

SEA-BIRD CONSERVATION IN THE ISLES OF SCILLY

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SEA-BIRD CONSERVATION IN THE ISLES OF SCILLY

A private report to the Nature Conservancy

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PRELIMINARY NOTE

I apologise in advance for any deficiencies in this report and for its rather unnecessary length. It has been submitted now in this form so that it can be seen by the Regional Officer for S.W. England in time for his visit to Scilly with other Conservancy officials from 15th-17th April 1964. For this reason, also, Appendix 3, which has not yet been completed, is not included, but will be forwarded later.

J.L.F. Parslow, 24th March 1964.

ABSTRACT

The main purpose of this report is to draw attention to the "gull problem" in the Isles of Scilly and in particular to the harm being done to the rarer sea-birds which breed on Annet by the Great Black-backed Gull. This gull has greatly increased in Scilly during the present century while the numbers of Puffins and Manx Shearwaters on which it preys have decreased. In 1963 Great Black-backs nested for the first time on the storm beaches around the southern "half" of Annet, resulting in a marked rise in the amount of predation on Storm Petrels. It is suggested that if the populations of the rarer species are to increase or be maintained, control measures will have to be taken against the Great Black-back on Annet. For this action to be effective the measures will have to be undertaken systematically and continuously over a number of years, since with a reduced population on Annet recruitment from the crowded

and relatively unsuccessful colonies on the Western Rocks may occur; and the net result could be an overall increase in breeding success, leading to a rapid return to former numbers.

In recent years, Lesser Black-backed Gulls have also increased on the southern end of Annet, and with increased competition for nest sites the Common Tern has been reduced to only a few pairs. Since the few small terneries elsewhere in Scilly are becoming increasingly disturbed by man, there is a case for discouraging the Lesser Black-back from nesting on the southern part of Annet so as to afford the terns a larger, undisturbed area on which to breed.

An up-to-date census of the Great Black-back and other sea-birds breeding in Scilly is urgently needed so that the present populations and future trends may be measured.

SEA-BIRD CONSERVATION IN THE ISLES OF SCILLY

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A. INTRODUCTION

1. The sea-birds of the islands

The sea-bird colonies of the Isles of Scilly are unique and with the possible exception of the Farne Islands are unrivalled in importance anywhere in England. They contain the only sizeable colonies of Manx Shearwaters Procellaria puffinus and Storm Petrels Hydrobates pelagicus in the country and also a variety of other commoner sea-birds.

Some of these, notably the Great Black-backed Gull Larus marinus and Kittiwake Rissa tridactyla, and possibly Herring and Lesser Black-backed Gulls L. argentatus and fuscus have increased as breeding species during the present century. Others, particularly Puffin Fratercula arctica and probably also Manx Shearwater, Razorbill Alca torda, Guillemot Uria aalge, Cormorant Phalacrocorax carbo and Common Tern Sterna hirundo have decreased, in the case of the Puffin very markedly. Yet others are newly established (Fulmar Fulmarus glacialis) or re-established (Roseate Tern Sterna dougallii); or have become extinct (Arctic Tern Sterna macrura); or appear to have maintained a fairly constant population (Shag Phalacrocorax aristotelis, and possibly Storm Petrel).

With almost all these species the lack of published information on their distribution and numbers in the Isles in the past has made it difficult to determine in any detail the changes which have taken place.

On balance, however, it seems that the rarer and more interesting species have declined (especially Puffin) or are in danger of doing so (Storm Petrel, Manx Shearwater), while the commoner species which have a more widespread distribution in Britain (notably the larger gulls) have increased.

2. The sea-bird islands

Because of its shearwaters and petrels, and formerly its large numbers of Puffins and terns, Annet is the best known sea-bird station in Scilly. But many other islets and rocks have considerable numbers of sea-birds nesting on them and often the variety of birds and their density is as great or greater than on Annet. The more important of these and their most notable birds are given in Appendix 1.

3. Nature Conservation in Scilly

In 1947 the Wildlife Conservation Special Committee said that several parts of the Isles of Scilly "have the highest claims to inclusion in the list of National Reserves because they show individual characteristics of great biological interest ... and as representative areas of a set of conditions unique in Great Britain"; and also "for the better representation of sea-bird populations of peculiar island faunas". The exact site or sites to be included were to await a more detailed survey of the islands (Conservation of Nature in England and Wales. HMSO London. 1947).

For many years the Dorrien Smith family maintained Annet and some of the other uninhabited islands as sanctuaries. Annet was closed to visitors during the breeding season, a measure primarily designed to prevent excessive disturbance of the nesting terns. In 1957 an agreement was reached between the Nature Conservancy, the Duchy of Cornwall and Lt.-Commander T.M. Dorrien Smith that the uninhabited small islands should be treated as S.S.I.(A) to ensure the continuance of nature conservation and to prevent spoilation by development and other threats. Commander Dorrien Smith acts as Hon. Warden on behalf of the Conservancy (Nature Conservancy Ann. Rep. 1957).

4. The St. Agnes Bird Observatory

The bird observatory on St. Agnes was founded in 1957 and since its inception Commander Dorrien Smith has kindly permitted its members to visit Annet to carry out the ringing of various sea-birds, especially Manx Shearwaters. The number of night visits made each year for this purpose has varied between none and 11, the average being three or four. Most have been in spring and autumn, outside the breeding season of most other sea-birds.

In all, during 1957-63 about 2600 Manx Shearwaters and 1700 Storm Petrels were ringed. But while the ringed shearwaters have provided a number of interesting recoveries away from the island (including several showing interchange between Annet and the colony on Skokholm) the work has been largely uncoordinated, resulting in the loss of potentially useful information of the populations of these two species on Annet.

This lack of coordination has been largely due to the continual change at the observatory of volunteer watchers of varying ability and enthusiasm which has resulted in an inconstancy of effort during each season and from one year to another. In particular the absence of any one person to take charge of the work has led to inconsistencies in recording details of retrapped birds and areas of the island where the ringing was carried out.

