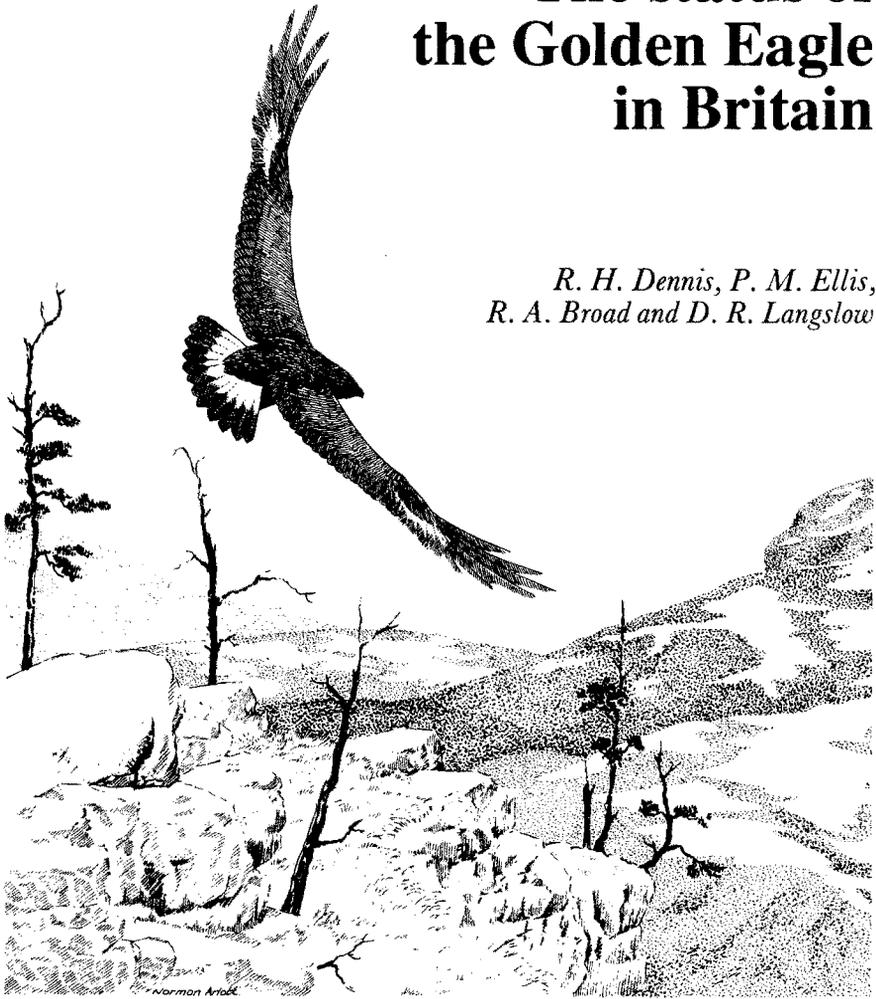


# The status of the Golden Eagle in Britain

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continued...

**F**or such a large bird, the Golden Eagle *Aquila chrysaetos* can be surprisingly elusive, and an accurate picture of its status in Britain has always been difficult to obtain. The physical nature and remoteness of many of its nesting areas, together with adverse weather and the frequent use of widely distributed alternative eyries, have always hampered fieldwork.

The Wildlife and Countryside Act 1981, which followed the EEC Directive on the Conservation of Wild Birds, drew attention to the need to conserve wildlife habitats and to protect rare and vulnerable breeding birds in the United Kingdom. The problems of adequately conserving raptors with large home-ranges has been brought into focus by this legislation. Successful conservation action will depend upon a sound knowledge of the numbers, distribution and ecology of birds such as Golden Eagles. The Royal Society for the Protection of Birds (RSPB) and the Nature Conservancy Council (NCC) decided, therefore, to organise the first complete census of Golden Eagles in Britain in 1982; in the event, some follow-up fieldwork was required in a few small areas in 1983. The aim of the survey was to visit all potential nesting areas in order to record the numbers, distribution and breeding success of Golden Eagles. Additional information on nest-site characteristics and other factors affecting eagles was also collected. This paper presents a summary of the results for population size, home-range occupancy, breeding success and production of Golden Eagles in Britain (other information will form the basis of a further paper).

