is to help public bodies undertake their Biodiversity Duty but it is also a useful source of information for anyone interested in nature conservation in Scotland.

A spreadsheet containing a simple listing of the habitats and species is available on the Scottish Government website: http://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL. This includes land and freshwater species; land and freshwater habitats; marine species and habitats.

A version which includes Categories of Action is currently being prepared by Scottish Natural Heritage:

- Conservation action needed (which includes the habitats and species in most urgent need of conservation action);
- Avoiding negative impacts: this includes three categories - protected species or habitats, rare or restricted distribution, and significant decline;
- Watching brief only which includes two categories - on the UKBAP list but not considered to be at particular risk in Scotland; species with international obligations not picked up in the other categories for action.

It is hoped a Tayside version will also become available during the life of this Action Plan. There is the original Tayside Priority Species list in the 1st Edition, but the data has not been updated since the 1999 Tayside biodiversity audit. Working with our Partners and the Tayside Recorders' Forum a Tayside Biodiversity List will be prepared in the short-term and featured on the website.

Action for Key Species

Northern Brown Argus © Iain Cowe

Butterflies and Moths

Tayside holds significant populations of some butterflies and moths which are the highest priority for conservation in Scotland. Butterfly Conservation's Regional Action Plan outlines the main actions for survey and conservation work - http://eastscotland-butterflies.org.uk/actionplans.html. On the Angus coast, the Small Blue is the current focus for activity, including the planting of its food plant, Kidney Vetch. The Northern Brown Argus and its food plant, Common Rock-Rose, needs a focus too as there are small isolated colonies in the Sidlaws and Glen Garry.

The hills around Loch Rannoch are home to some of our most threatened upland moth species including the Kentish Glory, Northern Dart and Small Dark Yellow Underwing: in some areas there are no post-2000 records so further surveys are urgently needed.

Bearded Tits

The Tay Reedbeds cover 410 hectares and are home to a variety of specialised wildlife. Amongst them is one of our most charismatic birds which can be seen in only a few scattered locations throughout the country.

The Bearded Tit first colonised the Tay Reedbeds in the 1990s; they now hold c50% of the UK population. The Tay Ringing Group has revealed much about this species' requirements and movements. In 2014 an amazing 723 birds were ringed at the reedbeds some of which dispersed far and wide throughout Scotland. Sympathetic habitat management is critical to the species' long-term future. Work carried out by the RSPB and Tay Ringing Group (www.tayringinggroup.org) is ensuring this colourful and engaging bird continues to thrive.

Bearded Tits © Vicky Turnbull

Formica Aquilonia © Craig Macadam

Wood Ants

Tayside hosts both the Hairy wood ant and the Scottish wood ant. Both are Priority Species that are limited in their distribution and currently experiencing a population decline.

Wood ants play an essential part in the ecosystem, dispersing seeds, stimulating the roots and shoots of trees, distributing nutrients around the woodland and as a food source for birds and Badgers. Nest Quest is a Buglife citizen science project encouraging us to search for Wood ant nests - these resemble large piles of pine needles next to a tree or a tussock of grass and are found in coniferous, mixed and broadleaved forests. Wood ants need the sun to keep their nest warm so will choose somewhere not too shaded. Take part via https://www.buglife.org.uk/nest-quest.

Amphibians and Reptiles

The Tayside Amphibian & Reptile Group (TayARG) is raising awareness of our herpetofauna to a wide audience: from roads engineers and planners to local communities and species specialists. The area hosts Smooth, Palmate and Great Crested Newts, together with Common Lizard, Adder and Slow-worm: all Priority Species.

The Amphibian in Drains project is helping to safeguard our declining numbers of Common Frog and Common Toad, also listed as Priority Species. Sustainable Drainage in both urban and rural areas is the next key focus, as is the rolling out of the Tayside Pond Doctor projects. Further information is available from http://www.arguk.org/local-groups and there is a lively Facebook page which keeps everyone in touch with volunteer events and training workshops.

Smooth newt © D Muir

Bottlenose dolphin © WDC/Charlie Phillips

Marine Life

The Angus coastline is a wildlife watching secret - home to a wide range of coastal and marine habitats and species. The Marine Life Angus website introduces some of these sites and species and offers an opportunity to report cetacean sightings at www.marinelifeangus.co.uk.

The information is used to help understand and conserve our maritime habitats and species. Tayside Priority Species include Bottlenose dolphin, Harbour porpoise and Minke whale and there are occasional visits from other species too. By collecting presence, behavioural and sightings frequency data along our coast we can build a picture of how these mammals use our coastal waters and suggest protective measures where needed.

Scottish Wildcat

The Angus Glens is one of the best areas in Scotland for wildcat and maintaining a strong population is key to halting and then reversing the decline of this unique mammal. Scottish Wildcat Action http://www.scottishwildcataction.org/ is a five year collaborative project involving more than 20 partners. Its monitoring of the wildcat population will inform conservation approaches, promote land management actions beneficial to Scottish wildcats (e.g. wildcat-friendly predator control), and will promote responsible cat ownership within the local community.

Whilst the Action Plan has been developed within the Scottish Environmental policy context, volunteer engagement is vital for collecting valuable data on this iconic species.

Scottish Wildcat © Scottish Wildcat Action

Smolts © Atlantic Salmon Trust

Atlantic Salmon

In the economic, social, environmental and cultural context of Tayside the wild Atlantic salmon is a vitally important species. The east coast is a stronghold for it, despite the decline in overall numbers. Our rivers continue to generate large numbers of young salmon (smolts) which migrate to ocean feeding grounds where they feed for between one and four years.

EU Special Areas of Conservation on Tayside salmon rivers are targeted at the management of wild Atlantic salmon and the endangered Freshwater pearl mussel. The Scottish Government's ending of the practice of mixed stocks coastal netting ensures more salmon gain access to the Tay and the South Esk, both of which continue to have sustainable runs of salmon. Rivers and Fisheries Trusts of Scotland – www.rafts.org.uk.

Fungi

Local Fungus Recording Groups are run by enthusiasts keen to share their knowledge and help improve identification skills - http://www.britmycolsoc.org.uk/. The Tayside & Fife Fungal Group has a very large area to cover, especially as it has not been intensively surveyed and many species no doubt remain undiscovered. Habitat is all important: old meadows, unsprayed and unfertilised, host Waxcaps (the Hygrocybe species), whereas the coastal areas include specialised species such as Dune Stinkhorn. Old woodlands with plenty of dead wood host Boletus, Chanterelle and the rare Golden Cap (*Phaeolepiota aurea*), the latter often associated with nettles. The uplands have not been investigated in any great detail but they could hold a number of very interesting fungi.

Amanita Muscaria © Jim Cook

Landscape Statements

Glen Clova © VisitScotland

1 Angus Glens

Ancient glacial activity has created one of Scotland's most atmospheric and unspoilt places, the Angus Glens, where you can explore dramatic wild moorland, high cliffs and rocky crags, as well as the birch woods and waterfalls plunging down hillsides.

Each of the Glens is different in character but is collectively home to a wonderful array of species. The rivers are rich in salmon and provide a refuge for the endangered Freshwater pearl mussel. Archetypal Scottish mammals abound – the elusive wildcat, Pine marten, Otter and Red squirrel, as well as Water voles. Golden eagles, Peregrines and Ravens soar above the crags and Red deer and Mountain hare roam the seasonably colourful hills.

2 Angus Coast

Our Angus coastline extends from Milton Ness in the north to Broughty Ferry Castle in the south. It exhibits a wonderful diversity unparalleled on the North Sea coast. These include volcanic headlands and sandstone cliffs, wide expanses of sand dunes and open bays. There are also muddy estuarine shallows, and sheltered saltmarsh, reedbed and seagrass: all culminating at the mouth of the mighty River Tay.

Abundant coastal and marine species make these habitats their home - roaming whales and dolphins, and our renowned resident and migrant seabirds. Rockpools shine like jewels and summer coastal meadows contrast with the ever-changing sea and sky.

Deil's Heid © VisitScotland

Glen Doll © Angus Council

3 Angus Rivers

The Rivers North Esk, South Esk and Lunan Water, together with their tributaries, meander across the region, shaping the Angus landscape, and are joined by the River Isla, a tributary of the River Tay.

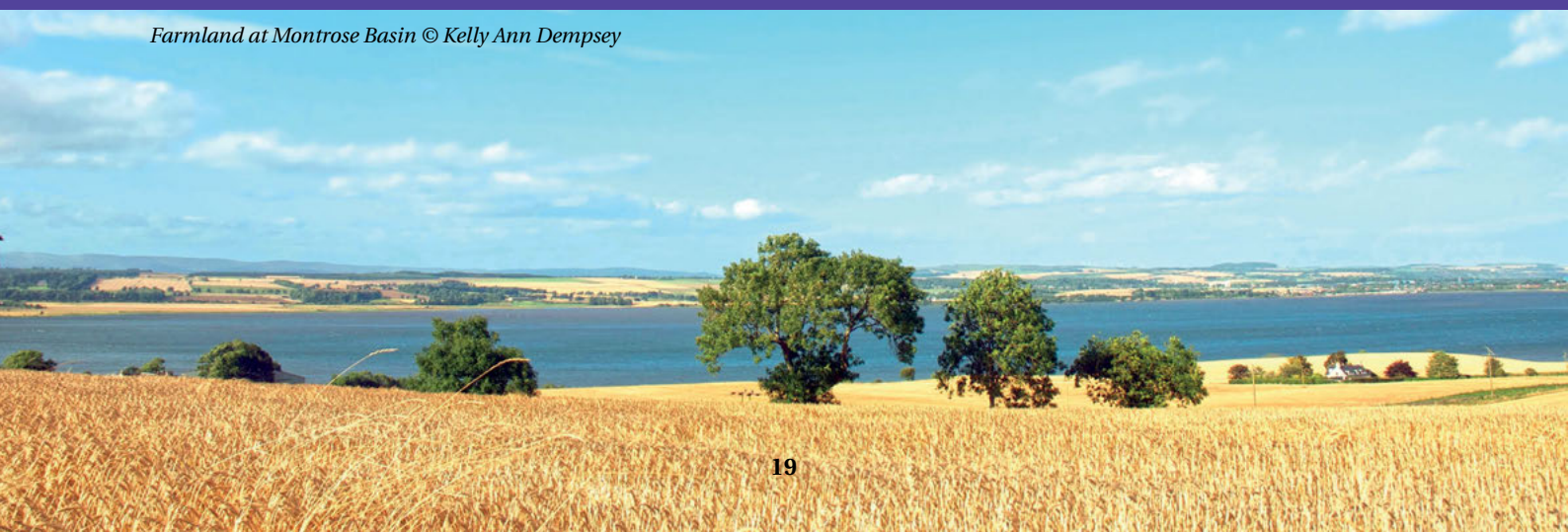
The North and South Esks are amongst the most prolific salmon and sea trout rivers in Scotland, flowing from high in the Angus Glens into the sea. The South Esk has a range of nature conservation designations: it is designated a Special Area of Conservation for its Atlantic salmon and Freshwater pearl mussels. In contrast, the Lunan Water flows out of Rescobie and Balgavies Lochs, both of which have SSSI status.

4 Lowland Angus

Lowland Angus boasts some of the best quality arable land in Scotland and so is intensively farmed, predominantly with combinable crops and potatoes, but also vegetables, soft fruit and grass.

It is broken up by hedges, treelines and drystone dykes, as well as by wooded dens and riparian corridors. Post-war intensification has seen these decrease as field sizes have increased. Spring barley maintains fields in stubble over winter and the area still hosts the rare Corn Bunting as well as other important farmland species such as Yellowhammer, Tree sparrow, Linnet and Brown hare.

Farmland at Montrose Basin © Kelly Ann Dempsey



View across the Carse of Gowrie to Fife © Land Use Consultants

5 Carse of Gowrie

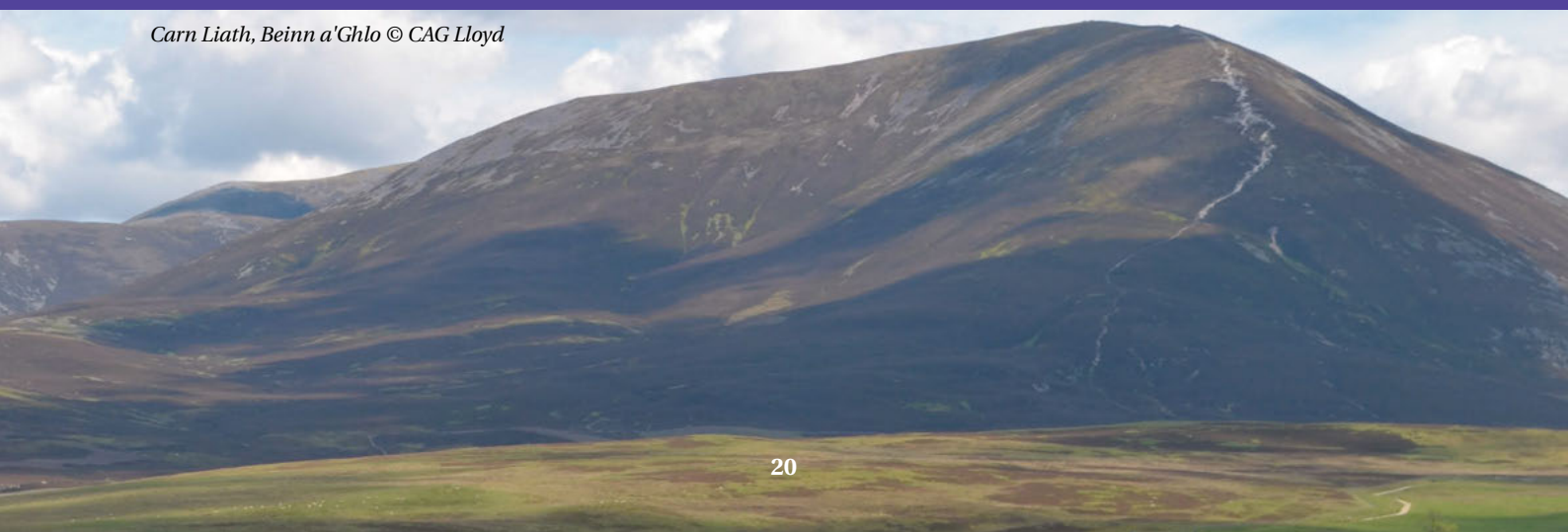
This distinct landscape stretches between Perth and Dundee. Upland heath succumbs to wooded valleys and waterfalls which eventually become pows (drainage ditches) flowing into the Tay. A diversity of hedgerows and treelines line the fields. The area's redwoods were the first to be introduced into the UK by Patrick Matthew, famous also for his evolution theory. Hidden away are ancient orchards with unique local varieties; fabulous for their burst of colour and in enticing bees and birds.

The River Tay is internationally recognised as having the largest continuous reed beds in the UK. With their associated wetlands and mud flats, they support large numbers of rare insects, some unknown elsewhere in Scotland. The reed beds' golden winter hues are critical for overwintering birds.

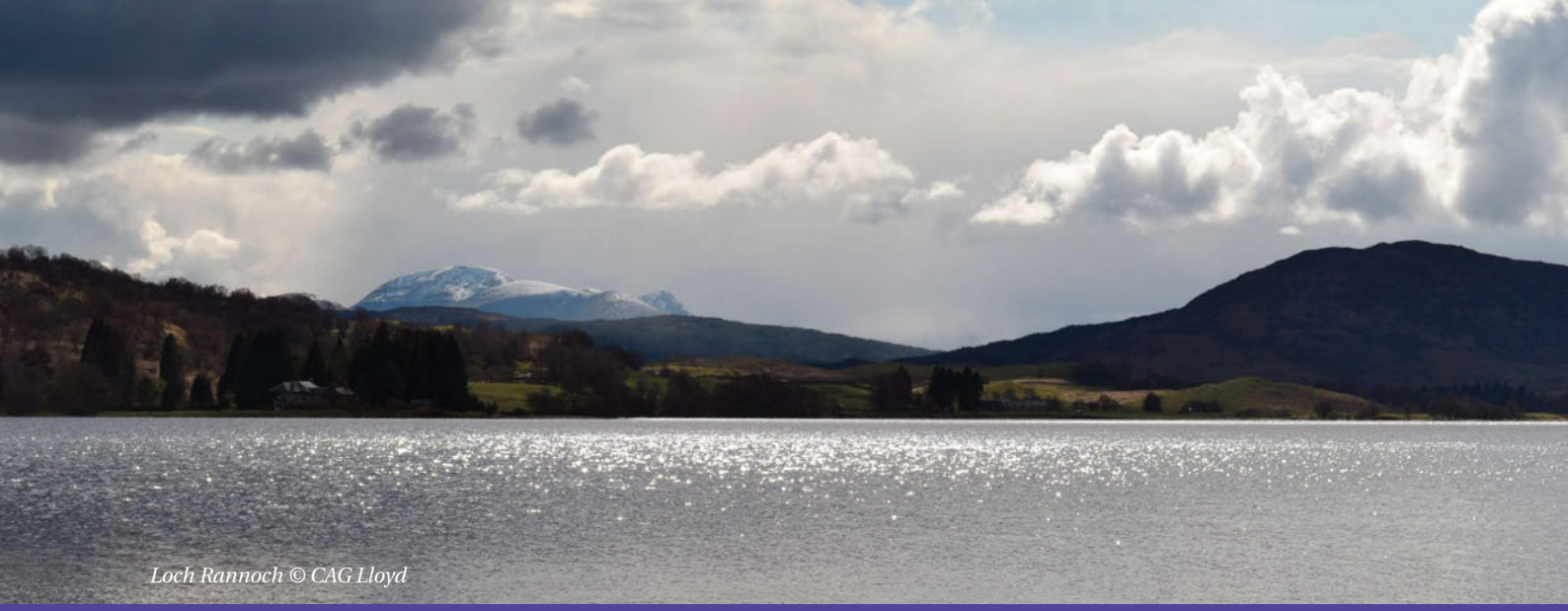
6 Highland Perthshire

Situated in the geographic centre of Scotland, just north of the Highland Boundary Fault, the landscape is one of steep-sided wooded hills, fertile glens and picturesque lochs. The majestic mountains host unique sub-arctic plants, Mountain hares and Ptarmigan – and beyond lies the vast Rannoch Moor over which one of the world's most scenic railways runs.

The region is known as Big Tree Country because of its iconic trees, one of which is the Fortingall Yew, Europe's oldest living thing. The area is famous for its birdlife, including Golden eagle, Osprey, Capercaillie and Black grouse. The area also abounds with Red squirrels, Badgers, Red deer and Pine martens.



Carn Liath, Beinn a'Ghlo © CAG Lloyd



Loch Rannoch © CAG Lloyd

7 Tay Catchment

With a length of 193 kilometres, the River Tay is the longest river in Scotland, stretching from Ben Lui to the Firth of Tay near Dundee – and it is teeming with internationally-important wildlife. It encompasses coastal, lowland, upland and transitional landscapes. Picturesque tributaries include the Rivers Garry, Tummel, Lyon, Braan, Isla and Almond. The largest lochs include scenic Loch Rannoch, Loch Ericht and Loch Tay - many of the lochs and rivers are managed to produce hydropower.

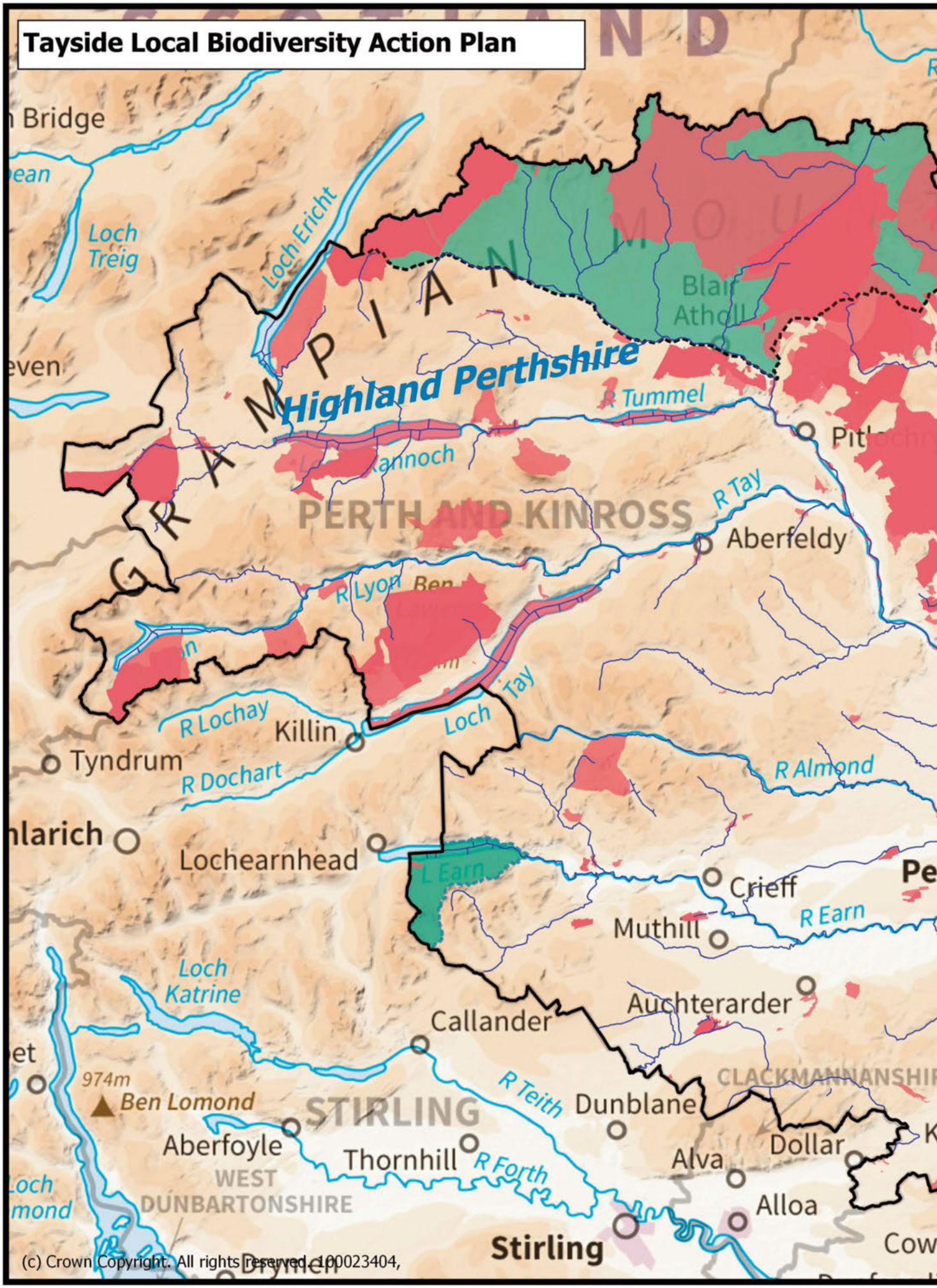
The Highland Boundary Fault cuts across the catchment from Glen Almond to Kirriemuir and marks distinct differences in topography, climate and land use. North of the fault the catchment includes forestry, rough grassland, heather and montane habitat. To the south, it is lowland in nature – more settlements and largely arable.

8 Tay Estuary

From the Tay Railway Bridge in the east to the confluence of the River Earn and up to the Queen's Bridge in Perth, the Tay Estuary is one of the largest in Scotland and at its widest, 2.5km across. Inter-tidal sand and mud flats extend seaward out to the estuary's main channel offering Common, Grey and Harbour seals great resting spots from their foraging on the many species found in the tidal waters.

Saltmarsh and Phragmites reedbeds stretch along its shores, providing nationally important habitat for Greylag and Pink-footed geese, Bearded tit, Marsh harrier, Cormorant, Goldeneye and Water rail. The abundance of insect life attracts huge numbers of Swallows and Sand martins on their autumn passage – a sight to behold as the seasons change.

Tay Estuary © CAG Lloyd


Tayside Local Biodiversity Action Plan
Bridge
Loch Treig
Loch Ericht
Highland Perthshire
R Tummel
Pitlochry
Aberfeldy
PERTH AND KINROSS
R Tay
R Lyon
Ben
R Lochay
Killin
Loch Tay
Tyndrum
R Dochart
R Almond
Lochearnhead
L Earn
Crieff
R Earn
Muthill
Loch Katrine
Auchterarder
Callander
974m
Ben Lomond
STIRLING
R Teith
Dunblane
CLACKMANNANSHIRE
Aberfoyle
Thornhill
R Forth
Alva
Dollar
WEST DUNBARTONSHIRE
Alloa
Stirling
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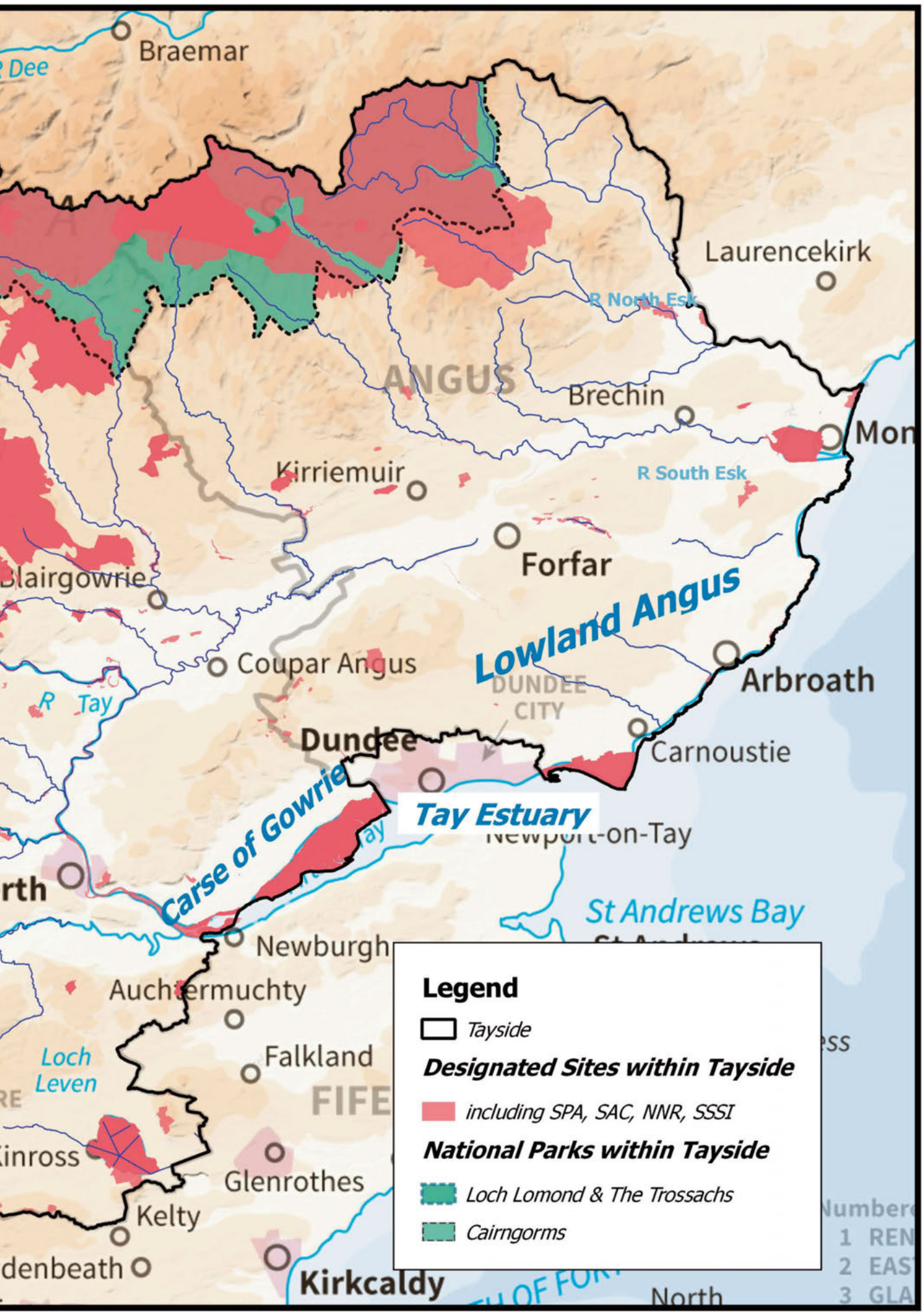

Braemar
Laurencekirk
R North Esk
ANGUS
Brechin
Kirriemuir
R South Esk
Forfar
Lowland Angus
Coupar Angus
Arbroath
DUNDEE CITY
Dundee
Carnoustie
Carse of Gowrie
Tay Estuary
Newport-on-Tay
St Andrews Bay
Newburgh
Auchtermuchty
Falkland
Loch Leven
FIFE
Glenrothes
Kelty
Kirkcaldy
Legend
Tayside
Designated Sites within Tayside
including SPA, SAC, NNR, SSSI
National Parks within Tayside
Loch Lomond & The Trossachs
Cairngorms

1 Water And Wetland Ecosystems

Loch Tummel, Perthshire © CAG Lloyd

Background

Tayside has a rich heritage of water and wetland habitats and their associated species. This diversity is due in large part to a complex geology and varied landscape. The division of the area by the Highland Boundary Fault is one feature which gives rise to some of the most valuable habitats in the region. Tayside is dominated by the River Tay catchment which drains the largest area of any river in Scotland. It has the largest mean average annual flow of any river in the UK in terms of volume at nearly 200 cubic metres per second.