Until recently, manning by volunteer watchers has been mainly confined to the spring and autumn and the observatory's chief work has been concerned with bird migration problems on St. Agnes itself. Most of my personal visits were also at these times, but in 1961 I spent two weeks on St. Agnes in late May, and in 1962 and 1963 I was able to stay in the islands for several weeks in late May and June. My particular interest in the sea-birds of the islands developed from these visits.

5. Public interest in sea-birds

Interest in ~~sea-birds~~ natural history by the general public on holiday in Scilly is extensive, as witness the popularity of boat trips around Annet and the Western Rocks "to see Seals and Puffins". Together with the Scottish Ospreys and the Farne Islands' Kittiwakes and auks, the sea-birds of Scilly are probably enjoyed by a greater number of the lay-public than any other birds, and this awareness that apparently exotic species exist other than on television or in St. James's

Park is as important a reason as any intrinsic one for ensuring that the sea-birds of Scilly are preserved. Fortunately, most can best be seen from a boat, though this is perhaps not always realised by the general visitor. On Annet itself, for example, the Puffins are extremely shy on land and are now unapproachable; yet on the sea around the island they can be viewed from a launch within a few yards. Similarly, on Gorregan, as good or better views of the nesting Guillemots, Razorbills and Kittiwakes can be obtained from a boat than by landing on the island itself.

Only a very limited number of permits to visit the uninhabited islands are issued during the breeding season with the result that human interference is kept to a minimum. This is important on the smaller islands particularly, where great care has to be taken to avoid undue disturbance of the shyer species since their unattended eggs and small young may be taken by Great Black-backed Gulls. Observatory members visiting Annet are asked to avoid the Common Tern colony as much as possible. They are also instructed to tread very carefully in the main Puffin colony on Annet Head where accidental damage has occurred to burrows, which in this area are only a few inches beneath the surface of the eroded cliff-top.

Direct human interference appears to be slight, though with tourism an ever increasing factor, ^{and} with pressure on boatmen to land visitors on the bird islands, it may be expected to increase. There is evidence that some shearwater and Puffin burrows have been dug

up on Annet in recent years, presumably to show visitors the young birds or nesting adults in August when the island is open to the general public. More seriously, in early June 1963, during the close season, at least 20 shearwater burrows on the northeast side of the island were found to have been recently opened. The Common and Roseate Tern colony on Green Island has also been subjected to interference and the landing of a boatload of trippers in 1961 caused the desertion of the colony in that year. But in any case disturbance on this island is difficult to prevent since it can be approached overland from Samson at low spring tides. (There may be a case for erecting "Keep Off" notice boards both here and at the Puffin colony on Annet Head. But this is debatable; the effect may be the opposite to the desired one.)

B. ANNET AND THE "GULL PROBLEM"

1. Survey of breeding species

Nine different species of sea-birds nest regularly on Annet. The populations of two of these, Shag and Razorbill, are relatively unimportant; the numbers are small (c.30 and c.15 pairs respectively) and the species are well represented on other islands in Scilly. Three species, Storm Petrel, Manx Shearwater and Puffin, have their main breeding colony situated on Annet; for both Storm Petrel and Manx Shearwater well over 90 per cent. of the total population in Scilly nest on this island. Another species, Common Tern, was formerly numerous but now nests in small numbers (c.35 pairs in 1962; c.10 in

1963); it has various other scattered small colonies in Scilly, most of which are prone to human interference. (Roseate Terns formerly nested in some numbers; one pair bred in 1962 for the first time for many years.) The remaining three species are the larger gulls --- Herring, Lesser Black-back and Great Black-back --- all of which are now numerous on Annet as well as on many other islands in Scilly. Both the Great and Lesser Black-backs have increased in recent times and there is evidence that this has had a detrimental effect on the other sea-birds.

2. Status of the important species and evidence of predation by gulls

A general review, by species, of the changes in status of sea-birds in Scilly is given in Appendix 2^(and 3) and this section is confined to a consideration of the more important species on Annet.

Storm Petrel. Nesting on Annet was not reported until 1903 (Clark & Rodd 1906) but almost certainly the species had been overlooked for a number of years prior to this, if not much longer. Certainly by 1915 they were very numerous, their numbers probably running into thousands (Whitaker & Fowler 1916). Since then all observers who have visited Annet at night have recorded its presence in the summer and most report it as a common or abundant breeding bird. Today, the main colonies are along the storm beaches especially around the southern half of the island and the Neck, most birds nesting on the bare shingle floor beneath the boulders, several feet from the surface. A few pairs nest away from the shores in cracks and cavities in the granite outcrops. No accurate

estimate of the breeding population has been made but the numbers are probably around 1,500 pairs, perhaps more. Over 200 adults have been ringed on a single night on several occasions in recent years. In all, over 600 were banded in 1958 and over 700 in 1960, in each case with very few subsequent retraps, indicating that only a small part of the population was marked. In June 1961, a count was made of the number of "crooning" birds at night in a boulder beach at the southern end of the island. This showed an estimated minimum of 296 nest/sites along 121 yards of storm beach.

Predation on adults by Great Black-backs appears to have been comparatively unknown until recently. Whitaker & Fowler (1916), for example, found in June 1915 only two corpses "amongst the litter of skins and bones of Puffins and shearwaters which the gulls had devoured". In June 1962 I found not more than a dozen petrels which had been killed by Great Black-backs. But on two days in June 1963 at least 100 Great Black-back castings containing individual petrels were found, mostly near gull nests around the southern half of the island. The reason for this sudden and very marked increase in the amount of predation on Storm Petrels appears obvious. Until 1963 ~~most~~ Great Black-backs nested almost entirely on the northern half of the island, mainly inland away from the shores, and it was not until last year that birds started nesting actually on the petrel beaches on the southern part of the island. In all about 30 pairs bred there and in doing so appear to have discovered in the petrels a previously overlooked source of food. The total number of petrels taken

throughout the summer is not known but it was probably considerable. Not all of the dead petrels found in 1963 were examined for rings, but four were found, all of which were illegible and which had therefore probably been placed on the birds at least four years previously (most probably as adults in 1958). This fact suggests that older, and presumably experienced, birds were being taken at least as often as younger ones. If Great Black-backs continue to nest on these beaches, and increase, the consequences may prove serious to the petrel population. The situation in future years needs watching carefully.

