8 The fowling economies of the Shiant Isles, Outer Hebrides: resource exploitation in a marginal environment

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Abstract
Excavation of a Late Iron Age to Norse/Early Medieval roundhouse, an 18th century shieling hut and a Post Medieval midden on the Shiant Isles in the Outer Hebrides revealed that birds constituted a notably high proportion of the faunal assemblages from each period. This paper details and discusses the results from the analysis of these avian remains.
Investigation identified that Atlantic puffin (*Fratercula arctica*), dominated the assemblages, especially in the Iron Age data where it accounted for over 91% of the NISP. A limited range of other species were represented, including shag (*Phalacrocorax aristotelis*), cormorant (*Phalacrocorax carbo*), razorbill (*Alca torda*), guillemot (*Uria aalge*) and gannet (*Morus bassanus*), but in significantly smaller numbers than puffin. A temporally persistent abundance of wing elements has also been recognized, particularly for puffin. This imbalance does not appear to reflect a preservation bias since delicate elements and juvenile remains have survived, implying that human activities influenced the elemental makeup. The remains were recovered from within manmade features or structures, while butchery marks and burning also suggest human processing, consumption and deposition. The species exploited and the presence of juveniles show fowling concentrated around the breeding season and demonstrate the importance of these wild species for maximising resources in marginal island environments.

Key words
Shiant Isles, puffin, fowling, roundhouse, midden, island

Introduction
The Shiant Isles are a collection of small islands situated in the Outer Hebrides, four to five miles southeast of Lewis and approximately twelve miles north of Skye. The Shiants consist of three main islands: Rough Island, House Island and Mary Island (WWW1). From 2000, excavations by the Shiant Islands Project (SHIP) have unearthed evidence for Prehistoric through to Post Medieval human habitation (Foster, 2004: pp. 1-3; Foster & Hooper, 2005: pp. 2-4). This paper considers the avian remains present at four of the Islands' archaeological sites:

- Late Iron Age phases of a roundhouse on Rough Island,
- Norse / Early Medieval phases (possibly 9th-10th century) of the above roundhouse on Rough Island,
- 18th century shieling phase of the above roundhouse on Rough Island and its 19th/20th century destruction phase,
- A Post Medieval midden deposit on House Island (Foster, 2004: pp.4-21; Foster *et al.,* 2006: p.16).

Initial analysis identified that in all periods bird bone constituted a high proportion of the faunal assemblages (table 1) (Madgwick & Mulville, 2005: pp. 3-7). All of the bird bone from the roundhouse was examined, however, only a sample of the bird remains from the Post Medieval midden was analysed due to the quantity of bone produced and time constraints. This sample was randomly selected to prevent the subjective choice of elements or species.
The animal bone was recovered primarily by hand during excavation, with selected samples taken for further processing (Foster, 2004: pp. 10-12). The bird bone was extracted from the faunal assemblages by hand to ensure accurate retrieval. The remains were identified using

Table 1. Proportion of avian and non-avian remains identified by the initial assessment. Based on Madgwick and Mulville, 2005: p. 2.

Period	Cow	Sheep/Goat	Pig	Horse	Bird	Fish	Other	Unident	Total
Iron Age	4	23	1	0	267	1	9	253	558
Norse Phase	0	5	0	0	16	10	10	67	109
18th Century	0	0	0	0	17	0	35	8	44
Destruction Period	0	1	0	0	2	0	0	16	19
Post Medieval	238	1654	42	2	5068	2204	182	6902	16292

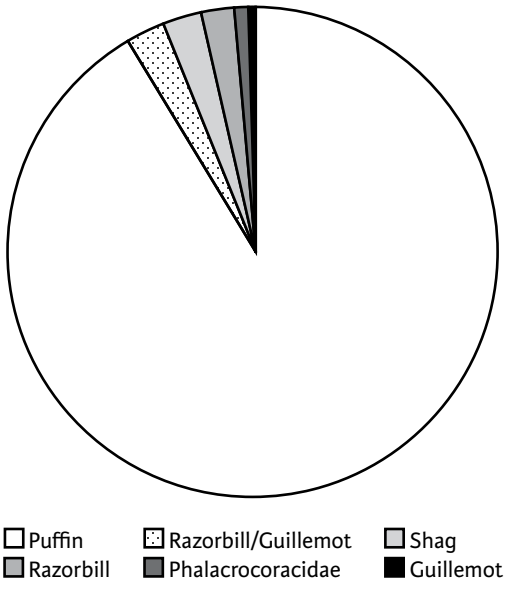

Figure 1. Iron Age Species Abundance as a % of the NISP

Cardiff University and Southampton University's reference collections and recorded following Cohen and Serjeantson's conventions (Cohen & Serjeantson, 1996: pp. 2-10).

