US 6

LICHENS SPECIES ACTION PLAN

SPECIES PROFILE

Common names: River jelly lichen *Collema dichotomum,* Elm gyalecta lichen *Gyalecta ulmi.*
Scientific name: *Catillaria aphana, Collema dichotomum, Gyalecta ulmi* and *Halecania rhypodiza.*
UK Biodiversity Status: Priority species.
Relevant Priority Habitats: Montane.
Statutory Protection: Some species are protected by the Wildlife and Countryside Act (1981).

BIODIVERSITY CONTEXT

Catillaria aphana - It has been found from four localities in Western Scotland, one in Wales and one in Northern Ireland. This species is of local occurrence, and not known in large populations.

River jelly lichen - This species is rare and decreasing. It has been recorded from a total of 21 ten km squares, but only 17 since 1970. It is found in some European countries, Russia and North America. It is rare in all of these. It is known from 7 sites in Scotland

Elm gyalecta - This species was formerly widespread in Britain, but has suffered a considerable decline. It has been recorded from a total of 19 ten km squares, but only 7 since 1960. Elm gyalecta is thought to have disappeared from all but one site in England. The European distribution of this species is widespread but scattered, including Iceland and Caucasia.

Halecania rhypodiza **-** This species is endemic to Scotland was known only from the two sites Ben Lawers and Caenlochan. Thus the Stirling Area site is of national importance.

OBJECTIVES

Objective 1	**Have as full as possible knowledge of the distribution and status of the Priority and Conservation Concern Lichens in the Stirling Council Area.**
Target	By 2003, confirm the presence of river jelly lichen in the Stirling Council Area.
Target	By 2005, survey all known areas containing Priority and Conservation Concern species.
Target	By 2010, institute regular monitoring of all known sites containing Priority and Conservation Concern species.
Objective 2	**Maintain the existing populations of the Priority and Conservation Concern liverworts in the Stirling Council Area.**
Target	Identify local threats to these liverworts and take measures to remove or reduce these threats.

CURRENT STATUS AND DISTRIBUTION

Priority species.

Catillaria aphana.
This species grows on dry, calcareous cliffs below 300m. It has been recorded from NN31SW in Pollochro Woods (1987 A. Orange) on a dry mica-schist cliff at 150m. However, given its widely scattered known localities and the variety of rock types from which it has been found, it seems likely that this species has been somewhat overlooked. This suggested under recording could be the result of a lack of critical exploration of suitable habitats, combined with the indistinctiveness of the species and its superficial similarity in field characteristics to other much more common types. (Coppins).

River jelly lichen.
This species is not recorded as being present in the Stirling Council Area according to its O'Hare and Coppins (1995). However, it has been recorded in the River Endrick (N. Willby pers. comm.). River jelly lichen is known to occur in moderately flowing, fresh water rivers on slightly basic sandstone rocks, conglomerates or shales, which are usually permenantly covered with water. It is best developed on mostly flattish, ± horizontal or gently sloping surfaces, occasionally on vertical surfaces. Light appears to be an important requirement, as river jelly lichen is absent from suitable rocks found under the dense shade of overhanging trees or the cliffs of narrow gorges. This species is protected under Schedule 8 of the Wildlife and Countryside Act and is listed as Vulnerable in the Red Data Book.

Elm gyalecta.
Distribution - Elm gyalecta is found on calcareous rock faces within Glen Lochay. This lichen is only known from 6 sites (5 ten km squares) in Scotland and the Stirling Area must therefore be regarded as an important region for this species. Although previously known as an elm epiphyte, it is now found only on calcareous rock outcrops. The Scottish sites are all nearly vertical rock faces at altitudes of 100-550m with a northerly to easterly aspect. Although previously recorded from 9 5km squares in the audit area – latest records indicate one site on mica schists in NN43NE. This species is protected under Schedule 8 of the Wildlife and Countryside Act and is listed as Endangered in the Red Data Book.

Factors influencing population - The spread of Dutch elm disease considerably reduced the traditional habitat and the species is probably now extinct in Britain as an epiphyte. Pollution from agricultural sprays and collection by botanists have also had a detrimental impact upon this species.

Halecania rhypodiza.
This species is a UK endemic, it grows on calcareous mica schist at an altitude of 610m in the Ben Lawers range. The only other site in Scotland is on Caenlochan. Recent records have placed the lichen in NN35NE and NN53NE. There are no obvious threats apparent, apart from changes that may arise from global warming.

Conservation concern.

Melaspilea interjecta.

This lichen grows on vertical slate and mica schist within the Stirling Area. It has been recorded from NN31SW in Pollochro Woods (A. Orange 1987) the only other locations for this species in Scotland are in Glen Strathfarrar and Shapinsay, Orkney. This species is endemic to Scotland.

***Lobaria amplissima* – A lungwort.**

This species tends to grow on rocks and bark in areas with high rainfall. It is locally frequent only in the west of Scotland. It is, however, probable that the lichen may be found in the north east of the Stirling Area. The UK holds at least 20% of the world population.

British and Irish distribution - Locally frequent in C & W Scotland; rare in SW Scotland; N. Wales, local; S. Wales very rare; NW. England, local; SW. England, rare and local; east to New Forest, very rare; Ireland, very rare and local.