Manx Shearwater: The existence of a Manx Shearwater colony on Annet has been known for a great many years. Statements of its abundance on the island in the early part of this century usually referred to "immense" or "prodigious" numbers (Clark & Rodd 1906; Clark 1906) and the only numerical estimates were probably wildly exaggerated (e.g. Robinson (1911)^a states that the population was put locally at 100,000-150,000 birds; and Whitaker & Fowler (1916) indirectly suggest there were tens of thousands). B. Lloyd (in Lockley 1953)^b put the population at 10,000 birds in 1930 but gave no ~~estimate of~~^{indication of} how this estimate was made. Wallis (1923) suggested a decrease on Annet and R.H. Blair (1947, 1948) said that the population appeared considerably smaller in 1946 and was very much diminished in 1947. There may have been a further decline in recent years though detailed evidence is lacking. The present population is not known but from retrapping of ringed birds it would seem to be very roughly of the order of 4,000 birds. (The position is complex since

numbers ringed may include prospecting or visiting birds from other colonies. Four birds ringed on Skokholm have been recovered on Annet in recent years; but whether they had genuinely shifted their breeding station is not known. If they had, and if the high mortality credited by some observers has occurred, there may be reason to think that newcomers from more successful colonies have helped to keep the Annet colony extant. But this suggestion is doubtful and the numbers of alien birds ringed at other colonies is clearly quite small.)

The evidence for a decline is therefore largely circumstantial, but there can be little doubt that one has occurred. Mortality due to Great Black-backs was already high by 1911 (Robinson 19^a11) and has remained so ever since (e.g. Whitaker & Fowler 1915, Glegg 1920, Wallis 1923, King 1924, Gordon & Gordon 1929, Robinson 1930, Harrison & Hurrell 1933, Dorrien Smith 194⁷6, Davis 1958). All writers noting a decrease in the numbers of shearwaters lay the blame at the door of the Great Black-back "such destruction cannot be indefinitely prolonged" (Wallis 1923), "fast exterminating shearwaters on Annet" (Dorrien Smith 194⁷6), "harm done is very great" (Harrison & Hurrell 1933), and so on, are statements frequently met with. (In 1949, however, Parsons (1950) noted little difference in the number of remains on Annet between 2nd and 23rd July and suggested that predation by gulls was not serious.)

More information on the present size of the shearwater population on Annet and on the numbers killed each year by Great Black-backs is badly needed. But systematic counts of corpses and more intensive

ringing cannot be undertaken at present due to a shortage of volunteer watchers (the observatory is rarely manned in July and August).

Terns: The terns have a curious and rather patchy history on Annet and in Scilly generally. There was evidently a ternery of some size on Annet between 1840 and 1884, with Arctic the dominant species, up to 40 pairs of Sandwich Terns, and also some Common and Roseates. All species were said to be decreasing by 1854, the last year in which Roseates bred until the 1920's. In 1885 the Sandwich Terns had gone (though they had been present the previous year) and apart from three pairs which nested in Scilly in 1903 this species has not since been recorded as breeding. The other species of terns had also evidently deserted Annet in 1885 and none appears to have nested there again until 1945. However, throughout this period colonies were reported from several other islands in Scilly, the Common Tern appearing to have replaced the Arctic as the dominant species in the latter part of the last century, and no Arctic being definitely recorded as breeding after 1903 (Yarrell 1843, Jenkinson in MS. (1854), Rodd 1864, Bidwell 1886, Clark 1906, Clark & Rodd 1906).

There was apparently no ternery on Annet in 1943 (Parrinder 1944) but in 1945 there were 31 nests, supposedly of the Arctic Tern (Buxton 1946). The following year the colony had increased to c.150 pairs, the species being identified as Common Terns by most observers but as Arctic by one. (Since that date all records of terns nesting in Scilly have referred unquestionably to Common Terns -- or Roseates, see below.) In these two years there also appears to have been an increase at some other

terneries in Scilly so the greater numbers on Annet were not necessarily due to birds deserting other islands in the archipelago. Up to 1952 the main colony of Common Terns on Annet numbered about 50-100 pairs and was situated to the northwest of the neck on the site of the present Lesser Black-backed Gull colony which had reached remarkably low proportions by the end of the war (see later). A second, smaller ternery was noted in 1947 and 1951 at the southern end of the island, away from the majority of the gulls. By 1953 this colony was the larger of the two, containing 50 of the 60 nests on the island, and the shift in the location of the ternery was almost certainly due to increasing competition from the Lesser Black-backed Gulls. Similarly, the re-establishment of a ternery on Annet in 1945 and 1946, after an absence of 60 years, appears to have been due to the temporary disappearance of the Lesser Black-backs in those years.

In 1954 there were two terneries of 40 and 30 pairs at unrecorded sites on Annet. No terns bred in 1955 but there was a "fair colony" in 1956 and four pairs in 1959. From 1960 to 1962 between 20-60 pairs nested on a flattened area at the southwest part of the island. This site was prospected by c.15 pairs in May 1963 but the area was by then surrounded by nesting gulls. The 10 pairs which eventually nested did so amongst tussocky grass in the extreme southeast corner, the only area now remaining free of gulls.

Roseate Terns again bred on Annet in the late 1940's and early 1950's with a maximum of seven pairs in 1951. One pair nested in 1962 amidst 35 pairs of Common Terns, but the species was not present in 1963, although there were small numbers on three other islands in Scilly.

There is a lack of evidence of predation on tern chicks and eggs by gulls on Annet. Doubtless some occurs, though in both 1962 and 1963 most eggs hatched successfully (fledging success is not known) and the well known offensive action by the terns against marauding gulls no doubt held them in good stead. As already mentioned, competition for nesting areas appears to be an important factor; and with the continuing spread of the large gulls, which begin breeding before the terns arrive and which now nest over almost the whole of Annet, the last remaining area, already small, available to the terns will soon disappear.

