



LANDSCAPE CHARACTER ASSESSMENT

LOCH LOMOND & THE TROSSACHS

LANDSCAPE EVOLUTION AND INFLUENCES



CONTENTS

1. Introduction	page 2
2. Physical Influences	page 4
3. Human Influences	page 11
4. Cultural Influences And Perception	page 42

Title page photographs, clockwise from top left

Loch Katrine from Ben A'an © Lorne Gill/NatureScot

Mixed woodland near Aberfoyle © Lorne Gill/NatureScot

Killin © George Logan/NatureScot

The Inchcailloch ferry, Balmaha © Lorne Gill/NatureScot

This document provides information on how the landscape of the local authority area has evolved. It complements the Landscape Character Type descriptions of the 2019 dataset.

The original character assessment reports, part of a series of 30, mostly for a local authority area, included a “Background Chapter” on the formation of the landscape. These documents have been revised because feedback said they are useful, despite the fact that other sources of information are now readily available on the internet, unlike in the 1990’s when the first versions were produced.

The content of the chapters varied considerably between the reports, and it has been restructured into a more standard format: Introduction, Physical Influences and Human Influences for all areas; and Cultural Influences sections for the majority. Some content variation still remains as the documents have been revised rather than rewritten,

The information has been updated with input from the relevant Local Authorities. The historic and cultural aspects have been reviewed and updated by Historic Environment Scotland. Gaps in information have been filled where possible. Some reports have been combined where original LCA area coverage was very small.

The new documents include photographs. They do not include the maps or sketches from the original LCAs, but these are still available from the [NatureScot Information Library](#). Additional information can be obtained from the websites of;

- [British Geological Survey](#) www.bgs.ac.uk
- [Historic Environment Scotland](#) (Historic Land use Assessment, Gardens and Designed Landscapes, historic features and their designations, etc). www.historicenvironment.scot
- NatureScot website especially [Landforms and Geology](#) (more specifically the “Landscape Fashioned by Geology” series) and [About Scotland’s Landscapes](#) soils; wild land; landscape character; designations etc.) www.nature.scot
- The relevant local authority, which will have information on landscape policies, etc.

The content of this document was drawn from the background chapter information in Loch Lomond & the Trossachs Landscape Character Assessment 2005, *Environmental Resources Management*, updated in 2009, *Scottish Natural Heritage*; and the Loch Lomond and the Trossachs Landscape Character Review 2015, *Carol Anderson Landscape Associates*.

If you have any comments, please email LCA_REVIEW@nature.scot

The population of 15,168 people is distributed throughout the lowlands, glens and straths. This figure had declined by 4.1% between 2001 and 2011, contrasting with Scotland as a whole in same period which experienced a 7.5% increase. There is a slightly older age profile than Scotland (55.5% 45+ as opposed to national average of 44.3%). The population is primarily concentrated in the largest town, Callander, and other small towns and villages (Aberfoyle, Balmaha, Birg O’Turk, Crianlarich, Tyndrum, Drymen, Balloch, Gartocharn, Croftamie, St Fillans, Lochgoilhead, Arrochar, Luss, Tarbet). There is a higher than average number of holiday homes in the area. The National Park Visitor Centre at Lomond Shores, with its shops, aquarium, and restaurants, is located in Balloch and is the most popular gateway to the park.

The National Park is very accessible, being only 27km from the centre of Glasgow, 21km from Stirling, 40km from Perth and 70km from Edinburgh. This contributes to its popularity for tourism and recreation. Principal attractions are the scenery, walking and wildlife. Much of the activity is focused on Loch Lomond. The West Highland Way and John Muir Way, popular Long Distance Routes primarily for walkers, pass through the area. Several Munros, particularly Ben Lomond, are also popular. Tourism and outdoor recreation are strongly dependant on the natural heritage, and represent an important source of local income and employment, with agriculture, forestry and sport fishing playing a key role in the economy. The Park’s economy is dominated by tourism, land-based businesses and the service sector. “The Value of the Park”, a study commissioned in 2011, suggests that the value of visitor services is £205.9 million per annum.

Rural land ownership is dominated by privately-managed farms and a number of private estates along with public and 3rd sector land, particularly Forestry and Land Scotland which owns large parts of Queen Elizabeth and Argyll Forest Parks. Agriculture, particularly sheep production and forestry, remain important in the rural economy. The entire Park is covered by Less Favourable Area Support Scheme, recognising the importance of agriculture in land management and that maintaining the traditional character of the Park is significant.

2. PHYSICAL INFLUENCES

The landscape of Loch Lomond and the Trossachs is mountainous with an intimate mix of forest and open ground. A key feature is its many large freshwater lochs.

Geology and Topography

The dominant grain of the landscape, running north-east to south-west, results directly from the great Caledonian earth movements which occurred approximately 470 million years ago. The Highland Boundary Fault (HBF) is a major fault zone, running from Arran in the west to Stonehaven in the east, that separates ancient Precambrian metamorphic rocks in the Highlands from the younger, softer sedimentary rocks to the south. These geological differences have been exploited over time by the erosive power of wind, water and ice to produce the present-day landscape of the National Park. Today the HBF separates the rugged peaks and deep glens to the north from the lower rolling hills and broad straths to the south.

The National Park landscape can be regarded as comprising three distinct topographic areas. Highland landscapes are located to the north of the HBF, transitional landscapes along it, and lowland landscapes to the south.

Highland landscapes

The highland landscapes of the Park have typical upland characteristics of hills, mountains and glens. They are the most common in the Park and the value of its highland scenery has been recognised through designation of Loch Lomond, the Trossachs, and the River Earn as National Scenic Areas (NSAs).

The highland landscapes are dominated by rugged relief. They are made up of exposed and more remote upper areas of the hills and associated upland glens, intercut by enclosed and relatively accessible lower areas of the main glens.

North of the Highland Boundary Fault the underlying geology consists mostly of metamorphic bedrock dating from the Cambrian and Precambrian periods, about 502 to 1000 million years ago. These are old even in geological terms. Originally, the rocks were sediments deposited in a range of marine environments now forming a sequence up to 25 km thick and designated as the Dalradian Supergroup. There was large-scale folding, faulting and metamorphism during a mountain building event – the Caledonian Orogeny - that occurred 480 to 425 million years ago. This resulted in the formation of a mountain range as high as the Alps, and the Grampian Highlands are the eroded remnants of these mountains. The orogeny also resulted in the formation of new minerals and re-crystallisation producing hard, cleaved rocks such as slates, phyllites and schists. Molten magmas were created towards the end of the Caledonian mountain-building event; these formed granitic bodies, for example near Arrochar. The distinctive peaks of Arrochar are formed of resistant igneous bodies including granites and diorites amongst quartzose mica schists.

Highland Border Complex

The Highland Boundary Fault (HBF) is well expressed in the National Park. It runs north-east to south-west, between the highland landscapes to the north-west and lowland landscapes to the south-east from Balmaha to Aberfoyle and Calendar.

The HBF is a large-scale lineament marking a major geological boundary. It separates tough Pre-Cambrian and Cambrian metamorphic rocks in the north-west from sediments of the Old Red Sandstone to the south-east. Between these areas lies the Highland Border Complex, a succession of weakly metamorphosed serpentinites (altered ultramafic rocks), sandstones, lavas, limestones, mudstones, black shales and conglomerates, that formed on the floor of a small ocean basin.

The Highland Border Complex forms a body of rocks distinct from the Dalradian Supergroup and the ORS. In the Park, it occupies a zone up to about 1200 m wide; this narrow band runs from near Arden on the west bank of Loch Lomond to Aberfoyle.

Lowland Landscapes

The lowland landscapes occupy a relatively small area of the National Park, contrasting with the highlands and the HBF. They are distinguished by rolling landform, wide straths and river valleys, and the extensive carse of the Forth. The lower-lying ground to the south-east of the HBF is underlain by rocks of Devonian and early Carboniferous age. They include a wide range of sedimentary rocks, but are dominated by sandstones which are locally pebbly. Finer-grained siltstones and mudstones are also common. The dip of the strata tends to be shallow, hence the generally gentle, rolling relief of the low-lying ground. The area of carse reflects former marine incursion about 10,000 to about 6,000 years ago when sea levels were higher. Carse sediments include sands and clays; these locally overlie peat deposits that formed during an intervening period of lower sea level.



Glaciated features, Ben Lui ©Lorne Gill/NatureScot

Glaciation

Much of the landscape in the Park results from glacial erosion and deposition. It is likely that major ice build-up occurred after 36,500 years ago, reaching its maximum extent about 25000

years ago. Following warming, this ice-sheet retreated. The re-growth and advance of ice saw the development of an ice cap about 12,700 to 11,500 years ago, in what is referred to as the Loch Lomond Stadial.

Glaciation caused significant erosion, with glaciers sourced mainly on Rannoch Moor and flowing predominantly in south-easterly and easterly directions. The Loch Lomond glacial trough cuts across the pre-existing drainage patterns. The glens have been deeply gouged and over-deepened, resulting in the rugged relief and typical highland features. Other features of glaciation include smoothed bedrock, large erratics and moraines of various types.

The Cobbler (Ben Artair or Ben Arthur), in the ‘Arrochar Alps’, displays the profound effects of the ice melting from about 11,500 years ago. Ice removal led to rock faces that had been contained by ice being exposed, resulting in collapse and slope failure leaving dramatic rock peaks, such as that of The Cobbler.

In lowland areas the landscapes have been smoothed by deposition of boulder clay and sands, washed out from the glaciers and receding ice sheet, and redistributed by meltwater in outwash plains. With the final melting of the ice, the Forth Valley was submerged by the sea and its landscape form further influenced by deposition of estuarine and marine muds and silts. The land rose as the weight of the ice was removed, leading to the formation of extensive raised shorelines and raised beaches around the coast. Fjords on the western seaboard, such as Loch Long, are the drowned seaward ends of a drainage system that was over-deepened by the ice sheets; they follow the direction of the Caledonian folding.

Many of the area’s lochs, including Loch Lomond, occupy radiating glacial troughs. Where grits, i.e. tougher rocks, occur the troughs narrow, e.g. at Pass of Leny. Loch Lomond clearly demonstrates the change from highland to lowland: it is narrow and 180m deep in the north; at Balmaha / Luss it becomes a wide lake only 23m deep. Old Red Sandstone forms the string of islands, starting with Inchailloch, which continues the line of Conic Hill into the loch.

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Unlike the highlands, where rugged relief is the dominant factor in determining the landscape character, the pattern of land use is more significant in the lowlands. The area has developed as farm and estate lands, with fields, meadows, parkland, farm and policy woodlands (mixed), shelterbelts and areas of more natural vegetation. These features tend to be functionally and visually integrated within a mosaic.

Hydrology

Surface water and aquifers

There is an abundance of surface water in the highlands due to the extent of largely impermeable metamorphic rocks covered by thin superficial deposits. In contrast, the porous sedimentary rocks of the lowlands are more permeable allowing water to percolate more freely

into the superficial deposits and underlying bedrock. The drainage pattern of the Park is complex due to the alteration of river courses following the modification of terrain and damming by ice sheets and glaciers.

Rivers

Larger rivers are key characteristics of the glen and strath floors and lowland areas of the National Park. The rivers are predominantly natural, but with some local realignments. At transitions, such as from upland areas or where there are lochs, there are significant waterfalls and rapids such as the Falls of Falloch, Bracklinn Falls, and the Falls of Dochart.



The Falls of Falloch waterfall, Glen Falloch.©Lorne Gill/NatureScot

Mature rivers meander across floodplains, with riparian and gorge woodlands, wet meadows and shingles creating natural settings. Rivers are foci for human movement and activities, being influential in the evolution of the cultural landscape, and are associated with bridging points, mills, settlements, moorings and lochs.

Moss (Lowland raised peat bog)

Lowland raised bogs are a rare component of lowland landscapes, occurring as a northern and western extension of the Forth Valley raised peat bogs. They also occur in more isolated pockets where local conditions have allowed. Many are recognised through national and European designation.

