

# Archaeological and ethnographic evidence for seabird exploitation in Scotland

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## RÉSUMÉ

Les études ethnographiques montrent que les oiseaux de mer ont été régulièrement exploités pour la nourriture ou d'autres produits, dans les îles du nord et de l'ouest de l'Écosse. L'archéologie montre que les oiseaux de mer étaient les espèces les plus exploitées pour les sites du 4ème millénaire BC jusqu'au 17ème siècle AD. Les restes de poules domestiques (*Gallus gallus*) ne sont pas communs, même dans les sites récents. *Sula bassana*, le Fou de Bassan, était l'espèce la plus communément capturée pour la nourriture, bien qu'elle n'ait pas été la plus abondante, et le Pingouin (*Alca impennis*) était également important aux époques préhistoriques.

## ABSTRACT

In the Western and Northern Island of Scotland, seabirds were exploited for food until modern times, mainly *Sula bassana*, *Alca impennis*. Evidence for *Gallus gallus* is scant.

**Key words** : seabirds, gannet (*Sula bassana*), great auk (*Alca impennis*), domestic fowl (*Gallus gallus*), bird bones, fowling, Scotland, prehistoric, medieval.

## History and Ethnography

The range of wild bird species regularly eaten today in the developed world, especially among Anglo-Saxon cultures, is so small that it is no longer common knowledge that seabirds and most other birds were eaten in the past. So unfamiliar is the notion, that it was possible for an archaeozoologist to write of the birds from a Hebridean site which include swan (*Cygnus cygnus*), gannet (*Sula bassana*) and puffin (*Fratercula arctica*): "Bird bones were few and mainly inedible" (Clarke 1961).

The main areas of seabird fowling in northern Europe were Iceland, the Faroes, the Northern Isles of Scotland (Shetland and Orkney), and the Outer Hebrides, where the population of the St Kilda group of islands partly depended

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on seabird exploitation. They were taken for food and for other products such as feathers and oil.

Written records are few in northern Europe before the modern period, and fewer still refer to economic life. One early account is the ninth century 'Terfinnas' of Ohthere, which relates that part of the tribute paid by the Lapps was in feathers (Ross 1940). In a report to the King of Scotland, Dean Munro (1549) described how men from Lewis made an annual voyage to Sula Sgeir to collect down from the eider duck (*Somateria mollissima*). In the same century fishermen were capturing numbers of great auk (*Alca impennis*) off Newfoundland to provision their ships (Grieve 1885). At the end of the seventeenth century, several writers published accounts of life in Orkney (Wallace 1963; Brand 1701) and the Western Isles (Martin 1716, 1740) of which Martin's "Voyage to St Kilda", most caught the imagination. The islanders took 20,000 gannets a year, many of which were sent out of the islands; in return they received grain. In the seventeenth century feathers were the main saleable commodity (Shaw 1980). The eighteenth century agricultural reports for each parish in Scotland inspired by Sinclair (1795) include descriptions of all aspects of economic life. Nineteenth century bird books (eg Mudie 1835) describe not only the habits and plumage of the birds but also their uses, their weights and their palatability. By the end of the century travellers and ethnographers, particularly Kearton (1897), were photographing the fowlers at work; their pictures often emphasize the very hazardous nature of many of the techniques of taking the birds and eggs on the cliffs. Much of the historical evidence for seabird fowling in Scotland and Faroe has been assembled by Baldwin (1974), whose study focussed on the methods of capture; Fenton (1978) has also collected a wide range of accounts of fowling in the Northern Isles.

Birds were captured on the cliffs and clifftops where they came to breed. The most common methods used were seizing birds by hand on the ledges or from their burrows, sometimes as they slept. They were also caught with snares on long poles, clubbed with long sticks or "swapped" with nets on poles (Baldwin *op. cit.* p. 65-88). The fowlers themselves were often roped and harnessed.

In order to explore the antiquity of seabird fowling we have to turn to the bird remains from archaeological sites. When Baldwin (*op. cit.* 61) wrote "Apart from the great auk... and the fulmar... the range of sea-birds taken by man in these areas would appear to have remained more or less constant" he had only written records on which to base his conclusions. However, in the last two decades a number of excavations have taken place at coastal sites in the west and north of Scotland (see Figure 1) in which high priority has been given to the recovery of organic remains, including bird bones, and it is possible to begin to test the historical assessments of the antiquity of seabird exploitation. Reports of sites excavated earlier restrict themselves to lists of the species present.

