

Freshwater

The major river systems in the National Park are the Tay, Forth, Teith and Lomond catchments (areas of land where rain falls then drains into rivers or lochs). There are also many small burns and rivers draining directly to the sea lochs on the western edge of the Park. They all provide a wide variety of wildlife habitats and can act as important wildlife corridors, allowing species to move around and adapt to changes to their environment.



Marine



Loch Long looking south from Arrochar

The Cowal area of the National Park includes 39 miles of coastline around three sea lochs: Loch Long, Loch Goil and the Holy Loch. Upper Loch Fyne and Loch Goil, some of which is in the National Park, are Marine Protected Areas. These are areas of the sea that are protected for their important habitats and wildlife.

This marine environment within the National Park includes the intertidal zone, the area of the seashore that is above high water at low tide and underwater at high tide. This area can support a wide variety of habitats and is extremely rich in biodiversity. The National Park's coastline has a range of habitats including rocky shores, cliffs, small areas of salt marsh and mudflats rich in marine invertebrates, which in turn support a range of wading birds.

Wildlife

Healthy populations of species such as Atlantic Salmon, Brown Trout, 3 species of Lamprey, Beaver, Gannet and Otter make their homes in the variety of National Park water bodies. Gannet and Brown trout are both Flagship species, which help gauge the natural health of threatened habitats in the National Park. There are fragmented populations of Water vole present in the National Park, however the Trossachs Water Vole Project which has had notable successes over the last 10 years following re-introductions, has seen the species increase its range, the geographical spread of the species in its habitat.



Adult Beaver and kit

© Steven Gardner, Scottish Beaver Trial

National Park Strategic plans for waterbodies

National Park Partnership Plan

The National Park Partnership Plan guides the work of not just the National Park Authority but of all the organisations and other partners involved in managing the area and making the overarching vision a reality. The Plan sets out how we will work together to tackle key issues within the National Park and to widen the many social, environmental, cultural and economic benefits it offers.

Wild Park

Wild Park is the National Parks Biodiversity Action Programme. It is the plan for how and where we deliver projects to benefit nature in the National Park, including key objectives and indicators of success, how we will know the project has made a difference.

Between 2018 and 2023 the Wild Park programme is concentrating on the following four key environmental threats as identified in the National Park Partnership Plan. A key environmental threat is considered to be a key pressure on the National Park's biodiversity -



Wild Park is concentrating on the following four environmental threats:



POOR QUALITY OF SOME LOCHS & RIVERS

Negative impacts on freshwater and marine water bodies from problems such as pollution from surrounding land uses



UNSUSTAINABLE LEVELS OF GRAZING

Unsustainable levels of wild and domesticated grazing and browsing animals in some upland and woodland areas, leading to reduced tree cover and the erosion of soils, which are important carbon stores.



INVASIVE, NON-NATIVE SPECIES [INNS]

The spread of invasive non-native species, which displace our rich native wildlife.



CLIMATE CHANGE PRESSURES

The impacts of climate change leading to warmer, wetter weather patterns and a subsequent increase in flooding, major landslides and rapid changes to natural ecosystems

Key Environmental Threats

Poor Quality of Lochs and Rivers

Restoring and improving waterbodies and peatlands that are in a poor condition (degraded), in order to aid their water and carbon storage natural functions, is highly important, as is their role as major sources of drinking water and hydro-electricity generation.

A waterbody's ability to function as a vital part of a National Park ecosystem is affected by many different pressures. Physical changes such as bank erosion control measures, flood defences and alterations to improve drainage reduces their ability to adapt to changing conditions that will occur through the impacts of climate change.

Rural diffuse pollution (such as fertiliser use or impacts from livestock manure and slurry), can increase levels of phosphorous which reduce the quality of a waterbody, by limiting the amount of oxygen and causing algae blooms.



Fencing watercourses to manage grazing, bank erosion and pollution

Riparian Invasive Non-Native Species

The National Park are working with partners to prevent, monitor and control the introduction, spread and extent of Invasive Non Native Species (INNS) that affect the riparian zones (wetland habitats next to rivers and lochs) of the rivers and lochs in a sustainable manner on a catchment-wide scale. The focus will concentrate primarily on the control of invasive non-native plants: Giant hogweed, Japanese knotweed, Himalayan balsam and American skunk cabbage.



American skunk cabbage

Climate Change Pressures

We need to ensure that our ecosystems in the National Park can adapt to the effects climate change is having to our native biodiversity, and the wider environment. These ecosystems can also help mitigate (measures that can be taken to reduce negative impacts) against climate change by maintaining carbon stores, sequestering carbon (removing carbon dioxide from the atmosphere), and storing surface water. The National Park's peatlands hold an estimated 20 million tonnes of carbon.



Stabilised peat bank, traps Co₂

Flooding



Callander flooding

Over decades our moorlands have been drained and eroded. We need to block those drainage systems, halt the erosion, and cover bare peat to retain water in the hills for longer. This can reduce the risk of flooding in the lowlands and move towards restoring healthy peatlands that are capturing, rather than emitting, carbon-based greenhouse gases.