The rivers and burns in Tayside tend to be fast flowing and nutrient poor and hold a wealth of habitats and rare wildlife. As important wildlife corridors, they enable dispersion and migration of species, interconnecting fragmented populations. They are particularly valuable in Tayside with a total length of over 5,000km not only making them essential to wildlife but also a familiar and important part of everyone's environment. Nine of these important waterways have been labelled "Freshwater Fish Protected Areas" under the Water Framework Directive.

Associated with these river networks are a large number of standing waters from the very large, deep highland lochs to small ponds and lochans and flood plain habitats such as wet woodlands, swamp and marshes, flood meadows and reedbeds. Wetlands, and particularly running waters, contribute to valuable habitat mosaics with thousands of kilometres of burns linking wildlife corridors between other terrestrial habitats. The margins of rivers and standing waters form the transitional zone between the aquatic and terrestrial environment.

Objectives

1 **Endeavour to reduce the direct pressures on water and wetland ecosystems by implementing projects to protect and restore ecosystem health.**

2 **Safeguard water and wetland ecosystem species and genetic diversity by enhancing connectivity and where possible preventing their decline.**

3 **Mainstream biodiversity conservation action by raising awareness and the enjoyment of water and wetland ecosystems.**

Priority Habitats

- Rivers and Burns
- Lochs and Standing Water
- Ponds and Pools
- Wetlands
- Lowland and Raised Bogs
- Transition Fen

Wetland, Glen Prosen © Kelly Ann Dempsey

Key Sites

Rivers and Burns

North Esk
River Tay (SAC)
South Esk (SAC)
Craighall Gorge (SSSI/SAC)
The Den of Airlie (SSSI)
The Lunan Burn system (SSSI, SAC)
Meikleour (SSSI)
Shingle Islands (SSSI, SAC)
Montrose Basin (SSSI/SPA & RAMSAR)

Lochs and Standing Open Water

Loch Laidon
Loch Tay
Loch Brandy
Carsebreck Lochs (SAC)
Loch Con
Dunalastair Water
Dun's Dish (SSSI)

Mesotrophic Lochs

Loch Moraig (SSSI)
Black Loch, Cleish (SSSI)
Loch of Craiglush
Loch of Lowes (SPA,SSSI)
Butterstone Loch (SSSI, SPA)
Loch Clunie (SSSI, SPA)
Loch of Drumellie or Marlee (SSSI, SPA)
Loch of Lintrathen (SSSI)
Long Loch of Lundie (SSSI)
Crombie Reservoir
Loch Monzievaird
Drumore Loch (SSSI)
Laird's Loch (SSSI)
Loch Leven (SSSI, SPA, SAC)
Rescobie Loch (SSSI)
Balgavies Loch (SSSI)
White and Fingask Lochs
Monk Myre
Loch Kinnordy (SPA)

Ponds

Lochindores (SSSI)
Kingoodie Quarry Ponds
Vane Farm Ponds
Bloody Inches/Meiklour (SSSI)
Barry Mill Ponds
Barrie Buddon Ponds
Pitmedden Forest

Wetlands (all are part/whole SSSIs)

Carsebreck Lochs
Dunalistair Reservoir
Dun's Dish
Loch Leven
Loch of Craiglush
Loch of the Lowes (SPA)
Butterstone Loch
Loch Clunie (SPA)
Loch of Drumelli or Marlee (SPA)
Loch Moraig
Laird's Loch
Rescobie Loch
Restenneth Moss (SSSI)
Balgavies Loch
Meikleour Area
Monk Myre
Loch of Kinnordy
Lochindores

Raised Bogs

Cairnleith Moss
Glenquey Moss
Portmoak Moss
Methven Moss
Shelforkie Moss
Crook of Devon Moss
Balloch Moss
Egnomoss

Otter © SNH

Key Species

- Salmonid species
- Riparian mammals
- Wading, wetland and diving birds
- Freshwater invertebrates
- Riparian, peatland and wetland plants

Integrated Catchment Management in Practice

The River South Esk Catchment Partnership leads in the delivery of ecosystem scale environmental improvement initiatives in the Angus area. One of only a handful of river catchment partnerships in Scotland, the partnership has implemented innovative work in this relatively new strategic partnership approach.

Main areas of success have been improving community access to the river (an SAC for Atlantic salmon and Freshwater pearl mussels and an SPA and RAMSAR site for migratory birds) and the control of the spread of invasive non-native species including Japanese knotweed, Giant hogweed, Himalayan balsam and American mink.

River restoration projects to aid in flood mitigation for affected towns such as Brechin, economic audits allowing sustainable development of the ecosystem services we derive from the catchment, landscape scale planning to mitigate the effects of climate change: all have played an important part in the success of the partnership.

The partnership carries out its objectives through the dedication of its stakeholders and increasing levels of community participation. Local and national PR and awareness raising, sharing good practice, citizen science and community volunteering raise the profile of the important species and habitats in the catchment. The work of a few improves the quality of the Angus environment for all of its residents.

Rottal Burn © Kelly Ann Dempsey

Ecosystem Services & Ecosystem Scale Projects

Ecosystem Services

- Flood management and natural attenuation
- Regulation and improvement of water quality
- Carbon sequestration (wetlands, bogs and tree planting)
- Water for irrigation
- Water and wetland-based recreation and tourism
- Climate regulation
- Health and wellbeing
- Renewable energy

Ecosystem Scale Projects

- River South Esk Catchment Partnership invasive non-native species project.
- Glen Clova Contour Planting Project.
- Tayside Lochs Project - project improving the water quality of Tayside mesotrophic lochs.
- Tayside SUDS and Ponds Initiative – increasing wetland habitat connections.
- Scottish Mink Initiative - local organisations assuming responsibility for mink control.
- Tayside Amphibians in Drains - developing wildlife-friendly road systems incorporating amphibian ladders, wildlife kerbs and amphibian migration hotspot mapping.
- River Basin Management Plans - protecting and improving Tayside's water environment in a way which balances costs and benefits to the environment, society and economy.

Pressures

Acidification

Acidification happens in areas where there is little underlying alkaline bedrock (such as limestone) to neutralise acids. Unnatural causes include acid rain from dissolved sulphuric and nitric acid, livestock waste and nitrogen fertilisers. Natural causes include coniferous forests close to a water body or acid rain caused from CO2 dissolving.

Toxic or Organic Pollution

These types of pollutants can be point source or from diffuse sources. Organic pollution can increase the concentration of nutrients within a water body, often leading to eutrophication and algal blooms which can remove the oxygen in a water system; Slender Naiad, *Najas flexilis* is particularly susceptible to changes in nutrient levels.

Drainage and Dredging

These activities can change the fluvial properties of water courses and surrounding habitat, forcing out key species.

Abstraction of Water

Removing large amounts of water from a river or water body for use in arable farming and renewable energy schemes can endanger many protected and priority species.

Sedimentation

As a natural phenomenon, sedimentation decreases the carrying capacity of rivers. However, unnatural levels can occur after activities such as river works which can de-stabilise banks. This can have a negative effect on the riparian zone particularly fish spawning habitat and Freshwater Pearl Mussels *Margaritifera margaritifera.*

Climate Change

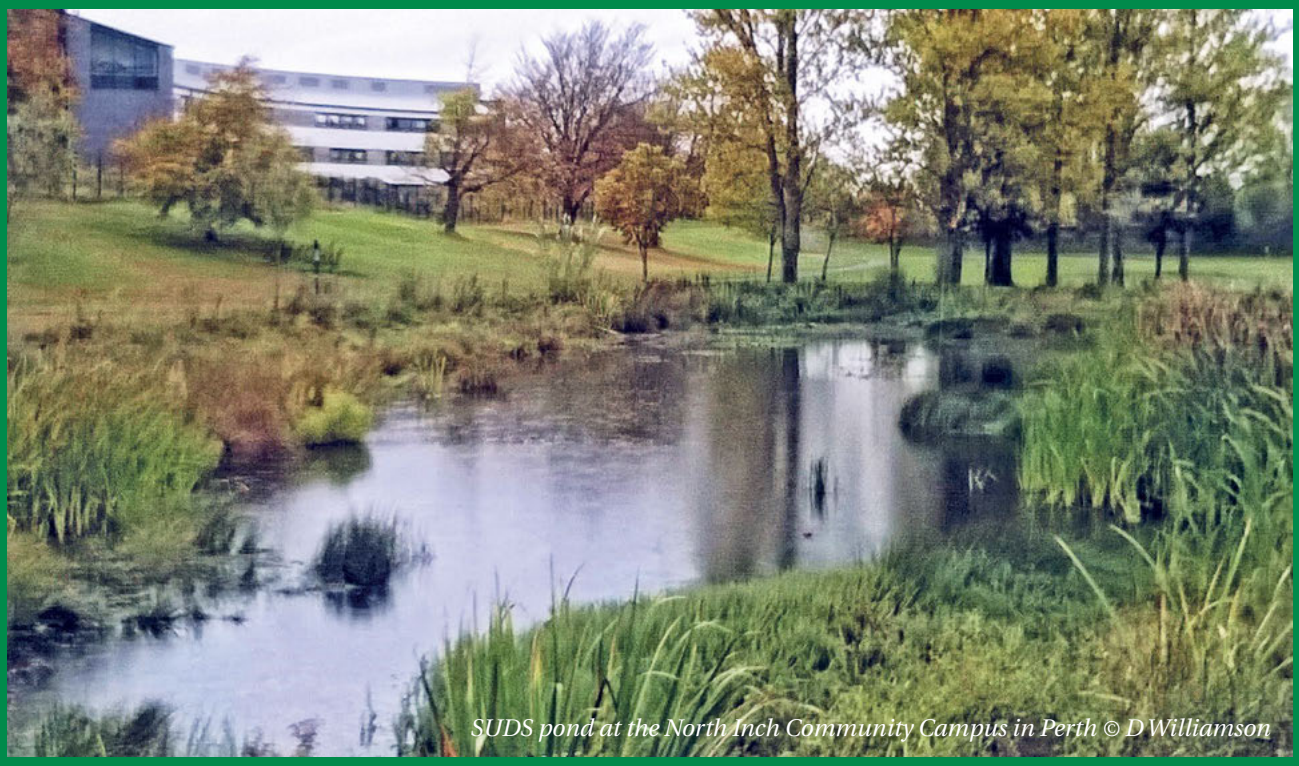
Changing patterns in weather will have far-reaching adverse effects on our wetlands. Countering this is a high priority.

Invasive Non-Native species (INNS)

INNS pose a growing serious threat as they can out-compete native species, resulting in serious changes and imbalance in ecosystem processes.

Riverbank erosion and sediment transfer © Kelly Ann Dempsey

SUDS and Biodiversity



SUDS pond at the North Inch Community Campus in Perth © D Williamson

SUDS, or Sustainable Urban Drainage Systems, are legally required for new developments and assist in the active mitigation of flooding, erosion and pollution without compromising the downstream water quality. Swales, detention basins, wetlands and ponds, as well as rain gardens, are the more visible aspect of urban drainage management and can be easily designed to enhance biodiversity, as well as safeguarding existing populations. Other drainage includes manufactured permeable surfaces, filter strips and underground storage.

SUDS, swales, wetlands and ponds can create an oasis for wildlife in the middle of a development area. They are regularly populated by amphibians, including toads, frogs and newts, and can support a high abundance of invertebrates. These mini-ecosystems can therefore also support birds and bats, making them an important haven for wildlife and a vital aspect in creating landscape-scale green corridors.

The SUDS allow for a natural drainage system that can also reduce the amount of roadside gullypots which need to be created, kept and maintained. These gullypots are natural traps for amphibians and other wildlife which are attracted to water. A Tayside study has shown that thousands of animals are entrapped over the course of a year. Whilst active mitigation in the study area helps where gullypots are present (in the form of wildlife kerbs and the experimental amphibian ladders), in just one local authority area there is still an estimated loss of 44,000 animals (mostly amphibians) from drain entrapment.

Water & Wetlands Actions Schedule

Key for timescale Short: 1-3 yrs **Medium**: 4-6 yrs **Long**: 7-10 yrs

Actions will be input into the UK Biodiversity Action System (UKBARS)where Lead Partners will be outlined

Maintaining & Improving Habitats

Action	Action breakdown	Who takes the action	Timescale
1 Support the creation, restoration or enhancement of ponds across Tayside to provide connectivity of this habitat across the region.	**Pond Doctor Community Projects** Create, restore and enhance 3 ponds or wetlands per year from 2017. **Amphibian Management Plans** Collate SUDS audits, mapping of ponds/SUDS within 1km of roads. Map amphibian migration routes and hotspots to ensure wildlife kerb, dropped kerb/amphibian ladder installation is mainstreamed.	Tayside Biodiversity Partnership Perth & Kinross Council Angus Council Scottish Green Infrastructure Group TayARG	Short/ medium
2 Reduce nutrient enrichment and pollution.	Improve or maintain the water quality classification of all lochs in Tayside.	Scottish Environment Protection Agency Scottish Water Perth & Kinross Council Angus Council Landowners and land managers; developers; angling clubs.	Long
3 Promote adoption of biodiversity-managed SUDS in developments.	Encourage SUDS audit and proactive management of SUDS and swales for biodiversity. Increase terrestrial habitat for amphibian species. Decrease eutrophication and point source pollution. Provide habitats for other wildlife. Support a Tayside Community SUDS Pond project.	Scottish Water Perth & Kinross Council Angus Council Scottish Environment Protection Agency Tayside Biodiversity Partnership Scottish Green Infrastructure Group ARC Trust TayARG	Long
4 Minimise pollution of watercourses from toxic substances and organic enrichment from poor farming practice.	Priority Catchment work – ensure best practice advice is available through dedicated projects and websites.	Scottish Environment Protection Agency Scottish Government Rural Payments and Inspections Directorate National Farmers Union Scotland Landowners and Land Managers Scottish Land & Estates	Long

Maintaining & Improving Habitats

Action	Action breakdown	Who takes the action	Timescale
5 Encourage better biodiversity management and protection of watercourses on farmland and forestry.	Explore follow on projects from the Pearls in Peril LIFE Project (Freshwater Pearl Mussel) within Tayside. Expand the UK Green Shoots initiative into Tayside. Support collaborative projects at all spatial scales which focus on riverine habitats and species. Promote awareness of appropriate tree planting approaches and best practice schemes. Maximise the use of social media to engage as wide an audience as possible.	Scottish Natural Heritage British Association for Shooting and Conservation Scottish Environment Protection Agency Scottish Rural University College Forestry Commission Scotland River South Esk Catchment Partnership National Farmers Union Scotland Scottish Land and Estates North East Green Network	Long
6 Maintain current mesotrophic lochs in Tayside.	Continue the Tayside Lochs Project, including the Lintrathen Loch Enhancement Project.	Scottish Environment Protection Agency Tayside Biodiversity Partnership Tayside Lochs Partnership Scottish Natural Heritage	Medium
7 Support flood alleviation schemes that improve habitat connectivity through natural landscaping or native tree planting.	Encourage strategic planting of broadleaf trees along watercourses to assist with flood attenuation and the creation of habitat corridors. Support ongoing projects e.g. Glen Clova Contour Planting Scheme Brechin Flood Prevention Scheme Almondbank Flood Prevention Scheme Strathallan Project Where appropriate, favour broadleaf against pine to reduce acidification of watercourses to safeguard Stonefly and Freshwater pearl mussel. Maintain an awareness of funding opportunities to instigate further projects.	Forestry Commission Scotland Angus Council Perth & Kinross Council UK Scoter Steering Group Landowners and land managers	Long
8 Minimise detrimental impacts of hydro-power schemes.	Protect riverine habitats and species, especially Freshwater pearl mussel, salmonid species, Otters, Water voles and River jelly lichen. Where appropriate, provide fish ladders to allow migration of salmon. Ensure sufficient flows remain downstream of dams and use freshets to mimic natural spates.	Scottish Environment Protection Agency Southern & Electric Scotland District Salmon Fishery Boards Angus Council Perth & Kinross Council Cairngorms National Park Authority	Medium/ long

Maintaining & Improving Habitats

Action	Action breakdown	Who takes the action	Timescale
9 Restore and enhance watercourse biodiversity.	Safeguard existing riparian habitats and enhance wherever possible. Reduce overfishing of river stocks. Encourage the removal of weirs to aid fish migration. Encourage restoration of watercourses by enhancing urban water quality through community engagement (especially the Perth Lade and the Dighty Burn). Identify and facilitate ongoing opportunities for riparian planting, biodiversity improvements as part of all Tayside Flood Prevention Schemes. Support the setting up of the Tay Western Catchment Project.	Angus Council Perth & Kinross Council River South Esk Catchment Partnership Tay Western Catchment Partnership Scottish Environment Protection Agency Scottish Natural Heritage Perth Lade Group Broughty Ferry Environmental Project	Long
10 Protect shingle-bank habitats.	Safeguard Priority Species from INNS. Control aggregate removal from rivers changing sedimentation. Explore fixed point photography opportunities in a range of wetland and riverine habitats.	Scottish Natural Heritage Scottish Environment Protection Agency Scottish Wildlife Trust	Short/ medium
11 Working in partnership, explore the implications of Eurasian Beaver *Castor fiber* in river catchments.	Work with Fisheries Boards and Catchment Initiatives to incorporate flood attenuation into management plans. Expand local knowledge of management techniques and disseminate lessons derived from UK beaver reintroduction projects. Encourage studies into added biodiversity value from beavers, especially dragonflies and damselflies, amphibians, otter and water vole, wetland and riparian birds and native fish populations. Research the potential for riparian planting grants to mitigate for any beaver damage or the species entering crop fields, traditional or community orchards.	Forestry Commission Scotland Scottish Wild Beaver Group Tayside Biodiversity Partnership Tay Landscape Partnership Fisheries Boards Amphibian and Reptile Conservation Mammal Society International Otter Survival Fund British Dragonfly Society British Trust for Ornithology River South Esk Catchment Partnership	Medium/ long

Maintaining & Improving Habitats

Action	Action breakdown	Who takes the action	Timescale
12 Research status of Lamprey in Tayside.	Research potential for Lamprey Pow Burn Project. Support habitat enhancement for Lamprey. Share good practice for the timing of river work where Lamprey is concerned.	District Salmon Fishery Boards Tayside Biodiversity Partnership Scottish Natural Heritage River South Esk Catchment Partnership	Medium
13 Mainstream mitigation to safeguard amphibian populations across Tayside.	Conserve and enhance amphibian populations by raising awareness of mitigation measures including amphibian ladders, wildlife kerbs, modified drains, etc. Expand Amphibians In Drains Projects across Tayside. Encourage the preparation, where appropriate, of Amphibian Management Plans at the design stage of new developments to incorporate dropped kerbs, modified drains and wildlife kerbs.	Tayside Biodiversity Partnership Tayside Amphibian and Reptile Group Friends of Angus Herpetofauna Perth & Kinross Council Angus Council Amphibian & Reptile Conservation	Long

Surveying & Monitoring

Action	Action breakdown	Who takes the action	Timescale
14 Survey and monitor the Tayside Water vole population.	Investigate further the Water vole population in Glen Clova and support actions to protect and enhance habitat for the population. Investigate the possibility of fissoral Water vole populations in Tayside. **Water Vole GIS Survey (Tayside)** Collate the Water vole data from SSE to share nationally (NBN and SNH) and locally (local authority GIS). **Loch Leven Water Vole Survey** Continue regular surveys to ascertain status of Water vole in/around Loch Leven. **Tay Landscape Partnership Riparian Mammals Survey** Undertake Mink control throughout TLP area. Ongoing coppice management and scrub clearance to increase light onto riverbanks. Control Himalayan balsam to improve favourable habitat. Ensure sympathetic pow and ditch management with biodiversity in mind. Create additional wetland habitat. Consider Water vole reintroduction and land management for natural reintroduction. Re-survey medium and low priority survey sites by 2025.	Scottish Natural Heritage Scottish Southern Energy Angus Council Perth & Kinross Council River South Esk Catchment Partnership Tay Landscape Partnership Tayside Biodiversity Partnership Mammal Society	Medium

Surveying & Monitoring

Action	Action breakdown	Who takes the action	Timescale
15 Distribute national information to pond creation groups.	**Pooling Our Ponds** Support the setting up of a Tayside School and Community Ponds Project. Encourage 50 x community surveyors to undertake quarterly pond surveys and expand the project by 2020. Undertake regular amphibian and dragonfly surveys of Tayside ponds.	Tayside Biodiversity Partnership North East Scotland Biodiversity Partnership North East of Scotland Biological Recording Centre Tayside Amphibian and Reptile Group British Dragonfly Society	Medium
16 Surveying for Unknowns in Tayside Rivers – eDNA national Research.	Undertake research to ascertain population status of Shad in Tayside rivers.	Scottish Natural Heritage Community groups	Short

Education & Awareness Raising

Action	Action breakdown	Who takes the action	Timescale
17 Increase public awareness of water and wetland habitats and species.	Engage residents groups, community councils and local environment groups in catchment-scale projects. **Perth Lade Project** Update Management Plan. With the community, prepare a Site Biodiversity Action Plan. Undertake conservation tasks to enhance the Perth Lade. Undertake interpretation and habitat improvement along Perth Lade. Provide training opportunities for volunteers to enhance riparian habitat for priority species. **Wildlife Ways Project** Enhance the landscapes where the rivers Tay and Earn meet. Reconnect residents and visitors with the natural, built and cultural heritage within the Tay Landscape Partnership area. Discuss future pow management with the Pow Commission. **Dighty Connect** Continue and expand community biodiversity projects along the Dighty. **River South Esk Catchment Partnership** Promote the value of wetland habitats and species in all ongong projects and social media and develop restoration opportunities where possible.	Tayside Biodiversity Partnership Amphibian and Reptile Conservation Froglife Buglife Scotland Plantlife Scotland Tay Landscape Partnership Broughty Ferry Environmental Project Perth Lade Group River South Esk Catchment Partnership Local Community Angus Council Perth & Kinross Council	Medium/ long

Education & Awareness Raising

Action	Action breakdown	Who takes the action	Timescale
18 Raise awareness about freshwater ecology and the role of the freshwater fishery in the local economy.	**Salmon in the Classroom** Continue programme to 2-4 local schools per annum. Expand the project to include Angus schools.	Perth & Kinross Council Angus Council District Salmon Fishery Boards – school field visits (electro-fishing and provision of eggs) SSE (advice only) Ranger Services, including Atholl Ranger Service	Medium
19 Raise awareness of water and wetland issues to Local Authorities, Community Planning Partners and the wider stakeholder network.	Report twice yearly to community planning thematic partnerships on project contributions to local and national Single Outcome Agreement objectives. Regularly provide biodiversity seminars and workshops to local authority staff on relevant legislation and good practice. Use social media and targeted websites to promote water and wetland issues to as wide an audience as possible.	Tayside Biodiversity Partnership Angus Council Perth & Kinross Council River South Esk Catchment Partnership	Long

Invasive Non-Native Species

Action	Action breakdown	Who takes the action	Timescale
20 Endeavour to reduce the direct pressures on riverine and wetland biodiversity and ecosystem health from invasive non-native species.	Encourage control and eradication of invasive non-native species (INNS) throughout Tayside: Support the Montrose Basin and River South Esk INNS Projects; expand the River Earn INNS projects. Monitor for the presence of American Signal Crayfish in the Pow Burn and Dighty Burn and if found remove in accordance with INNS procedures. Keep up-to-date the Tay Catchment INNS map and roll out similar maps to other Tayside catchments. Reduce the risk of the introduction of new INNS. Encourage the use of Plant-Tracker and Riverwatch schemes to detect and monitor INNS. Promote new INNS initiatives across Tayside e.g. the Scottish Invasive Species Initiative.	Esk Rivers and Fisheries Trust Scottish Wildlife Trust River South Esk Catchment Partnership Cairngorms National Park Authority Angus Council Perth & Kinross Council Loch Lomond and the Trossachs National Park Rivers And Fisheries Trusts of Scotland Landowners and land managers	Long
21 Secure multiple adjacent river catchments as breeding mink-free areas to protect significant populations of water vole, salmonids, ground nesting birds and other native riparian biodiversity.	**Scottish Mink Initiative** Continue to recruit and support volunteers who monitor for and subsequently trap American mink. Raise awareness of the negative impact American mink have on the environment. Survey and record native wildlife returning to previously unoccupied areas.	Scottish Natural Heritage Cairngorms National Park Authority University of Aberdeen Tay Landscape Partnership Rivers And Fisheries Trusts of Scotland	Long

2 Coastal & Marine Ecosystems

Auchmithie © Kelly Ann Dempsey

Background

For centuries people have used the coasts and estuaries of Tayside as a source of food, for sheltered anchorage and for trade. It is a landscape of great beauty, exhibiting a diversity of features from the muddy shallows of Montrose Basin, the sand dunes of Barry Links and the wide, nutrient-rich Tay Estuary. The variety of life supported by coastal habitats includes groups of dolphin and porpoise, shoals of commercially important fish, tiny zooplankton, resident seabirds and internationally-important numbers of migrant birds such as pink-footed geese.

The reedbeds in the Tay Estuary are the largest continuous stand of this habitat anywhere in Britain, one of the largest in Europe - and they are the only place in Scotland where the rare Bearded tit breeds. The beds of seagrass and seaweed also provide important nursery grounds for flat fish in the summer and food for ducks and geese in winter. The coasts and estuaries are under increasing pressure from human activity – commercial fishing, recreational use, climatic erosion, the development of urban areas and ports, to name just a few.

Marine ecosystems are particularly difficult to access and understand, although more is known about coastal habitats and our influence upon them. Increased consultation and work between those influencing these habitats has resulted in a better understanding for the value of coasts and estuaries in Tayside. This has engendered a greater willingness to work together to conserve and enhance the habitats, at the same time as managing change.