### The archaeological evidence

The seabirds which breed round the west and north of Scotland are listed in table 1. The species most commonly referred to in the historical literature are marked (\*) in the table. Their relative proportions at a range of sites has been compared (figure 2 - 5). The great auk, extinct since the middle of the last century, has been included. Records for the herring gull (*Larus argentatus*) and the lesser black-backed gull (*Larus fuscus*) have been combined as their bones can rarely be distinguished. In the figures the percentage of each species in the total assemblage is shown. Pro-

portions for domestic fowl (*Gallus gallus*) and the goose (*Anser anser*) are also shown; and also other species for which the bones make up 10% or more of the total assemblage. As the histograms omit species which make up less than 10% of the assemblage, they do not add up to 100%. A characteristic of bird bone assemblages which was noted by Brothwell et al. (1981) is that many different species are commonly identified in relation to the total number of bones. This has proved to be the case in all the sites looked at. Consequently, even in collections of hundreds of bones the number identified for each species is not high, and it was thought more appropriate to base the calculations on numbers of identified bones, rather than on a minimum number of individuals. Articulated bones, where recorded, are counted as one. The deposits at the Udal were sieved; the other sites were not sieved or were partly sieved.

### The settlements

The sites (Figure 1) are coastal settlements with an economic life based on mixed farming, with domestic livestock and cereal cultivation, mainly of barley. At some, fishing was also important. They range in date from post-medieval to neolithic. There are detailed reports on the bird bones from the chamber tombs of Quanterness and Isbister (Bramwell 1979, 1983) but they have not been considered here since at neither site does the main component of the bird remains appear to be food remains.

The Udal (Crawford & Switsur 1977; Crawford 1978) lies on a peninsula of shell sand on the north coast of North Uist, Outer Hebrides. There are dunes, some low cliffs and small offshore islands in the vicinity of the site. Some 550 bird bones have been identified among the sample of bones examined from Udal North, from deposits dating from AD c.300 to AD c.1700 (Table 2). Newark Bay (Brothwell et al., op. cit) is on the east coast of Orkney Mainland island. Buckquoy (Bramwell in Ritchie 1977) and Saevar Howe (Rowley-Conwy in Hedges 1983), lie within a kilometre of each other on the west coast of Orkney Mainland, close to some densely occupied seabird cliffs and to some still surviving wetlands, as well as agricultural land. Only a few prehistoric sites have published records of the bird bones. Crosskirk broch (MaCartney in Fairhurst 1984), on the north coast of mainland Scotland, belongs to the early and Roman Iron Age. The Knap of Howar, Papa Westray, Orkney, (Bramwell in Ritchie 1984) is an early neolithic settlement, also near high cliffs with numerous nesting seabirds today.

### Seabirds

The majority of bird bones are of seabirds at all the sites considered except Newark Bay. At the Knap of Howar the figure is 84% and at Crosskirk 71%. The proportion is also high in the early historic levels at the Udal (XI-XIII) and Buckquoy (79% and 70%). It is also very high (67%) in the late and post-medieval levels (II-VI) at the Udal. It is somewhat lower in the Norse levels at Buckquoy (53%) and the Udal (55%). The lower consumption of seabirds at these two sites and Newark Bay may reflect cultural and social choice as there is no reason to invoke environmental change on a scale to affect the scope for seabird fowling.

The birds found in the greatest numbers are the gannet or solan goose, (*Sula bassana*) and the guillemot (*Uria aalge*), together with the great auk on prehistoric

sites. Bones of the shag (*Phalacrocorax aristotelis*) and the cormorant (*Phalacrocorax carbo*) are also regularly found; the shag is the most common species at Crosskirk. Gulls are also present, except for the kittiwake (*Rissa tridactyla*). The kittiwake is common today (Table 1) but the increase in numbers has been in this century (Cramp et al. 1974 p. 139) and the archaeological records confirm that it was uncommon in earlier times. Some fulmar (*Fulmarus glacialis*) bones are present at most sites; up to 8% in the Pictish levels at Buckquoy and at the Knap of Howar; though the figures given for the minimum number of individuals for each species in the Knap of Howar report (Bramwell, 1984, 100) suggest that the eleven bones from T2,11 were from a single bird. It is also present at most of the sites. The only historically recorded breeding site of the fulmar in the British Isles until the end of the last century was on St Kilda. Since then it has become widespread. As it breeds on walls and ruined buildings (Cramp et al., *op. cit.*, p. 59) and can often be seen nesting on ruined stone structure on archaeological sites (personal observation), it is therefore very liable to be intrusive, and finds on sites need to be considered with caution.

The predominance of seabirds among the archaeological bird remains confirms the historical accounts, but there are some unexpected features. The predominance partly reflects the simple abundance of seabirds in the region, which is summarised in table 1. More than that, it reflects their breeding behaviour. The gannet, the guillemot, the razorbill (*Alca torda*), the puffin, and the manx shearwater (*Puffinus puffinus*), come together to breed in very large, densely occupied colonies. They are present in the breeding season and virtually unavailable at other times. Some of the species, such as the gannet and the manx shearwater also spend a notably long period at the breeding site rearing the young. The behaviour of the cormorant and the shag is rather different: they breed in smaller groups and are more readily taken at all times of year, including winter.

