

GLEN ETIVE AND GLEN FYNE

The Scientific Case



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GLEN ETIVE AND GLEN FYNE

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SUMMARY

The current UK Special Protection Area (SPA) suite for golden eagles, which has been criticised for failing to adequately represent species numbers and distribution in the UK, comprises eight sites. On the 7th March 2005 the then Deputy Minister for Environment and Rural Development, Lewis Macdonald, requested that "...SNH identify additional areas for the protection of golden eagle habitat to complement the general protection the species receives under legislation wherever it is found in Scotland". To adequately represent the ecological requirements of golden eagles any such area would be extensive, encompassing a wide variety of upland habitats, interests and management regimes, suitably located to better represent the species range in its UK stronghold of Scotland. Glen Etive and Glen Fyne is one such area.

Glen Etive and Glen Fyne consists of two large separate upland areas located in the south west Highlands. The predominant habitats are dwarf shrub heath and upland grassland, with rocky slopes and outcrops and significant areas of commercial forestry and native woodland in the glens.

The nature of upland habitats and the complex species management required by the golden eagles associated with them are such that conservation benefits are best secured for this area from targeted positive management rather than the guardianship of the Site of Special Scientific Interest (SSSI) system. If government were minded to consider the classification of the area as a Special Protection Area (SPA) it is suggested therefore, as with other recently classified SPA for golden eagle, that proposals for management would primarily be through Rural Priorities options within the Scotland Rural Development Programme (SRDP).

Golden eagles tend to be traditional in their use of range such that, without external influences, populations tend to be largely stable and fluctuate over time between narrow limits. Glen Etive and Glen Fyne is of special nature conservation importance within Britain and the EU for regularly supporting a population of European importance of the Annex 1 species golden eagle (*Aquila chrysaetos*). The area holds good numbers of golden eagle at high density and with moderate productivity. The site supports 19 pairs of golden eagle, slightly greater than 4.2% of the GB population, thereby meeting Stage 1 of the UK SPA guidelines for Annex 1 species. The area also meets five of the seven Stage 2 guidelines.

Glen Etive and Glen Fyne is therefore considered to meet the UK SPA selection guidelines and to be a suitable site for further consideration as an SPA for golden eagle.

QUALIFYING BIRD SPECIES WITHIN GLEN ETIVE AND GLEN FYNE

BREEDING BIRDS

Table 1: Best recent estimates of the populations of qualifying breeding bird species for the Glen Etive and Glen Fyne area, and the proportion of the British and international populations that these represent.

Species	Numbers (breeding pairs)	% of British Total	International comparison Area* %	Status: Annex 1 (A) or migratory (M)
Golden eagle	19	4.2%	EUR 0.24	A

* The relevant areas of comparison are; EUR = Europe

Sources of bird information and population estimates against which counts for Glen Etive and Glen Fyne have been compared are listed in Appendix A. The population estimate for the area is the number of active territories (breeding pairs) recorded in 2003 (The year of the most recent national survey of golden eagle; see Appendix B for details). Annex 1 species, listed in the Wild Birds Directive, are considered to be rare or vulnerable in the EU and are referred to in Article 4.1; regularly occurring migratory species are covered by Article 4.2.

LOCATION AND HABITATS

Glen Etive and Glen Fyne are located in the south west Highlands (OS 1:50,000 sheets 41, 50 and 56). The site falls within the West Highland, and Argyll and Stirling Area of Scottish Natural Heritage and lies within the Argyll and Bute, Stirling and Highland local authority areas.

The habitats of the area are dominated by open, steep-sided mountainous land with a mix of wet heath, bog-land, upland grassland, and native woodland. Native woodland tends to be oak and birch dominated on south-facing slopes, whilst pine and birch dominate on north-facing slopes. Areas of blanket bog are significant where ground conditions are favourable. The habitats mentioned above are essential components of the upland ecosystem, and provide important breeding and foraging grounds for golden eagles.