## **Methods**

A survey of Golden Eagles in Britain required the full and generous co-operation of those who have studied eagles for many years. Much historical information has been collated in recent years, and this identified those areas in which Golden Eagle distribution was poorly known. In 1981, a pilot survey was organised to test the methods for the full survey. Three detailed recording forms were produced to facilitate collation of results: (i) Form A dealt mainly with occupancy and success data; (ii) Form B contained six-figure map references of all known eyries and, where possible, sketches or photographs of nest sites; (iii) Form C recorded the site characteristics of the eyrie (this information will be the subject of a further paper).

Golden Eagle home-ranges were defined as areas which (a) had been used by eagles for breeding, from the evidence of used eyries, or (b) had a previous history of nesting. A home-range can contain a number of alternative eyries, only one of which is used in any one year. The presence of recent pellets, moulted feathers or fresh food remains on an eyrie was the minimum evidence needed to confirm the occupation of a home-range. Proof of occupancy by a pair required that two eagles were seen together, or that a nest containing eggs or young was found. This probably resulted in a slight underestimate of the number of occupied home-ranges. Individual eagles, often immatures, were recorded in areas with no history of nesting and considered unsuitable for nesting; these were not included in the analysis. Also excluded were the immatures occasionally recorded in occupied home-ranges.



**255.** Golden Eagle *Aquila chrysaetos* at eyrie with two young, Scotland, summer (Harold Auger)

The early part of the year, before egg-laying begins, is a good time to find displaying Golden Eagles and to record nest-building. This is also a good period to identify the ages of the eagles and to note the presence of immatures in the home-range. During the survey, we did not want to risk disturbing eagles when they were laying or early in incubation. In 1982, egg-laying was first confirmed on 9th March; we therefore encouraged observers to examine nests from a discreet distance during March and early April, so that eagles were not flushed early in incubation. If the eyrie is approached carefully, and left rapidly, later during the incubation period (mid April-early May), Golden Eagles will return quickly to the nest; the shortest time recorded between flushing a female from eggs and her return to incubate was seven minutes. We had no evidence to suggest that any eagles deserted their eggs because of the surveyors in 1982.

Using this advice, and following Postapalsky's (1974) comments on data collection in population surveys of large raptors, we recommended observers to adopt the following procedure for each home-range:

- (1) an initial visit in good weather between January and early March to check for occupancy;
- (2) observation of the nest from a distance in late March-early April to check for incubating birds;
- (3) a quick visit on a mild day in mid April-early May to check the number of eggs;
- (4) a visit around mid May to count the number of small chicks;
- (5) a visit in mid June to check the progress of the young and to record the nest-site characteristics;
- (6) a final visit in late July and August to confirm fledging.

Unoccupied home-ranges were the most difficult category to confirm, and several visits to all possible alternative nesting areas were required

before definite nil returns could be recorded. Young eagles remain with their parents for several months after fledging, and this gave a further chance to search for any successful eyries which had been overlooked.

Egg-laying was confirmed only when eggs or young were seen in a nest. Eagles were observed in an incubating posture at a few eyries which were built-up and fully lined, but where eggs or young were not seen. As egg-collectors and others have been known to remove clutches soon after completion, this may have contributed to a slight underestimate of the number of eyries in which eggs were laid.

In 1982, the RSPB employed nine contract wardens, part-funded by the NCC, to carry out the survey work along with RSPB and NCC staff; they were helped by a large and willing band of raptor enthusiasts, birdwatchers and local people (see Acknowledgments). Golden Eagles are on Schedule 1 of the Wildlife and Countryside Act 1981, and all nest examinations required a scientific licence issued by the NCC. In September 1981, Jeff Watson, Stuart Rae and DRL of the NCC began a four-year research project on Golden Eagles in selected areas, and this was most useful to the survey. The RSPB organised the fieldwork, with RHD and RAB responsible for the Highlands, the Spey watershed and Mull, while PME was responsible for the rest of the mainland and the Western Isles.

