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# BIRDS OF ST KILDA



Institute of Terrestrial Ecology  
Natural Environment Research Council

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is essential for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the various methods and tools used to collect and analyze data. It highlights the need for consistent and reliable data collection processes to support informed decision-making.

3. The third part of the document focuses on the role of technology in modern data management. It discusses how advanced software solutions can streamline data collection, storage, and analysis, thereby improving efficiency and accuracy.

4. The fourth part of the document addresses the challenges associated with data security and privacy. It stresses the importance of implementing robust security measures to protect sensitive information from unauthorized access and breaches.

5. The fifth part of the document concludes by summarizing the key findings and recommendations. It reiterates the importance of a data-driven approach and provides actionable steps for organizations to optimize their data management practices.

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A St Kildan and his catch of fulmars.  
(Photograph N. Rankin)

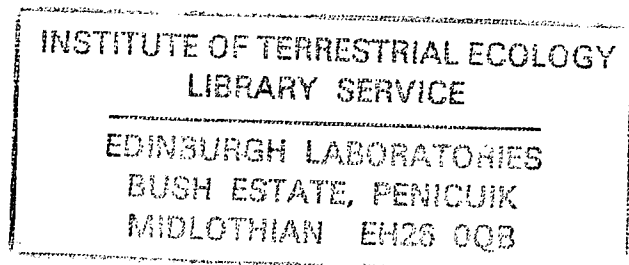




Institute of Terrestrial Ecology

# Birds of St Kilda

M P. Harris  
S Murray



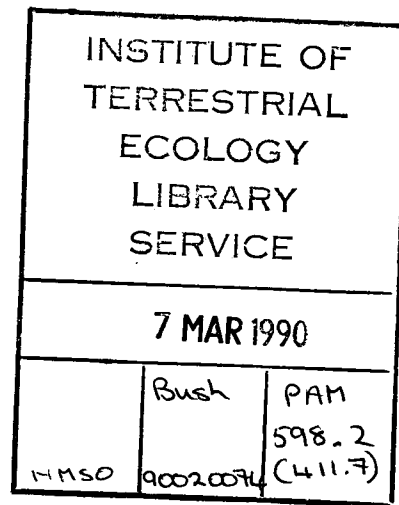
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COVER            PHOTOGRAPHS (M. P. Harris)  
Right            Puffin  
Top left        Boreray and the Stacs  
Lower left      Gannets

Half title        A St Kildan and his catch of fulmars (Photograph N. Rankin)

Frontispiece    Top section of the main gannet cliff below the summit of Boreray, July 1975 (Photograph M. P. Harris)



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II	Scientific name





# Acknowledgements

Scientific studies at St Kilda since 1957 have been carried out under the aegis of the Nature Conservancy Council who have provided facilities on Hirta and access to records; the National Trust for Scotland working parties have made observations and the Army has provided transport and also contributed records.

Our main debt is due to the observers, too many to name individually, who deposited their records with the Nature Conservancy Council warden on the island or as complete lists in the regional office in Inverness. In addition we have obtained detailed information or clarification of specific points from A. Anderson, G. W. V. Birnie, A. Blackburn, D. G. Boddington, J. M. Boyd, R. Broad, C. Brown, H. Brown, D. Budworth, R. N. Campbell, J. C. Davis, H. E. M. Dott, E. K. Dunn, W. J. Eggeling, J. J. M. Flegg, P. Grubb, D. C. Gwynne, D.

Haddy, M. Hornung, H. Insley, D. James, P. Lack, M. Marquiss, C. Milner, D. Neal, I. D. Pennie, N. Picozzi, C. Rose, M. Sutherland, K. Taylor, R. Tulloch, W. E. Waters, J. Watson. Our thanks are also due to the many owners and crews of visiting boats and resident Army personnel who put themselves out to land us on Soay, Boreray and the Stacs or to count birds from the sea.

K. Williamson kindly allowed us to use his 1958 checklist as a basis for the species list and also read and corrected a draft of this paper just prior to his death. Many of the above observers also spared time to read and correct the manuscript, though we ourselves must bear the blame for any inadequacies in it. During part of the work the senior author was funded by a Nature Conservancy Council contract.



*Plate 1 Aerial view of Village Bay, Hirta, from Dun (left foreground) around to Oiseval (right). This was taken in 1947 before the Army camp was constructed. (Photograph E Hosking)*

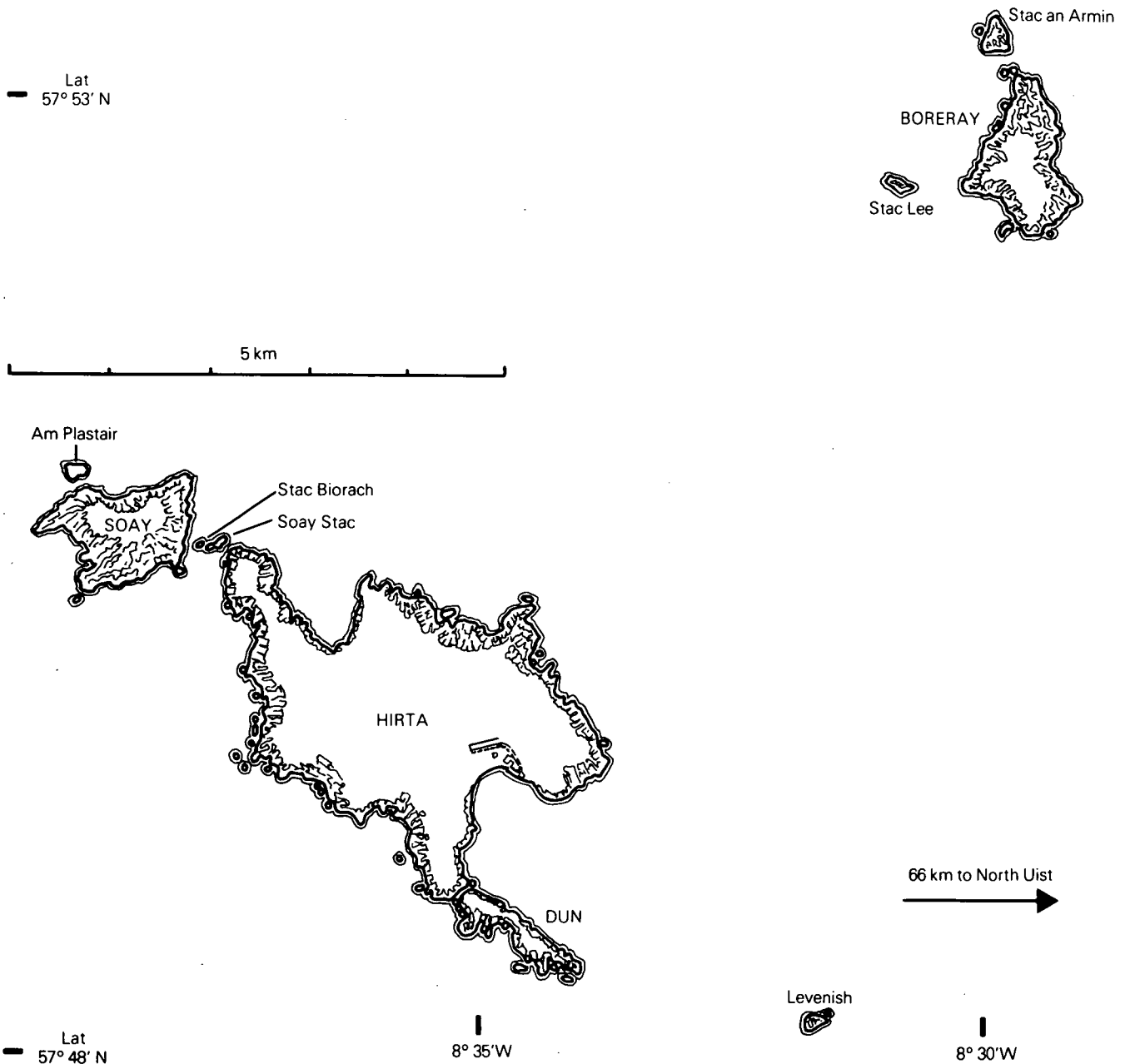


Figure 1. The islands and stacs of the St Kilda group

## Introduction

This annotated list presents information on the birds of St Kilda, Outer Hebrides, collected by us during five complete summers' field work 1974–78, and also summarizes previously published and many unpublished records made since the last review in 1959 (Williamson & Boyd 1960)

For a full description of the physical and biological characteristics of the islands the reader is referred to the accounts in Williamson and Boyd (1960) and in Jewell, Milner and Boyd (1974). Sufficient here to say that the term St Kilda covers four islands, the inhabited Hirta (638 ha, highest point 430 m), the adjacent Dun (32 ha, 175 m) and Soay (99 ha, 378 m), and Boreray (77 ha, 384 m), some 6 km away, and the small satellites Stac Lee (172 m) and Stac an Armin (196 m). All are cliff-bound and difficult of access. Most of Hirta is

covered by a complex of *Agrostis-Festuca* grasslands with two large areas of *Calluna-Eriophorum* bog. There is a small area of long-abandoned agricultural land in the village area and truly maritime vegetation around the coasts and often high up the cliffs modified by spray and the large numbers of seabirds. The whole island, except for the most precipitous ledges, is heavily grazed by sheep. Neighbouring Dun, ungrazed since before 1930, has two main vegetation types – rank *Festuca* grassland and bird-influenced *Rumex* sward. Soay has three major plant communities – a dry *Eriophorum* bog, a wet *Holcus* grassland on the south-east and an area of mixed grassland. In contrast, the vegetation of Boreray is a uniform, grassy sward. Both Soay and Boreray are heavily grazed. On all the islands, most birds are found on the coasts. The land avifauna is very impoverished.

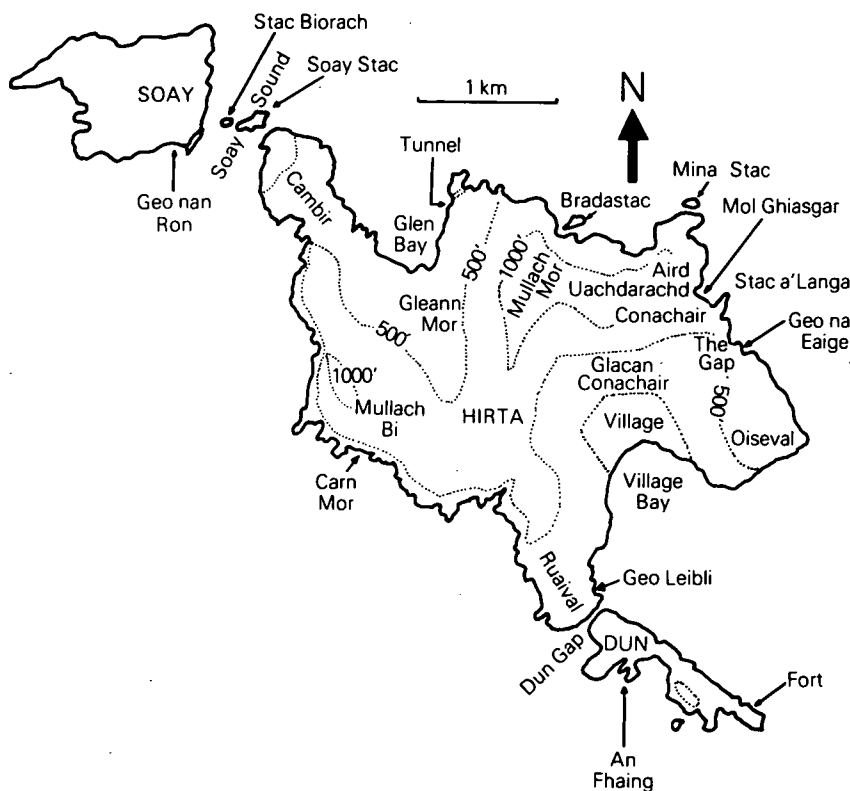


Figure 2. Hirta showing the place names used in the text and the 500' and 1000' contours

## The development of ornithology on St Kilda

Starting with Martin (1698), most early visitors (Table 1) to the islands made casual observations on the birds but, with a few exceptions, they were more concerned with the human inhabitants, their bird-catching activities and the various stoneworks. The most thorough account of the birds before this century is one compiled by Mackenzie (1905) from memoranda written in 1840 and 1841 by his father, Revd Neil Mackenzie, who was the minister on Hirta for 14 years from 1829. Although this gives a good account of the birds and their habits, the few population estimates, calculated on the numbers of eggs taken or birds killed, must be treated with reserve. For instance, it is just not possible to fit 50 000 guillemots on to Stac Biorach. Sands (1878) gives a few records based on his ten months in the islands, but the main point of ornithological interest is his calculation of 89 600 puffins being killed in 1876. Dixon (1885) and Elliott (1895) added several species to the island list and Wigglesworth (1903) treated the resident birds in some detail. The systematic recording

of migrants, which still continues, was started by Clarke and Stout in September and October 1910 and 1911. They recorded 96 species, including 48 for the first time on St Kilda (Clarke 1912a,b).

Harrison and Lack (1934) made the first systematic counts of resident landbirds and counted the gannets in July and August 1931, the year after the human population evacuated the island, and these counts of landbirds and/or gannets and fulmars were repeated in 1939, 1947 and 1949 (Nicholson & Fisher 1940; Fisher 1947; Fisher & Lockley 1954). Several visits by Nature Conservancy staff and others between 1952 and 1956 also produced some population data (Boyd 1960a, 1961; Boyd, Munns & Whitehouse 1956; Boyd, Tewnton & Wallace 1957).

With the establishment of a National Nature Reserve at St Kilda by the Nature Conservancy in agreement with the National Trust for Scotland, the owners, and also

**Table 1. Early visits to St Kilda which produced significant ornithological observations. For later visits see Table 2**

Year	Visitor(s)	Time spent	Source
1697	M. Martin	12 June for three weeks	Martin (1698)
1758–59	Rev K. Macaulay	19 June 1758–July 1759	Macaulay (1764)
1829–43	Rev N. Mackenzie	Resident minister	Mackenzie (1905)
1831	G. C. Atkinson	31 May–2 June	Atkinson (1832)
1840	J. Macgillivray	July	Macgillivray (1840)
1841	J. Wilson	2–3 August	Wilson (1842)
1847	Sir W. Milner	14–15 June	Milner (1848)
1853	O. H. Mackenzie	1–4 June	Mackenzie (1921)
1868	H. J. Elwes	23 May	Elwes (1869)
1875	J. Sands	3 June–19 July	Sands (1878)
1876–77	J. Sands	22 June–22 February	Sands (1878)
1883	R. M. Barrington	Three weeks in June	Barrington (1884)
1884	C. Dixon	4 June for two weeks	Dixon (1885)
1886	H. Saunders	August	in Williamson (1958a)
1886–87	G. Murray	10 June for a year	in Williamson (1958a)
1894	J. S. Elliott	Three weeks in June	Elliott (1895)
1896	R. and C. Kearton	13–24 June	Kearton (1897)
1898	N. Heathcote	Summer	Heathcote (1900)
1902	J. Wigglesworth	Three weeks in June	Wigglesworth (1903)
1905	J. Waterston	11 June–10 July	Waterston (1905)
1910	O. Pike	7 July	Clarke (1912a)
	Duchess of Bedford	23–25 August	Clarke (1912a)
	W. E. Clarke, G. Stout	1 September–8 October	Clarke (1911, 1912a)
1911	W. E. Clarke, G. Stout	2 September–12 October	Clarke (1912a,b)
1914	Duchess of Bedford	23–25 May	Bedford (1914)
1927	S. Gordon	12–19 June	Mathieson <i>et al.</i> (1928)
1930	A. Macrae	27 July	Macrae (1930)
1931	J. Buchan, T. H. Harrison, D. Lack	22 July–14 August	Buchan <i>et al.</i> (1932), Harrison and Lack (1934), Harrison and Buchan (1934, 1936)
1938	R. Atkinson	23 July–9 August	Atkinson (1947, 1949)
1939	J. Fisher, J. S. Huxley, E. M. Nicholson	31 May–2 June	Nicholson and Fisher (1940)

with the building in the same year of a permanent army base, Williamson and Boyd (1960) spent the summer of 1957 on Hirta and produced the most comprehensive account of the birds to date. Communications to the islands improved dramatically and since then migrant birds have been recorded most years by NCC wardens, research workers, army personnel, and members of the National Trust for Scotland (details in Table 2). Although the coverage is most complete from late April to late August, there are six sets of winter records – 1957–58–59 (Boddington & Maclellan 1959; Williamson & Boyd 1960), 1961–62 (Waters 1962a), 1964–65 (D. C. Gwynne, P. Grubb), 1975–76 (D. Neal) and 1977–78 (M. S. Forsyth). Counts of breeding land- or wading birds have been made in 1956 (Boyd *et al.* 1956), 1957 (Williamson 1958a), 1961 and 1962 (Waters 1962b, 1964a) and 1963 (Williamson 1964), and some or most

seabirds in 1956 (Anderson 1957; Boyd *et al.* 1957), 1957 (Williamson 1958a; Williamson & Boyd 1960), 1959–60 (Boyd 1960a, 1961), 1961 (Anderson 1962; Waters 1962b), 1962 (Waters 1962b), 1963 (Williamson 1964), 1968 (Dott *et al.* 1969), 1969 (Birnie 1972; Birnie & Yule 1969; Boyd 1969; J. J. M. Flegg *et al.*), 1972 (Schofield 1975) and 1973 (Dixon 1972).

Since 1973, we have spent the summer on Hirta, and tried to keep a daily census of migrants and, as time allowed, count the breeding birds (Harris & Murray 1977). Unlike previous groups we had unlimited access to Dun by means of a breeches buoy. This made little difference to the recording of migrants, as the bulk of these are always to be found in the village and Gleann Mor, but it enabled us to do more detailed counts of the birds of Dun than was practicable before.

Table 2. Months when ornithological records were made on St Kilda 1947–78 and the main sources of records

	J	F	M	A	M	J	J	A	S	O	N	D	
1947						□							Fisher (in Williamson 1958a)
48							□						Fisher (in Williamson 1958a), Ferguson-Lees (1948)
49					□	□							Fisher (in Williamson 1958a)
51						□							Armstrong (1953)
52						□	□						Boyd (1954), Bagenal (1953)
54								□					Rae (in Williamson 1958a)
55					□	□	□						Boyd <i>et al.</i> (1957)
56						□	□						Boyd <i>et al.</i> (1957), Anderson (1957)
57				□	□	□	□	□	□	□	□	□	Williamson (1958a), Williamson and Boyd (1960), Eggeling (1959)
58				□	□	□	□	□	□	□	□	□	Boddington and Maclellan (1959), Williamson and Boyd (1960), Eggeling (1959)
59	□	□	□	□	□	□	□	□	□	□			Boddington and Maclellan (1959)
60						□	□						W. R. P. Bourne, Boyd (1960b)
61						□	□	□	□	□	□	□	Waters (1962a, b, c), Anderson (1962), Fullagar (1962)
62	□	□	□	□	□	□	□	□	□	□			Waters (1962a, b), J. M. Boyd, M. Smith
63						□	□	□					Williamson (1964)
64					□		□	□	□	□	□	□	Brown and Gregory (1964), Gibbs (1964a, b), Grubb (1965), Gwynne (1964, 1965)
65	□	□	□	□	□	□	□	□	□	□	□	□	Grubb (1965), Gwynne (1964, 1965)
66	□			□	□	□		□		□	□		J. C. Davis, D. C. Gwynne
68				□	□	□	□						M. E. Ball, G. Birnie, R. Broad, J. C. Davis, Dott <i>et al.</i> (1969), H. King, M. Marquiss, R. Tweedle, P. Wormell
69			□		□	□	□						N. Picozzi, Dunrobin School, G. W. V. Birnie, J. J. M. Flegg
70						□	□						D. James, J. J. M. Flegg
71			□	□	□	□	□	□	□				Brathay Exploration Group (1972), E. K. Dunn, C. Rose, D. Stewart, J. J. M. Flegg
72				□	□	□	□	□	□				D. Stewart, J. J. M. Flegg, Authors
73				□	□	□	□	□					R. Brant, D. Haddy, Authors
74				□	□	□	□	□	□	□			P. Lack, J. Watson, G. Wiersema, Authors.
75			□		□	□	□	□	□	□	□	□	H. Brown, H. Insley, D. Neal, M. Sutherland, Authors
76	□	□	□	□	□	□	□	□	□	□		□	H. Brown, D. Neal, K. Taylor, Authors
77				□	□	□	□	□					K. Taylor, W. Wright, C. Brown, Authors
78	□	□	□	□	□	□	□	□					W. Wright, K. Taylor, M. S. Forsyth, Authors
	6	6	9	14	21	25	24	18	12	9	7	6	Total of months

**Material**

1. Our own personal records collected during single two week visits in 1972 and 1973, and longer stays when one or both of us were present on Hirta and Dun, from late April to mid August each year 1974–77 and in May, July, August 1978.
2. A survey of the published data.
3. An unpublished list made in 1957 by K. Williamson, and which formed the basis for the last review of the birds of these islands (Williamson & Boyd 1960).
4. Records in the files of the Nature Conservancy Council in Inverness.
5. Unpublished records solicited directly from people whom we knew had visited the islands, and indirectly by requests for records published in *Scottish Birds* and *British Birds*.

**Methods of counting breeding birds****CLIFF-NESTING SPECIES**

On Hirta and Dun, fulmars, kittiwakes, razorbills and guillemots were counted from the land. Using ropes, it was possible to cover virtually the whole coastline, except for a few small areas at the north tip, the west face of the Cambir and east side of Oiseval. These colonies were counted from a boat. Boats were also used to check that no colonies were overlooked during the land counts. Soay, Boreray and Stac Lee were counted from the sea and during landings which are documented in Table 3. Numbers of fulmars on the south face of Stac an Armin were estimated from an enlargement of a photograph taken from Boreray; although certainly more accurate than any other method for this difficult area, the result was still unsatisfactory.