Post-glacial changes in sea level caused the formation of extensive areas of marine alluvium and basin peat over the Forth Valley. These form distinct hydrological units, with a central dome of peat, with woodlands and drainage pools to the edge.

Natural moss is scarce. For the most part it has been modified as a result of peat extraction, through drainage and peat stripping for agricultural improvement, and through deep ploughing and drainage for afforestation.

Lochs

Twenty two Lochs occur throughout the National Park, mainly in uplands, glens and lowlands. Upland and glen lochs reflect the glen form and are consistently linear in shape. Lowland lochs are broader funnel or circular shapes.

Freshwater lochs of the glens and lowlands have well-expressed and extensive lengths of loch shore fringe, with beaches, river outflow deltas and floodplains, rocky knolls and promontories, reed beds and wet woodlands. Loch Lomond is unique in that it is the only loch to 'bridge' the highlands and lowlands.

Sea lochs tend to have a less well-expressed loch shore fringe that relates to raised beach features, with glen slopes rising steeply behind. The fringe can be locally more extensive at sea loch heads, or river outflows that form deltas.

Loch islands vary in size, with larger examples generally in lowland lochs and smaller islands and islets in the glen lochs. The Loch Lomond islands lie within the Highland Boundary Fault Zone – this can be clearly seen from Conic Hill. The distinctive ridged landform and orientation of the fault zone are defining landscape characteristics. Many islands have been used for fortifications and religious use, often features that appear to be islands at first glance turn out to be artificial crannogs.

Coast and Sea Lochs

There are 63 kilometres of coastline around three sea lochs in the south-west of the Park - Loch Long, Loch Goil and Holy Loch. They are linear, enclosed and generally sheltered, with locally developed intertidal zones of saltmarsh, mud flat and sands at the head of lochs. Elsewhere, there are generally less distinctive intertidal zones of rocky shorelines, pebble and sand beach strips. Raised beaches and deltas are a feature of Cowal - evidence of former higher sea levels can be seen along the shores of Loch Long and Loch Goil in the form of fragments of flat-topped raised beach deposits up to 12 metres above sea level.

Loch Long is 32 kilometres long, between 1.6 and 2.4 kilometres wide, and up to 30 metres deep. The smaller Loch Goil forms an 'arm' on its western side. Loch Long forms part of the coast of the Cowal peninsula and the western coastline of the Rosneath Peninsula. It is surrounded by mountains, with the Arrochar Alps on the western side of the loch head. The coast is mostly rocky, with a few beaches which are mainly shingle.

Most of the broader bays are overlooked by ancient fortifications, placed on higher ground, and later became the focus for farmsteads and settlements. The best harbours are also usually marked by medieval castles and later stately homes.

Holy Loch, with the Firth of Clyde at its eastern end, is 1.6 kilometres wide and 3-5 kilometres long, depending on the tide. It is part of the Cowal peninsula and its name is believed to date from the 6th Century, when St Munn landed there after leaving Ireland. During World War Two the loch was used by the Royal Navy as a submarine base, and between 1961 and 1992 it

was used a US Navy missile submarine base. There is a marina at Sandbank, and roads and settlement follow the loch's periphery.



Aerial view of Loch Long and Loch Goil ©Patricia and Angus Macdonald/NatureScot

Soils

The HBF divides the Park into two distinct regions with vastly differing soil types. Blanket peats and gleys (wet clay soils deprived of oxygen) dominate the soils above 200m and are widespread on gentler hills, slopes and rounded summits. Soils become thin on upland slopes, and rock outcrops, boulders and screes can be extensive. 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.

South of the HBF and in sheltered glens soils are primarily Brown Earths, which are well-drained and have high natural fertility. They are often cultivated for fodder crops or support better quality grassland.

Climate

Scotland has a temperate maritime climate, which means that it is changeable but not extreme. Temperatures are moderate, influenced by the surrounding seas. Summers are generally cool, winters are mild and rain falls throughout the year. Over the last century the climate has become warmer, with drier summers, wetter winters and frequent heavy rainfall. In the Park the sea influence is generally less than near Scotland's far west coasts, making it slightly cooler. January is the coldest month with minimum temperatures of -3 to 0 degrees Celsius. July is usually the warmest month.

In the upland areas of the National Park temperatures are lower than the surrounding lowlands, due to altitude, with a mean annual average of 8 to 9.4 degrees Celsius.

3. HUMAN INFLUENCES

Landcover and Land Use

Summary

Land cover in the Park broadly comprises a mixture of upland and moorland vegetation (around 50%), woodlands and forestry (around 26%), enclosed agricultural land (around 15%) and water – lochs and rivers - (around 7%).

Most of the land in the National Park is owned and managed by private individuals and businesses. 56% is privately owned farms and estates, 56% is publicly owned (mainly Forestry and Land Scotland) and 5% is owned by charities and Non-Governmental Organisations (NGOs) including the RSPB, Woodland Trust and National Trust for Scotland. Land use is 65% agriculture, mainly extensive livestock farming of hill sheep and beef cattle, with unenclosed farm and estate lands occupy the majority of the National Park's area. Woodland comprises extensive swathes of commercial forestry, as well as ancient broadleaf woodland, wood pasture, and farmland with policy trees.

In the highlands the bulk of land use today is rough pasture, managed for sheep grazing and game. Commercial forestry is widespread, especially on the southern edge of the Trossachs and in the Queen Elizabeth Country Park. There are also pockets of broadleaf woodland, mainly along the shores of Loch Lomond, as well as many areas being newly established.

Lowland areas are mostly farms laid out during the agricultural improvement period (1750-1850) with a pattern of rectilinear fields with hedges/stone dykes, as well as urban areas, commercial forestry and estates and policy landscapes.

Agriculture and Estates

Agriculture, particularly sheep production and forestry, remain the backbone of the rural economy. While not the largest employer, the importance of their role in land management and maintaining the traditional character of the Park is significant. The entire Park area is currently covered by the Less Favoured Area Support Scheme which reflects the challenges to farming across the area.

Extensively managed and unenclosed farm and estate land and enclosed improved farm and estate lands are important cultural landscapes within the National Park. Because of the predominantly traditional and non-intensive methods of management, they have retained a balance with natural habitats, supportive of diverse species. Although managed traditionally by grazing with livestock, unenclosed upland farmlands are perceived as natural landscapes due to the absence of structures or obvious human activity. They have some wild characteristics and extensive panoramic views, dominated by mountains and high plateaus. Enclosed farmlands tend to be distinctively ordered, well used and settled, either in pockets or extending more widely. The distinctive patterns of these landscapes draw the eye and scenically contrast with generally apparently 'wilder' and more natural surroundings.

Recent changes in the farmed landscape

In the late 20th Century, the main drivers for change in the farmed landscape were policies and economics. Europe's Common Agricultural Policy (CAP) played a significant role in

steering agriculture towards intensification, standardisation and specialisation. This resulted in the decline of low-input mixed farming. In recent years, the economic return from farming within the National Park has been increasingly marginal, largely due to the globalisation of markets and increased regulation, with farmers less inclined to invest in maintaining non-productive landscape features.

These factors have impacted on the landscape in numerous ways. Poor returns from hill sheep farming have led some farms and estates to convert parts or all of their rough grazings to commercial forestry (often upland glens and/or glen sides). Agricultural improvements through drainage and reseeded, made possible by advances in farm machinery, have resulted in the replacement of seasonally colourful, species-rich grasslands and wetlands, with species-poor swards dominated by rye-grass. Mechanisation and a reduced labour resource have resulted in less sensitive maintenance of features such as dykes, hedges and ditches. Many dykes built in the late 18th Century have now been replaced by post-and-wire fencing.

Successive agri-environment schemes have changed the landscape from the 20th Century onwards, such as The Environmentally Sensitive Area (ESA) Scheme, launched in 1987 in Loch Lomond, improved condition of dykes and hedges within the Loch Lomond ESA and controlled areas of bracken.

In 2005, the CAP was reformed so that subsidies were decoupled from production - farmers no longer have to produce an agricultural output in order to receive financial support. Because much of the National Park is marginally viable for cost-effective agricultural production, some farmers in these areas are choosing not to retain livestock so that they can maximise their net income. Cessation or reduction of grazing pressure has resulted in gradual change from pastoral habitats to scrub, and eventually woodland. In some upland areas, current densities of red deer may be sufficient to suppress regeneration, which changes visual characteristics and can reduce recognisable land use patterns of enclosure, such as crofting strips. Landscape features such as traditional outbuildings, fanks, dykes, hedges and shelter belts are then often less well maintained, which can be most evident in remote areas in both upland and lowland settings. Current LLTNP environmental priorities are mountain bogs, black grouse, woodland habitat network, red squirrels and Invasive Non Native Species.

Unenclosed Uplands

Extensive unenclosed farm and estate lands occur in uplands of the National Park's highland and transitional areas, where altitude, high rainfall, poor soils and drainage, or a northern orientation have discouraged more intensive land use, soil improvement or enclosure.

Extensive and unenclosed farm and estate lands have been grazed by sheep and deer, but retain natural and semi-natural moorland-type vegetation. In the past, areas have been managed for grouse. They are extensive and large-scale landscapes, including summits, ridges, upper slopes and plateaus, which form the watersheds, headwaters and majority of water catchments for the National Park. Some of these areas form parts of sporting estates or upland farms. They are marginal for farming and have been subject to changing land use in the past, often to extensive and localised afforestation. Otherwise apparently natural landscapes, their remote and exposed nature, mountainous vistas and absence of development, are an introduction to the wild character of iconic highland landscapes. Local soil conditions and varied grazing regimes have given rise to diverse vegetation swards. The

high biodiversity value of some of the mountain areas has been recognised by national and European designations, and they are a key scenic component of the three NSAs in the Park. Rarer alpine species occur in the shorter swards on poorer soils and in exposed areas with harsher climates, such as mountain tops.

Features and patterns from relict farming systems are revealed by the open land cover in today's unenclosed upland landscapes. Shielings, townships and field patterns are visible characteristics of upland glens and glen sides, often distinguished from their surroundings by local enrichment of soils, with vivid greens of grass sward. These areas were a significant part of the pre-improvement farm economy, when summer grazing of cows in upland areas was part of a seasonal farming system. Extension of sheep farming in the uplands led to the decline and abandonment of this system, with Victorian estates favouring sheep and converting areas to deer forest.

Enclosed upland farmland

In upland contexts, enclosed and improved farmland and estate lands tend to occur in pockets over the lower slopes and floor of upland glens, and in more extensive linear tracts along the south-facing slopes of glen sides. They also occur over glen floors, in the highlands and transitional areas, where sheltered lower slopes, better soils and southerly orientation have favoured soil improvement and enclosure. This land use occupies a small proportion of the National Park area.

In the highlands, enclosed and improved farmlands have natural and cultural heritage value, and contribute greatly to scenic quality. These lands have been used as in-bye land in livestock grazing systems and, in the past, in cropping rotations. Similar to adjacent unenclosed lands, these areas have a high proportion of semi-natural vegetation, including unimproved grasslands and wetlands, as well as woodlands. The areas are marginal for farming and have been subject to changing land use with, in some localities, a tendency to agricultural abandonment over recent years. Where grazing pressure by deer is low, land is reverting to scrub and woodland. Over glen floors, more fertile soils have attracted more intensive modification through drainage, cultivation, reseeding and enclosure, but the fields tend to form mosaics with semi-natural woodland, wetland and grassland habitat types. The restricted nature of glen areas has limited the degree of agricultural modernisation, and farming remains predominantly traditional.

Features and patterns from relict farming systems are revealed by the open land cover in today's enclosed upland farm landscapes. Upland areas have been less modified and shielings, townships and field patterns are visible characteristics of upland glens and glen sides. The pattern of land division from former times persists in enclosed landscapes, with crofting strips, old hedgerows, drystone dykes and boundary features, as well as built elements and important historic features. As with unenclosed uplands, prior to the improvements and favouring of large estates with sheep and deer forests, these areas were under a different farming system of townships and associated field systems. Characteristics of relict designed landscapes are also evident as policy and formal plantings, estate boundaries, entrance features, hunting lodges and estate cottages.