Objectives

1 **Endeavour to reduce the direct pressures on coastal and marine biodiversity by implementing projects to enhance ecosystem health**

2 **Safeguard coastal and marine ecosystems, species and genetic diversity by enhancing connectivity and where possible preventing its decline**

3 **Mainstream biodiversity conservation action by raising awareness and the enjoyment of marine and coastal ecosystems of local communities**

Priority Habitats

- Saltmarsh
- Intertidal mudflats & Estuarine Reedbeds
- Marine
- Maritime cliffs
- Sand dunes


Montrose beach © Kelly Ann Dempsey

Key Sites

Estuaries

Firth of Tay & Eden Estuary SPA 6,923.29 hectares

Firth of Tay & Eden Estuary SAC 15,412.53 hectares

Firth of Tay & Eden Estuary Ramsar 6,918.42 hectares

Inner Tay Estuary SSSI 4,115.38 hectares

Inner Tay LNR 1,176 hectares

Montrose Basin SPA, Ramsar, SSSI, LNR approx. 986 hectares

St Cyrus and Kinnaber Links SSSI 304.91 hectares

Lunan Water
Elliot Links SSSI 27.1 hectares

Pitairlie Burn
Buddon Burn

Barry Links SSSI 1027.51 hectares

Monifieth Bay SSSI 199.23 hectares

Maritime Cliff & Slope

Whiting Ness (next to Victoria Park in Arbroath) to Ethie Haven – most of this is covered by Whiting Ness to Ethie Haven SSSI – 136.17 hectares

Rickle Craig (at the north end of Lunan Bay) to Scurdie Ness (just south of Montrose at Ferryden) which is all designated as an SSSI. – 72.17 hectares

Barry Links is also notified as an SAC and the Firth of Tay & Eden Estuary SAC/SPA/Ramsar

Sand Dunes

The northern part of **Charleton and Kinnaber Links to Montrose** is included within the St Cyrus & Kinnaber Links SSSI

The **Arbroath to Broughty Ferry** area includes Elliot Links SSSI, Easthaven SSSI (designated for Greater yellow rattle), Barry Links SSSI and Monifieth Bay SSSI


Carlinheugh © VisitScotland

Key Species

- Wintering waterbirds, including Pink-footed and Greylag geese
- Cetaceans
- Maritime plants, including Zostera spp.
- Breeding seabirds
- Coastal invertebrates


Eider duck © John Crichton

Angus Cetacean Awareness Project

The cetacean survey incorporating the coast from the Tay to St Cyrus continues to focus on the collection of anecdotal sightings data from the Angus community, awareness raising and the promotion of coastal locations in Angus. The website www.marinelifeangus.co.uk was launched on the International Day of Biodiversity (May 2012) and is promoted by small business card size cards and a colourful poster. These are distributed to a wide range of visitor attractions along the Angus and Aberdeenshire coasts. The website reaches a wide audience having been promoted by VisitScotland on their website and on the new Angus Ahead website.

Since recording began in 2011 sightings from members of the Angus community have included Bottlenose dolphins, Minke whale, Harbour porpoise, Common dolphin and even Humpback whales have occurred at many locations along the coastline of Angus. All sightings are fed into national recording schemes and help to conserve species and habitats.

Dolphin watching, River Tay © Kelly Ann Dempsey

Adult Small blue butterfly © Barry Prater

Back From The Brink:

Using a local, collaborative approach to aid in the rescue of a vulnerable, fragmented *Cupido minimus* population in North East Scotland.

Butterflies are a species like many others that are vulnerable to 21st century anthropogenic threats such as climate change, habitat destruction and unsympathetic land management practices. The UK has seen a decline in many species and our smallest native species the Small Blue (*Cupido minimus*) has seen a great decline in numbers over recent years. Scotland holds some strongholds for the butterfly but in recent times, they too have faced challenges that have led to the demise of populations.

The fragmentation of colonies has been identified as the most limiting factor on population size followed by a decline in the favoured plant host Kidney vetch (*Anthyllis vulneraria*).

Angus has suffered the same declines as the rest of the UK but still has pockets of populations of both species. Surveys have been carried out at locations along the coastline since the late 1970's in a generally sporadic manner. This has produced a wealth of data which has recently been revisited by Butterfly Conservation and the Tayside Biodiversity Partnership. Records of Small blue are numerous whilst Kidney vetch data is not so. Since 2012 both organisations have worked together to facilitate annual surveys of both species along the coastline. Historical survey materials and current Scottish Wildlife Trust and Scottish Natural Heritage survey data from Seaton Cliffs Local Nature Reserve and St Cyrus National Nature Reserve respectively, have been used as a starting point for where to focus survey effort. Investigation will hopefully lead to the discovery of extant populations.

Ecosystem Services & Ecosystem Scale Projects

Ecosystem Services

- Coastal protection from floods and storm surges
- Climate regulation
- Biomass storage
- Photosynthesis and oxygen production
- Renewable energy
- Water quality regulation
- Seafood
- Recreation and leisure
- Health and wellbeing
- Tourism

Ecosystem Scale Projects

Angus Maritime Plant projects – monitoring and restoring sea pea and kidney vetch populations.

Linking & Exploring Tayside's Coastal Wildlife Sites – Marine Life Angus website and Nature on Track.

Treating invasive coastal species – Himalayan balsam at Montrose Basin NNR, Japanese rose and gorse at Elliot links and intertidal species first defence monitoring.

Beach cleans along the length of the Angus coastline.

Angus coastal butterfly projects – Small blue and Grayling surveying, monitoring and habitat enhancement projects.

Shore Thing Survey © Kelly Ann Dempsey

Pressures

Erosion

Unless artificially constrained, seaward dune edges can be highly mobile. Few dune systems are in overall equilibrium and generally the Tayside coast demonstrates net erosion. Limited natural erosion helps regenerate dune systems, but the survival of the biological interest and the actual structure may be at risk if it increases excessively.

Development & Sea defences

Pressure, especially on the older dune systems, continues with further developments proposed leading to the destruction of this habitat. Many dune links are now golf courses where fertilisers, herbicides and irrigation are used for 'improving' the vegetation. Car and caravan parks widen access and increase trampling, fires and disturbance. Many dune systems are affected by coastal defence works that arrest the formation of new dune systems and affect the dynamism of dune systems. Offshore pressures have increased and the installation of oil and gas platforms, marine turbines and supporting cable infrastructure all have varying effects on the coastal and marine environments.

Climate change

Sea level rise and increased storms forecast as global climates change may cause foreshore steepening, thus allowing increased wave attack at the base of the dunes. Marine invasive species may also find it easier to colonise new areas. Higher carbon dioxide levels in the atmosphere are making oceans warmer and more acidic, affecting the health and distribution of species and species interactions.

Recreation

The coast and its sand dune systems offers easy access by local residents and visitors and provides opportunities to watch wildlife, pursue outdoor sports such as golf, or simply walk, contemplate and seek inspiration. However, such a major land use causes damage to vegetation, exposes the underlying sand to the wind and rain and results in the loss of vegetation and sand. Rehabilitation of such areas can be carried out, but it often takes years for the natural diversity to become re-established. On our seas, pressures can come from water sports such as boating, jet-skiing and irresponsible cetacean watching.

Grazing

Whilst continued grazing is necessary to maintain the grassland and to prevent scrub development, overgrazing can have damaging effects. Undergrazing is more widespread, allowing vegetation to be invaded by coarse grasses and scrub.

Other pressures include: nutrient enrichment from farmland and waste effluent, marine pollution, bait digging, laying of cables and pipelines, the introduction of new or non-native species, maintenance dredging, shipping accidents, beam trawlers and scallop dredgers, waste tipping.

Common terns at home on the artificial raft © SWT

Montrose Basin Tern Raft Project

A raft was designed and built in 2008 at Montrose Basin, the enclosed estuary of the River South Esk, intended to support breeding Arctic Terns in the area.

Locally, Arctic Terns had been known to breed on rooftops of businesses in Montrose town. 'Urban' terns developed an uneasy relationship with local businesses as their territorial behaviour included dive-bombing workers and customers entering the premises. The Scottish Wildlife Trust approached local company, Glaxo Smith Kline, seeking funding for a raft on the Local Nature Reserve intended to provide an alternative nest site for Arctic Terns. GSK provided £10,000 funding; a further £2,000 was received from SNH.

The raft aptly named 'Maid of Sterna Stuff' was installed on 5th June 2008 and moored in a subsidiary channel of the River South Esk meaning it floats on all tides to protect the nest site from land based predators. Though both Arctic and Common Terns prospected the nest site it was quickly established that only Common Terns were nesting there and in subsequent years, only Common Terns have approached the raft.

The nesting effort on the raft has fluctuated greatly since 2008 with 2011 being the most successful year to date with 150 hatchlings. In 2012 and 2013 breeding was attempted and eggs observed however nests were thought to have flooded during the heavy continuous rainfall experienced. Fledgling success varies year on year.

Coastal & Marine Actions Schedule

Key for timescale Short: 1-3 yrs **Medium**: 4-6 yrs **Long**: 7-10 yrs
Actions will be input into the UK Biodiversity Action System (UKBARS)where Lead Partners will be outlined

Maintaining & Improving Habitats

Action	Action breakdown	Who takes the action	Timescale
1 Restore maritime plant species numbers and genetic diversity where possible, by preventing decline, supplementary planting and enhancing species connectivity.	**Kidney Vetch** Survey Kidney vetch along the Angus Coast annually (and inland where appropriate). Use fixed point photography at identified sites to monitor plant number fluctuations. Carry out seed collection, growing on and supplementary broadcast sowing and planting at suitable sites. Monitor land use regimes on identified sites encouraging favourable management techniques. **Sea Pea Project** Identify historical or new sites for planting sea pea grown locally at Dundee Botanic gardens. Monitor replanting and plant colonisation. **Greater Yellow Rattle** Monitor coastal population and spread. Carry out site works to improve habitat for plant spread particularly at Easthaven SSSI. Support new projects which identify additional threatened species.	Angus Council Scottish Natural Heritage Scotia Seeds Tayside Biodiversity Partnership Landowners Dundee Botanic Gardens Easthaven Together Community groups	Long
2 Promote the sustainable development of the partnership area coastline through increased policy integration.	Ensure that TAYplan (Strategic Development Plan), Angus Local Development Plan and the Angus Shoreline Management Plan 2 in Angus take into account the sustainable development of coastal units. Promote Integrated Coastal Zone Management as a means of sustainably managing the coast in accordance with National Marine Plan. Annually produce updates for Public Bodies Duty reporting. Annually produce updates for Local Authority statutory biodiversity reporting against the 2020 Challenge.	Angus Council Scottish Natural Heritage Tayside Biodiversity Partnership Tay Estuary Forum	Long

Maintaining & Improving Habitats

Action	Action breakdown	Who takes the action	Timescale
3 Endeavour to reduce the direct pressures on coastal and marine biodiversity by implementing litter reduction and beach clean projects enabling the enhancement of ecosystem health.	Identify all areas of the Angus coastline where regular beach cleans take place and facilitate coordination of new activity at sites of limited action. Identify new projects to tackle littering at problem sites in line with Scotland's Marine Litter Strategy. Raise awareness of microplastic-type pollution and the damage caused to marine and coastal environments and species by supporting projects such as the Great Nurdle Hunt and Beat the Microbead Campaign. Investigate the reduction of use of Chinese lanterns and organized balloon releases by awareness raising, supporting the "Don't Let Go" campaign and appropriate policy implementation.	Angus Council Scottish Natural Heritage Tayside Biodiversity Partnership Voluntary Action Angus Friends of the Earth Community groups Community Councils Marine Conservation Society Marine Life Angus FIDRA	Long
4 Support saltmarsh habitat enhancement and species and showcase best practice land management techniques.	Maintain species richness found within the different saltmarsh zones: upper, middle and lower, including transition saltmarsh habitats such as reedbed and swamp. Identify areas where grazing can be more intense to create a sward attractive to wintering and passage wildfowl and waders. Montrose Basin: Source funding to install and maintain fencing in the areas being encroached with juncus to secure grazing livestock.	Scottish Wildlife Trust River South Esk Catchment Partnership Angus Council Landowners and Land Managers	Long

Maintaining & Improving Habitats

Action	Action breakdown	Who takes the action	Timescale
5 Support sand dune system restoration projects and species management programmes.	Remove invasive plants such as gorse, hawthorn, sycamore and rose species. Explore options for fencing to protect sensitive habitats from disturbance. Elliot Links SSSI – encourage better conditions for Sea pea (*Lathyrus japonicus*) reintroduction. Consider planting of Kidney vetch as part of a wider Kidney vetch connectivity project. Promote and develop other demonstration sites for the restoration of dune vegetation, particularly in areas which are experiencing human-induced pressures. Encourage additional conservation and enhancement measures that support the natural heritage importance of Barry Buddon, taking into consideration the MoD operations. Encourage golf course management polices and practice which take into consideration the flora and fauna of sand dune systems.	Angus Council Scottish Natural Heritage Dundee Botanic Gardens Tayside Biodiversity Partnership Ministry of Defence Angus County Golf Association Scottish Golf	Long
6 Support and encourage collaborative regional working for both green networks and blue spaces (i.e. watercourses, coasts and wetlands).	Identify and promote "cross-boundary" opportunities, such as joining up path, habitat and other network elements between local authorities, Biodiversity Partnerships and other geographically based organisations. Share and promote good practice to other land users and in collaborative working between partners. Help co-ordinate regional scale projects, surveys, etc. and advise on funding. Encourage sustainable grazing on cliff and slope SSSIs and other coastal grazing areas as appropriate. Work with a wide range of partners in supporting integrated coastal management and marine planning. Act as an informal network to highlight projects being developed and create opportunities of scale and collaboration.	Scottish Environment Protection Agency Tayside Biodiversity Partnership Scottish Natural Heritage Angus Council Perth & Kinross Council Cairngorms National Park Authority Forestry Commission Scotland Scottish Government Rural Payments & Inspections Directorate Tay Estuary Forum Landowners and land managers North East Green Network	Medium

Surveying & Monitoring

Action	Action breakdown	Who takes the action	Timescale
7 Investigate the effects of climate change on the movement of marine invasive intertidal species through regular surveying and monitoring.	Generate records of marine wildlife by facilitating intertidal Shore Thing biological surveys at sites around the Angus Coast. Raise awareness of marine species and conservation amongst the wider community.	Tayside Biodiversity Partnership Angus Council Scottish Wildlife Trust Marine Biological Association Marine Life Angus	Long
8 Investigate cetacean spatial and temporal distribution patterns in Angus waters.	Generate sightings records through targeted media such the Angus Cetacean Awareness Project and the website www.marinelifeangus.co.uk. Analyse sightings data submitted to website. Promote the availability of data and disseminate to relevant organisations.	Tayside Biodiversity Partnership Scottish Wildlife Trust Scottish Natural Heritage Marine Life Angus	Long
9 Support tern populations and encourage appropriate site management.	Review the Tayside Terns Information & Code of Practice leaflet; feature it on appropriate websites and create a poster for distribution. Review the existing nesting sites, including the tern raft at Montrose Basin and advise on additional safeguarding of the sites, if appropriate, e.g. signage to reduce human and dog disturbance. Review inappropriate nesting sites such as industrial site roof-tops and advise on management.	Tayside Biodiversity Partnership Scottish Wildlife Trust Scottish Natural Heritage Marine Life Angus	Long
10 Support projects and surveys that provide an understanding of coastal bird ecology.	Undertake annual Beached Bird Survey along the Angus coast.	Royal Society for the Protection of Birds	Long
11 Survey and monitor threatened coastal butterfly populations.	**Small Blue** Collect annual survey data for Small blue sightings along the Angus coast and inland where appropriate. Verify data regularly to develop a management and monitoring strategy. Investigate the potential improvement of connectivity of populations along the coast and experiment with broadcast Kidney vetch seed and planting of established pot-grown Kidney vetch plants at specified sites (with the landowners' permission). Expand the project to inland Angus, in particular potential disused railway sites and quarries.	Butterfly Conservation Scotland Tayside Biodiversity Partnership Angus Council Angus County Golf Association Landowners and land managers Community groups Dundee Naturalist's Society	Long

Surveying & Monitoring

Action	Action breakdown	Who takes the action	Timescale
	Grayling Collect annual survey data for grayling sightings along the Angus coast. Verify data regularly to develop a management and monitoring strategy.		
12 Survey and monitor breeding Eider populations.	**Montrose Basin LNR** Collect bi-annual survey data for breeding Eider populations on the Montrose Basin Local Nature Reserve. Analyse collected data bi-annually and investigate any changes in trends. Investigate the possibility of improving the habitat for the breeding population including the introduction of artificial shelters. Humanely control predators at the breeding site including foxes, mink and crows to a sustainable level. Maintain a minimum level of human disturbance at the breeding site.	Scottish Wildlife Trust Angus Council	Long
13 Develop fixed point photography investigation to explore habitat and species change.	Monitor Kidney vetch density at chosen sites to understand the variability of plant numbers annually. Identify partners using fixed point photography to monitor erosion at coastal sites.	Tayside Biodiversity Partnership Angus Council Tay Estuary Forum Landowners and land managers University of Dundee	Long
14 Support a Tay Reedbed Invertebrates Study.	Set up a citizen science survey project to study the wide invertebrate interest in the Tay reedbeds.	Dundee Naturalists Society Buglife Scotland	Long
15 Build on a baseline study of Sparling, also known as European Smelt (*Osmerus eperlanus*) undertaken in 2009 to identify and map spawning sites on the Tay.	Identify further survey effort required, particularly looking at population density and spawning. Also, investigate potential impact of climate change. Source funding for further survey work. Consider conservation targets for the species to ensure the survival of the population on the Tay in to the future. Potentially source further funding to support conservation targets.	Tay Salmon Fisheries Company Scottish Natural Heritage Landowners and land managers	Long
16 Support and promote intertidal species monitoring projects.	Encourage community participation in citizen science projects along the Tayside coast e.g. Capturing our Coast.	Tayside Biodiversity Partnership Scottish Association for Marine Science Marine Life Angus Community groups	Medium

Education & Awareness Raising

Action	Action breakdown	Who takes the action	Timescale
17 Increase awareness of cetaceans in Angus waters and facilitate community participation in data recording.	Promote the website www.marinelifeangus.co.uk and the Angus Cetacean Awareness Project, a dedicated project where community sightings of cetaceans in Angus waters can be submitted to a central database. Focus on awareness raising through local and national press, specialist publications and events. Develop web and social media presence focussing on the media used by local communities and tourists e.g. VisitScotland and Angus Ahead websites.	Marine Life Angus Tayside Biodiversity Partnership Community groups Seawatch Foundaton	Long
18 Raise awareness of endangered coastal butterflies and encourage community participation in conservation.	**Small Blue** Provide survey training for recorders and volunteers for Small blue and other coastal butterflies where appropriate. Produce and reprint postcards and posters to raise awareness of the ongoing project. Expand the project to include the North East Biodiversity Partnership area - especially St Cyrus NNR. Annually prepare and circulate updates on survey work, publicity and volunteers.	Butterfly Conservation Scotland Tayside Biodiversity Partnership Angus Council Landowners and land managers Community groups	Long
19 Encourage school age participation in projects relating to marine and coastal issues.	Facilitate a "Keep the Sea Free of Debris!" Art Contest as a regular competition for schools to tie into curriculum projects highlighting the impacts of marine debris and how to minimise it. Raise marine debris awareness year-round by developing a Marine Debris Calendar using contestant entries. Promote Scottish Wildlife Trust educational activities at Montrose Basin Wildlife Centre. Encourage reporting to surveying schemes such as the Angus Cetacean Awareness Project, Small Blue project, Shore Thing, Marine Conservation Society projects, WeBS etc.	Tayside Biodiversity Partnership Angus Council Scottish Wildlife Trust Butterfly Conservation Scotland Marine Conservation Society Marine Life Angus	Long

Education & Awareness Raising

Action	Action breakdown	Who takes the action	Timescale
20 Promote local recorders, clubs and biodiversity open days.	Maintain an up to date database of local recorders and specialist clubs. Utilise the skills of local recorders and clubs to target specific projects including local BioBlitzes. Encourage local open days and promote to the partnerships extended network. Research the possibility of setting up a Seashore Project based on the success of the Highland Seashore project - raising awareness of our marine and seashore wildlife. Investigate the potential to set up an Angus Coastal Festival with a wide range of partners to raise awareness of coastal issues and encourage citizen science surveys.	Tayside Biodiversity Partnership Tayside Recorders' Forum Scottish Wildlife Trust Butterfly Conservation Scotland Scottish Natural Heritage Marine Life Angus Marine Conservation Society	Medium
21 Encourage responsible interactions when encountering marine and coastal wildlife minimising disturbance potential.	Promote The Scottish Marine Wildlife Watching Code through social media and publications. Investigate the Dolphin Space Programme being rolled out to Tayside boat trip providers.	Tayside Biodiversity Partnership Angus Council Scottish Natural Heritage Marine Conservation Society Taymara	Long
22 Raise awareness of marine and coastal issues to Local Authorities, Community Planning Partners and the wider stakeholder network.	Report twice yearly to community planning thematic partnerships on project contributions to local and national Single Outcome Agreement objectives. Regularly provide biodiversity seminars and workshops to local authority staff on relevant legislation and good practice. Use social media and targeted websites to promote marine and coastal issues to as wide an audience as possible.	Tayside Biodiversity Partnership Angus Council Perth & Kinross Council Marine Conservation Society	Long
23 East Scotland Sea Eagle Education Project.	Engage schools in East Scotland with the story of the Sea Eagle reintroduction through a series of tailored outreach programmes.	Royal Society for the Protection of Birds	Short

Invasive Non-Native Species

Action	Action breakdown	Who takes the action	Timescale
24 Endeavour to reduce the direct pressures on coastal and marine biodiversity and ecosystem health from invasive non-native species.	Facilitate the production of a map of the coast highlighting key areas threatened by invasive non-native species. Limit the spread of the invasive non-native species such as Himalayan balsam, Giant hogweed and American Mink at coastal sites e.g. Montrose basin LNR. Raise awareness of invasive non-native species and demonstrate the impact that can be achieved by labour intensive control. Facilitate work party days with volunteer input to carry out control. Showcase good practice control effort e.g. controlled re-growth at SWT Montrose Basin control project.	Angus Council Scottish Wildlife Trust Tayside Biodiversity Partnership Voluntary Action Angus Scottish Natural Heritage River South Esk Catchment Partnership Scottish Mink Initiative Esk Rivers and Fisheries Trust	Long

3 Urban Ecosystems

Wildflower roundabout, Perth © Beautiful Perth

Background

Urban areas, from small villages to larger towns and cities provide invaluable space for wildlife. Across Tayside there are wildlife garden projects and wildflower areas in communities within care homes, school grounds, churchyards, and industrial estates all providing valuable greenspace. The surrounding golf courses include wildlife-rich ponds that host amphibians and dragonflies and rare insects, waxcap fungi and lichens find homes in a range of surprising urban settings. Urban bluespaces - watercourses, ponds, sustainable urban drainage systems (SUDS) and rivers support biodiversity and there are opportunities to manage them with this in mind.

The built environment is as important as the greenspace surrounding it - buildings can all support wildlife. In addition to safeguarding the wildlife utilizing older buildings, new developments are now including integral bird nestboxes and bat roosts. Living roofs are becoming more common on public buildings, such as schools, as well as on architect-designed properties and mature trees are increasingly being retained within new developments and road-widening projects to improve the visual aspect of the landscape as well as safeguard biodiversity. Greenspace and private gardens create a buffer between the built environment and surrounding countryside.

Well-managed urban greenspace greatly helps mitigate against the effects of climate change: sustainable urban drainage ponds, swales and rain gardens reduce the effect of flash floods and ecosystem services provided by 'living', 'green' or 'brown' roofs, helps reduce both the urban heat island effect and the impact of summer storms. With the intensification of agricultural practices urban species are all the more precious, especially where pollinating insects are concerned. Grassland

and woodland alongside railways, roads and watercourses provide important habitat for a range of species.

Importantly, urban greenspace directly contributes to physical and mental well-being by way of recreation and volunteering opportunities. Community orchards and allotments are important refugia for a variety of species and help to safeguard genetic diversity, especially where Scottish fruit varieties are concerned. Everyone can help increase biodiversity in urban areas: leaving gaps under fences to allow hedgehogs to move between gardens, creating ponds, growing bee-friendly plants to encourage pollination, or planting berried trees to help feed the birds and provide spring blossom. There are some 23 million gardens across the UK so they create a web of wildlife corridors which enable many species to colonise or forage across a huge area.

Objectives

1 **Endeavour to reduce the direct pressures on urban biodiversity by implementing projects to protect and restore ecosystem health**

2 **Safeguard urban ecosystems, species and genetic diversity by enhancing their connectivity and where possible preventing decline**

3 **Mainstream actions for biodiversity conservation by raising awareness of the benefits of the natural environment and the services it provides for the enjoyment of the local communities**

Priority Habitats

- Riparian corridors
- Open Mosaic habitats, including brownfield sites
- Urban woodland and community orchards
- Pollinator networks
- Green roofs
- Species rich verges
- Designed landscapes


© CAG Lloyd

Key Sites

- Buildings, including open spaces, bridges and walls
- Urban corridors: waterways, railways, roads and paths
- Businesses with Land, including golf courses and industrial estates
- Healthcare and Education premises, including care homes
- Burial Grounds (Kirkyards and Cemeteries)

Key Sites Designated

Tay (SAC) & catchment tributaries
Kinnoull Hill, Perth
River South Esk (SAC)
Birks of Aberfeldy
Weem Meadow Aberfeldy
Loch Leven, Kinross
Comrie Woods, Comrie

Key Species

- Mammals, including Red Squirrel, Bat and Hedgehog
- Birds, including Swift and House Sparrow
- Amphibians, including Common Toad
- Pollinators, including bees and butterflies
- Invasive non-native species, e.g. Japanese Knotweed, Grey Squirrel


Common frog © SNH

Green Graveyard Initiative

Churchyards are sanctuaries for the living as well as the dead. The Perth & Kinross Heritage Trust's project in East Perthshire achieved a suite of sustainable management initiatives with the support of the SITA Tayside Biodiversity Action Fund. Wildflowers were established around headstones to safeguard lichens from herbicide usage, Red squirrel feeding areas and bat and bird boxes were included at each site, and hedges planted to give refuge to insects, birds and small mammals. Reptiles and amphibians were also considered when improving stonework and boundary walls. The Scottish Churchyard Lichen Group's fieldwork in the graveyards discovered 176 lichen species, 30 of them very rare. Astonishingly there were two new British records: a tiny crustose lichen *Lecanora invadens* and a lichen parasite, *Sclerococcum tephromelarum,* found growing on the black shields lichen *Tephromela atra.*

The Tayside Green Graveyard Initiative continues to work with churches and Eco-Congregations across Tayside. The article 'Kirkyard Heritage: Graveyard Conservation in Scotland', co-authored by Dr Susan Buckham and the Tayside Biodiversity Co-ordinator, featured in the 2013 Historic Churches journal and is now available on the Building Conservation website. The Perth & Kinross Tree Wardens Network hope to set up a Church Yew project and Tayside Biodiversity partners are considering a Swifts & Bats in Churches project.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Brownfield Site Management

Muirton's Buzzing Project, Perth

Over 97% of wildflower meadows have been lost in the UK since the Second World War and the loss of these habitats has resulted in the decline in many of our pollinating insects. The site selected for the creation of a wildflower meadow for this project was in an area with a stalled housing development in Muirton in the north of Perth. Habitat creation involved planting a native wildflower seed mix including 21 species of annuals, biennials and perennials as well as the creation of two bee banks.