The units counted were: apparently occupied nest-sites (fulmar), nests (kittiwake) or individual birds on breeding ledges or at boulder colonies (razorbill, guillemot). The dates of counts (all in 1977) were:

**Hirta:**

auks, kittiwakes in late June; fulmars 1–16 July.

**Dun:**

all counted 5–12 June.

**Soay:**

most cliffs counted 12 July, rest on 16 July. Fulmars on the north coast were estimated from sample counts.

**Boreray:**

auks and kittiwakes were counted 30–31 May and on 6 July, fulmars on 6 and 13 July. The figures for the north-east coast were estimates based on sample counts and the area was inadequately covered.

**Stac Lee and Stac an Armin:**

counted 30–31 May and 18 June and (fulmars) from a photograph taken 13 July.

**Soay Stac, Stac Biorach:**

where possible, counts were made during the coverage of Hirta, and hidden faces were counted from the sea on 12 July.

**Levenish:**

counts were made 12 July 1975.

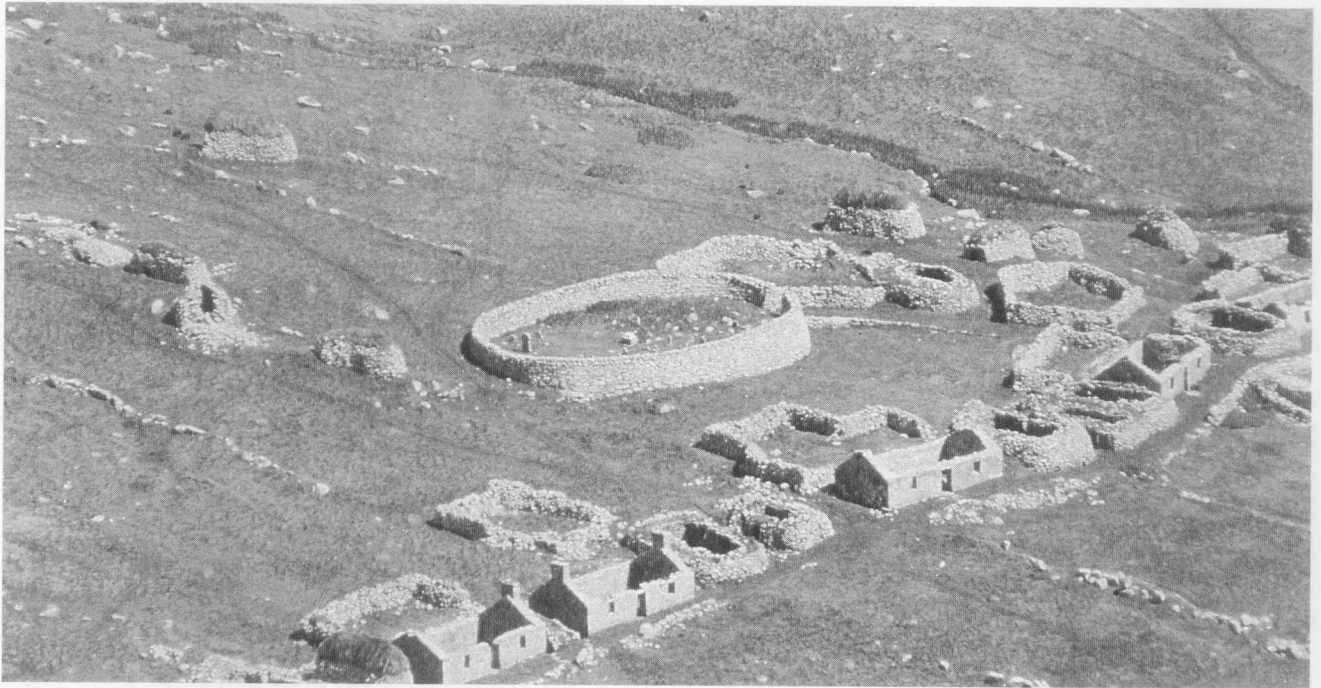
The counts of Hirta and Dun are considered to be as accurate as possible. However, they were only single counts and so are of unknown accuracy. The counts of the other islands and stacs were made under more rushed circumstances and the figures presented should not be treated too literally, but rather as orders of magnitude. However, we think that they are at least as good as previous estimates as we had more time available than had earlier counters, calm weather, and a good knowledge of the cliffs and colonies based on many circumnavigations in previous years.

**OTHER SPECIES**

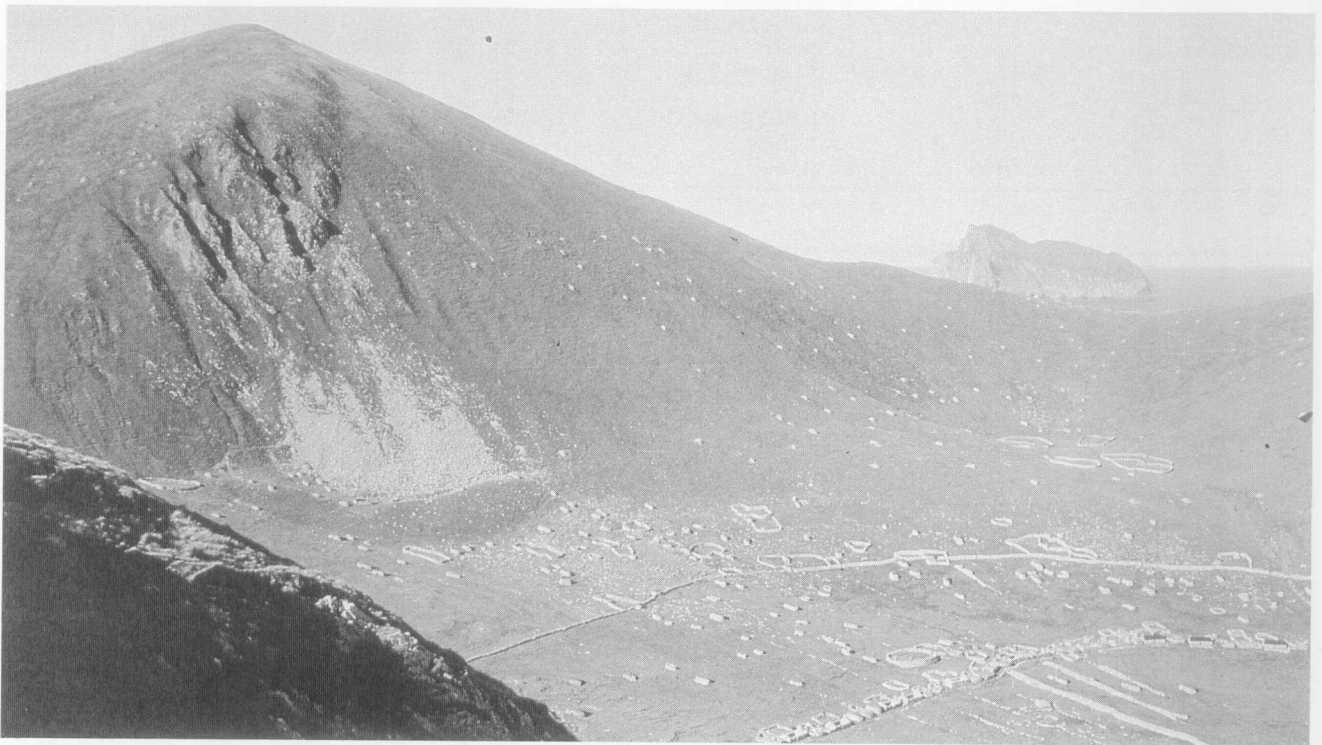
Nests of great black-backed and herring gulls, great skuas and oystercatchers, and singing or food-carrying wheatears were plotted on a 1:10 000 map. Nests in the Gleann Mor gull colonies were counted by up to six observers walking in parallel lines to and fro through the colony. No estimates were made of the numbers of nocturnal shearwaters and petrels, and the distributions given are based on many nights spent mist-netting on Dun and at various points on Hirta. A single night was spent netting on Boreray.

**Table 3. Summary of landings on Soay, Boreray and the Stacs 1930–77. Details from Williamson and Boyd (1960), Lack (1930), Weir (1969), Boyd (1960b), Brathay (1972). Where several or many people landed only the names of the ornithologists are given**

Year	Date	Place	Remarks	Year	Date	Place	Remarks
1931	31 July	Boreray	T. H. Harrison plus 1 for a few hours		May	Stac an Armin	J. M. Boyd, R. Balharry, C. Welsh to summit
	7 August	Soay	T. H. Harrison, D. Lack plus 4 for a few hours				
1932	?	Soay	Marquis of Bute and a party of St Kildans removed some sheep	1971	11–13 July	Boreray	M. L. Brooke and 4 others from Brathay Exploration Group and Atlantic College spent one night
1939	2 June	Boreray	E. M. Nicholson, J. Fisher, J. Huxley for a few hours		17 July	Boreray	Six people removed some sheep
1947	June	Boreray	J. M. Naish		18 July	Boreray	18 shore
1951	?	Boreray	A. Ferguson and Harris fishermen attempted to take off sheep		17–18 July	Soay	M. L. Brooke and 5 from Brathay Group and Atlantic College for a night
1956	June	Boreray	J. M. Boyd and others from Glasgow University Expedition, a very short visit		19 July	Soay	M. L. Brooke plus 1 for an afternoon
	June	Soay	J. Wilson for 1½ hours		19 July	Stac an Armin	C. Milner and 2 for an afternoon; went to summit
1959	13 May	Stac an Armin	J. M. Boyd, D. A. Ratcliffe, D. G. Boddington to summit	1974	29 May	Boreray	S. M., H. McInnes, M. Antoine for 2 hours
	14 May	Soay	J. M. Boyd for 1 hour	1975	5 July	Boreray	M. P. H., D. Neal, H. Brown and 10 others for 5 hours
	21 May	Boreray	J. M. Boyd, D. G. Boddington for 2 hours				
	22 May	Levenish	J. M. Boyd				
1960	16–19 May	Boreray	J. M. Boyd plus 2 – overnight		12 July	Levenish	M. P. H., S. M., D. Neal, H. Brown for 45 minutes
1963	6 May–8 June	Boreray	J. M. Boyd, R. N. Campbell – four visits of a few hours		13 July	Soay	M. P. H., S. M., H. Brown plus 4 for 2 hours
	1 May	Soay	R. N. Campbell, P. A. Jewell, for a few hours	1976	3 July	Boreray	M. P. H. and 12 others for 1 hour
1964	early June	Boreray	W. J. Eggeling, R. N. Campbell for a few hours		18–19 August	Boreray	S. M., K. Taylor overnight
1965	8–10 July	Boreray	D. C. Gwynne plus 2 for 2 nights		19 August	Stac Lee	S. M., G. and D. Tiso to first gannet ledges
1966	July	Soay	D. C. Gwynne, A. Warwick by helicopter for 2 hours	1977	31 May	Stac Lee	S. M. to summit
1967	summer	Soay	M. Robson by helicopter for 2 days		18 June	Stac an Armin	S. M., K. Taylor, W. Wright plus 4 for 4½ hours
1968	May	Stac Lee	J. M. Boyd, R. Balharry to the summit		6 July	Boreray	S. M., W. Wright plus 6 for three hours
					12 July	Soay	S. M., K. Taylor, W. Wright, 3 others for 3 hours
					13 July	Stac Lee	S. M. plus 3 to first gannet ledges
						Boreray	S. M. plus 14 others
					14 July	Boreray	S. M. plus 5 for 4 hours
						Boreray	S. M. plus 14 others
					14 July	Boreray	S. M. plus 5 for 4 hours



*Plate 2 Part of the village on Hirta in 1975 showing the ruined modern houses (built in the 1860s) interspersed with the black houses they replaced, and the circular walled graveyard behind. The edges of the long-abandoned field systems can still be traced by the lines of boulders. Despite the sparseness of the vegetation this area attracts most of the migrant and vagrant passerines which visit the islands. (Photograph M. P. Harris)*



*Plate 3 Village Glen as seen from the south-west in 1975 with Boreray showing above The Gap. The main peak of Conachair (430 m) looms over the boulder scree of Glacan Conachair at its base. The main street and the boundary wall around the village are clearly visible. The dots on the hillside are stone cleits which the St Kildans used to dry turf and store food. This glen has high concentrations of nesting snipe, oystercatchers and wheatears. (Photograph M. P. Harris)*



## Conclusions

### Breeding species

#### SEABIRDS

St Kilda is one of the most important seabird stations in the North Atlantic, with maybe half a million breeding pairs. However, only five of the 16 species (Table 4) occur in large enough numbers for the populations to be considered important in a British context. By far the most important is the gannet, as about 37% and 25% of the British and North Atlantic populations are on Boreray and its Stacs (Cramp, Bourne & Saunders 1974). The 300 000 pairs of puffins constitute about half the British total, but the Icelandic and Norwegian populations, although of a different race, are several times larger. Even following the dramatic spread of the fulmar, St Kilda is still the single largest colony, with some 13% of the British birds (Cramp *et al.* 1974). No estimates are available for the numbers of the nocturnal petrels, but the islands must have one of the largest concentrations of storm petrels in Britain and are one of the very few colonies of Leach's petrel in the eastern Atlantic which can rank with those in North America.

During the last century, the inhabitants of St Kilda killed large numbers of seabirds for food and feathers. Mackenzie (1905) estimated annual harvests of 12 000 young fulmars (from 20 000 hatched), and 2000 young and 2000 adult gannets, while Sands (1878) calculated 89 600 puffins killed in 1876. Lesser numbers of other species were also taken. Clarke (1912a,b) was told that 9600 young fulmars were salted down in 1910. By then the islanders depended less on birds for food. The human impact dwindled to nothing before the evacuation of the people in 1930. This relaxation of predation was soon followed by an increase in the numbers of fulmars (Harvie-Brown 1912) which continued at least until the 1940s. The population was considered to have been stable from then until 1969 (Cramp *et al.* 1974), but the 1977 figures for the easily counted Hirta and Dun are so much higher than previous estimates as to suggest a real increase. The totals for Hirta and the whole archipelago indicate a gradual but significant increase for the last few decades. The increases in both gannets and fulmars are presumably due to an improvement in the environment (or the capacity of the species to cope with the environment) as much as to the cessation of predation, as all British populations have been, and are still, expanding (Fisher 1952; Cramp *et al.* 1974). The majority of the puffins on Hirta disappeared sometime between 1947 and 1957–60 and the population on Dun possibly declined slightly later (Harris & Murray 1977). Those changes were probably caused by fluctuations in the food available near the breeding colonies (Harris 1976; Harris & Hislop 1978). The puffin population on Dun increased slightly in the period 1974–76 but declined again by 1978.

The number of nesting great black-backed gulls increased following the 1930 evacuation, for the species was persecuted by the St Kildans, but has remained constant since the 1950s. Lesser black-backed gulls also increased in the 1950s; since then there have been great variations in the population estimates, though with no obvious long-term trend. In contrast, the numbers of herring gulls have remained stable for the last 50 years. This stability contrasts with most other British populations which have increased rapidly, probably due to food made available by man (Harris 1970; Monaghan & Coulson 1977). Herring gulls on St Kilda raise their young on food obtained 'naturally' on the shore and in seabird colonies, and seldom scavenge around the Army camp where little waste food is available to them.

Difficulties in making counts of known accuracy of the cliff-nesting species make any assessment of recent changes difficult. However, guillemots have increased significantly since 1969 and far more razorbills were counted in 1969 and 1977 than ever before. The totals of kittiwake nests in 1959 and 1977 were not significantly different, but both were significantly lower than Boyd's 1969 estimates. Either there was a big increase and then a decline or the 1969 counts were too high.

#### WADERS AND WATERBIRDS

Oystercatchers are now very common, following two increases, the first between 1939 and 1947 when the species colonized the inland parts of Hirta, and the second between 1962 and 1963. Snipe were uncommon prior to 1930, but have since increased greatly. The reason is not clear. In the village human activity may have kept them away, but would not have prevented nesting in Gleann Mor and elsewhere. Although whimbrel were not definitely proved to breed until 1964, they could well have nested much earlier; e.g. Waterston (1905) was told that eggs had been collected. There seems plenty of suitable habitat for golden plover, and possibly also redshank and dunlin, but no other species would be expected to nest regularly.

#### LANDBIRDS

Only seven species are now breeding annually (Table 4), the lowest total since records began. Twite and tree sparrow bred occasionally up to 1971, and peregrine was a regular breeder up to 1939. If the corn bunting was once a regular nesting species it died out soon after the deterioration of agriculture (Williamson & Boyd 1960). The range of habitat available is so restricted that it is difficult to see which other species could find an

ecological niche. However, it is surprising that there is now no raptor, and that owl, swallow or wagtail have never attempted to breed. They certainly reach the island regularly, but rarely stay long. Perhaps there are too few insects for insectivorous birds, although elsewhere owls feed on storm petrels and other seabirds.

#### MIGRANTS

The many interesting birds seen and collected by G. Stout and Eagle Clarke in September–October 1910 and 1911 gave St Kilda a reputation as a good place to study migration, or rather a good place to see rare birds. However, regular observations, started with the re-inhabitation of the island in 1957, showed them to have been very lucky and those months must be regarded as exceptional (Williamson & Boyd 1960). A total of some 186 migratory species (including some, like wheatear, which also breed) have been recorded, but, of these, 57 have been recorded only two to five times, and 37 only once. Even in the best year for variety (1977), only 113 species, including breeding birds, were recorded. Owing to the isolated position of the islands, the only regular migrants are the relatively few species which

nest in Iceland and Greenland. In spring, wheatear, meadow pipit, white wagtail and geese are common and there are usually a few ducks, swans, merlin, dunlin, redshank and common gulls. In autumn, the same three passerines and redwings are common, and there are usually a few ringed plover, dunlin, sanderling and ruff. Most other species can be regarded as lost individuals, either overshooting mainland Britain during their spring migration (e.g. hirundines, warblers, chats, spotted flycatcher), or being drifted westwards towards the open Atlantic by easterly winds with overcast skies in the autumn (e.g. willow warbler, pied flycatcher, the less common warblers). The five American species, Baird's sandpiper, evening grosbeak, grey-cheeked thrush, American robin and water pipit, were obviously completely lost. Other species will presumably be added to the island list in the future (there have been 42 additions since the 1959 list of Boyd & Williamson), but there are unlikely to be any other regular landbird migrants. However, there is little information on seabird migration, and skuas, shearwaters and terns could well turn out to be regular visitors offshore.

**Table 4. Status of breeding birds based on records of the last 30 years**

	Annual (year of colonization if known)	Irregular or rare in period (no. of records, p = probable)	Bred in earlier years (p = probable)
<i>Seabirds</i>	Fulmar Manx shearwater Storm petrel Leach's petrel Gannet Shag Eider Great skua (1963) Great black-backed gull Lesser black-backed gull Herring gull Kittiwake Razorbill Guillemot Black guillemot Puffin	Common gull (1)	Cormorant (p) Great auk
<i>Waterbirds/waders</i>	Oystercatcher Snipe Whimbrel (1964)	Teal (1) Golden plover (2) Redshank (p) Red-necked phalarope (1)	
<i>Landbirds</i>	Raven Hooded crow Wren Wheatear Meadow pipit Rock pipit Starling	Kestrel (1) Skylark (1) Stonechat (1) Twite (10) Tree sparrow (4)	White-tailed eagle Peregrine Corncrake Rock dove Song thrush Corn bunting Snow bunting

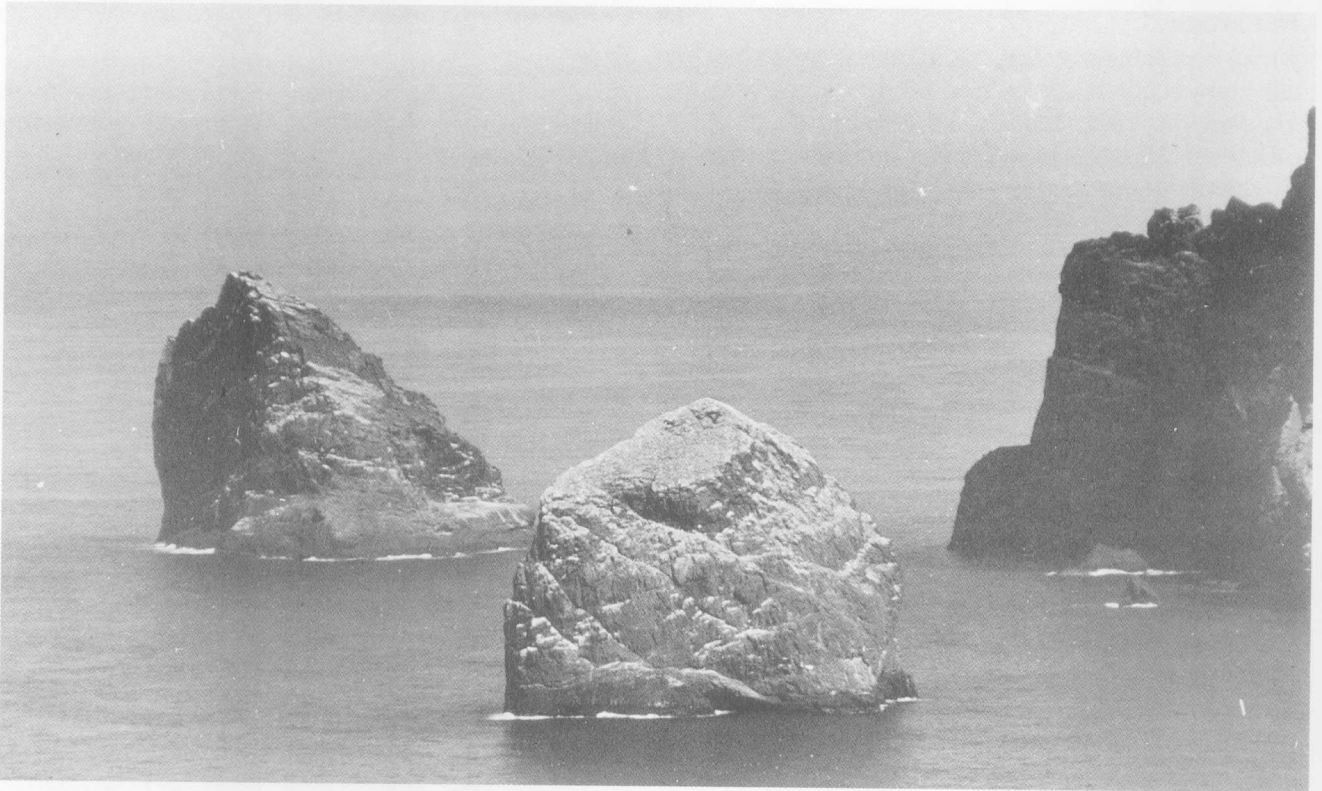


Plate 4 *Stac Lee (centre) flanked by Stac an Armin (left) and Boreray showing the dense concentration of gannets (estimated at 6300 pairs in 1959) on the summit platform. (Photograph M. P. Harris)*



Plate 5 *Boreray, Stac an Armin (left) and Stac Lee (centre) viewed from the slopes of Conachair on Hirta. (Photograph M. P. Harris)*

### The future

All the populations of seabirds appear to be flourishing but more accurate, or at least more regular, data are required on most species. At best, such data for cliff-nesting guillemots, kittiwakes and razorbills will be difficult, time-consuming and expensive to obtain. At worst, data may prove impossible to collect. The increase in industrial fishing and the possibility of deep-sea oil drilling in the seas between the Hebrides and Rockall are both threats to the well-being of these important seabird colonies. Some scheme to check at least periodically some of the main seabird colonies should be instigated. However, a far more likely danger to those on Hirta and possibly Dun is that rats may be introduced with the increasing boat contact with the mainland. Indeed, it is surprising that rats have not already arrived. Rats would threaten the burrow-nesting species and the only landbird of any consequence, the well-marked endemic subspecies of wren.