In highland areas, inhabitants of cleared towns were often allocated a few acres arranged in strips known as crofting townships, of which those at Lochearnhead are perhaps the best

example in the National Park. Since crofts were associated with the agricultural improvements they date to that same period – 18th and 19th Centuries, although in the extreme north and west of Scotland this process continued into the 20th Century. The pattern is best preserved in the Crofting Counties following the Crofting Act of 1886.

Enclosed lowland farmland

Enclosed and improved farmlands predominate over the lowland areas of the National Park. Where fertile soils have been attractive to farming, soil improvement through drainage, cultivation, fertilising and enclosure have occurred. Whilst locally extensive, this is a relatively small proportion of the National Park area.

In the lowlands, enclosed and improved farmlands originated predominantly during the age of agricultural improvements. Fields, meadows, pastures, parkland, hedgerows, drystone dykes, farm and policy woodlands, and semi-natural woodland, wetland and grassland habitats form a mosaic. In the past, traditional cropping rotations would have featured. These lowland farmlands, in juxtaposition with lochs and the wilder highland backdrop, contribute to the wider scenery and, locally, as designed landscape elements. The mature open and woodland habitat networks also have high wildlife value. Farmland is often a component of designed estates. The lands, formerly used for dairy grazing and cultivation, are now used for sheep and cattle grazing. The continuity of management associated with traditional estates and the relatively restricted area of better land between surrounding uplands and urban areas have meant that farming methods have been slow to change. Whilst the lowlands have fewer designations here they contribute an important component of the Loch Lomond NSA. Some of the designed landscapes are listed in the Inventory of Gardens and Designed Landscapes.

The lowland landscapes have undergone much change, both in terms of land use changes, such as field amalgamations and some afforestation, and also with development pressures, particularly relating to housing, golf courses, recreation facilities, transport infrastructure and visitor accommodation. Characteristics and patterns of relict field systems and designed landscapes persist, such as policy and formal plantings, estate boundaries, entrance features and gate houses and estate cottages.

Crofts are relatively rare in lowland improved landscapes and occur most frequently as allotments of a few acres for the inhabitants of planned villages. These are usually recognisable by their grid pattern and small field size. Lowland Crofts are sometimes arranged in a relatively formal fashion, such as those to the south of Callander, which may be called planned smallholdings, but elsewhere can be irregular. Generally, the areas of lowland croft in the Park are not readily discernible from the surrounding field patterns and are not distinctive characteristics of the landscape of the Park.

Woodland

The National Park has a rich heritage of diverse woodland types and, along with Perthshire, has been at the heart of forestry development in Scotland. Total woodland cover in the National Park is 55,950 hectares, some 37% of the total National Park area, at 1865km², with approximately 22.5% productive conifers and 7.5% native woodland. The Scottish Forestry Strategy and the National Park's Tree and Woodland Strategy are driving change as forests are being restructured, upland agriculture is declining and some large areas of native woodland are being established. The strategic objectives of the Park's strategy are to;

- increase woodland cover,
- improve woodland condition and diversity,
- protect and enhance the Special Qualities of the Park,
- maintain and enhance economic sustainability through forest-related skills, and business development, and
- encouraging/promoting public access to woodlands for recreation and improving quality of life.

Birch is the dominant broadleaf species, with oak the second most common as a result of its favoured status from the 17th to the 19th Century. The National Park contains an exceptionally diverse and extensive area of Atlantic oak woods. Sitka spruce is the dominant commercially planted species of tree. Invasive species such as *Rhododendron ponticum* are a threat to regeneration of woods throughout the Park.

Woodland cover is a defining characteristic of some of the Park's landscapes, but woodlands are more commonly present as features. Adverse typology of woodlands that exist. The density of different woodlands can vary from a few open-grown mature trees giving a potential canopy cover of 20% to areas of woodland over 0.1ha with dense, closed canopy.

In the highlands, woodlands are often remnants of ancient woodland, semi- ancient natural woodlands of plantation origin, naturally regenerated woodlands, or new native woodlands. In the lowlands, where woodlands occur as estate policies, farm woodlands and shelter belts, they become part of a mosaic of diverse land cover and use. Throughout the National Park, woodlands are often characteristic of all or part of loch shore fringes.

The woodlands in the National Park vary considerably in terms of origins, extent and condition and are the product of a wide range of management regimes, both historic and current. The following sections outline the range of types and their background;

- *Relict ancient woodlands*
Relics of ancient woodlands tend to be limited, to steep slopes in ravines and gorges, which have been unsuitable for clearance and farming, and to small patches inaccessible to grazing, such as on cliffs and burn sides. These relics have great biodiversity value and add to the diversity of the otherwise often rugged scenic character of landscape. They emphasise topographic features and the pattern of burns, and provide a scale reference. Such remnants occur along the northern slopes of Glen Dochart. They are also important in the setting of waterfalls and river landscapes. Examples in the National Park include the River and Falls of Falloch and Bracklinn Falls.
- *Relict wood pasture*
In upland glens and over glen sides, open and moribund ancient woodland remnants persist. This was traditionally managed as wood pasture and coppice, but grazing has suppressed natural regeneration. Open woodlands reveal underlying topography and cultural features; aging trees often have sculptural qualities. Examples include the pasture woodlands around Glen Finglas. These are now being regenerated as part of a native woodland scheme.



Great Trossachs Forest and Loch Lomond ©Lorne Gill/NatureScot

The Great Trossachs Forest, which has been granted National Nature Reserve status, stretches from just outside Callandar to the shores of Loch Lomond, an area equal in size to Glasgow. It extends to Glen Finglas in the east, RSPB Inversnaid in the west and contains Loch Katrine in the centre. It will ultimately be one of the largest native broadleaved woodlands in the UK. A large mosaic of woodland and open habitat is being created, including restoration and enhancement of ecosystems. There is a large emphasis on visitor access, with a Visitor Gateway at Glen Finglas. There are natural play trails and a long distance path. The whole project is a legacy of the Scottish Forestry Alliance, a unique collaboration between BP, Forestry Commission Scotland, RSPB Scotland and the Woodland Trust Scotland.

- *Native pine woods*
The National Park contains examples of ancient pinewoods and new native pinewoods. The two remnants of ancient Caledonian pine forest, in Glen Falloch and Connonish Glen, are both under positive management and have been fenced to protect from grazing and promote regeneration. The scarcity of these woodlands, and the sculptural qualities of granny pines, make them important and distinctive landmarks.
- *Natural regeneration*
In areas where agricultural abandonment has taken place or grazing has been relaxed, natural regeneration of scrub and woodland occurs. Natural regeneration is supplemented where necessary by new planting. Some of these areas have been the focus of new native woodland schemes as the existing trees are sources of local provenance seed. Natural regeneration and planting of native woodland is of great biodiversity benefit, and adds visual diversity and structure to the scenery of open landscapes. In Glen Ogle, scrub and woodland regeneration is occurring as grazing pressure is reduced and the pattern of croft strips distinctive to this area is becoming obscured.

- *Oak woods*
In many glens of the National Park, the woodlands were historically managed as coppiced oak woods for charcoal production (used in iron and lead smelting), tannin and timber production. Accessible glen sides were particularly attractive for industrial use. Locally native *Quercus petraea* (sessile oak) has hybridised with *Quercus robur* (pendunculate oak), widely introduced in the 17th Century because of the high tannin content of its bark. These oak woods are now valued as 'natural' features and as the setting for lochs and mountains in typical highland scenery. The Loch Lomond woodlands are a defining feature of the NSA. They form strategic links in woodland habitat networks and are recognised by national and European designation.
- *Long-established plantation and policy woodlands*
Plantation and policy woodlands are a feature of estate landscapes. These are now well-established mature woodlands, comprising native and exotic species. They often contain areas of relict ancient woodland, semi-ancient native woodland and veteran trees, and are valuable for biodiversity. *Rhododendron ponticum*, originally introduced for game cover and ornamental interest, overruns many policy woodlands, and its control and removal, with other invasive species, is now a priority. Policy woodlands were generally part of the functional and aesthetic objectives underpinning the laying out of estates, which are distinctive components of the local scenery in some areas of the National Park.
- *Estate, farm woodlands and trees*
Estate and farm woodlands, shelter belts, hedgerow trees, parkland trees, and avenues of mature trees are components of the farmland mosaic of the lowlands and occur locally elsewhere. They are mostly of plantation origin from the Improvement period, are usually mixed or broadleaf, and tend to be traditionally managed for sport, timber and shelter. Areas of relict ancient woodland survive in some areas. Veteran trees are another important feature, particularly along boundaries. These are not only important cultural and historic features, but are particularly significant for wildlife and as local links in woodland habitat networks. In areas of enclosed farmland, naturally regenerated native woodlands are limited to areas of land which were less suitable for improvement, or which have other land management benefits, such as shelter belts, riparian woodlands, wet woodlands, and loch shore fringe woodlands. These woodlands are often of limited extent, but are particularly important as strategic and local links in woodland habitat networks and in the natural setting of rivers and lochs.

In the 1980s there was a shift away from the priority for food production on better land, allowing the conversion of productive agricultural lands to woodlands, supported by the Farm Woodland Premium Scheme. Such woodlands have tended to be of small scale and to comprise native species, in line with changing environmental priorities. Examples include new planting in Glen Finart. Smaller-scale woodlands are a key component of farmed scenery and important to the setting of villages in the countryside. However, there are some examples of plantation forests on previously improved and enclosed agricultural lands of glen floors, such as in Strathfillan, Strath Eachaig, and by the River Goil. These tend to obscure the distinctive enclosure pattern and screen views through the glen landscapes.

Some policy and farm woodlands such as the estate woodlands of Buchanan Castle, Rednock House, Ross Priory, and Benmore (Younger Botanic Garden), are

recognised through designation in the Inventory of Gardens and Designed Landscapes. However, many woods remain unprotected through designation. The Inventory of Ancient and Long Established Woodlands and the Inventory of Semi-natural Woodlands provide records of ancient natural and semi-natural woodland sites, although inclusion in this does not guarantee protection or positive management.

Forests

Forests are an important cultural and economic aspect of the landscape and a resource for recreation. There are several forest landscapes in the National Park, which are the focus of two forest parks, The Queen Elizabeth Forest Park and the Argyll Forest Park. The forest areas of the Park have different scenic qualities, depending on the nature of the terrain and the siting and design of the forests. Where the terrain is rugged and the vertical tree forms are associated with crags and gullies, well-sited conifer plantings, designed to reveal the underlying topographic features, add to the drama of the scene. However, the extensive scale and homogenous nature of some plantations tends to obscure local topography, makes landscape features less visible, and unifies diverse landscape character. This means that they can reduce local distinctiveness at the detail scale. Geometric forest lines can also detract from otherwise ‘apparently natural’ scenery.

The appearance of today’s forests shows a diversity of silvicultural principles and management practice from different periods of time. Less well-integrated forests usually date from post-World War Two until the 1980s. Pre and post this period, forest design generally produced high quality landscapes.

In upland landscapes, which have been marginal for agriculture, large areas have been forested, covering whole or significant proportions of landholdings. In more fertile farm and estate lands, forests occur as policies and farm woodlands and shelterbelts. They are of smaller scale and become part of a mosaic of diverse land-cover and use. In these instances, like woodlands, they are often key landscape characteristics.