Muirton © Buglife Scotland

Members of the local community were involved throughout the project. A talk to a class from a local primary school promoted the importance of invertebrates, especially pollinating insects and what people can do in their gardens to help bugs.

The class, along with members of the local community, helped plant wildflowers and later, on site, the community groups and council planners discussed the importance of brownfields.

This pilot project involved Buglife Scotland, Perth & Kinross Council and the Tayside Biodiversity Partnership. The wildflower meadow added colour and life to the area, as well as providing important foraging habitat for a suite of pollinating insects including solitary bees and hoverflies and all six bumblebee species. Together with the surrounding brownfield land, the meadow also provided a home for a wide number of other wildlife species.

Ecosystem Services and Ecosystem Scale Projects

Ecosystem Services

- Flood management and natural attenuation
- Climate regulation
- Food production and waste management
- Recreation and leisure
- Health and wellbeing
- Tourism

Ecosystem Scale Projects

- Swift Conservation Project – community-based projects across the area: safeguarding existing natural nest sites and creating new nest sites.
- Biodiversity Villages Project – local communities, groups, churches and schools enhancing local greenspace for biodiversity.
- Green Graveyard Initiative – partnership working to enhance existing and new graveyards.
- BeeWild projects for Businesses, Care Homes and Day Care Centres.
- Going the Whole Hog – providing hedgehog hibernation boxes, wildflower plants and wildlife gardening advice within Angus schools.
- Control of invasive non-native species – River South Esk and the Scottish Wildlife Trust's Save Scotland's Red Squirrels.
- Urban Grassland Management, e.g. Muirton's Buzzing Project (Perth) and Monifieth Wildflower Meadow.
- Recreation and Well-being – including walking, cycling, sports, volunteering, gardening, visiting public greenspace.

Pressures

Development

Poor planning at the masterplan stage of development can lead to the fragmentation of species populations, loss of notable or veteran trees and hedgerows, together with destruction of wildlife habitats.

Pollution, Pesticides and Litter

Vehicle exhausts fumes; industrial leakage, oil and salt from the road surface all have a direct impact on wildlife, especially trees, amphibians, invertebrates and birds. Over-use of chemicals to control insects and weeds seriously impacts the diversity of urban wildlife, including woodworm treatment in attics which can destroy bat colonies.

Wildlife Crime

Trees illegally felled, hedges trimmed and scaffolding erected during bird and bat breeding season, and wildflowers uprooted (especially the native bluebell) are all common occurrences of urban wildlife crime.

Invasive Non-Native Species

A range of plant and animal species impact on native biodiversity and have a serious detrimental effect. Plant species can outcompete natives and cause erosion. The New Zealand Flatworm *Artioposthia triangulata* is well-established in Tayside and is causing the eradication of native earthworms in farmland and garden soils. This has a direct impact on soil fertility and mammals such as moles.

Himalayan Balsam © Kelly Ann Dempsey

Swift © Bev O'Lone

Swift Conservation in Tayside

Stanley Community Swift Project

The idea of a Stanley Swift Project came about during an evening Wildlife Walk in Stanley in the summer of 2014. The wildlife walkers were delighted to hear that Stanley is a hot spot for swifts in Perthshire and said that it would be great to do whatever they could as a community to not just protect them, but also ensure the birds continue to have a safe place to return to and breed each year after their 6,000 mile migration back from Africa.

In July 2014, a small group of keen volunteers undertook a survey of swift numbers and nest sites in the village. They surveyed the area three times at weekly intervals on beautiful summer evenings and counted – as best they could – given the sweeping and swirling of ever– changing group sizes in the skies above them, the swift screaming parties. The village residents also added information from sightings in between times.

There were frequently groups of about 40 swifts, and once or twice the numbers increased to around 70 to 80 birds, which at that time of year is likely to have included late arriving nonbreeding juveniles.

Through their observations, the group began to recognise when birds were gathering to roost, and by standing and watching carefully 15 nest sites were located as the birds whizzed in for the night, which would mean 30 breeding adults. Most of the nest sites were in eaves behind gutters or fascias, but one excellent bit of news was that one of the nest boxes recently installed on the Tayside Hotel was found to be occupied by a pair of swifts. The 15 nest sites were recorded on street maps provided by Perth and Kinross Council and the information will contribute to the "dots on maps" survey work that is going on throughout Tayside.

The group hopes more people will want to become involved in Stanley so that a full picture of swift activity in the village can be built up and the information shared with Tayside Swifts. They will continue to raise awareness about this special bird, help to improve their protection, install nest boxes and aim to at least maintain or ideally increase swift numbers in the village over the coming years.

The Carse of Gowrie Swift Conservation Project was the first of its kind in Tayside, working with the local community in surveying nest sites and helping to safeguard them in the future. The Kirriemuir Swift Conservation Area Regeneration Project followed and there are numerous ongoing projects in Strathearn, as well as in Stanley.

Urban Ecosystems Actions Schedule

Key for timescale Short: 1-3 yrs **Medium**: 4-6 yrs **Long**: 7-10 yrs
Actions will be input into the UK Biodiversity Action System (UKBARS)where Lead Partners will be outlined

Maintaining & Improving Habitats

Action	Action breakdown	Who takes the action	Timescale
1 Encourage utilisation and upgrading/creation of Urban Greenspaces.	**Urban Greenspace Project** (incorporating community orchards, allotments and community gardens) Establish best practice projects with local communities. Raise awareness of health and wellbeing benefits. Raise awareness of grassland maintenance and creation for biodiversity. Develop the Inch area at the Brechin Flood Prevention Scheme site and provide outdoor classroom activities. Distribute the Tayside Biodiversity Partnership's "Making Way for Nature" advisory booklet.	Angus Council Perth & Kinross Council Tayside Biodiversity Partnership Tay Landscape Partnership Hillcrest Housing Association Trellis LandLife NHS Scotland Scottish Natural Heritage Perth & Kinross Heritage Trust River South Esk Catchment Partnership Sustrans	Medium
2 Promote the sustainable development of the Partnership urban areas through increased policy integration.	Ensure that TAYplan (Strategic Development Plan), Perth & Kinross and Angus Local Development Plans take into account the sustainable development of urban areas. Encourage the integration of biodiversity management and innovative projects in place-based policies or community initiatives, including town and city plans, and development masterplans. Annually produce updates for Local Authority Climate Change Declaration, reporting where appropriate. Annually produce updates for Local Authority statutory biodiversity reporting against the 2020 Challenge.	Angus Council Perth & Kinross Council Scottish Natural Heritage Tayside Biodiversity Partnership Chambers of Commerce Urban Regeneration Companies Developers	Long

Maintaining & Improving Habitats

Action	Action breakdown	Who takes the action	Timescale
3 Increase opportunities for communities to participate in experiencing and enjoyment of nature.	**Urban Meadows Projects** Manage urban grassland and planted wildflower meadows with biodiversity in mind. Roll out Buglife's "Buzzing" project across Tayside and investigate new areas of stalled space within cities, towns and villages. Continue the management of Monifieth Wildflower Meadow. Encourage InBloom group contributions to wildflower or pictorial meadow plantings at roundabouts, flower beds, etc. **Biodiversity Villages Initiative** Investigate the potential to set up a suite of village-based projects to encourage local communities to participate in a wide range of projects and events.	Angus Council Perth & Kinross Council Tayside Biodiversity Partnership Buglife Scotland Local community groups	Long
4 Improve the biodiversity quality of greenspace and green networks.	**Verge Champion Initiative** Set up a Verge Champion Initiative to engage volunteers and specialists to survey key sites and to then nominate important biodiversity verges for future management to safeguard species. Encourage local authorities to manage road verges for biodiversity taking into consideration the guidance given in the Plantlife 'Good Verge Guide: a different approach to managing our waysides and verges'. Instigate the use of A5 laminated cab cards or similar to provide site-specific verge management advice to operatives. **B-Lines** Encourage participation on all spatial scales in habitat enhancement for pollinators in line with B-Lines guidance.	Angus Council Perth & Kinross Council Tayside Biodiversity Partnership Tay Landscape Partnership Botanical Society Britain and Ireland Buglife Scotland Plantlife Scotland Scottish Wildlife Trust BEAR Scotland	Medium

Maintaining & Improving Habitats

Action	Action breakdown	Who takes the action	Timescale
5 Raise awareness of Urban issues to Local Authorities, Community Planning Partners and the wider stakeholder network.	Report twice yearly to community planning thematic partnerships on project contributions to local and national Single Outcome Agreement objectives. Regularly provide biodiversity seminars and workshops to local authority staff on relevant legislation and good practice. Use social media and targeted websites to promote urban issues to as wide an audience as possible.	Tayside Biodiversity Partnership Angus Council Perth & Kinross Council	Long
6 Improve the biodiversity quality of greenspace and green networks in graveyards.	**Green Graveyard Initiative** Expand existing green graveyard projects (beyond the Carse of Gowrie and N E Perthshire) and undertake biodiversity management of graveyards, cemeteries and crematorium across Tayside.	Tayside Biodiversity Partnership Angus Council Perth & Kinross Council Perth & Kinross Heritage Trust Tay Landscape Partnership Eco-Congregation Scotland	Long
7 Improve the biodiversity quality of greenspace and green networks on golf courses.	**Wildlife in the Rough - Tayside Golf Course Projects** Monitor all those Perth & Kinross golf courses that received Ryder Cup funding (£44,000) during 2014 and 2015 and raise awareness of all that has been achieved. Research funding options to expand the participation in projects across Tayside. Encourage and support an increase in the wide range of biodiversity projects currently underway on Tayside golf courses.	Scottish Golf Tayside Biodiversity Partnership Local golf clubs	Medium
8 Improve the biodiversity quality of greenspace and green networks on buildings.	**Living Roofs & Greening Infrastructure Initiative** Mainstream the use and increase the number of green/living roofs, and rain gardens. Raise awareness of biodiversity and sustainable development benefits from green/living roofs, SUDS and rain gardens. Collate Tayside good practice examples for the Scottish Green Roof Forum and Scottish Green Infrastructure website. Complete audit of Tayside's SUDS and shortlist those suitable for community pond projects. Encourage installation of dropped kerbs, wildlife kerbs and amphibian ladders in new build developments and encourage retrofit where appropriate.	Tayside Biodiversity Partnership Angus Council Perth & Kinross Council Scottish Green Infrastructure Forum Royal Institute of Chartered Surveyors Tayside Amphibian & Reptile Group	Long

Maintaining & Improving Habitats

Action	Action breakdown	Who takes the action	Timescale
9 Improve the biodiversity quality of greenspace and green networks by working with local businesses and Local Authorities.	Raise awareness of the benefits of pollinator plants within urban greenspace. Mainstream wildlife gardening and management techniques in private and community gardens, allotments and greenspace. Mainstream biodiversity management of greenspace in business parks and industrial estates. Encourage active input into gardening from local communities to improve wellbeing and health. Increase urban biodiversity across Tayside and its enjoyment by local people. **Tayside BeeWild Community Project** Prepare a Site Biodiversity Action Plan template for businesses (including care homes) and schools to use to manage their greenspace and gardens for wildlife. Support delivery and continue to raise awareness of good practice examples within hospitals, schools, care homes, sheltered housing complexes, day care centres and businesses with land (industrial estates, business parks, etc). Set up a BeeWild project in Angus (x25 sites 2016-18) and expand project across Tayside (2020-26).	Angus Council Perth & Kinross Council Tayside Biodiversity Partnership Voluntary Action Angus Scottish Environment Protection Agency Balhousie Care Group Barchester Healthcare Hillcrest Housing Association Bumblebee Conservation Trust Buglife Scotland NHS Scotland Business parks and industrial estates	Medium
10 Work with public organisations and businesses to highlight their responsibilities to biodiversity protection in development and action for biodiversity to make positive contributions.	**Tayside Swift Conservation Project** Work with communities across the region to safeguard existing nest sites and to create new ones. Work with Planners and developers across Tayside to install integral nestboxes in new-builds and to safeguard existing nest sites in properties being restored, insulated or renovated. Use the Carse of Gowrie Pilot Project as a model and expand the project across Tayside. Support the Tay Landscape Partnership in installing external nestboxes across its region. Use the Kirriemuir Swift Conservation Project as a model to work with other Conservation Area Regeneration Schemes across Tayside. Advise on Biodiversity Villages Initiative incorporation of swift projects, using the Stanley Community Swift Group as a model of best practice. Where appropriate, Hillcrest Housing Association to install integral and external nestboxes in its programme of works throughout Tayside.	Tayside Biodiversity Partnership Hillcrest Housing Association Tayside Swifts Tay Landscape Partnership The Carse of Gowrie Sustainability Group Stanley Community Group Concern for Swifts Scotland Swift Conservation Angus Council Tayside Development Trusts Perth & Kinross Council Royal Society for the Protection of Birds Perth and Kinross Heritage Trust Historic Environment Scotland National Trust for Scotland Scottish Wildlife Trust	Short/ Medium

Surveying & Monitoring

Action	Action breakdown	Who takes the action	Timescale
11 Encourage participation in urban citizen science surveys and projects.	**Scotland's Urban Flora Project** Encourage collection of survey data on flowering plants, ferns, mosses, lichens and fungi within the city limits of Perth. **Hirundine Survey** Prepare and circulate postcard and poster to raise awareness of swallows, house martins and sand martins and to obtain 'first sightings' data to share with NGOs. **Fixed point Photography** Identify partners using fixed point photography to monitor changes in urban habitats and species distribution. **National Species Surveys** Encourage local communities to partake in a wide variety of surveys, including the National Bat Monitoring Programme, RSBP Big Garden Birdwatch, BeeWalks, Big Butterfly Count, National Moth Nights, Living with Mammals, National Insect Week, National Plant Monitoring Scheme, and OPAL Bugs Count surveys. **Tayside Swift Survey** Continue and widen the Tayside Swift Survey, reporting back data to appropriate organisations. Map Swift populations and nest sites to add to local authority planning GIS layers. **Understanding Our Rivers** Promote educational activities, including suitable surveys, on the River South Esk at Brechin and Montrose. **Local Patch Survey** Investigate the repeating of the Tayside Local Patch (Wildlife on your Doorstep) surveys to engage the public in urban biodiversity recording. **Wildlife Watching** Engage the tourism industry in participating in biodiversity surveys, projects and awareness-raising for all their visitors, service providers, operatives and staff. Work with eco-tourism organisations to raise awareness of key species in and near Tayside towns such as Red Squirrel, Eurasian Beaver, Peregrines; encourage best practice guidelines in wildlife watching.	Tayside Biodiversity Partnership Botanical Society of Britain & Ireland British Trust for Ornithology Royal Society for the Protection of Birds Bumblebee Conservation Trust Buglife Scotland Plantlife Scotland Bat Conservation Trust Mammal Society Butterfly Conservation Scotland Wild Scotland VisitScotland Tourism and business community River South Esk Catchment Partnership	Medium

Education & Awareness Raising

Action	Action breakdown	Who takes the action	Timescale
12 Raise public awareness of their connections with urban biodiversity.	Connect people of all ages with the seasons and their special places by encouraging them to explore their local area. Increase wellbeing through interaction with the natural environment. Support biodiversity awareness – raising projects and initiatives in local garden centres, gardens open to the public and their visitors. **ZOOMIn2 Project** Encourage participation in the time-lapse nature photography project with its own website – www.zoomin2.co.uk	Tayside Biodiversity Partnership Schools, local community groups, special interest groups (walkers, photographers, etc) Business community Scottish Natural Heritage Royal Society for the Protection of Birds Butterfly Conservation Scotland	Short
13 Encourage school age participation in projects relating to urban issues, working with schools to increase access to nature.	**Going the Whole Hog (Angus)** Provide 70 schools in Angus with access to the Hedgehog Street education packs and/or the Hedgehog Preservation Society packs to promote their work. Provide 70 schools in Angus with a hedgehog hibernation box, as well as hedgehog-friendly pack of hedging, wildflower seeds and bulbs. Hold a series of biodiversity fairs at key schools within each burgh to raise awareness of wildlife gardening. Expand the project into Perth & Kinross. Contribute records to the People's Trust for Endangered Species' Big Hedgehog Map and publicise the Hedgehog Street projects. **School Bats Project** Work with schools to install bat roosting boxes where appropriate and to learn more about the ecology of bats.	Angus Alive Ranger Service Tayside Biodiversity Partnership Perth & Kinross Council River South Esk Catchment Partnership Scottish Wildlife Trust Tayside Biodiversity Partnership	Medium
14 Raise awareness across the community of the importance of urban bats and their protection.	**Urban Bats** Increase the bat population by a variety of conservation methods and surveys, expanding the original Perth-fectly Batty Project.	Tayside Bat Group Bat Conservation Trust Angus Alive Ranger Service Tayside Biodiversity Partnership	Medium

Education & Awareness Raising

Action	Action breakdown	Who takes the action	Timescale
15 Reduce littering and safeguard wildlife.	**Don't Let Go** Work with the local authorities to implement policies relating to the ban of mass balloon or sky lantern releases. Raise awareness of alternatives to balloon releases. Raise awareness of alternatives to phosphate-rich household cleaning products – consider repeating the "Make the Link to your Sink" tea-towel campaign.	Tayside Biodiversity Partnership Marine Conservation Society National Farmers Union of Scotland Angus Council Perth & Kinross Council River South Esk Catchment Partnership	
16 Raise awareness in villages of endangered species.	**Tree Sparrows on the Edge** Increase the population and distribution of Tree sparrows in Perth and Kinross and Angus by providing nestboxes and raising awareness within local communities. **Biodiversity Villages Initiative** - Encourage Tayside village communities to audit their local biodiversity by surveys and BioBlitz events. Facilitate community participation in safeguarding common and endangered species.	Tayside Biodiversity Partnership Volunteer Action Angus Scottish Natural Heritage Royal Society for the Protection of Birds British Trust for Ornithology Tay Landscape Partnership Angus and Dundee Bird Group Perth & Kinross Council Angus Council Local communities	
17 Promote local recorders, clubs and biodiversity open days.	Maintain an up to date database of local recorders and specialist clubs. Utilise the skills of local recorders and clubs to target specific projects including local BioBlitzes. Encourage local open days and promote to the partnerships extended network.	Tayside Biodiversity Partnership Tayside Recorders' Forum Butterfly Conservation Scotland Scottish Natural Heritage	Medium

Invasive Non-Native Species

Action	Action breakdown	Who takes the action	Timescale
18 Raise awareness of INNS and actions that can be taken to halt their spread and treat existing problem areas.	**Biosecurity Initiative** Support agencies involved in the control of the spread of invasive non-native species, especially Japanese Knotweed, Giant Hogweed, American Skunk Cabbage and Himalayan Balsam. Limit the spread of Grey squirrel. Raise awareness of invasive non-native species and demonstrate the impact that can be achieved by labour intensive (volunteer) control. Facilitate the production of urban area maps highlighting key areas threatened by invasive non-native species. Facilitate work party days with volunteer input to carry out control. Focus on urban areas and in particular those within the following catchments: River Tay and tributaries Western Catchments River South Esk River North Esk Lunan Water	Scottish Environmental Protection Agency Angus Council River South Esk Catchment Partnership Perth & Kinross Council Landowners and land managers Rivers & Fisheries Trust of Scotland Scottish Wildlife Trust Scottish Natural Heritage Tayside Biodiversity Partnership Voluntary Action Angus	Long
19 Safeguard EU Protected Species.	**Targeting INNS** Assist in targeting INNS in Tayside as directed by Scottish Biodiversity Committee INNS Forum, especially Grey Squirrel control (SWT Red Squirrel Project).	Scottish Environmental Protection Agency River South Esk Catchment Partnership Angus Council Scottish Wildlife Trust Perth & Kinross Council Landowners and land managers	Long
20 Raise awareness of INNS garden pests such as New Zealand Flatworm and actions that can be taken.	**New Zealand Flatworm Sightings** Publicise the James Hutton Institute campaign to raise awareness of this major threat to biodiversity.	James Hutton Institute	Medium

4 Upland Ecosystems

Loch Lee © ANGUSalive Ranger Service

Background

Tayside is richly blessed with upland habitats straddling as it does the Highland Boundary Fault. The montane habitat encompasses a large area, at least 5% of Tayside – stretching from the entrance to the Cairngorm Plateau through the Angus Glens in the North East and across to Ben Laoigh and Beinn Achaladair in the West. Tayside holds 9% of the total Scottish area of upland heath which occurs in mosaic with peatland, rough grassland and montane habitats. Heather moorland, by far the most extensive single upland habitat in Tayside, represents some 12% of the whole area.

The dwarf shrub heaths which make up Tayside's upland heathland contribute 16% to the total Scottish area of this habitat. As they are largely confined to the UK and the Western seaboard of Europe, they have international conservation significance.

These habitats support an array of flora and fauna including the Mountain hare, Golden eagle and Red grouse. The sub-arctic conditions of the montane habitat host species not found anywhere else in Britain and are very significant percentages

of the world population. Alpine gentian, the evocatively-named Blue dew moss, alongside lichens and other mosses are amongst those UK species found only within the borders of Tayside.

This unique combination of the exceptional and the commonplace makes the Tayside upland habitats very special. Not only do they provide a local asset much enjoyed by the people of Tayside, they are also a national asset and are in no small part responsible for attracting the many visitors who come to enjoy this area's outstanding natural heritage.

Objectives

1 **Endeavour to reduce the direct pressures on upland biodiversity by implementing projects to enhance ecosystem health.**

2 **Safeguard upland ecosystems, species and genetic diversity by enhancing connectivity and where possible preventing its decline.**

3 **Mainstream biodiversity conservation action by raising awareness and the enjoyment of upland ecosystems of local communities.**

Priority Habitats

- Montane
- Upland Heath
- Montane scrub
- Blanket bog

Ben Vrackie from Moulin Moor © David Williamson

Key Sites (Designated)

Montane (all SSSIs)

Beinn A Ghlo (SAC)
Caenlochan (SAC)
Drumochter Hills (SAC)
Beinn A' Chuallaich
Glas Tulaichean
Ben Chonzie
Ben Vrackie
Meall Ghaordie
Carn Gorm
Meall Garbh
Coire Bhachdaidh
Schiehallion

Blanket Bog

Rannoch Moor
Balnaboth Moor (Glen Prosen)
The Cairnwell, Glenshee
Atholl-Drumochter Hills

Upland Heath

Forest of Clunie (SSSI SPA) and neighbouring areas
Drumochter Hills (SSSI SPA)
Angus Glens Grouse Moors
Strathbraan, Glenqueich and Logiealmond Grouse Moors
Kynachan, Strathtummel
Forest of Atholl
Forest of Alyth
Rannoch Moor (SAC)

Montane Scrub

Caenlochan/Corrie Fee
Ben Lawers
Drumochter Hills/ Cama Choire

Key Species

- Upland mammals including Mountain hare and Water vole
- Upland birds, including Golden eagle, Snow bunting and Scoter
- Upland plants, including Oblong woodsia, Mountain Scurvy grass and Snow caloplaca

Mountain hare © SNH

Wooly willow © SNH

Rare Vascular Plants in Tayside

Tayside is a vitally important area for a number of extremely rare upland species. These include:

- *Astragalus alpinus* (Alpine milk vetch). Of the few sites known in the UK, three of them occur in Tayside. The population is decreasing to a critical stage.
- *Carex norvegica* (Close-headed Alpine-sedge). Nationally rare, most populations occur in Tayside and have fewer than 200 plants. Overgrazing, trampling – and undergrazing – are all threats.
- *Oxytropis campestris* (Yellow Milk-vetch). Three known sites in the UK: two are in Tayside, the other in the Mull of Kintyre.
- *Polygonatum verticillatum* (Whorled Solomon's-seal). In the UK this Nationally Rare plant is restricted to Tayside, but its populations are decreasing because of habitat destruction, erosion and collecting.
- *Lathyrus japonicus subsp. acutifolius* (Sea Pea). Rare in Scotland. The variety occurring in Angus is genetically distinct from the species elsewhere. It is vulnerable to developments and under-grazing.
- *Salix lanata* (Woolly willow.) This montane willow occurs locally in Tayside, but is sparse elsewhere. Climate change and overgrazing is its main threat.
- *Schoenus ferrugineus* (Brown Bog-rush).This species is restricted to four SSSI sites in Perthshire and one site in Selkirkshire. In current good condition, the plant could be vulnerable to disease, a single outbreak potentially wiping out an entire local population.
- *Veronica fruticans* (Rock Speedwell). Tayside is the stronghold for this species. Populations are typically small and the species may be decreasing.
- *Woodsia ilvensis* (oblong woodsia). Endangered in Britain and very rare in Scotland, Glen Clova is one of only three sites known in Scotland.

The National Trust for Scotland has pioneered methods of regenerating montane willows and other rare plants at Ben Lawers. The reserve has the largest abundance of arctic-alpine plants in the UK; these include Snow gentian (unique to Tayside) and Alpine forget-me-not which is restricted to Tayside and Upper Teesdale. It also hosts over 500 lichens which makes it the UK's most important site for lichens. The Vital Habitat Enhancement project at Ben Lawers is focussing on grazing management, habitat restoration and peat restoration. Elsewhere, SNH manages an exclosure at the Corrie Fee National Nature Reserve which is regenerating montane scrub and tall herb vegetation.

Ecosystem Services & Ecosystem Scale Projects

Ecosystem Services

- Carbon storage
- Photosynthesis and oxygen production
- Renewable energy
- Water quality regulation
- Recreation and leisure
- Health and wellbeing
- Tourism
- Woodland and peat
- Protection from floods
- Climate regulation

Ecosystem Scale Projects

- Angus Upland Plant projects – monitoring and restoring Twinflower and Woolly willow populations.
- Linking and Exploring Tayside's Upland Wildlife Sites.
- Controlling invasive upland species – Mink, INNS, etc.
- Upland Tayside butterfly projects –surveying, monitoring and habitat enhancement projects.
- Woodland restoration.
- Grassland projects.
- Peatland projects.
- Tayside mammals projects.

Pressures

Overgrazing by Deer and Sheep

High grazing levels of both deer and sheep have left montane habitats such as dwarf shrub heath, willow scrub, herb-rich vegetation and moss-heath fragmented and seriously degraded. Grazing-tolerant species such as Mat grass have taken over in large areas of montane habitat and this has reduced the species diversity of grass swards.

Trampling damage is becoming a serious threat to blanket bog, plants found in areas of high-altitude, water seepage and sub-alpine calcareous grassland. Trampling of ground-nesting bird nests and chicks by sheep and deer is also an issue.

Fragmentation of Habitat

Mountain willow populations are now so small and dispersed, clinging to inaccessible ledges out of reach of browsing animals, that they are susceptible to landslide or damage from rock-falls. As these plants have male and female flowers on different plants (and female plants are more common), isolated plants can no longer regenerate naturally. Other rare plants within the montane habitat are in a similarly precarious state and need long-term resources and management to safeguard them. Construction routes for windfarms and new or redesigned hill roads have also led to fragmentation.

Muirburn

Poorly-managed muirburn followed by heavy grazing is resulting in the loss of dwarf shrubs and leading to a transition to grassland where bracken is free to colonise. Erosion and sedimentation of watercourses may also occur.

Increasing Recreational Use

Hill-walkers, climbers and off-piste skiers are increasing in number and can cause damage to fragile vegetation and soils, especially where paths cross wet boggy areas or traverse just below cliffs in which calcareous grassland and tall herb vegetation grow. Path management can ensure erosion does not escalate, especially on the summits.