## Results

Fieldwork progressed extremely well in 1982 and no major problems occurred. A contingency plan had been made to delay the survey until 1983 if extremely bad weather prevailed in the spring of 1982. Following the severe cold in December 1981, January 1982 was also very cold, but temperatures rose in the second half of the month. The late winter was generally mild, but colder weather occurred in late March and April. Above 500m there were heavy snowfalls, and these persisted in the high mountains until May. In May and June, the weather was often ideal for fieldwork in the hills, and weather conditions remained favourable during the rest of the breeding season. Observer coverage was extraordinarily high (94.5%), only a few areas (mainly parts of Harris and Lewis in the Western Isles) requiring follow-up work in 1983. The additional records gathered in 1983 for areas D, G and H (see fig. 1) were added to the 1982 data to produce the population and occupancy figures; all calculations of production refer only to 1982.

For the analysis of the results, the distribution was divided into eight areas (fig. 1). These divisions are based roughly on the areas outlined by Brown & Watson (1964) and Everett (1971), but geographical features such as main roads were used to define boundaries. The areas are defined as follows:

- A eastern highlands
- B northern moors and flows
- C north-central highlands
- D south-central highlands

- E northwest highlands
- F west highlands
- G southwest uplands and north England
- H Hebridean islands

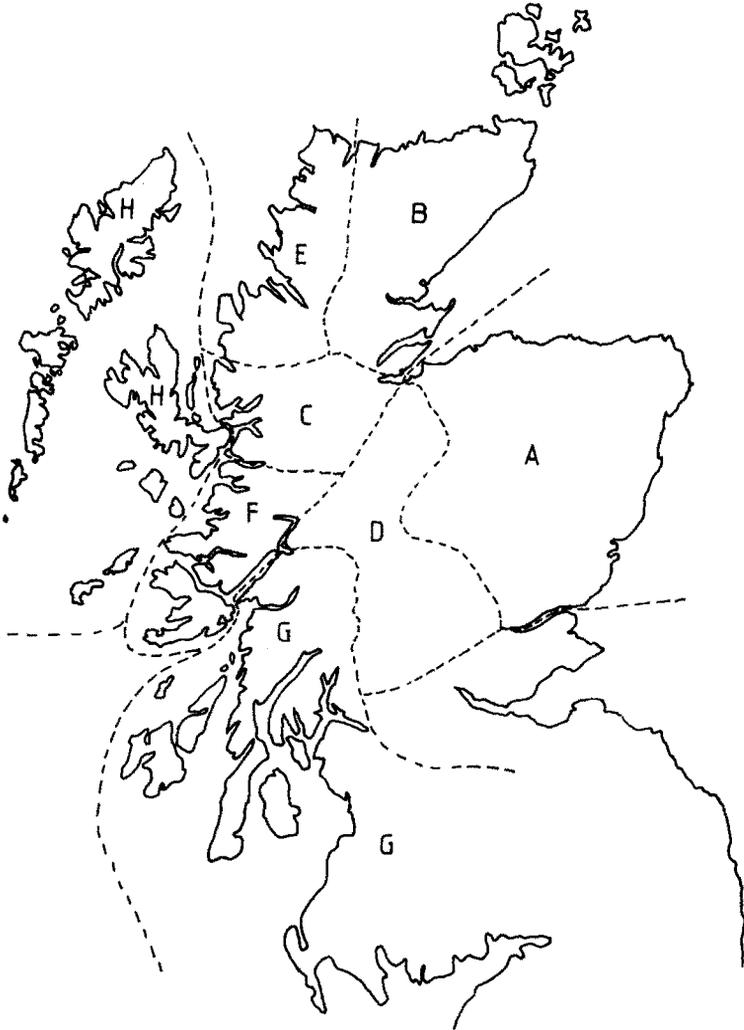


Fig. 1. Divisions of study area of Golden Eagles *Aquila chrysaetos* in Britain, 1982-83

#### *Nesting areas and occupancy*

The collation of historical material from books, museum collections of eggs, and personal archives resulted in the identification of 598 home-ranges. All were checked during the survey (table 1). In 1982-83, a minimum of 511 home-ranges were occupied, at least 424 by a pair of eagles; of all known home-ranges, 70.9% were occupied by pairs. Regional differences were quite marked: the mountainous regions of central and western Scotland (areas C, D, E, F & G) and the Hebridean islands (H) ranged from 69.1% to 78.9% occupancy, while areas in eastern Scotland (A & B) had only just over 50%. Occupancy of known home-ranges by single eagles was 14.5%, but varied from 24.6% in area A down to 8.8% in area E.

