

= Fauna of Scotland =

The fauna of Scotland is generally typical of the northwest European part of the Palearctic ecozone , although several of the country 's larger mammals were hunted to extinction in historic times and human activity has also led to various species of wildlife being introduced . Scotland 's diverse temperate environments support 62 species of wild mammals , including a population of wild cats , important numbers of grey and harbour seals and the most northerly colony of bottlenose dolphins in the world .

Many populations of moorland birds , including the black and red grouse live here , and the country has internationally significant nesting grounds for seabirds such as the northern gannet . The golden eagle has become a national icon , and white @-@ tailed eagles and ospreys have recently re @-@ colonised the land . The Scottish crossbill is the only endemic vertebrate species in the UK .

Scotland 's seas are among the most biologically productive in the world ; it is estimated that the total number of Scottish marine species exceeds 40 @,@ 000 . The Darwin Mounds are an important area of deep sea cold water coral reefs discovered in 1998 . Inland , nearly 400 genetically distinct populations of Atlantic salmon live in Scottish rivers . Of the 42 species of fish found in the country 's fresh waters , half have arrived by natural colonisation and half by human introduction .

Only six amphibians and four land reptiles are native to Scotland , but many species of invertebrates live there that are otherwise rare in the United Kingdom (UK) . An estimated 14 @,@ 000 species of insect , including rare bees and butterflies protected by conservation action plans , inhabit Scotland . Conservation agencies in the UK are concerned that climate change , especially its potential effects on mountain plateaus and marine life , threaten much of the fauna of Scotland .

= = Habitats = =

Scotland enjoys a diversity of temperate environments , incorporating deciduous and coniferous woodlands , and moorland , montane , estuarine , freshwater , oceanic , and tundra landscapes . About 14 % of Scotland is wooded , much of it in forestry plantations , but before humans cleared the land it supported much larger boreal Caledonian and broad @-@ leaved forests . Although much reduced , significant remnants of the native Scots pine woodlands can be found . Seventeen per cent of Scotland is covered by heather moorland and peatland . Caithness and Sutherland have one of the world 's largest and most intact areas of blanket bog , which supports a distinctive wildlife community . Seventy @-@ five per cent of Scotland 's land is classed as agricultural (including some moorland) while urban areas account for around 3 % . The coastline is 11 @,@ 803 kilometres (7 @,@ 334 mi) long , and the number of islands with terrestrial vegetation is nearly 800 , about 600 of them lying off the west coast . Scotland has more than 90 % of the volume and 70 % of the total surface area of fresh water in the United Kingdom . There are more than 30 @,@ 000 freshwater lochs and 6 @,@ 600 river systems .

Under the auspices of the European Union 's Habitats Directive , as of December 2007 a total of 239 sites in Scotland covering more than 8 @,@ 750 square kilometres (3 @,@ 380 sq mi) had been accepted by European Commission as Special Areas of Conservation (SAC) . Scotland 's seas are among the most biologically productive in the world and contain 40 @,@ 000 or more species . Twenty @-@ four of the SACs are marine sites , and a further nine are coastal with marine and non @-@ marine elements . These marine elements extend to an area of around 350 square kilometres (140 sq mi) . The Darwin Mounds , covering about 100 square kilometres (39 sq mi) , are being considered as the first offshore SAC .

= = Mammals = =

Scotland was entirely covered in ice during the Pleistocene glaciations . As the post @-@ glacial weather warmed and the ice retreated , mammals migrated through the landscape . However , the opening of the English Channel (as sea levels rose) prevented further migrations , so mainland

Britain has only two @-@ thirds of the species that reached Scandinavia . The Hebridean islands off Scotland 's west coast have only half those of Britain . Sixty @-@ two species of mammal live wild in and around Scotland including 13 species found in coastal waters . The populations of a third of the land mammal species are thought to be in decline due to factors including environmental pollution , habitat fragmentation , changes in agricultural practices , particularly overgrazing , and competition from introduced species . No mammal species are unique to Scotland , although the St. Kilda field mouse , *Apodemus sylvaticus hirtensi* , is an endemic subspecies of the wood mouse that reaches twice the size of its mainland cousins , and the Orkney vole or cuttack , *Microtus arvalis orcadensis* found only in the Orkney archipelago , is a sub @-@ species of the common vole . It may have been introduced by early settlers about 4 @,@ 000 years ago . There are various notable domesticated Scottish mammal breeds including Highland Cattle , the Shetland Pony , Soay Sheep and Scottish Terrier .

