

THE CURRENT STATUS OF FERNS ON LUNDY

by

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ABSTRACT

The results of a number of field surveys of the fern flora of Lundy between 2006 and 2010 are discussed and the earlier records of ferns from previous surveys are reviewed. 18 species of ferns appear to be present on the island, and there are a further six species which have been recorded in the past but are apparently no longer present. Two species are present in populations of national significance.

Keywords: *Lundy, ferns, stone walls, quarries, grazing, competition*

INTRODUCTION

Some of the earlier lists of the Flora of Lundy give the names of a range of fern species, many of which are still present on the island, but they also include a number of species which seem unlikely to have ever occurred, or have become extinct there for various reasons. At least two species, the Small Adder's-tongue Fern and Hay-scented Buckler-fern are present in large enough populations to have national significance, whilst there are some surprising absences amongst the ferns which are very common on the nearest mainland habitats. Surveys were undertaken between 2006 and 2010 to establish the status of Lundy's Fern Flora and attempt to relocate some of the missing species. As far as possible, the whole island was surveyed, including every wall and building, but not some of the inaccessible cliffs. Old lists were consulted and known locations checked. During the course of the survey two new fern species were added to the Lundy lists and new sites were found for some of the scarcer species. Changes were noted in the distribution of some species.

Lundy offers some superb habitats for ferns, especially those requiring a maritime/oceanic climate. The scarcity of woodland means that some species commonly found on the mainland are absent here, but the lack of disturbance and cultivation has enabled others to flourish. Shaded cliff slopes on Lundy's sidelands provide alternative sheltered sites for some woodland species and man-made sites such as some of the quarries have been colonised by species requiring acidic rock substrates. The stone walls criss-crossing the island provide excellent niches for a number of small wall ferns, although some species which are very common on the mainland are extremely scarce here.

PART ONE: SPECIES RECORDED IN 2006-2010

ROYAL FERN *Osmunda regalis* L.

Description: A very large and conspicuous fern with broad, deeply divided fronds of a fresh green colour, some of them topped with brown fertile tufts of sporangia, somewhat reminiscent of the flowers of a dock. Mature plants growing in sheltered sites may be over 2 metres tall.

National status: Mainly found in the west of Britain in lowland acidic habitats, often in wet woodlands, fens and bogs and on sheltered cliffs and coastal gulleys.

Status on Lundy: Recorded on all recent surveys and present in several sheltered locations on the east side and especially in the quarries where it seems to grow out of the solid granite. It exploits tiny fissures in the rock face where there is water seepage and some shade. Growing on these high rocks gives some protection from grazing animals, and also reduces competition from the more aggressive bracken. Although it does not attain the proportions of plants growing in sheltered woodlands on the mainland, it seems to thrive on the east side of Lundy, and is re-appearing in some of the areas now cleared of Rhododendron.

BRACKEN *Pteridium aquilinum* (L.) Kuhn

Description: A very large and robust fern with tough, deeply divided fronds on thick stalks, often forming dense masses of foliage. New fronds start to unfurl in late spring, and then develop rapidly during the summer, turning golden brown in autumn and often persisting in a dried state through the winter, eventually collapsing to produce a mass of tangled stalks and fronds.

National status: Widespread and abundant in all regions, apart from areas of regular cultivation and in very waterlogged conditions. Unable to cope with dense shade, bracken is most common in open sites such as moorland and cliff tops where it can often grow almost to the exclusion of all other species.

Status on Lundy: An abundant and widespread fern, found on much of the island apart from the cultivated areas. It is the dominant species in the sheltered areas of the east side where it reaches a height of over 2 metres by the end of the summer, but is also present on the more exposed west sidelands where it is greatly reduced in stature. On top of the island where there is a good depth of soil it can form dense thickets, towering over the other vegetation. Some management is taking place here in order to reduce the vigour of this rather aggressive plant and allow the maritime heath and acid grassland plant communities to flourish. Rolling the bracken during the summer flattens and bruises the fronds and stops any further growth, although this does produce a thick mulch of decaying fronds. In the absence of much tree cover it is the abundance of Bracken which provides Lundy with its autumn colours in November.

DWARF or SMALL ADDER'S-TONGUE FERN *Ophioglossum azoricum* C. Presl

Description: A very small and unusual fern, from about 3-8cm tall, with bright green, slightly re-flexed undivided fronds, resembling tiny sorrel or plantain leaves, and usually found growing in colonies in short coastal turf. The fronds often arise in twos or threes

from a creeping rootstock and the fertile spikes bearing the paired sporangia may also grow in pairs. The number of sporangia is within the range 4-13, compared with 11-44 for *O. vulgatum* (Paul, 1987). Although this fern was known in Britain from the mid-nineteenth century it was not given full species status until 1964.

National status: Rather rare in Britain and found in very widely scattered locations, almost always near the sea in exposed situations, and in short turf. Most known colonies are on islands in the west of Britain, such as Scilly, Skomer, the Hebrides, Orkney and Shetland, with Lundy having one of the largest populations in Britain and Ireland. An isolated population exists in the New Forest, Hampshire, on an old airfield where sand and shingle were imported from a coastal location, but two other small colonies are found elsewhere in the New Forest in more natural sites.