### Systematic list

To avoid cluttering the text and so making it unreadable, sources of records are not given for a species which has been recorded four or more times, or when one of us saw the bird. Sources of numerical or distributional data are also given when this is not apparent from the context. For published data, just the name of the author is given; for unpublished records, the initials are added. Sources can be traced by reference to Tables 1 and 2 and the bibliography, but the main population data come from the following sources.

Year	Dates	Reference
1931	22 July–14 August	Harrisson and Lack (1934)
1939	31 May–2 June	Nicholson and Fisher (1940)
1947	10–13 and 16–19 June	Fisher (1948)
1955	23–30 May	Boyd <i>et al.</i> (1956)
1956	19 June–11 July	Boyd <i>et al.</i> (1957)
1957	All summer	Williamson (1958a), Williamson and Boyd (1960)
1959	May	Boyd (1960a)
1961–62	All summer	Waters (1962a)
1963	22 June–9 July	Williamson (1964)
1968	13–25 July	Dott <i>et al.</i> (1969)
1969	May–July	Birnie and Yule (1969), J. J. M. Flegg <i>et al.</i> (unpubl), Boyd (1969)
1974–78	April–August	This study

All pre-1957 records have been documented by Williamson (1958a) but we have attempted to trace records back to their original sources. This has proved impossible for some recent records in the Nature

Conservancy Council files and these are credited to NCC.

All records of migrants refer to Hirta unless otherwise stated. Scientific names and systematic order follow Voous (1973, 1977).

#### Red-throated diver *Gavia stellata*

Recorded 1 August 1964 (Brown & Gregory), 13 September 1965 (D. C. Gwynne), and at sea off Hirta 24 May 1976 (R. Tulloch).

#### Black-throated diver *Gavia arctica*

One on 28 November 1975 (D. Neal).

#### Great northern diver *Gavia immer*

Although most of the 22 records are in the summer months, it has been noted throughout the year. Two birds summered in 1961.

#### Slavonian grebe *Podiceps auritus*

Recorded 6 May 1966, June 1973, 9 September 1958, 4–14 October 1961, 10–20 October 1911, and 11–17 November 1961. A small grebe seen 12–17 September 1961 was probably this species.

#### Fulmar *Fulmarus glacialis*

Abundant as breeding bird, but only few birds usually present November to January.

In 1977 we counted 25 175 occupied nest-sites on Hirta and the Soay Sound stacks and 6940 on Dun. We were surprised at the latter high figure but can think of no peculiar circumstances producing it. Less accurate estimates for the other islands were 4300–6300 on Soay, 2000–3500 on Boreray, 50 on Stac Lee and 2000 on Stac an Armin. There were 12 pairs on Levenish in July 1975. Details of the counts are compared with previous counts in Tables 5 and 6. There has been a significant increase in the number on Hirta and the whole archipelago in recent years (counts in Tables 5 and 6, correlation coefficients significant  $P=0.01-0.05$ ). Some of the differences between individual area counts in 1956, 1961 and 1977 are probably due to the movement of birds as some colonies have obviously declined or virtually disappeared (e.g. area 3–4 on the cliffs on the western flank of Ruaival), whereas others have expanded (e.g. area 1–2 from the village to Dun Gap). Although some few pairs have nested high up on the cliffs of Mullach Bi overlooking Glen Bay since the early 1950s and a pair bred on a cleit in Gleann Mor in 1977, the species has not colonized inland or even low sea cliffs on Hirta as has happened elsewhere in the Hebrides and Shetland Isles.



*Plate 6* Until 1878, St Kilda had the only breeding colony of fulmars in Britain. Even now after the species has colonized most of the coastline of Britain, St Kilda still has the largest single colony estimated at c.44 000 pairs in 1977. (Photograph M. P. Harris)



*Plate 7* The head of a fulmar showing characteristic tubular nostrils. The St Kildans regarded the fulmar as the most useful seabird and killed up to 12 000 young a year. (Photograph M. P. Harris)

**Table 5. Counts of apparently occupied nest-sites of fulmar on Hirta and its stacs. Areas are those of Anderson (1957) and these are shown in Figure 3**

Area	13-18 July 1956	12-23 July 1961	15-21 July 1968	28 June- 10 July 1969	1-16 July 1977	Area	13-18 July 1956	12-23 July 1961	15-21 July 1968	28 June- 10 July 1969	1-16 July 1977
1-2	15	57	99	153	130	18-19	50	?	48	80	323
2-3	63	39	39	44	91	19-22	2340	3334	3626	4304	4702
3-4	170	81	47	74	0	22-23	665	1158	861	900	1363
4-5	310	249	205	275	294	23-24	1600	918	209	85	1246
5-6	540	368	276	242	699	24-25	0	0	10	0	0
6-7	75	67	56	116	296	Inland					
7-9	1150	2847	3161	1856	3624	Gleann Mor	?	?	14	12	few
9-10	775	464	705	502	1132	Hirta total	19040	19354	22691	19644	24350
10-11	160	100	383	588	1146	Mina Stac	110	168	255	170	200
11-12	1100	918	997	974	814	Brada Stac	265	194	302	373	259
12-13	450	193	426	327	374	Stac Biorach	?	?	11	?	43
13-14	95	58	45	73	c.50	Soay Stac	?	?	115	?	323
14-15	82	56	72	56	55						
15-16	670	654	456	461	483						
16-17	3030	1400	1594	1575	988						
17-18	5700	6393	9362	6959	6549	Total	19415	19716	23374	20187	25175

Note: Sources – Anderson (1957, 1962), Anderson and Birnie (unpubl.), Birnie and Yule (unpubl.) and present survey.

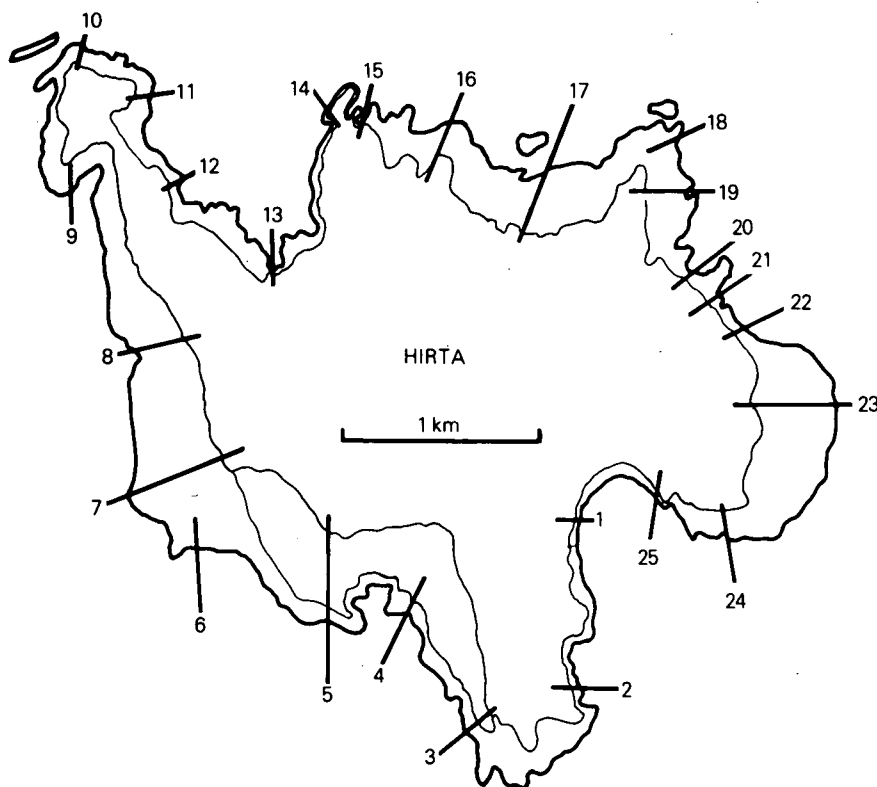
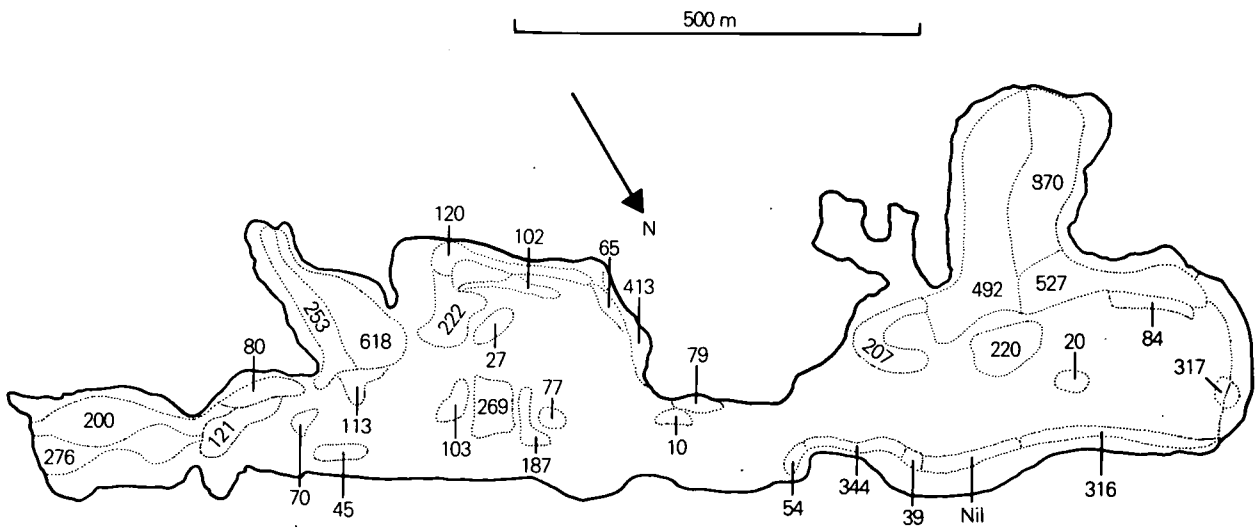


Figure 3. Lines demarcating areas of coast on Hirta where fulmars have been counted 1956-77 (see Table 5) After Anderson (1957)

**Table 6. Counts of apparently occupied nest-sites of fulmars on St Kilda**

Year	1931	1939	1949	1956	1961	1968	1969	1977
Date	22 July– 13 August	2 June	19 May	13–18 July	12–23 July	15–21 July	28 June– 10 July	1–16 July
Hirta				19040	19354	22691	19644	24350
Stac Biorach						11	12	43
Soay Stac						115	160	323
Brada Stac				265	194	302	373	259
Mina Stac				110	168	255	170	200
Hirta & Stacs total		11770	19943	19415	19716	23374	20359	25175
Levenish								12
Dun		1610	3600	[3360]	[2450]	2057	2417	6940
Soay		4500	7550					6300
Boreray		2500	5600					3500
Stac Lee			35					50
Stac an Armin		400	1450					2000
Total for whole group	25500	20780	38178	(c.37000)	(c.38000)	(c.42720)	(c.36600)	43977

- Notes: 1. The 1949 Soay total includes Stac Biorach and Soay Stac.  
 2. The 1956 and 1961 totals for Dun are from Cramp *et al.* (1974) and are double the actual counts to allow for unseen birds.  
 3. The 1969 figures are from Birnie and Yule (unpubl.) which differ by c.600 from the totals in Cramp *et al.*  
 4. The totals for the whole island group 1956–69 are estimated from partial counts, i.e. Soay, Boreray and the Stacs were not counted.  
 5. Sources, 1931 (Harrison in Fisher 1952), 1939 (Nicholson & Fisher 1940), 1949 (Fisher 1952), 1956 and 1961 (Anderson 1957, 1962), 1968 (Anderson & Birnie unpubl.), 1969 (Birnie & Yule unpubl.) and 1977 (present study).



**Figure 4. Counts of apparently occupied nest-sites of fulmars on Dun in 1977**

**Great shearwater** *Puffinus gravis***Sooty shearwater** *Puffinus griseus*

Rarely seen from land but both species are not uncommon at sea around the islands. Extreme dates 16 June (sooty) and 19 June (great) and 12 October (both species).

**Manx shearwater** *Puffinus puffinus*

Breeds; adults present on land from March to September. There are few concentrations of breeding birds, notably at Carn Mor and on the steep coastal slopes to the north and south, the high slopes of Oiseval, boulders on the west side of Gleann Mor and above the Gap to Mol Ghiasgar. A few hundred pairs on Dun. Unknown but possibly large numbers nest on Soay. Presumably breeds on Boreray but relatively few birds have been recorded and none in burrows. No concentrations have been seen at sea and the total population is probably not very large.

**Storm petrel** *Hydrobates pelagicus*

Breeds; adults present early May to early November. It is more widespread than the previous species but individual colonies are probably smaller. Missing from some apparently suitable areas, e.g. boulder scree at Glacan Conachair. Abundant on Soay (Brathay) and common on Boreray; the total population must be extremely large.

Ringling has shown movements of storm petrel between St Kilda and colonies on Fair Isle (10 birds), Foula (6), Fetlar (4), mainland Shetland (2), Orkney (1), Summer Isles (7), Sule Skerry (1), and islands off Co Kerry (1) and Co Donegal (1).

**Leach's petrel** *Oceanodroma leucorhoa*

Breeds in large numbers; adults present late April until early November. The densest concentration on Hirta was at Carn Mor, also recorded both sides of the Cambir, east side of Aird Uachdarachd and Gleann Mor. The colony on Dun is probably much larger than any on Hirta. Also large numbers on Soay and Boreray, a few pairs on Levenish and an unknown number on Stac an Armin.

**Gannet** *Sula bassana*

Breeds on Boreray, Stac Lee and Stac an Armin; adults present from late February to November. The colonies are by far the largest of this species and the population is increasing, counts being 21 300 adults (?16 500 pairs, Wynne-Edwards *et al.* (1936), 16 900 pairs (1939), 17 035 pairs (1949), 44 526 (1959), 52 099 (1969) and 59 258 pairs (1973) (Boyd, Dixon).

**Cormorant** *Phalacrocorax carbo*

Probably bred last century as Mackenzie said there were two species of cormorants breeding 1829–43. Macgillivray and Milner also recorded it in the 1840s, the latter claiming to have obtained eggs. Clarke saw a number in September–October 1910 and 1911. Since then the only records have been in February (1), April (1), May (3), July (1) and August (1).

**Shag** *Phalacrocorax aristotelis*

Breeds; some birds present throughout the year but most birds leave after the breeding season and return in February.

By far the largest colony is among the boulders on Dun. This was estimated at several hundred pairs in 1956; 600 pairs in 1969. 134 and 144 nests were found in May 1975 and 1977. Nests are harder to find on Hirta where estimates have been c.100 pairs in 1931, 200+ pairs in 1956 and 10 in 1969; in 1968 only 82 birds were counted on Hirta and the population was probably less than 100 pairs in 1974–77. Also breeds on Boreray and Soay.

**Grey heron** *Ardea cinerea*

A fairly regular visitor, being reported most years and months – January (one record), February (1), April (4), May (5), June (5), July (8), August (10), September (5), October (1), November (3), usually singles, rarely two together and once a group of five. Many birds remain and die on the island.

**Mute swan** *Cygnus olor*

Six in Glen Bay on 22 April 1972, eight on 1 May 1972 (NCC).

**Whooper swan** *Cygnus cygnus*

Frequent in small numbers (rarely to 12) in April and May. Occasional birds in June and July may be late migrants or, as in 1971, injured birds. Single on Dun 27 July 1972. One overwintered 1977–78. Also recorded in October (twice), November (once) and December (once).

**Bean goose** *Anser fabalis*

One bird 14–24 September 1957 was later joined by two others, all remained until late in the winter (Williamson). One bird 16–17 June 1974.

**Pink-footed goose** *Anser brachyrhynchus*

Probably a commoner spring visitor than the 16 records between 13 April and 14 May suggest. The maximum count was 150–200 on 22 April 1972. A few in October 1958, one 28–30 September 1965, one 7–8 October 1959 and one for two weeks in December 1975. A single bird summered in 1977.





Plate 8 Adult and young gannets. (Photograph M. P. Harris)

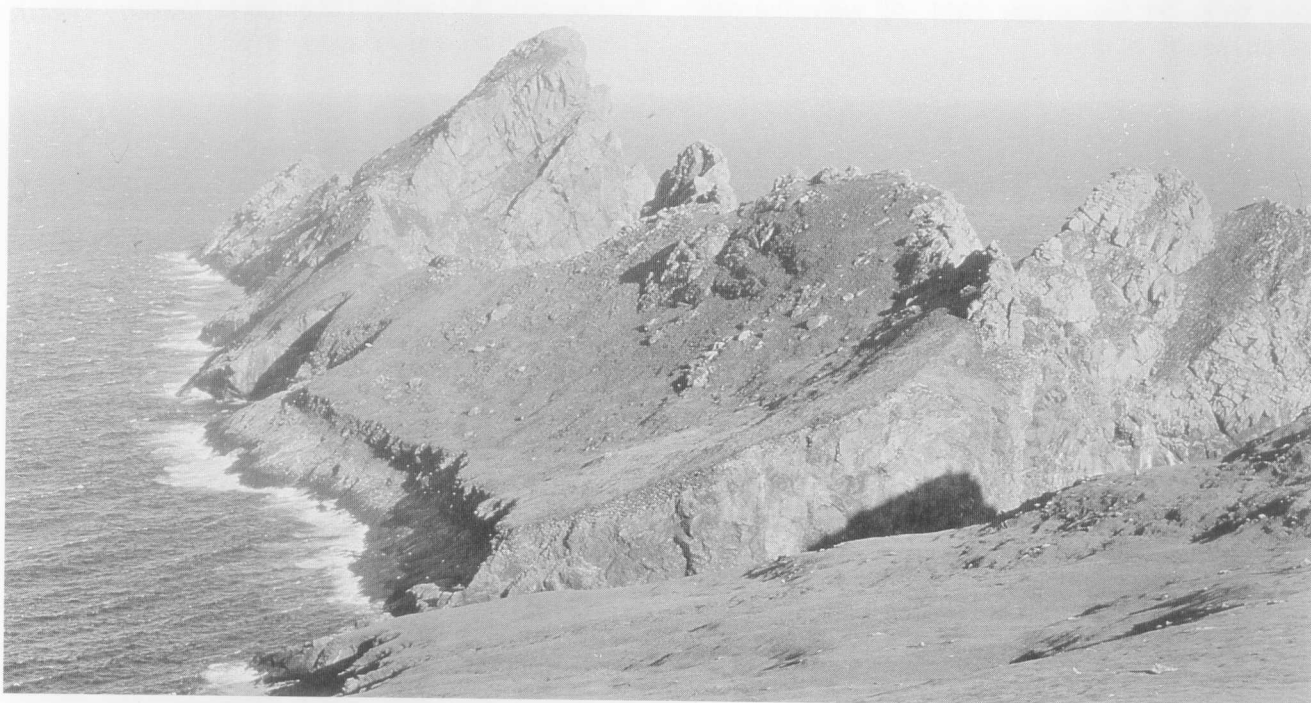


Plate 9 The whole length of Dun as seen from Ruaival, Hirta. The densest puffin colony is on the north (left) slope of the summit. Most razorbills and shags nest among the boulders near the tip of the island, fulmars breed on all the steep slopes whereas most guillemots and kittiwakes breed on the sheer southern cliffs which are mostly hidden. (Photograph M. P. Harris)

**White-fronted goose** *Anser albifrons*

Three hundred on 29 April 1973, two on 28 April 1966 and single birds 19 April 1972, 25–27 April 1975, June 1895, 12–13 November 1958 (*A. a. flavirostris*).

**Greylag goose** *Anser anser*

Small numbers (maximum 50–60) recorded many springs between 12 April and mid May; usually rare in autumn and winter but one or two from 27 October 1964 to 31 March 1965. Single birds in July 1948, during most of June 1962 and from early December 1977 to 28 April 1978. A flightless bird was on Boreray 12–13 July 1971.

Other records of overflying geese in April and May presumably refer to this and/or pink-footed goose.