### Domestic fowl

It is striking that the domestic fowl was so late in its dispersal to the north and west of Scotland. It is common in mainland Britain from the Roman period onwards: yet one or two bones only were present at Crosskirk (Figure 5), and in the pre-Norse levels at Udal North and Buckquoy (Figure 4). They become more common in the centuries of Norse domination of the region: 20% of the identified bird bones from among those examined from the Udal are from domestic fowl and between 6% and 13% at the Orkney sites. Even in the late middle ages the proportion of domestic fowl bones from sites can be very low: at the Udal it is 21% and at Newark Bay it is 27%. This is very few compared with contemporary mainland sites in Britain and Europe, where the majority of bird bones are of domestic fowls. The needs fulfilled elsewhere by the chicken: eggs, feathers and flesh, could as readily be met from wild sources as from keeping domestic birds.

### Goose

In figures 2 - 5 numbers of bones of the wild greylag goose and its domestic form (both *Anser anser*) are combined. Domestic geese have been identified from early historic times onwards at all sites considered except Saevær Howe, where the sample is very small. The bones from the Udal range in size from those of the wild

greylag to domestic geese (Serjeantson, n.d.). It appears that both are present, and until the eighteenth century eggs of the wild greylag were collected on the moors of North Uist and reared with the domestic fowls, thus providing ample opportunity for interbreeding between wild and domestic stock.

## Gannet

The gannet stands out as the seabird most commonly exploited for food in early historic times, more so than the written accounts suggest. As figures 2 - 4 show it is the most common species at all sites except Newark Bay. The proportion of gannet bones is between 21% and 38% and even as late as the AD C16th/C17th, 38% of the bird bones studied from the Udal are from the gannet. They are more common than those of the domestic fowl. Though on unsieved sites there may be some bias in favour of the large gannet rather than smaller birds, it is at least as relatively common at the Udal, where the deposits were sieved, as at most other sites.

The explanation for the outstanding role of the gannet as a food species does not lie in the fact *either* that it is a more common species (Table 1) than the other seabirds *or* that it is more readily available. It is less numerous today than the others discussed, as table 1 shows, and furthermore the number of gannet breeding locations is fewer than for most of the other main seabird species (Nelson 1978; Bourne & Harris 1979). There are 36 colonies today in the eastern Atlantic, but at least 17 of these have only become established this century (Cramp *et al.* op. cit.). There are only eight very large colonies today and 12 medium sized ones (Figure 6).

If the breeding colonies were similarly restricted in the past the birds must have been taken from the offshore islands which they now occupy. Traditionally the right to exploit the resources of the offshore islands and stacks was restricted to different communities. The earls of Orkney, for instance, owned Sule Stack (Shaw *op. cit.*), [in figure 6 the triangle between Sula Sgeir and Orkney]; the men of Ness, the northern part of Lewis in the Hebrides, still have a right, maintained in the face of a certain amount of opposition from the EEC (Sunday Times, 2.9.84), to take birds annually from Sula Sgeir. On St Kilda the gannetries on the cliffs together with the rest of the land belonged to MacLeod of Harris. The inhabitants paid a rental partly in birds. Households had individual rights to some cliffs and shared others (Martin 1701). The economic and social organisation for the capture of gannets from the offshore islands and stacks appears to have varied from place to place; but nowhere was it a subsistence activity: on the contrary it required seaworthy boats and large crews and was on a scale comparable to the offshore fisheries. The capture of gannets ceased on Mykines in the Faroes when there were no longer "24 fit men" available to carry it out (Baldwin, *op. cit.* p. 65). In this it contrasts with the gathering of the other species with a wider breeding distribution which could have been carried out locally on a small scale.

Presumably great effort was put into the capture of gannets because they have the greatest body weight of the seabirds (Table 3); and they are also among the fattiest of birds (Nelson 1978). Fat and oil were crucial resources to these farming communities in the isles, and though in Orkney the pig could supply some of this need, there is little evidence of pigkeeping at the Hebridean sites. Birds were sold in London until the middle of the last century, and are still enjoyed by the people of Lewis.