These habitats are represented within the site by several SSSIs and Special areas of Conservation (SACs). Within the Glen Fyne area the lower slopes and valley bottoms include areas of western acidic oak woodlands, whilst upland areas contain acidic scree, high-altitude plant communities associated with areas of water seepage, species-rich grassland with mat-grass and tall herb communities. Glen Falloch SSSI provides some diversity in the form of native pinewoods.

Within the Glen Etive area there are good examples of mixed woodland on base-rich soils associated with rocky slopes. Part of Glen Coe is designated for calcium-rich spring water-fed fens, clear-water lochs with aquatic vegetation. Pinewoods are also present in the area. To the north of this forested area lies Loch Dochard, which is

part of Rannoch Lochs SPA and SSSI with black-throated divers as the qualifying interest.

The remainder of the site is covered in heather moorland and bog-land interspersed with rocky crags and peaks and numerous freshwater lochs and rivers. Although the eagles tend to nest in the higher rockier areas, the high percentage of open ground across the site provides excellent foraging opportunities.

All of the above habitats are encompassed within the golden eagles' home ranges (see 'Birds and Boundaries' page 6).

SITE STATUS

BOUNDARIES

The total area is 81,104ha, which is divided into two: Glen Etive to the north and Glen Fyne to the south. The proposed boundary is shown on the [map](#). The nature of upland habitats and the complex species management requirements of golden eagle are such that conservation benefits are best secured from targeted positive management rather than the guardianship of the SSSI system. If government were to consider classification of this area as an SPA, in line with other recently classified SPAs for golden eagle, it is suggested, that proposals for management would primarily be through Rural Priorities options within the Scotland Rural Development Programme (SRDP)

The two individual and separate glens are divided by the Pass of Brander in the west running into the Glen Lochy and Glen Orchy which continue the divide east through to the northern end of Strath Fillan.

Central to the Glen Etive portion is Ben Starav and the mountains to the north and east making up Black Mount and through to Glen Coe. To the south and west this area extends to the south side of Ben Cruachan and smaller mountains which abut the afore mentioned divide. Further to the west it extends to Loch Etive and beyond, encompassing upland areas through to Salachan Glen above Loch Linnhe and north to Ballachulish.

Beinn Bhuide is the central point for the Glen Fyne section of the SPA. The area runs north to the Glen Lochy and east to Glen Falloch but excludes the bulk of Ben Lui. The east and south of the area extends to Glen Array and south to the bottom of Glen Fyne and to the northern slopes of Ben Ime before travelling north east toward Inverarnan and Glen Falloch.

The process by which the boundary of Glen Etive and Glen Fyne was identified is described in the 'Birds and boundaries' section below.

BIRDS AND BOUNDARIES

The boundary of Glen Etive and Glen Fyne has been drawn to include the ranges of the 19 pairs of golden eagle as predicted by the refined RIN292 model. This model is based on the original RIN292 model, as developed by the RSPB and Forestry

Commission (McGrady *et al.* 1997), and predicts golden eagle range boundaries from the range centres (the average of used alternate eyries) and altitude. The model recommends that for golden eagle territories in medium altitudes, an altitudinal cut-off of 150m outside the core area should be applied, and in high altitudinal territories a cut-off of 150-200m from the valley floor should be applied. This is because at medium and high altitudes the eagles avoid low ground. However, in a commissioned SNH report (Whitfield & McLeod 2007) concerning range use in relation to nest site altitude it was considered that in the absence of range use data the lower limits of upland vegetation communities may represent the lower limit of eagle range use. Due to the lack of range use data for the Glen Etive and Glen Fyne pSPA, it was considered more appropriate to map the lower limits of eagle range use by presence of upland vegetation communities following ground-truthing.

Additionally, the refined RIN292 model uses a maximum ranging distance which is responsive to the local breeding density. This principal is taken from the PAT model (McLeod *et al.* 2002) which notes that in areas of high density golden eagles typically do not range as far as 6 km from the range centre as predicted by the basic RIN292 model.