**Table 1. Population and home-range occupation of Golden Eagles *Aquila chrysaetos* in Britain, 1982-83**

All home-ranges were checked during the survey;  
for description of areas A-H, see text and fig. 1

Study area	Known home-ranges	Home-ranges occupied (%)	Home-ranges occupied by a pair (%)	Home-ranges occupied by a single eagle (%)
A	57	44 (77.2)	30 (52.6)	14 (24.6)
B	42	32 (76.2)	22 (52.4)	10 (23.8)
C	82	75 (91.5)	62 (75.6)	13 (15.9)
D	59	54 (91.5)	43 (72.9)	11 (18.6)
E	68	53 (77.9)	47 (69.1)	6 (8.8)
F	95	87 (91.6)	75 (78.9)	12 (12.6)
G	73	61 (83.6)	53 (72.6)	8 (11.0)
H	122	105 (86.1)	92 (75.4)	13 (10.7)
TOTALS	598	511 (85.5)	424 (70.9)	87 (14.5)

*Egg-laying and non-breeding*

As mentioned above, it is often very difficult to obtain proof of egg-laying at nests which fail at an early stage; the values in table 2 are, therefore, minima. The percentage of pairs proved to lay ranged from 46.8% to 86.7%, except in area B, where it was 27.3%. A comparison with the results for pairs where laying was suspected but not proved suggests that rather more pairs (between 59.1% and 87.8%) probably laid. A minimum of 64.7% of pairs laid eggs, but probably around 75% did so: this suggests that about 25% of the pairs occupying home-ranges did not breed.

**Table 2. Breeding success of Golden Eagles *Aquila chrysaetos* in Britain, 1982**

For description of areas A-H, see text and fig. 1

Study area	No. pairs occupying home-ranges	No. pairs proved to lay eggs (%)	No. pairs proved to hatch eggs (%)	No. pairs fledging young (%)	% pairs laying which hatched eggs	% pairs laying which were successful
A	30	26 (86.7)	20 (66.7)	19 (63.3)	76.9	73.1
B	22	6 (27.3)	4 (18.2)	4 (18.2)	66.7	66.7
C	62	29 (46.8)	25 (40.3)	21 (33.9)	86.2	72.4
D	40	23 (57.5)	19 (47.5)	18 (45.0)	82.6	78.3
E	47	28 (59.6)	24 (51.0)	24 (51.0)	85.7	85.7
F	75	49 (65.3)	33 (44.0)	31 (41.3)	67.3	63.3
G	49	42 (85.7)	28 (57.1)	24 (49.0)	66.7	57.1
H	77	57 (74.0)	46 (59.7)	41 (53.2)	80.7	71.9
TOTALS	402	260 (64.7)	199 (49.5)	182 (45.3)	76.5	70.0

*Hatching and fledging success*

Throughout the whole population, 45.3% of pairs on home-range in the spring successfully reared young in 1982 (table 2). The highest success rate was 63.3%, in the eastern highlands (A), while the lowest was 18.2%, in the northern moors and flows (B). From the 260 nests in which eggs were definitely laid, at least 199 clutches (76.5%) hatched successfully. Most of these produced fledged young: 182 pairs produced at least 210 fledged



**256.** Female Golden Eagle *Aquila chrysaetos* massaging eaglet's head, Sutherland, summer 1932  
(*Seton Gordon*)

young in 1982, giving a mean brood size for all successful nests of 1.15 (table 3). The highest mean figure was 1.26 for the eastern highlands (A): very similar to the 1.3 per successful nest in 1944-57 (Watson 1957) and 1.31 in 1964-68 (Everett 1971) for this area. Areas D and G were also high at 1.22 and 1.21, respectively. The lowest mean brood size was 1.05 per successful nest in area H. The sample size for area B is too small for useful comparison.

