

## California Status Factors

**Elcode** NFSM000123  
**Gname** PHAEOCOLLYBIA OLIVACEA  
**Gcomname**

### Number of Occurrences

C = 21- 80

**Comments** In California, there are 39 total known occurrences, of which at least 28 are believed extant (Norvell 1998ac, 2002; ISMS 2002 database & GIS map for PHOL). Much of the habitat surrounding occurrences sampled during the 1950's has been eradicated.

### Number of Occurrences with Good Viability

D = Some (13-40) occurrences with good viability

**Comments** There are 28 known extant occurrences of PHOL in California.

### Population Size

U = Unknown

**Comments** Records reflect only species occurrence, i.e. fruitbodies, not numbers of individuals. Genets of ectomycorrhizal fungi cannot be delimited without DNA sampling.

### Range Extent

E = 5,000-20,000 km<sup>2</sup> (about 2,000-8,000 square miles)

**Comments** Endemic to the northern spotted region in western North America, in California PHOL ranges from the Oregon Border south to Santa Cruz County between the Pacific Ocean and the eastern slope of the California Coast range at Castle Crags SP. (Norvell 1998ac, ISMS 2002 database and GIS map for PHOL).

### Area of Occupancy

U = Unknown

LU = Unknown

**Comments** Occupancy is highly spotty and cannot be extrapolated for this organism, which appears restricted to fairly complex environments. For fungi can only estimate area occupancy from fruitbodies as vegetative organism is underground had has unknown biological and ecological requirements that determine how and when ectomycorrhizal associations are formed with coniferous host trees. There are large areas of unsuitable habitat within the overall range.

### Long-term Trend in Population Size, Extent of Occurrence, Area of Occupancy, and/or Number or Condition of Occurrences

B = Large Decline (decline of 75-90%)

C = Substantial Decline (decline of 50-75%)

**Comments** Due to the spotty nature of the occurrences, it is difficult to project a long-term trend in population size, extent of occurrence, or the area of occupancy. Ectomycorrhizal fungal stability depends on the stability of the symbiotic partners so that the fungus and forest trends coincide. PHOL occurs

most frequently in mixed fagaceous/coniferous forests, apparently forming preferential symbiotic associations with *Quercus* or *Lithocarpus* spp. Because of this inferred preference, PHOL occurrences may be greatly affected by sudden oak death in California. Current populations appear healthy and are inferred to be long-lived; individuals are less dependent upon spore dispersal than with mycelial interactions with other individuals and their mycorrhizal partners. (Norvell 1998ab, pers comm 2002)

## Short-term Trend in Population Size, Extent of Occurrence, Area of Occupancy, and/or Number or Condition of Occurrences

D = Declining. Decline of 10-30% in population, range, area occupied, and/or number or condition of occurrences

E = Stable. Population, range, area occupied, and/or number or condition of occurrences unchanged or remaining within  $\pm 10\%$  fluctuation

**Comments** Ectomycorrhizal fungal trends are inextricably linked to the trends for the symbiotic partners, in this case trees. Road construction, hot fires, clearcutting, or development that displaces the tree partner will compromise both tree and fungus. Current occurrences of PHOL are relatively common, with at least 13 occurring in protected forest reserves; therefore *P. olivacea* is believed to be stable and possibly expanding over the short term, provided no human interference or hot fires imperil the host forests and they remain free of the sudden oak death *Phytophthora*.

## Threats

A = Substantial, imminent threat. Threat is moderate to severe and imminent for most (> 60%) of the population, occurrences, or area. Ecological community occurrences are directly impacted over a widespread area, either causing irreversible damage or requiring long term recovery

Scope High Severity High Immediacy Moderate

**Comments** Whatever threatens the extant forest will threaten the fungus. This species is usually found in complex mixed oak-coniferous forests. Populations are inferred to be long-lived from the fact that collections have been made in or near the type locality from 1956 to 2000 (Norvell 1998ac, ISMS 2002). Like the forest, PHOL is threatened by hot fires, road construction or other development, and clearcutting, but appears to be able to withstand light to moderate thinning (Norvell pers comm 2002). The most serious long-term threat is the predicted rapid spread of the "sudden oak death" *Phytophthora* to the oak partner trees.