**Canada goose** *Branta canadensis*

Two 25 May–10 June 1975 and one 12 July 1975.

**Barnacle goose** *Branta leucopsis*

Flocks (maximum 270) are seen most springs between 19 April and 24 May. One early December 1977 to 28 April 1978. Other singles on 19 December 1958 and 4 March 1976, and two on 15 March 1976.

**Brent goose** *Branta bernicla*

Recorded 4–20 May 1975, 9 May 1977, 10 June 1957, June 1898, 21 September 1911. All were the pale-bellied race *B. b. hrota*.

**Shelduck** *Tadorna tadorna*

One overwintered 1977–78 (M. S. Forsyth), singles 11–20 July 1959 (MacLellan) and 29 July 1964 (Brown & Gregory).

**Wigeon** *Anas penelope*

An uncommon visitor, usually in April and May, maximum six on 22 April 1968.

**Teal** *Anas crecca*

A pair hatched young in Gleann Mor in 1974 but none fledged.

Small numbers occur in most years, especially in May.

**Mallard** *Anas platyrhynchos*

An uncommon visitor in small numbers at all times of year.

**Pintail** *Anas acuta*

Singles on 30 August 1958, 14 September 1910, 7 October 1911, and two on 30 April 1958 and 22 September 1959.

**Shoveler** *Anas clypeata*

Male 23–26 May 1976.

**Pochard** *Aythya ferina*

Four records: 5 May 1972 (2 birds), 8–13 May 1976 (1), 7 June 1976 (2) and 22 June 1973 (1).



Plate 10 The cliffs of Conachair and Mina Stac as seen from Glacan Mor. The 300 m high slopes of Aird Uachdarachd (in the left half of the picture) were described by James Fisher in 1947 as having one of the six largest puffin colonies in Britain. Today there are few puffins here. (Photograph S. Murray)

**Tufted duck** *Aythya fuligula*

First recorded in 1958, with 16 records since. Most common 10–31 May, with some birds remaining into June/July. Single autumn record on 17 September 1961.

**Scaup** *Aythya marila*

Five records in April–May and one in July. Birds sometimes remained for up to two weeks.

**Eider** *Somateria mollissima*

Breeds; the few birds present between late August and mid February may be winter visitors rather than residents. Our own and previous counts of adult birds suggest that the population has remained at about 50 breeding pairs from 1961 to 1977. The main concentration of nests is on Dun.

**[King eider** *Somateria spectabilis*

Dixon recorded two pairs in June 1884 but they may have been immature eiders as he thought they were breeding in Dun.]

**Long-tailed duck** *Clangula hyemalis*

Uncommon visitor between October and December. Four spring records with one bird remaining until 1 June, and one 20 June 1977.

**Common scoter** *Melanitta nigra*

A total of 11 records between 20 April and 20 October.

**Velvet scoter** *Melanitta fusca*

Three records 27 July–1 August 1961 (Waters), 16 April 1972 (NCC) and 14–28 July 1975.

**Goldeneye** *Bucephala clangula*

Recorded 21 April 1976, 1–28 April 1975, 8–16 May 1977, 12 May–2 June 1978, 3 June and 13 September 1974, and 10–18 October 1961.

**Red-breasted merganser** *Mergus serrator*

Said to have bred last century (Seebohm). Frequent visitor between May and July, and October to November, rare at other times. Most records refer to single birds but there were up to nine in May 1975. Scattered records of a male and a female in 1976 probably referred to a summering pair.

**Goosander** *Mergus merganser*

Males on 26 April 1973 (R. Brant) and 7–8 May 1977, a female 8–16 May 1977.

**White-tailed eagle** *Haliaeetus albicilla*

Apparently bred in the 17th, 18th and possibly early 19th centuries.

**Marsh harrier** *Circus aeruginosus*

Single 24 May 1975 (C. J. Hendriks).

**Hen harrier** *Circus cyaneus*

Single 6 May 1975 (NCC).

**Buzzard** *Buteo buteo*

Singles 24 August 1958 (Eggeling) and 20 April–20 June 1976.

**Golden eagle** *Aquila chrysaetos*

Single records in five years 1955–76, all between 22 April and 26 May.

**Osprey** *Pandion haliaetus*

Single 29 March 1965 (Gwynne).

**Kestrel** *Falco tinnunculus*

Probably bred in 1952 as Bagenal and Boyd saw a male, a female and two others they thought were juveniles 27 July–10 August. Also it probably was one of the two species of hawks nesting on the cliffs 1829–43 (Mackenzie).

Since 1952, it has been a rare summer visitor with ones or twos being recorded on only a few days in 14 years. Most records are in May. Seen on Boreray in 1960 (Boyd).

**Merlin** *Falco columbarius*

One or two recorded most springs from the start of observations to late May and in many autumns. A pair on 7 June 1969 and one 21 June 1973. The occasional bird overwinters, e.g. 1964–65.

**Peregrine** *Falco peregrinus*

Up to the early part of the century there were usually 2–3 pairs nested with eyries on Dun, Hirta, Soay and Boreray. Two pairs were present on Hirta in 1931 and 1939, and birds seen in June–July 1947, 1948 and 1956 and in late May 1955 could have been breeding. Recorded on seven dates March–July 1962 but breeding was not suspected. Since then the only records have been 11 June 1963, November 1964–February 1965, 18 March, 17–20 April and 28 May (calling) 1965, 3 June 1969, 15 May 1972, 23 June 1977 and 10 August 1978.

**Gyr falcon** *Falco rusticolus*

Recorded in spring 1910 (Clarke) and 1 December 1964–24 January 1965 (Grubb & Gwynne). An immature landed on a trawler 65 km west of the Outer Hebrides 16 February 1973 (R. H. Denis in Smith).

**Red grouse** *Lagopus lagopus*

Singles 5 December 1959 (Mackay) and 21 July 1970 (M. Hornung).

**Ptarmigan** *Lagopus mutus*

One undated record before 1841 (Wilson).

**Quail** *Coturnix coturnix*

Singles 20–21 May 1959 (Boddington), 13 May 1965 (D. C. Gwynne) and 29 July 1965 (Grubb).

**Water rail** *Rallus aquaticus*

Two spring records 18–19 April 1968 and 20 May 1957; otherwise 24 October 1958–18 January 1959, 3 November 1903, December 1961–January 1962 and a late autumn migrant reported by Clarke.

**Corncrake** *Crex crex*

Probably bred the first half of last century but was not recorded between 1841 and 1915 when chicks were found; this is the only definite breeding record (Clarke).

The species was not recorded in 1931 but may have bred since as birds were heard calling 1938, 1939, 1947, 1952, 1955, 1963 and 1965 (late June–9 July on Dun). Since 1965 the only records are 10–11 April 1968, 3 June 1969, and 16 and 28 May 1977.

**Moorhen** *Gallinula chloropus*

Singles 13–22 May and 13 September 1957, 20 August 1975 and 7–9 April 1977.

**Coot** *Fulica atra*

Singles recorded 24 September 1910, 21 October 1964, 12 November 1902, 5 February and 17–20 May 1965.

**Oystercatcher** *Haematopus ostralegus*

Breeds; adults present from late February to late August with migrants at other times. In 1974 there were 48 pairs on Hirta with marked concentrations in Village Glen (9 pairs), Gleann Mor and the Cambir (Figure 5), and three pairs on Dun. Although no complete count was made, there were certainly fewer

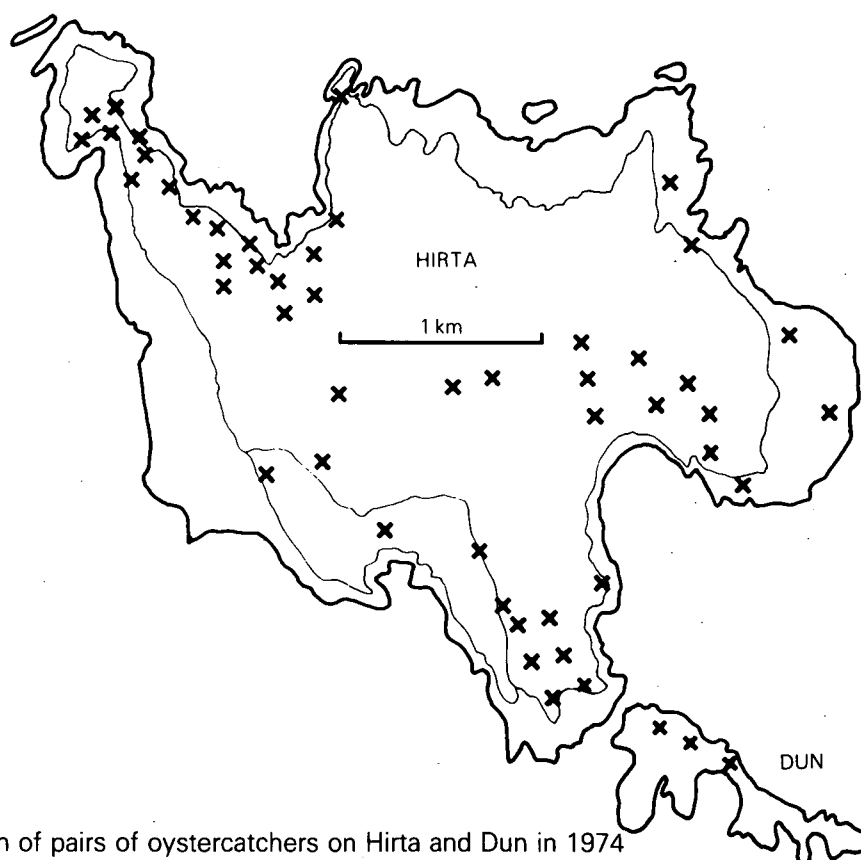


Figure 5. Distribution of pairs of oystercatchers on Hirta and Dun in 1974

pairs in 1977 and 1978. A few pairs bred on Soay and Boreraay. Previous population estimates are shown in Table 7. There was an increase between 1939 and 1947 and another between 1962 and 1963. In 1931 all pairs were on the coast except for one in Gleann Mor; now at least half the pairs feed inland.

Two birds found on Hirta had been ringed during the winter in Wales.

**Table 7. Estimates of the numbers of breeding pairs of oystercatchers on Hirta**

Year	Estimates	Source
1829–43	'at no time numerous'	Mackenzie (1905)
1910	Considerable numbers nested	Clarke (1912a)
1931	About 17 pairs on Hirta (late in season)	Harrisson and Lack (1934)
1939	About 5 pairs around Village Bay, 2–3 near the Cambir, others at base of cliffs. 3 pairs on Dun	Nicholson and Fisher (1940)
1947	An increase. Same number in Village Glen, 4 pairs near the Cambir, 4 pairs in Gleann Mor where none in 1939	Fisher (1949)
1955	6 nests within village wall	Boyd <i>et al.</i> (1956)
1956	100–120 adults and young in July	Boyd <i>et al.</i> (1957)
1957	6 pairs in both Village Glen (but none inside the wall) and Gleann Mor	Williamson (1958a)
1960	20–25 pairs on Hirta	Bourne (1960)
1961–62	Perhaps 20–25 pairs on Hirta, four pairs inside village wall	Waters (1962b)
1963	48 pairs on Hirta including 12 in village	Williamson (1964)
1968	66 adults and 8 fledged young in July	Dott <i>et al.</i> (1969)
1974	48 pairs on Hirta, 3 on Dun	This study
1977	4 pairs inside village wall	This study

**Little ringed plover** *Charadrius dubius*

One on 2 August 1977 (D. Budworth, A. Blackburn).

**Ringed plover** *Charadrius hiaticula*

Regular migrant in small numbers, commoner mid July to late September (maximum count 27) than in spring (most records from early May to mid June). Two winter records, 11 October 1964 and 30 October–16 November 1975.

**Dotterel** *Eudromias morinellus*

One 29 August–2 September 1974 (P. Lack, J. Watson).

**Golden plover** *Pluvialis apricaria*

Bred in 1947 (2 pairs in territory, one young found) and 1948 (pair with young) (Fisher *et al.*). Pairs were seen, apparently in territory, in 1949 and 1955, birds 'singing' 29 May 1965 and July 1978. Birds summered in 1976 and 1977 and in 1977 one was seen feigning injury.

Common migrant April and May, numbers rarely above 30 but 100 on 18 April 1966 and 120 on 29 April 1975. Odd birds seen in June and July in many years. Autumn passage is from late August until at least mid-October but the number of birds are usually very small. Single on 6 December 1958.

**Grey plover** *Pluvialis squatarola*

One 28 September 1910 (G. Stout in Clarke) and two on 8 September 1974 (G. Wiersema).

**Lapwing** *Vanellus vanellus*

Small numbers have occurred in all months but the species is most regular in March and April (maximum count 16). Most of these birds are probably lost and not infrequently are later found dead.

**Knot** *Calidris canutus*

Rare in May (4 records) and June (2 records), and small numbers from late July to September in several years. Twenty on 23 December 1975. A bird ringed as a chick on Ellesmere Island, Canada, was present on Hirta 19 August–5 September 1961 (Waters).

**Sanderling** *Calidris alba*

Four spring records 6 May–11 June. Recorded in 14 autumns from 12 July–7 October. Maximum number eight birds.

**Little stint** *Calidris minuta*

Singles 13–15 September 1957 (Brownlow in Williamson) and first fortnight August 1965 (J. C. Davis).

**Temminck's stint** *Calidris temminckii*

Singles 24 June 1970 (J. J. M. Flegg), and 21 and 26 July 1974.

**Baird's sandpiper** *Calidris bairdii*

One shot 28 September 1911 (Clarke).

**Purple sandpiper** *Calidris maritima*

The rather few widely scattered records probably belittle the species status. Certainly a few wintered 1961–62, 1975–76 and summered 1976 and 1977. Maximum count 21 on 26 April 1959.

**Dunlin** *Calidris alpina*

Breeding suspected on several occasions 1840–1902 but no definite proof (Macgillivray, Wigglesworth).

Migrant in small numbers, spring passage (maximum count 21) from late April (though single 3 March 1965) to early June, and return from mid July to October. Autumn numbers are usually small but 40 on 12 July 1975. Uncommon in winter. One on Soay 7 August 1978.

**Buff-breasted sandpiper** *Tryngites subruficollis*

Single 15 June 1962 (J. M. Boyd, M. Smith in Waters).

**Ruff** *Philomachus pugnax*

An uncommon visitor noted 12 times between 24 July and 13 September. Also on Boreray 17 May 1960 (one) and 8 August 1978 (two).

**Jack snipe** *Lymnocyptes minimus*

One 26 April 1972, 6 June 1969, 21 September 1957 and three 8–14 October 1961.

**Snipe** *Gallinago gallinago*

Breeds; most birds are summer visitors, very few remaining by the end of September. The small numbers occurring in winter are presumed to be immigrants (Waters). During our visits the species was abundant in 1972, 1973 and 1974 but there were far fewer (?half the numbers) drumming in 1975 and 1976. Although nests were found all over the island the main concentrations were low down on Gleann Mor, in Village Bay and on Dun.

Up to the evacuation in 1930 the species was apparently scarce, and was absent from the village enclosure. In 1931 there were only three pairs on Hirta and one on Soay but by 1938 they were common and tame. In 1939 there were at least 30 pairs on Hirta, and 24 birds in the village, but in 1947 there were only two pairs in the village and six elsewhere and only a single bird was seen on 20 May 1949. It was again numerous in 1948, 1952, 1955, 1957 (60–70 pairs on Hirta and 30+ pairs in the village area), and 1963 (35 pairs, concentrated in the Village Glen).

It also breeds on Soay but is uncommon on Boreray.

**Great snipe** *Gallinago media*

One 6 September 1910 (Clarke).

**Woodcock** *Scolopax rusticola*

A scarce autumn visitor from mid October and some birds may overwinter (1958–59; 1964–65). Numbers are usually small (maximum six since 1958) but N. Ferguson reported occasional large influxes early this

century. Also recorded in May 1962 and 1972 and July 1948.

**Black-tailed godwit** *Limosa limosa*

Recorded February (once), April (4), May (3), June (1), July (1), August (1), September (1) – maximum flock seven birds.

**Bar-tailed godwit** *Limosa lapponica*

Singles 31 August 1974 (P. Lack, J. Watson) and 15 and 25–26 May 1977.

**Whimbrel** *Numenius phaeopus*

The species has definitely or probably bred annually since the first record in 1964 (M. Macmillan). Normally one pair but three pairs in 1972. A second pair summered in 1976 but there was no evidence of it breeding. Three birds present in 1977, possibly a male and two females as six eggs were laid in a single scrape; however, there were seven eggs laid in 1978 when only two birds were seen. May possibly have bred in 1884, 1905, 1956, 1961 and 1963.

Otherwise there is a well marked spring passage from late April (earliest record on 17th) to June. Maximum daily count is 20 (in 1957) but usual numbers are small. The species is very scarce in autumn with latest records 7 September.

**Curlew** *Numenius arquata*

Dixon thought that two pairs nested in 1884, and the species may have bred at the start of the century (Harrison & Lack). Song flights and display were recorded 1969–71 (J. J. M. Flegg).

Otherwise a visitor in small numbers in all months. Apparently more frequent formerly.

**Redshank** *Tringa totanus*

A pair behaved as though nesting in Village Glen in late May 1974 but one adult was killed by a merlin.

Regular migrant in April and May and from mid July to 10 September. Other records are June 1975 and 4–5 October 1961. Numbers are normally small but 100 on 12 July 1975 and 20 on Levenish July 1975.

**Greenshank** *Tringa nebularia*

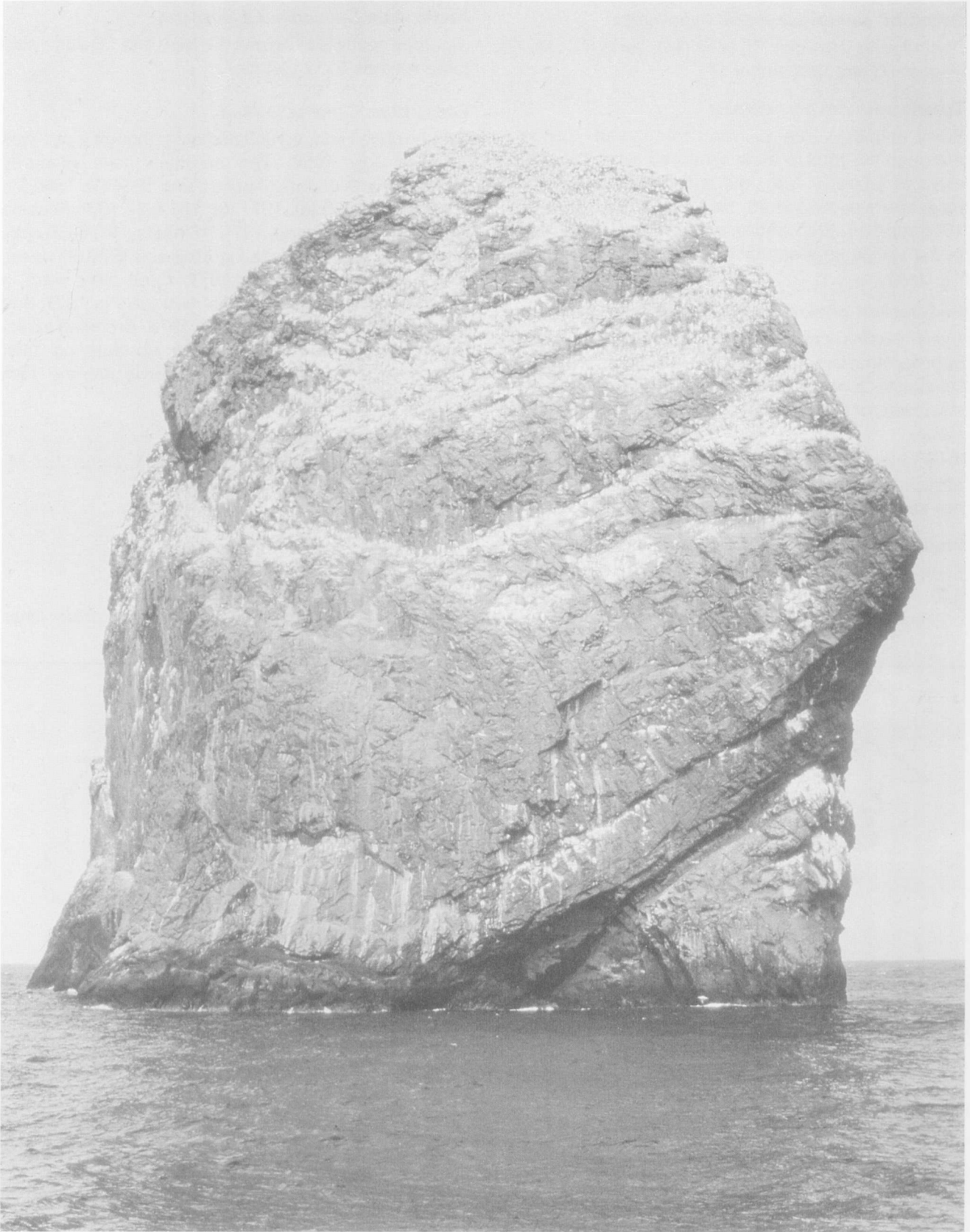
Singles 23 June 1964, 3 August 1957, 6 July 1976, 17 August 1974 and 2 September 1965.

**Green sandpiper** *Tringa ochropus*

Singles 26 July 1959 (Boddington & Maclellan), 4 May 1965 (D. C. Gwynne) and 9–11 May 1977.

**Wood sandpiper** *Tringa glareola*

Singles 25–26 May 1958, 14 and 22 June 1977 and 24 June 1973.



*Plate 11 The south face of Stac Lee showing gannets nesting on every usable ledge. The St Kildans climbed this stac at night to kill gannets. Since the islanders left in 1930 this has only been climbed twice. (Photograph M. P. Harris)*

**Common sandpiper** *Actitis hypoleucos*

Recorded in late April (1), May (14), June (7), July (3), August (2) and September (3).

