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Seabirds breeding at the Berlengas, forty-two years after Lockley's visit

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Changes in seabird numbers and distribution have been monitored in the British Isles for decades, contrasting sharply with the paucity of equivalent information available from some adjacent regions. This situation in the past encouraged several expeditions by British specialists to some of the Portuguese colonies. Long since recognized as a major seabird site in Iberia, the Berlengas were visited by R. M. Lockley, who stayed on the main island from 20 to 24 June 1939. At that time, only four seabird species were found breeding at Berlenga (Lockley 1952), namely Cory's Shearwater *Calonectris diomedea*, Shag *Phalacrocorax aristotelis* (*c.*70 pairs), Herring Gull *Larus argentatus* (*c.*1000 pairs) and Guillemot *Uria aalge* (*c.*6000 pairs). Breeding of all four species had been known to earlier ornithologists (Daveau & Girard 1884, Paulino d'Oliveira 1896, Lopes Vieira 1904, Tait 1924, Reis Júnior 1931) though population sizes had not been estimated prior to Lockley's visit. Unfortunately, it is not clear which census techniques Lockley used to make his evaluation of the breeding populations (Lockley 1952), and care must be taken when using his results to check any subsequent population changes.

The Berlenga islands are located off the western coast of Portugal, near the fishing village of Peniche. This group includes Berlenga itself with some associated rocky stacks, the smaller Estelas and the Farilhões (Fig. 1). Geologically, both Berlenga and the Estelas are granitic whereas the Farilhões are composed of gneiss. Permanent human settlements exist only at Berlenga and occupation fluctuates markedly during the year, reaching a peak in July and August due to the influx of tourists from the mainland.

During the breeding seasons of 1977, 1978 and 1981, census work was carried out at the Berlengas, following current techniques described elsewhere (Cramp *et al.* 1974, Lloyd 1975, Nettleship 1976). A further three species were found to breed, namely Madeiran Petrel *Oceanodroma castro*, Lesser Black-backed Gull *L. fuscus* and Kittiwake *Rissa tridactyla*.

Cory's Shearwater still breeds at the Berlengas, in spite of much human persecution in past times (see Fisher & Lockley 1954). In 1981, as many as 550 Cory's were counted in late July, 'rafting' at dusk between Berlenga and the Estelas and early in September of the same year, *c.*600 Cory's were also counted 'rafting' close to the Farilhões but the actual size of the breeding population is very difficult to census correctly. From the relatively small number of birds observed ashore at night and a

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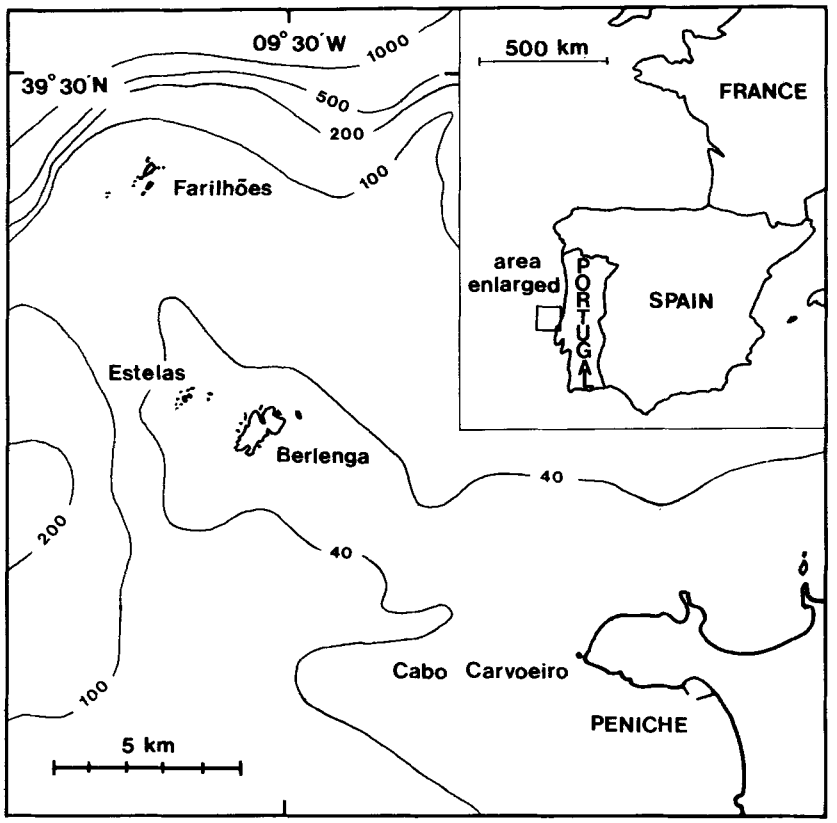

FIGURE 1. The Berlengas and their position relative to the Portuguese mainland. Depth readings are in metres.

most noticeable scarcity of both eggs and young at the known nesting sites it is estimated that no more than 20–40 pairs were breeding at Berlenga in 1981. The species is somewhat more obvious at the Farilhões, probably reflecting their isolated character and the absence of rats, and up to 40 pairs were estimated breeding there in September 1981.