Common Terns breed on a number of other islands and islets in Scilly and at first sight the disappearance of the species from Annet would seem unfortunate but to have comparatively little importance. So long as their numbers are maintained elsewhere in the Isles this may be so. However, on the islands where they are at present nesting, some of which are inhabited and almost all of which are easily accessible, the terneries are very vulnerable to human disturbance. All are small (see Appendix 3) and with the increasing tourist industry and a greater number of private small boats, disturbance may be expected to increase. A further hazard, not present on Annet but important at the main colony on Green Island, is the destruction in some summers of nests by high tides. There are no other terneries in Peninsula England, and while there seems to be no immediate danger to the species in Scilly as a whole, it would appear desirable in the long term interest of the species that the Annet colony

is preserved. And the only way to achieve this would be to rid part of the island of the large gulls.

Puffin: No species has declined so dramatically in Scilly as the Puffin. On Annet, their numbers had dropped from the "countless thousands" at the beginning of the century down to a score or so in the 1940's. Since then there appears to have been a slight recovery though not more than 70-100 pairs have nested in recent years and the usual number appears to have been around 50 pairs. (Fuller history and references in Appendix ³2.)

Marked decreases at other puffinries in southwest England and in Wales have also been noted (Lockley 1953^a). The chief reason for the decline is not known and several different factors may have contributed. On Annet, predation by Great Black-backed Gulls appears to have been important and the main period of increase in the gulls coincided with the main period of decrease in the Puffins. Whitaker & Fowler (1916) record that in 1915 very many were being killed by Great Black-backs and that Puffins together with shearwaters formed the staple diet of the gull in summer. Several other observers (e.g. Wallis in MS, King 1924, Dorrien Smith 1948) have blamed the decrease on the Great Black-back. Today, there are few instances of Puffins being taken by Great Black-backs during the summer though I have found freshly killed corpses, possibly inexperienced birds nesting for the first time, in April at the start of the breeding season. Adults in mid-summer are now very wary and enter and leave their burrows without delay.

As well as predation by Great Black-backed Gulls, other factors which have been suggested as causing the decline on Annet include (1) the encroachment of thrift on the nesting area (King 1924) (extensive thrift, however, seems to be a characteristic ^{feature} of extinct puffinries and it seems possible that the thrift on Annet increased after the Puffins had moved out), (2) oiling at sea (several authors), and (3) a diminution in abundance of sand-eels (Ammodytes) and small fish-fry (Dorrien Smith in Lockley 1953^a). The latter suggestion needs testing. If numbers are being limited by the available food supply and are being maintained (as appears to be the case) control measures on Great Black-backs would be of little help in the conservation of the Puffin at Scilly. Information on numbers of Puffins at other colonies in the Isles would be valuable.

3. The status of the big gulls on Annet

Herring Gull: The species has been breeding commonly or abundantly on Annet for at least the past 80 years. Any fluctuations which may have occurred are not recorded and there is a complete lack of any numerical estimate in the past, though circumstantial evidence suggests there has been an increase in Scilly generally. The population on Annet now numbers 300-400 pairs. Colonies are situated on most of the boulder beaches around the island and on the cliffs at Annet Head. A few scattered pairs nest in the midst of the main Lesser Black-back colony. Chick

mortality is high due to cannibalism by adults and predation by Great Black-backs. The Herring Gull is primarily a scavenger and on Annet, at least, it probably does not seriously predate other species. It nests on a great many other islands and rocks in Scilly.

Lesser Black-backed Gull: The history of this species on Annet is only a little better known than that of the Herring Gull. A statement by Bidwell (1886) suggests that in 1885 it was breeding less numerously on Annet than on three other islands in Scilly. In 1915 and 1923 there were "very many" (Whitaker & Fowler 1916, Wallis in MS) and in about 1936 many were nesting "anywhere and everywhere, some in bracken, sea-pink and a few on the shore" (Bond 1937). By 1945, however, there had been a big reduction (since 1938-39) "in their traditional colony amongst the giant tufts of thrift" (Blair 1946) and the following year only a few scattered pairs nested. In both these years there was a marked increase at the two nearest colonies to Annet, on Samson and the Gugh. Numbers have since recovered and the population on Annet is now between 400 and 500 pairs. The colony on the Gugh has declined from an exceptional peak of 200 pairs in 1946 to only 24 pairs in 1963.

At the present time the main colony on Annet is situated on the vegetated (mainly bracken) part of the southern slope of the main hill, down almost to the neck. Increasing numbers are nesting amongst bracken on the flat top of the southern part of the island and there are a few pairs on the beaches. Chicks are well hidden in the bracken and predation, at least of the small young, ~~apparently~~ by Great Black-backs appears to be less serious than in the Herring Gull.

Predation on other species by Lesser Black-backs is slight. On the other hand, as already mentioned, competition occurs with Common Terns for nest sites with the result that in 1963 the terns were restricted to a small area at the southeast corner of Annet. There are several other Lesser Black-back colonies in Scilly, mostly on the larger uninhabited islands such as Samson and the Eastern Isles. More information is needed on the size of these colonies and the risk to the species of increased human interference. The large colony on the northern part of Annet seems safe, however, and it would clearly be of advantage to the terns if the relatively small numbers of Lesser Black-backs now breeding on the southern part of the island were to be discouraged from doing so.

Great Black-backed Gull: Just as the Puffin has shown the most dramatic decline, so, in the same period, the Great Black-backed Gull has shown the most dramatic increase of any species in Scilly (see Appendix 2). On Annet it was not breeding at any time during the second half of the last century, or in 1903. Since then its history on the island may be summarised as follows:

1910: odd nests (Atkinson 1917)

c.1913: several nests each year (King in MS.)

1915: many ("countless numbers"); very many shearwaters and Puffins being preyed upon (Whitaker & Fowler 1916)

1923: 70-80 pairs (Wallis in MS.); 60 adults shot on one day (Wallis 1923)

1924: reduction since 1923, suggesting control measures were having some effect (Wallis in MS.)