= = = Carnivores = = =

The representation of the weasel family (*Mustelidae*) in Scotland is typical of Britain as a whole save that the polecat is absent and that Scotland is the UK 's stronghold of the pine marten , although the purity of the latter breed is threatened by a release of American martens in northern England . Scotland hosts the only populations of European wildcat (sub @-@ species *Felis sylvestris grampia*) in the British Isles with numbers estimated at between 400 and 2 @,@ 000 animals , and of the red fox sub @-@ species *Vulpes vulpes vulpes* , a larger race than the more common *V. v. crucigera* and which has two distinct forms . The wild cat is at risk due to the inadequacy of protective legislation and is now considered at serious risk of extinction . In 2013 it was announced that the island of Càrna is to provide a sanctuary and breeding station in order to protect the species . Exterminations of the population of feral American mink , which were brought to Britain for fur farms in the 1950s , have been undertaken under the auspices of the Hebridean Mink Project and the Scottish Mink Initiative , which hopes to create a mink @-@ free zone in a large area stretching from Wester Ross to Tayside .

Other than occasional vagrants , among the seals only the *Phocidae* , or earless seals , are represented . Two species , the grey seal and harbour or common seal , are present around the coast of Scotland in internationally important numbers . In 2002 the Scottish grey seal population was estimated at 120 @,@ 600 adult animals , which is around 36 % of the world population and more than 90 % of the UK 's . The Scottish population of the common seal is 29 @,@ 700 , about 90 % of the UK and 36 % of the European total .

= = = Rodents , insectivores and lagomorphs = = =

Seventy @-@ five per cent of the UK 's red squirrels are found in Scotland . This species faces threats that include competition from the introduced grey squirrel , and the ' Scottish Strategy for Red Squirrel Conservation ' provides a framework for supporting its long @-@ term conservation . Research in 2007 credited the growing population of pine martens with assisting this programme by preying selectively on the grey squirrels . Scotland has no population of the edible or hazel dormouse , or of the yellow @-@ necked mouse , and the harvest mouse 's range is limited to the southern part of the country . The St Kilda mouse and Orkney vole (see above) are endemic , but otherwise population distributions are similar to the rest of mainland Britain . Colonies of black rats remain only on the island of Inchcolm in the Firth of Forth and on the Shiant Isles .

Mainland insectivore populations are generally similar to the rest of Britain . Recent steps by Scottish Natural Heritage , the Scottish Executive and the Royal Society for the Protection of Birds to remove European hedgehogs from the Outer Hebrides , where their introduction has caused declines in internationally important breeding populations of wading seabird such as dunlin , ringed plover and redshank , has caused considerable controversy , and hedgehog culls were halted in 2007 . The trapped animals are now relocated to the mainland . The programme has reduced this population ; only two individuals were caught in 2007 .

Of the lagomorphs only hares and rabbits are represented in Scotland . The mountain hare is the only native member of the hare family and is the dominant species throughout most of upland Scotland . The European hare and European rabbit are both present , the latter having been brought to Britain by the Romans but not becoming widespread in Scotland until the 19th century .

= = = Artiodactyls = = =

Landseer 's painting of a red deer stag , Monarch of the Glen , is one of the most notable images of Victorian Scotland . The species , a member of the biological order artiodactyla or " even @-@ toed ungulates " , is still 400 @,@ 000 strong , although its existence in the pure form is threatened by hybridisation with introduced sika deer . Very much a hill @-@ dwelling species in Scotland (and so typically smaller in stature than its European forest @-@ loving cousins) , it is generally replaced by roe deer in lower @-@ lying land . Although found elsewhere in the UK , no wild populations of Chinese water deer and no or very few Chinese muntjac exist in Scotland . It has isolated populations of feral goats *Capra hircus* and feral sheep (*Ovis aries*) , such as the herd of 1 @,@ 000 Soay sheep on St Kilda . Since 1952 a herd of semi @-@ domesticated reindeer have lived in the Cairngorm National Park , the species having become extinct in Scotland after it was recorded as having been hunted in Orkney in the 12th century .

= = = Other mammals = = =

Only nine of the sixteen or seventeen bat species found elsewhere in Britain are present in Scotland . Widespread species are common and soprano pipistrelles , the brown long @-@ eared bat , Daubenton 's bat and Natterer 's bat . Those with a more restricted distribution are the whiskered bat , noctule , Leisler 's bat and Nathusius 's pipistrelle . Absences include the greater and lesser horseshoe bat , the greater mouse @-@ eared bat and Bechstein 's bat . No bats reside on the Shetland Islands ; the only records there are of migrants or vagrants .