Forests in the National Park are representative of the complex growth and evolution of forestry. The Park provides a microcosm of forestry typical of Scotland as a whole, with examples of forest landscape types that have arisen through different management priorities. The majority of today’s forest areas relate to plantings dating from World War One and the establishment of the Forestry Commission, but there are older forests, which have long-established forest origin (Long Established Plantation Origin) woods status. Some of these early areas are no longer managed intensively for timber production. The types of forests, their key features and background are;

- *Royal hunting forests* were locally significant through the Middle Ages in terms of maintaining and managing existing woodland cover. However, by the start of the 17th Century, Scotland had become largely barren of tree cover due to clearance for agriculture, over-exploitation of timber, overgrazing by domestic stock and a failure to protect forests. From the early 14th Century until the late 17th Century, when it was sold off, Glen Finglas was one of the most popular royal hunting forests. David II, Robert II, James I, II, III, IV and V and many Scottish earls hunted there. Another example in the National Park was the royal deer forest in Glen Artney.



Forestry and woodland on banks of Loch Lomond ©Lorne Gill/NatureScot

- *Early forestry and estate 'improvements'*. Early forest management from the 17th Century on arose from recognition of a lack of timber and woods and interest in land 'improvements'. The landed classes, encouraged by Acts of the Scots Parliament, new publications, and the Scottish Enlightenment, planted woodlands in association with their grand houses. These plantings had multiple objectives: for timber, for shelter for crops and animals, and for amenity. They reflected the aesthetic preferences of their day, initially influenced by geometric European designs and later in the 18th Century by more 'picturesque' English styles. The National Park has a legacy of such policy woodlands. Rossdhu was laid out by Thomas White, credited as an 'ingenious planter' who combined aesthetics with good timber production. The relict designed landscape at Cameron House has suggestions of both more formal and park-like layouts in the tree plantings, albeit hugely modified by subsequent developments.
- *Plant collectors and experimental planting*. Early plantings were important in experimentation and trialling of exotic conifer species, initially planted for ornamental purposes, but used later in larger and then full-scale forest plantations. The sheltered sea lochs and maritime influence of Cowal made it attractive for exotic plantings. Here the Benmore Younger Botanic Gardens is home to specialist collections of trees from this period and other nearby plantings such as those at Kilmun Arboretum, Puck's Glen, and Ardkinglas Pinetum (near to the National Park on Loch Fyne), are the result of further trial plantings. The large trees that have resulted from these plantings are celebrated in the tree initiatives such as Champion Trees and the Big Tree Walk based in the area. An original giant redwood, introduced in 1857, remains at Buchanan Castle Estate.
- *National forest*. At the start of the 20th Century interest in forestry was confined to particular estates. However, an organised forestry movement was stimulated by the

Scottish Arboricultural Society (latterly the Royal Scottish Forestry Society). Expansion of the railway networks allowed exploitation of inland forests and markets. The requirement for adequate timber resources after World War One led to establishment of national forest policy and eventually the formation of the Forestry Commission, tasked with afforestation. The Commission bought estate lands, both areas of rough grazing and remains of woods devastated by wartime felling. Other areas such as Benmore and Kilmun estates were gifted by sympathetic landowners, originally for use as a national demonstration forest and botanical gardens for education in forestry.

- *Forest Parks* were developed for recreational access and could be seen as an early example of social inclusion, encouraging people out of the cities to enjoy the benefits of the countryside. The first, Argyll Forest Park, around Ardgartan, Glen Finart, Benmore, and Glen Branter, was designated in 1935. The Queen Elizabeth Forest Park was designated in 1953. These Forest Parks have become defining areas of the National Park; early plantings associated with the basis of forestry are celebrated special qualities of the National Park and the benefits of forest recreation are enjoyed by local communities and visitors.
- *World War Two and the Dedication Scheme*. During World War Two, the forest resource again came under pressure and the majority of forest workers were from civilian life, including the Women's Timber Corps. There is a monument to their wartime endeavour at the David Marshall Lodge. The Forestry Commission's afforestation programme was confined to the uplands as the priority on lower ground was for food production. This effectively concentrated the programme in the north of England, Scotland and Wales. Ben Lomond Memorial Park was established in memory of those who died in conflict, notably World War Two. After the war the Dedication Scheme was established - this offered landowners financial help if they committed their woodlands to forests in perpetuity and this ran until the 1980s.
- *Forest villages* were also built as part of the afforestation programme, in anticipation of increased rural populations to service the forest industry. There are several in the National Park, including Deer Park and Glen Branter. However, forest mechanisation meant this need was generally not realised in the longer term.

Pre-World War Two silvicultural principles were based on site indices such as soils and vegetation, which gave a more natural feel to the forest. However, plantings from the late 1950s were intended to fulfil economic and social objectives, with the emphasis on the economic production of valuable crops, rather than amenity. Sitka spruce tended to be the tree of choice for upland areas, due to its tolerance of poorer peaty soils and exposure to wind. These plantings created the legacy of forests with geometric lines and of a homogenous nature. Mechanisation and technological experimentation in ploughing and fertilisers exacerbated this further. Tax benefits between 1960 and the early 1980s promoted commercially driven forest management. Examples include some of the forests in the Balquhider area. Whilst the designation of National Nature Reserves in the 1950s protected some special areas of native woodland, extensive areas of the landscape were affected by planting that was less sympathetic to the environment, including plantings of non-native species in upland areas and ancient woodland sites. Examples include Loch Goil side, Glen Finart, Loch Eck side, and Strathyre. Some of the areas, such as the Ptarmigan plantation on Ben Lomond, were also less suitable for productive forests and have proved less economic, prone to windthrow and difficult to extract. The issue of extraction of poor-quality crops recurs

throughout the Park area. Many of these stands are being left, because there is no economically feasible means of extraction.

Water Bodies and Associated Features

The Park has internationally important lochs, sea lochs and water catchments many of which are used for water extraction and hydro power generation.

Lochs

Many upland lochs are reservoirs in remote upland glens. These and their catchment areas tend to have been protected from development and major land use change due to water sensitivities and their remoteness. Thus they have characteristics of naturalness, tranquillity and wildness. Dams and associated infrastructure are of cultural interest as feats of engineering and human endeavour, as distinctive designed elements, as examples of corporate aesthetics and as ‘design classics’ of their time. Dams can emphasise the sense of scale and grandeur in dramatic upland landscapes, such as at Loch Arklet and Loch Sloy.

Glen lochs are either natural or modified to varying degrees for water impoundment or water flow management. They occur in the main glens and are therefore less remote. They have generally been more influenced by change and visitor pressure and are set in managed glen landscapes, with instances of development. These lochs have scenic and tranquil qualities and feel predominantly natural. Natural loch shore fringes enhance these aspects.

Lowland lochs are set in managed landscapes, and are locally developed although the scale of the lochs allows extensive areas to retain tranquil and natural characteristics. As with glen lochs, natural loch shore fringes contribute to their scenic qualities. These more accessible lochs in fertile farmlands provided settings for designed landscapes and grand houses, the grounds of many of which have recently attracted leisure developments such as golf courses, chalet parks and marinas.

Loch Lomond, the only loch to cross between the highlands and lowlands, is more natural and remote in the north, becoming increasingly modified and actively used in the south.

Whilst of a relatively small scale, the features associated with lochs – freshwater and sea loch shore fringes, sea loch foreshore, and islands – contribute significantly to Landscape Character Types, as well as possessing their own characteristics. They are particularly vulnerable to landscape change.

In the past the strategic and defensive qualities of loch islands led to their modification and use for habitation and fortification. Ancient crannogs, which persist or have become submerged with loch level changes and time, utilised natural islands, or in some cases were constructed in the lochs. Larger islands attracted various types of use: ecclesiastical, traditional agriculture and woodland management. Some were incorporated as features of designed landscapes. In recent times, however, the small scale and remote and inaccessible nature of many islands has meant that they have been less disturbed and have become havens for wildlife – some with secluded ruins.



Inchcailloch National Nature Reserve, Loch Lomond. ©Lorne Gill/NatureScot

The Loch Lomond islands across the south of the loch form a distinctive ‘islandscape’, where the interlocking of land and water between islands, the loch and the indented shoreline create a picturesque composition of great local distinctiveness. The calm waters, sheltered and enclosed by natural shorelines, have a tranquil character.

Sea Lochs

Sea lochs are integral to the landscape of Cowal. The shore fringe and tidal foreshore areas have a defining role in their distinctive maritime character. Their raised beaches and loch heads have been the focus for land improvements and built development. Marine character is not as significant with enclosed sea lochs, without outlook to the wider sea and with less obvious intertidal zones. Distinctive boating activities, sea smells and tidal movement do influence the ambience, and where the lochs open out to the less enclosed Clyde seaways, the obvious coastal quality increases.

Maritime influence made Cowal a suitable location for the establishment of exotic tree and shrub species by the early Scottish plant collectors. The legacy of these trees, along with Victorian plantings, is a key aspect of local distinctiveness around the sea lochs. Victorian villas and heritage features relating to early tourism, such as ornamental pier houses, are also features.

Water Resource

The abundance of water has led to a long history of water resource exploitation. Initially, small-scale water power was used for local industry. Since the industrialisation of the mid-19th Century, with the modification of natural lochs and creation of new reservoirs, the National Park area has been a major catchment for water supplies to Glasgow and the Central Belt. In

the 20th Century, the Park's water resources were, and continue to be, developed for hydro-electricity.

Loch Katrine, Loch Arklet, Loch Venachar, and Loch Ard Forest have been greatly influenced by engineering works associated with the Glasgow water supply constructed between 1856 and 1859. Dams, sluice houses, outflows, aqueducts, occasional houses, dressed sandstone wall detailing and associated Victorian plantings are all features in the landscape, valuable as industrial archaeology and for the distinctive design qualities associated with the former Glasgow Corporation.



Loch Sloy Hydro-electric scheme ©Lorne Gill/NatureScot

Loch Sloy, formally opened in 1950, was the first hydro-electric power station of the North of Scotland Hydro-Electric Board. The power station is a landmark on the shore of Loch Lomond, and Loch Sloy Reservoir and dam are significant features set in rugged upland. Substantial additional engineering works are associated with the scheme, including visible water pipes, power transmission lines, and less obvious tunnel systems. Glen Finglas Reservoir is another example of water impoundment which significantly altered the landscape, with the loss of historic and cultural landscapes beneath the new water body.

More recently, there has been growing interest in developing small-scale run-of-river hydro schemes in the National Park. Burns and small rivers have been used to drain glen sides and upland glens, which due to steep gradients provide a good potential resource for this form of

renewable energy. Such schemes include weirs and water outlets from the small rivers, undergrounded pipes and power houses downslope. The landscape and visual impact of these tends to be localised and are often mitigated by sensitive siting and design. Where there are several schemes in a catchment or in a glen, cumulative impact on the landscape can become an issue.

Water-based recreation is a key feature of the area. Lochs are used for sailing, windsurfing, water-skiing, and pleasure craft, with jet skiing notable on Loch Lomond. There are also canoeing and rafting on most lochs and rivers, such as the rivers Teith and Leny. Water sports (particularly motorised) can create noise and disturbance, cause trampling and erosion of shores at launch sites. Pressure for such recreational uses is increasing, but the recently reviewed by-laws have established new controls which help to balance conflicting uses in the sensitive Loch Lomond environment.

Fishing is generally widespread and contributes significantly to the local economy. The construction of fishing platforms, erosion of banks, spread of litter and the effects of these on local habitats can impact adversely on the landscape.

Natural Mosses

Natural moss can contain cultural features that have been either concealed in the overlying peat, or remain undisturbed due to lack of more recent interference. During the Stone Age the marshlands would have provided a rich resource for early settlers, and evidence of hunter gatherer and early settlement activities has been found. In prehistoric times the moss edge seems to have attracted settlements and fortification, and the area is overlooked by the Menteith Hills, which rock art evidence suggests were a focus of prehistoric ritual activity. In the medieval period a broadly similar pattern of mottes and tower houses concentrated on the better ground around the moss edge. These, in part, formed the focus of subsequent substantial policies developed during the improvement period. The mosses, which reached a depth of 6 metres, were mostly cleared in the 18th and 19th Centuries in order to bring the fertile clays into cultivation. Only fragments now survive which, for the most part, lie outwith the Park. Drainage schemes and agricultural improvements have been so effective that it is difficult to know the full extent of wetlands and peat mosses, but the 30 metre contour frames the likely maximum area of the wetlands.