**Turnstone** *Arenaria interpres*

Small numbers are present throughout the year. Although the total of birds scattered along the coastal rocks is probably high, the annual maximum counts have rarely exceeded 40. However, there were 65 in 1965 and 60 in 1971, and an unprecedented 1000–2000 in the village area end October/early November 1975 (D. Neal).

**Red-necked phalarope** *Phalaropus lobatus*

A pair bred in Gleann Mor in 1972. Prior to this a female in breeding plumage was seen 13–16 July 1968 (M. Marquiss), a pair was present in July 1970 and a pair displayed for three weeks June and July 1971 (J. J. M. Flegg).

Two phalaropes 12–14 October 1961 were probably grey phalaropes (*P. fulicarius*) but the identification was not certain (Waters).

**Pomarine skua** *Stercorarius pomarinus*

Seen between St Kilda and the Hebrides 13 May 1968 (I. D. Pennie) and 12–13 October 1911 (Clarke), and one off Hirta 24 May 1976 (R. Tulloch).

**Arctic skua** *Stercorarius parasiticus*

Nineteen records between 11 May and 18 July; also three records 2–12 October.

**Great skua** *Catharacta skua*

First bred on Hirta in 1963 (Pollock), though a pair was seen in July 1956. The numbers have gradually increased with counts of pairs being 1964 (1), 1965 (3), 1968 (5–6), 1969 (6), 1971 (8), 1972 (8), 1974 (9 nests plus 4 pairs in territory), 1975 (15 nests), 1976 (20 pairs bred), 1977 (22 pairs) (see Figure 6) and 1978 (25 pairs). One pair bred on Soay in 1971, three pairs were in territory there in 1975, at least two pairs in 1977, and eight birds were seen 7 August 1978. Breeding adults return early April but there are no data on their departure. It was an irregular visitor in the late 19th century (Dixon).

**[Laughing gull** *Larus atricilla*

One reported 28 June 1971 (C. Cox, E. K. Dunn, J. J. M. Flegg). Record unsubstantiated.]

**Little gull** *Larus minutus*

Single on 15 May 1962 (Waters).

**Black-headed gull** *Larus ridibundus*

Frequent visitor in small numbers, occasionally large

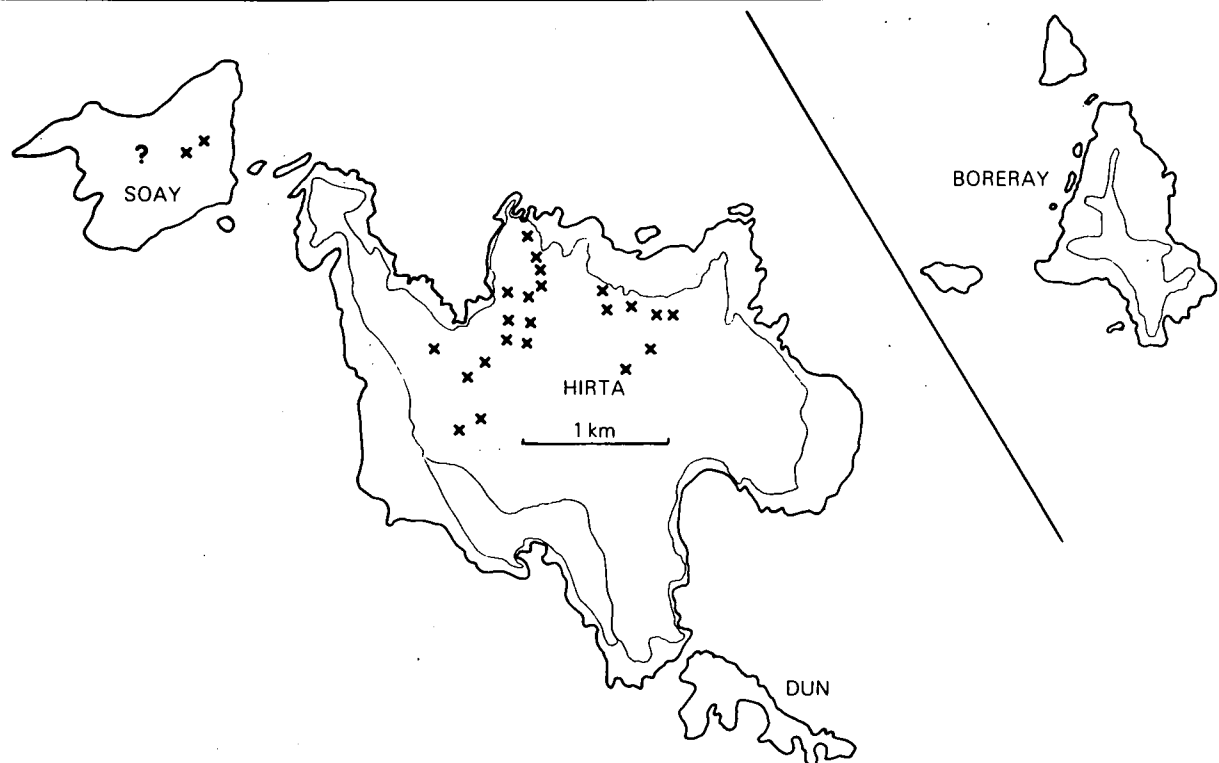


Figure 6. Distribution of pairs of great skuas on St Kilda in 1977. There may have been additional pairs on Soay



flocks as 126 on 8 April 1968. Less frequent in winter but has been recorded in all months.

**Common gull *Larus canus***

A pair bred in 1963 (Williamson), and possibly also in 1840 (Macgillivray) and on Boreray in 1847 (Milner).

Small numbers (though up to 100 on two dates) recorded throughout the summer months but commonest in late July and August. There are also records in October and November 1961.

**Lesser black-backed gull *Larus fuscus***

Breeds; the earliest birds return in mid March but most not until late April. Most are gone by early September.

The majority nest in Gleann Mor (Figure 7) on Hirta where there are difficulties in both finding nests and assigning them to species. The densest concentration is on the rocks between the tunnel and the stream. This colony was not present in or before 1968 (Dott *et al.*) although some pairs did nest on the higher grassy slopes. Since 1973 the number of nests here has varied between 40 and 79 (Table 8); in addition there were 40–60 pairs nesting among the boulders and on the sea

rocks at the western part of Gleann Mor. The total population on Hirta increased from 120 nests with eggs (plus 51 empty nests) in 1974 to 160 (plus 80) in 1976

**Table 8. Lesser black-backed gulls breeding in Gleann Mor, Hirta. The East colony refers to birds nesting on the rocks between the tunnel and the stream (taken as the dividing line). The figures in brackets are additional empty nests**

	West	East	Source
1931	0	1	Harrison and Lack (1934)
1952	0	0	Boyd in Williamson (1958a)
1955	80 birds	–	Boyd <i>et al.</i> (1956)
1956	30–50 pairs	–	Boyd <i>et al.</i> (1957)
1957	70–75	[25 on grass]	Williamson (1958a)
1961	40 pairs	–	Waters (1962b)
1962	less	–	Waters (1962b)
1963	200 pairs	–	Williamson (1964)
1968	?	0	Dott <i>et al.</i> (1969)
1973	41	45 (+84)	This study, J. J. M. Flegg
1974	59 (+31)	40 (+20)	This study
1975	?	75 (+27)	This study
1976	39 (+44)	79 (+10)	This study
1977	?	48 (+11)	This study

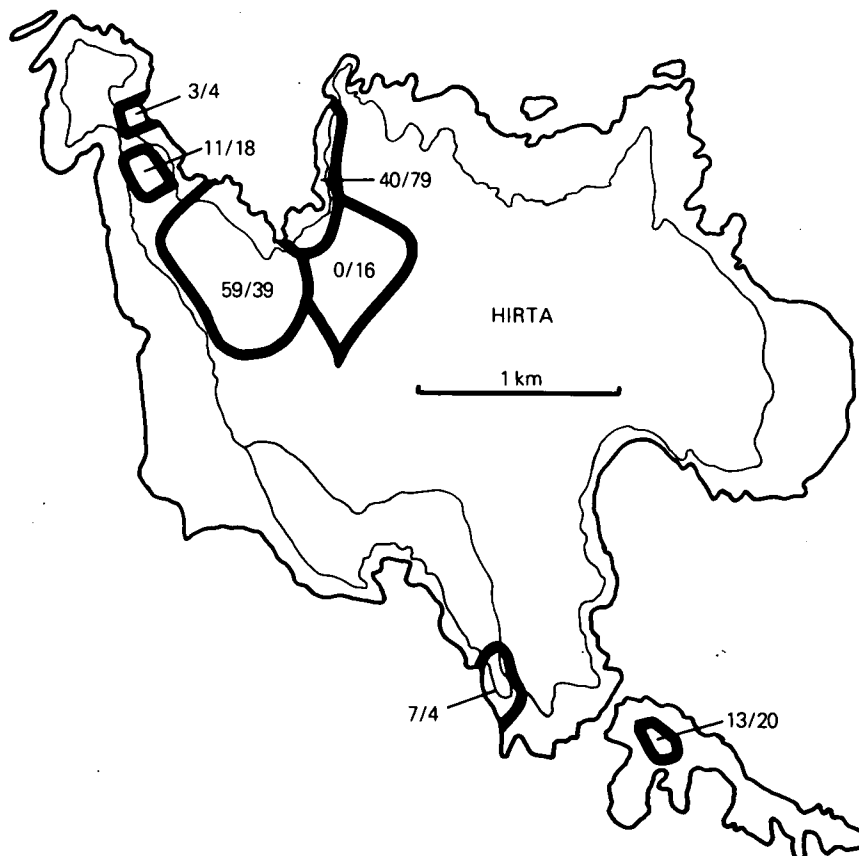


Figure 7. Counts of nests in the colonies of lesser black-backed gulls on Hirta and Dun in 1974 and 1976

**Table 9.** The numbers of pairs of gulls nesting on Hirta and Dun, 1969–77. The figure in brackets for lesser black-backed gulls refers to additional empty nests. The 1969 counts were made by J. J. M. Flegg *et al.*

	Hirta		Dun	
	Herring	Lesser black-backed	Herring	Lesser black-backed
1969	30	263	34	29
1974	40	120	24	13
		(+51)		
1975	31	138	16	10
		(+74)		
1976	41	160	14	20
		(+80)		
1977	?	?	15–20	30

(Table 9). There were also 13–30 pairs on Dun and an undetermined but considerable number on Soay.

The early status is obscure but the species bred last century. At least one pair nested in 1931 and 15 pairs in Gleann Mor in 1947 but none in 1952. Nesting has occurred regularly since with counts varying from 40 to 200 pairs at Gleann Mor. The only complete island count, 263 pairs, was in 1969 when there were also 29 pairs on Dun. The first recorded nesting on Soay was c.30 pairs in 1971 (Brathay) and there were some 60

visible from the Cambir in 1973. Excepting the high 1963 estimate which was based on counts of birds present in Gleann Mor, there seems to have been a slow increase in the St Kilda population.

#### Herring gull *Larus argentatus*

The scarcest nesting gull. Resident with a winter population of usually less than a hundred individuals. A thorough search in 1974 found 40 and 24 pairs on Hirta (Figure 8) and Dun respectively.

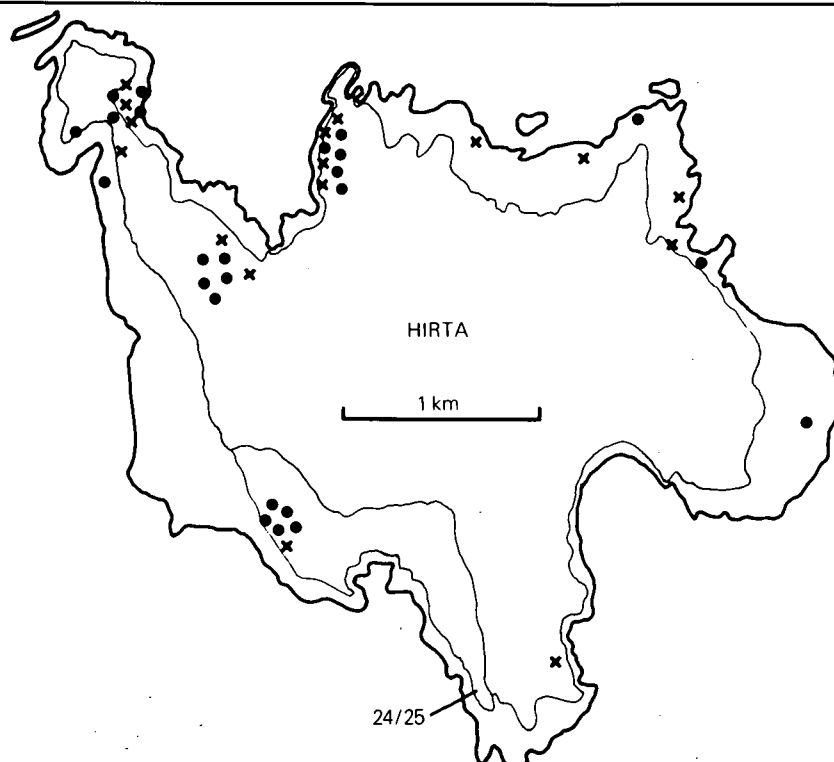
In 1931 and 1939 there were about 50 pairs on Hirta, and in 1969 30 pairs on Hirta and 34 on Dun. There were 10–15 pairs on Boreray and 3–4 pairs on Soay in 1971 (Brathay). There is no sign of a recent increase as has occurred throughout most of Britain.

#### Iceland gull *Larus glaucoides*

Ten records between December and June including birds found dead April 1971 and May 1974.

#### Glaucous gull *Larus hyperboreus*

Over 20 records mostly in winter but also in May 1903, 1968 and 1977, August/October 1965 and September 1976. One or two immatures summered 1975.



**Figure 8.** Distribution of nests of herring gulls on Hirta in 1974 (x) and 1976 (●). There were 24 and 25 pairs on Ruival in these years respectively

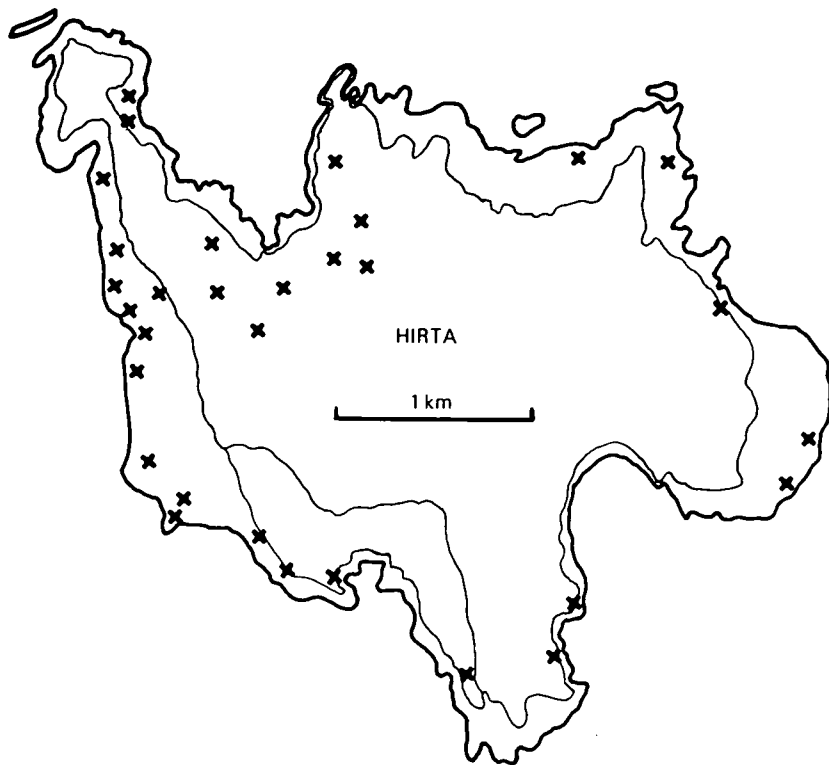


Figure 9. Distribution of nests of great black-backed gulls on Hirta in 1976

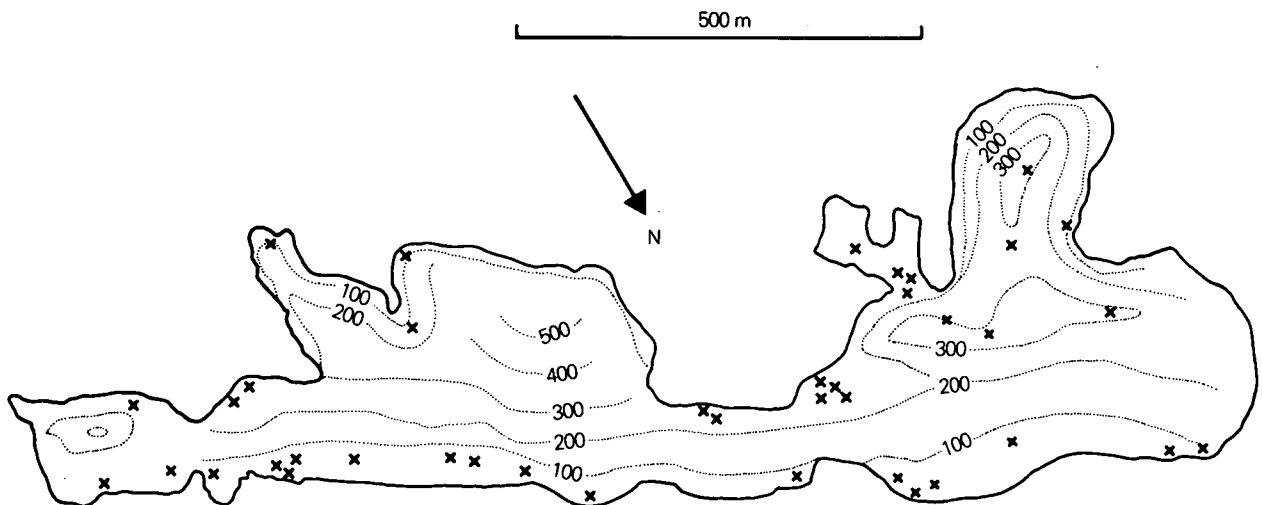


Figure 10. Distribution of nests of great black-backed gulls on Dun in 1977. The 100' contours are also shown

**Great black-backed gull** *Larus marinus*

Breeds. On Hirta 27 and 31 nests were located in 1974 and 1976 (Figure 9), and the population was probably 30–35 pairs which compares with 30 pairs in 1956, 40–50 pairs in 1961–62, and 55 pairs in 1969. It was much harder to determine the population on Dun due to the dense vegetation, and the gradual increase of counts there from 15 nests in 1974 to 40 in 1977 (Figure 10) was thought to be attributable to our increasing interest in the species, because there was no corresponding increase in the numbers of adults on that island. On 12 July 1975 there were 45 adults and at least 22 young on Levenish. The populations appear to have increased since the evacuation although the species was fairly common in 1894 and 1910. In 1956 there were probably 30 pairs on Hirta, 10 on Levenish and 10 on Dun, and in 1961–62 40–50 pairs on Hirta and 20 on Dun. There were less than 15 pairs and about 10 pairs on Boreray and Soay respectively in 1971 (Brathay). Large numbers of non-breeders roost in Gleann Mor and counts of up to 850 have been made in the winter months.

**Kittiwake** *Rissa tridactyla*

Breeds; adults present at the colonies from March to August, rarely September. Only a few birds seen in the winter. In 1977, we counted 5846 nests in the islands, with the main concentrations on Boreray and Dun (Table 10).

