

Washington Status Factors

Elcode NFSM000086
Gname HEBELOMA OLYMPIANUM
Gcomname

Number of Occurrences

A = 1 - 5

Comments There are only 5 confirmed occurrences of *Hebeloma olympianum* represented by 7 collections. (Smith et al 1983, Norvell 1995, Castellano et al 1999, ISMS 2002).

Number of Occurrences with Good Viability

C = Few (4-12) occurrences with good viability

Comments At least 4 of occurrences are believed extant. More should be detected through surveys.

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

D = 1,000-5,000 km² (about 400-2,000 square miles)

E = 5,000-20,000 km² (about 2,000-8,000 square miles)

Comments HEOL3 is a western North American endemic presumably restricted to Washington state's Olympic Peninsula, ranging from the Olympic National Park in Clallam County south to the Olympic National Forest in Grays Harbor County. (Smith et al 1983, Norvell 1995, Castellano et al 1999; ISMS Database 2002 and GIS map for HEOL3).

Area of Occupancy

U = Unknown

LU = Unknown

Comments Area occupancy can only be roughly approximated from fungal fruitbodies as the vegetative organism is hidden from site within the substrate. HEOL3 has unknown biological and ecological requirements that determine how and when symbiotic associations are formed with partners.

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

U = Unknown. Long-term trend in population, range, area occupied, or number or condition of occurrences unknown

Comments HEOL3 is an ectomycorrhizal fungus dependent upon the health of its symbiotic partner/s (*Tsuga* and/or *Picea*) for its existence. All known occurrences were collected from LSOG coniferous forests. Individuals are less dependent upon spore dispersal than upon mycelial interactions with other individuals and their mycorrhizal partners. Longevity of individuals and populations is unknown. The fruitbodies are relatively nondescript and may be easily ignored; more occurrences

may be found in the same area. Although current populations may be considered relatively stable, the longtime trend for the current population cannot be predicted. (Norvell 2002 pers comm).

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 HEOL3 is an ectomycorrhizal fungus dependent upon the health of its symbiotic partner (Tsuga and/or Picea) and is commonly found in LSOG forests. Natural catastrophes or human activities that imperil the known habitats will compromise both tree and fungus. Known occurrences of HEOL3 are rare, but all occur in currently protected areas. The species is inferred to be relatively secure over the short term (Norvell pers comm 2002).

Threats

H = Unthreatened. Threats if any, when considered in comparison with natural fluctuation and change, are minimal or very localized, not leading to significant loss or degradation of populations, occurrences, or area even over a few decades' time. (Severity, scope, and/or immediacy of threat considered Insignificant.)

Scope	Moderate	Severity	Unknown	Immediacy	Insignificant
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Comments HEOL3 has been confirmed only from LSOG forests, where it is an inferred mycorrhizal associate of Tsuga and/or Picea. Whatever threatens its habitat and symbiotic partners will threaten HEOL3. All populations are at risk to hot fires or unmonitored human interference; the Park populations may be at risk to landslides that wipe out the community. Unprotected populations would be at risk to road construction or other development, and heavy logging (i.e. clean/or clearcutting or heavy thinning). (Norvell pers comm 2002).

Number of Appropriately Protected and Managed Occurrences

B = Few (1-3) occurrences appropriately protected and managed

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

Comments ISMS-ONH (2002; based on data provided in Norvell 1995) cite 5 occurrences in protected areas: 4 in permanently protected preserves, and 1 in a late-successional reserves. If late-successional and/or riparian reserves are opened to clearcutting, road construction, or other development, the number of protected and managed occurrences could decrease to 4. One of the sites listed above was sampled in 1941 and not since and so may not represent an extant population.

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 health is linked to that of the symbiotic partner (here presumed Tsuga and/or Piceae). This fungus is inferred as long-lived and slow-growing; therefore climax communities occur in older stands. (Norvell pers comm 2002). It is vulnerable to anything that threatens the forest habitat, including drought, insect infestations, hot fires, road construction and development, and clearcutting.

Environmental Specificity

A = Very Narrow. Specialist or community with key requirements scarce.

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

Comments HEOL3 is generally found in complex LSOG coniferous forests where it forms symbiotic partnerships with *Tsuga* and/or *Picea*. Its precise biological and ecological requirements are unknown. It appears restricted to the Olympic Peninsula and fruits in the fall, when it produces gregarious fruitbodies. It cannot be predicted to fruit annually. (Norvell pers comm 2002).

Other Considerations

There are no known synonyms. The small, nondescript fruitbodies are easily overlooked; thus more sites may be found through fungal surveys of transects in coniferous forests.

Edition 11/23/2002 **Edauthor** Lorelei L Norvell

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Reasons

HEOL3 is an ectomycorrhizal fungus dependent upon the health of its symbiotic partner/s (*Tsuga*, *Picea*). There are only 5 confirmed occurrences (4 extant), restricted to the Olympic Peninsula in Washington state in western North America. All known occurrences lie in currently protected forest reserves. It is endemic to the northern spotted owl region in the Pacific Northwest western hemlock zone. Its unknown biology precludes estimation of population size, area of occupancy, and long-term trends. Extant populations are presumed stable. Unprotected occurrences will be threatened by road construction & development and clearcutting or heavy thinning. All occurrences are imperiled by hot fires.

BCD Sources

New Sources

Smith, Evenson, Mitchel. 1983. Veiled species of *Hebeloma* in the western United States. U of Michigan Press, Ann Arbor.

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 Corvallis, Oregon.

Castellano et al. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. USDA-FS PNWRS PNW-GTR-476.

ISMS 2002 database (with Oregon Natural Heritage input) with GIS map for HEOL3.

MICH Herbarium Database. 11-23-02. <http://www.herb.lsa.umich.edu/combquery.htm>