Twenty @-@ one species of cetacean have been recorded in Scottish waters within the last 100 years including Cuvier 's beaked whale , killer whales , sperm whales , minke whales and common , white @-@ beaked and Risso 's dolphins . The Moray Firth colony of about 100 bottlenose dolphins is the most northerly in the world . As recent dramatic television coverage indicated , this species preys on harbour porpoises ; a third of the porpoise carcasses examined by pathologists from 1992 to 2002 indicated that death resulted from dolphin attacks . However , conservationists expressed dismay that the UK government decided to allow oil and gas prospecting in the Moray Firth , putting these populations of cetaceans at risk . In response , the government have placed seismic surveys " on hold " during 2009 pending further research . The introduced marsupial , the red @-@ necked wallaby , is confined to a colony on an island in Loch Lomond .

= = = Extinctions and reintroductions = = =

During the Pleistocene interglacials , arctic animals that are no longer extant occupied Scotland , including the woolly rhinoceros , mammoth , polar bear , lemming , Arctic fox and the giant deer *Megaloceros giganteus* . Other mammals that used to inhabit Scotland but became extinct in the wild during historic times include the Eurasian lynx , which lived in Britain until 1 @,@ 500 years ago , the European brown bear , subspecies *Ursus arctos caledoniensis* , which was taken to entertain the Roman circuses but died out in the 9th or 10th century , and the elk , which lasted until about 1300 . The wild boar and wild ox or urus died out in the subsequent two centuries , although the former 's domesticated cousin , the grice , lasted until 1930 in Shetland . The last known wolf was shot on Mackintosh land in Invernessshire in 1743 , and the walrus is now only an occasional vagrant . St Kilda also possessed an endemic subspecies of the house mouse , *Mus musculus muralis* , which was longer , hairier , coloured differently and had a skull shape at variance to the norm . It became extinct in 1938 , just eight years after the evacuation of the native St Kildans .

Scottish Natural Heritage have re @-@ introduced the European beaver to the wild in Scotland

using Norwegian stock . The species was found in the Highlands until the 15th century , and although the then Scottish Executive initially rejected the idea , a trial commenced in May 2009 in Knapdale . In Tayside , deliberate releases or escapes have led to up to 250 animals colonising the area . The Scottish Government is monitoring the situation and expected to make an announcement about the species ' future in 2016 . After a feasibility study in Glen Affric , wild boar have been re @-@ introduced to a large fenced area of the Dundreggan Estate in Glenmoriston . Various other schemes are under consideration . For example , the owner of the Alladale estate north of Inverness has expressed a desire to reintroduce wolves as part of a wilderness reserve , the first of its kind in Britain .

= = Avifauna = =

The history of mammals suggests three broad overlapping phases : natural colonisation after the ice age , human @-@ caused extinctions , and introduction by humans of non @-@ native species . The greater mobility of birds makes such generalisations hard to substantiate in their case . Modern humans have done great damage to bird species , especially the raptors , but natural variations in populations are complex . For example , northern fulmars were present at Skara Brae during the Neolithic period , but in medieval times their breeding range was restricted to St Kilda . Since then they have spread throughout the British Isles .

Most of about 250 species of bird regularly recorded in Britain venture into Scotland , and perhaps up to 300 more occur with varying degrees of rarity . A total of 247 species have been assessed and each placed onto one of three lists , red , amber or green , indicating the level of concern for their future . Forty species are red @-@ listed , 121 are amber @-@ listed and 86 are green @-@ listed .

The Scottish crossbill , *Loxia scotica* , which inhabits the coniferous forests of the Highlands , is Britain 's only endemic bird and , with only 300 breeding pairs , one of Europe 's most threatened species . Its shape , red / green hue and habit of hanging upside down has led to comparisons with parrots . St Kilda has a unique subspecies of wren , the St Kilda wren *Troglodytes troglodytes hirtensis* , which has adapted to perching on the rocks and cliffs of this treeless Atlantic island , and consequently has developed larger and stronger feet than the mainland variant . It is also slightly larger , has a longer beak , a drabber though more varied colouring , and a " peculiarly sweet and soft " song . The subspecies was recognised in 1884 and was protected by a special Act of Parliament in 1904 to prevent its destruction " at the hands of ornithologists , egg @-@ collectors , taxidermists and tourists " .

