

## **SPONSOR AND CONTACT INFORMATION**

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I hereby certify that, to the best of my knowledge, all statements made in this sponsorship are true. I understand that the information provided (with the exception of detailed specimen locations) will be made public and attributed to me by the California Lichen Society's Conservation Committee, however I am welcome to publish all or part of this information in other avenues as well.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## **EXECUTIVE SUMMARY**

*Usnea longissima* is distributed among several locations in North America, Europe and Asia. Concerns for the species are valid in that European populations have seen dramatic declines over the past century or two, and threats exist in most parts of the species' world range. Furthermore, evidence of range contraction within California is valid cause for alarm. However, over 200 extant locations for the species are known in California and some populations remain substantial. Current forestry regulations will likely maintain many of these populations, possibly even allowing them to grow. The current risk of extinction is low and as a charismatic species, awareness of conservation concerns are unlikely to fade. Provided that forestry regulations remain strong for conservation (particularly old-growth and riparian forests), and provided that the species is monitored to alert against future declines due to forestry, air pollution, over-collecting for decorative purposes, or other unforeseen causes, we can consider the species to be more secure than many truly-rare species within California. Recommended ranks are G5.1, S4.2 and list 4 (watch).

## **TAXONOMY**

### ***accepted scientific name***

*Usnea longissima* Ach.

### ***common name***

Methuselah's Beard

### ***type specimen and location, if known to you***

Presumably in the herbarium of the University of Uppsala, Sweden, as that is where Erik Acharius, student of Linneus, worked.

### ***synonyms***

Unknown.

***description (with citations if applicable)*** Adapted from Brodo et al. 2001:

Thallus pendent, extremely long (occasionally exceeding 3 meters), consisting of slender, almost undivided main branches with many perpendicular side branches and fibrils of about equal length (3-40 mm), round to angular in section, often with circular cracks; cortex smooth, but disintegrating on the main stems, leaving rough patches of white medulla over the pale, sometimes pinkish to brownish central cord; thallus generally draped over branches, rarely attached to the substrate by a holdfast; soralia or isidia occasionally form on the side branches in some populations (taxonomic significance unknown); apothecia exceedingly rare but frequently formed on transplants in presumably stress-inducing habitats outside the natural range of the species. Chemistry: medulla PD-, K- KC-, C-, IKI+ blue (various  $\beta$ -orcinol depsides including evernic, barbatic, or diffractaic acid). Although not all have been tested, no other *Usnea* species have been reported to have the IKI+ blue reaction.



Photo by E.B.Peterson, taken in Humboldt County, CA.

***similar species and distinguishing characteristics***

*Usnea* species in the *U. filipendula* group frequently form long strands (up to 0.5 meters) with little or no branching and relatively uniform fibril length. These are frequently found in herbaria identified as *U.*

*longissima* by inexperienced lichenologists. None of the species in this group are known to have the IKI+ blue reaction (McCune & Geiser 1997). Furthermore, these species retain the cortex on the central branches (though it may be partially eroded in places due to formation of soredia or isidia) and the cortex is often papillose.

***biological characteristics:***

*growth form:* Fruticose, pendant, exceptionally long

*reproductive method:* asexual, fragmentation (soredia and isidia are frequent in some populations); apothecia exceptionally rare in natural situations (Keon 2002).

*dispersal agents:* wind, probably birds (when using the species for nesting materials)

*substrate and specificity:* tree branches; commonly seen on hardwoods in the understory of coniferous forests, however source populations in the canopy are often findable in these situations. Although it occurs frequently on both conifers and hardwoods in North America, one European study suggests that bark overflow chemistry can influence the ability of the species to inhabit trees (Gauslaa et al. 1998).

*habitat and specificity:* humid forests, usually where fog is frequent

*pollution sensitivity:* known to be sensitive to air pollution

*ecological function:* used by birds for nesting materials; a food source for native ungulates

**GEOGRAPHY, GLOBAL**

Circumboreal, mostly coastal, occurring in humid, frequently foggy, temperate forests. Known to occur in Europe, far eastern Asia, and North America. In North America, occurring on the northern side of the Great Lakes region and the eastern seaboard from Vermont to Nova Scotia; and along the Pacific coast from California to Alaska. Along the Pacific coast, the species exists primarily in areas where coastal fog or wet interior fog occurs frequently, inland of the hyper-coastal salt spray zone.