Previous complete surveys were made by Boyd in 1959 and 1969 who estimated 7770 and 11 485 pairs respectively. These counts were based on assessments of colony size, made from the sea, after a series of familiarization counts (Boyd 1960a). Flegg *et al.* (unpubl.) recounted some of the colonies on Hirta and suggested a total population of 5500 pairs on that island, i.e. over four times our total. Assuming that our counts are comparable, a paired-data t-test on the area counts in Table 10 indicates that the 1959 and 1977 figures are not significantly different but both are significantly lower than the 1969 counts. But the decreases are not shown by more regular counts at two small colonies, e.g. Geo Leibli 1959 (20 pairs), 1961 (11 nests), 1968 (80 nests), 1969 (80 pairs), 1974 (85 nests),

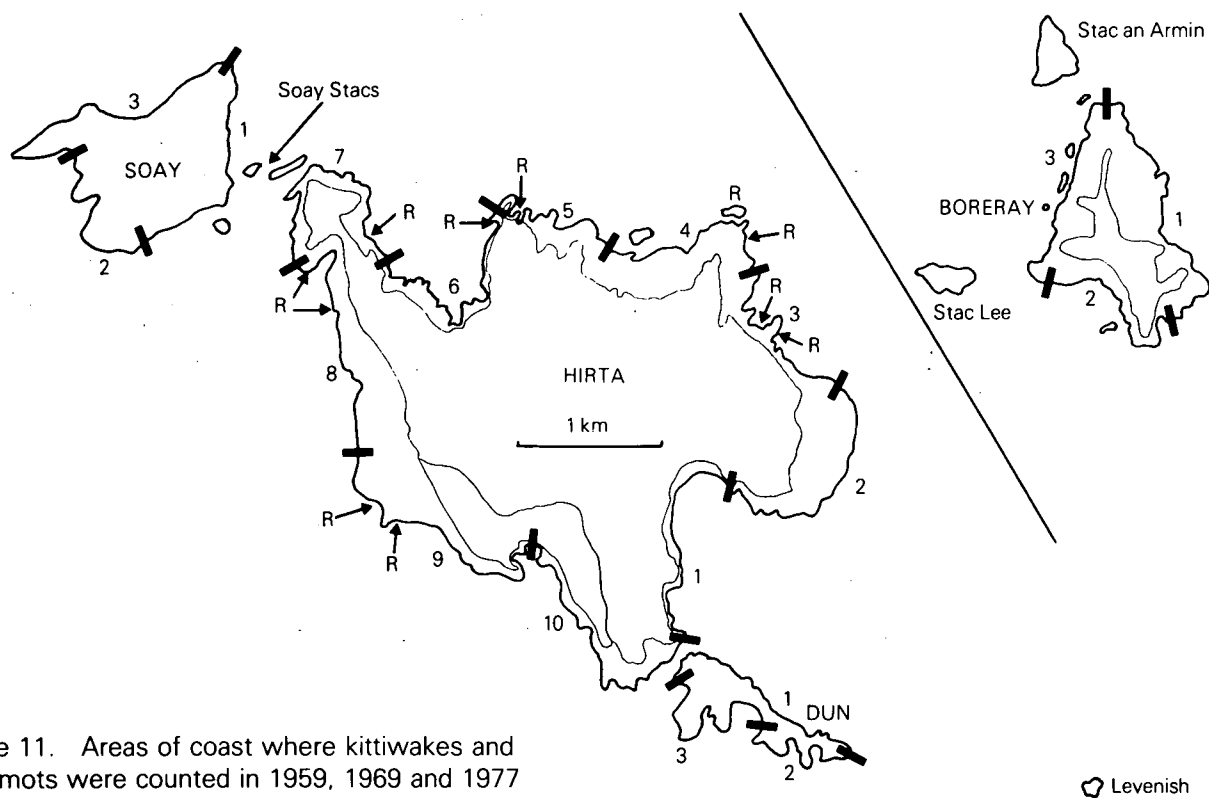


Figure 11. Areas of coast where kittiwakes and guillemots were counted in 1959, 1969 and 1977 (Table 10). After Boyd (1960a). R indicates a razorbill colony on Hirta

**Table 10. Counts of kittiwake nests and individual guillemots on St Kilda in 1959 (Boyd 1960a), 1969 (Boyd 1969) and 1977. The 1959 and 1969 figures may refer to birds or pairs as they were based on assessments of colony size (see Boyd 1960a). The areas are those used by Boyd in 1959 and are shown in Figure 11. Am Plastair was included with Soay in 1977. Flegg *et al.* (unpubl.) recounted some areas in 1969 and gave totals of 13 500 and 2150 guillemots on Hirta and Dun respectively, and 5500 kittiwake nests on Hirta**

		Kittiwake			Guillemot		
		1959	1969	1977	1959	1969	1977
Hirta area	1	20	80	91	0	0	0
	2	20	50	0	70	110	10
	3	140	260	84	610	990	1205
	4	730	1150	342	1970	5860	5569
	5	70	180	11	670	710	815
	6	120	140	146	100	80	439
	7	530	910	334	1460	1210	1137
	8	300	300	215	900	990	1399
	9	50	0	0	500	30	288
	10	100	0	0	100	20	68
Total		2080	3070	1223	6380	10000	10930
Dun	1	180	190	182	30	380	644
	2	890	775	1248	130	670	1333
	3	250	310		60	400	1829
Total		1320	1275	1430	220	1450	3806
Soay	1	410	470	346	190	280	180
	2	410	1100	270	1540	700	950
	3	800	850	296	870	650	725
Total		1620	2420	912	2600	1630	1855
Soay Sound							
Stacs		150	80	83	2680	1700	1855
Boreray	1	270	830	596	110	570	628
	2	360	410	164	610	890	790
	3	1700	2520	999	1450	1700	578
Total		2330	3760	1759	2170	3160	1996
Stac Lee		200	310	158	200	460	300
Stac an Armin		70	570	281	720	1880	1313
Levenish		0	0	0	40	70	30
Grand total		7770	11485	5846	15010	20550	22085

1976 (78 nests), and 1977 (71 nests); and at the west entrance to the tunnel – 1959 (50 pairs), 1961 (60 nests), 1968 (55 nests), 1971 (67 nests), 1973 (68 nests) and 1977 (89 nests). More counts of the larger colonies are needed to assess changes there.

#### **Sandwich tern *Sterna sandvicensis***

Two 6 July 1963 (Williamson) and one 19–26 March 1969 (N. Picozzi).

#### **Common tern *Sterna hirundo***

##### **Arctic tern *Sterna paradisaea***

Both species have been identified but most records refer to unidentified birds – April (3), May (2), June (1), July (1), August (3), September (5), October (8 including 7 in 1961).

##### **Guillemot *Uria aalge***

Breeds; adults present from late February to early August; odd birds inshore at other times. In 1977 we counted 12 785 birds on Hirta (+Stacs), 3806 on Dun, 1855 on Soay, 1996 on Boreray and estimated 300 and c.1300 on Stac Lee and Stac an Armin respectively. The latter two estimates may be too low as counting is difficult. In 1975 there were 30 birds on Levenish. The 1977 counts were significantly higher than those made by Boyd in 1959 (paired t-test.  $P < .01$ ) but not higher than the 1969 counts. The small colony at the west entrance to the tunnel had about 50 pairs in 1959, 70 birds in 1968, about 80 pairs in 1969, 88 birds in 1971, 80 birds in 1973 and 136 birds in 1977. The previous estimate of three million birds by Sands is obviously an exaggeration and the figure of 20 000 pairs in 1939 is also probably too high. The few descriptive accounts do not suggest many more birds than now and Harrison and Lack describe it as only 'not uncommon' in 1931.

##### **Razorbill *Alca torda***

Breeds; birds at the colonies from late February to early August. In 1977 the main concentration was on Dun (Figure 13) where over 1000 individuals were counted at the Fort and 634 elsewhere. On Hirta, main colonies (Figure 12) at Leac Mhina Stac (?100 pairs), at Poll a' Choire (?100 pairs), Stac a Langa (40 birds), below Carn Mor (60 pairs), Ruaival (50 pairs), Mol Ghiasgar (40 birds) and Geo nan Eaige (30 birds). Many other pairs were also scattered elsewhere – the total population is guessed at 500 pairs. No good estimates are available for the other islands but in 1977 there were at least several hundred pairs on Stac an Armin, less than 50 pairs on Stac Lee, about 100 pairs in the boulders above Geo nan Ron and others scattered through the rock piles below the village on Soay, 60 birds on Soay Stac, and 1 pair on Levenish. We have no records for Boreray.

Previous counts on Hirta have been 152 birds in 1961, 78 birds in 1968, 90 pairs in 1969; on Dun over 100 pairs in 1956 and 2500 pairs in 1969. There are no earlier counts for the other islands but in 1939 there were 100 pairs on one crevice on Boreray. In this instance nothing can be said concerning changes in population size.

##### **Great auk *Pinguinus impennis***

Bred in the 17th century. The last British example is said to have been caught on Stac an Armin in July 1840.



Plate 12 Two bridled forms of the guillemot on Dun. (Photograph M. P. Harris)



Plate 13 Adult razorbills on Dun. (Photograph R. K. Murton)

**Black guillemot** *Cepphus grylle*

Breeds; adults present mid April, (rarely February) to August. Total of 10 pairs on Dun and Hirta in 1974–78 as recorded by most previous visitors, regularly at Dun Gap (3–4 pairs), Glen Bay (2–3), Carn Mor (1–2) and An Fhaing, Dun (1).

**Little auk** *Alle alle*

Remains of a few storm-driven birds found April 1957 (Williamson & Boyd) and Dixon said it occurred sparingly in winter.

**Puffin** *Fratercula arctica*

Breeds; adults present mid April to August, rarely September.

In 1975–76 the population on Dun was estimated at 40 000–60 000 pairs, that on Hirta as 8100–13 500 pairs. The populations now appear to be stable though that on Hirta has declined this century – with most birds being lost in the period 1947–57. There may also have been a decline on Dun, but if so the reduction in numbers has been less (Harris & Murray). The present breeding distribution is shown in Figure 13. The population on Dun increased slightly between 1974 and 1976 but since then there has been another small decline.

The population on Soay has always been larger than that on Hirta or Dun. In 1977, six circular quadrats each

of 30 m<sup>2</sup> were laid through the main colony on a line running north-east from Tigh Dugan at about the 200 m contour. The mean densities per m<sup>2</sup> of occupied and total burrows were 0.61 (SE 0.08) and 0.74 (SE 0.07). In 1971 Brooke (1972) found a similar (0.76) overall burrow density on approximately the same line but of these only 30% were occupied. Thus there appears to have been a great increase in the proportion of burrows now being used for nesting. In 1971 there was a mean density of 0.175 occupied burrows per m<sup>2</sup> through the estimated 440 000 m<sup>2</sup> of colonies. If the increase in burrow occupancy noted by us was representative of the whole colony, the mean occupied burrow density of the whole colony would be 0.46 per m<sup>2</sup> and the total population some 200 000 pairs. Even allowing that the colony may be slightly less extensive than previously thought (Harris & Murray), the population must be at least 150 000 pairs.

On Boreray six similar quadrats were laid down through the main colony from Glagan na Ruskochan to the cleit village. The mean densities per m<sup>2</sup> of occupied and total burrows were 0.62 (SE 0.11) and 0.77 (SE 0.11). A similar rate of burrow occupancy (77%) was found in this colony in 1975. The area of the colony is estimated at 100 000 m<sup>2</sup> giving a total of 55 000 occupied burrows. Using different methods, Brooke estimated 41 000 burrows in 1971. The other colonies on Boreray were slightly smaller and had a lower burrow density. A total population estimate of 100 000 pairs is suggested. There was also a small colony on Stac an Armin.

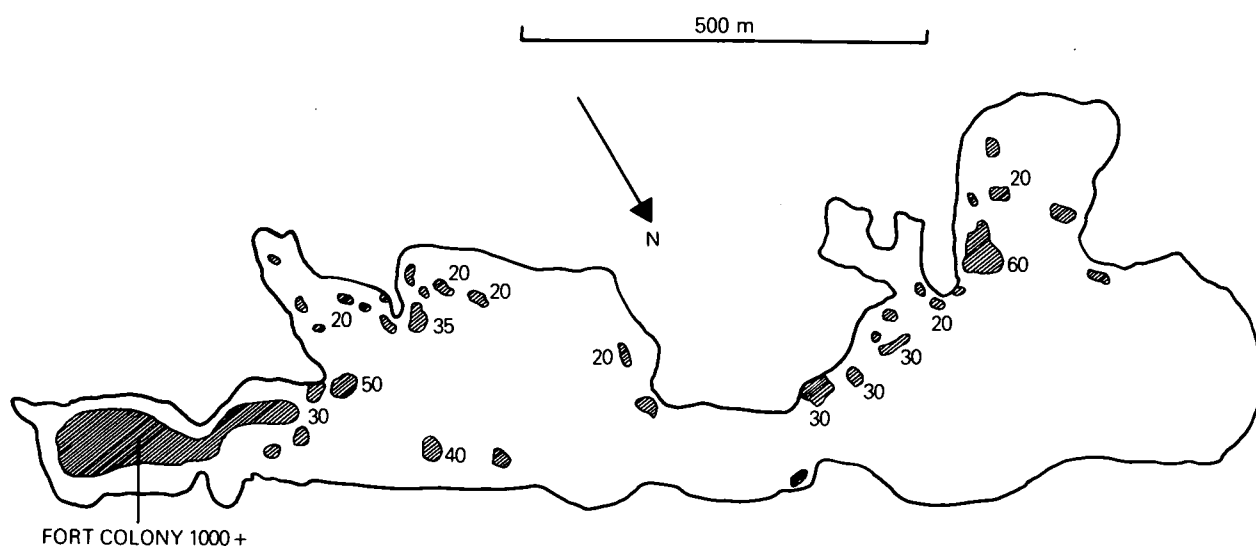


Figure 12. Distribution of nesting razorbills on Dun in 1977. Figures given are for estimates of maximum numbers of birds seen where these were 20 or more

**Rock dove** *Columba livia*

Almost certainly bred in 1884 but was soon extinct as Elliott found none in 1894 and by 1910 the inhabitants did not know the bird. However, it was breeding in 1930, five birds were recorded in 1931, but only two in 1939. Since then only one on 25 June 1975 and a probable on 23 June 1958.

**Stock dove** *Columba oenas*

Singles 12–19 July 1970 (D. James) and 21 May 1977 (M. Jacques).

**Woodpigeon** *Columba palumbus*

About 25 records, mostly single birds, maximum three, April–August. Some birds remained for several weeks.

**Collared dove** *Streptopelia decaocto*

First recorded 29 April 1965 (D. C. Gwynne in Macmillan) and soon became an increasingly regular and numerous visitor with up to 14 birds together between 20 April and 2 September annually since 1969.

**Turtle dove** *Streptopelia turtur*

Twenty-five records mostly between 14 May and 14 July. One 21–22 April 1968, and nine in September.

**Cuckoo** *Cuculus canorus*

Twenty-three records prior to 1977, all between 11 May and 21 June, except for odd singles in late June 1969 and 1970. In 1977 and 1978 at least three and two males respectively called regularly from mid May to late June.

**Snowy owl** *Nyctea scandiaca*

Singles 14–28 November 1962, 30 March and 12–14 April 1968, 17 April 1972, male and female on various dates April–June 1973 and a male 1 and 26 May 1975.

**Long-eared owl** *Asio otus*

One 10 August 1958 (Eggeling).

**Short-eared owl** *Asio flammeus*

Records in February (1), March (1), April (1), May (12 including 3 birds together), June (1), July (1), September (1), November (1), and December (1).

**Swift** *Apus apus*

Small numbers regular in July. Recent peak counts have been 30, 10, 50 and 19 in 1975, 1976, 1977 and 1978 respectively. Extreme dates 1 May and 4 September.

**Alpine swift** *Apus melba*

One 12–16 May 1974 (many observers).

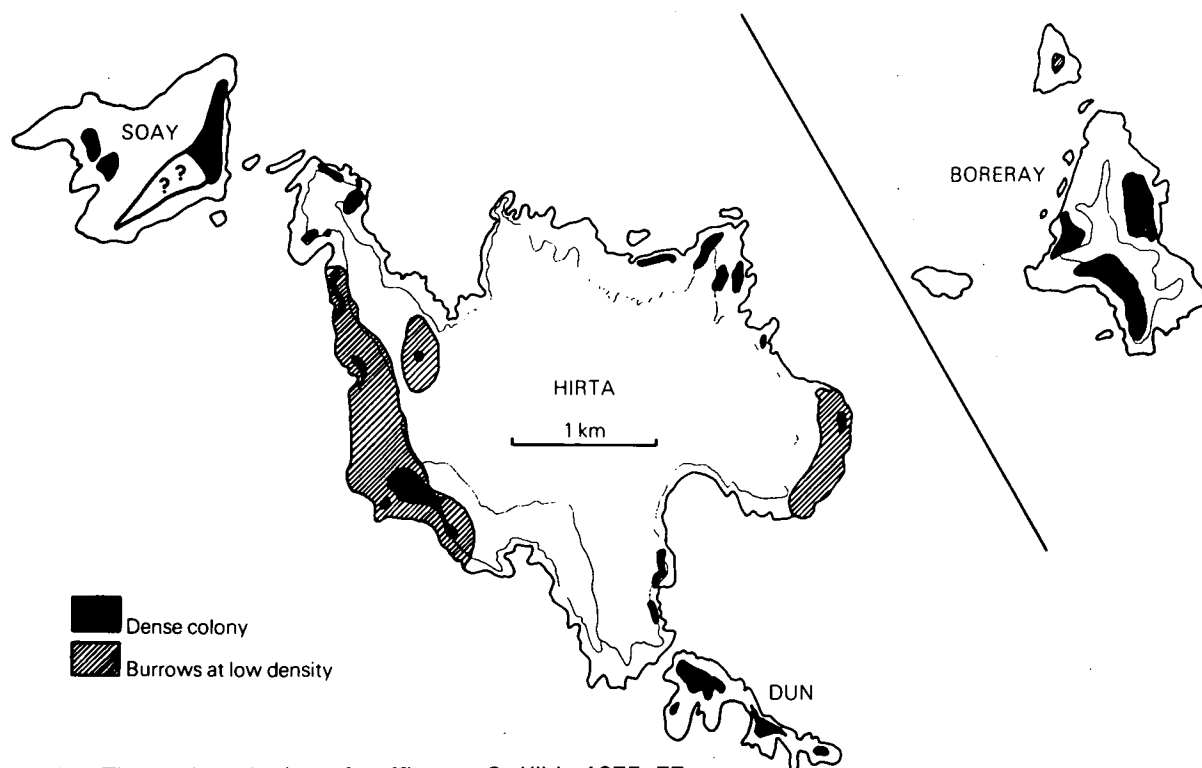


Figure 13. The main colonies of puffins on St Kilda 1975–77



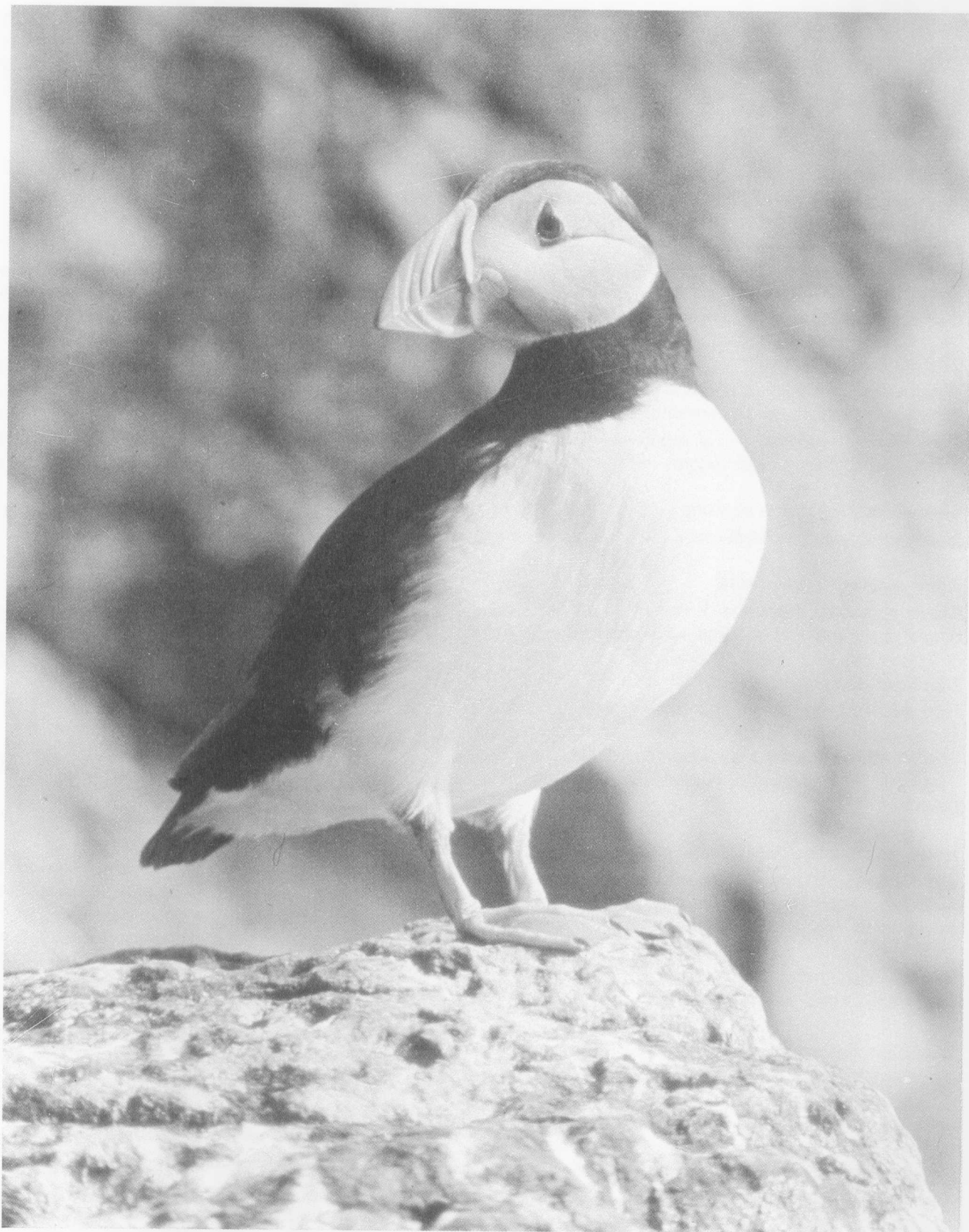


Plate 14 An adult puffin, the commonest seabird on St Kilda. The population is estimated at 300 000 pairs, about half the British total. (Photograph M P Harris)

**Roller** *Coracias garrulus*

One some time before 1841 (Wilson).

**Hoopoe** *Upupa epops*

One 16 May 1977.

**Wryneck** *Jynx torquilla*

Recorded 5–6 May 1977 (1 bird), 1–3 September 1974 (1), 6 September 1910 (1) and 14 June 1975 (remains of a bird dead about a week).

**Short-toed lark** *Calandrella cinerea*

One 29 May–5 June 1957 (Williamson & Boyd).

**Skylark** *Alauda arvensis*

A pair bred 1947 (Fisher) and one sang in May 1974, June 1970 and through the summer of 1976.

Otherwise ones and twos in all months except August and September with most records in March and April.

**Shore lark** *Eremophila alpestris*

One photographed 1 September 1976 (K. Taylor).

**Sand martin** *Riparia riparia*

Thirteen records between 1 April and 1 June and singles on 5 July and 3–8 and 13 September.

**Swallow** *Hirundo rustica*

Frequent between May and July, usually in small numbers but once 20 birds together. The earliest record is 15 April. The only records after the end of July are 29 August 1959 (3), 17 and 20 September 1961. Does not breed.

**House martin** *Delichon urbica*

Slightly less common than the previous species with most records 16 May to end of July. Extreme dates 27 April and 17 September.

**Tawny pipit** *Anthus campestris*

One 8 May 1974.

**Tree pipit** *Anthus trivialis*

Recorded on eight dates between 1 September and 6 October. Also 11 May 1959, 14 May 1978, 12 May (3 birds) and 8 August 1958 (2 birds), and 25 May 1957.