Results

Rough Island

The Iron Age Data

The Iron Age roundhouse on Rough Island had two distinguishable phases of use: Early Late Iron Age and Later Late Iron Age (Foster, 2004: pp. 4-12); bird bone was only recovered from the latter. Deposits within the roundhouse produced 324 fragments identifiable to element, of which 244 were identifiable to species. (Only 38 non-avian fragments were identified, 23 of which were sheep/goat). Identification to species revealed that the Atlantic puffin (*Fratercula arctica*) dominated the assemblage, accounting for over 91% of the NISP (fig. 1 and table 2). Shag (*Phalacrocorax aristotelis*), cormorant (*Phalacrocorax carbo*), razorbill (*Alca torda*) and guillemot (*Uria aalge*) were also present but in significantly smaller numbers than puffin. Due to the greater size and robustness of bones from these larger, but less abundant species their relative invisibility is unlikely to be a result of preservation biases (Bovy, 2002: p. 968). Juvenile birds were present but only accounted for 3.4% of the assemblage. The presence of fragile juvenile shag and razorbill bones reinforces the suggestion that human exploitation and not preservation is mainly responsible for the predominance of puffin. Puffin wing elements are dominant, with puffin humeri the most frequently occurring element in the assemblage. The 72 humeri and 39 ulnae fragments identified gave MNEs of 23 and 16 respectively (fig. 2) thus providing an MNI of 23 for the Iron Age puffins. The puffin MNI is small considering the quantity of fragments for this species (table 2), however, it is very much a minimum, and when one considers the large number of 'puffin-sized' fragments (55 in total, predominantly wing elements) it is probable, though unfortunately not provable, that the total was somewhat higher.

In addition to being recovered from within the roundhouse, butchery and, to a lesser extent, burning provide evidence for human processing and consumption of these Iron Age seabird resources. Butchery marks have been recorded on eleven fragments, nine knife cuts and two 'scrapes' upon the shaft (knife scrapes vertically down the partial length of the shaft). The majority of butchery marks occur on puffin remains, although a shag radius bears a series of cut marks. Of the five puffin femurs two bear a double knife cut below the femoral head implying a butchery process which could have involved removal of the leg. Twenty bones are burnt, of which nine are extensively calcined. All of these are 'puffin' or 'puffin sized' elements. Eight fragments display rodent gnaw marks, all but one of which came from an occupational floor deposit, suggesting that some bird remains lay upon the house floor and were open to rodent wear after human modification or consumption. One of the gnawed bones also bore butchery marks.

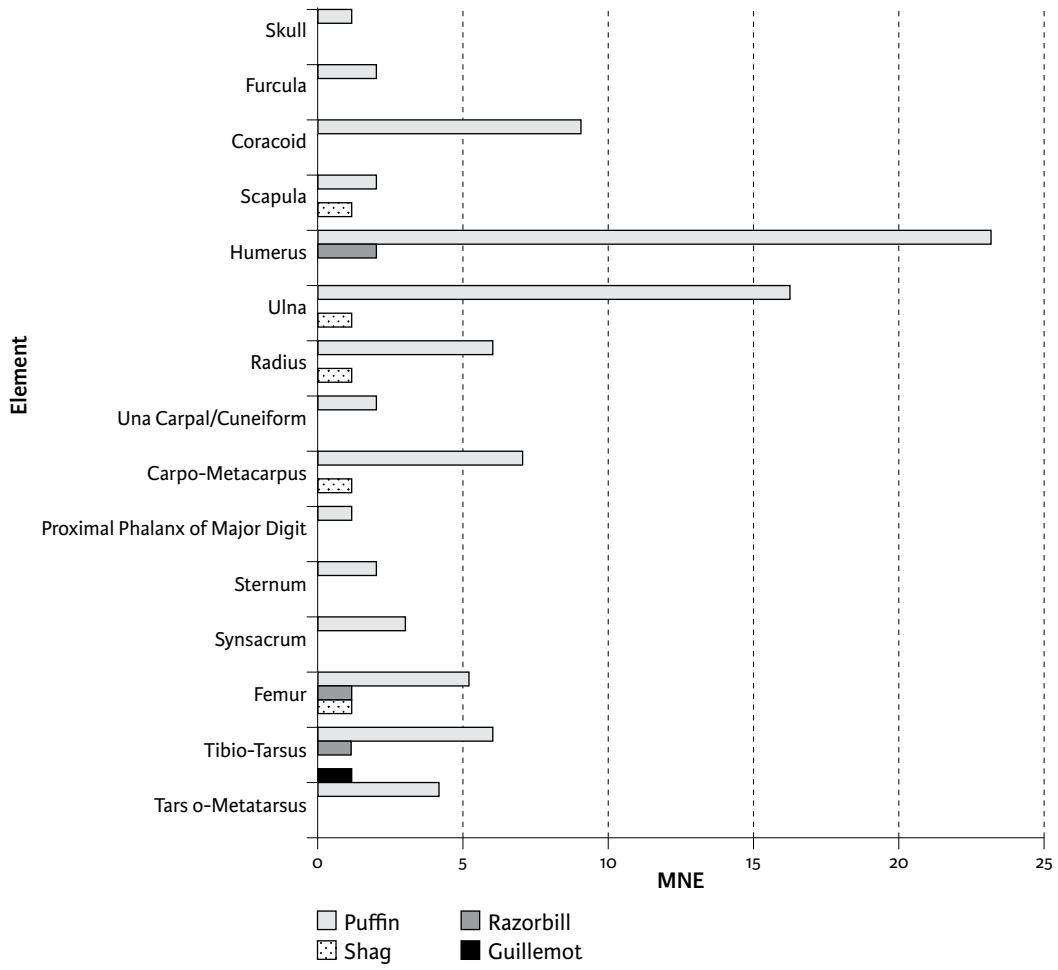

Figure 2. MNE of Iron Age Birds

Table 2. Proportion of avian and non-avian remains identified by the initial assessment. Based on Madgwick and Mulville, 2005: p. 2.