Visitors and their dogs can cause disturbance to ground nesting birds adjacent to popular montane routes. Dotterel, Golden plover and Dunlin are all vulnerable, leading predators to take eggs or young. There is also risk of direct trampling of eggs or young (especially for Dotterel which often nest on the open summit plateau) where walkers stray from designated pathways.

Climate Change and Pollution

Our montane areas are very vulnerable to the effects of climate change with the mean annual temperature expected to rise between 1.4C and 3C by 2050. Many montane species will be unable to colonise other suitable areas and there will be changes in the distribution and abundance of species, including invertebrates. Changes in vegetation composition and structure may cause the loss of many of our rare alpine plants. Acidification (atmospheric deposition of sulphur and nitrogen compounds) may alter the natural nutrient levels in the soil and affect the composition and structure of vegetation communities.

Unlocking carbon

Destruction, erosion from excessive grazing or development on peatland is very detrimental to the surrounding hydrology, as well as to peatland species. Drainage of bogs over an extended period has reduced water levels leading to peat drying out and affecting the ability of sphagnum to regenerate the peat. However, it is peatland's capacity to retain carbon that in its release can contribute to increased atmospheric carbon levels and therefore climate change and increased greenhouse gases.

Lack of Knowledge

There is a lack of information on the management of montane areas in Tayside, and limited basic information on the ecology of many species associated with such habitats, especially lower plants and invertebrates.

Afforestation

Afforestation with non-native conifers can seriously affect species such as Black grouse and Curlew, although clear-felling and replanting operations can create temporary areas of suitable habitat. Black grouse may use early stage plantations or small, restocked woodland. Calcareous grassland present in Tayside, should be retained for its floristic value, as well as that of *Osmia inermis* (a very rare mason bee).

Wildlife Crime

There has been an alarming increase in wildlife crime across Scotland in recent years, with incidents involving unauthorised use of snaring, badger baiting, deer and hare coursing and bird poisoning.

Peregrine falcon © SNH

Operation Countrywatch

This initiative began in 2000 as a Tayside Police-led project involving Tayside Raptor Study Group and two Estates. The project expanded in 2004 to include SNH, RSPB and five participating Estates, becoming known as the Operation Countrywatch Partnership. The project enables the police, conservation and estate interests, through improved communication and co-operation, to combat wildlife crime, work for the conservation of heather moorland and its birds, and promote the role and reputation of sporting management.

A fieldworker, employed by RSPB Scotland and part-funded by SNH, works with the Raptor Study Group to carry out surveys. Annual reports for each Estate are produced. These detail the breeding success of the focal species - Hen harrier, Golden eagle, Peregrine and Black grouse, and shorter accounts of other species such as Merlin. The Police also provide a summary of wildlife crime issues and updates.

Partnership meetings provide a neutral forum in which issues of concern to participating Estates may be discussed. Positive news is publicised to help promote the role and reputation of sporting management on participating Estates; it illustrates a way forward in best practice management for sport shooting estates. Identifying the presence of protected nesting birds of prey as factors in moorland management helps promote professional management. Overall, it is a novel project to promote the conservation value, the economic value and the wise management of heather moorland.

Upland Ecosystems Actions Schedule

Key for timescale Short: 1-3 yrs **Medium**: 4-6 yrs **Long**: 7-10 yrs
Actions will be input into the UK Biodiversity Action System (UKBARS) where Lead Partners will be outlined

Maintaining & Improving Habitats

Action	Action breakdown	Who takes the action	Timescale
1 Restore montane plant species populations and genetic diversity and enhance species connectivity.	**Twinflower** Survey twinflower annually - use fixed point photography at identified sites to monitor plant number fluctuations. Monitor land use regimes on identified sites encouraging favourable management techniques. **Woolly Willow** Monitor replanting and plant colonisation. Support new projects which identify additional threatened species. **Other Species** Support new projects which identify additional threatened species.	Scottish Natural Heritage Cairngorms National Park Authority Angus Council Perth & Kinross Council Landowners National Trust For Scotland	Long
2 Promote the sustainable development of the Partnership's upland areas through increased policy integration.	Ensure TAYplan (Strategic Development Plan), Angus Local Development Plan, PKC Development Plan and Indicative Forestry Strategies take into account protecting biodiversity as a component of sustainable development. Annually produce updates for Local Authority Climate Change Declaration reporting. Annually produce updates for Local Authority statutory biodiversity reporting against the 2020 challenge.	Cairngorms National Park Authority Scottish Natural Heritage Forestry Commission Scotland Angus Council Perth & Kinross Council Tayside Biodiversity Partnership	Long
3 Reduce the direct pressures on montane and upland heath biodiversity by enhancing ecosystem health.	Tackle littering and invasive non-native species at problem sites focusing particularly on upland catchments. Raise awareness of pollution and the damage caused to upland environments and species. Encourage measures which reverse habitat fragmentation. Encourage and support Muirburn good practice.	Angus Council Perth & Kinross Council River South Esk Catchment Partnership Scottish land & Estates The Moorland Association The Heather Trust Scottish Natural Heritage Tayside Biodiversity Partnership Scottish Gamekeepers' Association	Long

Maintaining & Improving Habitats

Action	Action breakdown	Who takes the action	Timescale
4 Showcase best practice land management techniques.	Maintain species richness within the different upland zones (upper, middle and lower). Identify areas where (a) grazing can be more intense to create a sward attractive to wintering and passage wildfowl and waders; (b) areas suitable for lower grazing pressure to favour breeding waders and ensure flowering and fruiting of key species. Reduce grazing pressure from deer and encourage lower levels of sheep grazing where appropriate. Protect montane areas from inappropriate development, disturbance and damage (including recreation and development). Establish a landscape-scale montane scrub restoration project, taking account of designated sites and features. Promote demonstration sites and advice on good muirburn practices. Encourage sympathetic management of upland heath for wildlife, structural diversity and rich lower plant communities.	Scottish Natural Heritage Cairngorms National Park Authority National Trust Scotland River South Esk Catchment Partnership Angus Council Perth & Kinross Council Landowners and Land Managers Royal Society for the Protection of Birds British Trust for Ornithology North East Green Network Scotland's Rural College Deer Management Groups	Long
5 Promote restoration projects and species management programmes.	Explore options for fencing to protect sensitive habitats from disturbance. Encourage collaborative sustainable flood management projects at a catchment scale starting at the headwaters. Explore the setting up of a Green Habitat Network to create stepping stones for key species. Promote and develop new demonstration sites for the restoration of peatland - explore the opportunity to set up Bog Squad projects to tackle ditch blocking and other tasks. Establish a landscape-scale peatland project, taking account of designated sites and features. Promote and support the creation and restoration of montane scrub in suitable areas.	Cairngorms National Park Authority Angus Council Perth & Kinross Council Scottish Natural Heritage Tayside Biodiversity Partnership Tay Fisheries Board River South Esk Catchment Partnership	Medium

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
6 Investigate and support projects and policy which create more native woodland and forest cover, where appropriate, in Tayside.	Promote spatial planning tools that help landowners to consider how best they can develop woodland in order to maximise benefits for wildlife through improving habitat connectivity. Promote the findings of the Native Woodland Survey of Scotland (Tayside area). Support catchment led tree planting initiatives that encourage natural flood management and mitigate against the impacts of climate change. Revitalise and expand the areas of Woolly willow scrub.	Forestry Commission Scotland Cairngorms National Park Authority Angus Council Perth & Kinross Council Scottish Natural Heritage Tayside Biodiversity Partnership River South Esk Catchment Partnership	
7 Support land management actions for wildcats in the Angus Glens from "the Scottish Wildcat Conservation Action Plan" which will in turn benefit a range of native species.	Promote Scottish wildcat-friendly forestry practice. Promote Scottish wildcat-friendly management on estates, farms and crofts. Ensure adequate protection for Scottish wildcats from development pressures by increasing wildcat awareness amongst developers and planning authorities to ensure adequate survey and mitigation for wildcats prior to approvals. Promote competency of ecological surveys for Scottish wildcat.	Scottish Natural Heritage Forestry Commission Scotland Angus Council Cairngorms National Park Authority Perth & Kinross Council National Farmers Union Scotland Tayside Biodiversity Partnership River South Esk Catchment Partnership Scottish Wildlife Trust Scottish Land & Estates Scottish Gamekeepers' Association Game & Wildlife Conservation Trust Landowners	
8 Encourage collaborative regional working for green networks.	Identify and promote "cross-boundary" opportunities to join up paths and habitats between local authorities, Biodiversity Partnerships and other geographically based organisations. In collaboration with partners, share and promote good practice to other land users. Encourage or co-ordinate regional-scale projects and surveys and advise on funding. Highlight projects being developed and create opportunities of scale, collaboration etc.	John Muir Trust Tayside Biodiversity Partnership Scottish Natural Heritage Angus Council Perth & Kinross Council Cairngorms National Park Authority Forestry Commission Scotland River South Esk Catchment Partnership Landowners and land managers Scottish Environment Protection Agency North East Green Network	

Surveying & Monitoring

Action	Action breakdown	Who needs to take the action	Timescale
9 Investigate the effects of climate change on the movement of montane species through regular surveying and monitoring.	Undertake survey to identify remnant areas of near-natural montane communities. Generate records of upland wildlife by facilitating biological surveys at sites around upland Tayside. Raise awareness of upland species and conservation amongst the wider community. Promote the CNPA as a key area for monitoring climate change impacts on montane habitats and species.	John Muir Trust Scottish Natural Heritage Angus Council Perth & Kinross Council Scottish Wildlife Trust Butterfly Conservation Scotland North East Scotland Biological Records Centre Tayside Biodiversity Partnership Cairngorms National Park Authority	Long
10 Investigate mammal spatial and temporal distribution patterns in Tayside (e.g. Scottish wildcat, Mountain hare, Pine marten and Water vole.	Investigate expanding the NESBReC Mammal Survey to Tayside. Promote the availability of data and disseminate to relevant organisations. Support ongoing projects such as Scottish Wildcat Action. Support the ANGUSalive Ranger Service in ongoing surveys of Scottish wildcat, Pine marten and Water vole. Facilitate and support training for upland species survey techniques.	Scottish Natural Heritage Scottish Wildlife Trust Forestry Commission Scotland North East Scotland Biological Record Centre Mammal Trust Tayside Biodiversity Partnership Tayside Recorders' Forum Community ANGUSalive Ranger Service Cairngorms National Park Authority River South Esk Catchment Partnership	Long
11 Investigate upland bird spatial and temporal distribution patterns in Tayside.	Support the 'What's Up' and Mountain Bird surveys to increase biological recording in upland habitats to ascertain changes in land use and climate change.	Royal Society for the Protection of Birds British Trust for Ornithology	
12 Support Upland Bird populations and encourage appropriate site management.	Prepare Code of Practice leaflet; feature it on appropriate websites and create a poster for distribution. Review the existing nesting sites for Dotterel and advise on additional safeguarding of the sites, i.e. signage to reduce human and dog disturbance. Create and expand montane and juniper scrub to support Ring ouzel.	Royal Society for the Protection of Birds Angus & Dundee Bird Group Tayside Raptor Study Group British Trust for Ornithology Scottish Natural Heritage	Long

Surveying & Monitoring

Action	Action breakdown	Who needs to take the action	Timescale
13 Survey and monitor threatened upland butterfly and moth populations.	Collect annual survey data in upland areas. Analyse collected, verified data annually and develop adaptive management strategy to develop surveying and monitoring protocol. Investigate the connectivity of upland populations.	Butterfly Conservation Scotland Tayside Biodiversity Partnership ANGUSalive Ranger Service Landowners and land managers Community	Long
14 Survey and monitor breeding upland bird species.	Collect annual survey data via Operation Countrywatch for upland species, e.g. raptors, Black grouse, divers, etc. and bi-annually within the Forest of Clunie SPA. Maintain a minimum level of human disturbance at breeding sites.	Royal Society for the Protection of Birds Angus Council	Long
15 Prepare baseline study of upland Water vole.	Identify further survey effort required, particularly looking at population density etc. Research data available in SSE Wind Farm Ecological Reports and prepare baseline map to show upland population extent. Investigate potential impact of climate change. Consider conservation targets for the species to ensure the survival of populations in Tayside in to the future.	Scottish Natural Heritage Scottish & Southern Electric Landowners and land managers Tayside Biodiversity Partnership Cairngorms National Park Authority ANGUSalive Ranger Service	Long
16 Increase awareness of upland species in Tayside and facilitate community participation in data recording.	Determine current status and distribution, and monitor populations of Mountain hare, Scottish wildcat and Pine Marten in Tayside. Determine current status and distribution of upland birds. Determine current status and distribution of upland butterflies and moths. Promote Citizen Science websites where community sightings can be submitted to a central database. Focus on awareness-raising through local and national press, specialist publications and events. Develop web and social media used by local communities and tourists e.g. VisitScotland, CNPA, and Angus Ahead website.	Cairngorms National Park Authority North East Scotland Biological Records Centre Tayside Biodiversity Partnership Community Butterfly Conservation (Scotland) British Trust for Ornithology River South Esk Catchment Partnership ANGUSalive Ranger Service Royal Society for the Protection of Birds Tayside Raptor Study Group VisitScotland	Long

Education & Awareness Raising

Action	Action breakdown	Who needs to take the action	Timescale
17 Encourage school age participation in projects relating to montane and upland heath issues.	Highlight the Mountains & The People project in the Cairngorms National Park which brings together young people and volunteers to train and address serious path erosion issues.	Cairngorms National Park Authority. Tayside Biodiversity Partnership Angus Council Scottish Wildlife Trust Royal Society for the Protection of Birds Butterfly Conservation Scotland Police Scotland (PAW) Scottish Land & Estates	Long
18 Promote local recorders, clubs and biodiversity open days.	Maintain an up to date database of local recorders and specialist clubs on the TBP website. Utilise the skills of local recorders and clubs to target specific projects. Encourage local open days and promote to the partnership's extended network.	Tayside Biodiversity Partnership Tayside Recorders Forum North East Scotland Biological Records Centre Scottish Wildlife Trust Butterfly Conservation Scotland Scottish Natural Heritage Scottish Land & Estates	Long

Education & Awareness Raising

Action	Action breakdown	Who needs to take the action	Timescale
19 Encourage responsible interactions when encountering montane and upland heath in minimising disturbance potential.	Encourage projects that raise awareness on how best to tackle montane and upland heath disturbance. Collect bi-annual survey data for breeding wader populations. Analyse collected data bi-annually and investigate any changes in trends. Maintain a minimum level of human disturbance at breeding sites.	Cairngorms National Park Authority Scottish Natural Heritage Angus Council Perth & Kinross Council Tayside Biodiversity Partnership Scottish Gamekeepers' Association Scottish Land & Estates VisitScotland	Long
20 Raise awareness of montane and upland heath to Local Authorities, Community Planning Partners and the wider stakeholder network.	Report regularly to community planning thematic partnerships on project contributions to local and national Single Outcome Agreement objectives. Regularly provide biodiversity seminars and workshops to local authority staff on relevant legislation and good practice. Use social media and targeted websites to promote montane and upland issues to as wide an audience as possible.	Cairngorms National Park Authority Scottish Natural Heritage Angus Council Perth & Kinross Council Tayside Biodiversity Partnership River South Esk Catchment Partnership	Long
21 Hen Harrier Education Project.	Engage schools through a series of tailored outreach programmes.	Royal Society for the Protection of Birds	Short

Invasive Non-Native Species

Action	Action breakdown	Who needs to take the action	Timescale
22 Reduce the direct pressures on montane and upland heath biodiversity and ecosystem health from invasive non-native species, particularly American mink.	Raise awareness of invasive non-native species and demonstrate the impact that can be achieved by control.	Angus Council Perth & Kinross Council Tayside Biodiversity Partnership Landowners River South Esk Catchment Partnership Scottish Mink Initiative Esk Rivers and Fisheries Trust Scottish Environment Protection Agency	Long

5

Farmland Ecosystems

Aberlemno, Angus © Carol Littlewood

Background

The area covers probably the greatest variety of farm enterprises seen in Scotland: from extensive upland sheep grazing units on semi-natural grasslands, to highly intensive fruit, vegetable and crop growing on some of the best quality land in Scotland. Accounting for just over 200,000 hectares, Tayside's arable land provides the patchwork of fields, hedges, dykes, veteran trees and farm buildings generally associated with land under cultivation. Although malting barley, winter wheat, oats, potatoes and oilseed rape are the mainstay of the area's agriculture, many farms still have some land down to rotational grassland, used either for grazing sheep and cattle, or producing hay or silage for winter feeding. This rotational grassland covers 86,000 hectares of land; add to this 11,000 hectares of potatoes, 3,500 hectares of market-quality vegetables and over 1,500 ha of soft fruit (mainly raspberries and strawberries) and Tayside's land is certainly extensively farmed. There are also units producing herbs and a recently established tea plantation, as well as the associated commercial production of honey.

Although the traditional patchwork of different crop types still prevails, much more intensive management has seen a decline in many habitat types and species as farm and field sizes have increased with the greater mechanisation of farming systems. Managed and cultivated farmland in Tayside still acts as a vital haven for some of the UK's rarer species – Corn bunting, Brown hare, Skylark, Tree sparrow and Grey partridge, as well as locally important species such as Lapwing, Common frog and Barn owl. Changes from hay to silage as the main means of conserving grass, the liming and fertilising of "unimproved" grasslands and greater use of sprays and fertilisers on cropped land have all contributed to a reduced diversity of both plant and animal species over recent decades, particularly invertebrates.

Through cross-compliance and greening measures farmers maintain areas of habitat to benefit biodiversity and reduce pollution risk. This can be, for example, by maintaining buffer strips, leaving fields fallow or growing crops to benefit farmland birds. Via competitive schemes they can also apply to manage more complex habitats such as wetlands and species-rich grasslands, to exclude livestock from watercourses and manage hedgerows to name but a few of the options which can attract funding for creation and management. With an ecosystem approach now being mooted there are excellent opportunities arising for partnerships to consider larger-scale projects. Managing land for biodiversity at a catchment or green network scale - and for rare butterflies, farmland birds or wet grassland species at a smaller scale - can involve not just farmers and landowners (and the statutory bodies), but also local communities and non-governmental organisations.

Objectives

1 **Endeavour to reduce the direct pressures on farmland biodiversity by implementing projects to enhance ecosystem health.**

2 **Safeguard farmland ecosystems, species and genetic diversity by enhancing connectivity and where possible preventing its decline.**

3 **Encourage mainstream biodiversity conservation action by raising awareness and the enjoyment of farmland ecosystems by local communities.**

Priority Habitats

- Lowland Meadows
- Upland Hay Meadows
- Calcareous and Base-rich Grassland (including limestone pavement)
- Wet Grassland
- Farm Buildings
- Hedgerows and Treelines
- Stone Dykes

Hedgelaying training, Brechin, Angus © CAG Lloyd

Key Sites Designated

Calcareous & Base-Rich Grassland

Ben Lawers NNR

Beinn a'Ghlo SSSI

Ben Vrackie SSSI

Corrie Fee NNR (Glen Doll and Glen Fee)

Tulach Hill and Glenfender Meadow SSSIs

Tigh An Eilein, Glenshee

Forest Hill SSSI

Edintian Bog, Glen Fincastle

Loch Kinardochy & Tomphubil Limekiln, Tummel Bridge

Creag Mhor, Loch Tummel

Kiltyrie Meadows, Loch Tayside

Gleann Taitneach

Grandtully Meadow, Strathtay

Auchleeks

Gleann Beag, Glenshee

Upland Hay Meadows

Brerachan Meadow

Straloch

Keltneyburn SSSI

Weem Meadow SSSI

Limestone Pavement/Granular Limestone

Allean Forest Limestone, Loch Tummel

Meall Ban

Trinafour

Lassintulloch

Wet Grassland

Loch Freuchie Meadows (SSSI)

River Braan, by Amulree

Meikleour Area SSSI

Loch Tay Marshes SSSI

Tay and Isla Valley

Loch Leven meadows

Egno Moss

Strathallan

Strathmore

Glen Clova

Montrose Basin

Key Species

- Bat species
- Farmland birds, including Barn owl, Tree sparrow, Grey partridge, Linnet, Lapwing, Corn bunting and Skylark
- Reptiles, including Common lizard and Slow worm
- Hirundine species (Swallow, House martin, Sand martin) and Swifts
- Calcareous Grassland species, inc. *Osmia inermis* (Mason bee), Northern brown argus, Rock rose

Bat © SNH

Rock rose © Bryan Smith

Highland Perthshire Calcareous Grassland Project

This project, which ran until 2010, increased awareness of the conservation value of calcareous and other species-rich grasslands and encouraged their restoration and enhancement. Demonstration sites were established at Glenfincastle, Tomnaguie, Strathgarry and Chesthill. A Best Management Practice booklet was published in 2011 to show the lessons learnt from each site.

Sward enrichment was achieved at Glenfincastle by seeding into improved and semi-improved grassland via a turbo tiller which created bare patches of ground for seeding. Seeds laboriously collected on site were sown in the autumn by hand using a mix of wildflower seed and sand. Natural regeneration was also undertaken from existing seed sources at three sites: Strathgarry, Tomnaguie and Glenfincastle. Removing lime, inorganic fertiliser, pesticides and farmyard manure allowed improved or semi-improved grasslands to become more flower-rich. A section of calcareous grassland was fenced to allow targeted grazing. The quickest results for enrichment of the sward were seen at Foss Meadow where a combination of Yellow rattle and the introduction of cutting and baling at the end of the summer resulted in the rapid spread of wildflowers throughout the sward.

Ecosystem Services & Ecosystem Scale Projects

Ecosystem Services

- Pollination of crops by insects
- Food provision, biomass fuel and fibre (sheep's wool)
- Protection from floods
- Climate regulation
- Carbon storage
- Photosynthesis and oxygen production
- Water quality regulation
- Recreation and leisure
- Soil formation and conservation
- Health and wellbeing
- Tourism

Ecosystem Scale Projects

- Buildings and Biodiversity Project (Carse of Gowrie pilot)
- Wet Grassland Waders
- Farmland Bird Lifeline
- Wildlife corridor projects
- Sustainable grazing projects
- Controlling invasive species – Mink, INNS, etc
- Farmland butterfly projects
- Farmland Bird (inc. Barn Owl) Projects
- Grassland projects

Yellowhammer © Angus Council

Pressures

Agricultural Intensification

Fertiliser and herbicide applications, ploughing and re-seeding all destroy calcareous grasslands or wet grassland habitat. Supplementary feeding results in poaching and enrichment of grasslands, encouraging the growth of ruderals. Drainage of land affects flooding regimes, nutrient loading and lowering of water levels.

Major biodiversity loss can occur when sustainable farming practices are not followed, i.e. the loss of topsoil from harvested potato fields, lack of pollination opportunities for pollinator-dependent crops, and the lack of management of field corners and margins for biodiversity.

Overgrazing

Heavy grazing by sheep, cattle and horses adversely affect species-richness and structural diversity, with loss of tall herbs in particular. Deer and rabbits can be a problem in some areas.

Loss of Traditional Rural Buildings

Demolition or conversion to housing of old buildings invariably destroys bat roosting and bird nesting sites, or excludes them during restoration works. Timber treatments are also toxic to bats; some rodenticides used in and around farm buildings are detrimental to owls and other birds of prey, particularly Red kites.

Fragmentation of Habitat

Field enlargement results in the loss of boundary features, especially hedges, treelines and drystane dykes. Remaining hedges are often cut on an annual basis, resulting in the hedge's decline in quality and removing berries that could feed wild birds over winter. Spray drift and fertilisers in hedge bottoms can destroy bumblebee nests and encourage undesirable weed species. Ploughing too close to a hedge weakens the plants and hedgerow trees. Cost and time requirements means dyke restoration is no longer viable without grant aid.

Climate Change

Our weather patterns are changing. Long dry spells can no longer be relied upon to ripen crops or to make hay. Unseasonably low temperatures can create issues with our soft fruit farming or delay ploughing. A change in farmland ecosystems is inevitable: pressures on many of our species will increase and many will have nowhere else to go to.

Loss of Boundary Trees

There is a continuing loss of boundary trees to natural age, wind blow and disease. With little replacement being undertaken, biodiversity loss is exacerbated. Boundary trees (including road side trees and standard treelines in hedges) contribute to habitat connectivity.

Inappropriate Tree Planting

Open landscapes suitable for breeding waders can be damaged with tree planting, not just removing habitat, but also creating a 'predator shadow' where birds will not breed close to woodland owing to an actual or perceived threat of predation.

Barn Owls in Tayside

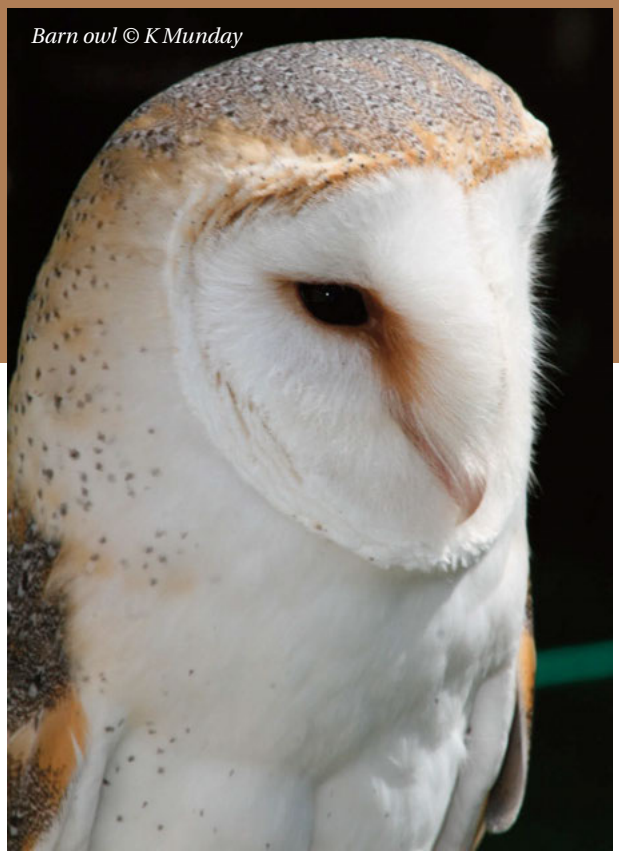
During 2004, SNH funding enabled the Scottish Agricultural College and Perthshire FWAG to raise awareness of Barn owls to farmers in the River Tay corridor. Additional funding from the SITA Tayside Biodiversity Action Fund and the Biodiversity Action Grant Scheme (BAGS) widened the project to include the River Isla corridor with farms surveyed and Barn owl habitat requirements discussed with farmers.

Tayside was also involved in the Barn Owls of Lowland Scotland Project (BOOLS) funded through BAGS. The Angus Barn Owl Project is still ongoing, having attracted funding from SNH, the Cairngorms Biodiversity Fund and Angus Environmental Trust - one particular nestbox in Angus has been highly successful, producing 14 chicks in 3 years.

Harsh winters have had a devastating effect on Barn owl numbers as snow cover hides small mammals and Barn owls can very quickly starve to death. The British Trust for Ornithology reported over 100 dead ringed Barn owls in the winter of 2010-2011, double the usual number for Britain.

Despite this there is optimism as birds are still present and breeding so milder winters should see numbers starting to bounce back.

Many Barn owls use old steadings for roosting and nesting, but there is an increasing pressure to convert these to housing or replace them with modern farm sheds. This is why nestbox provision is so important to helping maintain populations. The Partnership continues to collate Barn owl sightings for Tayside and maintains a distribution map to help advise planners where Barn owls are likely to be present. Please add your sightings via www.taysidebiodiversity.co.uk.