Status on Lundy: First recorded by Dr Elliston Wright in the 1930s when this tiny fern was then thought to be a variant of the **Common Adder's-tongue Fern** *Ophioglossum vulgatum*. It was usually described as *Ophioglossum vulgatum* var *polyphylla*. Lundy specimens have the characteristically small reflexed leaves and smaller number of sporangia compared with *O. vulgatum*. It was originally listed as being common in Middle Park, where it still occurs in good numbers. It can be found in several scattered locations on the west side, especially on the slopes above Jenny's Cove and at the south end, particularly in areas where there is some grazing pressure and therefore reduced competition from more vigorous species of grasses. It is often associated with other species of short, damp coastal turf, such as **Allseed** *Radiola linoides* or **Procumbent Pearlwort** *Sagina procumbens*, but in sites where grazing pressure has been reduced it can appear with **Sorrel** *Rumex*, and various **Fescue** *Festuca* spp. In the early 1980s *O. azoricum* could be found in some abundance at the south end, especially around the Rocket Pole Pond, but reduced grazing pressure here seems to have favoured a more dense sward of grasses to the detriment of the Small Adder's-tongue.

HART'S-TONGUE FERN *Asplenium scolopendrium* L (Syn. *Phyllitis scolopendrium* (L.) Newman).

Description: A distinctive, medium-sized fern with undivided strap-shaped leaves, from 10-50 cm long, usually persisting through the winter. The spores are produced in numerous parallel rows of orange sporangia on the underside of mature fronds.

National status: Widespread and fairly common in most of Britain, apart from the far north, and usually found in sheltered, partly shaded locations, including woodlands, hedgerows and riverbanks. Hart's-tongue often occurs on mortared walls and limestone rocks, but it avoids very acid conditions and is absent from high altitudes.

Status on Lundy: Recorded on all recent surveys, and fairly common in sheltered locations on rocks and walls in the south of the island, and in a few places in the east side copses. Some of the largest specimens occur in the more shady, wooded areas of Millcombe, but small specimens are quite frequent on walls and buildings, including St Helen's Church. There are even a few specimens managing to survive inside the Church where condensation has formed on window ledges.

SEA SPLEENWORT *Asplenium marinum* L.

Description: A perennial fern with bright green, shiny and rather tough pinnate fronds, from 10-30cm long, growing on a stiff, reddish-brown stalk. Sea Spleenwort usually occurs on vertical rock faces, in crevices and gulleys and sometimes on the walls of derelict buildings at or near sea-level. It is tolerant of some exposure to salt spray and also a degree of shading, and can be found in the mouths of caves and on rocks just above the splash zone.

National Status: Entirely confined to the coast, and most common in western Britain. Absent from most of the south and east coasts of England. This species is rarely found out of sight of the sea, and is often found in situations where it is within reach of salt spray. It seems to be intolerant of frosts and usually grows in sheltered rock overhangs or cave mouths.

Status on Lundy: Recorded on all recent surveys and a common fern of exposed and sheltered rock faces close to sea level, presumably also occurring in many places around the island's coastline which are inaccessible to surveyors. It is also present in the Earthquake, growing in a few shaded sites where some of the largest specimens on Lundy can be found, and it is easy to observe on the ruined buildings of the Battery. Some plants grow on the retaining walls on the lower sections of the Beach Road and a few small plants have gained a foothold at the base of the walls of the Castle where they are a considerable distance above the sea and salt spray.

MAIDENHAIR SPLEENWORT *Asplenium trichomanes* L

Description: A small tufted wall fern with evergreen fronds, from 10-30cm long, almost always found growing on walls. The fronds are composed of a wiry, dark midrib and paired rounded or oblong pinnae. Spores are produced in clustered, dark sori on the underside of the pinnae.

National Status: A widespread and sometimes very common species over much of Britain, especially in the west and along rocky coasts. Three sub-species are recognised, and the Lundy population appears to be all *Asplenium trichomanes* ssp *quadrialeans*. D.E. May. The remaining two sub-species seem to be less tolerant of acidic conditions, or have a more montane distribution. They appear in acidic areas where mortared walls provide a base enriched substrate.

Status on Lundy: Recorded in all recent surveys, and an abundant species on walls in both sheltered and exposed locations. In some sites this is the only fern species to thrive, and it can be seen on many of the walls in the village area, and in some of the derelict buildings on both inside and outside walls. Dry stone walls with a fairly loose construction are not suitable for Maidenhair Spleenwort, as the gaps between the blocks are usually too large to allow any humus to collect in which the rhizome can develop. Mortared walls, usually those of buildings rather than field boundaries, and especially those that are in a good state of repair and have few crevices in them, are also unsuitable, so it is usually where the wall has suffered some damage or where the mortar has eroded away that this species does well. It does not tolerate high levels of shade so declines if there is any shading from encroaching vegetation. It is particularly common on some of the walls in the village and appears to be doing very well on the crumbling walls of the Old Hospital.

