

Management Recommendations for

Loxosporopsis corallifera Brodo, Henssen & Imshaug

[formerly *Loxospora* sp. nov. “*corallifera*”]

version 2.0

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SUMMARY

Species: *Loxosporopsis corallifera* Brodo, Henssen & Imshaug
[formerly *Loxospora* sp. nov. “*corallifera*”]

Taxonomic Group: Lichens (Oceanic-Influenced)

ROD Components: 1,3

Other Management Status: None

Range: *Loxosporopsis corallifera* is a North American endemic ranging from southeastern Alaska and the Queen Charlotte Islands south to the coast of northern California. It may be locally common in the range of the northern spotted owl, specifically in the Oregon Coast Range and along the central Oregon Coast. This species is documented from at least 30 sites within the range of the northern spotted owl. Ownership for all known sites is currently not available, but at least 22 are on federal land.

Specific Habitat: In the range of the northern spotted owl, *L. corallifera* may be found in several different types of habitats, where it is generally an epiphyte on conifers. It occurs near sea level in the coastal dune/wetland mosaic, often with dense shrubs and in open stands of shore pine, Sitka spruce, and Douglas-fir. It is also found in upland conifer and riparian forests of the Western Hemlock and lower Pacific Silver Fir zones up to 1210 m (4000 ft) elevation in the Oregon Coast Range and up to 790 m (2600 ft) in the Cascades, and has been reported on an alder snag in a sphagnum bog. The species has been documented in open to dense stands in young forests (50-70 years), and in mature and old-growth stands.

Threats: The major threat to *L. corallifera* is loss of populations due to activities that affect the populations or their habitat, particularly removing colonized substrate.

Management Recommendations:

- Manage populations at known sites by maintaining the ecological conditions associated with *L. corallifera*, including forest structure, substrate, and microclimate.
- Maintain habitat conditions at the type locality of *L. corallifera* at Sutton Creek and avoid disturbing this site once the precise location is determined.

Information Needs:

- Determine if *L. corallifera* meets the criteria established for designating a species as closely associated with late-successional and old-growth forests.
- Determine the distribution of populations, species abundance, and ecological requirements of *L. corallifera* in the range of the northern spotted owl.
- Determine the precise location of the type locality of *L. corallifera* at Sutton Creek.

Management Recommendations for *Loxosporopsis corallifera* [formerly *Loxospora* sp. nov. "corallifera"]

I. NATURAL HISTORY

A. Taxonomy and Nomenclature

Loxosporopsis corallifera Brodo, Henssen & Imshaug was described in 1995 (Brodo and Henssen 1995). It was formerly referred to as *Loxospora* sp. nov. "corallifera" (Brodo in edit, USDA and USDI 1994a). Although it bears many similarities to the genus *Loxospora*, its developmental anatomy and chemistry make it distinct (Brodo and Henssen 1995).

B. Species Description

1. Morphology and Chemistry

Loxosporopsis corallifera is an inconspicuous, small white isidiate crustose lichen that is easily overlooked (Figure 1). When well developed, it can easily be mistaken for young *Sphaerophorous globosus*, with the isidia resembling young podetia. The absence of a white crust and the typically orange or greenish color of *S. globosus* help distinguish the two species.

Technical description: Thallus crustose, clearly visible and mostly continuous, more or less smooth or rimose, pale, yellowish-white or light brown to pale orange, more or less covered with very long, slender, cylindrical isidia, unbranched or branched, 0.5-2.4 mm long, 0.07 - 1.5 mm in diameter; soredia absent. Photobiont a green alga, *Trebouxia*. Apothecia lecanorine, 0.5-0.8 (1) mm in diameter, occurring singly, sessile or constricted at the base, flat when mature, smooth. Thalli with apothecia are rarely found outside of the Queen Charlotte Islands. Pycnidia very rare. All spot tests negative; thallus cortex UV (LW)+ white or bluish-white (Brodo and Henssen 1995).

2. Reproductive Biology

Loxosporopsis corallifera reproduces sexually by producing ascospores in apothecia. Apothecia were documented in the North Cascades population, but material with ascocarps is rare in the range of the northern spotted owl. Vegetative reproduction by isidia is probably the main mode of reproduction for *L. corallifera* in this region.

3. Ecological Roles

Little is known about the ecological roles of *L. corallifera*.