Barn owl © K Munday

Buildings & Biodiversity Project

Following an action featured in the 1st Edition Tayside Biodiversity Action Plan, fifty site management plans are being prepared throughout the Tay Landscape Partnership area to benefit Barn owls, bats, Tree sparrows, hirundines and Swifts. The project is also raising awareness of good practice where timber treatment and pesticides are concerned. Together with the Tay to Braes Project the overall aim is to improve connectivity between habitats to address fragmentation and permeability of the landscape to wildlife. Installation of nest boxes, hedge restoration and tree planting is all underway, as is grassland management to maximise biodiversity.

The Carse of Gowrie is laced with a network of pows (man-made drainage ditches, some dating back to the 18th century). These, plus grasslands and linear woodlands, provide vital habitat links between the Braes of the Carse and the River Tay, an area of large arable fields associated with mechanised farming. The mixed agriculture around the River Earn affords excellent habitat for Barn owls so rough grassland creation and installation of nestboxes is especially important here. Improvements to the area's habitats will benefit many species.

Farmland Ecosystems Actions Schedule

Key for timescale Short: 1-3 yrs **Medium**: 4-6 yrs **Long**: 7-10 yrs
Actions will be input into the UK Biodiversity Action System (UKBARS)where Lead Partners will be outlined

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
1 Restore species-rich grassland to improve and enhance invertebrate and bird populations.	Support improved management of existing sites through Agri-Environment Climate Scheme grant aid. Encourage the wide dissemination of Best Practice information for managing land for farmland birds and beneficial invertebrates. Encourage the use of agri-environment schemes to plant new hedges where appropriate. Encourage the use of agri-environment schemes to restore drystane dykes. Encourage flowering species by appropriate management of marginal land and rural road verges, together with the planting of nectar-loving annuals along field margins. Support actions within the Scottish Pollinator Strategy to protect pollinators and to safeguard the ecological services they provide, especially for food production and the health of Tayside's environment. Support Plantlife's Save our Magnificent Meadows project and its National Meadow Day celebrations. Encourage community participation, where appropriate, to increase knowledge and skills to reverse the ongoing losses of wildflower meadows and grasslands.	Cairngorms National Park Authority Scottish Natural Heritage Scotland's Rural College National Farmers Union Scotland Royal Society for the Protection of Birds Scottish Wildlife Trust National Trust for Scotland Plantlife Scotland Landowners and managers Angus Council Perth & Kinross Council Tayside Biodiversity Partnership Tay Landscape Partnership Scottish Association of Farm Conservation Advisers Communities	Long
2 Promote appropriate grazing regimes to safeguard calcareous base-rich grassland.	Raise awareness of the importance of this habitat to landowners and planners, especially within Forest and Woodland Plans, to encourage appropriate and proactive management. Promote Best Practice demonstration sites to raise awareness of positive management of this habitat, e.g. the Keltneyburn Special Area of Concern (SAC).	Forestry Commission Scotland Scottish Natural Heritage Scotland's Rural College Scottish Association of Independent Farm Conservation Advisors Scottish Wildlife Trust Landowners and managers Woodland owners and businesses Perth & Kinross Council Angus Council	Long
3 Ensure legal obligations regarding EU Protected and Scottish Biodiversity List Species are met.	Develop a series of seminars for planners, developers, landowners and agricultural businesses on the legal responsibilities regarding EU Protected Species and wildlife in general. Encourage wildlife-friendly features in the conversion of redundant farm buildings (including Barn Owl ledges, integral Swift and bat boxes).	Tayside Biodiversity Partnership Scottish Natural Heritage Angus Council Perth & Kinross Council Tay Landscape Partnership Royal Society for the Protection of Birds Scottish Badgers Bat Conservation Trust Scottish Association of Independent Farm Conservation Advisors	Medium

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
4 Showcase best practice land and farm building management techniques.	Encourage the retention or creation of foraging habitat close to farm buildings (rough grass, hedges, trees, ponds, puddles, etc) to assist bats, Barn owls and other birds. Encourage landowners to provide alternative roosting sites/nesting sites when building work is being undertaken. Work with farm construction companies (e.g. Knapp, Algo) to incorporate integral nest and roosting sites in new buildings (self-contained so as to comply with Farm Assurance Schemes). Increase farmers' awareness of threats posed to birds such as Barn owls by rodenticides in/around farm buildings. Work with landowners and timber treatment companies to raise awareness of targeted chemical usage in farm buildings to safeguard bats, birds and beneficial invertebrates. Encourage farmers to use waste grain/tailings to feed birds during the winter months. Encourage lower levels of sheep grazing where appropriate. Promote Wildlife Estates Scotland accreditation to demonstrate a high standard of excellence in land management that encourages biodiversity. Promote LEAF (Linking Environment & Farming) Open Days on local farms and visits to their demonstration farms. Encourage the development of a leaflet to promote high quality farm trails that demonstrate the inclusion of biodiversity management within farmland habitat (including the Loch Leven Heritage Trail, Scotland's Berry Trails).	Scottish Natural Heritage Scottish Government Rural Payments & Inspections Directorate Cairngorms National Park Authority North East Green Network Angus Council Perth & Kinross Council Royal Society for the Protection of Birds British Trust for Ornithology Bat Conservation Trust Scotland's Rural College Scottish Association of Independent Farm Conservation Advisors Deer Management Groups Linking Environment & Farming (LEAF) Tayside Biodiversity Partnership Tay Landscape Partnership Scottish Land & Estates National Farmers Union Scotland Wildlife Estates Scotland (inc. Atholl Estate and Stracathro Estate) VisitScotland Landowners and Land Managers	Long
5 Safeguard wet grassland habitat.	Maintain appropriate management and restoration of wet grassland habitat, especially through the agri-environment schemes. Identify farms where there is well-managed wet grassland habitat and conduct regular training days for farmers, advisers, etc. Ensure all planning documents within the region take account of wet grassland as a habitat of national and international importance. Support Wet Grassland for Waders projects across Tayside. Undertake Wetland Inventory of Tayside.	Angus Council Perth & Kinross Council Royal Society for the Protection of Birds Cairngorms National Park Authority Scottish Association of Independent Farm Conservation Advisors Scotland's Rural College Landowners and managers	

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
6 Reduce the direct pressures on farmland biodiversity by enhancing ecosystem health.	Tackle invasive non-native species at problem sites. Raise awareness of diffuse pollution and the damage caused to farmland species, by investigating the introduction of best practice demonstration projects. Encourage measures which reverse habitat fragmentation. Curb plastic litter from entering watercourses, especially silage bags and berry baskets by introducing a recycling scheme and raising awareness of the issue with landowners. Encourage Ecological Focus Areas (EFA) to manage fallow land for the benefit of pollinators and ground-nesting birds, and to protect water courses from spray drift and erosion. Support the inclusion of buffer strips, wild bird cover, beetle banks, and wildflower or in-field grassland strips.	Scotland's Rural College Cairngorms National Park Authority Scottish Association of Independent Farm Conservation Advisors Angus Council Perth & Kinross Council Scottish Natural Heritage Tayside Biodiversity Partnership River South Esk Catchment Partnership	Long
7 Promote restoration projects and species management programmes.	Work in partnership with different organisations to establish demonstration sites to illustrate best management practice for calcareous grassland. Remove invasive plants such as Japanese Knotweed, Himalayan Balsam and Giant Hogweed. Explore options for fencing to protect sensitive habitats from disturbance. Continue to run rural skills training days to encourage appropriate management of hedgerows (including hedge-laying), less frequent cutting, the retention of hedgerow trees and the restoration of gappy hedges. Encourage the development and setting up of a Tayside Farmland Butterfly Initiative to advise farmers and landowners on targeted management for farmland moths and butterflies.	Cairngorms National Park Authority Scotland's Rural College Scottish Association of Independent Farm Conservation Advisors Angus Council Perth & Kinross Council Scottish Natural Heritage Scottish Environment Protection Agency Tayside Biodiversity Partnership Butterfly Conservation (Scotland) River South Esk Catchment Partnership	Medium
8 Encourage collaborative regional working for green networks.	Identify and promote “cross-boundary” opportunities to safeguard degraded calcareous grasslands where they buffer or link small or discontinuous sites. Encourage or co-ordinate landscape-scale projects and surveys and advise on funding. Set up Green Habitat Network to create stepping stones for key species. Promote the expansion of Buglife’s B-Lines project to contribute towards insect pollination for lowland crops. Encourage the setting up of a Boundary Trees Project to champion natural green networks and their associated species (especially songbirds, bats and invertebrates).	North East Green Network Tayside Biodiversity Partnership Scottish Natural Heritage Angus Council Perth & Kinross Council Cairngorms National Park Authority Scottish Government Rural Payments & Inspections Directorate Landowners and land managers Buglife Scotland River South Esk Catchment Partnership	

Surveying & Monitoring

Action	Action breakdown	Who needs to take the action	Timescale
9 Investigate the effects of climate change on the movement of farmland species through regular surveying and monitoring.	Promote the CNPA as a key area for monitoring climate change impacts on farmland habitats and species. Raise awareness of farmland species and conservation amongst the wider community. Generate records of farmland wildlife by facilitating biological surveys at sites around Tayside. Expand the Green Shoots programme across Tayside. Promote the Partridge Count Scheme as part of Grey Partridge Conservation projects. Support the gathering of data to discover the scale and trend of loss of farmland species and habitats since the mid-1940s. Expand the Linnet Link Project across Tayside to enhance cycle tracks and public footpaths for wildlife (especially farmland birds such as Linnets, Yellowhammers and Barn owls) by promoting shrub planting and linked habitats along pathways. The habitat enhancement will improve the surroundings for those using the route.	British Association of Shooting & Conservation Scottish Natural Heritage Angus Council Perth & Kinross Council Scottish Wildlife Trust Butterfly Conservation Scotland North East Scotland Biological Records Centre Tayside Biodiversity Partnership Tayside Recorders' Forum Cairngorms National Park Authority Game & Wildlife Conservation Trust James Hutton Institute Scottish Association of Independent Farm Conservation Advisors Botanical Society of Britain and Ireland	Long
10 Investigate farmland bird spatial and temporal distribution patterns in Tayside.	Undertake farmland bird wader and Corn bunting-focussed surveys. Support and expand the Tayside Barn Owl Projects. Support and expand the Save Tayside's Tree Sparrows and Tree Sparrows on the Edge projects. Promote the Farmland Bird Lifeline (FBL) Angus Corn Bunting Recovery Project in growing wild bird seed mixtures for Corn buntings and other farm wildlife. Consider the potential for expanding the existing FBL Fife Biodiversity Areas for Buntings & Bees Project into Tayside to benefit both pollinators and farmland birds.	Royal Society for the Protection of Birds Scottish Natural Heritage Tayside Biodiversity Partnership British Trust for Ornithology Scottish Association of Independent Farm Conservation Advisors Local community Landowners and managers	
11 Survey and monitor threatened farmland butterfly and moth populations.	Support the setting up of a pilot project or case study in Tayside to collect annual survey data in specific farmland areas. Collect annual survey data in farmland areas. Analyse collected, verified data annually and develop adaptive management strategy to develop surveying and monitoring protocol. Investigate the connectivity of farmland butterfly and moth populations.	Butterfly Conservation Scotland Tayside Biodiversity Partnership Angus Council Landowners and land managers Local community	Long

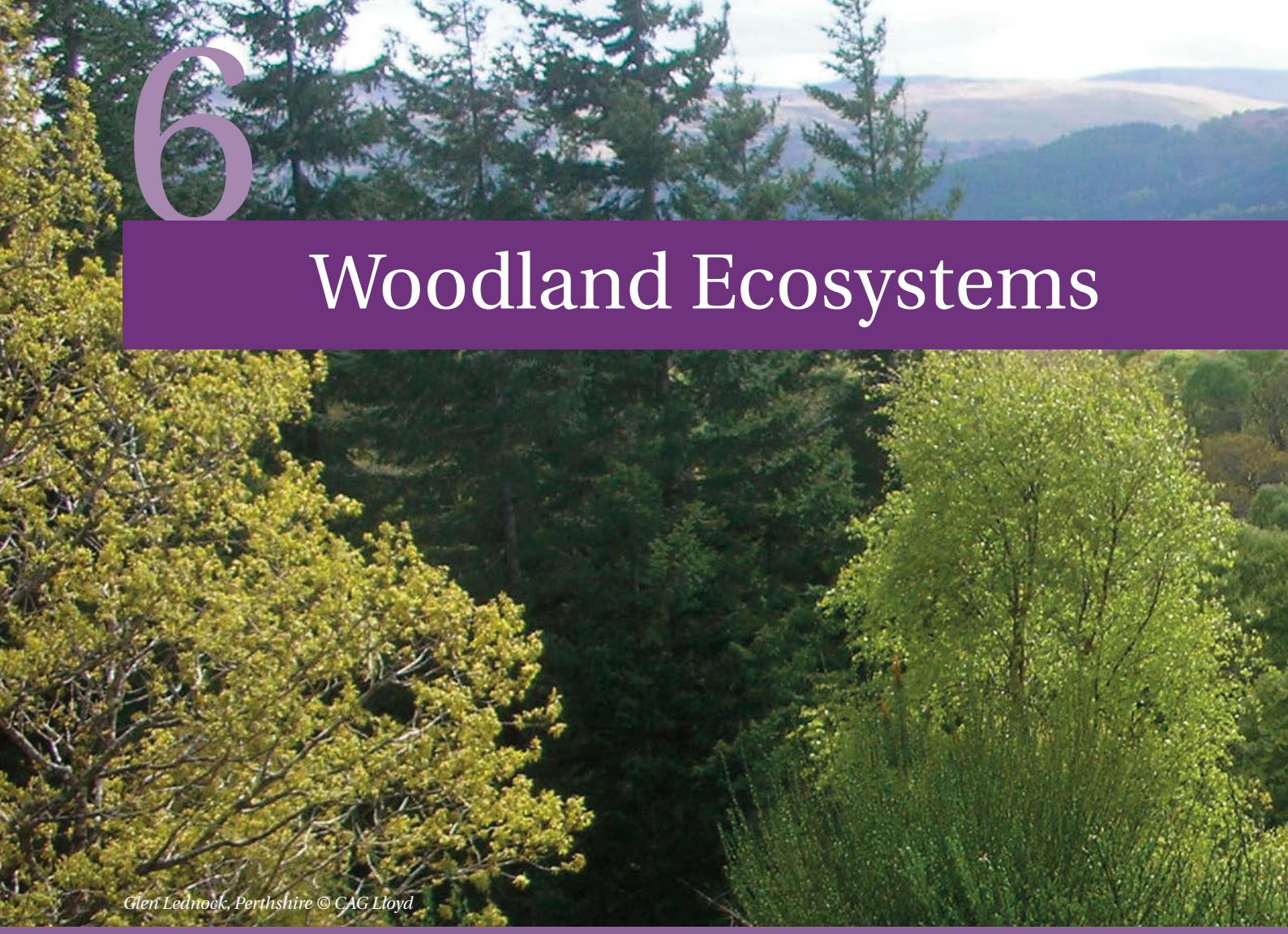
Education & Awareness Raising

Action	Action breakdown	Who needs to take the action	Timescale
12 Increase awareness of farmland species in Tayside and facilitate community participation in data recording.	Determine current status and distribution, and monitor populations of Barn owl, Tree sparrow and other farmland birds in Tayside. Determine current status and distribution, and monitor populations of farmland birds. Determine current status and distribution, and monitor populations of farmland butterflies and moths. Promote Citizen Science websites where community sightings can be submitted to a central database. Focus on awareness-raising through local and national press, specialist publications and events. Develop web and social media presence focussing on media used by local communities and the farming community. Provide survey training for recorders. Produce and reprint postcards and posters to publicise ongoing projects. Expand the project to include the North East Biodiversity Partnership areas and the CNPA. Annually prepare and circulate updates on survey work, publicity and volunteers.	Cairngorms National Park Authority Scottish Association of Independent Farm Conservation Advisors Tayside Biodiversity Partnership Tayside Recorders' Forum Scottish Natural Heritage Scottish Association of Independent Farm Conservation Advisors Local community Butterfly Conservation (Scotland) British Trust for Ornithology Scottish Land & Estates National Farmers Union Scotland North East Biodiversity Partnership	Long
13 Encourage school age participation in projects relating to farmland issues.	Work with the Royal Highland Education Trust in Angus and Perthshire to promote farm visits that demonstrate good wildlife management. Promote the use of the Living Field Centre (James Hutton Institute, Invergowrie), including its many projects, online facilities and the Living Field CD.	Tayside Biodiversity Partnership RHET Perth & Kinross Countryside Initiative RHET Angus Countryside Initiative The James Hutton Institute	

Invasive Non-Native Species

Action	Action breakdown	Who needs to take the action	Timescale
14 Reduce the direct pressures on farmland biodiversity and ecosystem health from invasive non-native species.	Produce a map highlighting key areas threatened by invasive non-native species. Limit the spread of the invasive non-native species such as Himalayan balsam and Giant hogweed. Raise awareness of invasive non-native species and demonstrate the impact that can be achieved by labour-intensive control. Showcase good practice control effort.	Angus Council Perth & Kinross Council Scottish Wildlife Trust Tayside Biodiversity Partnership Scottish Natural Heritage River South Esk Catchment Partnership Scottish Mink Initiative Esk Rivers and Fisheries Trust Scottish Environment Protection Agency National Trust for Scotland	Long

6 Woodland Ecosystems



Glen Lednock, Perthshire © CAG Lloyd

Background

Tayside is home to a rich variety of native woodland types and is also the 'cradle of Scottish forestry' as larch, spruce and Douglas fir were first introduced here. Europe's oldest tree is our renowned Fortingall Yew, which is between 3,000 and 5,000 years old. Tayside's woodlands are a major asset: biodiversity, recreation, tourism and carbon sequestration, as well as the economic value of wood fuel and timber extraction. There are, however, serious threats to individual woodlands, including Ash Dieback and the invasive non-native *Rhododendron ponticum*. In the SNH Biodiversity Indicators 15 of the 23 woodland bird species have increased by 10%. These include Great-spotted woodpecker, Chiffchaff and Blackcap. Many woodland birds are reliant on tree seeds as a source of food.

Tayside has 16% tree coverage, some 127,000 hectares of which 38,925 ha (2013 FCS Woodland Survey) is occupied by native and Ancient Woodland. In Perth & Kinross only 36% of native woodland is in good health, whereas it is 51% in Angus. Ancient Woods - land continually wooded since 1750 - are an important and irreplaceable national resource. They preserve the soil's ecological processes and associated biodiversity. Woodlands, hedgerows and individual trees (especially noteable and veteran trees) are vital both culturally and for biodiversity.

The outlook for native Pinewoods is the best it has been for 300 years, not only providing habitat, but also for its aesthetic and cultural contribution to the Scottish landscape. Wet Woodlands tend to be transient, colonising relatively inaccessible ground, often survivors of larger woods which have been felled and converted to other uses. In the Tayside landscape, the role of Wet Woodlands lies in their water quality and flood management benefits.

Lowland Mixed Broadleaved Woodland, on the other hand, is the most diminished Tayside woodland type. A very large proportion has been cleared for agriculture or in urban expansion and its use as pasture has died out. Its ecological condition has been compromised, especially in producing hardwood timber, supporting game species, or recreational use. Ash-Wych elm woodlands are today confined to the most fertile soils. With a renewed interest in traditional woodland skills in managing coppice and hedgerows (hedgelaying, etc.), there is an urgent need to source local materials. Coupled with a greater interest in planting broadleaves by community groups and in urban fringe woodlands, now is the time to review our management of this woodland type.

Birchwoods often form part of a complex mosaic, grading into other woodland types depending on

soil fertility, exposure and soil moisture. These are often interspersed with open areas of heath and bog. The ecosystem is especially dynamic as birchwood boundaries 'alter' over time. In the Angus Glens with continual selective removal there are losses of natural seed-sources. Over-grazing by sheep and deer has resulted in a lack of regeneration; climate change may affect their longevity and affect the ground flora beneath.

Some 80% of our woodlands are introduced conifer forests: these are amongst the longest established in the British Isles. Biodiversity benefits include greater species diversity and long-term retention, as well as their micro-climatic effects, carbon and oxygen exchange, soil stabilisation and regulation of water run-off. Forest rides, wayleave routes, roads, quarries and wetlands - and land where trees have failed to grow - make a valuable contribution to their overall biodiversity value.

As with other woodland types, the disappearance of traditional orchards in Tayside has been driven by economic and development pressures. Since the Historic Orchards of the Carse of Gowrie Survey, remaining orchards have been re-planted and the loss of skills addressed. The Perth800 celebrations resulted in hundreds of fruit trees planted; in Angus there are now 60 school orchards. The community orchard in Cultybraggan, Comrie, is proof that top fruit yields more than just community spirit - the economic benefit links the Slow Food movement and local food production.

Objectives

1 **Endeavour to reduce the direct pressures on woodland biodiversity by implementing projects to enhance ecosystem health.**

2 **Safeguard woodland ecosystems, species and genetic diversity by enhancing connectivity and where possible preventing its decline.**

3 **Mainstream biodiversity conservation action by raising awareness and the enjoyment of woodland ecosystems within local communities.**

4 **Recognise the important of ancient woodland in Tayside by protecting the existing resource and restoring and reconnecting ancient woodland remnants.**

Priority Habitats

- Native conifers: Scottish Pinewoods, Yew and Juniper
- Upland Birchwoods
- Wet Woodlands
- Upland Oakwoods
- Upland Mixed Ashwoods
- Lowland Mixed Broadleaf (Deciduous) Woodlands
- Aspen
- Traditional Orchards
- Planted Coniferous Woodlands (especially the woodland edge/glades)

Scot's pine © SNH

Key Sites

Black Wood of Rannoch: Caledonian Pinewood

Glenartney: Juniper Woodland

Crossbog Pinewood, Angus

Den of Airlie

Birks of Aberfeldy

Upper Farrochil and Strath Tummel: Upland Birchwood

Methven Woods: Lower Mixed Broadleaf

Drummond Hill: Planted Coniferous Woodland

Strathtay Estate: Upland Mixed Ashwood

Megginch Castle: Traditional Orchard

Loch Clunie: Wet Woodland

Key Species

- Woodland mammals, including Red squirrel and Pine marten
- Scottish crossbill and Nightjar
- Woodland invertebrates, inc. Scottish wood ant and moths
- Woodland plants, inc. Juniper, Blaeberry, Small Cow-wheat, Coral-root orchid and Twinflower
- Woodland lower plants and fungi

Native woodland type	PKC area ha.	AC area ha.	Total Tayside ha.
Wet woodland	3675 ha	928	**4603**
Native pinewoods	7032	1065	**8097**
Upland birchwoods	7292	1713	**9005**
Upland mixed ashwoods	1659	184	**1843**
Upland oakwoods	2235	174	**2409**
Juniper scrub	93	-	**93**

Red squirrel © SNH

Black grouse © Doug Shapley

Perthshire Black Grouse Study Group

This Group has been monitoring the Black grouse population in an area centred on Loch Tummel since 1990. Each year 25-30 volunteers count black grouse within seven 10 km squares. The group includes staff and volunteers from the RSPB, Game & Wildlife Conservancy Trust, Forestry Commission Scotland and SNH, as well as stalkers, gamekeepers and rangers. At least two visits are made to known lek sites between mid-March and mid-May and the numbers of blackcock present on leks counted between one hour before and one hour after sunrise. Other suitable habitat is also visited to search for new leks or displaying birds.

Despite national declines during the 1990s the Perthshire population has long been a stronghold for this species. The long-term data has been used in several peer-reviewed papers and the complete coverage and annual nature of the data means it can be used to analyse the importance of land management changes on the population over the long-term.

Glen Clova Contour Planting Project

Forestry Commission Scotland's work is driven by the Water Framework Directive, the Scottish Forestry Strategy, and the need to improve natural flood management. It is actively promoting responsible woodland management with landowners and tenant farmers in the River South Esk catchment to improve natural flood management opportunities, mitigate diffuse pollution, and improve habitats. Contour tree planting work being carried out in Glen Clova is being funded through project partner contribution and has been designed to ensure no loss of agricultural production or farm income. The increase of targeted woodland cover above 400m contours will contribute to greater soil permeability which, in the long term will result in a reduction in peak water flow during flood events. Not only will the project provide opportunities for employment in rural areas and create business opportunities from woodland management, the increase in trees could create shelter for livestock. Connections between important habitats will be improved, increasing the resilience of local biodiversity.

Glen Clova Contour Planting Project © Kelly Ann Dempsey

Ecosystem Services & Ecosystem Scale Projects

Ecosystem Services

- Carbon sequestration
- Photosynthesis and oxygen production
- Renewable energy
- Recreation and leisure
- Health and wellbeing, including medicines
- Tourism
- Wild food provision
- Timber and wood fuel
- Flood protection
- Climate regulation

Ecosystem Scale Projects

- Natural flood management processes
- Tayside Red Squirrel Conservation
- Tay Landscape Partnership Orchard Initiative
- Riparian Catchment Woodland Planting projects
- Wild Harvest projects
- Tayside Orchard projects
- Coppice woodland management
- Upper Strathearn Oakwoods Project

Pear orchard, Megginch by Errol © CAG Lloyd

Pressures

Invasive non-native species and diseases

Himalayan Balsam, Japanese Knotweed and Giant Hogweed all suppress the natural ground flora. As oak is a strong light demander, regeneration of oak under oak canopy is difficult with invasion of Rhododendron and Sycamore *Acer pseudoplatanus;* Rhododendron shades out native shrubs, young trees and ground flora, including lichens and bryophytes. Although a native plant, the spread of Bracken *Pteridium aquilinum* can seriously limit young growth.

Many tree pathogens are present in Britain - and spreading so research/ treatment is urgent and ongoing, especially where Ash Dieback and *Phytophthora ramorum* are concerned.

Climate Change

Many bird species are likely to be affected by climate change in the future, including Black grouse, Scottish crossbill and Pied flycatcher.

Silvicultural Systems

The cessation of coppicing and increased grazing pressure from domestic animals and browsing by wild animals has contributed towards a decrease in the structural diversity of Upland Oakwoods. Removal of large amounts of timber in the early 20th century significantly changed the composition and structure of Tayside's upland oakwoods. The replacement of native woodlands with crops of non-native species, notably Douglas fir in Tayside, is now largely historical, but its effects are ongoing.

Afforestation

Inappropriate afforestation and encroachment by scrub, trees and bracken in priority non-woodland habitats and key sites leads to impoverished habitats. Short-rotation coppice for biofuel also needs to be carefully located so that it does not damage priority upland or existing woodland habitats.

Fragmentation of Habitat

Felling and conversion of woodlands to intensive agriculture or development including housing, other infrastructure developments, golf courses and quarrying are key issues. Trees enclosed by new development risk being felled to abate an alleged nuisance and there is not a robust Tree Preservation Order system to safeguard them. Adjacent woodland areas are vulnerable to further encroachment or degrading owing to spray drift or run-off from agricultural land. Connecting features such as hedgerows and old wood banks can also be lost. In developing landscape-scale woodland planting projects, the development of forest habitat networks or urban greenspace networks must also take into consideration other priority habitats.

Lack of Management

Historical under-planting of oakwoods with coniferous species has contributed to the decline of about 40% of oakwoods across Scotland. Lack of management and adjacent land use changes (including new roads, quarrying and recreational access) have led to a limited

age structure within many woods. Unsympathetic management for wildlife in Planted Coniferous Woodland can occur if there is a limited range of tree species and minimal areas of open space. Such woodland can also be vulnerable to fire, wind-throw and major forest pests and diseases.