WALL-RUE *Asplenium ruta-muraria* L

Description: The smallest of the wall ferns, often only about 4-5 cm tall, and sometimes barely visible in deep crevices. The bi-pinnate leaves are evergreen, glossy and slightly fan-shaped on greenish stalks. The rusty reddish-brown sporangia sometimes cover the whole of the underside of the fronds.

National Status: A widespread and quite common species over much of Britain, occurring naturally on limestone and base-rich rocks, but also very common on mortared walls, bridges, and other man-made structures; it is often found on old walls of cathedrals and churches in city centres where other ferns could not survive.

Status on Lundy: Not found on any previous surveys, and not recorded in either the Atlas of the Devon Flora or the BSBI Atlas, but a survey of the island's walls by the author in July 2009 revealed a small colony of this species on the walls of the ruined Belle Vue Cottages, just north of Quarter Wall. A thorough search of other nearby buildings and walls of a similar type of construction produced a few more records, but this remains a very rare species on Lundy and one which is entirely confined to man-made habitats. This small fern does best where there is a crumbling lime-rich mortar and reasonable light levels, conditions which are perfect on only a few derelict buildings. Restoration of these buildings may prevent this species from colonising any new sites. A few plants were relocated from Barton Cottages to the Old Hospital in late 2010 when re-pointing of the walls was about to take place, but subsequent repairs on that wall destroyed most of the plants.

BLACK SPLEENWORT *Asplenium adiantum-nigrum* L

Description: A perennial wall fern with dark, glossy green fronds, from 10-40cm long, supported on dark, stiff stalks, which are much darker towards the base. The fronds are usually tri-pinnate, with toothed pinnae and linear sporangia on their undersides.

National Status: Widespread and common, preferring lightly shaded habitats in lowland areas such as walls and rock faces, where there is little competition from more vigorous species.

Status on Lundy: Recorded regularly and a common species on rocks and walls, especially in Millcombe and around the village where it reaches its greatest size in sheltered sites free from grazing. It replaces Sea Spleenwort on the higher sections of the Beach Road.

RUSTYBACK FERN *Asplenium ceterach* L. (Syn. *Ceterach officinarum* Willd.)

Description: A distinctive, small tufted wall fern with dark green, perennial fronds, up to 20cm long, but often smaller, which are pinnately divided and encrusted on the underside with rusty red-brown scales; these hide the sporangia which lie along the veins. It usually grows rooted in a crevice but with the fronds pressed flat to the wall in situations where it can receive maximum sunlight.

National Status: A predominantly lowland species, found mainly in the south and west of Britain and usually on limestone rocks, screes, mortared walls or other base-rich habitats. It seems to thrive in warm sunny situations, so is often seen on south-facing walls and rocks and in drier situations than those suitable for other small ferns.

Status on Lundy: The BSBI Atlas indicates a pre-1970 record for this species, but it does not appear in any lists or other surveys. It was re-located by the author in 2001. A small colony survives on the garden walls close to Stoneycroft, but the few plants in this location are in danger of being smothered by the encroaching shrubs. This is a species which enjoys a sunny aspect, so some control of the invading vegetation in the now abandoned garden might help this vulnerable colony to survive. In 2010 a further, much larger colony was discovered by the author on the south and west facing sides of the castellated walls near the Old School and this seems to be in a better state of health than those at Stoneycroft. A count in September 2010 indicated that about 150 plants are present in this location, and this colony now seems to be spreading to the north-east side of the wall.

LADY-FERN *Athyrium filix femina* (L.) Roth

Description: A large, tufted fern, sometimes up to 150cm tall, with pale green bi-pinnate leaves which taper towards the base. The pinnules are pointed and deeply toothed giving a rather delicate appearance to the fronds compared with the more robust Male-fern. Curved sporangia form on either side of the midrib on the underside of the pinnules.

National Status: A common and widespread fern, especially on moist, but not waterlogged, acidic soils. Usually found in lightly shaded situations, it is frequent in deciduous woodlands, on streamsides, hedgerows and shady ditches, cliffs and mountain gulleys.

Status on Lundy: A common species in sheltered locations, mostly in the south of the island, and thriving where there is a relatively deep, damp soil, and some shelter from the prevailing winds. This is an abundant species in the Earthquake and in the quarries, but may be encountered in many other sheltered spots around the island. Some of the best specimens can be found in Millcombe and under *Salix* spp. on the Terraces.

MALE-FERN *Dryopteris filix-mas*. (L.) Schott

Description: A robust, tufted fern, often growing up to 130cm tall in sheltered sites, with a crown of fronds arising from a scaly rootstock. The leaves taper at both ends and are bi-pinnate, with the pinnules also pinnately lobed and with toothed margins. The leaf stalks have a covering of pale brown scales towards the base. Up to six clusters of sporangia under kidney-shaped indusia can be found on the underside of each pinnule. Some fronds persist through the winter if not damaged by storms or frost.

National Status: Common and widespread where well-drained but moist, mildly acidic to neutral soils are present, occurring in woodlands, hedgerows, ditches, cliffs, mountain slopes and man-made sites such as railway embankments, bridges, walls and gardens.