### *Production*

The most important measurement of breeding success in large raptor populations is the number of young reared compared with the total number of pairs occupying home-ranges (table 3). In 1982, total production was 0.52 young reared per home-range occupied by a pair of eagles. Again, the eastern highlands (A) were highest (0.8 young), followed by south Argyll, southwest Scotland and northern England (G) (0.59). The northwest highlands (E) and the Hebridean islands (H) recorded, respectively, 0.57 and 0.56 young per pair. The north-central highlands (C) were below

average, with 0.37. The northern fells and moors (B) recorded 0.23 young per pair and, if the single pair which reared two young in Orkney is removed from this sample, production falls to 0.14 per pair.

**Table 3. Production of Golden Eagles *Aquila chrysaetos* in Britain, 1982**

For description of areas A-H, see text and fig. 1

Study area	Minimum no. young fledged per study area	Mean brood size at fledging	% pairs occupying a home-range which were successful	Production per pair occupying home-range	Production per home-range occupied	Production per known home-range
A	24	1.26	63.3	0.80	0.55	0.42
B	5	1.25	18.2	0.23	0.16	0.12
C	23	1.10	33.9	0.37	0.31	0.28
D	22	1.22	45.0	0.55	0.43	0.37
E	27	1.13	51.1	0.57	0.51	0.40
F	37	1.19	41.3	0.49	0.43	0.39
G	29	1.21	49.0	0.59	0.58	0.43
H	43	1.05	53.2	0.56	0.53	0.44
TOTALS	210	1.15	45.3	0.52	0.44	0.37

## Discussion

### *Status in Britain*

In the 19th century, the Golden Eagle was intensely persecuted by sheep farmers, game preservers and collectors in Britain and Ireland, and became extinct in England, Wales and Ireland. In Scotland, the population was much reduced and confined largely to the more remote mountain areas, although sometimes sympathetic local people protected eyries. The Golden Eagle did not, however, follow the White-tailed Eagle *Haliaeetus albicilla* into extinction. During the wars of 1914-18 and 1939-45, fewer game preservers and shepherds were on the land; this probably resulted in an increase in the Golden Eagle population, which recolonised parts of Scotland and also spread into areas vacated by the White-tailed Eagle. From 1953 to 1960, a pair nested in Co. Antrim, Northern Ireland; and, in 1969, the species returned to breed in northern England (British Ornithologists' Union 1971). In 1954, the Golden Eagle became specially protected under the Protection of Birds Act. Despite this, illegal persecution and collecting has continued (Nicholson 1957; Everett 1971). In recent years, concern over the deaths of eagles and other birds from the illegal use of poison baits has prompted the RSPB to campaign against their use (Cadbury 1980).

A number of attempts have been made to assess the size of the British Golden Eagle population. In the early 1950s, an estimate of at least 190 breeding pairs was made based on data collected by the late L. H. Brown, E. C. Palmar, P. W. Sandeman and Dr A. Watson (Nicholson 1957). Further information from these observers suggested a total of 231 pairs in 1968 (C. A. Palmar *in litt.*), while Dr A. Watson considered the Scottish



257. Golden Eagle *Aquila chrysaetos*, Hebrides, May 1980 (Dennis Green)

population close to 300 pairs (Everett 1971). The British Trust for Ornithology/Irish Wildbird Conservancy *Atlas* project confirmed breeding in 236 10-km squares in Britain between 1968 and 1972: some of these squares held more than one pair, while some pairs bred in different squares in different years; rather conservatively, the population was estimated at 240 pairs (Sharrock 1976).

The minimum of 424 pairs found during 1982-83 represents a population at least 40% higher than the highest recent estimate of 300 pairs. We suggest that most of this apparent increase can be accounted for by improved coverage of remote areas and improved survey techniques used in this census. A similar situation has arisen in Sweden, where the population is now estimated at 300-400 pairs as against previous figures of 100-150 pairs; this apparent increase is due to improved coverage and survey techniques, rather than being a true increase in the population (Tjernberg 1983).