1930: large colony (Harrisson & Hurrell 1933)

c.1936: "fairly well represented ... all but a pair or two nest on the highest ridge of the island" (Bond 1937)

1938: big colony (Harvey 1939)

1945: nesting in all usual positions (Blair 1946)

1946: 100 pairs nesting (C.B.W.P.S. Rep.)

1957: 50 pairs (Davis 1958)

1961: 120-140 pairs nesting (Observatory records)

1962: c.140 pairs (Parslow 1963)

1963: 150 pairs (see below).

By preference the Great Black-back is a solitary nester and the most favoured sites on Annet are situated at or near small granite outcrops on the northern part of the island. These traditional sites are probably occupied by the older and most experienced birds, and it is noticeable that they contain a greater number of shearwater corpses than nests elsewhere on the island. Most Great Black-backs now nest on the extensive area of deep thrift, marking the extinct puffinry, on the southern and western slopes of the main hill. Nests are well spaced over the whole area (though are rather denser along and near the shore which runs east from Irishman's Carn) forming a loose colony which totalled c.95 pairs in 1963. The total island population has increased gradually over the last three years and in 1963 c.30 pairs bred for the first time on the boulder beaches at the southwestern end. Breeding success is probably quite high and there was no evidence of chick mortality due to cannibalism, which is a marked feature of the crowded colonies on two of the small Western Rocks (Rosevear and Melledgan).

The predation by Great Black-backs on Manx Shearwaters, Puffins and Storm Petrels (also young Herring Gulls) has already been mentioned under the species concerned. It is sufficient to note here that the number of Storm Petrels being killed is increasing due to the colonisation by the gulls of the southern beaches, and that while the actual numbers of Puffins, and probably Manx Shearwaters, being preyed upon has decreased this is due to the overall depletion of their populations on the island. As discussed later, there is an urgent need for the control of the numbers of Great Black-backs on Annet.

4. Mammals

Rabbit: Rabbits are fairly numerous on Annet. Their young are taken as food by Great Black-backed Gulls; Harris (1962) found that on Skomer Rabbits formed an important part of the diet of the species. Harris also notes that burrow-nesting sea-birds drive out Rabbits successfully and use their burrows in preference to digging their own.

Brown Rat: On several islands in Britain where Puffins or Manx Shearwaters have decreased the accidental introduction of the Brown Rat is believed to have been responsible. Its present status on Annet is obscure, but if present their numbers must be small, and I personally cannot remember having seen them. Rats were evidently present on Annet in 1946 (C.B.W.P.S. Report) though they were said to be absent in 1911 (Robinson 1911b) and in 1887 (Gurney 1887).

C. CONCLUSIONS

1. The need for a survey of Scilly's sea-birds

Except in a few marked cases, the changes in status and distribution among sea-birds in Scilly have been difficult to determine due to the lack of any detailed estimates of numbers in the past. Changes which are known to have occurred are detailed in Appendix ^{ices and 3} ~~ix~~ 2, which together with Appendix 1, summarises the knowledge of the present numbers and distribution of the various species. For the most part, the information available is very slight. In order that a realistic conservation policy can be worked out, it seems important that a survey should be made of the numbers of each species breeding on all the important sea-bird islands in Scilly. At present the St. Agnes Bird Observatory does not have the necessary finances to undertake a complete survey, which would entail the hire of a launch and boatman for at least seven days. It is hoped, however, that Annet and the Western Rocks will be thoroughly surveyed during the summer of 1964.

2. The need for control measures against the Great Black-backed Gull

There is ample evidence to suggest that the Great Black-backed Gull is a serious menace to the rarer species breeding in Scilly, and their influence on Annet has already been described. Measures to reduce their numbers in Scilly have been taken in the past, though they have probably never been carried out systematically. During 1919-1924 many hundreds of eggs were taken and a considerable number of adults and young were destroyed; but according to A.A. Dorrien Smith (in Harrison & Hurrell 1933) the species

remained abundant and even increased. On Annet, Wallis (1923) noted that 60 were shot on one day in 1923 and the following year he recorded (in MS.) that numbers breeding were fewer, "they are shooting them down satisfactorily". These measures do not appear to have been continued, despite the need for control being recognised and the repeated warnings of the harm being done to shearwaters and Puffins. In some recent years, Great Black-back eggs have been destroyed at some colonies and there has been a limited amount of shooting. But neither method of control has been applied systematically and each appears to have had little or no effect on the Great Black-back population. (Indeed, the incomplete destruction of eggs at some colonies on smaller islets, where breeding success is low anyway, may well have increased the chances of survival of the chicks which did hatch.)

Measures to reduce the numbers of breeding Great Black-backs on some other islands in Britain have been taken in recent years (Lockley 1958, Barham 1960, Saunders 1962, etc.). On Skokholm, for example, where the Great Black-back : Puffin/Shearwater ratio/was very much smaller than on Annet, a reduction in the numbers of gulls by shooting resulted in a marked and immediate decrease in the number of shearwater corpses being found. Control methods have been described by Saunders (1962). They include the puncturing of eggs and the trapping and shooting of adults. Van Dobben (1934) and Gross (1957) found that the mere puncturing of eggs was relatively unsuccessful since eggs dried out quickly and the gulls relaid (some eggs even sealed themselves and hatched). Van Dobben found

a better method was to shake the eggs (thus killing the embryo) shortly after incubation had begun. Gross used an oil emulsion/formalin spray. More recently, Harris (1962) found that the injection of formalin into the eggs was more successful and took only a little longer than merely puncturing them.

The long-term effect of the systematic destruction in Scilly of all Great Black-backed Gull eggs (were it possible) would ultimately lead to the extinction of the species. The Great Black-back is, however, a long-lived bird and for more immediate results adults would also have to be killed. In addition to shooting and trapping, Harris (1962) mentions poison and shows that the use of poisoned baits placed on the rims of nests has been successfully employed against Herring Gulls in Holland. Clearly, strict precautions are necessary in the use of this method.