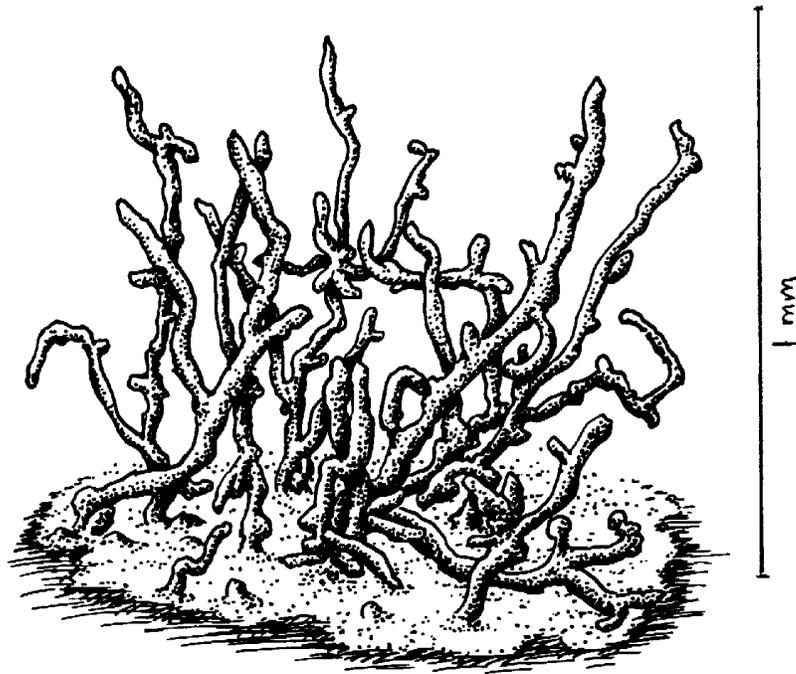
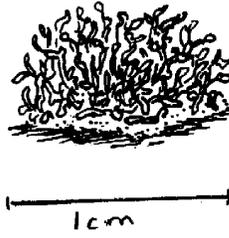


Figure 1. Line drawing of *Loxosporopsis corallifera* by Alexander Mikulin.

C. Range and Known Sites

Loxosporopsis corallifera is a North American endemic ranging from southeastern Alaska and the Queen Charlotte Islands south to the coast of northern California. It may be locally common in the range of the northern spotted owl, particularly in the Oregon Coast Range and along the central Oregon Coast. The type locality is on the Siuslaw National Forest at Sutton Creek Forest Camp on the Oregon Coast (Brodo and Henssen 1995). Most known sites are in the Oregon Coast Range or along the Oregon Coast. It is known from at least 30 sites in the range of the northern spotted owl; ownership for all known sites is currently not available, but at least 22 are on federal land. Known sites on federal lands in Oregon are on the Mt. Hood and Siuslaw National Forests, Columbia River Gorge National Scenic Area, Oregon Dunes National Recreation Area and BLM lands; Washington sites are on the Gifford Pinchot, Olympic, and Mt. Baker-Snoqualmie National Forests, and in Olympic National Park.

In Oregon, *L. corallifera* is known from Mary's Peak, McDonald Forest, and Salem District BLM Grass Mountain Area of Critical Environmental Concern (ACEC) (Benton Co.); Elk Creek area within 2-4 km (1-3 mi) of the Pacific Ocean (Coos County); Sutton Creek, Siltcoos River Area, Eugene District BLM Heceta Dunes ACEC, Oregon Dunes National Recreation Area (NRA), Lake Creek Falls and watershed, and Mohawk Research Natural Area (RNA) (Lane and Douglas counties); Death Ridge, Canal Creek, and Lost Prairie ACEC (Lincoln County); near Camp Meriweather and Hebo Ranger District (Tillamook and Yamhill counties); Old Maid Flats and Zigzag Ranger District (Clackamas County); near Lookout Point in the Bull Run Watershed, and McCord Creek in the Columbia River Gorge (Multnomah County).

The known sites of *L. corallifera* in Washington are more disjunct, perhaps an artifact of survey intensity, or this species may not be as widespread or common as in Oregon. It is known from the Washington Cascades near Goat Marsh RNA on the Gifford Pinchot National Forest (Cowlitz County), and the Suiattle River lahar on the Mt. Baker-Snoqualmie National Forest (Snohomish County). On the Olympic Peninsula, it is reported from Hurricane Ridge in Olympic National Park (Clallam County), the Hoh River (Jefferson County, unknown ownership), and the Dennie Ahl area on the Olympic National Forest (Mason County).