Following the recent discovery by Teixeira & Moore (1983), the Madeiran Petrel should now be included in the list of seabird species that breed at the Berlengas. Their presence is almost certainly restricted to the Farilhões, lying markedly isolated at the westernmost edge of the group (Fig. 1). Human disturbance is minimal there and other mammal species are lacking, in particular the brown rat *Rattus norvegicus* now so common at Berlenga. From observations carried out in early September 1981, the number of Madeiran Petrels ashore at night at Farilhão Grande has been tentatively put at around 100 birds.

The Shag is a fairly widespread and obvious breeder at the Berlengas. In 1981, nesting evidence was obtained for Berlenga itself, the Estelas and the Farilhões. Thirty-nine occupied nests were actually checked at Berlenga island alone, where they predominate in the northern cliffs. The true figure there could be up to 15% higher since a few nests are built inside natural caverns, where they may escape observation. An overall population of 50–60 breeding pairs has been estimated for the whole group in 1981 (see Table 1).

TABLE 1

Seabird populations at the Berlengas, April–July 1981. Census figures refer to the numbers of breeding pairs counted or estimated at the colonies. Where there is some uncertainty a question mark has been inserted

	Berlenga (including 'Cerro da Velha')	Estelas	Farilhões
C. diomedea	20–40	?	*c.*40[1]
O. castro	—	?	<50[1]
P. aristotelis	*c.*45	4	6–8
L. argentatus	*c.*3000	*c.*40	*c.*200
L. fuscus	1–3	?	?
R. tridactyla	3	—	—
U. aalge	30–40	2–4	—

Note: [1] Data from September 1981.

The Herring Gull stands out clearly as the most abundant seabird species on the islands, with just under 7000 adult birds counted in 1981, during the incubation period, at Berlenga island alone. It breeds also in most other islets of the group, reaching an overall total of more than 3000 breeding pairs (Table 1). Undoubtedly, there has been a large increase in numbers, the species apparently tripling its breeding population in forty years. It is worth pointing out that this was achieved despite considerable predation by man. Fishermen regularly collect large numbers of eggs from the nests of Herring Gulls and, later in the season, disturbance of unfledged young by tourists is a further cause of breeding failure.

A few Lesser Black-backed Gulls have been recorded regularly in recent years among the Herring Gull colonies, with up to three pairs in 1981. Actual breeding (single pair) was noted for the first time in 1977.

The possible breeding of the Kittiwake in Portugal was first suggested in June 1977, when the author was shown about a dozen birds in breeding plumage standing on the northeastern facing ledges of Cerro da Velha, a rocky stack close to Berlenga island. Some of the birds were in pairs but no conclusive evidence of nesting could be obtained at the time. According to the fisherman who drew our attention to the species, Kittiwakes had made their appearance 'a few years before', probably around 1970. The Kittiwake site was checked again in late May 1978 and 15 birds were counted on the ledges; six pairs and three solitary birds. Again, it was impossible to locate any nests or young from sea level, probably due to the early timing of the visit. Full confirmation of their breeding was obtained only in late June 1981 but, by then only three pairs were present at the Berlengas, one still occupying the 'traditional' site on Cerro da Velha and the remaining two on Berlenga island itself (Table 1). Their breeding sequence was then studied, revealing two nest failures with the third pair succeeding in rearing two chicks to fledging stage.

The Kittiwake has been expanding its range and numbers in the Western Palearctic (Cramp *et al.* 1974), Berlenga standing at the southernmost limit of their present breeding distribution (Silvar & Bermejo 1975, Yeatman 1976). However, the small number of breeding pairs so far recorded and the low breeding success observed in 1981 indicate that successful colonization of the islands must be a matter for observation in the years to come.

In June 1977, single head counts of Guillemots at all the major breeding ledges on Berlenga alone, accounted for 320 adults; by June 1981, this number had dropped to a mere 70 adult birds in the same areas, in spite of more rigorous census work.

Breeding of Guillemots at Berlenga itself in 1981 was restricted to a few sites on the northern cliffs. Away from the main island, Guillemots were found breeding also at nearby Cerro da Velha and at Estela Grande, again on north-facing cliffs.

There has been a very sharp decline in Guillemot numbers, from thousands of pairs in 1939 (Lockley 1952) to some few dozens in 1981. This reduction is substantiated by statements from local fishermen, who know the species well and agrees with published reports from similar areas located further north, such as northwest Spain (Silvar & Bermejo 1976) and Brittany (Guermeur & Monnat 1980). Reasons for this decline are not clear though oiling whilst at sea, changes in food resources exploitable during the breeding season and disturbance at the colonies by humans passing too close to the breeding ledges are just some of the more likely answers.

During the most recent census year (1981) the actual breeding success for this species appeared to be low and taking the Berlengas as a whole, less than 30 young Guillemots may have left the nest in 1981. Observations carried out regularly at the most accessible sites on Berlenga revealed a mean production of about one nestling to four adults frequenting the ledges by late June 1981. The same ratio has been assumed to apply also to the less accessible sites, where no eggs or young could be checked and the number of adults has been monitored by means of a single head count on 19 June.

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