Rare Plant Status Review: *Poa rhizomata*

Proposed Change from California Rare Plant Rank 4.3, G3G4 / S3S4 to 1B.3, G2 / S2

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Changes to the original are in blue font

Background and Taxonomy

*Poa rhizomata* Hitchc. is a perennial grass (Poaceae) occupying a restricted range in northwestern California (Siskiyou and n. Trinity cos.) and adjacent southwestern Oregon (Jackson Co.). It has been included in the CNPS Rare Plant Inventory since 1974, is currently a CRPR 4 taxon, and has undergone no recent changes in status (CNPS 2023). It is included in *The Jepson Manual* (Soreng 1993), *Jepson eFlora* (Soreng 2012), and *Flora of North America* (Soreng 2007). Some earlier works and current online resources have treated *P. piperi* as a taxonomic synonym of *P. rhizomata* (Hitchcock 1935, Hitchcock and Chase 1951, Tropicos 2023). With *P. piperi* recognized as a distinct species (Soreng 1993, 2007, 2012), *P. rhizomata* is understood to be much rarer than was previously believed, and an upranking to CRPR 1B.3 (plants rare or endangered in California and elsewhere) is warranted.

*Poa rhizomata* is distinguished from *P. piperi* in having leaves generally flat and smooth or sparsely scabrous (vs. leaves inrolled and adaxially hairy in *P. piperi*) and lemmas with long-cobwebby hairs at the base (vs. lemmas glabrous) (Soreng 2007, 2012). The two species also have non-overlapping geographic ranges with *P. rhizomata* occurring further inland from the coast (R. Soreng 2021, pers. comm.). The range of *P. piperi* includes Del Norte Co., California and sw. Oregon (Josephine, Coos, and Curry cos.) (Soreng 2012, CCH2 2023, CPNWH 2023, SEINet 2023). Other similar species include *P. pratensis* and *P. chambersii*. *Poa pratensis* has ligules truncate to rounded (vs. acute in *P. rhizomata*), inflorescences densely flowered (vs. sparse), lemmas 3–4 (vs. 4–6.5) mm long, and flowers bisexual (vs. usually unisexual). *Poa chambersii* has sheaths closed for ⅓–⅞ (vs. ½–⅓) their length, ligules mostly 0.5–2 (vs. 2–8) mm long, lemmas glabrous or with keel and marginal veins sparsely soft-puberulent (vs. keels and marginal veins sparsely short- to long-villous), and cobwebby hairs at base of lemma absent or 1–2 mm long (vs. hairs longer, over ½ the lemma length) (Soreng 2007, 2012). Due to the possibility of misidentification, occurrences of *P. rhizomata* should be documented with voucher specimens and verified by an expert (e.g., Dr. Rob Soreng of the Smithsonian Institution).

Taxonomic Information provided by Rob Soreng during Forum Review: “*Poa* is a large (including at least 580 species), world-wide genus of cool-season (C3) grasses, belonging to subfamily Pooidae tribe Poeae subtribe Poinae. *Poa rhizomata* Hitchc. is one of 21 species placed in *Poa* subg. *Poa* supersect. *Homalopoa* (Dumort.) Soreng & L.G. Gillespie in sect. *Madropoa* Soreng. All of these species are diclinous, mostly gynomonoecious or dioecious and variations between those, with various combinations of pistillate, staminate, and perfect flowers, but always some significant proportion of unisexual flowers. All are endemic to North America including northern Mexico, and are mostly confined to western North America. *Poa rhizomata* reproduces sexually and by rhizome. The flowers of some individuals are all or mostly pistillate, while other individuals in the same populations vary from perfect to staminate. Seed set is predictably low (< 20% per inflorescence) in diclinous species (absent apomixis). The species is readily distinguished from other species that might be confused with it.
Few perennial species (other than those of subg. and sect. Secundae, which look nothing like it) co-occur with it. *Poa pratensis* L. (type of subg. and section *Poa*), which is widely seeded for pasture, lawns and soil stabilization, is hermaphroditic, has truncate ligules, sheath margins fused for less of their length, denser pubescence on lemma nerves, smaller spikelets, and shorter anthers. *Poa piperi* which occurs in coast ranges to the west is restricted to serpentine substrates, has involute leaf blades, lemma nerves glabrous, and is strictly dioecious. *Poa pringlei*, which occurs above it in subalpine habitats, is densely tufted with involute leaf blades, long hyaline ligules, narrow contracted inflorescences, glabrous lemmas, and is strictly dioecious and sexually reproducing in its western range (pistillate and apomictic to the southeast). *Poa wheeleri*, which is widespread in western North America, has retrorsely scabrous to strigulose lower sheaths, with short truncate ligules, glabrous lemmas (sometimes pubescent on keel and marginal veins), and no callus hairs, has rudimentary, sterile anthers (it reproduces apomictically by seed and vegetatively by rhizome). *Poa cusickii* subsp. *purpuracens*, apomictic with only pistillate flowers, with scattered populations in the subalpine of the PNW, is known from the top of Mt. Ashland, but otherwise is rare or absent from the range of *Poa rhizomata*.