= = = Raptors = = =

All but a few pairs of Britain 's approximately 600 golden eagles are found in Scotland as are most of the breeding peregrine falcons . The hobby , marsh harrier and Montagu 's harrier although found in England and Wales are generally absent .

In 1916 an English vicar stole the last native white @-@ tailed sea eagle eggs on Skye , and the last adult was shot on Shetland two years later . However , the species was reintroduced to the island of Rùm in 1975 . The bird spread successfully to various neighbouring islands , and 30 pairs were established by 2006 . Despite fears expressed by local farmers , the Royal Society for the Protection of Birds (RSPB) are in process of releasing up to 100 young eagles on the east coast in the Forth and Tay estuaries . The red kite was exterminated in Scotland in 1879 , and a reintroduction programme was launched by the RSPB in the 1980s . Although the species has made significant advances , it is estimated that 38 % of the 395 birds fledged between 1999 and 2003 were poisoned and a further 9 % shot or otherwise killed by humans . The RSPB stated : " it may take a custodial sentence before people engaged with this activity begin to take the matter seriously " .

After an absence of nearly 40 years the osprey successfully re @-@ colonised Scotland in the early 1950s . In 1899 they had bred at the ruined Loch an Eilean castle near Aviemore and at Loch Arkaig

until 1908 . In 1952 they claimed a new site at Loch Garten . There are now 150 breeding pairs .

Other raptor species found in the UK such as the kestrel , hen harrier , goshawk , sparrowhawk , tawny owl , and barn owl are widely distributed in Scotland , although the little owl is confined to the south . Buzzards have displayed a remarkable resilience , having recovered from human persecution and the myxomatosis epidemic of the 1950s , which reduced their food supply . Numbers more than trebled between 1978 and 1998 . At the other end of the population scale , a single pair of snowy owls bred on Fetlar from 1967 to 1975 .

In 2009 it was reported that the Scottish Government have decided to proceed with a controversial plan to relocate sparrowhawks found near pigeon lofts in Glasgow , Edinburgh , Kilmarnock , Stirling and Dumfries at a cost of £ 25 @, @ 000 .

= = = Seabirds = = =

Scotland 's seas host almost half of the European Union 's breeding seabirds including about half of the world 's northern gannets and a third of the world 's Manx shearwaters . Four seabird species have more than 95 % of their combined British and Irish population in Scotland , while a further fourteen species have more than half of their breeding population in Scottish colonies . St Kilda , which is a World Heritage Site , is a seabird haven of great significance . It has 60 @, @ 000 northern gannets , amounting to 24 % of the world population , 49 @, @ 000 breeding pairs of Leach 's storm petrel , up to 90 % of the European population , 136 @, @ 000 pairs of puffin and 67 @, @ 000 northern fulmar pairs , about 30 % and 13 % of the respective UK totals . The island of Mingulay also has a large seabird population and is an important breeding ground for razorbills , with 9 @, @ 514 pairs , 6 @. @ 3 % of the European population .

Sixty per cent of all breeding bonxies nest in Scotland , mostly in Orkney and Shetland , even though they did not arrive at all until the 18th century . Scotland is the breeding station for about 90 % of the UK 's Arctic terns , the majority of which make use of colonies in Orkney and Shetland . A similar percentage of the UK 's tysties breed on Scottish islands including Unst , Mingulay and Iona . Scotland also hosts 1 @, @ 000 pairs of Arctic skua and 21 @, @ 000 breeding pairs of shag , 40 % of the global population of the species .

In excess of 130 @, @ 000 birds inhabit Fowlsheugh nature reserve in Aberdeenshire at the peak of the breeding season , making it one of the largest seabird colonies in Britain . As of 2005 about 18 @, @ 000 breeding pairs of kittiwakes return to each year , and there are also significant numbers of Atlantic puffin , razorbill , fulmar , herring gull and great black @-@ backed gull . The Bass Rock in the Firth of Forth hosts upwards of 40 @, @ 000 pairs of northern gannets and is the largest single rock gannetry in the world . The bird 's scientific name *Morus bassanus* , derives from the rock .

= = = Game birds , waders and water fowl = = =

Red @-@ listed western capercaillie and ptarmigan breed in Scotland and are absent elsewhere in the British Isles . The former became extinct in Scotland in 1785 but was successfully reintroduced from Swedish stock in 1837 . There are significant populations of other Galliformes including blackcock and the famous red grouse . Common quail , grey partridge and pheasant are well @-@ distributed , although the red @-@ legged partridge is less so . A small colony of the introduced golden pheasant exists in the southwest .