**Meadow pipit** *Anthus pratensis*

A few pairs bred on Hirta in most years, e.g. 1931 (4–6), 1939 (8–17), 1947 (6), 1948 (2–3), 1956 (c.10), 1957 (at least 20), 1960 (1), 1961 (at least 3), 1962 (1), 1963 (6), 1976 (2) and 1977 (3). Bred on Boreray and possibly Soay (a juvenile seen) in 1971 (Brathay).

Common passage migrant (maximum estimate 7500 in a day) from mid April to mid May and during August–September. Also recorded in March, October and November.

**Red-throated pipit** *Anthus cervinus*

Singles 21 September 1910 and 8 October 1911, 7–10 October 1961 and 26 May 1977.

**Rock pipit** *Anthus spinoletta*

Most birds are summer residents from March to October but some (c.20 in 1961–62, 10 in 1958–59) overwinter. A juvenile ringed on Hirta was recovered on Harris in the winter.

In 1931 there were 105 pairs on Hirta, 16 on Boreray, 19 on Dun, 15 on Soay. In 1939 60 birds were counted on Hirta and 4–8 pairs on Dun. The 1957 and 1960 estimates were over 100 pairs on Hirta, and in 1963 there were at least 75 pairs nesting inland. The species was seen on Stac Lee and Stac an Armin in 1977.

An American water pipit *A. s. rubescens* was shot 30 September 1910 (Clarke).

**Yellow wagtail** *Motacilla flava*

Twelve records 8 May–10 July. Most were identified as grey-headed wagtails *M. f. thunbergi* and there appears to be only one definite record of the British race *M. f. flavissima* (8 May 1968).

**Grey wagtail** *Motacilla cinerea*

Twelve records in March (2), May (1), August (5), October (3) and November (1).

**White wagtail** *Motacilla alba alba*

The most obvious migrant on St Kilda with 30–100 a day recorded in most springs. In spring earliest birds have been recorded 16 April, but the main passage is from the end of the month to the end of May. Relatively few birds recorded in June and July (1 summered 1962). Autumn passage August–September with some birds into October.

Pied wagtails *M. a. yarrelli* have been recorded in April (4 records), May (3), June (4), July (2), August (4), September (1) and October (1).

**Waxwing** *Bombycilla garrulus*

One 14 November 1961 (Fullagar).

**Wren** *Troglodytes troglodytes hirtensis*

Resident – population estimated as 45 pairs on Hirta, 11 on Dun, 9 on Soay and 3 on Boreray in 1931, c.230 pairs in whole group including 116 on Hirta in 1957, and well

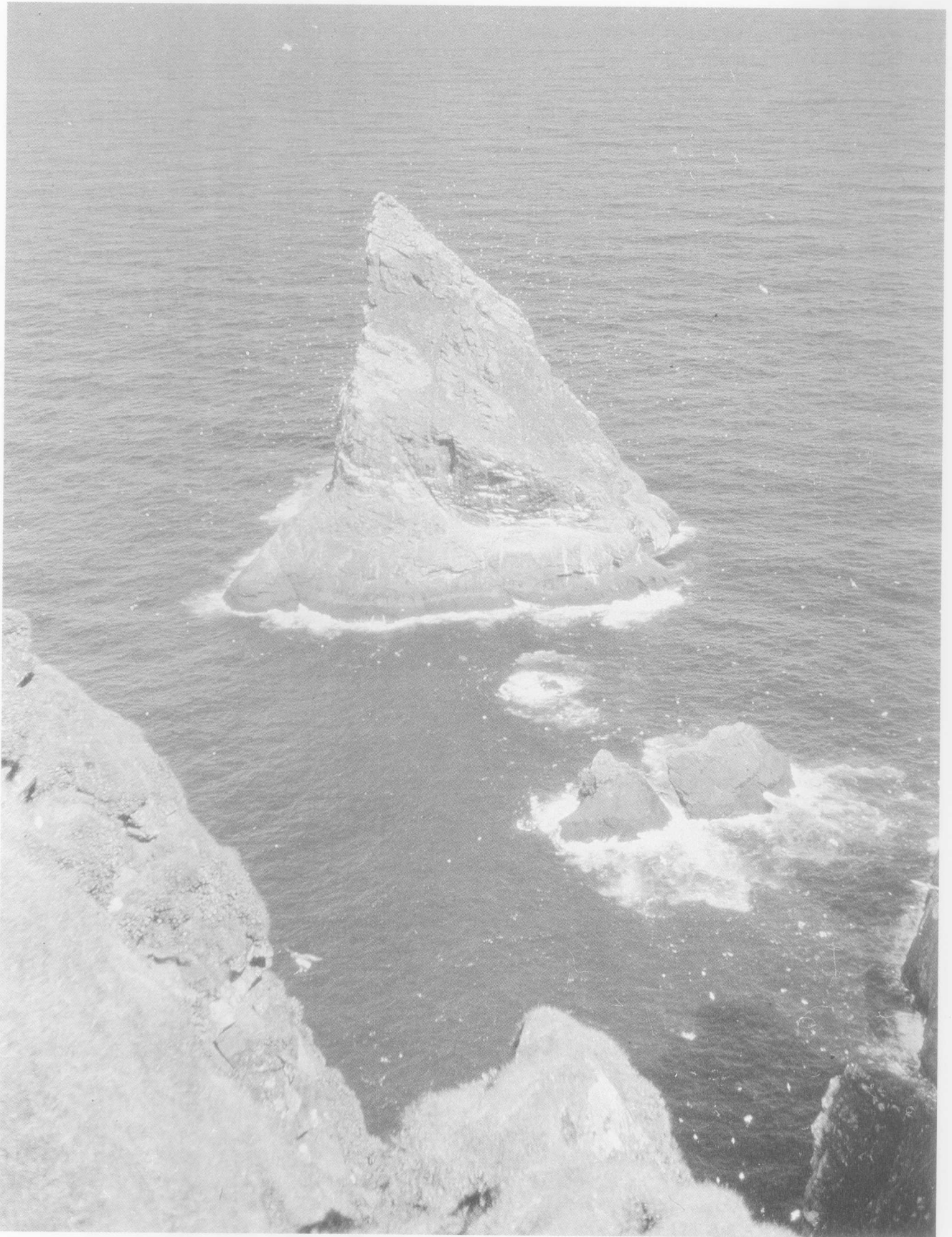


Plate 15 *Stac an Armin* seen from the summit of Boreray, June 1974. (Photograph S. Murray)

over 100 and 92 pairs on Hirta in 1960 and 1962 respectively. Three or four pairs on Stac an Armin in 1957. Not seen on Levenish or Stac Lee.

In 1977, six pairs raised young within the village wall and there were probably an additional 1–2 pairs. This compares to eight, seven and six pairs in this area in 1931, 1957 and 1962 respectively. At least 20 singing males on Dun in 1977. A single bird of the mainland race *T. t. troglodytes* on 4 November 1965 (P. Grubb).

**Dunnock** *Prunella modularis*

Singles on 26 April 1972, 10–21 May 1958, 11–12 May 1975 (singing), 15–16 May 1977, 27 May 1966 and 29 July 1964.

**Robin** *Erithacus rubecula*

Recorded in March (4 times), April (3), May (2), June (1), September (1), and November (1).

**Thrush nightingale** *Luscinia luscinia*

One trapped 28–30 May 1975.

**Nightingale** *Luscinia megarhynchos*

One trapped 12 May 1958 (Eggeling).

**Bluethroat** *Luscinia svecica*

Singles 15 May 1959, 15 September 1974, 27 September 1965 and 13 October 1961.

**Black redstart** *Phoenicurus ochruros*

Four records, 26 October 1958, 14 May 1962, 20 October–2 November 1965 and 20 July 1975.

**Redstart** *Phoenicurus phoenicurus*

A very early record 31 March–3 April 1965, the five other spring records are between 6 and 12 May. Ten records between 3 September and 12 October.

**Whinchat** *Saxicola rubetra*

Ten records between 2 and 27 May, others 27 April 1966, 10 June 1955 and in five Septembers.

**Stonechat** *Saxicola torquata*

One pair bred in 1975, the young fledging about 18 August.

Otherwise four spring records between 15 March and 24 April and in August 1886.

**Wheatear** *Oenanthe oenanthe*

Summer visitor. Nineteen pairs bred on Hirta in 1977 (Figure 14). Population estimates on Hirta have been made in several earlier years – 1894 (6 pairs all near the village), 1931 (10 pairs plus one on Boreray), 1947 (8 pairs in Village Glen), 1956 (14 pairs), 1957 (25 pairs),

1961–62 (8–10 pairs) and in 1963 (at least 48 pairs), one or two pairs on Boreray in 1971. The population varies greatly (Williamson), and we noted at least a 50% reduction between 1975 and 1976.

Also a common migrant from 31 March until late June and from August to November. Many of these birds are of the Greenland race *O. o. leucorrhoa*.

**Black-eared wheatear** *Oenanthe hispanica*

Female collected 21 September 1911 (Clarke).

**Rock thrush** *Monticola saxatilis*

Female seen 17 June 1962 (Boyd & Waters).

**Grey-cheeked thrush** *Catharus minimus*

One dead 29 October 1965 (Grubb).

**Ring ouzel** *Turdus torquatus*

Seven singles between 23 March and 11 May, and on 29 June 1963 and 7 and 11 October 1965.

**Blackbird** *Turdus merula*

A winter visitor in very small numbers (c.5 wintered in 1961–62 after 17 counted on 12 November 1961, 3 overwintered 1964–65). These wintering birds arrive October/November and remain until late March. Otherwise uncommon with birds recorded in April (7 records), May (7), June (2), July (2).

**Fieldfare** *Turdus pilaris*

Uncommon visitor – some 30 records, most in late April, May, October and November. Maximum count 30 birds. One or more birds overwintered 1958–59.

**Song thrush** *Turdus philomelos*

Probably bred 1840 and 1847 (Lack).

Apparently a regular winter visitor 1829–43 (Mackenzie), but in the last 15 years only scattered records – September (1), October (1), November (2), December (2), January (2), March (4), April (1), May (5) and June (2).

**Redwing** *Turdus iliacus*

Autumn passage from early October (rarely mid September) with up to 900 recorded in early November 1975. A few birds overwinter and these are augmented by migrants in March and April. Odd birds regularly remain until early June, one summered in 1976, 1977 and possibly also 1956. Most subspecific identifications refer to the Icelandic race *T. m. coburni*. A bird ringed in Iceland was caught on St Kilda 13 February 1962 and another ringed on Hirta in January was recovered the following May in north Iceland.

**Mistle thrush** *Turdus viscivorus*

Singles 21 March 1969 (N. Picozzi) and 26 August 1976 (K. Taylor) and several in first half of April 1969 (NCC).

**American robin** *Turdus migratorius*

One 14 January to 15 February 1975 (D. Neal, C. Brown).

**Grasshopper warbler** *Locustella naevia*

One 1 May 1965 (Grubb).

**Sedge warbler** *Acrocephalus schoenobaenus*

A total of 14 birds recorded between 28 April and 14 June in six springs and three singles between 6 and 15 September, all in different years.

**Marsh warbler** *Acrocephalus palustris*

Female shot 6 September 1910 (Clarke).

**Subalpine warbler** *Sylvia cantillans*

One collected 15 June 1894 (Clarke).

**Barred warbler** *Sylvia nisoria*

Recorded 13 and 28 August 1957 (1 bird), 1 September 1910 (1), 1 and 3 September 1974 (2), and 13 September 1965 (1).

**Lesser whitethroat** *Sylvia curruca*

Observed on four dates in mid September 1910 with several on the 14th; also one 7 October 1911. Singles on 18 and 21 May 1978 and 3 June 1969 (sang).

**Whitethroat** *Sylvia communis*

About 13 individuals between 11 May and 3 June in 1955–59. Only other records singles 1 May 1966, 15 and 29 May 1977, 25 May 1975, 22 August 1958, 8 September 1959 and 6 September 1910.

**Garden warbler** *Sylvia borin*

Recorded in six springs between 18 May and 12 June (8 records) and in six autumns between 11 August and 28 September (9 records).

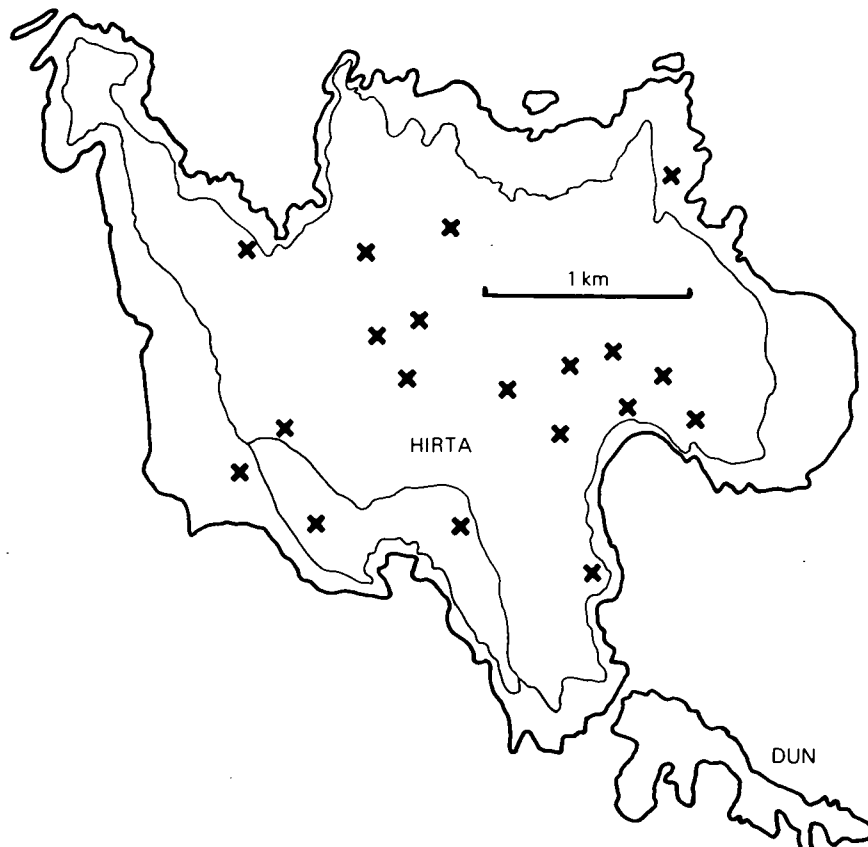


Figure 14. Distribution of pairs of wheatears on Hirta and Dun in 1977

**Blackcap** *Sylvia atricapilla*

Males on 9 May 1975, 5 October 1964, 10 October 1911 and females 26 August 1957 and 9 October 1965.

**Yellow-browed warbler** *Phylloscopus inornatus*

One 20 September 1957 (Williamson & Boyd).

**Wood warbler** *Phylloscopus sibilatrix*

Singles 4–5 August and 13–17 August 1957 (Williamson & Boyd) and 6 September 1965 (D. C. Gwynne).

**Chiffchaff** *Phylloscopus collybita*

In spring a total of nine birds arriving between 9 April and 24 June. One remained and sang from 1 April to 3 June 1965. In autumn small numbers in two Septembers, on 7 and 11 October, 7 November and 6 December.

**Willow warbler** *Phylloscopus trochilus*

Recorded in six springs between 20 April and 22 May. The commonest warbler in the autumn with records 2 August–30 October. Numbers are normally very small but it was 'fairly numerous' on 6 September 1910.

Willow warblers/chiffchaffs have also been reported 26 April–23 May (14 dates) and in August (10 dates) and November (once).

**Goldcrest** *Regulus regulus*

Up to three birds noted between 1 April and 15 May in six springs and on 5 September 1961 and 1 November 1975.

**Spotted flycatcher** *Muscicapa striata*

A total of ten records of up to three birds between 27 April and 3 June.

**Red-breasted flycatcher** *Ficedula parva*

Singles 14 October and 5–8 November 1966 (Grubb).

**Pied flycatcher** *Ficedula hypoleuca*

In spring seen 7–8 (1 bird) and 16 May 1977 (1), 11–12 May 1968 (2), 4 June 1969 (1); in autumn 11 August 1975 (3), 18 September 1964 (1) and 5 October 1961 (1).

**Golden oriole** *Oriolus oriolus*

Bird found long dead 23 July 1975.

**Great or lesser grey shrike** *Lanius minor/excubitor*

A single black, grey and white shrike with pinkish underparts 5 May 1977 (S. Moyes, W. Wright).

**Jackdaw** *Corvus monedula*

Rare visitor in winter and spring with singles 9 December 1911, 25–29 December 1961, 13 April 1966, 14–16 April and 7–13 May 1962, 11–14 May 1974, 3–23 November 1975; two on 30 June 1972. Three corpses were found in April 1974.

**Rook** *Corvus frugilegus*

Large numbers in the winter of 1893 and up to 3 19 March–1 April 1969. Otherwise singles 17 September 1961, 19 March–3 April 1965, 1 April 1962, 7–14 April 1966, 18 and 23 May 1977.

**Hooded crow** *Corvus corone cornix*

In 1974–78 bred on Dun, Oiseval and possibly 1–2 pairs elsewhere on Hirta; also single pairs seen on Soay and Boreray. Other population estimates have been 6 pairs or families in 1960, 2–3 pairs in 1961–63, 3–4 pairs in 1969 but only 1 in 1971. Far more numerous in 1927–28 with perhaps 10 pairs and up to 40 birds seen together (Cockburn in Harrison & Lack) but down to present level by 1931. An unusually large flock of 21 on 10 June 1963.

A single carrion crow *C. c. corone* 30 August 1959 (MacIellan).

**Raven** *Corvus corax*

Breeds. In 1974–76 4–6 pairs were present on Hirta and Dun but we could find no nests and no young fledged. In contrast in 1977 there were three pairs on Hirta (although only 2 nests found), and a pair on Dun. These fledged at least seven young. There was one additional pair on Hirta whose nesting success was unknown. Presumably bred on Boreray and Soay where birds were seen. Most recent accounts suggest 3–5 pairs on Hirta and Dun but there were 5–6 in 1963. Recent annual maximal counts of birds have been 16 in 1961–62, 14 in 1963 and 1965, 12 in 1968, 19 in 1971 and 18 (all adults) in 1975.

**Starling** *Sturnus vulgaris*

Breeds; the last estimate of 100–200 pairs in 1961–62 is probably still valid. In 1963 there were only 34 pairs in the village, 14 others elsewhere inland and other pairs on the cliffs. The figures of 9 pairs on Hirta, 5 on Soay, 4 on Boreray and one on Dun in 1931 may be too low as they came from a visit late in the season; there were c.100 pairs in 1927–28. There were only 100 birds in 1939 and 29 pairs in the village and 21 elsewhere in 1947, but a flock of 350–400 birds, mostly juveniles, in 1948. Some birds overwinter.

**Rose-coloured starling** *Sturnus roseus*

Singles July 1925 (Clarke) and 18–19 June 1974.

**House sparrow** *Passer domesticus*

Recorded 11 May 1958, 7–21 July 1960 (4 birds), 5–8 May, 2–3 and 15 July and 14 August 1962 (1 or more), August 1974, 25–26 May 1975 and 25 April 1976.

**Tree sparrow** *Passer montanus*

Bred 1884, 1896, 1902, 1910–11 and 1914. Then followed a gap until 1962 when at least four and possibly six pairs bred (Waters). In 1963 there were three pairs, in 1969 two or three pairs had nests, in 1970 there were none but again there were three pairs in 1971. In the last year three birds were seen on Soay (Brathay).

Singles or small flocks occur many years between May (commonest) and August.

**Chaffinch** *Fringilla coelebs*

A total of 19 records spread between October (4), November (4), February (1), April (5), May (4), June (1).

**Brambling** *Fringilla montifringilla*

In March (1 record), April (2), May (9) and October (2).

**Greenfinch** *Carduelis chloris*

Two on 10 October 1911, five on 18 August 1978 and singles 25 May 1966 and 17 August 1975.

**Goldfinch** *Carduelis carduelis*

Two on 9 November 1961 (Fullagar), one on 21–25 May 1977 and two the following day.

**Siskin** *Carduelis spinus*

One 12 November 1961, five 29 July 1964, two 13 May 1972 and one 8 November 1975.

**Linnet** *Carduelis cannabina*

Single 31 May and 1 June 1977.

**Twite** *Carduelis flavirostris*

Previously bred on Hirta with 13 pairs in 1931 (plus one on Boreray), 10–11 pairs in 1939 (plus 2 on Dun), 13 pairs in 1947, at least four pairs in 1948, no more than 10–11 pairs in 1956, few pairs only in 1957, 12–25 pairs not all breeding in 1960, 10 pairs in 1961, one 1962, 17 pairs in 1963, 2–3 pairs in the village in 1970, 8–10 pairs on Hirta in 1971. Since then only scattered records, although birds sang in 1975, 1976 and 1977. Always a summer visitor from March (once 24 February) to September, sometimes October. Suggestion of passage in September.

**Redpoll** *Carduelis flammea*

Eleven records of up to 20 birds between September and November, one 18–20 May 1966, one on 30 May 1958 and up to two on four dates between 11 May and 28 June 1977. Both the Greenland and Mealy races *C. f. rostrata* and *C. f. flammea* have been recorded.

**Crossbill** *Loxia curvirostra*

Recorded 7 July and 17 September 1910 (1), 22 July 1930 (1), 16–19 July 1956 (c.20), 31 July–9 August 1959 (up to 20), 8 July–4 August 1962 (c.50), 14–22 June 1966 (2), early July (6) and 2 August (3) 1972.

**Common rosefinch** *Carpodacus erythrinus*

Three birds 8–19 September 1910 (Clarke) and an adult male 25–26 May 1977.

**Hawfinch** *Coccothraustes coccothraustes*

Singles 30 May 1969 (J. J. M. Flegg) and for about three weeks from 18 May 1972.

**Evening grosbeak** *Hesperiphona vespertina*

One 26 March 1969 (Picozzi).