Areas generally avoided by eagles, e.g. human settlements, pre-thicket and post-thicket conifer plantations and some enclosed land, have been excluded from the indicative boundary following ground-truthing.

The resultant site covers a mosaic of habitats which are important to the population of golden eagles. Golden eagles nest, roost, display and hunt throughout the area.

BIRDS

ANNEX 1 BIRD SPECIES

These species are listed in Annex 1 of the EC Council Directive of 2 April 1979 on the Conservation of Wild Birds (79/409/EEC). Article 4.1 of the Directive states that "Member States shall classify in particular the most suitable territories in number and size as special protection areas for the conservation of these species, taking into account their protection requirements in the geographical sea and land area where this Directive applies." Glen Etive and Glen Fyne supports populations of European importance of the following Annex 1 species.

Golden eagle *Aquila chrysaetos*

Population and location in Glen Etive and Glen Fyne

In 2003 Glen Etive and Glen Fyne supported 19 active golden eagle territories representing over 4.2% of the British population. While complete monitoring of this area has not been undertaken annually, numbers have been consistent over three surveys in recent decades (19 active pairs in 1982 and 20 active pairs in 1992) and no eagle territories are known to have fallen vacant since the time of the 2003 survey (see Appendix B).

Assessment of Glen Etive and Glen Fyne against SPA Guidelines

The current UK SPA suite for golden eagles, which has been criticised for failing to adequately represent species numbers and distribution in the UK, comprises eight sites. Consequently on the 7th March 2005 the then Minister, Lewis Macdonald, requested that “...SNH identify additional areas for the protection of golden eagle habitat to complement the general protection the species receives under legislation wherever it is found in Scotland”. Improvement on the site-based approach could be by the classification of additional SPAs and/or targeted management measures either through a specific management scheme or a nationally implemented rural (agri-environment) management initiative. To adequately represent the ecological requirements of the golden eagle such areas would be both extensive, encompassing a wide variety of upland habitats, interests and management regimes, and suitably located to better represent the species range in its UK stronghold of Scotland.

Detailed analysis of the 1982, 1992, and 2003 national surveys of golden eagle has identified Glen Etive and Glen Fyne as one of six important areas in Scotland for the golden eagle to augment the eight sites already listed in the UK SPA Review (Stroud *et al.* 2001) for this species.

The basis for judging whether a site in Great Britain merits selection as a 'most suitable territory' is the published UK SPA Guidelines (JNCC 1999, Stroud *et al.* 2001). In this exercise “a most suitable territory” was taken as synonymous with “an additional area for the protection of golden eagle habitat”. For a site holding an Annex 1 species to pass Stage 1 of the UK Guidelines, it must hold at least 1% of the reference GB population. For golden eagle the baseline population numbers are 442 pairs (Eaton *et al.* 2007). Stage 2 consists of seven further considerations, one or more of which, if a site passes Stage 1, are used to select the most suitable areas for SPA classification.

Stage 1 Guidelines

Glen Etive and Glen Fyne holds 19 pairs of golden eagle (2003), approximately 4.2% of the GB population. Consequently Glen Etive and Glen Fyne passes Stage 1.1 of the Guidelines.

Stage 2 Guidelines

Stage 2.1: Population size and density

Golden eagle numbers within this area are high; it supports 19 pairs of golden eagle, 4.2% of the GB population. Furthermore, analysis of high density areas indicated that Glen Etive and Glen Fyne holds the largest high density cluster of golden eagle nest sites in East Lochaber Natural Heritage Zone (NHZ).

Densities of breeding birds at Glen Etive and Glen Fyne compare favourably with other SPAs for golden eagles (see Table 2). However, caution should be exercised when comparing sites in this manner as density figures are highly dependant on the

precise location of SPA boundaries in addition to the numbers of eagle pairs present. It should be noted that in multi-interest SPAs the full extent of the site may often be influenced by the presence of species other than eagles, possibly resulting in a site with a larger area than the distribution of golden eagle territories and, therefore, inaccurate eagle density figures.