Parts of Lewis and Harris, Argyll and the Highlands have never before been thoroughly surveyed. In addition, a significant number of further home-ranges were confirmed after plotting the distribution of known nesting sites on maps and following up with more intense fieldwork.

#### *Regional differences*

The two most easterly study areas (A & B) had the lowest occupancy of home-ranges by pairs and the highest frequency of single eagles in home-ranges. The most likely explanation for these features is the continued persecution of full-grown eagles. The frequency of two-chick broods was highest in area A, suggesting that wild prey remains abundant there. By

contrast, B had very low production; in this area, a combination of persecution and a scarcity of wild prey resulting from overgrazing and excessive burning depresses both production and the number of adult eagles.

Brown & Watson (1964), Everett (1971) and Brown (1976) have looked at the breeding success of Golden Eagles in different types of habitats in Scotland. Their results indicated that more young were reared in areas with relatively abundant wild prey. In a survey during 1964-68, Everett (1971) reported 0.55 young produced per occupied territory in areas of good wild food supply and 0.44 young in areas of poor food supply; this production is very similar to the mean figure of 0.52 young per pair in 1982.

Brown (1976) suggested that, in any particular year, between 10% and 25% of Scottish Golden Eagles did not lay, and that there was some evidence that non-breeding might occur more often in areas of poor food supply; the information from the 1982 survey tentatively supports this suggestion. In areas A and G, both with good food supplies, nearly 90% of pairs laid eggs. Non-laying pairs formed 18% of the population in the northwest highlands (E), 23% in the Hebridean islands (H) and 31% in the west highlands (F). Areas C and D include some of the highest mountains in Scotland and often hold snow late into the spring. In April 1982, there was heavy snow in the high mountains which persisted into May and June; this probably accounted for non-breeding, especially at the highest eyries (400-800m above sea level), which reached 30% in area C and 36% in D. Area B includes much land which has been regularly overburnt, and some home-ranges have been badly affected; 41% of pairs did not lay.

Lockie & Ratcliffe (1964) drew attention to the effects of chlorinated hydrocarbon insecticides, especially dieldrin sheep-dips, which caused a decline in the breeding success of eagles in western Scotland between 1961 and 1963. In 1966, this sheep-dip was withdrawn and an improvement in breeding success followed (Lockie *et al.* 1969). At present, there is no evidence that pesticides are adversely affecting Golden Eagles. Indeed, among British birds of prey, they have consistently had the lowest residues of organochlorines in eggs and carcasses in the last decade (Cooke *et al.* 1982).

#### *Impact of man on Golden Eagles in Scotland*

Some landowners and their staff have traditionally protected Golden Eagles on their land and, in recent years, many fieldworkers have commented that there has been a change of attitude by some landowners, keepers, stalkers and farmers who were previously 'anti-eagle'. Sometimes, this is because an individual has stopped persecuting eagles; alternatively, it can result from a change in land ownership. In some areas, numbers of Red Grouse *Lagopus lagopus* have decreased; keeping pressures have then declined, with a consequent reduction in eagle persecution. The establishment of nature reserves and the influence of nature conservation bodies and other eagle enthusiasts, especially through protection, monitoring and ringing studies, have also assisted the population. There is positive evidence that a number of home-ranges which have not been occupied by a breeding pair for many years have been reoccupied in the last decade.

Nevertheless, there exist several home-ranges which were regular breeding sites until 20 years ago, but have not been occupied recently. Despite the new provisions of the Wildlife and Countryside Act 1981 and the increase in the maximum fine for killing an eagle or taking its egg to £2,000, some of these sites continue to suffer from persecution. Persecution, particularly the illegal use of poison baits, remains a significant threat to eagles. In 1982, the carcasses of five full-grown eagles from Scotland were analysed and found to contain poison, while, in 1983, a crofter on the island of Skye was fined £300 for poisoning breeding eagles.

There are also some areas, such as northeast Sutherland, the Monadhliath Mountains, north Argyll and parts of west Perthshire, where breeding success and the occupancy of nesting areas by pairs of eagles may have been influenced by a decline in the numbers of wild prey, especially Red Grouse and mountain hares *Lepus timidus*. The long-term degradation of the environment by overgrazing and overburning (Darling 1954) and by the establishment of commercial forestry plantations has contributed to these declines.