Species	NISP	% NISP
Puffin	224	92
Razorbill/Guillemot	6	2
Shag	6	2
Razorbill	5	2
Phalacrocoracidae	2	1
Guillemot	1	<1
Total	244	

The predominance of puffin remains suggests that they were being selectively and purposefully chosen for exploitation. The Shiant Isles are well known for the vast colonies of puffins that gather there to breed between March/April and mid August (WWW2). Modern seabird surveys suggest that roughly 240,000 puffins, 18,000 guillemots, 11,000 razorbills, and 1,500 shags seasonally occupy the Shiant Isles (WWW2). Although modern data should never be blindly imposed upon the past, it is likely that today's large-scale presence of puffin extends back into the Iron Age. Thus puffins were present in such large numbers that they were the preferable bird for large-scale exploitation, both for immediate subsistence and for preservation and consumption during the winter (Fleming, 2005: pp. 56-59; Maclean, 1972: pp. 68-95; WWW2). Shag and cormorant are resident all year on the islands and the presence of juvenile birds demonstrates that they too were exploited during the breeding season and may have also supplemented the winter diet. Although all evidence of porosity was recorded not all of the assemblage could be aged due to fragmentation or incompleteness, thus more juveniles could be present, especially as juvenility of plumage and fledging does not always correlate with skeletal immaturity (deFrance, 2005: pp. 1131-1146).

At this site the bird remains indicate that preservation and bone density biases are not the main factors creating the imbalance of wing elements. The presence of juvenile puffins

and minute, delicate elements such as wing phalanges make it appear implausible that larger, more robust adult leg elements were subject to worse preservation (Bovy, 2002: pp. 975-976). It therefore appears that human activity has influenced the elemental makeup of the assemblage.

It is possible that unwanted parts of the bird were removed from the roundhouse environment, and if these included the legs this would create the seemingly disproportionate amount of wings within the house (Maclean, 1972: p. 91). It is also feasible that birds may have been partially processed away from the roundhouse, perhaps at the capture site, a factor considered at Dun Vulan (Cartledge & Grimbly, 1999: p. 288). However, the femur and to an extent the tibio-tarsus provide a useful quantity of meat, making this illogical, whereas puffin wings do not. Alternatively the dual effects of food processing and waste disposal, with food bearing elements weakened by the cooking and/or thrown into the fire could explain the abundance of wings and the small quantity of leg and axial elements (Baldwin, 2005a: pp. 31-32; Bovy, 2002: p. 965; Serjeantson, 2009: pp. 153-154). Interestingly, gnaw marks are only represented on wing elements, which implies that the wings were removed, processed and disposed of differently (while still attractive to predators), for example to obtain feathers as was described on St Kilda, another Hebridean island site (this point is further explored below) (Baldwin, 2005a: pp. 29-34; Maclean, 1972: pp. 90-92). Thus the abundance of wings may represent pre-consumption processing. This processing may have facilitated the incorporation of the larger quantities of wing elements into the occupational floor deposit (Foster, 2004: pp. 6-9).

The Norse/Early Medieval Data

The Norse or Early Medieval population of Rough Island used the Late Iron Age roundhouse remains as a basis for their own roundhouse from which only twenty-eight bird bone fragments were recovered, all from the general occupational floor deposit (Foster, 2004: pp. 12-17). Again puffin dominates the assemblage, accounting for 85% of the NISP (22 fragments). Razorbill (three fragments) and shag (one fragment) are also present, occurring far less frequently than puffin but making up a larger percentage of the NISP than in the Iron Age. The remaining two fragments were classified as 'puffin-sized'. No porosity or unfused epiphyses were identified in this period. Puffin humeri are again the most frequently occurring element, a count of 12 identifiable fragments giving an MNE and MNI of five. Wing elements constitute 82% of the puffin NISP. A puffin femur and a puffin humerus were calcined and burning was evident upon a fused shag vertebrae. There is evidence of knife cuts upon one puffin humerus, which may also display rodent gnaw marks.

As far as is possible due to the limitations of size, this assemblage demonstrates continuity of fowling practices. This is not unexpected since the bird remains are from the Earliest Medieval period, which in Hebridean contexts need not be temporally distant from the end of the Late Iron Age (Fleming, 2005: pp. 56-65). Puffin continues to be the main bird exploited, the abundance of wing elements persists and the remains are incorporated into the occupational floor deposit, suggesting that to some extent seabirds were still being processed within the house environment (Armit, 2006: pp. 8-10; Foster, 2004: p. 15).