## Great auk

It is not possible to assess the early importance of the great auk as a food species in Europe from historical data as it was already rare by the time of the first written records. Archaeological findspots of bones are shown in figure 7. The latest in Scotland appear to be the two bones from Buckquoy which were present in the topsoil (Bramwell, *op. cit.*) and probably derive from the Norse occupation, and the specimen recorded from Newark Bay (Brothwell *et al.*, *op. cit.*). A maxilla and an ulna were found in level XI at Udal North (Table 2) and one bone was found in Pictish levels at Buckquoy. At Brettaness, Rousay, Orkney, an early historic site, a humerus was found (Serjeantson *in* Marwick, *in prep.*). However, it is never frequent in these later sites. It has been found on many prehistoric sites (Figure 7) and may be one of the commoner species present. At the Knap of Howar 14%, and at Crosskirk 9%, of all bird bones are of the great auk. In Iron Age levels at Baleshare, North Uist, Outer Hebrides, (Barber 1986 *in press*) five bones of the great auk were found, the most common species, and at Hornish Point, also in Iron Age deposits, two out of 12 bird bones identified are of the great auk (Serjeantson *in* Barber, *op. cit.*). There are also records of finds at Elsay broch (Harrison 1980), Keiss broch (Grieve *op. cit.*), the chambered tomb of the Knowe of Ramsay (Platt 1936) and the mesolithic shell middens on Oransay (Grieve *op. cit.*) and Risga (Rich 1974). With a body weight which has been estimated to be comparable with that of a goose (Grieve, *op. cit.*), it may have approached the gannet in importance as a food source in early post-glacial times. However, as it was flightless and lacked a fear of man, as the sailors attested who exploited it in Newfoundland, it was easily taken when it came ashore on to the low rock shelves to breed. The fact too that it laid a single egg which was not replaced if taken, meant that it could not withstand predation by man as the other species could.

## Conclusion

Seabirds are the most frequent species among archaeological bird bone assemblages, as both the historical records and also their natural abundance in the region would suggest. Their habit of breeding in dense colonies made them a resource which, if not easy to exploit, was at least reliable. Written records often record a situation where as well as carcasses, products such as feathers were valuable in exchange and trade; whereas bird bones from archaeological sites show the birds which were *eaten* at the settlement. The gannet and before that the great auk, presumably because of their large body size, had an importance as food species out of proportion to their absolute numbers in the region.

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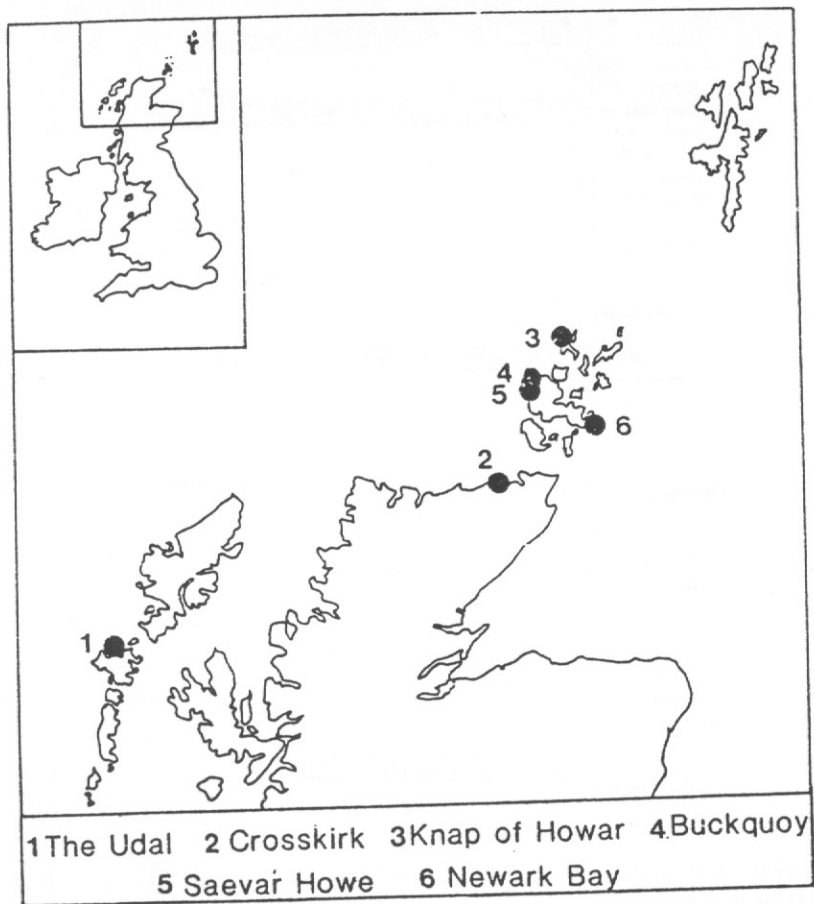


Figure 1. Northern Scotland showing archaeological sites discussed in the text.