**Lapland bunting** *Calcarius lapponicus*

Up to 20 together recorded in nine Septembers, including three on Boreray on 15 September 1911. Some birds remain into October. Two in May 1972.

**Snow bunting** *Plectrophenax nivalis*

Bred in 1913 (Lack).

Regular migrant late September–November (maximum count c.80), occasional birds stay overwinter. Spring passage February–end April with a few birds recorded in May (8 years), June (2), August (1).

**Yellowhammer** *Emberiza citrinella*

One 18 June 1884 (Dixon), also on Boreray on 17 May 1960 (Boyd).

**Ortolan bunting** *Emberiza hortulana*

Recorded on several dates 1–16 September 1910 and 2 September 1911 (Clarke) and on 20 May 1975 (H. Brown).

**Little bunting** *Emberiza pusilla*

Two on Boreray 15 September 1911 (Stout in Clarke).

**Yellow-breasted bunting** *Emberiza aureola*

Single collected September 1910 (Clarke in his edition of Saunders (1927)).

**Reed bunting** *Emberiza schoeniclus*

Ones or twos between 30 April and 29 May (9 records in five years), singles 21 March 1969 and 4 September 1976.

**Red-headed bunting** *Emberiza bruniceps*

Eight records of males in seven years apparently arriving in May (2), June (3), July (2) and September (1).

Birds often remain for several weeks. As with all records there is the possibility that these may be escaped cage birds.

**Corn bunting** *Miliaria calandra*

Probably bred 1840, 1879 and 1896.

Since then one record 17–20 May 1957 (Williamson & Boyd).



Plate 16 A flypast of puffins on Dun. (Photograph K Taylor)

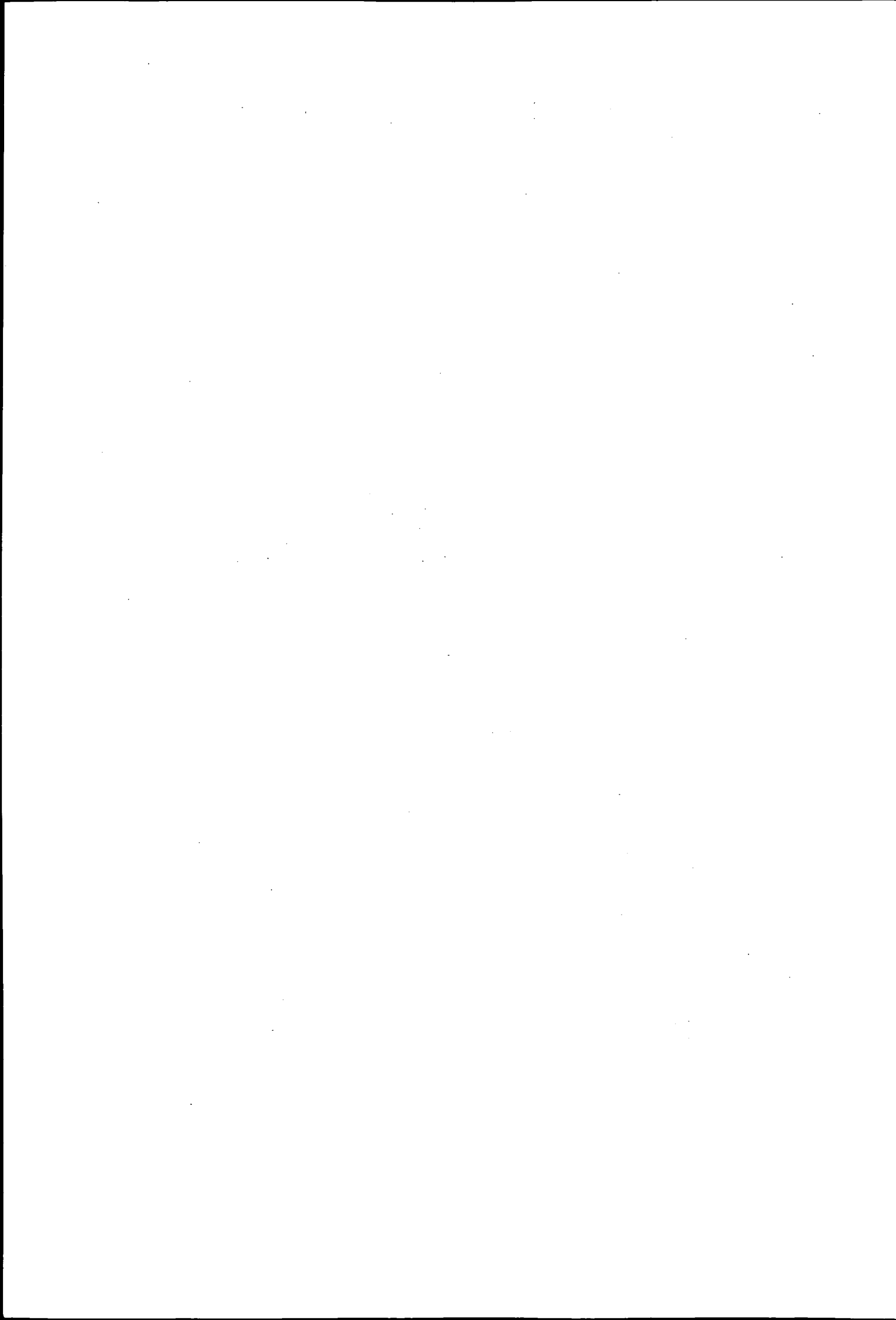


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## APPENDIX I

## List of birds in alphabetical order of English name

Alpine swift	<i>Apus melba</i>	page 30	Great snipe	<i>Gallinago media</i>	page 20
American robin	<i>Turdus migratorius</i>	35	Green sandpiper	<i>Tringa ochropus</i>	20
American water pipit	<i>Anthus rubescens</i>	32	Greenfinch	<i>Carduelis chloris</i>	37
Arctic skua	<i>Stercorarius parasiticus</i>	22	Greenshank	<i>Tringa nebularia</i>	20
Arctic tern	<i>Sterna paradisaea</i>	27	Grey heron	<i>Ardea cinerea</i>	14
Baird's sandpiper	<i>Calidris bairdii</i>	19	Grey phalarope	<i>Phalaropus fulicarius</i>	22
Bar-tailed godwit	<i>Limosa lapponica</i>	20	Grey plover	<i>Pluvialis squatarola</i>	19
Barnacle goose	<i>Branta leucopsis</i>	16	Grey wagtail	<i>Motacilla cinerea</i>	32
Barred warbler	<i>Sylvia nisoria</i>	35	Grey-cheeked thrush	<i>Catharus minimus</i>	34
Bean goose	<i>Anser fabalis</i>	14	Grey-headed wagtail	<i>Motacilla flava thunbergi</i>	32
Black guillemot	<i>Cepphus grylle</i>	29	Greylag goose	<i>Anser anser</i>	16
Black redstart	<i>Phoenicurus ochruros</i>	34	Guillemot	<i>Uria aalge</i>	27
Black-eared wheatear	<i>Oenanthe hispanica</i>	34	Gyr falcon	<i>Falco rusticolus</i>	18
Black-headed gull	<i>Larus ridibundus</i>	22	Hawfinch	<i>Coccothraustes coccothraustes</i>	37
Black-tailed godwit	<i>Limosa limosa</i>	20	Hen harrier	<i>Circus cyaneus</i>	17
Black-throated diver	<i>Gavia arctica</i>	10	Herring gull	<i>Larus argentatus</i>	24
Blackbird	<i>Turdus merula</i>	34	Hooded crow	<i>Corvus corone cornix</i>	36
Blackcap	<i>Sylvia atricapilla</i>	36	Hoopoe	<i>Upupa epops</i>	32
Bluethroat	<i>Luscinia svecica</i>	34	House martin	<i>Delichon urbica</i>	32
Brambling	<i>Fringilla montifringilla</i>	37	House sparrow	<i>Passer domesticus</i>	37
Brent goose	<i>Branta bernicla</i>	16	Iceland gull	<i>Larus glaucooides</i>	24
Buff-breasted sandpiper	<i>Tryngites subruficollis</i>	20	Jack snipe	<i>Lymnocyrtus minimus</i>	20
Buzzard	<i>Buteo buteo</i>	17	Jackdaw	<i>Corvus monedula</i>	36
Canada goose	<i>Branta canadensis</i>	16	Kestrel	<i>Falco tinnunculus</i>	17
Carion crow	<i>Corvus corone corone</i>	36	King eider	<i>Somateria spectabilis</i>	17
Chaffinch	<i>Fringilla coelebs</i>	37	Kittiwake	<i>Rissa tridactyla</i>	26
Chiffchaff	<i>Phylloscopus collybita</i>	36	Knot	<i>Calidris canutus</i>	19
Collared dove	<i>Streptopelia decaocto</i>	30	Lapland bunting	<i>Calcarius lapponicus</i>	37
Common gull	<i>Larus canus</i>	23	Lapwing	<i>Vanellus vanellus</i>	19
Common rosefinch	<i>Carpodacus erythrinus</i>	37	Laughing gull	<i>Larus atricilla</i>	22
Common sandpiper	<i>Actitis hypoleucos</i>	22	Leach's petrel	<i>Oceanodroma leucorhoa</i>	14
Common scoter	<i>Melanitta nigra</i>	17	Lesser black-backed gull	<i>Larus fuscus</i>	23
Common tern	<i>Sterna hirundo</i>	27	Lesser grey shrike	<i>Lanius minor</i>	36
Coot	<i>Fulica atra</i>	18	Lesser whitethroat	<i>Sylvia curruca</i>	35
Cormorant	<i>Phalacrocorax carbo</i>	14	Linnet	<i>Carduelis cannabina</i>	37
Corn bunting	<i>Miliaria calandra</i>	38	Little auk	<i>Alle alle</i>	29
Corncrake	<i>Crex crex</i>	18	Little bunting	<i>Emberiza pusilla</i>	37
Crossbill	<i>Loxia curvirostra</i>	37	Little gull	<i>Larus minutus</i>	22
Cuckoo	<i>Cuculus canorus</i>	30	Little ringed plover	<i>Charadrius dubius</i>	19
Curlew	<i>Numenius arquata</i>	20	Little stint	<i>Calidris minuta</i>	19
Dotterel	<i>Eudromias morinellus</i>	19	Long-eared owl	<i>Asio otus</i>	30
Dunlin	<i>Calidris alpina</i>	20	Long-tailed duck	<i>Clangula hyemalis</i>	17
Dunnoek	<i>Prunella modularis</i>	34	Mallard	<i>Anas platyrhynchos</i>	16
Eider	<i>Somateria mollissima</i>	17	Manx shearwater	<i>Puffinus puffinus</i>	14
Evening grosbeak	<i>Hesperiphona vespertina</i>	37	Marsh harrier	<i>Circus aeruginosus</i>	17
Fieldfare	<i>Turdus pilaris</i>	34	Marsh warbler	<i>Acrocephalus palustris</i>	35
Fulmar	<i>Fulmarus glacialis</i>	10	Meadow pipit	<i>Anthus pratensis</i>	32
Gannet	<i>Sula bassana</i>	14	Merlin	<i>Falco columbarius</i>	17
Garden warbler	<i>Sylvia borin</i>	35	Mistle thrush	<i>Turdus viscivorus</i>	35
Garganey	<i>Anas querquedula</i>	16	Moorhen	<i>Gallinula chloropus</i>	18
Glaucous gull	<i>Larus hyperboreus</i>	24	Mute swan	<i>Cygnus olor</i>	14
Goldcrest	<i>Regulus regulus</i>	36	Nightingale	<i>Luscinia megarhynchos</i>	34
Golden eagle	<i>Aquila chrysaetos</i>	17	Ortolan bunting	<i>Emberiza hortulana</i>	37
Golden oriole	<i>Oriolus oriolus</i>	36	Osprey	<i>Pandion haliaetus</i>	17
Golden plover	<i>Pluvialis apricaria</i>	19	Oystercatcher	<i>Haematopus ostralegus</i>	18
Goldeneye	<i>Bucephala clangula</i>	17	Peregrine	<i>Falco peregrinus</i>	17
Goldfinch	<i>Carduelis carduelis</i>	37	Pied flycatcher	<i>Ficedula hypoleuca</i>	36
Goosander	<i>Mergus merganser</i>	17	Pied wagtail	<i>Motacilla alba yarelli</i>	32
Grasshopper warbler	<i>Locustella naevia</i>	35	Pink-footed goose	<i>Anser brachyrhynchus</i>	14
Great auk	<i>Pinguinus impennis</i>	27	Pintail	<i>Anas acuta</i>	16
Great black-backed gull	<i>Larus marinus</i>	26	Pochard	<i>Aythya ferina</i>	16
Great northern diver	<i>Gavia immer</i>	10	Pomarine skua	<i>Stercorarius pomarinus</i>	22
Great grey shrike	<i>Lanius excubitor</i>	36	Ptarmigan	<i>Lagopus mutus</i>	18
Great shearwater	<i>Puffinus gravis</i>	14	Puffin	<i>Fratercula arctica</i>	29
Great skua	<i>Catharacta skua</i>	22	Purple sandpiper	<i>Calidris maritima</i>	19

Quail	<i>Coturnix coturnix</i>	page 18	White wagtail	<i>Motacilla alba alba</i>	page 32
Raven	<i>Corvus corax</i>	36	White-fronted goose	<i>Anser albifrons</i>	16
Razorbill	<i>Alca torda</i>	27	White-tailed eagle	<i>Haliaeetus albicilla</i>	17
Red grouse	<i>Lagopus lagopus</i>	18	Whitethroat	<i>Sylvia communis</i>	35
Red-breasted flycatcher	<i>Ficedula parva</i>	36	Whooper swan	<i>Cygnus cygnus</i>	14
Red-breasted merganser	<i>Mergus serrator</i>	17	Wigeon	<i>Anas penelope</i>	16
Red-headed bunting	<i>Emberiza bruniceps</i>	38	Willow warbler	<i>Phylloscopus trochilus</i>	36
Red-necked phalarope	<i>Phalaropus lobatus</i>	22	Wood sandpiper	<i>Tringa glareola</i>	20
Red-throated diver	<i>Gavia stellata</i>	10	Wood warbler	<i>Phylloscopus sibilatrix</i>	36
Red-throated pipit	<i>Anthus cervinus</i>	32	Woodcock	<i>Scolopax rusticola</i>	20
Redpoll	<i>Carduelis flammea</i>	37	Woodpigeon	<i>Columba palumbus</i>	30
Redshank	<i>Tringa totanus</i>	20	Wren	<i>Troglodytes troglodytes</i>	32
Redstart	<i>Phoenicurus phoenicurus</i>	34	Wryneck	<i>Jynx torquilla</i>	32
Redwing	<i>Turdus iliacus</i>	34	Yellow wagtail	<i>Motacilla flava</i>	32
Reed bunting	<i>Emberiza schoeniclus</i>	38	Yellow-breasted bunting	<i>Emberiza aureola</i>	37
Ring ouzel	<i>Turdus torquatus</i>	34	Yellow-browed warbler	<i>Phylloscopus inornatus</i>	36
Ringed plover	<i>Charadrius hiaticula</i>	19	Yellowhammer	<i>Emberiza citrinella</i>	37
Robin	<i>Erithacus rubecula</i>	34			
Rock dove	<i>Columba livia</i>	30			
Rock pipit	<i>Anthus spinoletta</i>	32			
Rock thrush	<i>Monticola saxatilis</i>	34			
Roller	<i>Coracias garrulus</i>	32			
Rook	<i>Corvus frugilegus</i>	36			
Rose-coloured starling	<i>Sturnus roseus</i>	36			
Ruff	<i>Philomachus pugnax</i>	20			
Sand martin	<i>Riparia riparia</i>	32			
Sanderling	<i>Calidris alba</i>	19			
Sandwich tern	<i>Sterna sandvicensis</i>	27			
Scaup	<i>Aythya marila</i>	17			
Sedge warbler	<i>Acrocephalus schoenobaenus</i>	35			
Shag	<i>Phalacrocorax aristotelis</i>	14			
Shelduck	<i>Tadorna tadorna</i>	16			
Shore lark	<i>Eremophila alpestris</i>	32			
Short-eared owl	<i>Asio flammeus</i>	30			
Short-toed lark	<i>Calandrella cinerea</i>	32			
Shoveler	<i>Anas clypeata</i>	16			
Siskin	<i>Carduelis spinus</i>	37			
Skylark	<i>Alauda arvensis</i>	32			
Slavonian grebe	<i>Podiceps auritus</i>	10			
Snipe	<i>Gallinago gallinago</i>	20			
Snow bunting	<i>Plectrophenax nivalis</i>	37			
Snowy owl	<i>Nyctea scandiaca</i>	30			
Song thrush	<i>Turdus philomelos</i>	34			
Sooty shearwater	<i>Puffinus griseus</i>	14			
Spotted flycatcher	<i>Muscicapa striata</i>	36			
Starling	<i>Sturnus vulgaris</i>	36			
Stock dove	<i>Columba oenas</i>	30			
Stonechat	<i>Saxicola torquata</i>	34			
Storm petrel	<i>Hydrobates pelagicus</i>	14			
Subalpine warbler	<i>Sylvia cantillans</i>	35			
Swallow	<i>Hirundo rustica</i>	32			
Swift	<i>Apus apus</i>	30			
Tawny pipit	<i>Anthus campestris</i>	32			
Teal	<i>Anas crecca</i>	16			
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Thrush nightingale	<i>Luscinia luscinia</i>	34			
Tree pipit	<i>Anthus trivialis</i>	32			
Tree sparrow	<i>Passer montanus</i>	37			
Tufted duck	<i>Aythya fuligula</i>	17			
Turnstone	<i>Arenaria interpres</i>	22			
Turtle dove	<i>Streptopelia turtur</i>	30			
Twite	<i>Carduelis flavirostris</i>	37			
Velvet scoter	<i>Melanitta fusca</i>	17			
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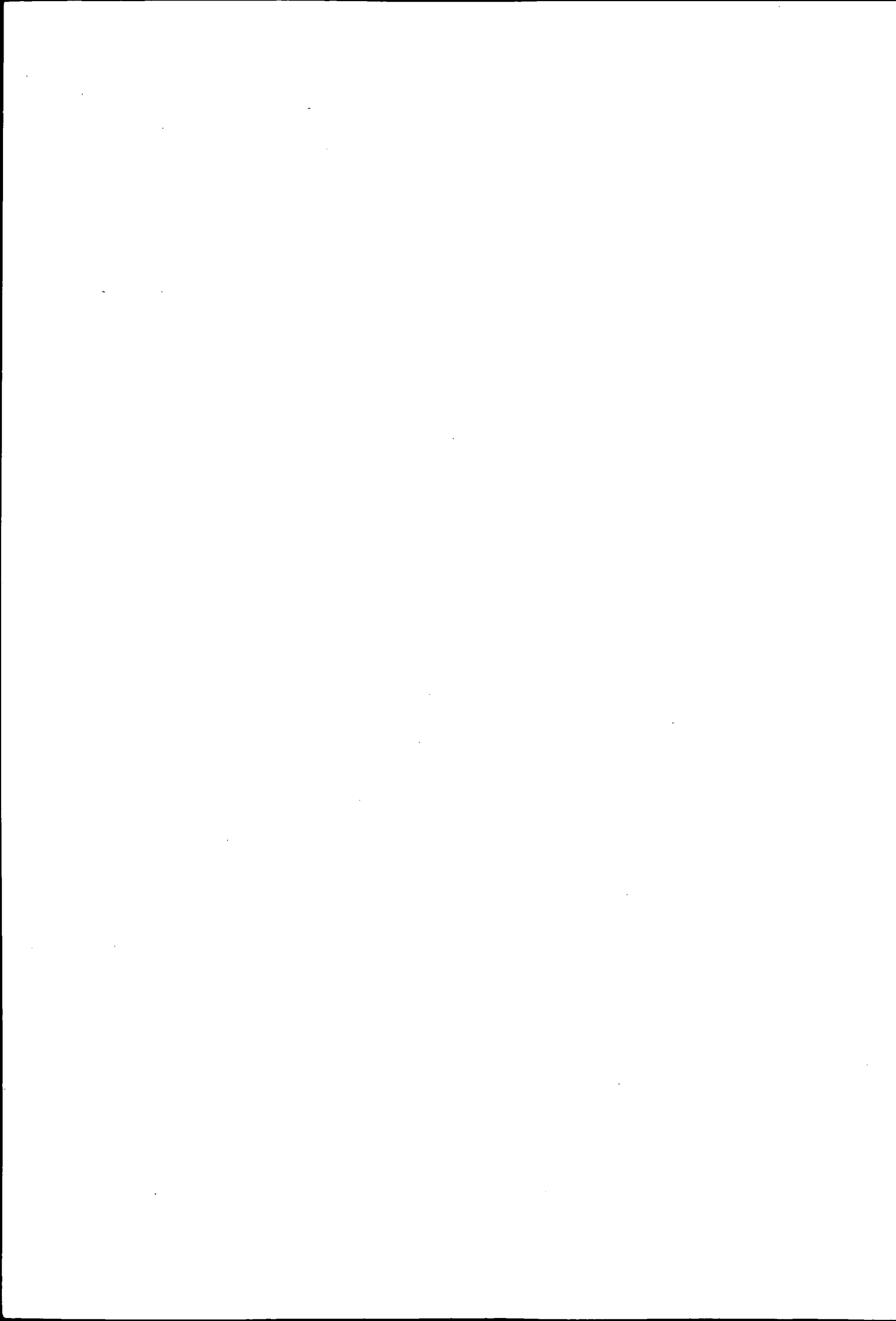
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*Plate 17 St Kildans catching fulmars with a long pole and a running noose. (Photograph N. Rankin)*







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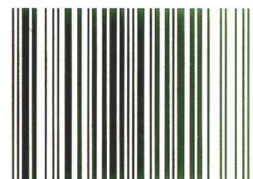
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