Status on Lundy: A very common species in sheltered locations, and also in some more exposed sites where it tends to suffer from wind and salt spray damage. In Millcombe this species forms dense stands under the shelter of deciduous trees, and it also appears further up the east side of the island in sheltered gulleys and the quarries. Small specimens manage to hold on in tiny crevices along the slopes above the beach road and on some walls, and there is also a large population in the Earthquake.

SCALY MALE-FERN *Dryopteris affinis* agg. (Lowe) Fraser Jenkins

Description: This taxon has been divided into three species - *D. affinis*, *D. cambrensis* and *D. borrieri*. It seems likely that the species present on Lundy is *D. borrieri* (Newman) Newman ex Oberh. & Tavel. It is superficially very similar to *D. filix-mas* but the fronds have yellowish-green leaves with a more glossy appearance and the tips of the pinnules look square-cut rather than rounded and they have entire, rather than toothed margins. There is a dark spot at the base of each pinna where it joins the midrib. The stalk is densely covered with light golden-brown scales. The fronds are more winter-hardy and persistent.

National Status: Widespread and common in shady, damp situations on acidic substrates, although it is quite scarce in eastern England, where it is most likely to occur in ancient woodland. In the west of Britain the taxon is more abundant and plants can often be found in more open situations such as cliffs, scree slopes and roadsides.

Status on Lundy: Present on the east side in just a few sheltered spots along the walls and in the quarries. Mostly occurring as single, isolated specimens, this species seems not to be thriving on Lundy, although it is quite common and easy to find in North Devon. Not recorded in some of the earlier surveys, so it may just have been overlooked as it is superficially similar to Male-fern, although it is possible that this is a recent colonist.

BROAD BUCKLER-FERN *Dryopteris dilatata*. (Hoffm.) A. Gray

Description: A large, tufted fern with broadly triangular dark green tri-pinnate leaves, growing up to 150cm long in sheltered situations. The leaves tend to spread outwards, becoming more prostrate by the end of the year. The stalks have numerous dark-centred scales on them. Spore cases are rounded and rather sparse on the underside of the sharply-toothed pinnules.

National Status: One of the commonest ferns in Britain and Ireland, found in a wide range of habitats, including both broad-leaved and coniferous woodlands, hedgerows, ditches, moorlands, cliffs, mountains slopes and many urban sites.

Status on Lundy: Recorded on almost all surveys, and still present in many sheltered locations such as around Millcombe, the east side copses and in the Earthquake. Some of the largest specimens grow in the wooded areas of Millcombe and there are also some fine individuals in deep crevices in the Earthquake. It is often associated with Lady-Fern which thrives in the same conditions. This species was not recorded by Dr Elliston Wright, but he did list Narrow Buckler Fern, presumably in error, which has not been recorded in any other surveys.

HAY-SCENTED BUCKLER-FERN *Dryopteris aemula*. (Ait.) Kuntze

Description: This species derives its name from the smell of the freshly dried foliage. The leaves are broadly triangular, bright green, fairly tough in texture, persistent through most winters and up to 60cm tall in sheltered situations. The lowest pair of pinnae are usually somewhat larger than the others, and the pinnules on all leaves are distinctly crisped. The stiff greenish stems bear uniformly red-brown scales.

National Status: Restricted mainly to the west of Britain and Ireland, with a few isolated outposts elsewhere, it occurs in small colonies in sheltered woods, on steep banks and cliffs, especially on moist but well-drained soils. It is usually found in lowland sites of high humidity and partial shade, and has been lost in many areas due to changes in woodland management.

Status on Lundy: A remarkably common species on Lundy, considering its scarcity elsewhere. Present in both sheltered and exposed locations along much of the east side and also in some of the much more exposed valleys on the west side such as the Punchbowl Valley. In some sheltered areas of the Terraces it almost forms a complete sward, growing prolifically on slopes recently cleared of the alien *Rhododendron*. This species is described by many authors as having a 'crisped' appearance and on Lundy this characteristic is very evident. It is unusual to see this species growing in quite open and exposed sites, as elsewhere in its range it is more likely to be found in woodlands, shady ravines, ditches and hedgerows. It is an easy fern to find on Lundy along the northern end of the Terraces, but it is also present in some quantity on the west side of the island in sites such as the Punchbowl Valley, for example, where it seems more vigorous than the stunted Bracken.

HARD-FERN *Blechnum spicant* (L.) Roth

Description: A distinctive, tufted fern with lanceolate, simply pinnate, overwintering leaves up to 70cm long. The individual pinnae are oblong and fairly uniform along the length of the leaves which have tough, dark stalks. The tough, dark green outer leaves are barren and spreading in habit, but the inner leaves, produced in the summer months are brighter green and more erect with more slender pinnae, resembling a fish-bone, and they have linear rusty red-brown sporangia on the underside.

National Status: A widespread and common fern over most of Britain and Ireland, but scarce in central and eastern England. Most commonly found on damp, peaty soils in both coniferous and broad-leaved woodlands, usually along the edges of ditches and streams, but also present on moorlands, streamsides and lush hedgerows.