## **GEOGRAPHY, LOCAL**

Historic records indicate that in California, the distribution of *Usnea longissima* was closely matched to that of coastal redwood, *Sequoia sempervirens* (Doell & Wright 2000). Currently, no extant populations of *U. longissima* are known south of Sonoma County. Within California, most known populations are in Humboldt and Mendocino Counties. Many are on private timberlands. By the standards of the California Natural Diversity Database (CNDDDB), which distinguishes known locations more than ¼ mile apart as separate occurrences, there are more than 200 occurrences of the species within Humboldt and Mendocino counties.

During a CALS field trip on 20 March 2004 to assess the species on Pacific Lumber Company lands in Humboldt County, fine-scale population patterns were observed that suggested many understory occurrences of the species may be transient, sink populations, blown out of a source population in overstory conifers. A study in Swedish spruce forests (Rolstad & Rolstad 1999) found that numbers of thalli corresponded to tree size (though not necessarily tree age), which may agree with the CALS observation that source populations are on large overstory trees. Further study would be useful to investigate dispersal from source to sink populations and the distance involved; is it possible that a single source population may produce multiple sink populations during high-wind events which are mapped as separate occurrences by CNDDDB standards?

## **POPULATION TRENDS**

It is thought that the species was once common in Europe, however it is now mostly restricted to small portions of Scandinavia and is considered threatened in all nations in which it occurs (see Esseen et al. 1981 and Gauslaa et al. 1998). A recent report indicates an extant population in Italy (Obermayer 1996; not reviewed for this sponsorship). Little information is available on Asian populations or those in eastern North America.

In the Pacific Northwest, the species receives some concern due to air pollution of inland valleys (e.g. Oregon's Willamette Valley), loss of appropriate habitat due to tree removal, and over-collection of populations for decorative purposes. The species is often speculated to be the origin of the Christmas garland, and is quite popular for use in indoor decorations.

In California, the species' range appears to have contracted away from the southern extents. A number of historical collections and observations were made south of the San Francisco Bay area. Currently, no extant populations are known south of Sonoma County. Loss of populations has likely been due to logging, as little coastal old growth forests remain in the historic southern

reaches of the species' range. It is possible that air pollution from cities or paper pulp mills has also been a contributing factor.

## **THREATS, HISTORY**

Forestry practices are thought to be the main cause of decline in Europe, while air pollution is thought to be a relatively minor, secondary cause. This logic is derived from the loss of the species from many parts of Scandinavia that have received relatively low levels of air pollution. It is likely that the same causes and logic apply to the range contraction in California, though poor documentation of the historical range, or population changes relative to logging history, will make it difficult to be certain.

## **THREATS, FUTURE**

Under current forest regulations within California, old-growth forests and foggy valley bottoms (which correspond to riparian zones) are relatively well protected from human disturbance. Thus the current threat appears to be low and the species may have an opportunity to regain some historic populations as long as forest regulations remain strong for conservation. Unfortunately, regulations are subject to political forces and current trends are toward deregulation with low regard toward conservation.

An additional threat that is poorly studied (though see Peck & Muir 2001) is collection as a secondary forest product for decorative purposes. While these collection activities can be regulated by public and private forest managers, those managers generally lack information for making good decisions and a great deal of collecting on public lands occurs illegally.

## **PROTECTION**

See discussion of future threats, above. Furthermore, the California Lichen Society is working on an agreement with Pacific Lumber Company (PALCO) to provide a monitoring mechanism on the company's private lands, which are currently thought to harbor the strongest populations of *Usnea longissima* within California. Monitoring *U. longissima* on PALCO lands, as well as other lands in the area, would provide an indication of the population trends for the species within California, especially if combined with monitoring of a number of geographically dispersed populations.

Outside of California, *Usnea longissima* is formally listed in Norway (Vulnerable), Sweden (Endangered), Finland (Extirpated) (The Threatened Macrolichen Project 1996). It was listed as extinct from the European Union in 1989, though it has been recently found in Italy (Obermayer 1996).

## **CONSERVATION STATUS SUMMARY**

*Usnea longissima* is a charismatic species that will likely continue to receive conservation concerns in the future. Concerns are valid in that European populations have seen dramatic declines over the past century or two, and threats are visible in most parts of the species' world

range. Furthermore, evidence of range contraction within California is valid cause for alarm. However, some populations within California remain substantial and current forestry regulations will likely maintain many of these populations, possibly even allowing them to grow. Provided that forestry regulations remain strong for conservation (particularly old-growth and riparian forests), and provided that the species is monitored to alert against other possible causes of decline including air pollution and over-collecting, we can consider the species to be more secure than many truly-rare species within California.

