

THE TERRESTRIAL ECOLOGY OF LUNDY: ORIGINS, PROGRESS AND THE FUTURE

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ABSTRACT

The possible origins of the terrestrial fauna and flora of Lundy are discussed. Early records and some of the recorders of the nineteenth century and the first half of the twentieth century are considered. The progress made since 1946 followed two major advances, the publication of *The Fauna and Flora of the Ilfracombe District* and the inauguration of the Lundy Field Society, which stimulated interest in the natural history of the island and led to numerous contributions to its study. The importance of Lundy in conservation terms, the effects of an upsurge in general interest in natural history, the influence of commercial factors, and possible future directions for studies are discussed.

Keywords: *Lundy, terrestrial fauna, terrestrial flora, bird records, conservation*

INTRODUCTION

In the Annual Report for 1967, Keith Gardner (1968) posed the question 'Lundy - a Mesolithic Peninsula?'. Keith concluded that the answer to that question must be 'yes', a conclusion with which I would concur. Following the last Ice Age, there is ample evidence worldwide of post-glacial fluctuations in sea level which is considered to have receded to 100 metres below the present level during the last glaciation (Zeuner, 1950). The island itself was not directly involved in the most recent glaciation, which probably reached the south coast of Wales, but adverse climatic conditions would have restricted the arrival of most species until some time after 10,000 B.C.

As the ice melted, the sea level rose and the re-opening of the Straits of Dover flooded the minus 40 metre level at approximately 7,000 B.C. It is reasonable to assume a comparable date for the Bristol Channel which suggests that Lundy was connected with the mainland for a significant period of time in the post-glacial period, during which the land bridge from Europe was still in existence and the post-glacial climate was increasingly clement.

ORIGINS

The fauna and flora

Immigration using such a connection would have an arbitrary origin for the earliest of the island's fauna and flora of perhaps 8,000 B.C. This would mean that species sensitive to a cooler climate would have been unlikely to reach the island prior to

its isolation. The composition and the continued existence of such an immigrant community into historic times would depend on numerous factors, not least the requirement for species to have survived in the proximity of glaciation or to have returned from continental Europe at an early date.

There is one small vertebrate which may have taken advantage of access to Lundy - the pygmy shrew (*Sorex minutus*). This appears to be the only one of the smaller, flightless mammals to have made its way to the island and to have survived to the present day (Bull & Parker, 1997). However, the assumption that it arrived independently and survived for several thousand years leads to the acknowledgement that there must already have been sufficient invertebrates on the island to support a population of these voracious little animals.

By no means all our common flightless species managed to arrive in time for the crossing. Our two commonest grasshoppers in Britain are the meadow grasshopper (*Chorthippus parallelus*) which is predominately flightless and which does not occur on Lundy, and the field grasshopper (*Chorthippus brunneus*) which flies well and which does so occur.

The best candidate for aboriginal immigrant status must be the tiny bagworm moth *Luffia feuchaultella* (Psychidae) which exists only as flightless, parthenogenetic females within small silken cases adorned with lichens. The moth occurs primarily on lichen-covered wood and rocks close to the coast and would be likely to spread at only a few metres a year and may well have survived close to the boundary of glaciation. To the present time, the moth has not been recorded on Lundy but I am sure that it will be found and that this will support the theory of a land-bridge to the island in the Mesolithic period.

There are many other candidates for aboriginal status such as flightless beetles, woodlice, centipedes and millipedes but there are many ways in which these might have arrived. Very large quantities of supplies have been transported to the island over several centuries and it is inevitable that many species will have been introduced even though not all such introductions will have been viable.

The majority of winged species could have arrived at any time but it may be possible to make some assessments of flightless species on the basis of probabilities. For example, the probability of introducing a species which may be synanthropic, such as the common large centipede *Lithobius forficatus*, must be higher than that of introducing a totally 'wild' species such as *Lithobius borealis*.

The origins of recording

The history of the fauna and flora of any site prior to the nineteenth century relates almost entirely to what has been written down in documents such as Court Rolls, diaries and account books where these have survived to the present day. A number of such early documents (referred to in Chanter, 1887 and Langham, 1994) provide minimal details of the terrestrial fauna. For example, the first mentions of rabbits come from 1225 when a dozen were introduced, from an 'Inquisition of Escheat' in 1274, and from further references from 1321 and from the 1580s (Camden, 1607) when the island was said to swarm with rabbits and black rats. Peregrines appeared for the

first time in the 1274 inquisition as did gannets which, in 1321, were noted to breed and, in 1607, the presence in winter of starlings and woodcock was noted. By 1725, deer had been introduced and, by 1787, the 'many deer and goats' were recorded as having been a part of numerous introductions of 'all sorts of game'. In 1775, we are told specifically that there were only black rats on the island, no brown rats, and in 1787 came the first mentions of razorbills, guillemots, puffins and kittiwakes.