Table 2. Comparison of Glen Etive and Glen Fyne complex with existing SPAs for golden eagle.

Site	Area Km ²	Territories occupied 2003	Density (territories / km ²)*
North Harris Mountains SPA	131	7	0.053
Cnuic agus Cladach Mhuile SPA	292	15	0.051
Caenlochan SPA (nest sites within SPA)	60	2	0.033
Rum SPA	109	3	0.027
Cuillins SPA	295	8	0.027
Glen Etive and Glen Fyne	811	19	0.023
Cairngorms SPA (nest sites within SPA)	509	7	0.014
Lewis Peatlands SPA	590	7	0.012
Caithness & Sutherland Peatlands SPA	1455	5	0.003

Single interest SPAs for golden eagle
 Multi- interest SPAs where boundary is based primarily on golden eagle distribution
 Multi- interest SPAs where boundary not only based on golden eagle distribution

Stage 2.2: Range

Golden eagles are widely distributed throughout much of northern and western Scotland. The SPA suite for golden eagles already includes a number of sites on the west coast of Scotland. Glen Etive and Glen Fyne lies approximately 30km east of Cnuic agus Cladach Mhuile SPA on the island of Mull.

Whilst Glen Etive lies completely within the East Lochaber Natural Heritage Zone (NHZ), Glen Fyne lies within East Lochaber, Argyll West and Islands, and Loch Lomond, the Trossachs and Breadalbane NHZ. All three NHZs currently have no SPAs for golden eagle, although Jura, Scarba and the Garvellachs pSPA also lies within the Argyll West and Islands NHZ. The Moidart-Ardgour area, also identified in this exercise, is the nearest site for golden eagle but this lies in the totally separate

Western Highlands NHZ. Consequently the Glen Etive and Glen Fyne pSPA would contribute highly to range.

Stage 2.3: Breeding Success

Data from the national surveys in 1992 and 2003 suggest that the numbers of young fledged per pair on Glen Etive and Glen Fyne are notably higher than the national and regional averages in 1992 but lower in 2003. The mean young fledged per pair on Glen Etive and Glen Fyne was 0.47 in 1992 and 0.21 in 2003 compared with the national average of 0.32 fledged per pair in 1992 and 0.36 in 2003, and regional figures which indicate that golden eagles in south west uplands and northern England (which includes Glen Etive and Glen Fyne) fledged an average of 0.34 young per pair in 1992 and 0.41 per pair in 2003 (Green 1996; Eaton *et al* 2007).

Analysis of productivity per unit area across Scotland, using combined productivity data from the 1982, 1992 and 2003 national surveys, indicated that Glen Etive and Glen Fyne hold the most extensive high productivity area in East Lochaber and Loch Lomond, the Trossachs, and Breadalbane, and one of the most extensive high productivity areas in Argyll West and Islands. However, the area compares less favourably with existing SPAs for the species (see Table 3 below). Consequently breeding success of the area is considered to be moderate, but still worthy of achieving the SPA selection guidelines.

Table 3. Productivity of Glen Etive and Glen Fyne compared with the current SPA suite for the species.

Site	Average fledged per recorded active territory per year 1982 - 2003
Caenlochan SPA (nest sites within SPA)	0.75
Rum SPA	0.64
North Harris Mountains SPA	0.62
Cnuic agus Cladach Mhuile SPA	0.54
Cairngorms SPA (nest sites within SPA)	0.47
Cullins SPA	0.46
Lewis Peatlands SPA	0.39
Glen Etive and Glen Fyne	0.37
Caithness & Sutherland Peatlands SPA	0.27

Stage 2.4: History of Occupancy

Data from the 1982, 1992, and 2003 national surveys shows that there is a long history of occupancy of golden eagle in Glen Etive and Glen Fyne. Records from the late nineteenth century note that golden eagles are breeding but uncommon in this area (Watson 1997).

Therefore there is a good history of occupancy of golden eagle in Glen Etive and Glen Fyne.