258. Golden Eagle *Aquila chrysaetos*, Highland, summer about 1932 (Niall Rankin)

The production of different areas cannot be adequately assessed on a single year's work. More detailed research is necessary to determine the effects on eagle breeding success of factors such as the availability of wild prey and carrion, which varies between areas and between years, and different land-uses. The project begun in September 1981 by the NCC is investigating the relationship between the occupancy and success of Golden Eagle home-ranges and land-use practices.

*Comparisons with European populations*

In 1982-83, a total of 424 pairs of Golden Eagles was recorded in Britain, with a further 87 home-ranges occupied by single eagles. The total population, including immatures, at the end of the summer was at least 1,200 individuals, and possibly as many as 1,400. This number is considerably higher than any previous estimate. Based on current population estimates in Europe (table 4), the Scottish population accounts for about 20% of the total in western and central Europe and 50% of the EEC population. (Note that the estimated 400 pairs in the Iberian Peninsula refer to the North African race *A. c. homeyeri* and not to the nominate race *A. c. chrysaetos* which breeds in the rest of Europe.)

Recent studies in Europe have also reported higher population figures than previously published. Estimates from most countries have increased, but it is difficult to separate real increases from the consequences of improved survey techniques. Nevertheless, persecution has generally decreased, although there remains much scope for further improvement.

**Table 4. The population of Golden Eagles *Aquila chrysaetos* in parts of Europe**

The British population represents 16-20% of the total European population, 19-24% of the nominate European population, and nearly 50% of the EEC population. \* = EEC country

Country	No. of pairs	Source
NOMINATE <i>A. c. chrysaetos</i>		
Britain*	424	Present study
France*	190-236	Mathieu & Choisy 1982
West Germany*	17	Cramp & Simmons 1980
Norway	250-300	Willgohs 1977
Sweden	350-400	Tjernberg 1983
Finland	100-200	Cramp & Simmons 1980
Poland	10	Cramp & Simmons 1980
Czechoslovakia	25-30	Cramp & Simmons 1980
Austria	40-50	Cramp & Simmons 1980
Switzerland	100-120	Cramp & Simmons 1980
Italy*	250	S. Allavena <i>in litt.</i> 1983
TOTAL	1,750-2,240	
NORTH AFRICAN RACE <i>A. c. homeyeri</i>		
Spain	400	Cramp & Simmons 1980
Portugal	4	Cramp & Simmons 1980
GRAND TOTAL	2,150-2,640	
TOTAL EEC POPULATION	880-930	

## The future of the Golden Eagle in Britain

### *Population size*

P. Brown (1964) suggested that the Golden Eagle population in Britain might once have been 3,000 breeding pairs, but L. Brown (1976) could not accept this figure, and neither can we. Brown (1976) also pointed out that the distribution of Golden Eagle home-ranges had been remarkably constant this century, a fact also reported by Seton Gordon (1955). The



259. Golden Eagle *Aquila chrysaetos* bringing two young Red Grouse *Lagopus lagopus* to eyrie, Cairngorms, summer 1925 (*Seton Gordon*)

frequency of occupation of home-ranges varies greatly, but their spacing alters much less. It is almost uncanny how eagles have recolonised home-ranges after very long absences and chosen the precise nest site known historically. Brown (1976) considered that the British population was once 650-700 pairs, 500 of those being in Scotland.

The present survey revealed 598 known home-ranges, of which 424 were occupied by pairs. There are still substantial suitable areas where eagles do not currently breed, especially around the grouse moors of east Scotland. This would suggest that, in unmolested conditions, the Golden Eagle population could reach as many as 600 pairs in Scotland, although this assumes no competition with White-tailed Eagles.

#### *Relationship with White-tailed Eagles*

Love (1983) estimated that nearly 200 pairs of White-tailed Eagles bred in the British Isles in historical times. The species was heavily persecuted in the last century and became extinct in Britain in 1916. Its distribution was principally coastal, mainly in the west and north. One of the major changes in Golden Eagle distribution this century has been the colonisation of unoccupied White-tailed Eagle home-ranges. It is not possible to know how many Golden Eagles are now using former White-tailed Eagle sites, but it may be as many as one-quarter of the present population. A proportion of these sites are probably sub-optimal for Golden Eagles and, consequently, rather unproductive.