The small NISP and MNI may suggest that wild seabird resources did not contribute so significantly to the islanders' diet and economy as before. However, very little faunal data at all has been recovered from the Norse/Early Medieval period (only 25 non-avian fragments were identifiable, table 1), supporting the continued importance of fowling for supplementing domestic subsistence resources (Madgwick & Mulville, 2005: pp. 2-7).

The 18th century to 20th century Data

In the 18th century the still-standing remains of the Norse/Early Medieval roundhouse were used as a shieling hut whose hearth produced 17 fragments of bird bone, two of which were burnt (Foster, 2004: pp. 21-23). The 20th century destruction layer produced three further fragments (Foster, 2004: p.23). The bird bones from the shieling hut represented puffin, shag and cormorant, with the Phalacrocoracidae dominating this small assemblage. Unlike before, there is no clearly visible dominance of wing elements. All of the bones from the 18th century hearth deposit are juvenile cormorant or shag and represent at least two individuals. Two fragments from the destruction layer were puffin. No butchery was visible, making it possible that these three destruction layer fragments may not be anthropogenic.

Although it was mostly impossible to distinguish juvenile shag from cormorant (except one fragment), this assemblage can still inform upon seasonality (Cartledge, 2000: p. 268;

Serjeantson, 1998: pp. 24-27). Shielings are traditionally summer dwellings associated with tending livestock (Foster, 2004: pp.21-23). The main nesting season for shag and cormorant is around June/July, coinciding with this and demonstrating that even people resident for short periods of time were exploiting the local wild resources (Serjeantson, 1998: p.26). It appears that bigger birds were being specifically chosen for exploitation in small numbers. The lack of butchery marks does not necessarily mean that these birds were not processed for food (Serjeantson, 2009: p. 143).
A sherd of pottery from the shieling exhibited decoration made by impressing a broken, hollow bird bone into the clay. This suggests that birds and their remains played a wider role in island lives than just subsistence, perhaps being utilised further as tools (Baldwin, 2005a: pp. 29-31; Fleming, 2005: pp. 92-94).

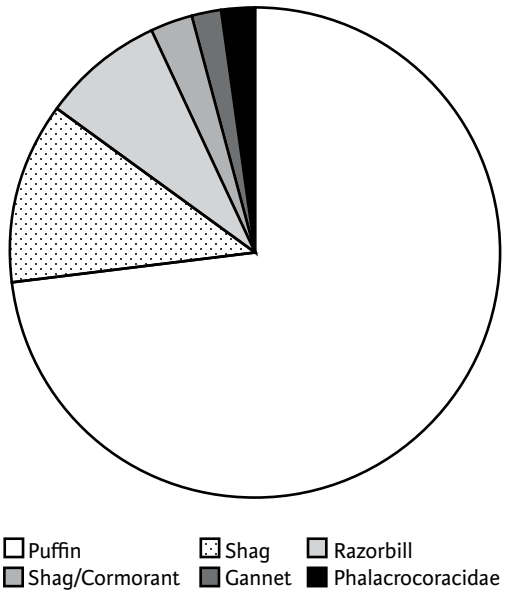

Figure 3. Post Medieval Species Abundance as a % of NISP

House Island
A Post Medieval midden (of possible 17th/18th to 19th century date) associated with a blackhouse on House Island produced a large faunal assemblage containing land mammals, sea mammals and a substantial quantity of avian remains (at least 5250 fragments, table 1) (Foster *et al.,* 2006: pp.15-16; Madgwick & Mulville 2005, pp. 1-3). Only a small randomly selected sample of the bird bone has been analysed to date. This consisted of 107 fragments identifiable to element, of which 106 were identifiable to species. Again puffin dominated the assemblage accounting for 74% of the NISP (fig. 3 and table 3). Razorbill, shag and gannet (*Morus bassanus*) are also present and constitute a much larger percentage of the NISP than in the other Shiant assemblages. Gannet is not present in the earlier assemblages.
The most frequently occurring elements are again puffin wing bones, 28 ulnas and 25 humeri fragments giving MNEs of 14 and 10 respectively, and a puffin MNI of 14 (fig. 4). Shag in particular is present in notably larger quantities than in the Late Iron Age with a MNI of four compared to one. Also, the third most frequently occurring element in the Post Medieval assemblage is shag humeri. For all of the main species identified wing elements dominate their respective NISPs. Three fragments representing two individuals (probably shag), displayed juvenile porosity. No burning or gnawing was observed. Five knife cuts are present on puffin longbones and four on shag. The knife cuts on the puffin femur occur on the femoral head as they did in the Late Iron Age examples.