Among the waders , avocet , stone @-@ curlew , little ringed plover and Kentish plover are absent , but most of the 100 or so pairs of dotterel in the UK spend their summers in Scotland as do all of the breeding whimbrel , greenshank and red @-@ necked phalarope , (although the latter two species also breed in Ireland) . In summer the shallow lochs of the machair lands in the Uists and Benbecula provide for a remarkable variety of waders and ducks including shoveler , eider , Slavonian grebe and the ' red @-@ listed ' common scoter . Goldeneye have colonised an area centred around the Cairngorms National Park since the 1970s , and about 100 pairs breed there . The majority of the roughly 8 @, @ 000 whooper swans in the British Isles winter in Scotland and Ireland .

Virtually all of the 40 000 barnacle geese , which breed in Greenland , arrive on Islay for the winter , most staying only for a few days before dispersing to the surrounding area . A similar number of pink footed geese use the Montrose Basin as a temporary roost in October and November . The amber listed black and red throated diver 's freshwater breeding strongholds in the British Isles are in the north and west of Scotland .

== Other non passerines ==

Considerable efforts have been taken to conserve the shy corncrake , and summer numbers of this red listed species have recovered to 670 pairs . The wryneck is also red listed and numbers fewer than 2 to 10 breeding pairs in Scotland . Of the Columbidae the turtle dove is largely absent , but in the British Isles the rock dove is confined to the north and west coasts of Scotland and Ireland .

== Passerines ==

Ravens are typically forest dwelling birds in much of Europe , but in Scotland they are generally associated with mountains and sea coasts . In 2002 the hooded crow was recognised as a separate species from the carrion crow . Scotland and Northern Ireland host all of the approximately 190 000 UK territories of the former . A recent survey suggest that raven numbers are increasing but that hooded crows had declined by 59 % while carrion crow numbers were essentially static . Concentrated on the islands of Islay and Colonsay , 340 pairs of red billed chough nest in Scotland .

In addition to crossbills (see above) , crested tits exist as a fragmented population of 2 400 breeding pairs in remnant patches of Caledonian Forest and in some larger plantations such as the Culbin Forest in Moray . Ring ouzels have declined to around 7 000 pairs , possibly due to disturbance from the growing number of human visitors to their upland habitat . There are fewer than 100 breeding pairs of snow bunting , although in winter they are joined by migrants from continental Europe . A nest site near Dumfries is thought to have been in use by dippers since 1881 . Scotland has 95 % of the British breeding population of red listed twite , about 64 000 pairs . However , a recent RSPB survey found a sudden and dramatic fall in winter numbers from 6 000 in 1998 to only 300 in 2006 in the counties of Caithness and Sutherland .

== Vagrants ==

Scotland 's position on the western seaboard of Europe means that a variety of birds not normally found in the country visit from time to time . These include accidental visits by vagrant birds that have wandered far from their normal habitations .

Fair Isle is an internationally renowned site for the observation of migrant birds . Rarities have included passerines such as the thick billed warbler , white throated sparrow , yellow rumped warbler and collared flycatcher . More than 345 species of bird have been recorded on this island , which measures only 7 68 square kilometres (2 97 sq mi) .

Elsewhere , other rarities reported in 2006 include a white billed diver at Gairloch , a black browed albatross in the Western Isles , a laughing gull in Shetland and a buff breasted sandpiper at Lossiemouth . Accidentals recorded in earlier years include an American bittern in 1888 and a purple heron in the same year , a Baikal teal in 1958 , and a black stork in 1977 . Birds are also presumed to have escaped from captivity , such as a lanner falcon in 1976 , Chilean flamingos in 1976 and 1979 , a black necked swan in 1988 , and a red tailed hawk in 1989 . These records are but a small selection from two counties in the north east and give only a flavour of the complexity and diversity of avian life in Scotland .

== Extinctions ==

The common crane and great bittern were exterminated by hunters and the draining of marshes in the 18th century . The last great auk seen in Britain was killed on Stac an Armin , a rocky pinnacle in the St Kilda archipelago in July 1840 .

