

Heritage Rank Status Factors

Elcode NFSM000038
Gname CORTINARIUS BOULDERENSIS
Gcomname

Number of Occurrences

B = 6 - 20
C = 21 - 80

Comments There are at least 21 occurrences represented by 27 collections of *Cortinarius boulderensis* in Washington, and perhaps Oregon and California, Idaho, and Europe. Continued fungal surveys may uncover more sites. (Smith 1944, Norvell 1995, Castellano et al. 1999, ISMS 2002 database; NAMA 1968 Idaho foray list, Moser 1981). The Idaho occurrence is based on a foray list. The European occurrence is based on a variety named by world *Cortinarius* expert Meinhard Moser: *C. boulderensis* var. *pallidulus*.

Number of Occurrences with Good Viability

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

Comments At least 14 occurrences are extant. 4 lie within permanently protected forest reserves, 3 within late-successional reserves, and 0-4 in riparian reserves and so are protected at the present time.

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

G = 200,000-2,500,000 km² (about 80,000-1,000,000 square miles)
H = > 2,500,000 km² (greater than 1,000,000 square miles)

Comments An endemic to Pacific Northwest North America, *Cortinarius boulderensis* ranges from the Olympic Peninsula south to Mt Rainier National Park and extends west of the Cascade Range crest south to the area near Castle Crags State Park in California. (Smith 1944, Norvell 1955, Castellano et al. 1999, ISMS 2002 database and map for COBO7). It is not known whether the NAMA foray collection (voucher apparently not retained) occurred in the Priest Lake region of northern Idaho or was brought to the foray by one of the attendees. No information is readily available to this contractor as to the European occurrence, which -- as a variety -- is excluded from the range data above. (Norvell 2002 pers comm).

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. There are large areas of unsuitable habitat within the overall range. Area occupancy can only be roughly approximated from fungal fruitbodies as the vegetative organism is hidden from site within the substrate. COBO7 has unknown biological and ecological requirements that determine how and when symbiotic associations are formed with

partners. (Norvell pers comm 2002).

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

E = Relatively Stable ($\pm 25\%$ change)

Comments Due to COBO7's spotty distribution, it is difficult to project a long-term trend in population size, extent of occurrence, or area of occupancy. COBO7 is ectomycorrhizal, so its trends are closely linked to the trees that are its symbiotic partners in LSOG coniferous forests where it is thought to form mycorrhizal associations with pinaceous partners. Individuals are less dependent upon spore dispersal than upon mycelial interactions with other individuals and their mycorrhizal partners. Trends will also be determined by occurrence of hot fires, human alteration of the habitats, and discovery of previously unknown occurrences.

Short-term Trend in Population Size, Extent of Occurrence, Area of Occupancy, 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 COBO7 is an ectomycorrhizal fungus dependent upon the health of its symbiotic partner (unnamed conifer species, Smith 1944). Natural catastrophes or human activities that imperil the health of one mycorrhizal partner will compromise both tree and fungus. Current occurrences of COBO7 are uncommon to rare, but at least 11 occur in currently protected reserves. As additional sites may be discovered, species "occurrences" may be either slightly at risk to relatively stable over the short term (Norvell pers comm 2002).

Threats

E = Localized substantial threat. Threat is moderate to severe for a small but significant proportion of the population, occurrences, or area. Ecological community occurrences are directly impacted over a small area, or in a small portion of their range, but threats require a long-term recovery.

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|-------|-----|----------|----------|-----------|-----|
| Scope | Low | Severity | Moderate | Immediacy | Low |
|-------|-----|----------|----------|-----------|-----|

Comments Whatever threatens the extant forest will threaten the fungus. This species has been collected primarily from LSOG forests. Populations are inferred to be long-lived: e.g. it is possible that collections made in the Olympic Hot Springs type locality from 1941 to 1993 represent one population (Smith 1944, Norvell 1995). Like the forest, COBO7 is threatened by hot fires, road construction or other development, and clearcutting (Norvell pers comm 2002).

Number of Appropriately Protected and Managed Occurrences

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

Comments ISMS (2002) and Norvell (1995) cite up to 11 extant occurrences in protected areas: 4 in permanent protected preserves, 3 in late-successional reserves, and 0-4 in riparian 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 4. 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 conifers). COBO7 is inferred as long-lived (Norvell pers comm 2002), but relatively slow-growing. (Smith 1944, Norvell 2002 pers comm). It is vulnerable to anything that threatens its symbiotic partner and forest habitat, including hot fires, road construction and development, and clearcutting.

Environmental Specificity

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

Comments COBO7 is generally found in complex montane late-successional and (inferred preferentially) old growth coniferous forests where it forms symbiotic partnerships with trees belonging to the Pinaceae (Castellano et al. 1999). Its precise biological and ecological requirements are unknown. Historically it was most commonly found in old-growth forests in Olympic National Park in the fall "abundant some years" and "gregarious under conifers" (Smith 1944). It has a spotty distribution..

Other Considerations

NRANK - N3N4. There are no known synonyms for *Cortinarius boulderensis*, believed to be endemic to Pacific Northwest North America. The variety "pallidulus" described from Europe by Moser is excluded from this treatment.

Edition 11/21/2002 **Edauthor** Lorelei L Norvell

Grank G2G4 **Grank Date** 11/21/2002

Reasons

COBO7 is uncommon to rare in the Pacific Northwest North America, where it is believed to be endemic. While there are at least 21 occurrences reported worldwide (including the European variety named by Moser), there are only 14 confirmed extant occurrences in North America, of which 11 lie in currently protected forest reserves. It is known from several collections in Washington and Oregon, and one occurrence each in California and Idaho. Its patchy distribution precludes estimation of population size and area of occupancy. The current known populations are believed to be stable. Unprotected occurrences will be threatened by road construction & development and clearcutting or heavy thinning. All occurrences are imperiled by hot fires or other natural catastrophes.

BCD Sources

New Sources

Smith, 1944. New and interesting *Cortinarii* from North America, *Lloydia* 7:163-235.
Moser. 1981. Keys to Agarics and Boleti. Phillips. P. 396: *C. boulderensis* var. *pallidulus*.
Norvell . 1995. ROD: Strategy 1 Fungal Species Evaluation (30 gilled and non-gilled Basidiomycete Strategy 1 species). Unpubl. report on file at the Regional Mycology Lab in in Corvallis, Oregon.
Castellano et al. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. USDA-FS PNWRS PNW-GTR-476.
NAMA Foray List from Idaho 1968: <http://www.collectivesource.com/fungi/nama/ID68.html>
ISMS 2002 database and GIS map for COBO7.