Due to the extreme vulnerability of moss habitats access is managed, but the right of responsible access applies to mosses. Access is limited by the scarce infrastructure and by the difficult terrain of deep heather, drainage ditches, bog pools, etc. However, the flat terrain allows expansive views and a sense of space, contrasting dramatically with the Highland Boundary Fault and with the more enclosed glen landscapes beyond.

Settlement

Settlement in the form of larger villages, smaller villages, hamlets, dispersed settlements, farms and occasional houses are frequent features of most of the National Park landscapes, except those of hills, upland glens, parallel and upland ridges. There is a wide diversity of settlement types and the patterns of location, siting, or design are not fixed or entirely regular. For the most part, settlements in the National Park are set within broader landscape contexts. In the highland areas larger settlements tend to be restricted to glen floors and the lower

slopes of glen sides, with occasional farms in upland glens. There are some general similarities of character, but with aspects of local distinctiveness.

Traditional highland villages

Highland villages are located within the glens flanked by high steep-sided mountains, associated with road, rail and ferry communication routes. They are often adjacent to rivers and lochs. The origin of the villages is often related to early routes, river crossings and strategic sites. Victorian expansion, particularly in relation to popular loch side destinations, is a feature of many of the villages, which tend to remain predominantly traditional in character.



Killin, showing Victorian architecture ©George Logan/NatureScot

Killin and Aberfoyle are larger highland villages, mainly occupying glen floors but extending over lower glen sides locally. Killin is located at the confluence of the Rivers Lochay and Dochart, near the head of Loch Tay. It is of linear form and highland in character, set in typical mountain and glen scenery. Killin grew in size at the time of the Clearances when the Earl of Breadalbane provided feued houses, resulting in the development of the main street over the 19th Century. The construction of the railway in 1885 resulted in many more houses being built. These usually comprised a large house with a small cottage at the back, the purpose being to let out the big house during the summer months. The traditional rows of cottages, Victorian houses and shops, and the old bridge and mill, and the relative absence of visible obviously contemporary development, give the village a historic feel. The popularity of the scenic village with highland visitors has remained, including by those visiting the Falls of Dochart. Killin is a popular destination for walkers and visitors to Ben Lawers. Aberfoyle, set on the edge of River Forth meadows on the Highland Boundary Fault, against a dramatic backdrop of forested hills and crags, is also essentially linear in character. The village was a popular destination for early tourists. It has a busy town feel, the traditional and Victorian

vernacular and design qualities have been somewhat altered by more recent suburban-type development.

Crianlarich and Tyndrum are small highland villages located at the junctions of major trunk road and rail networks. The villages have stations on the West Highland railway line. Crianlarich is the significant station for branches to Fort William and Oban and its high-level railway bridge is an important village landmark. Both Crianlarich and Tyndrum are enclosed by a surrounding landscape of forests and rugged high mountains. Development is typically low density, of a non-traditional style, and with several larger hotel and tourist-related developments. The main roads and suburban character have altered the rural qualities of the village. Set amongst mountain scenery and on the West Highland Way, both villages are popular destinations for walkers.

Several villages are associated with nearby lochs, although their buildings tend to be set back from the loch shores. Tarbet is a linear settlement that clusters loosely above Loch Lomond, around the junction of the A82 and A83, main roads to the highlands and west coast respectively. The village is a mixture of rows of traditional stone cottages and more recent development. The Victorian baronial Tarbet Hotel is a distinctive landmark in the village and on journeys through the Park. Lochearnhead and St Fillans are sited towards the head and outflow of Loch Earn respectively. Lochearnhead sits in a wider crofted landscape and the land division remains visible within the village structure. There are traditional cottages and the village was a popular destination in Victorian times. There was formerly a railway station and grand hotels. These are now gone, in part redeveloped by contemporary suburban-type housing. There has also been infilling of the croft plots with ad hoc recent housing. St Fillans is dominated by Victorian and early 20th Century villas, with the main street lined with a series of gable-fronted houses overlooking the loch. Further traditional cottages and railway heritage, along with more recent developments, sit back from the main street.

Strathyre, Brig o’Turk, and Kinlochard are small rural highland hamlets, within a farmed glen floor setting, enclosed by forested and wooded glen sides with the surrounding Highland landscape dominating their setting. Strathyre originated along an old drove route north to the highlands, but the characteristically linear village centre shifted over the river and aligned along the railway when it came. Brig o’Turk and Kinlochard are small dispersed hamlets, with houses set among local topographic features and woodlands.

Balquhiddy and Auchtbody sit in a wider crofted landscape, enclosed by forested glen sides and mountains. The villages have a dispersed rural character, with most of the houses spread out in a ribbon along the minor road accessing the glen from Kingshouse. Balquhiddy centre is towards the outflow of Loch Voil, with some clustering of traditional development around the church and village hall. Dispersed settlement is an unusually pronounced feature through the wider landscape, but highland glen and mountain landscapes remain the dominant local characteristic.

Traditional lowland villages

Lowland villages tend to be located along communication routes, at junctions or bridging points. Settlement is generally located off the flood plains in fertile rolling farmlands within a mosaic of fields, small woodlands and plantations. The villages are commonly a mix of traditional cottages and more recent housing types.

Drymen is a nucleated village clustered around the convergence of several routes and set in rolling farmland. The village adjoins Buchanan Castle Estate and some features of the village and its approaches suggest it has been influenced at least in part by the laying out and design intention of the estate. The small village green at the village centre, together with a grouping of older traditional stone buildings, public buildings, shops, inns, houses and cottages, conveys a strong sense of arrival and local distinctiveness. The older centre of the village is small, but 20th Century developments, such as small local authority and private housing estates, have added to the scale of the village. The size and style of these estates tend to sit well in the landscape. Generally the village is not highly visible in the wider landscape and has an enclosed quality. It is strategically sited on the road to the popular east side of Loch Lomond and is on the West Highland Way, a popular destination for walkers.

Gartocharn and Croftamie are small linear lowland villages, sited along main roads in the rolling farmland, comprising mixtures of traditional stone cottages and more recent development. They are not tourist destinations. Both villages sit into rolling farmland surrounds. Croftamie was formerly on a railway track, now an important recreational resource for locals and visitors. ‘The Dumpling’ (Duncryne Hill) is a distinctive local landmark on the edge of Gartocharn which, along with the village hall, enjoys exceptional views out over south Loch Lomond and up through the trough of the loch into the highlands.

The small lochside village of Balmaha occupies a dramatic position at the intersection of the Highland Boundary Fault and Loch Lomond, against the distinctive landmark backdrop of Conic Hill and the Loch Lomond islands, which continue the visible expression of the fault line. The boat yard and loch shore dominate the ‘villagescape’. Balmaha can be busy but retains an informal rural feel. The village attracts some low-key tourism, with visitor centre and car park, accommodation, an inn, café and shops.

Balloch is a main tourist hub within the National Park and is contiguous with the extensive urban area of the Vale of Leven. The River Leven is an important feature in Balloch, linking the centre of Balloch to Loch Lomond, with marinas and moorings. Balloch Castle Country Park extends from the town, along the river, to the banks of Loch Lomond and is significant as a well-maintained and publicly accessible designed landscape. Balloch contains many tourist-related shops, hotels and restaurants of various styles and design and its character is mainly suburban. The train link to Glasgow terminates here, making Balloch a readily accessible and popular destination. Loch Lomond Shores, a popular visitor destination on the southern tip of Loch Lomond with views up the loch, has shops, cafes and restaurants, as well as recreation opportunities.

Planned settlements, small estate villages – highland and lowland

Many villages assumed their present form within the ‘improvement’ period. The preference of landlords for improving order and regularity, displayed in the layout of their farms, extended to the design of settlements for estate workers, such as the neat rows of houses at Buchanan Smithy and Milton of Buchanan. Several planned villages were constructed during this period:

- Callander is set against the dramatic wooded slopes of Callander Crags on the Highland Boundary Fault, at the approaches to the Pass of Leny and the highlands. It is the only large planned town in the Park, laid out around a traditional Scottish feus system, with long strips of land running back from a linear main street. The regular

townscape is made up of tightly packed gable to gable rows of houses and hotels set against pavements on each side of the main street, which is a wide shopping street. This pattern is repeated in the grid layout of streets around the main street. Beyond the older core, recent peripheral development includes various housing estates of a generally suburban character. The river, river meadows and old bridge are important features in the town and are the focus of much recreational activity in summer. Callander is a very popular tourist destination, with a busy atmosphere.

- Luss and Gartmore are small planned estate villages, Luss associated with Roosdhu and Gartmore associated with Gartmore House. Luss originated as part of the mid-19th-Century estate improvements and is often described as one of the prettiest villages in Scotland. It is a popular tourist destination. Pier Road leads down to the Loch Lomond foreshore, with streets running off this. The buildings are distinctive single-storey, stone-built, slate-roofed cottages with regular detailing, including decoratively carved eaves and barge boards. Gartmore is a distinctive landmark occupying a dramatic position in a quiet rural location on the HBF. The village comprises rows of stepped gable to gable single- and two-storey cottages, predominantly painted white and with dark slates, with a main street running upslope. It enjoys an outlook over the lowlands and is an integral part of the designed landscape of Gartmore House. The village shares essentially the same plan as Callander: a single main street straddled roughly at its midpoint by a square.
- Buchanan Smithy and Milton of Buchanan are small estate hamlets specific to local estate development. Milton of Buchanan is located at the site of the former sawmill and is characterised by the distinctive piend-roofed cottages. Buchanan Smithy comprises two distinctive early 19th-Century cottage rows, built for estate workers and originally including a smithy. Both hamlets are set in rolling farmland.

The park contains several areas of housing established for forest workers. The most distinctive and isolated villages are Deer Park (by Benmore) and Glen Branter. Both villages are made up of attractive small-scale timber houses, located on the edge of farmed glen floors, but with a strong sense of enclosing forested glens. Housing at Braeval and Kinlochard would also have originally been associated with forest estates and has a distinctive architectural style.

Coastal villages

The sea loch margins are relatively densely settled, with linear expansion around most of the Kilmun peninsula and locally extensive settlements around each of the sea loch heads. Settlement is focused around the sea loch shore fringes, which are raised beach features, but extends up over the lower slopes of wooded and forested glen sides. The size of these coastal villages predominantly relates to Victorian expansion, when the area became popular both with tourists and with Glaswegian industrialists who made their homes there. There are numerous Victorian plantings and elaborate gardens, often incorporating built ornamental features, exotic plants and terraces. Steamers provided a convenient means of transport on the Firth of Clyde.

Arrochar and Lochgoilhead are coastal villages focused at the head of sea lochs. Both are sited on glen floors and extend linearly around sea loch shore fringes and locally up lower glen sides. They are enclosed by steep mountains, forests and woodlands and have a highland feel. The enclosed nature of the sea lochs means that the maritime character is not particularly strong. Arrochar is a destination for walkers to the popular Arrochar Alps. Lochgoilhead has a

remote quality, accessed over high passes of Hell's Glen or the Rest and Be Thankful. The villages contain a mixture of development types, with generally more traditional buildings at their cores, Victorian influence around the loch shores and late-20th Century growth on their edges.

Blairmore, Kilmun and Strone are coastal villages which form an extensive linear stretch of houses from the west end of Holy Loch around Strone Point into Loch Long. They are focused around sea loch shore fringe, but extend up over the lower wooded and forested glen sides. The villages' distinctive characteristics include Victorian villas and plantings, piers and ferry houses facing on to the lochs and the Firth of Clyde.

Ardentinny is a small coastal village, located on the sides of Loch Long. It comprises short rows of traditional cottages, some gabled semi-detached forestry houses, and more recent suburban-style housing. Carrick Castle is a small ribbon development hamlet, which spreads out along the road to Carrick Castle itself. It comprises a few Victorian villas and additional recent suburban style housing.