= = Fish life in the sea = =

Of the 42 species of fish found in Scottish fresh waters , only half have arrived by natural colonisation . Native species include allis shad , brown trout , European eel and river lamprey . Scottish rivers support one of the largest Atlantic salmon resources in Europe , with nearly 400 rivers supporting genetically distinct populations . Five fish species are considered ' late arrivals ' to Scotland , having colonised by natural means prior to 1790 . They are the northern pike , roach , stone loach , European perch , and minnow . Rarer native species include the endemic *Salvelinus killinensis* and the powan , the latter found in only two locations and under threat from introduced ruffe and the Arctic charr . The latter may have been the first fish species to re @-@ enter fresh waters when the last ice age ended , and about 200 populations exist .

The freshwater pearl mussel was once abundant enough to support commercial activities , and Scotland is the remaining European stronghold with about half the global number present . There are populations in more than 50 rivers , mainly in the Highlands , although illegal harvesting has seriously affected their survival .

Scotland 's seas , which constitute an area greater than that of the seas around the rest of the UK , are among the most biologically productive in the world . They are home to a third of the world 's whale and dolphin species , most of the UK 's maerl , (a collective term for several species of calcified red seaweed , and an important marine habitat) , Horsemussel (*Modiolus modiolus*) and seagrass beds , and distinctive species like the tall sea pen , *Funiculina quadrangularis* . It is estimated that the total number of Scottish marine species exceeds 40 @,@ 000 . This includes 250 species of fish , the most numerous inshore variety being saithe , and deeper water creatures such as the dogfish , porbeagle and blue shark , European eel , sea bass , Atlantic halibut and various rays . There are four species of sea turtle , the leatherback , loggerhead , Kemp 's ridley and green turtle . Scottish waters contain around 2 @,@ 500 crustacean species and 700 molluscs and in 2012 a bed of 100 million flame shells was found during a survey of Loch Alsh .

The Darwin Mounds , an important area of cold water coral reefs discovered in 1988 , are about 1 @,@ 000 metres (3 @,@ 300 ft) deep in the Atlantic Ocean , about 185 kilometres (115 mi) north @-@ west of Cape Wrath in the north @-@ east corner of the Rockall trough . The area covers approximately 100 square kilometres (39 sq mi) and contains hundreds of mounds of about 100 metres (330 ft) in diameter and 5 metres (16 ft) in height , many having a teardrop shaped ' tail ' orientated south @-@ west of the mound . This feature may be unique globally . The tops of the mounds have living stands of *Lophelia* corals and support significant populations of the single @-@ celled *Syringammina fragilissima* . Fish have been observed in the vicinity but not at higher densities than the background environment . Damage from trawler fishing was visible over about a half of the eastern Darwin Mounds surveyed during summer 2000 , and the UK government is taking steps to protect the area . In 2003 the European Commission provided emergency protection and banned damaging fishing activity in the locality .

Further action on a much wider scale may be required . According to a recent report " Scotland 's marine life could be almost wiped out within 50 years unless tough action is taken to manage the way humans use the seas " . Fears were expressed by a consortium of environmental organisations that commercial fish stocks , including Atlantic cod are suffering from over @-@ fishing , that fish farming , especially for salmon is damaging the aquatic environment , a reduction in coastal marsh habitats is affecting marine bird life , litter in densely populated estuaries such as the Firth of Clyde is affecting all forms of marine life and that the growth in off @-@ shore tourism was deleterious to populations of , for example , basking shark . A call was made for a ' Scottish Marine Bill ' to co @-@ ordinate and manage human activity at sea and to provide more protected areas such as marine national parks . The Marine (Scotland) Act 2010 was subsequently passed by the Scottish Parliament .

Calyptraea chinensis (L.) is a gastropod that has invaded the shores of Scotland and by 1998 had reached nearly as far north as Oban . One living specimen was found at Clachan Sound , and earlier records showed findings of gastropod shells .

= = = Riverine extinctions = = =

Pollution and predation led to the extinction of both species of vendace from its very restricted range in south @-@ western Scottish freshwaters in 1980 . In the 1990s a successful attempt to reintroduce *Coregonus vandesius* to the Lochmaben area began . *Coregonus albula* remains absent .

Salvelinus inframundus , a rare char species that could be vulnerable to extinct , has been found in Loch Mealt , Isle of Skye , Scottish Highlands .

= = Amphibians and land reptiles = =

Only six amphibians and four land reptiles are native to Scotland . The amphibians include three species of newt : the great crested , of which fewer than 1 @,@ 000 individuals survive ; the smooth , and the palmate . The other amphibians are the common toad , the natterjack toad , found in only four locations in the south @-@ west , and the common frog . A single alien amphibian is known in Scotland , the Alpine newt , a recent escapee confined to the Edinburgh area .