## Number of Appropriately Protected and Managed Occurrences

C = Several (4-12) occurrences appropriately protected and managed

D = Many (13-40) occurrences appropriately protected and managed

**Comments** ISMS 2002 and Norvell (1998ac) cite approximately 13 extant occurrences in protected areas: 8 in permanent protected preserves and 5 in late-successional reserves. If governmental management policies dictate opening late-successional and/or riparian reserves to clearcutting, road construction, or other development, the number of protected and managed occurrences could decrease to 8 (Rank C). Additionally, many sites in temporary reserves may not be managed appropriately at the present time.

## Intrinsic Vulnerability

A = Highly Vulnerable. Species is slow to mature, reproduces infrequently, and/or has low fecundity such that populations are very slow (> 20 years or 5 generations) to recover from decreases in abundance; or species has low dispersal capability such that extirpated populations are unlikely to become reestablished through natural recolonization (unaided by humans). Ecological community occurrences are highly susceptible to changes in composition and structure that rarely if ever are reversed through natural processes even over substantial time periods (> 100 years).

B = Moderately Vulnerable. Species exhibits moderate age of maturity, frequency of reproduction, and/or fecundity such that populations generally tend to recover from decreases in abundance over a period of several years (on the order of 5-20 years or 2-5 generations); or species has moderate dispersal capability such that

extirpated populations generally become reestablished through natural recolonization (unaided by humans). Ecological community occurrences may be susceptible to changes in composition and structure but tend to recover through natural processes given reasonable time (10-100 years).

**Comments** Ectomycorrhizal fungal vulnerability is linked to that of the symbiotic partner (here oak+conifers). This fungus is thought to be long-lived, but also relatively slow-growing; therefore climax communities occur in older stands. (Norvell 1998ac). It is vulnerable to anything that threatens the forest habitat, including hot fires, road construction and development, clearcutting and the "sudden oak death" Phytophthora in California. (Norvell pers comm 2002).

## Environmental Specificity

B = Narrow. Specialist or community with key requirements common.

**Comments** PHOL is generally found in complex mid to late-successional/old growth coniferous rainforests where it forms symbiotic partnerships with *Quercus* or *Lithocarpus* spp and possibly also members of the Pinaceae (it rarely is found in strictly fagaceous or coniferous stands). Its precise biological and ecological requirements are unknown. It generally is found in the more southern part of the northern spotted owl region, and fruits on soil in early to late autumn producing arcs of closely gregarious fruitbodies. It is like all *Phaeocollybias* in its extremely patchy in distribution.. (Norvell 1998ac, Norvell 2002).

## Other Considerations

There are no known synonyms for the species. This fungus may be highly receptive to the sudden oak death which would attack its inferred preferred mycorrhizal partner. Additional occurrences are to be expected in late-successional or unexplored old-growth forests. There are several currently protected sites.

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## Greasons

PHOL is unusual to uncommon in California (the suspected center of distribution), with 28 extant occurrences, of which 13 lie in currently protected forest reserves. It is endemic to the northern spotted owl region in the Pacific Northwest. Its patchy distribution precludes estimation of population size and area of occupancy. It usually occurs in mixed fagaceous+pinaceous forests, occasionally in pure coniferous stands. Currently known populations are relatively stable, but the advent of the "sudden oak death" *Phytophthora* imperils occurrences in mixed forests. Unprotected occurrences are possibly imperiled by road construction & development and clearcutting or heavy thinning. Moderate to light thinning is not considered a threat. All occurrences are imperiled by hot fires.

## BCD Sources

## New Sources

Norvell. 1998a. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim. 391 pp. ALSO Norvell. 1998b. . Observations on the development, morphology, and biology of *Phaeocollybia*. *Mycological Research* 102:615-630. ALSO Norvell. 1998c. ROD: Strategy 3 Fungal Species Evaluation (11 gilled Basidiomycete Strategy 3 species). Unpubl. report on file at the Regional Mycology Lab, Corvallis, Oregon. ALSO Norvell. 2002. *Phaeocollybia* in western North America 3: *Mycotaxon* 81: 25-112. ALSO ISMS 2002: database + GIS map on PHOL.