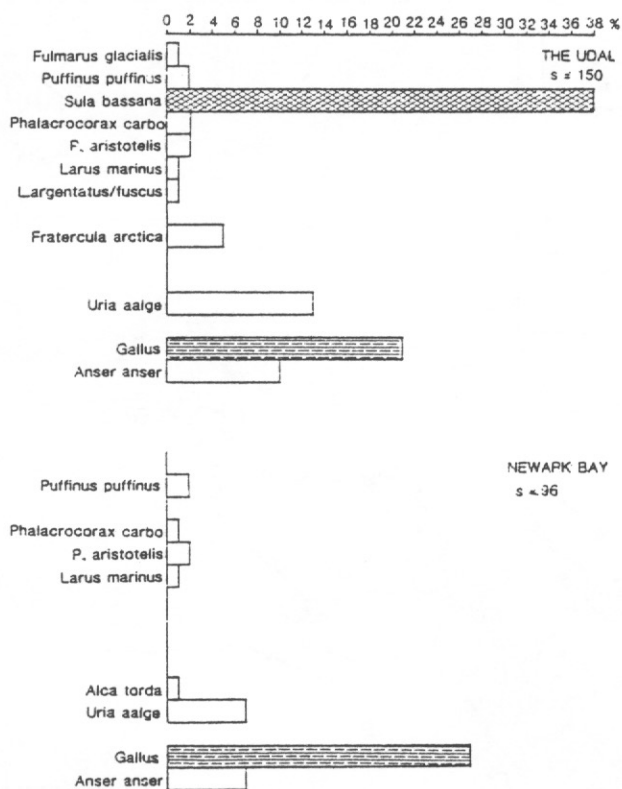


Figure 2. Seabirds, domestic fowl and geese from late and post-medieval sites: the Udal and Newark Bay.

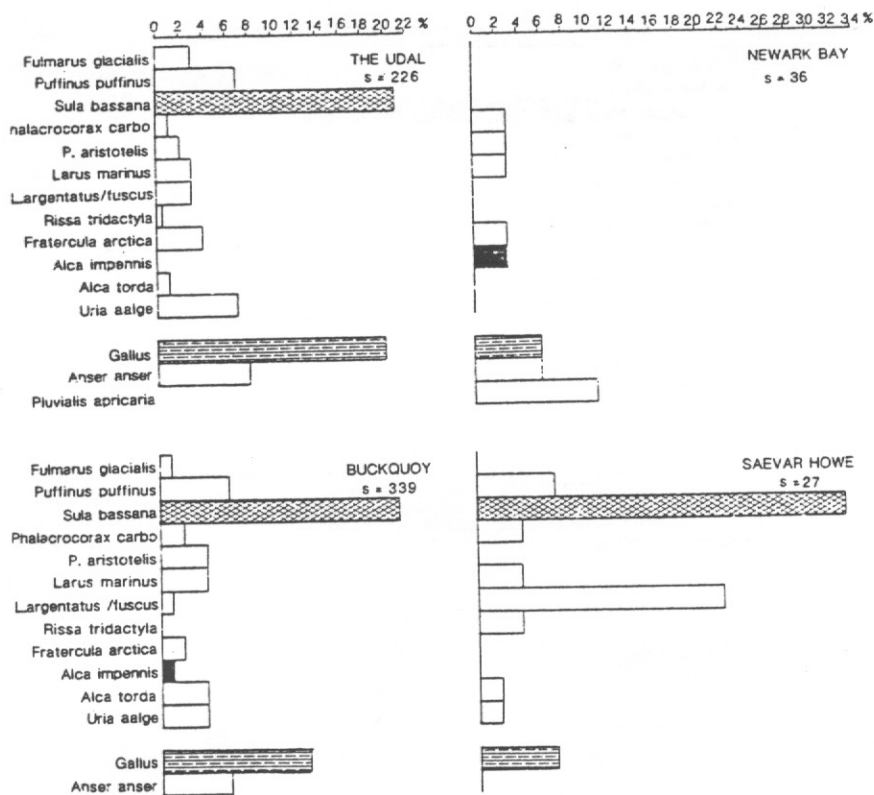


Figure 3. Seabirds, domestic fowl, and goose bones from Norse levels at the Udal, Newark Bay, Buckquoy, and Saevar Howe. Numbers of golden plover (*Pluvialis apricaria*) at Newark Bay are more than 10% of the total and are also shown.