Status on Lundy: A very scarce species on Lundy, but a common one nearby on the mainland of Devon. Only two small colonies have been found during this recording period, and this species has not been recorded on many previous surveys. One colony, comprising three or four plants, was found near Pondsbury by the author, where it grows amongst large tussocks of Purple Moor Grass *Molinia caerulea*, and a second colony exists in Smith's Point Quarry where about seven plants struggle to survive, growing amongst Hay-scented Buckler-fern and Broad Buckler-fern. In some years the fertile fronds are grazed off soon after they appear. A few small plants are occasionally found in adjacent quarries growing in wet patches in the shade of the Willow *Salix sp.* shrubs and in the vicinity of the Heligoland Trap. Hard-fern is very susceptible to grazing; the feral Goats and Sika Deer are easily able to reach it in this location so it rarely thrives.

COMMON POLYPODY *Polypodium vulgare* L

WESTERN POLYPODY *Polypodium interjectum* Shivas

MANTON'S POLYPODY *Polypodium x mantoniae* Rothm & U. Schneid.

Description: A small fern with lanceolate, simply pinnate leaves up to 50cm long, although they are usually much shorter, arising from a creeping rootstock. The pinnae are all oblong and bluntly pointed, and joined at the base along the greenish stalk. The rust-coloured, rounded clusters of sporangia occur in short rows on the underside of the pinnae. Three species of Polypody occur in Britain and they hybridise freely producing a number of sterile offspring. **Common Polypody**, which prefers acidic rocks and soils, and is most frequently epiphytic, is present on Lundy. **Western Polypody** *P. interjectum* can be larger with more pointed pinnae, the lower pair usually growing outwards away from the rest of the frond; this species often grows on trees, but may also form ground cover on basic soils in sheltered sites. **Southern Polypody** *P. cambricum* L. is usually smaller, more bell-shaped and proportionately broader with yellowish leaves and has oval-elliptic sporangia like *P. interjectum*; it too prefers basic soils but is not recorded on Lundy. A sterile hybrid between *P. vulgare* and *P. interjectum*: **Manton's Polypody** *P. x mantoniae* Rothm. & U. Schneid. which is a vigorous plant reproducing vegetatively to form large patches, has also been recorded in Millcombe, but it seems to be susceptible to grazing and is not always easy to find.

National Status: Common Polypody is one of the most abundant and widespread small ferns in Britain and Ireland, found over a wide area and in a good range of habitats, becoming scarce only in eastern areas of England, urban sites and high altitudes. In many western districts this is a common epiphytic plant, but it also occurs on rocks and soils and man-made structures. Western Polypody does have a markedly western distribution, but also occurs on the east coast of England on sand dunes and in other scattered locations; although this species prefers more basic rocks and soils it is able to grow on acid substrates such as granite if exposed to salt spray. Manton's Polypody is far less common, although probably under-recorded, having a mainly western distribution and occurring where both of the parents are present.

Status on Lundy: Polypody ferns have been recorded on all surveys and seem to be found in scattered, sheltered sites on rocks and walls, and also on trees and soil in a few areas. A few small colonies are present in the village and more can be seen on the rocks above the beach road, and in some of the east side copses. Further colonies occur on the tops of walls around the south end of the island where they are safe from grazing pressure. During very dry summers some of the colonies on south-facing walls are very vulnerable to desiccation, but seem to recover later in the season. Most of the earlier surveys recorded 'Common Polypody', which is the commonest species on Lundy, and the one seen in the more exposed situations, but recent work has shown that Western Polypody is also present in the sheltered south-east of the island and the hybrid Manton's Polypody is also sometimes seen in the same area.

PART TWO: SPECIES RECORDED ON PREVIOUS LISTS BUT NOT SEEN IN 2006-2010

MOONWORT *Botrychium lunaria*. (L.) Swartz

This very small fern was recorded by Dr Elliston Wright in the 1930s but has not been seen for many years despite extensive searching. His rather sketchy notes on this species give a clue as to where it last occurred. He noted 'a few plants seen south side of Three-quarter wall', but gave no more precise details of the location. The habitat still looks suitable in this area, so Moonwort may turn up again, especially if there is a reduction in grazing pressure. However, a Lundy Field Society Logbook for 1948 has a rather intriguing entry which sheds more light on the location of Moonwort. Apparently a small colony of Moonwort was discovered south of Quarter Wall in the Ackland's Moor area on 10 June 1948 and sketches were made of a few of the plants by the artist John Dyke. The position of the colony was staked out with goose quills and detailed notes of the location were lodged in the notebooks of the late Professor Harvey of Exeter University. Sadly, both the sketches and the notebooks seem to have disappeared so there is no more precise information available.