Table 3. The Post Medieval Bird Bone from NISP

Species	NISP	% NISP
Puffin	78	74
Shag	13	12
Razorbill	8	8
Shag/Cormorant	3	3
Gannet	2	2
Phalacrocoracidae	2	2
Total	106	100

The Post Medieval data demonstrates that larger birds such as shag and gannet were being more frequently exploited than in earlier periods. The presence of birds such as gannet and razorbill shows continued exploitation during the summer breeding season, when they visit the islands (Fleming, 2005: pp. 86-90; Serjeantson, 1998: pp. 24-25). Shag and cormorant are resident all year and could have also been a valuable supplement to the winter diet when spring and summer visitors have left and resources are limited (Serjeantson, 1998: p. 26).
The taphonomic characteristics of the Post Medieval assemblage suggest different methods of processing seabirds and/or that different products were being exploited than in earlier periods (Baldwin, 2005a: pp. 29-32). The higher percentage of the assemblage displaying butchery marks may represent a specific cooking practice, perhaps involving the selective removal of meat

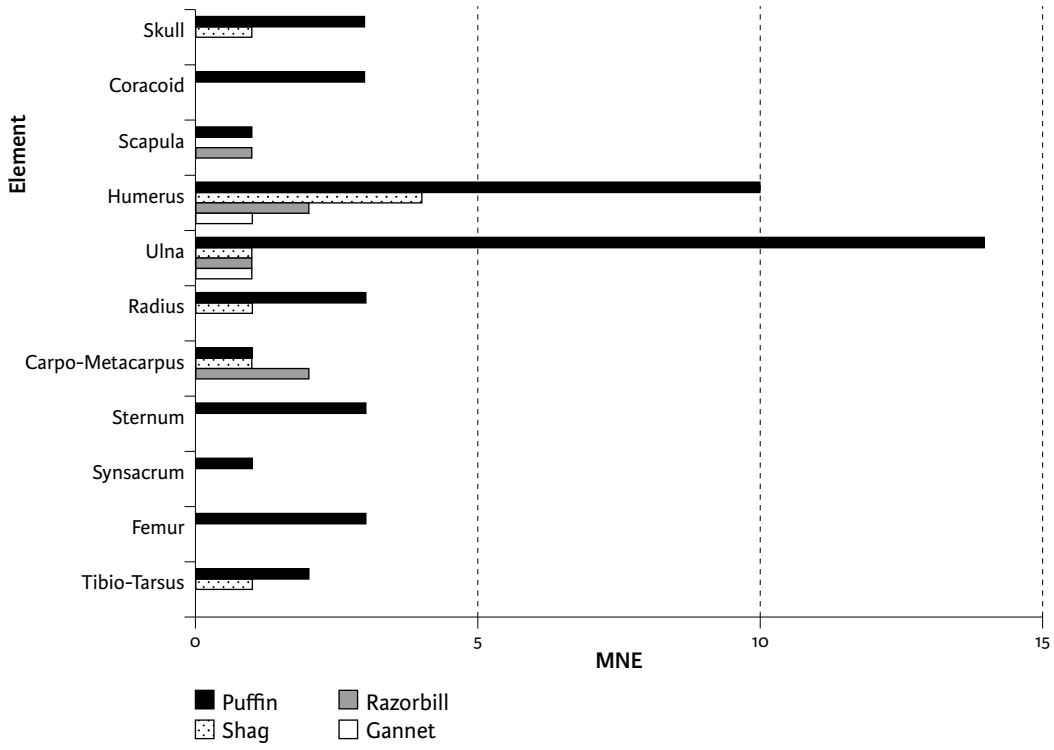

Figure 4. MNE of Post Medieval Birds

(Fleming, 2005: p. 89; Serjeantson, 2009: pp. 130-144). The absence of burning could reflect a process such as stewing, boiling or oven roasting, which does not necessarily visibly alter the bone (Serjeantson, 2009: p. 153), or suggest that these remains were not coming from a house environment. The majority of butchery marks (78%) occur on wing elements suggesting that parts of the bird were being removed prior to human consumption, and possibly for products such as feathers (Baldwin, 2005a: pp. 29-32; Mackenzie, 1995: pp. 67-68). Over half of the butchery marks appear on the proximal or distal ends of longbones which can be characteristic of dismembering a bird by cutting through its ligaments and tendons (Serjeantson, 2009: pp. 132-133). When considered alongside the lack of burning and gnawing, this butchery suggests that birds were processed at the midden site with waste swiftly deposited within it (Cartledge & Grimbly, 1999: p. 288).

Discussion of the Data as a Whole

Resource Exploitation in a Marginal Environment: The Role of Seabirds

One of the great assets of the bird bone from the Shiant Isles is that it allows a comparative analysis of fowling economies over a wide time period. The absence of any domestic birds from all the assemblages demonstrates that while the farming of domestic mammals (including cows, pigs and especially sheep) played an important role in the Shiants' economy, the avian products were provided solely by wild seabirds (no terrestrial birds or waterfowl were present). It is possible that domesticates and other species may be present in the unexamined Post Medieval sample, however their absence from the randomly chosen sample is indicative that seabirds continued to satisfy the majority of fowl resource needs throughout history.