Victorian settlement

The communication routes and the popularity of the Trossachs and Clyde seaways – particularly the lochs and sea lochs – with Victorian travellers and early tourists initiated Victorian settlement of more traditional houses, terraces and grand villas. These tend to be located around the heads and shores of lochs and are associated with loch shore fringes, farmed glen and strath floors and lower glen sides.

Recent built development

Traditional settlements in the highlands and the lowlands typically originated at sites selected for their shelter, where trees and landform gave protection from prevailing winds. However, lowland villages and farmsteads are generally raised up off low-lying ground, to avoid flood risk and provide surveillance over farmlands. Gartmore is an example of a village that occupies a prominent position in the landscape, to be appreciated as part of a wider design intention.

Vernacular townscape and architectural design of the core of these settlements broadly reflect local building materials and crafts, and the physical characteristics, and micro-climate of the landscape. In contrast, more recent development does not always respect these patterns of layout or choice of materials, or physical and visual relationship with its setting. Non-traditional styles of architecture have also become prevalent, as building technology and preferences for modern urban/suburban-style housing are imported. More recent development and associated access roads have tended to be suburban in character and often of standardised design, which do not reflect local or rural distinctiveness. There has been pressure for new development in the National Park due to increased mobility, advances in telecommunications technology, and rural diversification. Changes in farming and agricultural policy have increased the demand for new development in the countryside and conversion of barns and other redundant farm buildings for new uses. Housing and self-catering holiday units have been a growth area, as have farm-based businesses, such as small camping and caravan sites, farm shops and contracting.

Building has tended to focus on flatter ground, but this can be extremely limited in extent, particularly around the steep-sided sea lochs or glen sides. Development pressure in the

villages has therefore led to siting and design of buildings in increasingly challenging sites, with design and engineering solutions such as slope retention and under-build. Development pressures have also led to extension beyond the topographic or woodland containment of villages.

Tourism has been a significant activity in the National Park since Victorian times and many of the villages have been influenced by the development of holiday villas and hotels. Architectural designs were influenced by the fashions of their day and include building in baronial, Italianate, and Arts and Crafts style. These now have cultural heritage and scenic value. Some of the traditional hotels have been redeveloped. Route junctions and ‘gateways’ to destination areas are most popular for these forms of development, due to their strategic importance in visitor movement.

Historic Features

Historical remains tend to be more extensive and visible in the less disturbed and open uplands. Glens and lowlands have more intensive land use, less open land cover and development has destroyed and obscured remains.

Early prehistoric features

Mesolithic hunter-gatherer-fisher communities are thought to have travelled up lochs and through glens after the last Ice Age, at least 9000 years ago. Early farmers may have been active from 4000 BC onwards. There are no visible remains of these early periods of occupation in today’s landscape, but occasional discoveries of artefacts suggest this pattern of development.

Cup and cup-and-ring marked stones are thought to date from the late Neolithic-Early Bronze Age. These highly enigmatic features are common in the National Park, particularly within open parallel ridges along the HBF. Elsewhere, they tend to cluster at the entrance or transitional points in glens. There are concentrations north of the Lake of Menteith around Nether Glenny and Mondowie. Their location suggests that they may mark territories and hunting patterns.

Neolithic and Bronze Age sites and monuments not masked by later settlements include funerary and ritual monuments such as chambered cairns, long mounds, round cairns, stone circles, standing stones and settings. None of these are common in the National Park, but there are some local clusters, for example, standing stones and stone circle around Killin. Of note, at 322m in length, Auchenlaich burial mound near Callander is the longest in Scotland.

Settlements of later prehistory are comparatively common, with a wide variety of sites. There are 10 known forts in the area, which are structures with earth defences or stone ramparts and ditches. Duns and brochs are specific types found in the western highlands and islands of Scotland. They date from the first millennium BC and probably span the period of a millennium or so, with some examples being refortified in the early medieval period. Forts, duns and brochs tend to occupy strategically significant sites on low hills or promontories at the edge of more fertile ground, often overlooking glen mouths, lochs or rivers. They can be significant visual features in local landscapes, whether in open situations or forming wooded knolls. There are 3 duns (e.g. at Shemore), ten known forts, and brochs at Craigvern (near Drymen) and Auchinsalt (in Menteith) within the National Park. There is a concentration of

forts around Callander, some of which are composites of duns surrounded by hillforts. The most impressive hillfort in this area by far is Dunmore, occupying the summit of a steeply sloped hill near Bochastle and displaying several rings of fortifications.

The remains of homesteads likely to date from the first millennium BC are limited to crop marks, associated and legible with better land. Such remains are not visible features in the landscape. Recent golf course developments have initiated archaeological investigations into areas on the south-west shores of Loch Lomond, which are allowing a better understanding of this period.

Crannogs, ancient loch dwellings, are found in many of the National Park's lochs. They form artificial islands, built of boulders and timber piles, which provided a solid platform for timber roundhouses. They are found in freshwater lochs, loch shore fringes and on loch islands. Their situation gave some security and access to diverse resources. They date from around 500 BC and were occupied until the medieval period, when occasionally they were developed as castles. There are 20 known sites within the National Park. Some crannogs are not recognisable today, while others are revealed or concealed according to fluctuations in water level.

There are three main Roman forts in the National Park area: east of Drymen, west of the Lake of Menteith and north-west of Callander. There are also some temporary camps in the area indicating lines of march. The forts were constructed in the latter part of the 1st Century AD and all were positioned along the edge of the highland line. Parts of the ramparts of some remain, but are generally not highly visible in the farmed landscapes. The Romans also began to establish more formal roads in Scotland in contrast to the trackways and natural routeways used by the Iron Age population.

Medieval features

By around AD 600 the mountains around Loch Lomond appear to have formed a frontier zone between the Britons of Strathclyde to the south, the Scots of Dalriada to the west, and the Picts to the east. In the following centuries some crannogs and hillforts continued to be used. Christianity arrived around the 6th Century and many places have associations with the early saints, including small chapel sites and on island sites, such as Inchmurrin in Loch Lomond. In the 9th Century, conditions would have been turbulent, with Viking raids into the area.

Castles first appeared during the 12th Century, associated with the influx of Anglo-Norman knights who settled the area. By 1300 most of the parish churches had been established and churches and castles were often sited near one another, emphasising the close relationship between the Church and secular authority.

Early castles were built of wood on earth mounds known as mottes. Four are found in the Park, with the best preserved at Catter Law south of Drymen. Slightly later moated sites, with earthworks defined by a ditch, were apparently built as estate centres, with defence less of a priority. Both types had lowland distributions and their location on agricultural lands and their earth construction has made them vulnerable to erosion. Stone castles and towers are mostly ruins (eg. Inchgalbraith Castle on an island in Loch Lomond, and ruined Rossdhu Castle), with just three still occupied (such as at Duchray, Edinample), and three incorporated into later buildings, and others surviving as roofless shells. In the lowlands a significant proportion of

castles have been incorporated as the focus of estates. Abandonment of the more inaccessible highland castles has helped secure the preservation of their ruins as features. Castles and their ruins are important local landmarks. Often sited on knolls or in atmospheric loch side or island situations (e.g. Eilean Moiach on Loch Katrine and Eilean Rowan at Killin), and set off by trees or woodlands, they contribute to the scenic and historic qualities of the landscape. In the highlands, castles tend to be located on farmed strath and glen floors, and their margins. In the lowlands, castles and mottes tend to be located throughout rolling and river valley farmlands and carse landscapes. About half of the castle sites in the lowlands stand within 18th and 19th Century policies, therefore demonstrating continuity of occupation despite changes in architectural taste. Throughout the Park castles are found near lochs or on loch shore fringes and islands.

Cross-slabs and gravestones are all that survive of the early 6th Century church foundations. Most of the church sites are still in use, but the churches have been rebuilt. There are only built medieval remains in three sites: Inchcailloch, Strathfillan, and Inchmahome priories, the latter situated on an island in the Loch of Menteith, with a castle located on the nearby island of Inch Talla. There are also ruins of six Pre-Reformation chapels, such as those at Auchlyne and St Fillans. A number of burial grounds, including several traditional clan burial grounds, may have medieval origins. An example is the burial ground of the MacNab clan, associated with Killin, is located on Inchbuie in the River Dochart. Christian remains tend to be located along farmed glen and strath floors and their margins, often in the vicinity of rivers and loch margins.

Historic and early communication routes

The National Park has an extensive natural communication system, with a network of glens, lochs and seaways, interlinked by upland glens and passes. These are likely to have been used since prehistory by peoples moving through and into the area. Loch and river travel would probably have been preferred to negotiating dense woodlands or undrained and rugged terrain. Such routes would have been controlled and protected by the establishment of settlements and forts at strategic points along loch shores, heads of glens and bridging points. The settlement pattern relating to these routes remains a characteristic of today's landscape. Historic and early communication routes have been assimilated into subsequent infrastructure to some degree. However, they remain visible features in the landscape in open, less developed upland areas, and are distinctive features of some open upland glens.

Drove routes and hill passes were the main routes through the area. These linked with sea and loch routes between the lowlands and highlands, and areas east and west. Several important drove ways passed through the National Park landscapes from the north and west highlands and islands to the cattle markets in the central lowlands. An example is the route from Loch Fyne to Inverarnan (the A83 at the head of Loch Fyne), along which cattle from Glen Fyne were taken to Glen Falloch using the Lairig Arnan.

Pre-improvement landscapes

Before the sweeping changes of the agricultural improvements of the late 18th and 19th Centuries, agriculture in Scotland was generally based around a system of multiple-tenancy farms. Houses were clustered in townships and fields generally unenclosed, except for turf or stone head dykes. Cattle were taken to high or remote pastures in the summer months and communities would accompany them and live in small huts, known as shielings. The rural

population appears to have reached a maximum in the late 18th Century, followed by a swift decline due to a series of poor harvests, the attraction of employment in the developing and nearby industrial areas of central Scotland, and, mostly, by the conversion of large areas to sheep farming.

Shielings, and relict land use patterns are characteristic features of the highlands. They are most commonly found in upland glens (such as those in Gleann nan Caorann and Gleann a Chlachan) and locally on glen sides, where they are visible features in open areas, but obscured in woodland and forests. Lowland remains have been largely obliterated due to ploughing.

Upland crofts are a local feature of upland glen landscapes around Lochearnhead, Glen Ogle and Balquhidder, where the distinctive strip land division and settlement pattern is a defining characteristic of the area. There is also an area in lower Glen Buckie, but the relict pattern is not readily discernible from the surrounding field patterns. Lowland crofts are a relict feature south-east of Callander. However, they are not readily discernible from the characteristic farmed glen floor field pattern.

Early Industry

Bloomeries are small-scale ironworking furnaces, identifiable in today's landscapes as waste heaps of slag and charcoal. They are thought to have been in use from the 15th until the 18th Century. These have been found in the National Park, but they are inconspicuous structures and there may be many more as yet undiscovered. Along with charcoal burning platforms these were probably associated with woodlands, particularly relict oak woodlands, which were managed for charcoal production and associated with early industry, prior to the Industrial Revolution. Bloomeries tend to be found in upland glens and glen sides.

Designed Landscapes

Earlier designed landscapes of the late 17th and early 18th Century are in the Italian tradition, with avenues of geometric design focused on particular points of reference such as follies or remarkable features or buildings. This 'man-over-nature' regimented form of design changed to a 'naturalistic' approach to design in the later 18th Century, with curvilinear rides and vistas focused on apparently 'natural' features. Most of these features were man-made, although the lochs, islands, and rivers of the Park were often appropriated for their visual qualities and incorporated into designed landscapes. This approach was typified by the work of Capability Brown and examples of the work of his student Thomas White are found in the National Park. Exotica, such as Douglas firs, became more common in the designed landscapes during the 19th Century as people travelled to and returned from distant parts of the empire. Earlier and later designed landscapes incorporated deer parks and parkland, traditionally part of the aristocratic culture, and both included woodland as part of the design.