LANCEOLATE SPLEENWORT *Asplenium obovatum* Viv ssp *lanceolatum* (Fiori) P. Silva (Syn. *Asplenium billotii* F.W. Schultz)

Recorded in some earlier lists but not seen in any recent surveys. The inaccessibility of some apparently suitable sites makes searching for this species very difficult. A survey of almost every wall on the island in the summer of 2009 failed to produce any records of this species, although there are many sheltered locations low down on the cliffs which might prove to be suitable habitats for this fern. On the Isles of Scilly this species is found mainly on granite walls, both on buildings and field boundaries, and usually in sheltered situations, but it does seem to be susceptible to shading by more vigorous species.

MAIDENHAIR FERN *Adiantum capillus-veneris* L.

Not seen in any recent surveys, despite some searching in its suspected former haunts. It is thought that this delicate fern occurred in sheltered caves and gulleys on the east side, and particularly around Queen Mab's Grotto. The habitat still looks suitable, but the stories of collecting in the early nineteenth century may indicate why this species can no longer be found. It is still present in a few relatively inaccessible locations in south-west England and Wales so there is just a chance that a small colony may have persisted somewhere on Lundy as yet unexplored; however, in all of its currently known sites it does seem to favour more basic or alkaline substrates.

BRITTLE BLADDER-FERN *Cystopteris fragilis* (L.) Bernh.

Listed in Langham, but not mentioned by Dr Elliston Wright, or noted in any other surveys. There are some locations where this rather delicate fern could possibly occur, such as on loose scree slopes on the east side and under overhangs in the Earthquake, but so far this species has not been relocated. However, this is a species almost always found on limestone rocks and walls, so it is just likely that it was recorded in error. Very young specimens of Broad Buckler Fern and Lady-Fern have a similar delicate structure in their first year.

PRICKLY/HARD SHIELD-FERN *Polystichum aculeatum* (L.) Roth

Listed in Langham, but not seen in any recent surveys. This is not a common fern on the mainland, usually only occurring in fairly shaded situations on base-rich rocks, often in river valleys or on steep banks along lanes, and often only as single specimens. Soft Shield-fern *Polystichum setiferum* (Forsk.) is much more common in Devon, growing in abundance in woods and along lanes and banks, and occasionally a tough, slightly glossy form of the latter species is found, giving rise to erroneous records of the former. However, Soft Shield-fern has not been recorded on Lundy in any survey, so it is unlikely that this is the source of the record. The BSBI Atlas shows a pre-1970 record for Soft Shield-fern, but the plant does not appear in any known lists and has not been seen in any recent surveys. It would appear therefore that Hard Shield-fern was recorded in error, and Soft Shield-fern, if it had been present, has since disappeared.

NARROW BUCKLER FERN *Dryopteris carthusiana* (Vill.) H.P. Fuchs (syn. *Dryopteris spinulosa* Kuntze).

Recorded by Dr Elliston Wright (as *D. spinulosa*) but not seen subsequently. Despite extensive searches this species has not been found again. However, Dr Elliston Wright did not record **Broad Buckler Fern** *Dryopteris dilatata*, which is common on Lundy, so possibly there was some error in compiling the list and the names became mixed up. It is unlikely that an eminent botanist like Dr Elliston Wright would have mis-identified this species as there are very distinct and clear differences between the two ferns.

CONSERVATION OF LUNDY'S FERN FLORA

Most of the species recorded are present in reasonably stable conditions and do not appear to be under any immediate threat. Island floras do change, however, and there are some factors which may influence the survival of a few species which are dependent on particular environmental conditions. The Small Adder's-tongue Fern requires short turf and is unable to compete with rank vegetation, so any reduction in grazing pressure may lead to increased competition from more vigorous species. A reduction of the range of this small fern has already been noted at the south-west end of Lundy. Spraying Bracken with a herbicide in order to increase the areas available for grazing is likely to have destroyed some populations of Adder's-tongue at the south end as spray drift could not be avoided. The subsequent increase in vegetation height would then have created unfavourable conditions for this small species. The dense, matted vegetation which has developed at the south end is not a suitable habitat for this species which only seems to thrive in areas where grazing pressure, from both sheep and rabbits, is sufficiently high to maintain a close-cropped sward without the build-up of thick layers of dead plant material. This change in condition of the short turf areas has been noted by other authors following the crash in the rabbit population after an outbreak of myxomatosis in 2006 and is likely to influence other taxa in addition to the ferns (Smith & Compton, 2008; Hedger *et al.*, 2010).

Necessary repairs to walls and buildings will also influence the distribution of some of the smaller wall ferns and Wall-rue seems to be particularly vulnerable here. It is usually found on mortared walls, and these are likely to be on buildings still in use, so

re-pointing the walls and filling in various crevices and niches has removed some colonies and prevented further colonisation. Fortunately, the population of Rustyback Fern near the Old School seems to be on a stable section of wall not in immediate need of restoration. In addition to the fern flora, the stone walls are also important habitats for lichens and bryophytes so further work is required to identify some of the key sites.

The recent appearance of the alien umbellifer **Alexanders** *Smyrniium olusatrum* is of some concern as this aggressive colonist is likely to compete unfavourably with some of the species growing alongside the road and beneath the trees in Millcombe where species such as Hart's-tongue are in danger of being smothered. If this non-native species spreads along the east side it is likely to out-compete other more important ferns such as Royal Fern and Hay-scented Buckler-fern. On other islands, such as Steepholm and Scilly, where Alexanders has appeared it has swamped the edges of lanes and tracks and produced a high level of shading which is having an impact on a number of the smaller wall ferns.