The Victorians

The first scientific survey of the island's fauna came from Thomas Wollaston who visited the island in 1844 and 1845 and published his findings in 1845 and 1847. Wollaston was a highly respected gentleman-naturalist of a breed that flourished in the Victorian and Edwardian eras. They were educated, diligent and competent workers in their chosen fields, usually (although not always) comparatively affluent. They were certainly not the idle rich, however. Many of them were professional men who led extremely busy working lives as well as having absorbing hobbies. Despite being only 22 when he first visited Lundy, Wollaston managed to find what were then considered to be 153 different species of beetle, including a species new to science - what we now refer to as *Psylliodes luridipennis*, one of the beetles found on Lundy cabbage and one which is endemic to Lundy.

In 1851, Philip Gosse came to live in Torquay. Already an accomplished author, he was an expert in all aspects of the sea shore. He regularly visited Ilfracombe and, in July 1852, was invited by Hudson Heaven to stay on Lundy for a few days. This sojourn resulted in four chapters in his next book (Gosse, 1865) and his observations of the fauna and flora provide an invaluable background by an accomplished naturalist.

The publication of synopses of existing records is particularly important where early data may be in obscure sources. The first to do this for Lundy was John Roberts Chanter, solicitor and prominent citizen of Barnstaple whose *History of Lundy Island* (Chanter, 1887) is remarkable in that it is believed that Chanter never actually visited the island. Apart from his researches on the earliest relevant data, he repeated existing records and extracted some data from Gosse's book, with additional information in his 1887 edition on the birds, the Lepidoptera and the flowering plants and ferns, these provided by Lundy's owner, the Rev. Hudson Heaven.

Dr George Longstaff was a general practitioner in Wandsworth. He came from a wealthy family and, in 1890 at the age of about 40, he retired from medicine and moved to Morteohoe to concentrate on his great love, the Lepidoptera. He travelled widely and wrote one book on his travels but his other work, from 1907, although on Morteohoe parish, included the Lepidoptera of Lundy (Longstaff, 1907).

PROGRESS

The first half of the twentieth century

Up to this point in time, the data have come from relatively few sources and consist primarily of lists of species although, already, some indications of status have appeared. Another general practitioner, Dr Norman Joy from Reading, who became one of the best known coleopterists of the twentieth century, visited Lundy in 1905

and 1906, on the latter occasion with his friend J.R. le B. Tomlin. They published eight papers and notes between them as a result of their work (Brendell, 1976).

Much of the recording up to this point had been of beetles and even spider expert William Bristowe, who visited Lundy in 1928, recorded a few beetles and other insects as well as publishing the first paper on the spiders of the island (Bristowe, 1929). This was more than a list; for the first time there were considerable annotations regarding locations and status - sufficient in many cases for comparisons with the present day.

Up to the 1930s, studies on the flora had been primarily the list of Hudson Heaven (some records later being considered doubtful) supported by Gosse's notes but yet another general practitioner came to the rescue. Frederick Elliston Wright was the doctor in Braunton, with an abiding interest in natural history and particularly botany, and his papers on the flora and its origins (1934 and 1935), have formed the basis for most studies on these since. Wright's great claim to fame was that he realised that the Lundy cabbage was something unusual. Samples were sent to O.E. Schulz, who described the new species, which is endemic to Lundy, as '*wrightii*' in 1936.

In 1939, Richard Perry spent five months on Lundy studying seabirds (Perry, 1940). The book which resulted gave the first extensive information on the seabirds, acting as a benchmark for future studies. Incidentally, in his preface, he acknowledged the help and encouragement of numerous people; his list reads like a 'Who's Who' of twentieth century ornithology!

We now come to two of the most important advances of the twentieth century. The first was the publication of *The Fauna and Flora of the Ilfracombe District of North Devon* (Palmer, 1946). The synopsis of this corner of Devon also included all the Lundy records known to the authors and, in particular, to the editor Mervyn Palmer who was Curator of the Ilfracombe Museum and Chairman of the Ilfracombe Field Club. It is primarily due to Palmer's enthusiasm and leadership that this remarkable compilation was achieved. Despite the fact that there was very little new information on Lundy, the book stood for many years as a handbook - a first reference to turn to for information on the island's natural history. Undoubtedly, it also helped to stimulate interest in the island. I first visited Ilfracombe Museum in 1948 and my interest in Lundy stemmed from that visit, the book which I purchased, and the tantalising views of the island from the mainland.

The second, even more important step was, of course, the formation of the Lundy Field Society in 1946 and the publication of the Annual Reports which commenced from 1947. From this point to the present day, a wealth of information on all aspects of Lundy's natural history has been published.