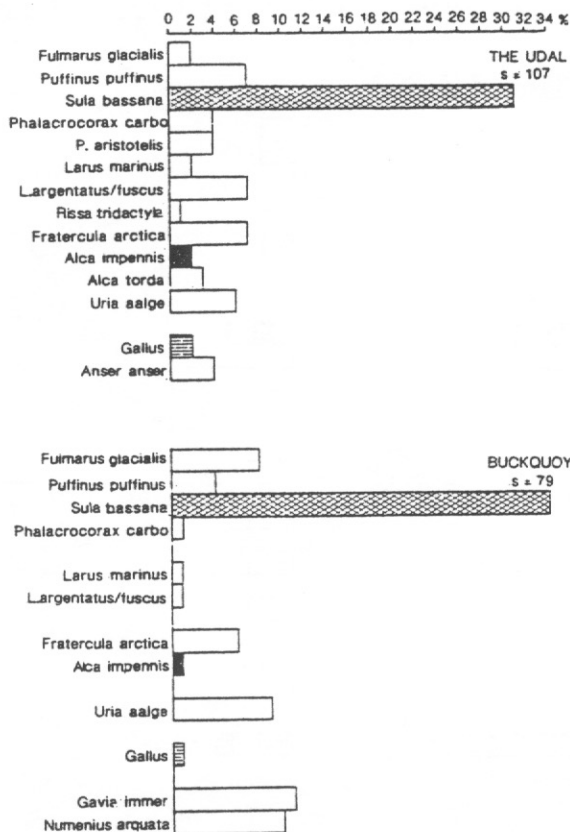


Figure 4. Seabirds, domestic fowl and goose bones in early historic levels at the Udal and Buckquoy. At Buckquoy numbers of the great northern diver (*Gavia immer*) and the curlew (*Numenius arquata*) are each more than 10% of the total and are also shown.

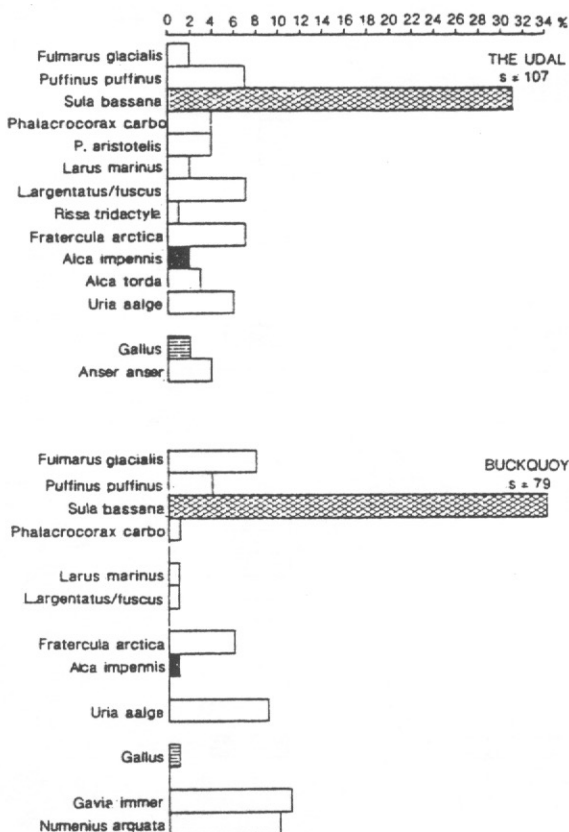


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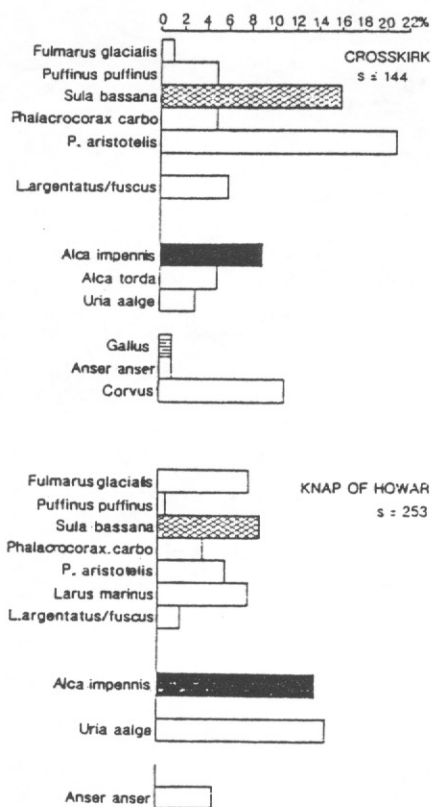


Figure 5. Seabirds, domestic fowl and goose bones at the early and Roman Iron age site of Crosskirk broch and at the early neolithic site of the Knap of Howar. More than 10% of the bird bones are of the crow or rook, (*Corvus* sp.), also shown.