Designed landscapes are associated with the 'improvement' periods of the 18th and 19th Centuries, during which landowners improved the agricultural, forestry and aesthetic potential of their estates by constructing large houses and establishing landscape policies around them. Many estates were focused around medieval castles and towers, which remain as ruins or were reincorporated into subsequent buildings.

In Victorian times shooting lodges, specifically for visiting hunting parties in the stalking or shooting season, were developed in the highland areas in conjunction with the development of Deer Forests. These lodges would often be surrounded by designed landscapes, which, apart from including kennels and housing for keepers, differed little from other designed landscapes of the 19th Century and could have quite extensive woodland plantations.

In the late 20th Century, many designed landscapes, particularly around the loch shores of the Park, have been converted to recreational use, with golf courses, hotel and chalet developments, marinas, housing, and various tourist facilities. This can help to conserve and enhance the features associated with designed landscapes, although care is needed to ensure that the nature and scale of development respect the sensitivities of designed landscapes. Around the south-west of Loch Lomond extensive development both in the context of designed landscapes and also within intervening areas of land has locally changed the key defining characteristics of the landscape to one where leisure development has become dominant.

Elsewhere, designed landscapes have become neglected. The upkeep and use of built structures such as walled gardens, glass houses, gate houses and entrance features, tends to be in decline, although there are some which are well kept. Boundary features, such as parkland fencing and estate walls, are often not maintained and have been replaced in whole or part by modern solutions. Woodland management and the care of specimen trees also vary. The spread of invasive species such as Japanese Knotweed, *Rhododendron ponticum* and locally other plants such as Giant Hogweed, Skunk Cabbage and Himalayan Balsam are present throughout the National Park, often associated with designed landscapes, where they were initially introduced for their exotic qualities.

Balloch Castle is a rare example of a designed landscape that is publicly accessible and in a good state of conservation resulting from recent restoration works. Five of the National Park's designed landscapes are listed in the Inventory of Gardens and Designed Landscapes (Historic Environment Scotland): Redknock House, Buchanan Castle, Ross Priory, Balloch Castle, and Rossdhu.

Land Improvement

Agricultural improvements were introduced in the 18th and 19th Centuries to increase yields and profits from farming. In lowland areas fields were enclosed, farm buildings replaced and farms amalgamated into larger holdings. New ground was brought under cultivation through drainage of the mosses, especially in the Forth Valley carse landscapes.

The field patterns resulting from these improvements are rectilinear. They are a key characteristic of lowland farmland, as well as, in more limited extent, farmed parallel ridges, glen floor ridges and Landscape Character Types with estates. Upland areas saw the large-scale conversion of upland townships to sheep farms which brought about the mass depopulation of many highland glens.

During this period, the improving landowners planned villages for their estate workers and further improved their estates by constructing country houses and establishing designed landscapes surrounded by policy woodlands. These are defining characteristics of the lowlands of the Park, and key characteristics of farmed strath and glen floors.

Resources, industry, tourism and infrastructure

Industry, tourism, and communications established a more significant presence in the National Park area in the 18th Century. This was in part because of available resources, but exacerbated by the area's strategic position and proximity to the requirements and pressures caused by the rapid industrialisation and growth of the population and associated wealth of Glasgow.

Historic Resource Use

Timber became an important source of income for many highland landlords. Apart from general demand for constructional timber, wood was consumed by acid works at Balmaha and Aberfoyle, and bark was in demand for the tanning industry. Charcoal was supplied as a fuel for the iron industry, and several ironworks were established in the highlands in the 18th Century, such as Bonawe Iron Furness at Taynuilt. Lime was used as both a mortar for the building industry and as an agricultural fertiliser, and various limestone outcrops in several locations north-west of the HBF were exploited, with limekilns a remaining feature. Slate occurs north of the Fault and was quarried at Luss, Salloch and Aberfoyle. From the 18th Century, deposits of silver, gold and lead were exploited around Tyndrum where the remains of a lead crushing mill can still be seen. Immediately south of the Park, the River Leven was a focus for various industrial concerns, including textiles.

The Glasgow Water Supply

Construction of the Glasgow Corporation waterworks were completed in 1859 and was one of the greatest engineering works of the 19th Century. This principally affected Loch Katrine, but also Lochs Venachar and Drunkie. Loch Arklet and Glen Finglas Reservoir were added later to cope with increasing demand. There is also an extensive network of associated infrastructure, pipelines and structures. Further use of the National Park's water catchment has been made for water supply, power generation, and water flow management. Most freshwater upland glen lochs and some freshwater strath and glen floor lochs are reservoirs.

Transport

In the 18th Century transport links were poor. Some roads through the area were constructed by the military, specifically to link highland garrisons. Parts of these routes, garrisons and bridges remain as features in the landscape, particularly visible in open upland glens. A few public roads were built, but many goods were moved by water to avoid road tolls. In the 19th Century, the fast growing tourist industry, inspired by the work of Sir Walter Scott and other romantic writers, led to more steamers and eventually railways. Hotels and other facilities sprang up at the steamer piers and railway stations.

The railway network in the National Park extended along key strategic east / west and north / south routes and would have integrated with steamers on Loch Lomond and steamers accessing the Clyde seaways. The railways boosted tourism, reaching Balloch in 1850, Callander in 1858, Crianlarich in 1873, Aberfoyle in 1882 and Killin in 1886. Railway heritage, associated Victorian architecture of stations and houses, and features associated with steamers, such as piers and pavilions, are distinctive characteristics. Communication routes tend to run along lower glen sides and across farmed glen and strath floors, linking through upland glen passes.

Modern Day Development

Mining and Quarrying

The geodiversity of the Park has led to a significant heritage of quarrying for building materials, which has contributed to the distinct character of the area's built heritage. Mineral resources, including gold, also exist near Tyndrum. Minerals extraction in the National Park is limited at present to a small number of specific sites. There is no general pattern of exploitation of minerals resource.

There is a localised area of active sand and gravel extraction in the floodplain of the River Teith which although reasonably well screened, forms a feature of the wider landscape. Other small-scale sand and gravel extraction is localised, usually located by lochs or rivers and related to specific developments. In the past extensive gravel extraction took place around the south of Loch Lomond. This resulted in large lagoon areas, such as at Midross, which are now valuable loch shore fringe environment, with biodiversity and landscape benefits. Lomond Shores was developed in a similar environment.

An exploratory gold mine was opened in the 1980s on the lower slopes of Ben Lui at the head of Glen Cononish. This is not currently operational due to low gold prices, but the mine workings, which have not been restored and which extend over the open upland glen and open hill LCT context, are extensively visible. Further planning permission has been granted for further gold mining in this location. Similarly, the excavations and spoil from the old lead and silver mines on the high ground immediately west of Tyndrum are still visible, now forming part of the cultural and industrial archaeological heritage of the area.

There are slate quarries on the slopes above Luss, and also above Aberfoyle off the Duke's Pass. Old stone and slate quarries in the National Park are occasionally reopened for the purpose of winning materials for building conservation projects which require local materials to preserve the integrity of the conservation work.

Wind Power

At present there are no wind farms within the National Park. However, development at the Braes of Doune, east of the National Park, which is visible from the Park, and also seen in association with key views of the Park and the setting of the key landscape features – the HBF and 'Highland Line'.

There are a number of other wind farms either installed or permitted on the periphery of the National Park, mainly to the south-east, south and south-west both in the Stirling and Argyll and Bute local authority areas. These areas are intervisible with the Park and are included in views from many of the popular summits, tops and Munros, the Duke's Pass, settlements such as Drymen and Gartmore, the West Highland Way, and many of the main roads..

Electricity Supply

Two high-voltage overhead power lines cross the National Park. The pylons and associated way-leaves are highly visible features, particularly in open landscapes, where they cross skyline ridges, or go through forests, such as those near Loch Sloy, Ben Glas and Loch Katrine. There are also a number of interconnectors, of various scales, most of which are reasonably discretely sited.

Low voltage overhead power lines are a frequent feature in the National Park, associated with all settlement, throughout the lowlands, along glen floors and sides, and through upland glens. They tend to follow the routes of roads, but are often set back in adjacent fields and can cut across views from the road.

A programme of undergrounding low voltage overhead power lines is currently underway. Screening some stretches of these from important access routes and viewpoints is also likely to take place as part of the SPEN VIEW project. The electricity companies have an obligation to underground lines in areas where the amenity of the landscape would potentially be enhanced, with priority given to National Parks and NSAs.

Transport Infrastructure

The National Park is within an hour's travel of over two million people and two of Scotland's largest airports. Road and rail are the main forms of transport through the area. There are some ferries which tend to be run by tour operators. Current ferries run from Gourock to Dunoon and Portavadie (Tighnabruich) to Tarbert across Loch Fyne. Numerous piers and slipways give access to the lochs for recreational use.

The strategic significance of the National Park area is evident in the modern road network. It contains 4 trunk roads – the A82, A83, A84 and A85. One of Scotland's two main routes north and which is a popular tourist route, the A82, passes along west Loch Lomondside, through Glen Falloch and along Strath Fillan. It is popular for its scenic qualities, with major upgrades currently under way to improve its safety for users. Other key routes link east/west from Perthshire and Stirling to Argyll. Often the roads are associated with natural regeneration of alder along new embankments, which enclose them from the surroundings. Whilst several extensive stretches of the trunk road network have been upgraded, the National Park's landscapes can still be enjoyed from traditional rural roads, which respond to the local topography, have typical agricultural or estate boundaries, and in places, features such as historic bridges and mileposts. However, further upgrades are likely given the strategic significance of the network and recent issues of stability where roads cross glen slopes. The road network is concentrated in the highlands to farmed glen and strath floors, loch shore fringes and lower glen sides, with links through upland glens. In the lowlands it extends through rolling farmlands with estates, but also crosses river valley farmlands with estates at bridging points.

The Oban and Fort William West Highland Line railways are the only rail routes still operational; the other branch lines closed down in the early 1960s. These provide limited rail transport within the Park to the north of Loch Lomond and Strath Fillan, with just four settlements served with stations. There are six railway stations in total, at Ardlui, Arrochar, Balloch, Crianlarich, and Tyndrum Upper and Lower. The rail routes have dramatic views and the railway infrastructure of stations, viaducts and bridges contributes to the local scenery and distinctiveness. Railways tend to follow lower glen sides above the farmed strath and glen floors, with links through upland glens. There are some timber transfer points on the railways, such as at Crianlarich.

Recreation and Leisure-related development

Growing demands for tourism and recreation are leading to changes in patterns of land use, particularly around the south of Loch Lomond, where many estates and policies have been

converted to golf courses and holiday accommodation. Strategic tourism locations have been identified in the Local Development Plan - Aberfoyle, Arrochar, Balloch, Blairmore area, Callander, Drymen, Tarbet and Tyndrum.

Car Parks

The need for car parking in main and other destinations in the National Park is high as seasonally the provision can locally be at or over capacity. In the villages, visitor pressure can adversely impact on community requirements. In rural situations informal car parking or overflow parking from lay-bys on to verges and elsewhere can damage the local environment and be hazardous to road use. Some car parks have been well set in the local surroundings, are of a small scale, or subdivided, with use of landform, traditional walling, and planting. Others are less well integrated into the landscape, comprising large expanses of tarmac, with suburban edging, boundary treatments, and planting. The quality and volume of car parking has been improved significantly by the National Park Authority in attempt to minimise adverse impacts.

Informal roadside picnics and camping

The National Park's loch shores are popular, accessed from main and minor roads. This has made them vulnerable to activities such as informal picnics and roadside camping. These can exacerbate countryside management issues, with fires, human waste and litter in key locations. Bylaws were introduced in 2017 to restrict camping and fire-lighting at some loch shores in the Park between March and September to help protect sensitive locations. Camping management zones covering 4% of the Park area have also been established, as well as the introduction of camping permits and low-cost campsites.