The second half of the twentieth century

The Annual Reports include many bird records and also the records and results of very many sessions of bird ringing. The published data on ringing (Taylor, 2004) lists almost 82,000 birds of 170 species, a remarkable effort. Many bird surveys have been carried out over the years, particularly of the island's very important seabird community. For example, in 1953, the Annual Report drew attention to the

increasing incidence of oiling of auks and gannets in the Bristol Channel, one of a series of reports which helped to ease the problem by new legislation.

Perhaps one of the more surprising aspects of studies of the Lundy fauna has been the papers published on the parasites found on the island. Between 1954 and 1988, a total of fifteen papers were published by six different authors covering ectoparasites (fleas, flat flies, lice and ticks) and endoparasites (roundworms, tapeworms and flukes) and are listed in Parsons, 1997. The amount of work involved was prodigious. For example, in the five years between 1952 and 1956 inclusive, 1252 ticks were collected from birds on the island.

One of the most encouraging aspects of recent years has been the study since 1993 of the ecology and conservation of Lundy cabbage and its associated fauna, culminating in papers in 1998 (Compton & Key) and 2000 (Key, Compton & Key). The regular presence of three prominent naturalists has also lead to many incidental records and their continuing work is leading to considerable advances in our knowledge of Lundy's ecology.

Some of the major studies have only taken place very recently. Although the lichens were reported in several papers between 1948 and 1972, it was not until the work of James, Allen & Hilton (1996 & 1997) that a comprehensive study was published. With the fungi, the comparable study of Hedger & George was published as recently as 2004 (Hedger & George, 2004). However, both studies are far from just species lists, providing large amounts of ecological data and setting extremely important baselines for the future.

Conservation

To warrant specific conservation measures for a site, one must first know what is present and which species are of particular importance, so the first requirement is a well-recorded site. By the 1970s, very considerable amounts of data had been collected and most of this had been published. The 1970s were a turning point in Britain, a time when most naturalists realised that specific measures were necessary to conserve our most important sites and species. The wheels of 'quangos' turn slowly and most of Lundy was eventually notified as a Site of Special Scientific Interest in 1987. In the meantime, the National Trust had purchased the island in 1969, thanks to the immense generosity of Jack Hayward, and Lundy had immediately received a good degree of protection from the Trust's own bye-laws. The interest being shown in the conservation of the island also encouraged Devon County Council to make several specific declarations from 1981, all these restraining future development. Thus, the island has various forms of statutory protection and should, in theory, be sacrosanct. However, we have all seen how governments are prepared to sacrifice areas of statutory protection on the altar of expediency and nobody in the conservation movement can afford to be complacent.

Of course, it is not only officialdom that can damage a site. One errant individual can do enormous damage. In the 1983 Annual Report, I commented on the presence of myxomatosis on the island (Parsons, 1984), assessing the arrival of the disease as probably being due to a deliberate introduction. Two years later, I was told who had

introduced it - one cannot keep secrets on a small island. The results are difficult to assess, although one recent paper (Compton *et al.*, 2004) introduces a possible effect but the point is that the introduction should not have happened. Compare this with the actions to eliminate rats or to eradicate rhododendron which have been the subjects of careful research, consultation and monitoring. Everyone with an interest in the conservation of Lundy must be aware of the dangers of arbitrary introductions or unregulated extinctions.

THE FUTURE

Much of our information on the terrestrial ecology relates to the identification of species and an assessment of status where possible. Such data, including regular updates, will always be required in order to pursue conservation issues but, increasingly, studies will take place relating to the ecology of the island communities. Continuing to plot the origins and destinations of migrant birds through ringing; the assessment of the effects of climate change from distributional and phenological data; the rearing of invertebrates from substrates and hosts; the use of DNA to assess relationships; all these will be important in the future. It is essential, of course, that as much material as possible should be published.

A recent paper in the Annual Report, giving details of a survey of the microbial parasites of the brown rat on Lundy (Blasdel & Read, 2004), demonstrates several points. Firstly, many studies now involve experts using extremely sophisticated techniques. Secondly, the work is a part of a much larger study relating to reservoir hosts for specific viruses. Thirdly, the rats which were examined were available as a result of the eradication programme; the carcasses were not wasted.

In 1951, I joined the R.S.P.B. when it had about 5,000 members. Since then, the population of the U.K. has risen by about 20% and the membership of the R.S.P.B. by 20,000%. This reflects the enormous surge of interest in and concern for our environment and its species during the past half century, relating to improved education, increased leisure and greater disposable income.

I doubt whether anyone has worked out just how much the ancient murrelet was worth to Lundy but the income from transporting and feeding 5,000 birdwatchers must have been considerable. Less dramatically, if Lundy can keep its fauna and flora despite the increasing despoliation and decreasing wildlife elsewhere, then the income generated will help with the running costs of the island and the maintenance of the necessary conservation measures.

Chanter made the comment 'this remarkable Island, as a field for research ... is yet far from being worked out'. That is as true today as it was in the nineteenth century, and will still be true in the twenty-second.

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