ACKNOWLEDGEMENTS

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Table 1: Fern species recorded on Lundy 1930 (approx) - 2010

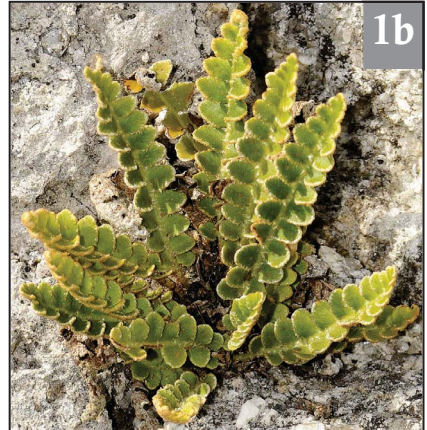
Scientific Name	English Name	Status	Langham	Wright	Devon Flora	New Atlas	AJC
<i>Botrychium lunaria</i>	Moonwort	extinct?					
<i>Ophioglossum azoricum</i>	Small Adder's-tongue	widespread on west side					
<i>Osmunda regalis</i>	Royal Fern	common - quarries					
<i>Adiantum capillus-veneris</i>	Maidenhair Fern	extinct?					
<i>Pteridium aquilinum</i>	Bracken	dominant					
<i>Asplenium marinum</i>	Sea Spleenwort	common - cliffs					
<i>Asplenium obovatum</i>	Lanceolate Spleenwort	extinct?					
<i>Asplenium ruta-muraria</i>	Wall-rue	rare - walls, Belle Vue					
<i>Asplenium trichomanes</i>	Maidenhair Spleenwort	frequent - walls, rocks					
<i>A. adiantum-nigrum</i>	Black Spleenwort	common					
<i>Asplenium ceterach</i>	Rusty-back Fern	rare - walls, Stoneycroft					
<i>Asplenium scolopendrium</i>	Hart's-tongue Fern	frequent - walls, rocks					
<i>Cystopteris fragilis</i>	Brittle Bladder-fern	incorrect identification?					
<i>Polystichum aculeatum</i>	Prickly Shield-fern	incorrect identification?					
<i>Polystichum setiferum</i>	Soft Shield-fern	incorrect identification?					
<i>Athyrium filix-femina</i>	Lady-fern	frequent - Earthquake					
<i>Dryopteris filix-mas</i>	Male-fern	abundant - east side					
<i>Dryopteris affinis</i>	Scaly Male-fern	occasional - east side					
<i>Dryopteris dilatata</i>	Broad Buckler Fern	occasional - copses					
<i>Dryopteris spinulosa</i>	Narrow Buckler Fern	incorrect identification?					
<i>Dryopteris aemula</i>	Hay-scented Buckler-fern	abundant - sidelands					
<i>Blechnum spicant</i>	Hard-fern	rare - quarries, Pondsbury					
<i>Polypodium vulgare</i>	Polypody	occasional - walls, rocks					
<i>Polypodium interjectum</i>	Western Polypody	occasional, walls, trees					
<i>Polypodium x mantoniae</i>	Manton's Polypody	Scarce, east side					

Key: Langham & Langham (1970); Wright in Hubbard (1980); Devon Flora (1984); New Atlas (2002); AJC Andrew Cleave.

Plate 1 - wall ferns: **1a** Lundy's stone walls provide valuable habitats for ferns. A mixed community of Maidenhair Spleenwort, Black Spleenwort and Polypody flourishes on an east-facing wall in the Village. May. **1b** A mature plant of Rustyback Fern on a west-facing wall near the Church. June. **1c** In dry conditions the fronds of Rustyback Fern roll inwards to conserve water, revealing the 'rusty' sporangiae on the underside. July.



1a



1b



1c



1d

1d Polypody, showing mature sporangiae, on top of a wall near the south end. September.

Plate 2 - wall ferns (cont.): **2a** Maidenhair Spleenwort is the commonest wall fern on Lundy forming extensive colonies on any wall where it can find a niche. September. **2b** Sea Spleenwort is tolerant of very harsh conditions and grows in exposed situations close to the sea. A colony has developed on the walls of the Battery, making use of gaps in the mortared walls. July. **2c** Wall-rue is one of the rarest ferns on Lundy with only a few known small colonies, all on walls to the south of Quarter Wall. A small plant on the wall of Belle Vue Cottages grows near the much more common Maidenhair Spleenwort. **2d** A typical wall community in a humid, shaded site with Black Spleenwort, showing fronds from the previous year, and Ivy-leaved Toadflax *Cymbalaria muralis*. July.