*Poa sect. Madropoa* taxa (*mesomorphic taxa, with relatively thin flat or folded blades*):

*P. arnowerae* Soreng, *P. atropurpurea* Scribn.,


*P. nervosa* (Hook.) Vasey, *P. piperi* Hitchc., *P. porsildii* Gjaerev., *P. pringlei* Scribn.,

*P. rhizomata* Hitchc., *P. sierra* J.T. Howell, *P. stebbinsii* Soreng,

*P. tracyi* Vasey, *P. wheeleri* Vasey.

Ecology

The habitat of *Poa rhizomata* has been described as “upper elevation, mixed coniferous forests” (Soreng 2007) and “[s]hady moist slopes in forest, in rich loose soils” (Soreng 2012). The elevational range in California is from 1,700 to 6,700 feet (Cheng 2004, Calflora 2023, CCH2 2023, CPNWH 2023, Smithsonian 2023). The known occurrences are on soils derived from a variety of substrates including marine sedimentary and meta-sedimentary rocks, metavolcanics, granitics, and ultramafics (CDC 2015). At least in California, the species does not seem to be restricted to ultramafics (i.e., serpentinite, peridotite) in spite of earlier reports to this effect (Soreng 2007, 2012). Noted plant associates in California and Oregon include the trees *Abies concolor*, *A. magnifica*, *Arbutus menziesii*, *Calocedrus decurrens*, *Pinus ponderosa*, *Pseudotsuga menziesii*, *Quercus chrysolepis*, *Q. garryana*, *Q. kelloggii*, and *Tsuga mertensiana*; shrubs *Arctostaphylos patula*, *Berberis pinnata*, *Ceanothus integerrimus*, *C. velutins*, *Cercocarpus* sp., *Chrysolepis chrysophylla*, *Corylus cornuta*, *Rosa gymnocarpa*, and *Symphoricarpos mollis*; and herbs *Festuca* sp., *Melica* sp., and *Xerophyllum tenax* (Calflora 2023, CCH2 2023, CNDDDB 2023, Smithsonian 2023; L. Wise 2023, pers. comm.). The blooming period is April–July (Soreng 2012).
**Poa rhizomata**

Comment by Rob Soreng made during Forum Review: Seed set is predictably low (< 20% per inflorescence) in dichlinous species (absent apomixis).

**Distribution and Abundance**

*Poa rhizomata* is a near-endemic of California with 16 known localities in the Klamath Ranges (KR) of Siskiyou and northern Trinity counties (Cheng 2004, Calflora 2023, CCH2 2023, CNDDB 2023, CPNWH 2023, SEINet 2023, Smithsonian 2023). In Oregon, it is known from eight occurrences in the Siskiyou Mountains in Jackson County, although at four of these sites the plants may have been misidentified (L. Wise 2023, pers. comm.). Plants from Lane County in central Oregon previously identified as *P. rhizomata* are now placed in *P. chambersii* (Soreng 1998). Using GeoCAT (Bachman et al. 2011), the overall extent of occurrence is estimated as 4,722 km², with the area of occupancy being 84 km² (conservatively estimated as the sum of occupied 4 km² grid squares).

Nine of the Californian occurrences (56%) are on National Forest land, including localities on the Klamath NF (7 occurrences), the Shasta-Trinity NF (1), and the Rogue River-Siskiyou NF (1). The remaining seven localities are on lands of unknown (presumably private) ownership. Only two locality records are based on observations made within the past 20 years, with the remainder being historical. One locality is in the Marble Mountain Wilderness as well as within the Sugar Creek candidate Research Natural Area (Cheng 2004). Another occurrence is within or near the boundary of the Trinity Alps Wilderness.