The reptiles include the adder and the grass snake , the slow @-@ worm , which is a legless lizard , and the common lizard . Smooth snakes , found elsewhere in the UK are absent , and grass snakes are rarely reported .

= = Terrestrial invertebrates = =

Seventy @-@ seven species of land snail and an estimated 14 @,@ 000 species of insect live in Scotland , none of them " truly " endemic . These include *Pardosa lugubris* , a species of wolf spider first found in the UK in 2000 at Abernethy Forest nature reserve , and the Scottish wood ant . These ants , which are the most numerous residents of the Caledonian pine forest , build mounds from the pine cones and needles they find on the forest floor and may inhabit the mounds for decades . A single colony may collect 100 @,@ 000 insects a day to feed its half million citizens and produce up to 250 kilograms (550 lb) of honeydew per season .

In addition to the Scottish wood ant , several Scottish species of invertebrate exist that are otherwise rare in the UK and important enough to have a specific " Action Plan " to provide protection . These are five species of ant and bee , six moths and butterfly , five flies and a single beetle (the reed beetle) and snail (the round @-@ mouthed whorl snail , *Vertigo genesii*) . Northern colletes is a rare species of bee , the most significant British habitat for which is in the Outer Hebrides , where there are more than ten colonies . Scotland is also the UK stronghold of the Blaeberry bumblebee , and the Bumblebee Conservation Trust recently created the world 's first sanctuary for this genus of insects at RSPB Vane Farm Nature Reserve near Loch Leven . The bumblebee *Bombus jonellus* var. *hebridensis* is endemic to the Hebrides . In 2010 , a colony of the beetle *Meloe brevicollis* was found on the island of Coll . The species is otherwise extinct in Scotland and is also flightless , raising the question of how the colony arrived on the island . The northern February red stonefly (*Brachyptera putata*) has recently lost its range elsewhere in Britain and is now it considered to be a Scottish endemic .

Although many species of butterfly are in decline in the UK , recent research suggests that some , such as the pearl @-@ bordered fritillary , marsh fritillary and chequered skipper , which are becoming rare in the rest of the UK , are moving north into Scotland in response to climate change . In June 2008 an adult *Ethmia pyrausta* moth was discovered in Easter Ross . This find was only the fifth sighting since its discovery in the UK at Loch Shin in 1853 , and the species has gained " almost mythical status " according to Butterfly Conservation Scotland .

The most well @-@ known invertebrate may be a species of midge (*Culicoides impunctatus*) , a

tiny flying gnat that is the scourge of summer visitors and residents alike . Its predations result in the loss of up to 20 % of summer working days in the forestry industry . Others of significance include the pine weevil , black pine beetle , clytra beetle , and the timberman , a long @-@ horned beetle . The archaeological site at Skara Brae provided the earliest known record of the human flea , *Pulex irritans* in Europe .

The islands of Colonsay and Oronsay are home to about 50 colonies of the only native species of honeybee in Britain ? *Apis mellifera mellifera* . The Scottish Government introduced the Bee Keeping (Colonsay and Oronsay) Order 2013 to protect the species from cross @-@ breeding and disease as the species has suffered serious declines on the mainland .

= = Cryptozoology = =

A variety of exotic cats are rumoured to exist , including the ' Beast of Buchan ' . The ' Kellas Cat ' of Moray is a jet black , long @-@ legged animal , and is probably the result of a modern wild cat / domestic cat hybrid , or a melanistic wild cat . In earlier times it may have spawned the legend of the Cat Sidhe or " Fairy Cat " . The fabulous Loch Ness Monster , possibly a form of " water horse " , has a long history ; the first recorded sighting allegedly took place in 565 AD . More recently , the Stronsay Beast was an unidentified cryptid washed ashore in the Orkney islands in the 19th century .