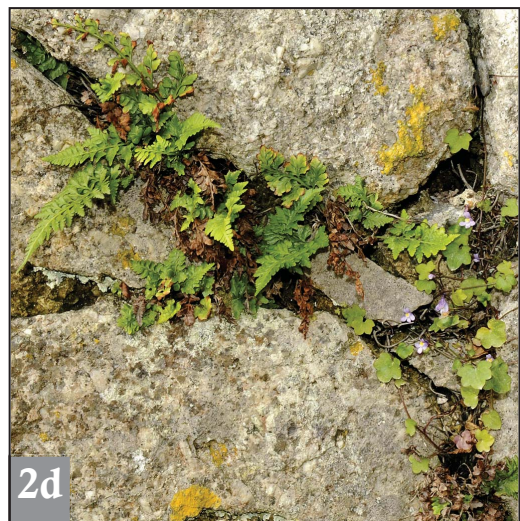
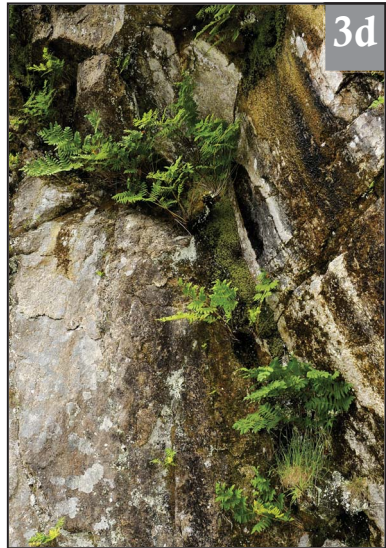
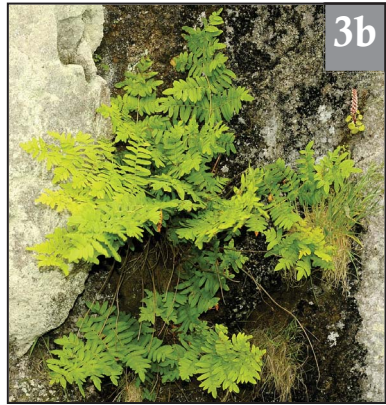


Plate 3 - Quarries and Earthquake: **3a** A luxuriant growth of ferns in a sheltered quarry on the east side photographed in late June. Hay-scented Buckler-fern, Hard-fern, Male-fern and Lady-Fern do well in these conditions, especially if protected from grazing. **3b** Royal Fern is found in sheltered sites on the east side of Lundy, and survives well where it is protected from grazing, often growing on steep rock faces. June. **3c** Lady-Fern is found in sheltered and partly shaded locations, so the best specimens are seen in Millcombe, some of the quarries and in the Earthquake. May. **3d** A damp flush in a steep gully in Smith's Point Quarry provides ideal conditions for a colony of Royal Fern. Although it is more usually found in woodlands on the mainland, on Lundy it almost always grows on rock faces.



3e Hard-fern is a very scarce species on Lundy, with very few known colonies. The best specimens are found in the quarries on the east side. Fertile fronds appear in mid-summer but are often grazed off. July.

Plate 4 - cliff and slopes: **4a** Bracken is the most common and widespread fern on Lundy, and it forms extensive stands on the sidelands and cliff tops, tolerating a considerable amount of exposure. Late July. **4b** Hay-scented Buckler-fern is abundant on the east side of Lundy, but also present on sheltered parts of the west coast. The Lundy plants have a particularly 'crisped' appearance. Late June. **4c** A typical colony of Hay-scented Buckler-fern on the east side. Late June.



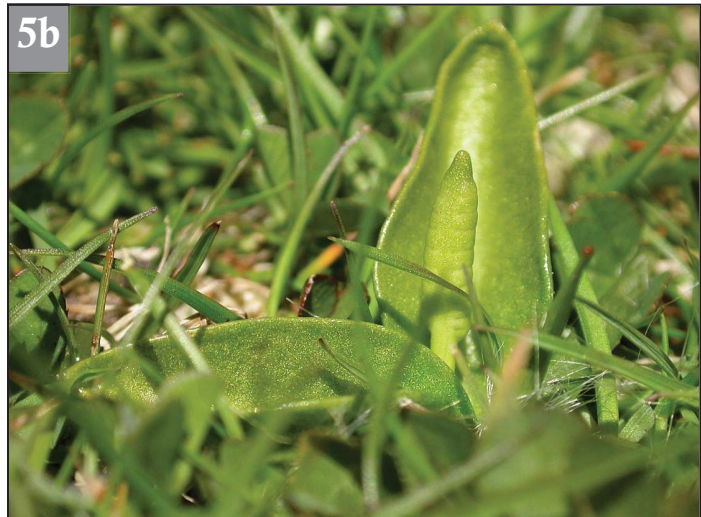
Plate 5 - Small Adder's-tongue Fern:



5a

5a Fronds of Small Adder's-tongue Fern start emerging in April and are mature by June. £1 coin (diameter 22mm) for scale. This species is easier to find early in the season, before other vegetation has smothered it. Late April.

5b By late May both fertile and sterile fronds of Small Adder's-tongue Fern are well advanced and show the typical structure of this species.



5b



5c

5c A colony of Small Adder's-tongue Fern struggling to compete with the thick sward of Fescues *Festuca sp* covering areas of the west side of Lundy. May.