The contexts of the remains, the butchery marks, species represented and ethnographic comparisons imply that a key reason for fowling was for human consumption of the meat (Baldwin, 2005a: pp. 30-31; Cartledge, 2000: p. 268; Serjeantson, 2009: pp. 130-144). The relative abundance of species indicates that the majority of birds exploited in the Iron Age, Norse or Early Medieval and Post Medieval periods were seasonal resources, predominantly those coming to the Shiants in summer to breed (Baldwin, 2005a: pp. 15-17; Serjeantson, 1998: pp. 23-26). These include puffin (who winter out at sea), guillemot, razorbill and gannet (Lysaght, 2005: p. 102); the latter three normally only

come to shore to breed (Serjeantson, 1998: p. 25). Thus it is possible to identify the time of year when fowling would have been practiced by the islanders and allows insights into the methods of capture (Fleming, 2005: pp. 87-91; Olsen & Nørrevang, 2005: pp. 166-175). The limited window of opportunity available to exploit these birds suggests that preserving would have been essential if these resources were to be used in the lean winter months (Love, 2005: pp. 59-60; Serjeantson, 1998: pp. 26-32). Serjeantson, 2009: p. 137) has noted that removing meat from the bones of preserved birds often leaves scrape marks upon their shafts and similar marks have been noted on two of the Iron Age fragments. Seabirds can provide a range of products in addition to meat. Since this study has identified exploitation concentrated around the breeding season, it is probable that the diet of the Shiant islanders was supplemented with eggs during all periods (Olsen & Nørrevang, 2005: pp. 166-175; Serjeantson, 1998: pp. 23-25). The birds may also provide valuable oil and grease (Baldwin, 2005a: pp. 29-31). Birds can also be used to attract other sources of food; puffin in particular is good to use as bait for fish and lobsters, thus unwanted flesh or guts could have fulfilled this role (Baldwin, 2005a: p. 32; Lysaght, 2005: p. 105). Although fish were virtually absent from the Iron Age assemblage they were fairly abundant in the Post Medieval midden, perhaps correlating with the more diverse range of species being exploited and increased maritime capability. It is worth considering all possible aspects of seabird exploitation, since maximising resources would be essential for sustaining a marginalized population on a small island (Maclean, 1972: p. 64).

Changes in Fowling Practice

This study has identified a change in fowling practice over time which moves from the concentrated exploitation of puffins in the Late Iron Age and Norse/Early Medieval periods through to a seemingly more diverse fowling economy in the Post Medieval period, which although still exhibiting a predominance of puffin, also includes a greater proportion of other, larger birds, particularly shag.

From the data available it appears that the Shiants' bird resources were exploited on a much larger scale in the Post Medieval Period, with at least 5250 bird fragments in the midden, compared to the 324 Iron Age fragments (Madgwick & Mulville, 2005: 2). The bird remains from the Post Medieval midden constitute at least 92% of the total avian remains from the four sites analysed here. The higher exploitation of larger birds in the 18th century (roundhouse) and Post Medieval period (midden) would also provide a larger quantity of meat per kill. However, while bird remains are more numerous in the Post Medieval period other animals were also exploited on an increased scale, particularly sheep and fish. Thus while still predominating, birds comprise a lesser percentage of the identifiable faunal assemblage over time: Iron Age c. 91%, Norse/Early Medieval c. 71%, 18th-20th century c. 56% and Post Medieval c. 52%. Of course, one cow would provide more meat than several birds. Site duration is also a point for future consideration.

A Puffin Economy?

One key feature identified by this investigation is the overwhelming exploitation of puffin from the Late Iron Age to the Post Medieval Period. With larger seabirds such as gannet, guillemot and razorbill visiting the islands to breed and raise young, choosing to exploit puffin extensively may appear uneconomical (Madgwick & Mulville, 2005: p. 1; WWW2). Aside from its long visiting period, a major factor favouring puffin fowling is its nesting choice and its relative ease of capture (Fleming, 2005: p. 87). Puffins, unlike many seabirds, nest in burrows in the ground. There are stomach-churning accounts from the aforementioned St Kilda of fowling accidents, where men descending down the sheer cliff faces in pursuit of guillemot and gannet have plunged to their deaths on the rocks below (Fleming, 2005: p.89; Maclean, 1972: pp. 98-99). Suddenly the large colonies of ground nesting puffins seem very desirable!

Ethnographic and historical accounts attest to a range of methods for capturing puffins. In its simplest form an arm or hooked stick could be pushed down the burrow to extract the chick or adult (Baldwin, 2005b: pp. 124-125; Williamson, 1948: pp. 127-129). Adult birds could be clubbed on returning to the burrow, nets spread over the burrow entrance to enmesh emerging adult birds or the burrows (which are often shallow) dug into to reach the puffin (Baldwin, 2005b: pp. 124-128; Lysaght, 2005: pp. 104-105). Puffins could also be caught like other seabirds by handnet, rods and nooses or by clubbing them out of the air from cliff tops (Baldwin, 2005b: pp. 126-134; Mackenzie, 1995: pp. 67-68; Maclean, 1972: pp. 93-94; Williamson, 1948: pp. 27-29). Comparative ease of capture combined with large numbers available may therefore be a factor in explaining the prevalence of puffin (Maclean, 1972: p. 95).