= = Nature conservation in Scotland = =

= = Challenges = =

Conservation of the natural environment is well @-@ developed in the United Kingdom . The resources of the organisations concerned may be insufficient to the challenge , but the contrast with earlier attitudes about the environment is striking . In Victorian times few animals became extinct in Scotland , but the scale of the slaughter on hunting estates was staggering . Richard Perry records that on a single estate in the Cairngorms between 1837 and 1840 the following " vermin " were exterminated by keepers purely in the interests of preserving the grouse population :

246 Martens , 198 Wild Cats , 106 Polecats , 67 Badgers , 58 Otters , 475 Ravens , 462 Kestrels , 371 Rough @-@ legged Buzzards , 285 Common Buzzards , 275 Kites , 98 Peregrine Falcons , 92 Hen Harriers , 78 Merlins , 71 Short @-@ eared Owls , 63 Goshawks , 35 Long @-@ eared Owls , 27 Sea Eagles , 18 Ospreys , 15 Golden Eagles , 11 Hobbys , 6 Gyrfalcons , 5 Marsh Harriers , 3 Honey Buzzards ,

and for reasons apparently unconnected to grouse shooting , a further

11 Foxes , 301 Stoats and Weasels , 78 House Cats , 1 @,@ 431 Hooded or Carrion Crow , 3 Barn Owls , 8 Magpies and 7 " Orange @-@ legged Falcons " .

Writing in 1947 , Perry stated that his " first reaction to this dreadful black @-@ list was that of amazed incredulity . I still find the details incredible . However , they were supplied by the lessee himself . " In several instances these extermination totals are larger than the current resident numbers for the entire country .

It remains to be seen if the destruction wrought by the Victorians continues to be the nadir for the fauna of Scotland . In addition to other difficulties the marine environment faces , climate change is a challenge facing all of Scotland 's habitats . Among the birds , ptarmigan , dotterel and snow bunting in particular may be affected as they depend on high @-@ altitude habitats , and populations are likely to decline if warmer weather brings competitors into their restricted ranges . Mammals and other vertebrates may fare better , although localised invertebrate populations are at risk . Marine life is already being affected . Planktonic species that prefer cold water are declining and are not able support the crucial food chains on which many seabirds depend . Further evidence of problems for marine species has been provided by the St Andrews University Sea Mammal Research Unit . An analysis suggests that common seal populations in Orkney and Shetland fell by

40 % from 2001 to 2006 , prompting the then Scottish Executive to announce the likelihood of a new protective conservation order .

The complexities involved in conserving Scottish wildlife are highlighted in an RSPB report , noting that pine martens have been found to be a significant predator of capercaillie nests . Both species are protected , providing conservation agencies with a challenging conundrum to address . In 2012 the Scottish Government published a " Code of Practice on Non @-@ Native Species " to help people understand their responsibilities and provide guidance as to which public body has responsibility for the various habitats involved .

= = = Conservation organisations = = =

Various public sector organisations have an important role in the stewardship of the country 's fauna . Scottish Natural Heritage is the statutory body responsible for natural heritage management in Scotland . One of its duties is to establish National Nature Reserves (NNR) s . Until 2004 there were 73 , but a review carried out in that year resulted in a significant number of sites losing their NNR status , and as of 2006 there are 55 . The Forestry Commission in Scotland serves as the forestry department of the Scottish Government and is one of the country 's largest landowners . The Joint Nature Conservation Committee is the statutory adviser to Government on UK and international nature conservation .

The country has two national parks . Cairngorms National Park includes the largest area of arctic mountain landscape in the UK . Sites designated as of importance to natural heritage take up 39 % of the land area , two thirds of which are of Europe @-@ wide importance . Loch Lomond and the Trossachs National Park includes Britain 's largest body of fresh water , the mountains of Breadalbane and the sea lochs of Argyll .

Charitable and voluntary organisations also have important roles to play . The National Trust for Scotland is the conservation charity that protects and promotes Scotland 's natural and cultural heritage . With more than 270 @,@ 000 members it is the largest conservation charity in Scotland . The Scottish Wildlife Trust is a leading voluntary conservation organisation , working to protect Scotland 's natural environment . The Royal Zoological Society of Scotland is a learned society and registered charity that maintains Edinburgh Zoo and the Highland Wildlife Park (a safari park and zoo near Kingussie , which specialises in native fauna) . The Society is also involved in various conservation programs around Scotland and the world . The Royal Society for the Protection of Birds promotes conservation of birds and other wildlife through the protection and re @-@ creation of habitats . The John Muir Trust is a charity whose main role is as a guardian of wild land and wildlife , through the ownership of land and the promotion of education and conservation . The trust owns and manages estates in locations including Knoydart and Assynt , and on the isle of Skye . It has links with the Sierra Club in the United States , which also celebrates the legacy of Dunbar @-@ born John Muir . Trees for Life is a charity that aims to restore a " wild forest " in the Northwest Highlands and Grampian Mountains .