In California, it is known from the Lanphere Dunes Unit (Humboldt Bay National Wildlife Refuge, USFWS) (Humboldt County) (Brodo and Henssen 1995).

D. Habitat Characteristics and Species Abundance

Loxosporopsis corallifera may be locally common in the range of the northern spotted owl. It grows as an epiphyte on conifers, including lodgepole (shore) pine (*Pinus contorta*), Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), noble fir (*Abies procera*), Sitka spruce (*Picea sitchensis*), and on evergreen huckleberry (*Vaccinium ovatum*), snags, and stumps. It appears to have a broader ecological amplitude in the range of the northern spotted owl than was previously thought.

Loxosporopsis corallifera has been documented in several different habitats in the Sitka Spruce, Western Hemlock, and lower Pacific Silver Fir zones. The known elevation range for this species

is from near sea level to 1210 m (4000 ft) in the Oregon Coast Range, and up to 790 m (2600 ft) in the Cascades. It grows near sea level in the coastal dune-wetland mosaic, with dense shrubs and in open stands of shore pine, Sitka spruce, and Douglas-fir, and in shore pine and *Arctostaphylos* sand dunes near the Pacific Ocean. Upland habitats include western hemlock/Douglas-fir forests ranging from young closed-canopy forests to mature and old-growth stands in the Cascades and Oregon Coast Range, and in upper elevation noble fir forests in the Oregon Coast Range. In the North Cascades, it was found in a 70-year-old forest in the Western Hemlock/Salal (*Gaultheria shallon*) plant association dominated by lodgepole pine, Douglas-fir, and salal. Near Goat Marsh RNA, it was in a forest dominated by lodgepole pine with scattered Douglas-fir, western hemlock and western white pine (*Pinus monticola*), with understory of kinnikinnick (*Arctostaphylos uva-ursi*) and *Racomitrium*. On the Olympic National Forest in the Dennie Ahl area, *L. corallifera* was documented in a young stand in the Western Hemlock/Salal-Beargrass (*Xerophyllum tenax*) plant association. Parent material consists of mudflow, lahar, or pyroclastic deposits at Old Maid Flats, the Suiattle River, and Goat Marsh RNA sites.

Loxosporopsis corallifera has also been documented in riparian or wetland habitats in the Oregon Cascades and Coast Ranges. Habitats include a valley bottom, riparian old-growth stand of Douglas-fir with red alder (*Alnus rubra*) and bigleaf maple (*Acer macrophyllum*); an old-growth Douglas-fir/western hemlock forest with inclusions of sedge-Oregon ash-red alder (*Carex-Fraxinus latifolia-Alnus rubra*) wetlands; and as an epiphyte on an alder snag in a sphagnum bog.

In the Queen Charlotte Islands of British Columbia, it is particularly abundant on the bark of coniferous trees in exposed bogs and swamps (Brodo and Henssen 1995).

II. CURRENT SPECIES SITUATION

A. Why Species Is Listed Under Survey and Manage Standard and Guideline

Loxosporopsis corallifera was considered at risk under the Northwest Forest Plan because of its presumed rarity and limited distribution in the range of the northern spotted owl. Information available at the time of the viability rating suggested this species was restricted to old-growth stands in the coastal fog zone (USDA and USDI 1994a, 1994b).

The concern for species persistence under the Northwest Forest Plan varies from low in the Oregon Coast Range, where this species is fairly common, to moderate in the Oregon Cascades and Washington, where known populations are fewer and more isolated, based on current information. *Loxosporopsis corallifera* is listed as a Survey and Manage strategy 1 and 3 species with objectives to manage known sites and to conduct surveys to identify high priority sites for management (USDA and USDI 1994c).

B. Major Habitat and Viability Considerations

The major viability consideration for *L. corallifera* is loss of populations resulting from management activities that affect the populations or their habitat. A warming climate may stress

populations at the limits of the species' range, and may result in a decline in vigor and a more restricted distribution of *L. corallifera*.

The occurrence of *L. corallifera* in different types of habitats, and in young and mature stands suggests that it may have a fairly broad ecological amplitude, and may not be as restricted in habitat or distribution as was thought at the time of the viability rating (USDA and USDI 1994a, 1994b). Information available since the FEMAT rating also suggests this species is more common in this region than was previously thought.