So far as Scilly is concerned, my personal view is that the immediate aim should be to reduce the Greater Black-back population on Annet to a few pairs, and to completely exterminate them on this island if this is possible. The ultimate aim should be to continue to keep their numbers in check on Annet, and also at any other sea-bird station in Scilly where their harm ~~on~~ to rarer species is found to be extensive. The complete extinction of the species, even if it were possible, is of course neither necessary nor desirable.

Quite clearly, if the numbers of Great Black-backed Gulls in Scilly are to be controlled successfully, volunteer or part-time labour cannot be used exclusively, and the employment of a full-time warden-ornithologist during at least the spring and summer would be necessary. Assuming that funds were available for this purpose, I would tentatively suggest that the following measures be undertaken in the initial years; subsequent measures would be determined by results and experience.

1. First year: no immediate action against Great Black-backs on Annet, but towards the end of the season selective killing of known rogue birds should be attempted. A survey should be made of numbers and breeding success both here and on other islands; chicks on Annet and chicks and adults on the Western Rocks should be ringed to determine in future years, should replacements occur on Annet, where these replacements are coming from, and the age-groups concerned. A census should be made of other sea-birds on Annet; breeding success and numbers of Herring and Lesser Black-backed Gulls should be recorded for comparison with future years when Great Black-backs have been removed. Systematic counts of shearwater, petrel and Puffin corpses should also be made for comparison with later years.

2. Second year: intensive control measures against adult Great Black-backs and their eggs on Annet; continued ringing of adults and chicks on Western Rocks, and a check kept on birds from these colonies to discover if they are replacing exterminated birds on Annet or are visiting the island to prey on sea-birds; continued

counts of shearwater and petrel corpses.

3. Third year: continued efforts to exterminate Great Black-backs from Annet; population should be down to negligible proportions by the end of the breeding season. Other investigations should continue.

4. Subsequent years: Great Black-backs on Annet should be kept in check; if replacements are occurring the question of control at other colonies should be considered. Populations of Herring and Lesser Black-backed Gulls should be kept under review.

3. Control measures against Lesser Black^k-backed Gulls on Annet

As already mentioned, the tern colony on Annet became re-established in 1945 when, for some unknown reason, there were only a very few Lesser Black-backed Gulls breeding on the island. However, as the gulls returned and spread the numbers of terns diminished, and in 1963 they were confined to the last remaining small area of the island which was free of gulls. Only a comparatively small part of the total Lesser Black-back population of Annet nests on the southern "half" of the island. Efforts should be made to discourage them from doing so, at least initially by the removal or destruction of their eggs, rather than by the killing of adult birds. If successful, this would leave a generous area available to the terns, whose other colonies in Scilly are becoming increasingly disturbed by man.

E. REFERENCES

(Additional references to Appendix ^{ices and 3} 2 (are given later)

- ATKINSON, J. (1917). The Great Black-backed Gull. Wildlife, 9: 184-185.
- BARHAM, K. (1960). Warden's Report. Skokholm Bird Obs. Rep. for 1959.
- BIDWELL, E. (1886). A visit to the Isles of Scilly during the nesting season. Trans. Norfolk and Norwich Nat. Soc., 4: 201-214.
- BLAIR, R.H. (1946). Visit to the Isles of Scilly. C.B.W.P.S. Rep., 15:57-58.
- _____ (1947). in C.B.W.P.S. Rep., 16:44.
- BOND, J.W. (1937). With sea-birds in the Scillies. Ool. Rec., 17:16-20, 25-29.
- BUXTON, E.J.M. (1946): in C.B.W.P.S. Rep. 15:57.
- CLARK, J. (1906): 'Birds' in Victoria County History of the county of Cornwall, vol. 1:309-347. London.
- CLARK, J. & RODD, F.R. (1906). The Birds of Scilly. Zool., 10: 242-252, 295-306, 335-346.
- DAVIS, T.A.W. (1958). The breeding distribution of the Great Black-backed Gull in England and Wales in 1956. Bird Study; 5:191-215.
- van DOBBEN, W.H. (1934): Bijdrage tot het meeuwenvraagstuk. Org. Club. Ned. Vogelk., 7: 63-78.
- DORRIEN SMITH, A.A. (1947): in C.B.W.P.S. Rep. 16; 41.
- _____, (1948): in C.B.W.P.S. Rep., 17.
- GLEGG, W.E. (1920). Some notes from the Scilly Isles. Brit. Birds, 14:59-60.
- GORDON, S. and GORDON, A.S. (1929). Some birds observed on the Isles of Scilly. Brit. Birds, 23:18-19.
- GROSS, A.O. (1957). The Herring Gull-Cormorant control project. Proc. X Int. Orn. Congr. Uppsala 1950: 532-536.
- GURNEY, J.H. Jnr. (1887). Notes on the Isles of Scilly and Manx Shearwater. Trans. Norfolk & Norwich Nat. Soc., 4: 447-454.
- HARRIS, M.P. (1962). Some aspects of the biology of the Larus Gulls. PhD. Thesis, University College of Swansea.
- HARRISSON, T.H., & HURRELL, H.G. (1933). Numerical fluctuations of the Great Black-backed Gull. Proc. Zoo. Soc. Lond., 1933: 191-209.