Explaining the Abundance of Wings

Another feature identified is the persistent dominance of wing elements over time. If this abundance was purely a matter of preferential preservation due to bone density, a greater equality of leg and wing elements could be expected in the Post Medieval assemblage to that of the Late Iron Age, since the bones would have been subjected to less temporal degradation (Bovy, 2002: p. 968; Serjeantson, 2009: pp. 155-162). However, this is not the case, especially with puffin, where the abundance of leg elements as a percentage of the NISP is higher for the Iron Age (20%), than for the Post Medieval (8%) assemblage, suggesting at least some human contribution.

The importance of puffin feathers should be considered, including the wing feathers, which are larger and more desirable than commonly assumed, and the downy body feathers which may be used to stuff bedding (Baldwin, 2005a: p. 31; Mackenzie, 1995: pp. 67-68; Maclean, 1972: pp. 40-41). The collecting, exporting and bartering of puffin feathers from island locations is well documented, and occurred into our recent past, being exported from the Hebridean island St Kilda into the 19th century and prized economically on Lundy (Bristol Channel) (Maclean, 1972: p. 40). Even in the mid 20th century expeditions were conducted to the Shiants to catch puffins by the boatful, primarily for feathers (Mackenzie, 1995: pp. 67-68). Although it would be imprudent to suggest that the Shiants were exporting seabird produce, it highlights the diversity of resources offered in small island environments and the versatility of seabird products (Baldwin, 2005a: pp. 23-32). It is therefore possible to suggest that the abundance of wings could be partially due to the collection of feathers. The presence of butchery marks both on the proximal and distal ends of wing longbones, and on their shafts could be caused by the removal of the wing and by subsequent feather removal (Serjeantson, 2009: pp. 130-138). Removal of the wing for differential processing would be logical and it may also make the bird easier to fit in a cooking pot or to preserve (Maclean, 1972: p. 68; Serjeantson, 2009: pp. 130-144).

The Wider Island World

Comparison with the wider island world has identified both similarities and individualities in the fowling economies of the Shiants. Until recently St Kilda housed a small Hebridean island community where fulmar was the primary bird exploited, even though its puffinries are of comparable size to the Shiants' (Fleming, 2005: p. 87; Maclean, 1972: p. 68). It is well documented that fulmar was prized above other birds, with preference playing a role in St Kilda's fowling (Fleming, 2005: p. 87). With the Shiants it appears that particularly in the Iron Age, the islanders were harvesting the most easily accessible and thus efficient bird resource, puffin, emphasising the significant role of wild resources in sustaining marginalized populations. Assessment of the Iron Age animal bone from the Shiants identified a high mortality rate for neonatal sheep and cattle (Madgwick & Mulville, 2005: pp. 2-7). When considered alongside the exceptionally puffin dominated assemblage, this may suggest that agricultural difficulties led the Late Iron Age occupants to rely on the natural resources for subsistence.

This assessment has also demonstrated that while the Shiant Isles share some features of their fowling economies with other small island sites, they also have their own characteristics. Like on the Shiants, the Iron Age assemblages from Mingulay and Pabbay are strongly dominated by one seabird species, which accounts for over two thirds of the identifiable remains, however in these instances shag is the focus of the fowling (Cartledge, 2000: p. 268). Interestingly, these assemblages are unlike the Iron Age bird bone from Dun Vulan on the larger island of South Uist in the Outer Hebrides, which is not dominated by a single species and has over 30 species identified (Cartledge & Grimbly, 1999: pp. 282-287). This suggests that while small island fowling assemblages are often dominated by a certain species, this species varies from island to island and is contextually determined.

Furthermore, the Shiants' assemblages contain a limited range of species compared to that of Pabbay or Dun Vulan, which are quite diverse (Cartledge, 2000: p. 268; Cartledge & Grimbly, 1999: pp. 282-284). The Shiants' repeated exploitation of puffin, shag, cormorant, razorbill, guillemot and gannet could suggest either a limited number of species present (although modern bird surveys do not imply this), or a fowling economy that specifically chose to primarily exploit these seabirds over a wide time period (Church e*t al.,* 2005: pp. 188; WWW2). These comparisons suggest that while fowling played a vital role in the economies of many small Hebridean islands, fowling economies are contextually constituted and can inform upon the choices and practices of these island inhabitants (Serjeantson, 1998: pp. 23-25).