Grazing Issues

Changes in woodland structure can occur if sites are over-grazed by both domestic animals and deer, leading to degradation of ground flora and lack of regeneration. Overstocking of sheep and deer inhibits regeneration of montane scrub and woodland. Sycamore and Beech can survive the effects of over-grazing to take over any gaps created in the Ashwood canopy; this hinders potential expansion of the original woodland type. Conversely, wood pasture can be under-grazed or converted to intensive grassland and veteran trees removed or severely pollarded.

Abstraction of Water

In wet woodland, agricultural drainage coupled with excessive grazing results in poached soils, changes in the woodland structure and ground flora, and regeneration issues. Increased water abstraction, eutrophication and other forms of pollution also take their toll.

Increasing Recreational Use

Visitor presence in woodlands has been shown to affect the number of birds, badgers and deer owing to increased disturbance. This may be worsened around breeding or hibernation time where bat species are concerned. Destruction or over-managed woodland ground cover for footpaths, orienteering or mountain bike routes can result in the loss of invertebrates which affects the wildlife that feed upon them. Careful path management can mitigate against this.

Juniper © SNH

The Hunt for Juniper

There are three native conifers in Scotland – the Scots Pine, Yew and Juniper. All can be long-lived if they are able to reproduce. Juniper was once a widespread species in Scotland and Perthshire is still a key area for it. It is, however, in trouble, with many veteran junipers left in the landscape, over-grazed and not able to regenerate. It is in serious decline and Scottish Natural Heritage is keen to find out where Juniper is growing in Perthshire. Stands of 50+ mature juniper bushes are needed to be self-sustaining and this is now rare in the landscape.

The loss of juniper will affect wildlife such as Black grouse, Snipe and Woodcock who benefit from the dense ground cover provided by juniper. Its evergreen leaves are often the only grazing available to sheep and deer during snowy winters. Farm livestock also use the shelter juniper affords. Most juniper berries for gin production in the UK are imported from Eastern Europe, although there is a Southern Uplands project underway. Scottish juniper was often used by illicit whisky distillers because of its smokeless wood.

Woodland Ecosystems Actions Schedule

Key for timescale Short: 1-3 yrs **Medium**: 4-6 yrs **Long**: 7-10 yrs

Actions will be input into the UK Biodiversity Action System (UKBARS)where Lead Partners will be outlined

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
1 Protect and expand Tayside's forests and woodlands, increasing their value to society and the environment.	Set targets for new and existing native tree cover, taking into consideration the Scottish Forestry Strategy's vision for woodland expansion to around 25% of Scotland's land area.	Forestry Commission Scotland Scottish Natural Heritage Cairngorms National Park Authority Angus Council Perth & Kinross Council Tayside Biodiversity Partnership River South Esk Catchment Partnership	Short
2 Maintain existing native woodland and Traditional Orchard areas and prevent net loss or reduction in their quality.	Protect native woodland resources through planning policy, conditions and Tree Preservation Orders. Protect, restore and enhance ancient woodland.	Forestry Commission Scotland Cairngorms National Park Authority Angus Council Perth & Kinross Council	Long
3 Investigate and support projects and policies which create more planting of native woodland species and forest cover in Tayside.	Expand the establishment of Scots Pine and native Oak plantings where appropriate within Tayside, or extend existing native woodland where there has been continuous cover of some kind for 500 years or more. Expand the establishment of mixed broadleaves, birchwoods and wet woodland plantings where appropriate within Tayside, or extend such existing native woodland where there has been continuous cover of some kind for 500 years or more. Identify Planted Ancient Woodland Sites (PAWS) and encourage landowners and managers to incorporate PAWS restoration in management plans.	Forestry Commission Scotland Cairngorms National Park Authority Angus Council Woodland Trust Perth & Kinross Council River South Esk Catchment Partnership Landowners and managers	Long
4 Improve the environmental value of woods and forests throughout Tayside.	Deliver new grants, including work in open space and non-woodland habitat within the woodland or forest area. Develop forest habitat networks.	Forestry Commission Scotland Cairngorms National Park Authority Angus Council Perth & Kinross Council River South Esk Catchment Partnership Community Woodlands Association Landowners and managers Community groups	Long

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
5 Encourage natural flood management through the planting of trees.	Where appropriate, support catchment-led tree planting initiatives that encourage natural flood management and mitigate against the impacts of climate change.	Forestry Commission Scotland Cairngorms National Park Authority North East Green Network Angus Council Perth & Kinross Council Scottish Natural Heritage Tayside Biodiversity Partnership River South Esk Catchment Partnership Woodland Trust Tay Foundation Esk Rivers & Fisheries Trust	Long
6 Extend and enhance Upland Oakwoods, bringing them under management to increase their biodiversity and conservation value.	Encourage the application for funds within the Scottish Rural Development Plan and Forestry Grant Schemes (or their successors) to raise awareness of the importance of Upland Oakwoods to woodland owners through examples of good practice, workshops, publicity and other events. Develop Forest Habitat Networks as detailed in the Scottish Forestry Strategy and Indicative Forestry Strategies.	Forestry Commission Scotland Cairngorms National Park Authority Angus Council Perth & Kinross Council River South Esk Catchment Partnership Landowners and managers Community groups	Medium
7 Maintain, improve and increase the habitat quality of Coniferous Plantations where Scottish Biodiversity List species are present.	Safeguard and enhance existing and potential habitat features in all plantations. Protect and suitably manage Great Crested Newt ponds to increase population. Restructure first rotation conifer plantations.	Forestry Commission Scotland Cairngorms National Park Authority River South Esk Catchment Partnership Landowners and managers Community groups Fife Amphibian & Reptile Group (Fife ARG) Tayside Amphibian & Reptile Group (TayARG)	Long

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
8 Maintain, restore and improve existing Wet Woodlands in Tayside and expand them where appropriate.	Safeguard and enhance existing habitat features in all Wet Woodlands, especially those in SAC and SSSI designated sites.	Scottish Natural Heritage Forestry Commission Scotland Cairngorms National Park Authority Angus Council Perth & Kinross Council River South Esk Catchment Partnership Landowners and managers Community groups	Long
9 Halt further loss of Traditional Orchards in Tayside.	Protect Traditional Orchard resources through planning conditions and Tree Preservation Orders. Undertake a survey of all Tayside orchards. Undertake a variety of biodiversity studies/surveys across Tayside to ascertain the biodiversity value of old orchards, and publicise the findings to a wide audience. Encourage the setting up of a fruit tree grafting programme to safeguard existing local fruit varieties and to make available local varieties to projects throughout Tayside. Disseminate the booklet 'Traditional Orchards in Tayside – a Guide to Wildlife and Management' as widely as possible.	Angus Council Perth & Kinross Council Tayside Biodiversity Partnership Tay Landscape Partnership Scottish Orchard Collective Plants with Purpose/Appletreeman Carse of Gowrie Group Landowners and managers Community groups	Medium
10 Restore and enhance Traditional Orchards in Tayside.	By 2025 restore 12 acres of Traditional Orchards in Perth & Kinross. By 2025 restore 8 acres of Traditional Orchards in Angus.	Scottish Orchard Collective Tayside Biodiversity Partnership Tay Landscape Partnership Carse of Gowrie Group	Long

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
11 Promote the biodiversity importance of Traditional Orchards, enhance orchard management and encourage their sustainable economic use.	Promote and publicise Traditional Orchards as part of the culture and landscape. Support groups such as the Carse of Gowrie Historic Orchards Forum. Support community events and training workshops throughout the year. Support an annual Tayside Orchard Festival and local community Apple, Pear or Orchard Days.	Scottish Natural Heritage Tayside Biodiversity Partnership Tay Landscape Partnership Carse of Gowrie Group Scottish Orchard Collective Landowners Community groups	Medium
12 Restore woodland plant species populations and genetic diversity and enhance species connectivity.	Support existing and new projects which identify and safeguard threatened species.	Scottish Natural Heritage Cairngorms National Park Authority Plantlife Scotland Botanical Society of the British Isles Angus Council Perth & Kinross Council Landowners River South Esk Catchment Partnership	Long
13 Promote the sustainable development of Tayside's woodland types through increased policy integration.	Ensure TAYplan (Strategic Development Plan), Angus Local Development Plan, Perth & Kinross Council, Development Plan and Indicative Forestry Strategies take into account sustainable development. Annually produce updates for Local Authority Climate Change Declaration reporting. Produce updates for Local Authority statutory biodiversity reporting against the 2020 Challenge.	Scottish Natural Heritage Forestry Commission Scotland Cairngorms National Park Authority Angus Council Perth & Kinross Council Tayside Biodiversity Partnership River South Esk Catchment Partnership	Long
14 Reduce the direct pressures on woodland biodiversity by enhancing ecosystem health.	Tackle littering and invasive non-native species at problem sites. Encourage measures which reverse habitat fragmentation. Safeguard alluvial forests and bog woodlands. Develop and promote ongoing beneficial deer management. Introduce biosecurity measures where necessary at outbreaks of notifiable tree diseases.	Angus Council Perth & Kinross Council Scottish Natural Heritage Forestry Commission Scotland Tayside Biodiversity Partnership Landowners and Land managers	Long

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
15 Ensure the long-term future of woodland habitat by showcasing best practice land management techniques.	Maintain species richness within the different woodland types. Reduce grazing pressure from deer and livestock ensuring a more collaborative management approach of roe and fallow deer to help promote more tree regeneration in existing woodlands. Protect woodlands and woodland strips from inappropriate development, disturbance and damage (including recreation). Promote demonstration sites and advise on good woodland management practices. Encourage sympathetic management of woodlands for wildlife, structural diversity and rich lower plant communities, including the natural turn-over of leaf litter and wood by invertebrates and fungi.	Forestry Commission Scotland Scottish Natural Heritage Cairngorms National Park Authority North East Green Network Angus Council Perth & Kinross Council Landowners and Land Managers Royal Society for the Protection of Birds British Lichen Society Plantlife Scotland National Farmers Union Scotland Scottish Land & Estates Tayside Biodiversity Partnership Tay Landscape Partnership	Long
16 Promote the safeguarding and management of veteran trees.	Support measures to protect and manage veteran trees across Tayside. Encourage the widening of the Ancient Tree Hunt surveys across Tayside. Support groups such as the Ancient Tree Forum and Perth & Kinross Tree Wardens' Network in raising awareness on veteran tree management. Support the setting up of a National Register of Scotland's Trees of Special Interest. Support community events and training workshops throughout the year.	Forestry Commission Scotland Woodland Trust Ancient Tree Forum Angus Council Perth & Kinross Council Tayside Biodiversity Partnership Perth & Kinross Tree Wardens Network	Long
17 Promote the importance of urban trees.	Protect urban trees in accordance with BS5837. Renew the street tree resource across Tayside. Encourage the need to renew the resource through new development opportunities with planners and developers. Raise awareness of the importance of urban trees with planners and developers through regular training events. Support the planting and management of community orchards, school orchards and fruit tree plantings in the urban setting.	Scottish Natural Heritage Angus Council Perth & Kinross Council Forestry Commission Scotland Woodland Trust Tayside Biodiversity Partnership Perth & Kinross Tree Wardens Network Developers Tay Landscape Partnership	Medium

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
18 Promote restoration projects and species management programmes.	Set up Green Habitat Network to create stepping stones for key species. Identify woodlands with the greatest potential for Red squirrel conservation and encourage the use of funding through the Scottish Rural Development Programme and Forestry Grant Scheme to support habitat management for Red squirrels. Investigate ways of managing upland forest ground to increase its value as a wildlife habitat. Explore options for fencing to protect sensitive habitats from disturbance. Where Juniper is present (>50 plants), enhance management by controlling grazing levels and timing, protecting bushes from burning and removing encroaching vegetation. Safeguard small and vulnerable populations of Juniper. Encourage natural regeneration of Aspen. Identify woodlands with the greatest potential for Bat species conservation. Remove invasive plants such as Japanese Knotweed, Himalayan Balsam and Giant Hogweed. Encourage the setting up of a Tayside Woodland Butterfly Project.	Forestry Commission Scotland Scottish Natural Heritage Scottish Wildlife Trust Plantlife Scotland Cairngorms National Park Authority Angus Council Perth & Kinross Council River South Esk Catchment Partnership Butterfly Conservation Scotland Bat Conservation Trust Landowners and managers Community groups	Medium
19 Support the Aspen 2020 Project	Encourage the gathering and sharing of information about Aspen to enable landowners and managers to safeguard and expand existing Aspen woodlands and plant new ones. Support the increased availability of local origin Aspen for planting.	Cairngorms National Park Authority Scottish Natural Heritage Landowners and managers	Long

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
20 Encourage collaborative regional working for green networks.	Identify and promote "cross-boundary" opportunities to join up woodlands and woodland strips between local authorities, Biodiversity Partnerships and other geographically based organisations. In collaboration with partners, share and promote good practice to other land users. Encourage or co-ordinate regional-scale projects and surveys and advise on funding. Investigate the potential for a partnership project to promote connectivity, management and expansion of ancient semi-natural woodlands around woodland SSSIs - consider the introduction of a pilot Upper Strathearn Oakwoods Project. Highlight projects being developed and create opportunities of scale and collaboration. Encourage landowners and land managers to consider how best to develop woodland in order to maximise benefits for wildlife through improving habitat connectivity. Support the setting up of a Scottish Coppice Association to raise awareness of sustainable coppice management for woodland products and biodiversity. Work in partnership to establish an overview audit of relict and existing coppice woodland in Tayside, its current status, and the potential to plant new coppice coupes.	Forestry Commission Scotland Scottish Natural Heritage North East Green Network Angus Council Perth & Kinross Council Perth & Kinross Countryside Trust Cairngorms National Park Authority River South Esk Catchment Partnership Tayside Biodiversity Partnership Scottish Crannog Centre Reforesting Scotland Tay Landscape Partnership Landowners and land managers	Long
21 Protect, restore and enhance ancient woodlands as identified in the SNH Ancient Woodland Inventory.	Protect ancient woodlands through planning policy and conditions, forestry applications, awareness-raising with planners and landowners of their irreplaceability and encouraging restoration. Raise awareness of the National Woodland Survey of Scotland and the Ancient Woodland Inventory.	Scottish Natural Heritage Forestry Commission Scotland Cairngorms National Park Authority Angus Council Perth & Kinross Council Tayside Biodiversity Partnership River South Esk Catchment Partnership Ancient Tree Forum	Long

Surveying & Monitoring

Action	Action breakdown	Who needs to take the action	Timescale
22 Investigate the effects of climate change on the movement of woodland species through regular surveying and monitoring.	Generate records of woodland wildlife by facilitating biological surveys in woodlands around Tayside. Raise awareness of woodland species and conservation amongst the wider community. Continue the Black Grouse Project.	Scottish Natural Heritage Scottish Wildlife Trust Royal Society for the Protection of Birds Butterfly Conservation Scotland British Trust for Ornithology Angus Council Perth & Kinross Council Tayside Biodiversity Partnership River South Esk Catchment Partnership Tayside Recorders' Forum Cairngorms National Park Authority Woodland Trust Botanical Society of Britain and Ireland	Long
23 Investigate woodland bird spatial and temporal distribution patterns in Tayside.	Encourage the continuation of Scottish Woodland Breeding Bird Surveys to improve information about woodland birds.	British Trust for Ornithology	Medium
24 Conserve genetic diversity by discovering and promoting the diversity of fruit varieties grown in Tayside.	Undertake varietal surveys throughout Tayside and widely share the information. Survey other key fruit such as plum varieties. Support growing of local and rare fruit varieties.	Scottish Orchard Collective Tay Landscape Partnership Carse of Gowrie Group Tayside Biodiversity Partnership	Medium

Surveying & Monitoring

Action	Action breakdown	Who needs to take the action	Timescale
25 Raise awareness of endangered woodland butterflies and moths and encourage community participation in conservation.	Analyse collected, verified data annually and develop adaptive management strategy to develop surveying and monitoring protocol. Investigate the connectivity of woodland populations. Provide survey training for recorders. Produce and reprint postcards and posters to publicise ongoing projects. Expand the project to include the North East Scotland Biodiversity Partnership area. Annually prepare and circulate updates on survey work, publicity and volunteers. Make all survey links available on the Partnership website. Encourage the undertaking of a Black Wood of Rannoch Moth Project.	Butterfly Conservation Scotland Tayside Biodiversity Partnership North East Scotland Biodiversity Partnership Landowners and land managers Community	Long
26 Promote local recorders, clubs and biodiversity open days.	Maintain an up to date database of local recorders and specialist clubs on the TBP website. Utilise the skills of local recorders and clubs to target specific projects. Encourage local open days and promote to the partnership's extended network.	Tayside Biodiversity Partnership Tayside Recorders' Forum North East Scotland Biological Recording Centre Scottish Wildlife Trust Butterfly Conservation Scotland Scottish Natural Heritage Scottish Land & Estates	Medium

Education & Awareness Raising

Action	Action breakdown	Who needs to take the action	Timescale
27 Increase awareness of woodland species in Tayside and facilitate community participation in data recording.	Determine current status and distribution, and monitor populations of Pine marten, bats, woodland birds and woodland butterflies in Tayside. Encourage the setting up of a community-based Migratory Birds Project to study populations of Pied flycatcher, Wood warbler, Redstart and Tree pipit. As part of the project, consider a targeted nestbox scheme in pilot areas (including Highland Perthshire) before widening out across Tayside. Focus on awareness-raising through local and national press, specialist publications, tree and woodland trails, and events. Develop web and social media presence focussing on media used by local communities and tourists e.g. VisitScotland, CNPA, and Angus Ahead website. Support Nightjar surveys and the species' safeguarding in Angus woodlands.	Cairngorms National Park Authority North East Scotland Biological Recording Centre Tayside Biodiversity Partnership River South Esk Catchment Partnership Community Butterfly Conservation (Scotland) British Trust for Ornithology Royal Society for the Protection of Birds Perth & Kinross Countryside Trust Dundee & Angus Bird Club Bat Conservation Trust Woodland Trust Perth & Kinross Tree Wardens Network	Long
28 Encourage community outreach, development and training.	Raise awareness of woodland management measures to community groups and voluntary organisations in Tayside to encourage woodland purchase, management and hardwood timber marketing. Encourage sharing good practice and training in woodland and orchard management and conservation, including sustainable coppice, veteran tree and hedgerow management (including hedgelaying).	Forestry Commission Scotland Angus Council Perth & Kinross Council Tayside Biodiversity Partnership Scottish Community Woodlands Native Woodlands Small Woods Association Perth & Kinross Tree Wardens Network	Long

Education & Awareness Raising

Action	Action breakdown	Who needs to take the action	Timescale
29 Raise awareness of woodland types to Local Authorities, Community Planning Partners and the wider stakeholder network.	Report regularly to community planning thematic partnerships on project contributions to local and national Single Outcome Agreement objectives. Regularly provide biodiversity seminars and workshops to local authority staff on relevant legislation and good practice. Use social media and targeted websites to promote woodland issues to as wide an audience as possible.	Cairngorms National Park Authority Scottish Natural Heritage Angus Council Perth & Kinross Council Tayside Biodiversity Partnership	Long
30 Encourage school age participation in projects relating to woodland and orchard issues.	Support new projects, including the Tayside Wildlife Trees Initiative, which identify woodland ecosystem, habitat and species issues. Support new Branching Out projects in Tayside, including expansion of the Tayside Woods for Health initiative. Expand the Schools into Woods Project to encourage schools to use nearby Woodland Trust sites for outdoor learning. Increase opportunities for learning outdoors via Outdoor & Woodland Learning Scotland (OWL Scotland). Encourage the expansion of Forest School, Forest Kindergarten and Skills for Work (rural skills and vocational training) facilities across Tayside. Develop educational resources to support the understanding of issues affecting woodlands, orchards and trees.	Tayside Biodiversity Partnership Forestry Commission Scotland Angus Council Perth & Kinross Council Scottish Wildlife Trust Butterfly Conservation Scotland OWL Scotland Cairngorms National Park Authority Tay Landscape Partnership	Medium
31 Encourage responsible interactions to minimise disturbance in woodlands.	Support new projects which identify good practice to minimise human disturbance in woodlands. Encourage community events to publicise cleaning up after dogs, e.g. Hounds on the Hill at Moncrieffe. Where there are high visitor numbers or recreational, educational or sporting activities that are detrimental to species within the woodland or sensitive areas, special zoning of areas, path re-routing or appropriate restrictions should be considered.	Forestry Commission Scotland Scottish Natural Heritage Angus Council Perth & Kinross Council Woodland Trust VisitScotland Tayside Biodiversity Partnership	Long

Invasive Non-Native Species

Action	Action breakdown	Who needs to take the action	Timescale
32 Reduce the direct pressures on woodland biodiversity and ecosystem health from invasive non-native species.	Produce a map highlighting key areas threatened by invasive non-native species. Limit the spread of the invasive non-native species such as Himalayan balsam and Giant hogweed. Raise awareness of invasive non-native species and demonstrate the impact that can be achieved by labour-intensive control. Facilitate work party days with volunteer input to carry out control. Showcase good practice control effort.	Angus Council Perth & Kinross Council Scottish Wildlife Trust Tayside Biodiversity Partnership Voluntary Action Angus Scottish Natural Heritage River South Esk Catchment Partnership Scottish Mink Initiative Esk Rivers and Fisheries Trust Scottish Environment Protection Agency	Long

7

People & Communications

Surveying for Small Blue butterflies, Angus coast © CAG Lloyd

Background

An understanding of biodiversity is essential to ensuring its conservation – and enjoyment. We are long past the stage where the word itself was once a hindrance. It is now widely used from travel brochures to gardening magazines, from children's books to television news. And it is becoming 'big news'. The RSPB's Big Garden Birdwatch regularly attracts more than half a million people who between them count well over 8 million birds each winter. They are asked to help for only one hour on the last weekend of January.

Community bioblitzes are increasingly discovering what species are found on specific sites and this paves the way for future management with biodiversity in mind. The national Garden BioBlitz surveys are capturing everyone's imagination - set up in 2013, this June event focuses on 24 hours over a weekend and encourages anyone with a minor interest in the wildlife around them to find out more. It has been described as a virtual field trip with people scouring their gardens and sharing their findings and photographs on social media, experts helping with identification and all the information being logged via iRecord. Something similar has happened with the Wildlife Trust's '30 Days Wild' Facebook campaign which recently attracted 8,000 contributors for the thirty days of June but proved so successful the campaign will continue for the rest of year.

With an increased interest in wildlife comes recognition that health and well-being is intrinsically linked with the natural environment and with it our sense of place and belonging. Access to greenspace and increased physical activity leads to better health outcomes, including shorter hospital stays and less anti-social behaviour in children and young people. Positive effects include a variety of physical and mental health benefits - better mood, blood pressure and concentration and less stress, depression and anxiety. There are many opportunities to improve our health, bring local communities together and collectively improve our commitment to caring for it.

Tayside Biodiversity partners are focussing on a variety of aspects to help raise awareness:

- Public engagement through events and community-based projects involving volunteers and people of all ages and abilities
- Engaging people of all ages to find out about species and habitats with citizen science surveys and projects such as Capturing our Coast and Tayside Swifts
- Life-long learning, education and natural play

- Professional guidance to raise awareness of biodiversity priorities and legislation, how to manage sites proactively and how to minimise negative impacts

There is continuing pressure on Ranger Services in Scotland and in some cases they no longer contribute to biodiversity targets or offer school visits. Without access to their expertise more pressure is put on NGOs (non-governmental organisations) who are themselves struggling to keep up with growing demand.

It has been seen that children learning about their local wildlife at an early stage results in a greater understanding of biodiversity through life. This does not have to be just via the curriculum, but out-of-school events involving the family, taking part in the John Muir Award scheme or enjoying woodland or coastal activities can all give a healthy regard to biodiversity that can pay dividends in the future.

The main drawback in Tayside is the lack of a Biodiversity Information Centre. Elsewhere in Scotland there are vibrant records centres which not only collate wildlife sightings and respond to queries from developers and planners, but also raise awareness of the subject with specialist and not so specialist training sessions. The Tayside Recorders' Forum fills the gap in a small way by bringing people together at its annual event, but without a dedicated centre little progress is possible beyond this.

There has, in the meantime, been a very welcome increase in local community action groups contributing directly to safeguarding sites and this fits well with key outcomes in the 2020 Challenge for Scotland's Biodiversity:

- Health and well-being improved through physical activity and contact with nature
- Communities involved in decision-making take pride in their local environment
- Healthier local environments more widely understood and supported by communities

Objectives

1. **Increase awareness, understanding and appreciation of biodiversity and ecosystem services throughout Tayside**
2. **Provide opportunities for residents and visitors alike to actively engage in biodiversity conservation action**
3. **Mainstream opportunities for everyone of all ages and abilities to take part in citizen science projects and biological recording**

Community Churchyard Lichens training © CAG Lloyd

Tayside Local Recorders' Forum

Set up in 2007, it has been tradition for each Tayside Recorders' area to host the annual event in turn, so well-attended Recorders' Days have taken place at Perth Museum & Art Gallery, The Meffan in Forfar and McManus Art Gallery & Museum (hosted by Leisure & Culture Dundee). The aim of the day is not just to hear updates from the many County Recorders and species experts in the area, but also to discover what is happening elsewhere in Scotland. There have been debates on a number of issues and practical demonstrations on how to use recording schemes such as iRecord or the Atlas of Living Scotland.

There is an extensive Tayside Recorders' Forum section on www.taysidebiodiversity.co.uk. It includes advice on how to record species, who to contact locally, and which surveys and projects need help.

Capturing our Coast fieldwork - in the rain! © CAG Lloyd

Bee on allium © CAG Lloyd

Tayside BeeWild Initiative

Many of the projects being actively taken forward by the Tayside Biodiversity Partnership involve local communities contributing directly to national targets. The Tayside BeeWild Initiative is one such project. It is exploring ways to safeguard our local pollinators – the bumblebees, butterflies, solitary bees and honey bees, beetles, moths and hoverflies which all play a part in pollinating our fruit, vegetables and crops. The premise is that small changes in how we manage our greenspace and gardens can really help and this can involve a wide variety of businesses, community groups, individuals and volunteers.

The pilot project in 2016, funded by the Angus Environmental Trust and jointly led by the Tayside Biodiversity Partnership and Volunteer Action Angus, is involving nine care homes, a day care centre and a sheltered housing complex. Each chose from a suite of wildlife kits to suit their surroundings – pond and bog gardens, wildflower meadow plantings, wildlife trees, biodiversity banks and orchards. All participants were given a Patios for Wildlife and People kit which included bat boxes, bee hotels and bird nest boxes, as well as wooden tubs, all expertly made in the Volunteer Action Angus workshop.

As part of the project, the Partnership provided a comprehensive Site Management Plan which not only highlighted potential biodiversity enhancements for each site based on the wildlife kits, but also a citizen science section on opportunities for an enhanced activities programme. A regular bulletin outlining potential citizen science surveys to join, together with a series of occasional workshops will help Activities staff, relatives and residents alike enjoy their improved surroundings – and contribute towards key biodiversity targets.

As part of the project, the 'Making Way for Nature - in our gardens, allotments, orchards and community spaces' booklet was revised and re-printed. This will be distributed to business and industrial parks throughout Tayside, as well as local schools, allotment and community groups who will all be invited to take part in the BeeWild Initiative.