Re-introduction experiments have culminated in a major release programme of White-tailed Eagles by the NCC on the island of Rhum in the Inner Hebrides (Love 1983). In 1983, the first two pairs laid eggs, but both nests were unsuccessful, although the outlook for successful re-introduction is good. Interactions have been seen between Golden and White-tailed Eagles as the latter established themselves, and experience from several sites suggests that White-tailed Eagles will succeed in reclaiming their historical sites (RAB, RHD and J. A. Love, personal observations). The Golden Eagle population of the western highlands and islands may well contract slightly as the White-tailed Eagle becomes re-established.

### *The future*

The present Golden Eagle population of Scotland is one of the largest in Europe, although it remains below that which could be maintained. The most serious threats are the continued degradation of the upland environment from overgrazing and excessive burning and from blanket afforestation. Without major changes in land management, the biological productivity of the land will continue to decrease. Afforestation with blanket monocultures of exotic conifers will affect Golden Eagles both by the removal of suitable hunting areas for wild prey, and by the removal of sheep and deer with the subsequent loss of carrion; such afforestation is no substitute for a policy of integrated land-use accompanied by the re-establishment of natural forests.

The number of home-ranges with single eagles, together with the number of poisoned eagles found each year, shows that some nesting areas suffer from continued persecution by some land-users who disregard the law. New hill roads and the breaking up of estates encourage the more intensive use of upland areas and increase the ease of access and subsequent risk of disturbance to nesting eagles at vulnerable periods. The desertion and failure of vulnerable eyries has already occurred, and, with the increasing recreational use of parts of the uplands, seems likely to continue.

Nevertheless, it should be possible to maintain a large and viable population of Golden Eagles in the Scottish highlands and islands. It is now important to formulate policies to ensure the long-term security of these populations. A complete overhaul of land-use policies in the uplands will be needed so that eagles, and nature conservation, are accepted as an integral part of that environment, along with man's use for agriculture, forestry, hunting and leisure. Britain has an international responsibility to conserve what is one of our most spectacular breeding birds.

### **Acknowledgments**

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## Summary

In 1982, the RSPB and the NCC organised the first-ever complete census of Golden Eagles *Aquila chrysaetos* in Britain. Some further fieldwork was required in a few areas in 1983 to complete the coverage. The results for occupancy and breeding success in each home-range are presented.

A total of 598 home-ranges was identified from historical information. Of these, 511 (85.4%) were occupied by Golden Eagles; 424 home-ranges (70.9%) were occupied by a pair. At least 260 pairs laid eggs, but proof of laying was sometimes difficult to obtain. Non-breeding by pairs in different regions ranged from 10% to as much as 41%. At least 199 pairs definitely hatched eggs; 182 of these were successful, and fledged at least 210 young. Mean brood size was 1.15, and production was 0.52 young per home-range occupied by a pair.

The population total of 424 pairs is higher than previous estimates. This is due mainly to better coverage and improved survey techniques rather than a substantial increase in eagles in recent years. Regional data revealed some interesting differences in occupancy and breeding success. The eastern areas showed the lowest percentage of occupied home-ranges (just over 50%) while, in the west, between 69% and 79% of home-ranges were occupied by a pair. Production was highest in the eastern Grampians (0.8 young per pair on home-range) and lowest in northern moors and fells (0.23 young per pair).

The British population forms an important part (nearly 20%) of the west and central European population. We estimate that the potential maximum population size in Scotland is 25-50% higher than the present number of pairs. Attention is drawn to the relationship between Golden Eagles and White-tailed Eagles *Haliaeetus albicilla*; the re-introduced White-tailed Eagles are likely to reclaim some nesting areas currently occupied by Golden Eagles. Finally, the future of the species in Britain is discussed: the most serious threats are identified as continued degradation of the environment and extensive monoculture of exotic conifers. An integrated land-use policy for the uplands encompassing agriculture, forestry, nature conservation, hunting and leisure is urgently required.

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