For two of the Californian occurrences (record #s 7 and 8), there are population estimates of 150 and 250 plants, respectively (CNDDB 2023). In Oregon, local populations have ranged in size from 30 to 8,000 plants (L. Wise 2023, pers. comm.).

Eight records found under *P. rhizomata* in CCH2 (2023) or SEINet (2023) have been excluded from the present analysis and are highlighted in pink at the bottom of our locations table. Seven of these records are from Del Norte County and are misidentified specimens referable to *P. piperi*. The eighth record, also presumably misidentified, is from Shasta County, 9 miles east of Burney and is based on the collection *Beetle 3021* (GH); a duplicate of the same collection in the UC herbarium is determined as *Poa* sp. indet. (CCH2 2023).

**Distribution comments made during Forum Review:**

Scott Loring: “A few notes on Oregon occurrences, due to the proposed ranking being dependent on assessments of the species throughout its known range. The OR/WA BLM GeoBOB database shows 19 sites, most of which are likely misidentifications IMO.” “The R6 USFS TESP database shows two additional sites, but I know little about them.”

Cindy Roche: “From 2007 to 2011 I did some field work with Wayne Rolle (Rogue-Siskiyou NF) and then (2011) a project for Mark Mousseaux (Medford BLM) on this species on BLM land in Jackson County, Oregon. I encountered it on a Native Plant Society botany field trip in Siskiyou County in 2009; this record shows on your spreadsheet. [There are records in the CPNWH that are clearly wrong and others that should be looked at to see what the actual identity is.] When I first started looking for it with Wayne Rolle in SW Oregon, the species we confused for it was *Poa wheeleri*. The growth form is quite similar, a loose bunch with open droopy
Poa rhizomata

Stephanie Puentes: “Looking over the location data excel, I think occurrence number 11 has been mis-mapped by CCH2 (and as described in the status review excel). From the text description I think the occurrence should be located further north than as mapped by the listed GPS coordinates (40.9519, -122.8287) which place the occurrence in 36N08W Section 30 in the Covington Mill quad and close to 6600 feet elevation. From the description of "ca 1 chain e of E Fork Coffee Creek bridge (take Coffee Creek Rd to, then spur rd down to flat, then ca 3 chains e)" and "3620 ft" this is likely more accurately mapped in 38N08W Section 30.”

Status and Threats

Poa rhizomata is reported as “a rare species” in the Flora of North America (Soreng 2007). It is not currently listed under the federal ESA or the California ESA. It also has no U.S. Forest Service status although it was recently evaluated as a possible Species of Conservation Concern (Stone 2021). In Oregon, it is ranked S1? (critically imperiled due to extreme rarity with a question mark indicating uncertainty) and is on Heritage Program List 2 (threatened with extirpation from Oregon) (ORBIC 2023).

Site quality and threats to this species are virtually undocumented. Because of its apparent preference for semi-shaded habitats in the forest understory, it may be vulnerable to high-intensity wildfire, timber harvest or other actions causing removal of the forest canopy. It might also be threatened indirectly by continued fire suppression (thereby increasing the risk of high-intensity wildfire). The microhabitat dimensions, successional status, and fire ecology of P. rhizomata need study. Another rhizomatous species, P. pratensis, has been noted as being shallow-rooted and intolerant of drought, but its soil-insulated rhizomes are known to survive and initiate regrowth after low-intensity fire (Uchytil 1993). The distribution and extent of P. rhizomata are too limited for it to be considered an important forage grass, although severe impacts of cattle grazing and trampling were noted in one of the Oregon localities (L. Wise 2023, pers. comm.).

Status and Threats comments made during Forum Review:

Scott Loring: “Most of the GeoBOB sites are in Cascade-Siskiyou NM where cattle grazing is no longer a threat, but the majority of them burned in the Klamathon Fire a few years back. During work on an unrelated project, I revisited some of those sites the year after the fire and found no plants at any of them. There have been no other post-fire monitoring efforts that I am aware of, but I assume the other sites also did not respond well.” “The OR/WA BLM and R6 USFS list this species with Sensitive status.”