Stage 2.5: Multi-species areas

No other species have been identified as present in qualifying numbers.

Stage 2.6: Naturalness

Much of the site has high levels of naturalness and is considered to be wild land by many. Indeed a large section is an Area of Search for wild land. The open moor and bog-land, such as Rannoch Moor, are areas least affected by management. Other areas are managed, or have been managed, as sheep grazing or deer forest, which has influenced the vegetation, either by burning or grazing levels. The native woodlands and conifer plantations are mainly located in the glens. The high percentage of open ground and the low levels of disturbance are attractive to golden eagles and, although the golden eagles tend to nest in the higher rockier areas, they are found foraging across most of the site. Consequently, Glen Etive and Glen Fyne retains a high level of naturalness.

Stage 2.7: Severe weather refuges

Not applicable

Overall assessment of Glen Etive and Glen Fyne against SPA selection guidelines

Glen Etive and Glen Fyne supported 19 pairs of golden eagle in 2003 and therefore meets Stage 1.1 of the selection guidelines on the basis of exceeding 1% of the national population of golden eagle and five of the Stage 2 judgements (see Table 4). In the light of the above it is considered that the area can be demonstrated to be a "most suitable territory" for this species.

Glen Etive and Glen Fyne consequently meets the UK SPA selection guidelines and therefore contributes to meeting the ministers request of SNH to identify additional areas for the protection of golden eagle habitat to complement the general protection the species receives under legislation wherever it is found in Scotland.

Table 4. Assessment of Glen Etive and Glen Fyne against SPA selection guidelines.

Site	Stage 1 Guidelines		Stage 2 Guidelines					
	Population (pairs)	% GB	2.1	2.2	2.3	2.4	2.5	2.6
			Size & density	Range	Breeding success	History of Occupancy	Multi-species area	Naturalness
Glen Etive & Glen Fyne	19	4.2	Y	Y	Y	Y	N	Y

Key: Y = Yes; N = No.

General Information

Breeding:

The 2003 national survey of golden eagles in Britain found 442 pairs (Easton *et al* 2007). The results are similar to previous surveys which identified a population of 424 pairs in 1982-83 (Dennis *et al.* 1984) and 422 pairs in 1992 (Green 1996). However the apparent stability of the population at a national scale masks regional variations in numbers of golden eagle. Golden eagles were formerly more widespread, breeding in mountainous areas of England and Wales as well as Scotland, but intense persecution during the 19th and parts of the 20th centuries led to substantial range contraction. At the beginning of the 20th century, when numbers were probably at their lowest, the golden eagle in Britain and Ireland survived as a breeding bird only within the remoter parts of the Scottish Highlands and Islands (Watson 1997). Since that time numbers have gradually recovered and some recolonisation of the former range has taken place, although the species range is still largely restricted to Scotland.

The golden eagle has a widespread, but discontinuous, distribution across much of Europe. The European population is estimated at 7,900 – 10,000 pairs (excluding Russia), which accounts for less than a quarter of its global breeding range (Birdlife International 2004). Within the European Community (EC25) golden eagles also breed in Austria (260-360 pairs), Denmark (1 pair), Estonia (35-45 pairs), Finland (300-350 pairs), France (390-460 pairs), Germany (45-50 pairs), Greece (100-150 pairs), Hungary (3-5 pairs), Italy (476-541 pairs), Latvia (5-10 pairs), Poland (35-40 pairs), Portugal (46-48 pairs), Slovakia (90-95 pairs), Slovenia (25-35 pairs), Spain (1,300 pairs) and Sweden (550-610 pairs).