- HARVEY, G.H. (1939). Notes on birds at Scilly. C.B.W.P.S. Rep., 8:92-99.
- JENKINSON, J.H. (1854). MS. in Tresco Abbey Library.
- KING, C.J. (1924). Wild Nature in Scillonia. Scilly.
MS. in Alexander Library, Oxford.
- LOCKLEY, R.M. (1953a). Puffins. London.
- _____. (1953b). On the movements of the Manx Shearwater at sea during the breeding season. Brit. Birds suppl., 56: 1-48.
- _____. (1958). Sea-birds and their protection. Bird Notes, 28:380-383.
- PARRINDER, E.R. (1944). Notes on birds at Scilly. C.B.W.P.S. Rep., 13:44-47.
- PARSLOW, J.L.F. (1963). St. Agnes Bird Observatory Rep. 1961-62.
- PARSONS, A.G. (1950). in C.B.W.P.S. Rep. 19.
- RODD, E.H. (1864): A list of British birds as a guide to the ornithology of Cornwall. London.
- ROBINSON, H.W. (1911a). Slaughter of Manx Shearwaters by Black-backed Gulls. Brit. Birds, 5:55.
- _____. (1911b). Rats and Manx Shearwaters. Brit. Birds, 5:88.
- _____. (1930). Departure and landing of Manx Shearwater. Brit. Birds, 23:224.
- SAUNDERS, D.R. (1962). The Great Black-backed Gull on Skomer. Nature in Wales, 8:59-66.
- WALLIS, H.M. (1923). Recent changes in the birds of Scilly. Brit. Birds, 17: 55-58; 91.
- _____. MS. in Alexander Library, Oxford.
- WHITAKER, A. & FOWLER, T.M. (1916). The Storm Petrel and Manx Shearwater. Wildlife: 8:269-279.
- YARRELL, W. (1843). History of British birds. London.

Additional references: Conservation of Nature in England & Wales. HMSO. London. 1947; Nature Conservancy Annual Rep. 1957; Annual Reports of the Cornwall Bird Watching and Preservation Society (C.B.W.P.S. above) and the St. Agnes Bird Observatory. Also St. Agnes B.O. records, unpubl.

D. APPENDIX 1. THE SEA-BIRD ISLANDS

The present distribution of sea-birds is known only imperfectly, and on most islands there have been no estimates made of the numbers of each breeding species. An accurate survey is urgently needed. This section is merely concerned with giving a general idea of the present avifauna of each of the main sea-bird islands; it is based on the most recent available information up to the summer of 1963. Capitals indicate the main part of the population of the species in Scilly is confined to the one or two islands thus shown; underlining denotes the species is relatively abundant on the island concerned. Herring Gulls (and a few pairs of Lesser Black-backs) nest on most islands and are not mentioned unless colonies are large; Shags also nest on most of the small barren islands, and only the main colonies are indicated.

1. South-west group

- Gugh: Herring Gull; also L.B.B. Gull, Manx Shearwater; occasionally Common Tern.
- St. Agnes: Manx Shearwater, Herring Gull; occasionally Common Tern.
- Annet: MANX SHEARWATER, STORM PETREL, PUFFIN; G.B.B. Gull, L.B.B. Gull, Herring Gull, Common Tern; also Shag, Razorbill; occasionally Roseate Tern.
- Melledgan: CORMORANT; Razorbill, Shag, G.B.B. Gull; also Puffin.
- Gorregan: KITTIWAKE, GUILLEMOT; Razorbill, Shag; also Puffin.
- Rosevear: Shag, G.B.B. Gull, Razorbill; also Puffin, Storm Petrel; occasionally Cormorant.
- Daisy, Rosevean, Great Crebawethan:
Probably Shags, Razorbills; a few pairs Puffins (Rosevean); occasionally Cormorants (Gt. Crebawethan); perhaps Storm Petrels.

2. North-west group

- Samson: Lesser Black-backed Gull, Herring Gull.
- Green I.: ROSEATE TERN, Common Tern.
- White I.: L.B.B. Gull, G.B.B. Gull, Herring Gull.
- Mincarlo: CORMORANT, Shag, Razorbill, G.B.B. Gull, Puffin; occasionally Guillemot.
- Castle Bryher: Fulmar, Razorbill, Shag; occasionally Storm Petrel.
- Illiswilgig: Shag, Razorbill. (?)
- Scilly Rock: Razorbill, Guillemot.
- Merrick I.: Formerly Common Tern (present situation not known).
- Shipman Head: Razorbill, gulls; formerly Fulmar.
- Great Minalto, Maiden Bower, Seal Rock, Gweal, Black Rocks: present sea-bird communities not known.

3. North-east group, including Tresco

- Tresco: Common Tern, formerly Manx Shearwater.
- Menavawn: KITTIWAKE, GUILLEMOT, Razorbill, Shag; formerly Puffin; occasionally Fulmar.
- St. Helens: Kittiwake, Lesser Black-backed Gull, Puffin.
- Round I.: Manx Shearwater; formerly Puffin, Storm Petrel.
- Great Cheese Rock: Common and Roseate Tern.
- Guthers: Formerly Common Tern.
- St. Martins: Common Tern, Herring Gull, Lesser Black-back.
- Northwethel, Foremans, Old Man, Tean, Pednbrose, Plumb, Pernagie, Hedge Rock, etc.: several islands have L.B.B. Gulls and Herring Gulls, a few, G.B.B. Gulls. Present position of most is not known.

4. Eastern Isles

Nornour : gulls.

Great Ganilly : Lesser Black-back, Herring Gull, G.B.B. Gull;
probably Manx Shearwater.

Hanjague : (Fulmar)

Great & Little
Innisvauls : Shag, Razorbill, Puffin, G.B.B. Gull. (?)

Menawethan : Puffin, Shag, Razorbill, G.B.B. Gull. (?)

Little Ganilly, Arthur, Ragged I., Ganinicks : G.B.B. Gull, L.B.B. Gull,
Herring Gull.

F. APPENDIX 2. STATUS AND NUMBERS OF THE GREAT BLACK-BACKED GULL IN SCILLY.

1. Past status

The distribution of the Great Black-backed Gull in England and Wales was the subject of special surveys by Harrisson & Hurrell (1933) and Davis (1958). Each of these reports contain fairly detailed sections on the Isles of Scilly, though several errors or omissions have been noticed, while in each the estimates of breeding numbers (in 1930 and 1957 respectively) are considered to be unreliable. The summary which follows is based partly on these accounts and partly on additional information.