Cindy Roche: “My collection in Siskiyou County, California, at Alex Hole was from an extremely heavily grazed area. The cattle spent most of their time in the moist/mesic habitats, but
had not apparently grazed the adjacent forested area where I found the *Poa rhizomata*. The severity/duration of the grazing impact is demonstrated by the *Cinna latifolia* specimen I found that was flowering at 2 inches height. (!) Under these conditions, I would consider grazing to be a threat to *Poa rhizomata*, as the cattle were bound to leave the mesic areas when there was nothing left and range into the surrounding forest area. Although *Poa rhizomata* is not abundant enough to be an important forage species, it is vegetatively similar enough to *Poa wheeleri* as well as *Poa pratensis* (on dry sites) to be palatable to livestock. Thus, in areas that are grazed, I would consider grazing and trampling to be definite threats to this species.”

Rob Soreng: “*Poa rhizomata* is highly vulnerable due to its narrow habitat preferences and few known stations within a narrow geographic range within an area increasingly disturbed by logging, and intense forest fires resulting from and general climate warming and extended droughts.”

**Summary**

Based on the information presented here, we recommend upranking *Poa rhizomata* from CRPR 4.3 to 1B.3 in the CNPS Inventory. This status change is needed since the previous ranking was based on a broader circumscription of *P. rhizomata* (including *P. piperi* which is now recognized as a separate species). With 24 known occurrences including 16 in California, *P. rhizomata* is rare although there is some uncertainty since all but two of the Californian occurrences are lacking recent observations. If knowledge on the distribution, abundance, or threats to *P. rhizomata* changes in future, then we will re-evaluate its status at that time.

**Recommended Actions**

CNPS: Change *Poa rhizomata* from CRPR 4.3 to 1B.3  
CNDDB: Change *Poa rhizomata* from G3G4 / S3S3 to G2 / S2

**Revised CNPS Inventory Record**  (Changes to the original record are in green text)

*Poa rhizomata* Hitchc.  
*timber blue grass bluegrass*  
Poaceae  
USDA Plants Symbol: PORH  
CRPR 4.3-1B.3  
Counties: Del Norte (DNT), Siskiyou (SIS), Trinity (TRI)  
States: California (CA), Oregon (OR)  
Quad name (code): Billys Peak (4112227), Callahan (4112237), Condrey Mtn. (4112288), Cottonwood Peak (4112286), Eaton Peak (4112238), Etna (4112248), Gasquet (4112378), Greenview (4112258), High Plateau Mtn. (4112388), Horse Creek (4112278), Kangaroo Mtn. (4112382), Ukonom Mountain (4112354), Ycatapom Peak (4112217)  
General Habitat: Lower montane coniferous forest, upper montane coniferous forest, subalpine coniferous forest (often serpentine)  
Microhabitat Details: Semi-shaded moist slopes, small openings in forest  
Microhabitat: Mesic, serpentine (sometimes)  
Elevation: 450—1000 520 – 2040 meters
**Poa rhizomata**  
Element Code: PMPOA4Z250  
Changed to CRPR 1B.2 on 2024-02-01

Life form: perennial rhizomatous herb  
Blooms: April – May-July  
Notes: On review list in Extremely rare and threatened in OR.  
- Threats: Possibly Potentially threatened by logging, inappropriate grazing, trampling, and fire suppression—changes in fire regime.  
- Taxonomy: Plants on ultramafic substrates in DNT Co. are referable to *Poa piperi* (previously treated as a taxonomic synonym of *P. rhizomata*). Other similar species are *P. pratensis* (non-native naturalized in CA) and *P. chambersii* (OR endemic).  
- Other: Microhabitat dimensions, successional status, and fire ecology need study.  

Selected References:  
- Rare Plant Status Review: *Poa rhizomata* Proposed Change from CRPR 4.3 to 1B.3 (2024)  
- Species Account: https://rareplantfiles.cnps.org/scc/PoaRhizomataSpAcctSCC20211101.pdf

**Literature Cited**


[CNDDB] California Department of Fish and Wildlife, Natural Diversity Database. 2023. Four unprocessed field survey forms for *Poa rhizomata*. CNDDB, Sacramento [transmitted December 2023].


**Persons Contacted**
Soreng, Rob. 2021. Research Associate, Dept. of Botany, U.S. National Museum of Natural History. Email correspondence regarding geographic distribution of *Poa rhizomata* and *P. piperi*
and current identification of other collections previously determined as *P. rhizomata*. Personal communication 06–08 July 2021.

Wise, Lindsey. 2023. Data Manager, Oregon Biodiversity Information Center. Email correspondence regarding the distribution and abundance of *Poa rhizomata* in Oregon. Personal communication 01 December 2023.