## **SPECIFIC CONSERVATION RECOMMENDATIONS**

### ***Recommended Global Rarity Rank: G5***

The species occurs over a number of humid temperate regions circumboreally.

### ***Recommended Global Threat Rank: 1***

Although current forest regulations and reductions of pollution might have stabilized the species in parts of North America and Europe, it remains very rare in Europe and Asian populations may still be in decline. Given the land and resource development that is currently happening in China and Russia, Asian populations may decline more rapidly in the future.

Note: a Global rank of G5.1 would be equivalent to G4 in standard Natural Heritage methodology.

### ***Recommended Local Rarity Rank(s) (per state): CA: S4***

#### ***Reasoning, if necessary***

Greater than 200 documented sites, many of which contain large populations. The CALS/PALCO field trip in 2003 indicated that many more sites exist as well. Although population viability remains undetermined, it is likely that well over 50 of the currently documented are viable.

### ***Recommended Local Threat Rank(s) (per state): CA: S2***

Ideally, this rank would be linked to conservation of coastal old-growth and riparian forests (within the distribution of *Sequoia sempervirens*). Monitoring of the species may show population trends that could modify this rank.

### ***Recommended List(s) (CNPS equivalent, per state):***

CA: 4 (limited distribution – watch list)

### ***Recommended conservation/management actions (consider site maintenance, monitoring, research, amendments to existing management plans, agencies/organizations to be involved, etc.)***

Although forest regulations may have stabilized the species within California, there are no data to provide certainty and the species is vulnerable to other threats too. Thus long term monitoring of some populations is strongly recommended. Also, given the charismatic nature of the species, any future perceived declines, real or not, will cause alarm. Monitoring will provide data to assess the validity of such concerns.

## **RELEVANT EXPERTS AND KNOWLEDGABLE LOCAL BOTANISTS**

Bittman, Roxanne – CNDDDB lead botanist  
California Dept Fish and Game  
Wildlife & Habitat Analysis Branch  
1807 13<sup>th</sup> Street Suite 2002  
Sacramento, CA 95814  
Phone: 916-323-8970

Doell, Janet – CALS founder and author of two papers on *U. longissima* in California  
1200 Brickyard Way #302  
Point Richmond, CA 94801

Keon, Dylan - Masters thesis was on *U. longissima* ecology)  
P.O. Box 102  
Corvallis, OR 97339  
Phone: 541-753-3866

McCune, Bruce - Professor of ecology lichenology  
Dept. Botany and Plant Pathology  
Cordley 2082  
Corvallis, OR 97331  
Phone: 541-737-1741

Renner, Maralyn – Pacific Lumber Company, Senior Botanist  
PALCO  
PO Box 37  
Scotia, CA 95565  
Phone: 707-764-4199

## **STAKEHOLDERS FOR NOTIFICATION OF COMMENT PERIOD**

California Dept Fish and Game  
via Roxanne Bittman

Six Rivers National Forest:  
Attn: Lisa Hoover, Botanist  
1330 Bayshore Way  
Eureka, CA 95501

Mendocino National Forest  
825 N. Humboldt Ave.  
Willows, CA 95988

Redwood National and State Parks  
1111 Second Street

Crescent City, CA 95531

PALCO

via Maralyn Renner (above)

Simpson Timber Company

P.O.Box 1089

Arcata, CA 95518

## LITERATURE CITED

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[reference not reviewed for this sponsorship]
- Peck, J. E. & P. S. Muir 2001. Harvestable epiphytic bryophytes and their accumulation in central western Oregon. Bryologist 104: 181-190.
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- The threatened macrolichen project. 1996. <http://www.toyen.uio.no/botanisk/botmus/lav/factshts/usnelong.htm> - last viewed 28 November 2005