In the latter half of the last century the Great Black-back was an uncommon breeding bird at Scilly, though it probably bred annually and increased slightly during the last decade. Jenkinson (in MS.) recorded one or two pairs, "but not more", breeding in 1854, and F.R. Rodd (in Harting 1880) said that it was breeding on the highest rocks, but made no mention of its numbers. Smart (1885), referring to a visit to Scilly in 1881, records the Great Black-back as the least numerous of the three gulls, but the only nests he found on the Eastern Isles on 21st May were of this species. Bidwell (1886) notes that the species "was always in sight" in late May 1885, several nests being found on Menawethan and at least one on Illiswilgig; he also visited several other islands including Annet, but makes no mention of their presence on them. In 1890 there were "very few" (Dorrien Smith in Harrisson & Hurrell) and in 1894 not more than 20 pairs (King 1924).

It was present in "limited numbers" in 1903, 11 nests being found on the Eastern Isles, but none in the Western Isles, though birds were present there (Clark & Rodd 1906). It is not stated when during the season this count was made but from Clark & Rodd's earlier statements it seems likely that nesting had only just begun. Moreover, it was nowhere claimed that the 11 nests represented the total in the islands, though several authors have since regarded the figure as representing a complete count (e.g. King in MS., Wallis 1923, Harrisson & Hurrell 1933, Ingram & Salmon 1934, Davis 1958) and all but the first named have measured the species' subsequent increase in Scilly from this date. However, King (in MS.) considered the "estimate" of the 1903 population to be "a long way below the mark", adding that by 1910 there were 50 nests on Illiswilgig, nearly as many as this on Menawegathan, and several on Annet and some other islands. Although there is some doubt as to when the increase commenced, it is evident that there was a considerable growth in the numbers of Great Black-backs in Scilly prior to 1910. The increase appears to have continued during the First World War and immediately afterwards, despite "serious measures" being taken during 1919-24 "to keep them down". In 1923 an incomplete estimate put the numbers at 300 pairs or more (C.J. King in Wallis 1923) and in 1924 there were at least 200 pairs (King 1924). (Wallis in MS. mentions a figure of 600 pairs in 1924, but in a published note (Wallis 1924) he refers only to the species as being "very numerous".)

In 1930 Harrisson & Hurrell (op.cit.) estimated 600-800 pairs but gave no details on how this figure was reached. An estimate in 1946

(C.B.W.P.S. Rep.16) showed approximately 250 pairs on 11 named islands. But the total number was probably greater than this since a number of traditionally well populated islands do not appear to have been visited. Davis (1958) gave the total population in 1957 as about 370 pairs. This included 100 pairs on St. Helens where there was none in 1946 and is apparently none at the present (though in 1946 and in recent years there was a large Lesser Black-backed Gull colony). Davis emphasises, however, that the figure is only an estimate, which I suspect was on the cautious side.

2. Present status

In 1963 I was able to count or estimate the number of pairs of Great Black-backed Gulls on several islands on which I landed, and also estimate very roughly the approximate number of pairs on a number of other islands which were passed in a boat (e.g. some of the northwest group) or could be seen from another island (e.g. parts of the Eastern Isles). Subjective minimal estimates were also made for a few islands, viewed from a distance and known to have had Great Black-backs nesting in other recent years. The north-east group was not visited. From these various estimates I arrived at a strictly minimal total breeding population of 550 pairs, distributed as in Table 1. This figure excludes any birds nesting on the northeastern islands and probably underestimates the numbers on all islands on which I did not land, i.e. the majority. The actual population may be between 700 and 800 pairs.

Of the two Western Rocks which I visited in both 1962 and 1963,

Table 1. - Distribution and numbers of Great Black-backed Gulls in the Isles of Scilly in summer 1963.

<u>Island/group</u>	<u>Estimated min. no. of breeding pairs</u>	<u>Possible max. no. of breeding pairs</u>
Annet	150	150
Melledgan	57	60
Rosevear	70	90
Other W. Rocks	20	60
Mincarlo	20	25
N.W. Isles	60	120
Eastern Isles	170	220
Totals, excluding N.E. Isles :	c.547 pairs	725 pairs

Great Black-backs had decreased from c.120 pairs to c.70 pairs on Rosevear, but had increased from c.12 to 57 pairs on Melledgan. The numbers on Melledgan were probably unusually low in 1962, possibly because severe gales and high seas the previous winter had altered the appearance and character of the island by scattering huge boulders from the shore over the flat, gravelly central area where the gulls nest. On Annet numbers increased slightly ^{during} ~~from~~ 1961-1963.

3. Fluctuations in Scilly and elsewhere in England and Wales.

Comparing their estimate of 600-800 pairs in Scilly in 1930 with estimates from elsewhere, Harrison & Hurrell (1933) reckoned that the Scilly population comprised about 65% of the total number of Great Black-backs breeding in England and Wales. They concluded that Scilly had acted as a centre of dispersal, "whence birds have spread into Devon and elsewhere". Even allowing for a considerable overestimate on their

part, it seems likely that there were as many Great Black-backs breeding in Scilly at that time as in the rest of England and Wales together. With the 1956 census (Scilly actually being covered in 1957), Davis (1958) recognised the inadequacy of the figures for the Isles and considered that a comparison with those for 1930 would be unprofitable since in each year the numbers were based on estimates rather than actual counts. Elsewhere, especially in Wales, he showed that some island populations had shown a threefold increase, and added that in Scilly there had been no perceptible fluctuations in recent years.

Table 2. Summary of recorded numbers of Great Black-backed Gulls in Scilly since 1854

<u>Year</u>	<u>Approx. no. of pairs estimated</u>	<u>Authority</u>
1854	1-2	Jenkinson, MS.
1881	several	Smart 1885
1885	several	Bidwell 1886
1890	very few	Harrisson & Hurrell 1933
1894	fewer than 20*	King 1924
1903	limited numbers*	Clark & Rodd 1906
1910	c.100; odd nests on Annet	King, MS.; Atkinson 1917
1915	many on Annet	Whitaker & Fowler 1916
1923	300+	Wallis 1923
1924	200+	King 1924
1930	600-800	Harrisson & Hurrell
1946	250+	C.B.W.P.S. Rep.16
1957	370	Davis 1958
1963	550+	present report

* but at least 11 in each year.

The various estimates for Scilly since 1854 are summarised in Table 2. In view of the vagueness of most of the figures it seems unwise to draw