A conservation framework for golden eagles in Scotland provides both national and regional targets for favourable conservation status (FCS) for the species as well as identifying constraints acting on these populations (Watson & Whitfield 2002, Whitfield *et al* 2008). Results of the 2003 national survey have shown that national

targets for population size were not met and that, at a regional level, only three out of sixteen regions where eagles are present were considered to be in FCS (Whitfield *et al.* 2006, 2008). Golden eagles are potentially threatened by a variety of pressures throughout their range including commercial afforestation of open hill areas, wind farm construction, persecution, unintentional disturbance and grazing pressure (from deer and sheep) leading to declines in live prey for eagles (Whitfield *et al.* 2001, 2007a & b). Failure to meet FCS in the 'grouse moor' regions is largely due to illegal persecution of eagles resulting in low survival and low levels of occupancy of territories (Whitfield *et al.* 2003, 2004 a & b). Analysis also identified that in some areas of the western Highlands overgrazing by sheep and deer appears to be constraining productivity of golden eagles due to lower levels of live prey available in such areas (Whitfield *et al.* 2006).

Habitat:

In Scotland, golden eagles are virtually restricted to open upland landscapes where most birds nest on cliffs, although a small percentage of nests are in trees (Watson & Dennis 1992). They feed on live prey caught mainly in montane habitats, open moorland and blanket bog communities, principally European rabbit (*Oryctolagus cuniculus*), European brown hare (*Lepus europaeus*), mountain hare (*Lepus timidus*), ptarmigan (*Lagopus muta*), red grouse (*Lagopus l. scoticus*) and black grouse (*Tetrao tetrix*), but pine marten (*Martes martes*), red squirrel (*Sciurus vulgaris*), red fox (*Vulpes vulpes*), European water vole (*Arvicola amphibious*), ducks and various seabird species are also recorded (BWPi 2004). They also feed regularly on carcasses of sheep and deer (Marquiss *et al.* 1985; Watson *et al.* 1989; Watson *et al.* 1992, 1993; Watson, 1997). Golden eagles require large areas of open ground over which to hunt and are consequently thinly distributed over areas of suitable habitat. Hence large expanses of suitable land are needed to ensure their survival. Golden eagles prefer areas with ridge features (as the deflected wind is probably an important aid for flight) and tend to avoid areas of human activity (such as buildings and roads), water bodies (due to the lack of air currents and prey availability) and closed canopy forestry (McLeod *et al.* 2002).

Both grazing and muirburn affect the condition and extent of the dwarf shrub heath upon which golden eagle prey species such as red grouse and mountain hares depend. Appropriate management is required to ensure that it continues to support adequate numbers of these prey species which are important to golden eagle breeding success (Watson *et al.* 1992), and also that it continues to provide enough carrion for overwinter survival of the eagles.

APPENDIX A

SOURCES OF BIRD INFORMATION FOR GLEN ETIVE AND GLEN FYNE

Information on breeding golden eagle were obtained from the National surveys of 1992 and 2003 carried out under the SCARABBS programme. Additional years' data were provided by Roger Broad on behalf of Argyll Raptor Study Group and RSPB Scotland.

POPULATION ESTIMATES FOR SPECIES MENTIONED IN THE TEXT

The table below gives the current national and international population estimates for the qualifying species present on Glen Etive and Glen Fyne.

Species	Pop type	Area	Size	Source
Golden eagle	Br	GB	442p	Easton <i>et al</i> 2007
	Br	EUR	7,900p	BirdLife International 2004 (Minimum excluding Russia)

Key: Pop (population) type, Br=breeding; Area, GB=Great Britain (excluding Isle of Man), EUR=Europe; Size, p=pairs.

APPENDIX B

Number of active golden eagle territories (pairs) at Glen Etive and Glen Fyne in 1992 and in each year between 2001 and 2005 (figures rounded down to 1 decimal place).

Year	Number of territories surveyed	Number of active territories recorded (pairs)
1982*	19	19
1992*	20	20
2001	9	8
2002	10	9
2003*	20	19
2004	7	7
2005	8	8
% GB from 2003 data		4.2 %

* Denotes years of national golden eagle surveys where a complete census was undertaken. The lower numbers in other years derive from the lower survey effort although, with the traditional behaviour of eagles, it can be anticipated similar numbers of ranges will be occupied to the census years