## **OTHER RELEVANT LITERATURE**

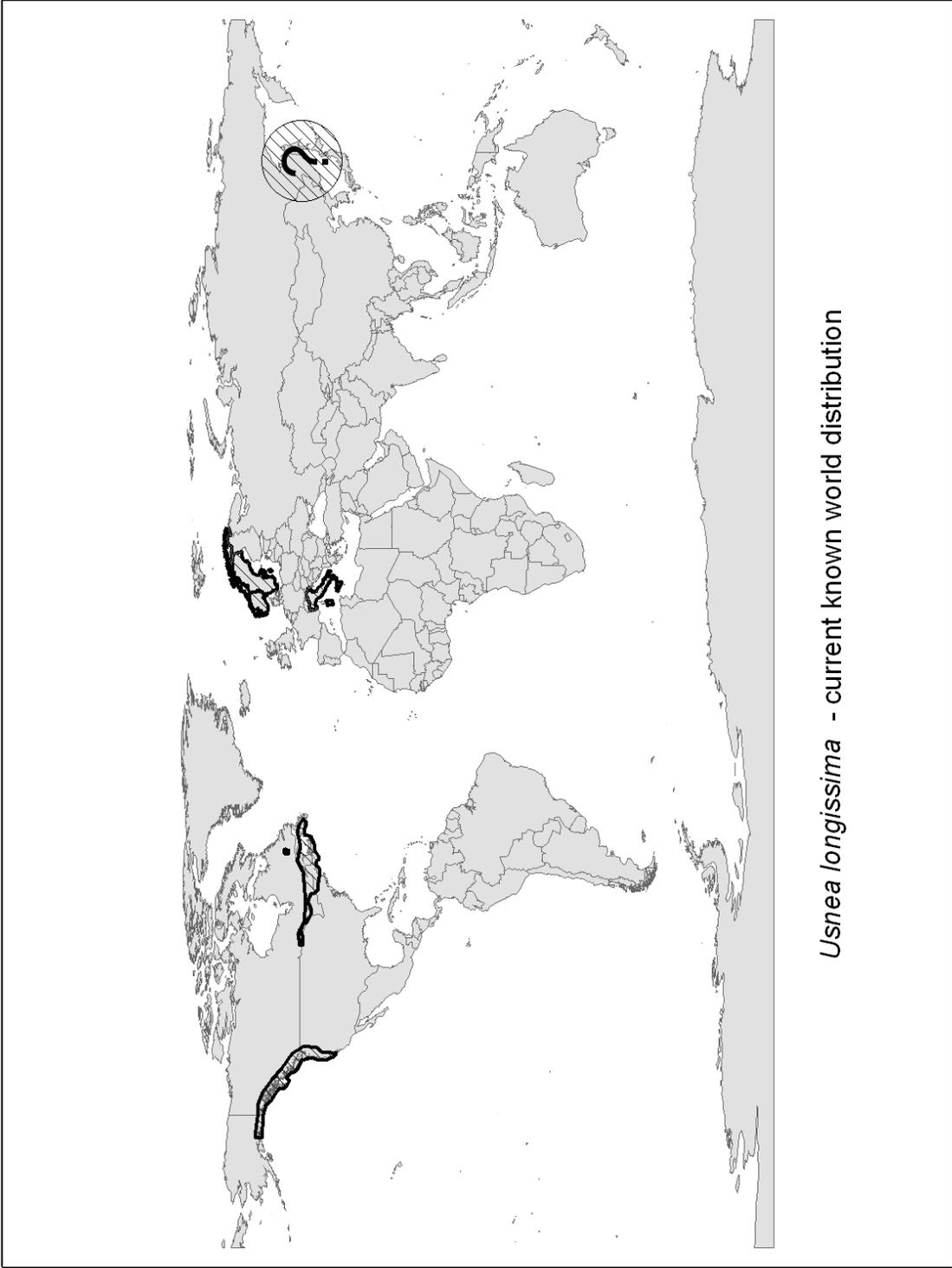
### **LOCATION/SPECIMEN LIST**

Given the large number (>200) of known occurrences in California, I will not include a list here. Files of reported locations are currently maintained by the California Natural Diversity Database (CNDDDB) within the California Department of Fish and Game. The CNDDDB will probably not enter further reports into their electronic database, but should maintain a paper file for reports. An output of their database as of 29 November 2005 will be stored electronically by the CALS Conservation Committee. These data include private land-ownerships and will not be available publicly.

### **MAPS**

A map of databased locations within California, as provided from CNDDDB data, is attached. An approximate world-range map is also attached with North American data according to Brodo et al. (2001), European data by country based on recent confirmed existence, and Asian data included simply as an educated guess as no published details exist.





*Usnea longissima* - current known world distribution