Substrate ecology - On trunks and main boughs of ash *Fraxinus excelsior,* sycamore *Acer pseudoplatanus* and oak *Quercus sp.,* especially high in the canopy. Now rare on elm *Ulmus sp.* but is still on that species in W Scotland, where Dutch Elm disease has not yet reached. Also on hazel *Corylus avellana,* hawthorn *Crataegus monogyna* and beech *Fagus sylvatica* in W Scotland, where it also occasionally occurs on rocks near the W coast. Apparently needs more light than the other *Lobaria spp.* and is often on roadside trees and in open woods; also in some ancient deer park woodlands. It clearly requires long-established woodland sites, where bark pH is normally 5.5 to 6.0. An "ancient woodland indicator".

Phytosociology/associated species - A species of better lit facies of the *Lobarion*, usually associated with the lichens *Lobaria pulmonaria, Degelia plumbea, Nephroma laevigatum, Sticta spp., Thelopsis rubella,* etc. and bryophytes such as *Homalothecium sericeum* and *Pterogonium gracile.*

Status - Native, but much decreased in Britain except in W Scotland, due to changes in woodland management and air pollution leading to acidification of bark since the mid 19th century, when it was more widespread and occured east to E. Sussex, Yorkshire and Durham.

Factors influencing population - Threatened by habitat changes and air pollution throughout much of Britain and Europe except in oceanic western fringes and in montane European areas above 1000m.

Green lungwort - *Lobaria virens***.**

Distribution - W Britain to S and SW England (Cornwall, W Somerset and Dorset); locally frequent in Hampshire (New Forest); very rare in Sussex (only one tree) and Ireland, very rare except in the far west. Still locally common in W Scotland; very rare in Northumberland and Durham. The UK holds at least 20% of the world population.

Substrate Ecology - On broad-leaved trees, especially oak *Quercus sp.,* ash *Fraxinus excelsior,* maple *Acer sp.,* hazel *Corylus avellana,* wych elm *Ulmus glabra* and beech *Fagus sylvatica,* mostly confined to ancient woodlands and parklands, occasionally on sheltered rocks in woods, and on western sea cliffs.

Phytosociology/associated species - Important member of *Lobaria* communities particularly in more shaded, sheltered sites, often with the lichens *Lobaria pulmonaria* (tree lungwort)*, Sticta* and *Nephroma spp.*
Status - Locally common throughout W Britain, also in S, but extinct in woodlands to NE; decreased in south and west.
Conservation - Sensitive to both air pollution (especially $S0_2$) and agricultural chemicals; also to excessive drying out due to heavy thinning of woodlands. Conservation of the mature tree stands in which it occurs is important.

Caledonian pannaria *Pannaria ignobilis***.**
Found on ash, willow or oak trees in open areas beside linear habitats e.g. roads, tracks, rivers. This species is found on two ash *Fraxinus excelsior* trees in Glen Beich within the Stirling Council area. This location is the most southerly location of this species currently know in the UK.

It is has been recorded in 14, 10 x 10 kilometer squares in the UK all of these are in Scotland. This species is classified as Nationally Rare and Vulnerable. (see O'Dare and Coppins 1995 for more information).

ETYMOLOGY, CULTURE AND FOLKLORE

It is possible that Lichen came from the Greek *Leikhein*, to lick. Perhaps related to medicinal properties.

Crotal is the general Scottish and Gaelic name for Lichen, specifically those used for dyeing. Strictly speaking the word refers to the red/ brown dyes obtained, rather than the lichen itself. Over 40 species of lichens were referred to as crotal, these dyed wool and especially tweed.

ECOLOGY AND MANAGEMENT

Lichens are very widespread occurring from the Antarctic, to deserts and even underwater in intertidal zones. Lichens are unique in being composed of two organisms, algae and fungi, which forms a close symbiotic association. Symbiosis is a prolonged permanent contact between dissimilar organisms.

In a lichen thallus the fungus is the dominant partner and usually forms most of the lichen plant. It is not apparently free living and can only survive when in contact with the appropriate alga. The fungus produces the fruiting bodies or sexual organs of the lichen plant. On the other hand, the alga usually forms a layer within the lichen thallus completely surrounded by fungal tissue: only in exceptional cases does it form the greater part of the lichen thallus. In lichen plants the algae multiply both vegetatively and asexually, but have no sexual reproduction. Due to the dominant nature of the fungi in lichen, they are now classified amongst the fungi.

The alga provides food (carbohydrates) for the fungi. The fungi provide protection from intense light, drought and heat. Thus the alga is sheltered and can live in extreme conditions (such as rock surfaces) where it would otherwise be destroyed by the harsh environment. The lichen survives these extreme conditions by losing their water quickly and thus reducing photosynthesis so that the thallus becomes dormant. Drying out in

itself does not lead to damage. Lichens have no root system, they absorbed minerals and water from rainwater.

Despite their adaptations, the amount of water they receive remains a limit to their growth and distribution. Most lichens prefer to dry out slowly, so they are most abundant in areas with high humidity. This is why the richest lichen flora occurs on mountains and areas with oceanic climates. The lower temperatures of these areas favour lichen's photosynthesis, which functions best between 10-15 degrees centigrade.

CURRENT FACTORS CAUSING LOSS OR DECLINE AND FUTURE THREATS

International.

- Global warming.
- Air pollution.

Local.

- Rock fall.
- Lack of suitable habitat.
- Lack of knowledge of the distribution and abundance of various species.
- Botanical collection.
- Changes in the ecology and hydrology of river systems and water pollution.

OPPORTUNITIES AND CURRENT ACTION

- Existing actions arising from National Biodiversity Action Plans.
- Loch Lomond and The Trossachs National Park, could commission further study on the distribution of these species, as many of these species are found in the National Park area.

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