C. Threats to the Species

Threats to *L. corallifera* are those actions that disrupt stand conditions necessary for its survival, particularly removing colonized substrate. The sensitivity of this species to air pollution is not known.

D. Distribution Relative to Land Allocations

The distribution of known sites of *L. corallifera* relative to land allocations needs to be determined. Each administrative unit should evaluate the land allocations for known sites on lands within its jurisdiction, and share this information at the regional level.

III. MANAGEMENT GOAL AND OBJECTIVES

A. Management Goal for the Species

The goal for managing *Loxosporopsis corallifera* is to assist in maintaining species viability.

B. Objectives

Manage known sites on federal lands by maintaining habitat, forest structure, occupied and potential suitable substrate, and microclimatic conditions associated with *L. corallifera*.

IV. HABITAT MANAGEMENT

A. Lessons From History

No specific information is available at this time.

B. Identifying Habitat Areas for Management

Known sites of *L. corallifera* on federal lands administered by the Forest Service and BLM in the range of the northern spotted owl are identified as areas where these management

recommendations apply. A habitat area for management is defined as suitable habitat occupied by or adjacent to a known population.

C. Managing in Habitat Areas

- Determine the extent of the local population and habitat area with a field visit.
- Manage habitat areas to include an area large enough to maintain the habitat and associated microclimate of the population.
- Maintain colonized substrates and provide for a distribution of appropriate substrate within the habitat area.
- Restrict collecting specimens where the species is rare or of limited abundance.
- Manage the site of the type locality to maintain the habitat conditions for *L. corallifera*. Determine the precise location of the type locality at Sutton Creek, identify and mitigate potential threats to the persistence of this population, and avoid disturbing the site.
- Maintain each local population of *L. corallifera* in watersheds where it is rare or of limited distribution.
- In watersheds where *L. corallifera* is more widespread or locally common, particularly along the Oregon Coast, or in the Oregon Coast Range, maintain enough individuals in a project area to sustain the local population. Before impacting a population, evaluate several factors to determine the importance of the population relative to other known sites, and the contribution of the population to the persistence of the species. Consider the landscape and ecological context of the population, and factors such as the location of the population in relation to other known sites, the relative isolation of the population, the ecological conditions of the site and how they compare to other known sites (typical or atypical), the areal extent of population and the species abundance, and the availability of potential suitable habitat in the area. Each local population should be maintained, however, it may be acceptable to impact a small percentage of individuals at a particular site if it has minimal impact to the persistence of the local population.

D. Other Management Issues and Considerations

Information from reported sites suggests that *L. corallifera* may not be closely associated with late-successional and old-growth forests. For a species to be appropriately listed as a Survey and Manage species, it must first meet the criteria established for designation as a species closely associated with late-successional and old-growth forests (USDA and USDI 1994a [Table IV-6] and 1994b). This issue should be addressed by a regional coordinating body.

V. RESEARCH, INVENTORY, AND MONITORING NEEDS

The objective of this section is to identify opportunities to acquire additional information which could contribute to more effective species management. The content of this section has not been prioritized or reviewed as to how important the particular items are for species management. The inventory, research, and monitoring identified below are not required. These recommendations should be addressed by a regional coordinating body.

A. Data Gaps and Information Needs

- Determine if *L. corallifera* is closely associated with late-successional and old-growth forests.
- Determine the precise location of the type locality of *L. corallifera* at Sutton Creek.
- Revisit known sites to verify the status of known populations, determine the extent of populations and abundance, and characterize ecological conditions.
- Determine the distribution of populations, species abundance, and ecological requirements of *L. corallifera* in the range of the northern spotted owl.

B. Research Questions

- How does *L. corallifera* respond to forest clearing activities (thinning, harvesting, and road building), particularly changes in light, temperature and moisture regimes?
- What are the dispersal mechanisms and dispersal distances of this species?
- Which habitat characteristics and ecological conditions are necessary for establishment of *L. corallifera* propagules and survival of established thalli?
- What limits dispersal and establishment of propagules and colonization of suitable habitat?
- What are the minimum and optimum patch sizes of colonized habitat necessary to provide for this species after timber harvest and thinning?
- How should refugial patches be distributed across the landscape to optimize recolonization into managed stands?
- Is *L. corallifera* sensitive to air pollution?
- What is the genetic diversity of this species within its local populations and across the region?

C. Monitoring Needs and Recommendations

- If management treatments occur near known sites, monitor populations to determine the response to treatment and effects on the local population.

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