People & Communications Actions Schedule

Key for timescale Short: 1-3 yrs **Medium**: 4-6 yrs **Long**: 7-10 yrs
Actions will be input into the UK Biodiversity Action System (UKBARS) where Lead Partners will be outlined

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
1 Encourage community groups to manage local areas for biodiversity.	Expand the Tayside BeeWild Initiative. Support the setting up of a Tayside Biodiversity Village Initiative, exploring the potential for a series of pilot projects in Stanley, Forteviot, Inchture and Monifieth. Support the setting up of the Castle Huntly Biodiversity Project to improve an area of prison grounds. Expand the Angus 'Going the Whole Hog' project into Perth & Kinross. Work with partners to set up the Tayside Church Yew Project, sharing yew tree cuttings with churches and Eco-Congregations across Tayside. Prepare and publish the A to Z Green Graveyard Guide (as part of the Tayside Green Graveyard Initiative). Work with ScotRail in the Community to expand the Nature on Track project to re-write and expand on the first Nature on Track leaflet (highlighting the biodiversity seen from trains between Perth and Montrose) and support a pan-Partnership project across other biodiversity partnerships areas in Scotland.	Tayside Biodiversity Partnership Volunteer Action Angus Perth & Kinross Association of Voluntary Service Angus Council Perth & Kinross Council Perth & Kinross Countryside Trust Keptie Friends East Haven Together Eco-Schools Tay Landscape Partnership Scottish Prison Service Scottish Natural Heritage Broughty Ferry Environmental Project Perth & Kinross Tree Wardens' Network Conservation Foundation Eco-Congregation Scotland A Rocha ScotRail	Short

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
2 Contribute to the setting up of a North East Green Network (NEGN) to strategically increase environmental, recreational, educational and tourism benefits across the North and East of Scotland.	Continue to promote discussion between all interested parties to scope out issues relating to the successful establishment of a collaborative North East Green Network, including geographical extent, project delivery and funding. Disseminate the gap analysis on the first proposed project 'From Frogspawn to Flood Prevention' for comment and possible action. Contribute to a second gap analysis on a further project (e.g. the proposed Coast Path Links). Whilst acting as Interim Chair, the Partnership to set up and host the NEGN website.	Scottish Environment Protection Agency Scottish Natural Heritage Forestry Commission Scotland Tayside Biodiversity Partnership River South Esk Catchment Partnership North & East Scotland Biodiversity Partnership Angus Council Perth & Kinross Council Highland Council Cairngorms National Park Authority Aberdeenshire Council Aberdeen City Council Dundee City Council Fife Council VisitScotland	Short

Surveying & Monitoring

Action	Action breakdown	Who needs to take the action	Timescale
3 Encourage community groups to manage local areas for biodiversity.	Support communities in undertaking a wide range of surveys to report back nationally, e.g. Tayside Town Swifts, Annual Moth Nights, International Bat Weekend, Garden Butterfly Survey, RSPB Big Garden Birdwatch, Insect Week, Dolphin Watches, Nurdle Counts, National Mammal Week. Support community bioblitzes across Tayside. Encourage community groups and individuals to take part in the annual National Garden BioBlitz. Set up a series of camera trap projects to engage all ages in confirming the distribution of specific species and to engage as wide an audience as possible. Ensure training is made available to community groups and schools.	Tayside Biodiversity Partnership Tayside Recorders' Forum Cairngorms National Park Authority Angus Council Perth & Kinross Council Bat Conservation Trust Butterfly Conservation Scotland Royal Society for the Protection of Birds Buglife Scotland Scottish Association for Marine Science MarineLife Angus Mammal Society North East Scotland Biodiversity Partnership Local community groups	Long
4 Review Local Nature Conservation Sites (LNCS) to contribute to better habitat connectivity, public access and outdoor education opportunities.	Across all habitats, review existing Local Nature Conservation Sites and consider their inclusion in the Local Development Plans. Identify and recommend a suite of potential new Local Nature Conservation Sites.	Scottish Natural Heritage Angus Council Perth & Kinross Council	Medium

Education & Awareness Raising

Action	Action breakdown	Who needs to take the action	Timescale
5 Prepare a Tayside Biodiversity Awareness Raising Strategy.	Outline a suite of costed awareness-raising actions to undertake within the Tayside Biodiversity Action Plan to strengthen the understanding of biodiversity issues.	Tayside Biodiversity Partnership	Short
6 Promote the Tayside Recorders' Forum.	Maintain an up to date database of local County Recorders and specialist groups/organisations on the TBP website. Utilise the skills of local recorders and specialist groups/organisations to target specific projects. Support a programme of events to promote the Forum.	Tayside Biodiversity Partnership Tayside Recorders' Forum Angus Council Perth & Kinross Council Angus Alive Culture Perth & Kinross Leisure & Culture Dundee North East Scotland Biological Records Centre Scottish Wildlife Trust Butterfly Conservation Scotland Scottish Natural Heritage	Medium

Education & Awareness Raising

Action	Action breakdown	Who needs to take the action	Timescale
7 Research the setting up of a Tayside Biodiversity Information Centre.	Support the introduction of a Tayside Counts Citizen Science project. Collate existing survey data and undertake new biodiversity audit of Tayside (building on the original 1999 audit). Support the production of atlases in Tayside to meet gaps in existing species atlases. Create a series of GIS map layers for key species to assist planners, developers, landowners and businesses in adhering to wildlife legislation.	Angus Council Perth & Kinross Council National Biodiversity Network Scotland Biological Recording in Scotland Tayside Biodiversity Partnership River South Esk Catchment Partnership Tayside Recorders' Forum	Medium
8 Promote Scottish Species Champions.	Encourage MSP Species Champions to visit Tayside to showcase projects taking forward specific species conservation, e.g. Small blue butterfly, Freshwater pearl mussel, Bottle-nosed dolphin. Identify Local Species Champions to help raise awareness of Tayside species.	Tayside Biodiversity Partnership Scottish Environment Link Angus Council Perth & Kinross Council	Medium
9 Disseminate advice to planners, developers and householders.	Continue to make available the 'Tayside Incorporating Biodiversity into Development Planning Manual', the 'Biodiversity: A Developers Guide' and 'Householders' Guide to Biodiversity' leaflets - online and in paper format. To support implementation of the Angus Local Development Plan, prepare, consult and publish a Planning Advice Note for Protected Sites and Species and their influence on development. Consider a similar Advice Note for the Perth & Kinross Local Development Plan. Ensure Supplementary Planning Guidance for Biodiversity is available across Tayside.	Angus Council Perth & Kinross Council Tayside Biodiversity Partnership Royal Society for the Protection of Birds Scottish Wildlife Trust	Long

Education & Awareness Raising

Action	Action breakdown	Who needs to take the action	Timescale
10 Assist local authorities and public bodies in Tayside to regularly report on their Biodiversity Duty.	Revise and re-publish the Tayside Biodiversity Partnership booklet "A Guide to Incorporating Biodiversity into Local Services".	Tayside Biodiversity Partnership Angus Council Perth & Kinross Council	Short
11 Provide a programme of professional training opportunities.	Continue the 'Building Better Biodiversity' series of professional lunch-time seminars and training events, practitioners' conferences and workshops to enhance knowledge on the Biodiversity Duty and specific habitats and species.	Tayside Biodiversity Partnership Scottish Natural Heritage Angus Council Perth & Kinross Council Non-governmental organisations	Short
12 Support the work of education professionals and the formal and informal education processes in raising awareness on biodiversity issues.	Publish the Tayside Teachers' Biodiversity Education Guide 'Signposts to Biodiversity and the Curriculum for Excellence'. Add an Education Information Hub to the Tayside Biodiversity website to host the Education Guide.	Tayside Biodiversity Partnership Angus Council Perth & Kinross Council Grounds for Learning	

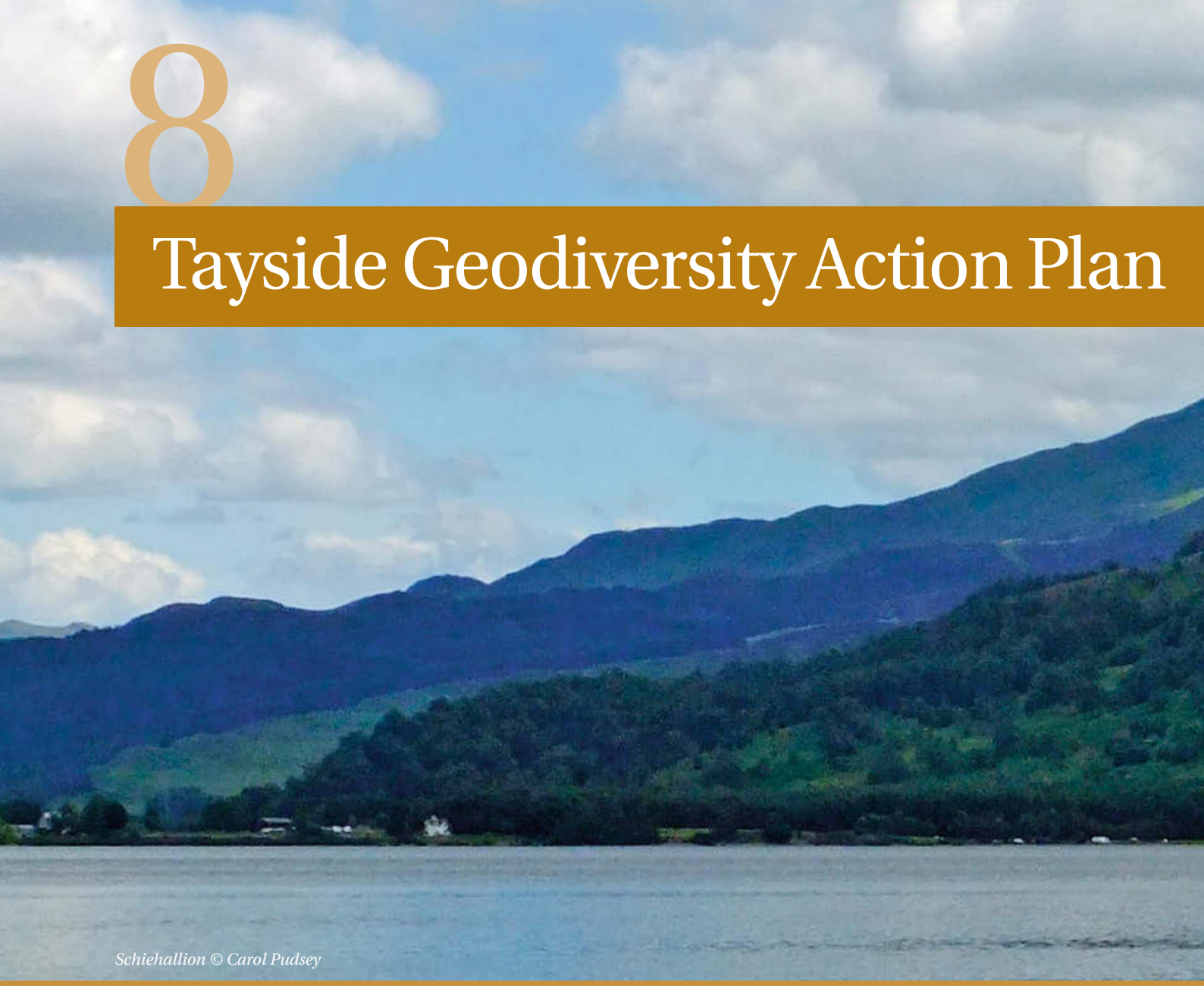
Education & Awareness Raising

Action	Action breakdown	Who needs to take the action	Timescale
13 Work in collaboration with partners and neighbouring Biodiversity Partnerships to support Business and Biodiversity events and projects.	Support an annual North & East Scotland 'Business Counts' week of events and workshops. Support the publication of a 'Business of Biodiversity Best Practice' advisory booklet. Distribute the 'Making Way for Nature' booklet to business parks and industrial estates across Tayside. Set up a suite of Business of Biodiversity/BeeWild best practice demonstration sites.	Tayside Biodiversity Partnership Angus Council Perth & Kinross Council North East Scotland Biodiversity Partnership Cairngorms National Park Authority Perthshire Business Enterprise Group Business Angus Chambers of Commerce	Short
14 Work with specialist and cultural groups to raise awareness of biodiversity in all its forms.	Support the setting up of a Tayside-wide 'Wildlife Words, Wildlife Art, Wildlife Sounds' Festival to highlight biodiversity through the medium of art, books and music. Support the setting up of a Scottish Coppice Festival to increase knowledge about rural skills (hedge-laying, coppice management, etc) and to bring together producers, suppliers and purchasers of sustainable woodland produce. Publicise the Tayside ZoomIn2 time-lapse photographic project and encourage all ages and all abilities to take part in the project.	Tayside Biodiversity Partnership Angus Council Perth & Kinross Council VisitScotland Perthshire Open Studios Angus Open Studios Reforesting Scotland Scottish Crannog Centre Atlantic Hazel Action Group Local businesses Community groups	

Education & Awareness Raising

Action	Action breakdown	Who needs to take the action	Timescale
15 Publicise and attend events to promote the Tayside Biodiversity Partnership and Tayside's local biodiversity.	Prepare local calendar featuring National Days to assist with local event planning, e.g. National Meadows Day, Garden BioBlitz, International Oceans Day. Take exhibition space at events such as Dundee Food & Flower Festival, the Kinross Discovery Day, etc.	Tayside Biodiversity Partnership	Short
16 Provide biodiversity information to a wide audience.	Encourage the publication of a variety of bulletins, e-bulletins and newsletters to increase knowledge about Swifts, Barn Owls, Farmland Birds and other species in Tayside. Continue to publish the Tayside "From Summit to Sand" Newsletter. Regularly update the Tayside Biodiversity website and contribute to Facebook and Twitter media pages to disseminate a wide range of information.	Tayside Biodiversity Partnership Tayside Recorders' Forum	Long

8 Tayside Geodiversity Action Plan



Schiehallion © Carol Pudsey

Background

The 1st Edition of the Tayside Biodiversity Action Plan was the first BAP to dedicate a detailed section to celebrating the area's geodiversity. Since its publication, the Tayside Geodiversity Group has reformed. Despite its small membership, it is taking forward a number of actions, especially the checking and recording of Local Geodiversity Sites and the preparation of a series of trail leaflets to raise awareness of geodiversity to a wider audience.

Geodiversity is the baseline to the ecosystem approach and biodiversity conservation – it supports our diverse habitats and species. It is a vital aspect of flood management and coastal/shoreline management. Use of groundwater and the winning of mineral resources heavily contribute to our economy, as does the land itself which provides many raw materials. The landscape provides for much of our recreational and tourism industry.

Over the past decade biodiversity has become more integrated into environmental and planning policy, but this has yet to fully happen to geodiversity. The Scottish Soil Framework (2009) has helped in integrating soil issues into policy. The setting up of the Scottish Geodiversity Forum in 2011 has enabled a national body to raise awareness of the subject and prepare the Scottish Geodiversity Charter. This was launched in 2012 and by 2015 there were 59 signatories, including the Tayside Biodiversity Partnership, Angus Council and Perth & Kinross Council.

The Scottish Geodiversity Charter addresses four key actions which are also relevant to Tayside, i.e.

1 Raise awareness of the importance of geodiversity and its wider links with landscape, culture and sense of place, and encourage a sense of pride through education (at all levels including schools, universities and life-long learning), promotion and interpretation;

2 Integrate geodiversity into relevant policies to ensure sustainable management of the natural heritage, land and water at a landscape/ ecosystem scale for the wider benefit of

Scotland's people, environment and economy;

3 Conserve and enhance our geo-heritage and its special character within existing designated sites and areas, further designation of local sites, and in the wider rural, urban and marine environment;

4 Research to improve our understanding of the role of geodiversity in providing benefits to ecosystems and people, and address key knowledge gaps such as the functional links between geodiversity and biodiversity in terrestrial, freshwater and marine environments.

The Geologists' Association is now hosting the UK Geodiversity Action Plan (UKGAP) website. The UKGAP provides a suite of UK Indicators and highlights national good practice by way of case studies published on the website. Of the 17 indicators listed, the Tayside Geodiversity Action Plan will contribute towards no. 9: "designation and protection of Local Geological Sites", no. 12: "visits to sites of geodiversity interest", and no. 14 "voluntary involvement and number of people involved".

Objectives

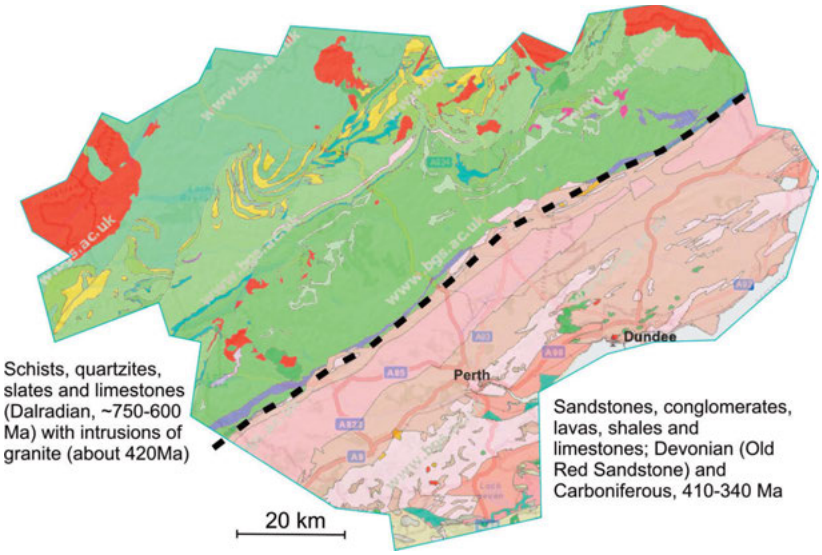
The objectives of the Tayside Geodiversity Action Plan are to:

1 **Identify, designate, protect and monitor important geological and geomorphological sites and landforms;**

2 **Raise awareness of geodiversity throughout Tayside, including its importance to biodiversity.**

Key Sites

- Arbroath to Auchmithie coast (Old Red Sandstone and coastal geomorphology)
- A9 road cuttings, Glen Garry (Dalradian folding and dykes)
- Schiehallion/Strath Fionan (Dalradian stratigraphy, Maskelyne experiment)
- Rannoch Moor (granite, hummocky moraines)
- Scurdie Ness, Montrose (Devonian volcanics)
- Gannochy Gorge (Highland Boundary)
- Corrie Fee, Glen Clova (glacial landforms)
- Cortachy Bridge (best outcrop of HBF serpentinite)
- Campsie Linn (dolerite dyke)
- Bishop Hill, Lomonds (Carboniferous sandstones and Midland Valley Sill)
- Glen Tilt (granite intrusion, Hutton locality)
- Ben Gulabin (landslide deposit)
- Friarton Quarry (Devonian sediments and lavas, dolerite dyke, peperite intrusion)
- Montrose Basin (Holocene tsunami deposit)
- Garry Drums (meltwater channels)
- Comrie pluton
- Barry Buddon (Holocene dunes)
- Glenquey (late-glacial delta)
- Kinnoull Hill/Moncreiffe Hill (Devonian lavas)
- Wester Bleaton quarry (Dalradian limestone, dolerite dyke, mineralisation)



Schiehallion: 'Weight of the World'


Cairn on East Ridge of Schiehallion © Carol Pudsey

Schiehallion can be found rooted in the Scottish Highlands, markedly apart from other peaks in the vicinity. With its iconic conical profile it is regarded as one of Scotland's well known Munros among locals, visitors and hill walkers. It provides ample opportunity for spectacular highland vistas, refreshing hill-walks along its main broad ridge and for those more hardened, hiking to a summit standing proud at 3,547 feet (1,083 metres).

The name Schiehallion translates to 'Fairyhill of the Caledonians' giving a tantalising glimpse of its diverse nature with its abundance of species from birds of prey, rare plants and the elusive wandering Red Deer. The John Muir Trust owns 935 hectares of the mountain and surrounding environment, and continues conservation and restoration across the summit, path and the southern-facing Gleann Mor.

The mountain was used during scientific research by the 18th century Astronomer Royal, the Rev. Neville Maskelyne, to test the measurement of the Earth's mass. In 1772 he proposed to the Royal Society the Schiehallion experiment for the determination of the Earth's density using a plumb line. His observations were carried out in 1774, assisted by Reuben Burrow, William Roy, William Menzies and a team of labourers. The experiment demonstrated that Newton's law of gravitational attraction was correct. The sites of the northern and southern observatories, as well as the two cairns on the summit ridge, are still visible.

Working with Other Organisations

In 2012 Tayside Geodiversity was tasked with undertaking a baseline Geodiversity Survey of the upper Firth of Tay - Lower Strathearn area. A 63-page report was subsequently presented to the Tay Landscape Partnership as part of its development phase. It included a brief technical account of the geology of the area, field and historical descriptions of 27 sites and a full bibliography.

Ahead of the A9 dualling, Tayside Geodiversity assisted Scottish Natural Heritage staff with field surveys of road cuttings along sections of the route to be dualled.


© Carol Pudsey

Sharing Geology with Visitors and Local Residents

A key output of Tayside Geodiversity has been in a series of geological leaflets. They can all be downloaded from the Tayside Biodiversity and Geodiversity websites. The most recent include:

The Arbroath to Auchmithie Trail – one of the first leaflets to be prepared and one of the most widely used. The trail includes the Whiting Ness to Ethie Haven Site of Special Scientific Interest (SSSI). It was selected as a SSSI for its geological interest, but also for the important areas of coastal grassland and cliff vegetation, and a variety of bird, plant and insect species. Look out for the Small Blue butterfly and its food plant Kidney Vetch whilst on the trail.

Strathardle –at the request of Kindrogan Field Studies Centre, a leaflet on the Quaternary landforms of the Straloch area was prepared. It describes three short walks where interesting moraines and meltwater channels can be seen.

Dundee Law – this leaflet describes the geological history of Dundee Law and outlines the uses of different building stones and features such as the old railway tunnel.

Schiehallion – a leaflet on the geology of Schiehallion, aimed at the hillwalker rather than the geologist, is in preparation.

Dighty Burn – Tayside Geodiversity advised the Dighty Connect project on the area's geodiversity ahead of publication of its leaflet.

A Landscape Fashioned by Geology: Fife & Tayside – for a wider picture the SNH publication can be downloaded via http://www.snh.org.uk/publications/on-line/geology/Fife_Tayside/

Tayside Geodiversity Actions Schedule

Key for timescale Short: 1-3 yrs **Medium**: 4-6 yrs **Long**: 7-10 yrs

Actions will be input into the UK Biodiversity Action System (UKBARS)where Lead Partners will be outlined

Maintaining & Improving Habitats

Action	Action breakdown	Who needs to take the action	Timescale
1 Promote the importance and value of Local Geodiversity Sites within Local Development Plans, all relevant local authority departments, and networks.	Join or continue as signatories to the Scottish Geodiversity Charter. Incorporate geodiversity and geo-heritage into Open Space Strategies, existing nature conservation practices and policies. Ensure repairs and renovations maintain and enhance the unique local character of our built heritage. Enhance geodiversity and access to sites during construction of new or upgrading of road routes, or as part of development and landscaping. Take into account geodiversity sites when commenting on Forestry planting plans. Encourage developers and planners to consider the ecosystem services geodiversity sites provide. Link geodiversity sites with development of core footpath network, cycleways and complementary signage strategy. Include enhancement of natural fluvial and coastal processes to reduce flood risk when undertaking statutory flood risk assessments. Encourage landowners and managers to restore/enhance natural river channels. Capture better GIS information on geodiversity sites and zones through an informed network-based planning approach and integration, where appropriate, into the North East Green Network.	Angus Council Perth & Kinross Council TayPlan Historic Environment Scotland Perth & Kinross Heritage Trust North East Green Network Scottish Land & Estates Forestry Commission Scotland Tayside Biodiversity Partnership Sustrans Tayside Geodiversity Landowners and land managers	Long

Surveying & Monitoring

Action	Action breakdown	Who needs to take the action	Timescale
2 Identify and designate Local Geodiversity Sites	Review existing list of potential Local Geodiversity Sites, draw up Priority Sites to check and prepare Site Designations to pass to the local authorities in Tayside. Local Authorities to add all Site Designations to their GIS to flag up in planning applications. Via citizen science surveys, identify and record new or temporary exposures, landslips, road cuts, development sites and add to geodiversity audit where applicable.	Tayside Geodiversity Angus Council Dundee City Council Perth & Kinross Council	Long
3 Monitor condition of Local Geodiversity Sites.	Report via Local Geodiversity Site listing as to site condition.	Tayside Geodiversity	Long

Education & Awareness Raising

Action	Action breakdown	Who needs to take the action	Timescale
4 Raise public awareness of geodiversity in the region.	Continue preparation and promotion of a series of trails, walks, etc. by way of leaflets, events and interpretation, etc. Provide and regularly maintain/update the Tayside Geodiversity website. Encourage the tourism sector to promote the region's geodiversity heritage, i.e. woodland, farmland and coastal trails, accommodation, guiding, Science Festivals input and interpretation. Work with local mineral extraction operations to ensure geodiversity information is collected and used. Education - encourage practical coastal and glacial fieldwork studies within the Curriculum for Excellence (Higher and National 5).	Tayside Geodiversity Tayside Biodiversity Partnership Broughty Ferry Environmental Project National Trust for Scotland Dundee Science Centre Angus Council Perth & Kinross Council	Medium
5 Develop the use of Tayside's geodiversity as a learning tool to promote outdoor teaching (for schools and adult education).	Provide maps and support materials that highlight local geodiversity sites, fossils, etc. Promote the importance of building stones, gravestones and local quarry sites as readily accessible examples of local geodiversity. Encourage local appreciation of geodiversity through art projects, awareness-raising of soil conservation in allotments, community gardens, etc.	Tayside Geodiversity Historic Environment Scotland Perth & Kinross Heritage Trust Angus Heritage National Trust for Scotland Local communities Tayside Biodiversity Partnership	Long

ACKNOWLEDGEMENTS

All the 2nd Edition Action Plans drew on a wide range of information and advice by a variety of specialists and organisations. The Tayside Biodiversity Partnership thanks all those who have contributed towards the production of the Action Plan. Particular thanks go to those who submitted comments on the Action Plan's Consultative Drafts. Many non-governmental organisations contributed text for their specialism and Angus Council provided the landscape map.

Editorial Team

Catherine Lloyd, Dennis Dick, MBE, Andrew Barbour, Kelly Ann Dempsey, David Williamson, Esther Rogers-Nicoll, Kate Baird, Carol Littlewood, Andrew Law, Steven Sinclair – and thanks to all the Working Groups and Species Interest Groups for their input.

Funding Partners

Tayside Biodiversity Partnership

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This document will be periodically reviewed and updated.
Revised sections will be uploaded to www.taysidebiodiversity.co.uk

Printed by Print Services, Angus Council
using environmentally-friendly Claro silk, an FSC4 certified recycled mix and digitally printed

Designed by Communications Team, Angus Council
(with thanks to the designers Kenny Saunders and Graham Pert)

Red Squirrel © SNH

Learning to look after our wildlife © Kelly Ann Dempsey

Coastal survey volunteering © Kelly Ann Dempsey

Planting a new orchard © CAG Lloyd

Published by
Tayside Biodiversity Partnership
2016

Wildlife does not exist for man's delectation. Man may find it beautiful, edifying, amusing, useful and all the rest of it, but that is not why it is there, nor is that a good enough reason for our allowing it to remain. Let us give beast and bird and flower the place to live in its own right.

Sir Frank Fraser Darling: Natural History in the Highlands and Islands

Tayside Biodiversity Partnership

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