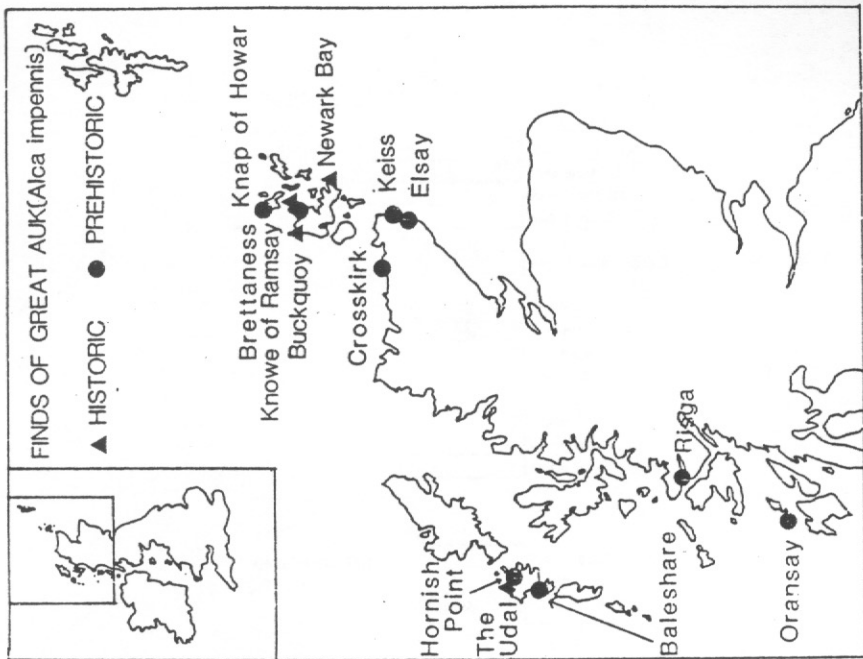


Figure 7. Findspots of bone on archaeological sites of the historic period (triangles) and the prehistoric

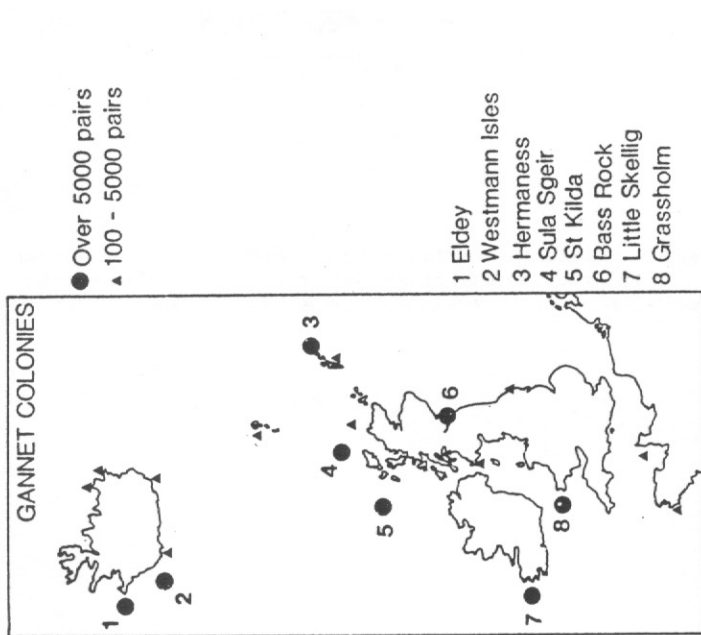


Figure 6. Principal breeding colonies of the gannet (*Sula bassana*)

SPECIES	BREEDING PAIRS (HEBRIDES)	BREEDING PAIRS (ORKNEY)
* Fulmar ( <u>Fulmarus glacialis</u> )	90,000+	47,000
* Manx shearwater ( <u>Puffinus puffinus</u> )	ORDER 6	ORDER 2 ?
Storm petrel ( <u>Hydrobates pelagicus</u> )	ORDER 5 ?	ORDER 4 ?
Leach's petrel ( <u>Oceanodroma leucorhoa</u> )	ORDER 4 ?	ORDER 2 ?
* Gannet ( <u>Sula bassana</u> )	65,000+	4,000
* Cormorant ( <u>Phalacrocorax carbo</u> )	803	600
* Shag ( <u>Phalacrocorax aristotelis</u> )	10,000+	3,600
Great skua ( <u>Stercorarius skua</u> )	22	90
Arctic skua ( <u>Stercorarius parasiticus</u> )	69	230
* Lesser black-backed gull ( <u>Larus fuscus</u> )	5,060	800
* Herring gull ( <u>Larus argentatus</u> )	26,000+	7,800
* Greater black-backed gull ( <u>Larus marinus</u> )	5,742	6,000
Common gull ( <u>Larus canus</u> )	4,744	4,850
Black-headed gull ( <u>Larus ridibundus</u> )	1,919	4,500
* Kittiwake ( <u>Rissa tridactyla</u> )	65,000+	128,000
Common tern ( <u>Sterna hirundo</u> )	1,247	200
Arctic tern ( <u>Sterna paradisaea</u> )	4,888	12,300
Little tern ( <u>Sterna albifrons</u> )	126	-
* Razorbill ( <u>Alca torda</u> )	38,000+	8,500
* Guillemot ( <u>Uria aalge</u> )	140,000+	129,000
Black guillemot ( <u>Cepphus grylle</u> )	2,517	2,240
* Puffin ( <u>Fratercula artica</u> )	350,000+	66,000 ?