There are areas, including villages and towns, of the National Park which are particularly vulnerable to flooding and with a changing climate, these threats are increasing. For example there have been incidents of heavy rainfall causing flooding or landslips within the National Park and this can be expected to continue to occur more often due to the warmer, wetter weather.

The National Park supports communities and landowners to develop natural flood management solutions to make them more resilient to these risks. These solutions use the natural landscape and floodwater processes, rather than hard engineering, to reduce the impact of flooding.

Also, as the Planning Authority, the National Park Authority allocates land suitable for development, and permitted developments will be sought to be out with flooding areas.

The National Park Authority is a partner in different flood risk management groups across the area. These groups produce the flood risk management plans that seek to set out the actions that need to be taken to reduce overall flood risk across Scotland. As well as natural flood actions, we are also working with Stirling Council to develop flood protection measures in Aberfoyle and Callander to protect the communities from the effects of flooding like they have experienced in the past.



Aberfoyle flooding

Water Uses

Run of river hydro

The National Parks (Scotland) Act 2000 sets our four aims and one of these is to promote the sustainable use of the natural resources of the area. We also support the Scottish Government target of up to 100% of electricity and 11% of all heat in Scotland being generated through renewable energy sources by 2020.

The National Park, with its sensitive landscape is not the best place to build large scale wind or solar farms. However, it is an area with a lot of hills and rivers, and very high rainfall –which is why we support the development of ‘run-of-river’ hydro schemes in the National Park. And for them, lots of rain means more electricity production (and more income).

Run-of-river hydro schemes are not big dams with reservoirs behind them, such as that at Loch Sloy. They are smaller scale schemes that take some (not all) of the water out of a burn at the ‘intake’ point, which is then carried down the hillside in a buried pipeline to a turbine house, before it is returned to the same burn at the ‘outfall’. The buried pipeline means they have less visual impact. It is important to note that these schemes are regulated by SEPA (Scottish Environmental Protection Agency) to make sure they continue to supply adequate compensation flows (minimum amount of water that must remain in the river) for the rivers they use so that the habitat is not degraded.



Water Recreation



Paddleboarding on Loch Lubnaig

The National Park Partnership Plan 2018–2023 sets out a clear ambition to develop more opportunities for everyone to enjoy water-based recreation and sporting activities across the National Park’s lochs, rivers and coasts.

Many people enjoy simply sitting or walking beside water and may not even be aware of the direct health and wellbeing benefits that this brings. Historically, Loch Lomond and the Clyde have provided escapism and health benefits to people from Glasgow for several generations, but the terms ‘blue space’ or ‘blue health’ are a new way of describing the benefits of large waterbodies

Many of the lochs in the Park are popular for water-based sport and recreation activities, with changing trends in what people come to the National Park to do. For example, we are seeing growth in the popularity of canoeing, open-water swimming and new activities, such as paddle boarding. Boating and fishing continue to be popular.

The well-established Loch Lomond Byelaws continue to help our Ranger Service to achieve balanced management of the loch in a way that enables a wide range of recreational activities, while minimising conflicts and protecting the environment.

Future projects

The National Park work with a variety of partners and landowners to deliver projects that will target some of the Key Environmental Threats outlined previously. This includes:

- Bank restoration and riparian (riverbank) tree planting
- Peatland restoration
- Rhododendron removal
- Ongoing Riparian INNS control through fishery trusts



Questions and pupil enquiry

- List the variety of ways the water resource in the National Park is used.
- Can you name the major river systems in the National Park?
- How many miles of coastline are there in the National Park and what sea lochs are included?
- What are 'flagship' species and can you name two of them?
- What do we mean as 'Key Environmental Threat'? Can you list the 4 of them?
- What are the main reasons that flooding is getting worse, and what are some of the ways the National Park is addressing flood risks to towns and villages? What role does peatland have in this?
- Can you explain what a run of river hydro scheme is? Why does the National Park favour this form of renewable energy?
- List as many forms of water recreation as possible, include both motorised and non-motorised. What new sports are becoming more popular? Why do you think this is?

FURTHER READING

Online

- [Luss Bathing water](#) : This link is to a detailed summary of the water quality testing and causes of issues of the water at Luss beach that SEPA publish
- [John Muir Trust, Field Studies Council and partners resource guide for Year of Coasts and Water](#)

Video clips

- [Forth Fisheries Trust & Callander's Landscape – Virtual Wild Salmon Walk – Falls of Leny](#)
- [Clyde Marine Planning Partnership – Marine planning in the Clyde Marine Region](#)

Site visits

- [Balmaha](#) on eastern shore of Loch Lomond is a great location to base a field visit, with the [National Park Visitor Centre and Outdoor Classroom](#) available for school groups.
- [Arrochar](#) is a small coastal village at the head of Loch Long -
- [Ardentinny](#) is a small village on the western shores of Loch Long in the Cowal Peninsula
- [LochGoil](#) is the coastal village at the northern tip of Loch Goil
- [Loch Katrine](#) is the freshwater loch in the heart of The Trossachs