Conclusion

In conclusion, this paper has demonstrated the importance of seabird resource exploitation in the Shiant Isles from the Late Iron Age to the Post Medieval period. A persistent dominance of puffin has been identified, and theories for its presence put forward, including ease of exploitation and availability (Maclean, 1972: p. 95; WWW2). An abundance of wing elements has been noted and the extent of human action in creating this explored, such as pre-consumption processing and feather collection (Baldwin, 2005a: pp. 29-34; Fleming, 2005: pp. 92-94; Maclean, 1972: pp. 90-92). The seasonal nature of the Shiants' fowling has also been revealed. Temporal changes in fowling practices have been identified, including a diversification of species exploitation in the Post Medieval period, and a greater use of larger birds. The fowling economies of the Shiants have also been compared with the wider world of small island communities, and this suggests that while many island populations are reliant upon their wild species to maximise subsistence resources, fowling economies are seemingly a fingerprint of the specific context that creates them.

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References

Armit, I., 2006. *Anatomy of an Iron Age roundhouse. The Cnip wheelhouse excavations, Lewis*. Society of Antiquaries of Scotland, Edinburgh.

Baldwin, J., 2005a. Seabirds, subsistence and coastal communities. An overview of cultural traditions in the British Isles. In: *Traditions of sea-bird fowling in the North Atlantic Region.* The Islands Book Trust, Isle of Lewis, pp. 12-36.

Baldwin, J., 2005b. A sustainable Harvest. Working the Bird Cliffs of Scotland and the Western Faroes. In: *Traditions of sea-bird fowling in the North Atlantic Region.* The Islands Book Trust, Isle of Lewis, pp. 114-161.

Bovy, K. M., 2002. Differential avian skeletal part distribution. Explaining the abundance of wings. *Journal of Archaeological Science* 29, pp. 965-978.

Cartledge, J., 2000. Bird bones from Pabbay PY10, Mingulay MY384 and Sandray SY14. In: K. Branigan & P. Foster (eds), *From Barra to Berneray.* Archaeological survey and excavation in the Southern Isles of the Outer *Hebrides.* Sheffield Academic press, Sheffield, p. 268.

Cartledge, J. & C. Grimbly, 1999. The Bird Bone. In: M.P. Pearson & N. Sharples (eds), *Between land and sea. Excavations at Dun Vulan, South Uist.* Sheffield Academic Press, Sheffield, pp. 282-288.

Church, M.J., S.V Arge, S. Brewington, T.H. McGovern, J.M. Woollett, S. Perdikaris, I.T. Lawson, G.T. Cook, C. Amundsen, R. Harrison, Y. Krivogorskaya & E. Dunber, 2005. Puffins. Pigs, Cod and Barley. Palaeoeconomy at Undir Junkarinsfløtti, Sandoy, Faroe Islands. *Environmental Archaeology* 10, pp. 179-197.

Cohen, A. & D. Serjeantson, 1996. *A Manual for the identification of bird bones from archaeological sites.* Archetype Publications, London.

deFrance, S.D., 2005. Late Pleistocene marine birds from southern Peru: Distinguishing human capture from El Niño-induced windfall. *Journal of Archaeological Science* 32, pp. 1131-1146.

Fleming, A., 2005. *St Kilda and the wider world. Tales of an iconic island.* Windgather Press Ltd, Cheshire.

Foster, P., 2004. *The SHIP project of the Shiant Islands 2004 season Report to the Hunter Trust.* WWW1, Excavation Report.

Foster, P. & J. Hooper, 2005. *The SHIP project of the Shiant Islands 2005 season report.* WWW1, Excavation Report.

Foster, P., J. Hooper, C. Dagg & L. Foster, 2006. *The SHIP project: The archaeology of the Shiant Isles 2006 Interim Report.* WWW1, Excavation report.

Love, J., 2005. Seabird resources and fowling in Scotland. In: *Traditions of sea-bird fowling in the North Atlantic Region.* The Islands Book Trust, Isle of Lewis, pp. 54-77.

Lysaght, P., 2005. Towering cliff and grassy slope. Cultural traditions of sea-bird fowling in Ireland. In: *Traditions of sea-bird fowling in the North Atlantic Region.* The Islands Book Trust, Isle of Lewis, pp. 78-113.

Mackenzie, O. H., 1995. *A Hundred Years in the Highlands.* Birlinn Limited, Edinburgh.

Maclean, C., 1972. *Island on the edge of the world. Utopian St Kilda and its passing.* Tom Stacey Ltd, London.

Madgwick, R. & J. Mulville, 2005. *Animal bone from the Shiant Isles Assessment.* Unpublished Report.

Olsen, B. & A. Nørrevang, 2005. Sea-Bird Fowling in the Faroe Islands. In: *Traditions of sea-bird fowling in the North Atlantic Region.* The Islands Book Trust, Isle of Lewis, pp. 162-180.

Serjeantson, D., 1998. Birds: A seasonal resource. *Environmental Archaeology* 3, pp. 23-33.

Serjeantson, D., 2009. *Cambridge Manuals in Archaeology: Birds.* Cambridge University Press, Cambridge.

Williamson, K., 1948. *The Atlantic Islands. A study of the Faeroe life and scene.* Collins Clear-Type Press, London.

Internet Resources

WWW1: http://www.shiantisles.net/
(All information from this site by the kind requested permission of Adam Nicolson, owner of the Shiant Isles)

WWW2: http://www.shiantisles.net/nat_hist/index.htm

N.B.
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