Table 1: Seabirds resident or breeding around the west and north of Scotland. Their approximate abundance in the Hebrides (after Bourne & Harris, 1979) and Orkney (after Lea & Bourne, 1975) is shown. The species discussed in this paper (marked \*) are those historically recorded as most commonly exploited.

SPECIES	APPROX WEIGHT
Fulmar	2-3lb
Gannet	6-7lb
Cormorant	5-6lb
Greater black-backed gull	5lb
Kittiwake	8oz
Razorbill	20-22oz
Guillemot	11b 8oz - 11b 12oz
Puffin	12oz
16oz = 11b    11b = 0.4536kg	

Table 3: Weights of seabirds (from Mudie 1835 and Gray 1871).



	II-IV	V-VI	VII-IX	IXc-X	XI-XIII	mixed	total
Red-throated Diver ( <i>Gavia stellata</i> )					1		1
Fulmar ( <i>Fulmarus glacialis</i> )		1	3	4	2		10
Manx Shearwater ( <i>Puffinus puffinus</i> )		2	13	3	7		25
Procellariidae indet.			8	1			9
Gannet ( <i>Sula bassana</i> )	24	33	23	23	33	13	149
Cormorant ( <i>Phalacrocorax carbo</i> )		3		2	4	1	10
Shag ( <i>Phalacrocorax aristotelis</i> )	2	1	1	3	4	2	13
Grey Heron ( <i>Ardea cinerea</i> )		1		1			2
Barnacle Goose ( <i>Branta leucopsis</i> )			2				2
Greylag Goose ( <i>Anser anser</i> )	3	4	9	2		3	21
Goose indet. ( <i>Anser</i> sp.)	4	4		6	4	5	23
Swan ?Whooper ( <i>Cygnus cf olor</i> )	1						1
Mallard ( <i>Anas platyrhynchos</i> )			1		1		2
Duck indet. ( <i>Anas</i> sp.)	1						1
White-tailed Eagle ( <i>Haliaeetus albicilla</i> )				2	1		3
Grouse ( <i>Lagopus cf lagopus</i> )				1	6		7
Black Grouse ( <i>Lyrurus tetrrix</i> )				2	1		3
Partridge ( <i>Perdix perdix</i> )			1				1
Water Rail ( <i>Rallus aquaticus</i> )						1	1
Coot ( <i>Fulica atra</i> )				1			1
Plover ?Golden ( <i>Pluvialis cf apricaria</i> )			3	11	3	3	20
Lapwing ( <i>Vanellus vanellus</i> )						1	1
Knot ( <i>Calidris canutus</i> )				1			1
Redshank ( <i>Tringa totanus</i> )					1		1
Green sandpiper ( <i>Tringa ochropus</i> )					1		1
Curlew ( <i>Numenius arquata</i> )			1		1		2
Snipe ( <i>Gallinago gallinago</i> )				1			1
Gull ?Black-headed ( <i>Larus cf ridibundus</i> )	1						1
Gull ( <i>Larus argentatus/fuscus</i> )	2		3	3	7	1	16
Great Black-backed Gull ( <i>Larus marinus</i> )		1	1	5	2	2	11
Gull ?Common ( <i>Larus cf canus</i> )	3				6		9
Kittiwake ( <i>Rissa tridactyla</i> )			1		1		2
Little Auk ( <i>Alle alle</i> )					1		1
Razorbill ( <i>Alca torda</i> )				2	3		5
Great Auk ( <i>Alca impennis</i> )					2		2
Guillemot ( <i>Uria aalge</i> )	3	17	6	10	6	7	49
Black Guillemot ( <i>Cepphus grylle</i> )				1			1
Puffin ( <i>Fratercula arctica</i> )	3	4		8	7	5	27
?Ring Ouzel ( <i>Turdus cf torquatus</i> )				2			2
?Song Thrush ( <i>Turdus cf philomelos</i> )	1		3	5		3	12
?Crow ( <i>Corvus corone/frugilegus</i> )			1	1*			2
Domestic fowl ( <i>Gallus gallus</i> )	20	11	26	19	2	6	84
total	68	82	106	120	107	53	536

\* 22 bones found in articulation

(357)

Table 2: Numbers of identified bird bones from the Udal, North Uist, Outer Hebrides. Phases II-VI date from AD c.1300-c.1700; phases VII-X from AD c.800 to c.1300; and phases XI-XIII from AD c.300-c.800.