Signage

Various types of signage - for roads, other route information and directional signage for cycle ways, entry points to the National Park and villages, and individual businesses - create a high level of visual information, focused around communication routes and settlements. Whilst serving an essential purpose, the level and quality of signage can lead to suburbanising of rural locations. Electronic information road signs are a recent feature on the A82. These can be large-scale and prominent in rural situations.

Interpretation

Interpretation tends to rely on signage systems for display and delivery. In the National Park these are focused around footpaths, car parks, visitor centres, and natural and cultural heritage sites.

Countryside furniture and public art

Countryside furniture and public art have also become features in the landscape, such as at the Gateway Centre and at Callander along National Cycle Route (NCR) 7.

Outdoor Access

There is a range of both formal and less formal opportunities to access the National Park landscapes, along paths, tracks, and over open ground. Public awareness of these routes is increasing as a result of signs, leaflets and other publications. Away from popular destinations and mountains, it is easily possible to find quiet access opportunities, in unspoilt locations, with encounters which offer opportunities of wildlife.

Long-distance routes, such as the West Highland Way and John Muir Way, and various cycle ways are a feature of the National Park. These use existing paths and disused railways, with new sections of routes constructed to link them. These routes have been of great benefit in opening up the landscapes to the public, traversing a range of landscape character types and supporting diverse experiences. Typically, routes cross the Highland Boundary Fault and take in lowland and highland areas, with loch shore, woodland, forest, upland glen passes, and mountain experiences. Some of the iconic National Park views, such as from Conic Hill, are accessed along these routes, as well as views of landmark features, and a range of typical visual and scenic qualities. These routes come under intensive use and require a high level of specification and maintenance.



Walkers on the West Highland Way long distance footpath at Conic Hill near Balmaha, Loch Lomond National Park. ©Lorne Gill/NatureScot

The Core Path Plan has been developed to meet the needs of local communities and visitors across the National Park area. The routes, which represent the most important paths within the wider path network, have been established through extensive community consultation. These will enhance the existing local resource and contribute to access available to visitors. The Core Path Plan is periodically reviewed.

The Forestry & Land Scotland estates and other private forest owners and farmers provide a range of woodland and forest access for path users. Forestry & Land Scotland is a public agency and the largest provider of access and recreational opportunities. Private landowners have provided opportunities mainly via the Scottish Rural Development Programme as measures in Rural Development Contracts.

The Park has an abundance of hill tops and mountains, the highest of which is Ben More at 1174 metres. There are 21 Munros (over 3000 feet, or 914 metres), including Ben Lomond, Ben Vorlich, Ben Ime, Ben Narnain and Ben Venue, as well as 19 Corbetts (2500 – 3000 feet, 762 – 914 metres) which include Ben Ledi and The Cobbler. Paths to Munros, Corbetts, tops and other popular summits can be subject to intense pressures, become eroded and scar the landscape. Upland footpath construction techniques are now well established and a number of key routes in the National Park are managed to this specification. Careful management measures, such as the positioning of car parks and raising of awareness of alternative routes, can also help.

Visitor Centres and Tourist Facilities

Visitor centres were inherited from Loch Lomond Regional Park and further developed as part of the National Park Authority's 'Early Actions' programme. These are associated with other facilities such as car parking, seating and interpretation. The National Park Gateway visitor centre has an arts trail in an area of woodland. Balmaha visitor centre has an innovative play area. The architecture of the visitor centres varies, but is contemporary, reflecting traditional forms and using materials in well-crafted ways.

Other commercial tourist facilities in the National Park mainly focus around retail: selling fuel, food, tourist information, outdoor gear, books and souvenirs. They tend to favour strategic locations such as key junctions and 'gateways', as high visibility is a fundamental objective from the developer's perspective. The required associated road upgrades to facilitate access can have a significant adverse impact on landscape character.

Golf Courses

The National Park contains a variety of golf courses including: smaller-scale community facilities at Aberfoyle, Blairmore, Callander, Killin, Strathendrick, and St Fillans; smaller-scale private facilities, either membership or associated with leisure complexes at Cameron House, Buchanan Castle, Ross Priory and Drimsynie; and large-scale championship courses such as the Loch Lomond Golf Course at Rosdhu (Weiskopf Course), or the new Carrick Golf Course at Midross, which is part of a large-scale leisure complex.

Generally, the smaller-scale facilities have located in attractive positions and worked with the opportunities presented by the existing landscape character. The championship facilities have greater demands in terms of golfing specification and corporate style and, with associated leisure and accommodation development, can impose significant modifications on existing landscape character.

There is a concentration of golf course development around the south-west of Loch Lomond, including championship courses. Along with other leisure complexes, the cumulative impact of golf course development in this area has eroded the more traditional lowland farm and estate landscape character distinctive to the area. The golf courses and associated features of artificial landforms, manicured grasslands, bunkers, access paths, and buildings, create a golf course landscape. Loch shore woodlands and natural loch shore fringe features are compromised where holes cross the water edge, and where artificial retention is introduced along natural shorelines.

Marinas, Hotels, Leisure Complexes, Caravan Parks and Chalet Developments

Marinas, hotels, leisure clubs, chalet development and caravan parks have been attracted to loch and sea loch shore locations throughout the National Park. Caravan parks and chalet sites originally often occupied small pockets of land, such as loch shore deltas, or meadows, where the available space was limited and clearly contained. However, demand for tourist accommodation and more sophisticated facilities has led to larger scale developments including hotels and leisure complexes. These often extend around lochs and sea lochs, over glen and strath floors, and along lower glen sides. Here, sites are more visually exposed and development can require engineering works or under-build to stabilise what are often sensitive and dynamic environments, not well suited to built development. Designed landscapes have also attracted such development. The wish for views out of sites tends to lead to the removal of trees and loch shore woodlands. There is commercial pressure to import 'off the shelf' designs for chalets.



Balmaha, Loch Lomond. ©Lorne Gill/NatureScot

Ministry of Defence Development

Ministry of Defence development has been significant in the past and is evident at the National Park boundaries at the head of Glen Fruin and Glen Douglas. Development around the Cowal sea lochs is for the most part outwith the National Park boundaries. However, built structures, artificial landforms, security boundaries and operations are highly visible from Cowal peninsulas. A military road extends from west Loch Lomond up Glen Fruin.

4. CULTURAL INFLUENCES AND PERCEPTION

Loch Katrine and the surrounding Trossachs have attracted and inspired writers, artists and musicians for hundreds of years, enticing visitors to explore and marvel at the wild landscapes and rugged hilltops that were once, before the end of the 18th Century, secret and foreign. First put on the map by Sir Walter Scott's "Lady of the Lake" in 1810, the area's popularity has grown and it remains one of the most loved and most explored areas of Scotland today. "The Great Trossachs Art and Literature Trail" has been established to celebrate the many artistic connections.

In 1691 the Reverend Robert Kirk, a minister in Aberfoyle published his famous book *The Secret Commonwealth of Elves and Fairies*. It was subtitled 'an essay of the nature and actions of the subterranean invisible people....going under the names Elves, Fauns and Fairies'. Not long after that he mysteriously disappeared. In spite of his religion, like most people in the 17th Century he believed in witchcraft, spirits and pagan rituals. In fact he was so obsessed by the study of fairies (known as Urisks) that he described their appearance, ways, habits and secrets in his book. Local people believed that by revealing their closely guarded secrets, he annoyed the spirit people and they killed him. The 'murder' took place on Aberfoyle's Doon Hill, which is a strange, knoll-like mound. The Reverend's body was found there on 14 May 1692, dressed only in a nightgown. The event is now known as the Doon Hill Mystery.

In 1803 three great English writers - William Wordsworth, his sister Dorothy and fellow poet Samuel Coleridge – explored the Trossachs. They were captivated by the area's landscape and aura of romance. Their subsequent writings inspired countless visitors to follow in their footsteps.

One of their 'footstep-followers' was Sir Walter Scott – he had met the Wordsworths in the Scottish Borders after their Trossachs visit. He visited the Trossachs several times and then set his bestselling *Lady of the Lake* in and around Loch Katrine. Published in 1810, the epic poem brought the history and majesty of the Trossachs into readers' homes. 25,000 copies were sold in six months – huge numbers at that time. Within ten years it had been translated into 20 languages, theatre plays, musicals and operas. Scott's highly dramatic prose brought to life the beauty of the Trossachs. It arguably changed forever how people looked at and enjoyed landscape.

The floodgates opened. More and more visitors came. Professional and amateur artists gathered with sketch books along the edge of the loch and even Queen Victoria joined the *Lady of the Lake* 'fan club'. In 1817 Scott went on to publish his adventure-novel *Rob Roy*. It romanticized the bandit-hero and further reinforced the appeal of the Trossachs. Other literary tourists who followed included such famous names as Thomas Carlyle, Hans Christian Anderson, Gerard Manley Hopkins, Alexander Smith and Jules Verne, whose book, *The Underground City*, is set beneath Loch Katrine.

In the summer of 1853, the Trossachs attracted the writer, naturalist and philosopher John Ruskin. He was accompanied by his wife, and the artist John Millais. Millais painted his famous portrait of Ruskin at Brig O'Turk. More painters came. Horatio McCulloch created one of Scotland's best known landscape paintings here: Loch Katrine. Its dramatic style reinforced the romantic imagery of the Trossachs. Other visiting great painters included Turner, Nasmyth,

Knox and Bough. William Fox Talbot (known as the inventor of photography) also published a hugely popular, pioneering book of photographs that were taken here.

The 'Romantic' Movement

Sir Walter Scott and other writers and artists of the Victorian era, such as John Ruskin, travelled to the Loch Lomond area and in particular the Trossachs. Inspired by the scenery of these areas and folklore such as surrounds the Fairy Knoll at Aberfoyle, their work popularised these landscapes. Scott's poetic and descriptive writings, such as 'The Lady of the Lake' and the novels Rob Roy and The Legend of Montrose, were set in the area. They were significant in the establishment of the Romantic Movement and Victorian tourism, as well as creating local identity, such as The Poker Tree in Aberfoyle. The Romantic Movement was the origin of and basis for Scottish tourism today and was also fundamental in the development of an aesthetic appreciation of landscapes, typical of and distinctive to the UK. The contribution of trees and woodlands to the iconic scenery was critical and the Victorian heritage in the National Park included native and exotic tree plantings. These perpetuated this picturesque image and were an expression of wealth and status associated with the Empire and with the industry of the age. The popularity of such scenery has persisted and National Park icons such as the Duke's Pass and Queen Victoria's route to Stronachlachar remain key tourist destinations. Whilst many of the Victorian plantings remain, they require positive and long-term management to maintain the critical link between the National Park's forests and woodlands and the scenery.

Musical connections

The Loch Lomond and the Trossachs area has also been an inspiration for composers and musicians. A young Schubert wrote one of his best known pieces, *Ave Maria*, to the words of Lady of the Lake, and Rossini's opera *La Donna del Lago* was similarly based on the Rob Roy and Lady of the Lake stories.

The well-known traditional song "The Bonnie Banks of Loch Lomond", whose composer is unknown, was first published in 1841 in "Vocal Melodies of Scotland". It has been performed and recorded by many musicians over the years including Bill Haley and the Comets, the rock band AC/DC, jazz singer Maxine Sullivan, the Mudmen and Runrig. There are many theories about the meaning of the song, most of which are connected to the Jacobite Uprising of 1745. One interpretation based on the lyrics is that the song is sung by the lover of a captured Jacobite rebel set to be executed in London following a show trial. The heads of the executed rebels were then set upon pikes and exhibited in all of the towns between London and Edinburgh in a procession along the "high road" (the most important road), while the relatives of the rebels walked back along the "low road" (the ordinary road travelled by peasants and commoners). Another interpretation of the "Low Road" is that it refers to the traditional underground route taken by the "fairies" or "little people" who were reputed to transport the soul of a dead Scot who died in a foreign land—in this case, England—back to his homeland to rest in peace.