Plant Species Evaluation Form

Stipa exigua (Thurb.) Columbus & J.P. Sm.

LITTLE RICEGRASS

Family: Poaceae (CNPS 2017) | **PLANTS Symbol:** PIEX4 (USDA 2017) | **Calif. Endemic:** No (CNPS 2017)

Synonyms/Other Names: *Piptatherum exiguum* (Thurb.) Dorn was changed to *Stipa exigua* (Thurb.) Columbus & J.P. Sm. in 2010 during the preliminary effort for the publication of *The Jepson Manual 2nd Edition*, when names were corrected to reflect monophyletic groups. Members of the Stipeae within California (incl. species in *Piptatherum*, *Piptochaetium*, and *Ampelodesmos*) were all moved to *Stipa* in an effort achieve monophyletic nomenclature, and reduce possible issues with identification (Columbus and Smith 2010). The basionym, *Oryzopsis exigua* Thurb., was established in 1874 (Tropicos 2017). Both *Piptatherum exiguum* and *Oryzopsis exigua* are names that continue to be used by some sources (USDA 2017; CPNWH 2017; NatureServe 2017).

Identification Issues: *Stipa exigua* lacks noteworthy deviations from the standard keying procedures for taxa in the Poaceae. There is one floret per spikelet; the florets have flat palea, spikelets have ovate glumes, and lemma have awns that are upward of 3.9-7mm. It may be worth emphasizing that floret and lemma length exclude the awn in the *Jepson eFlora* key (Columbus et al. 2017).

Taxonomy:

Unless otherwise cited, the following description is used with permission from the Jepson Herbarium. Jepson Flora Project (eds) 2017. *Jepson eFlora*, http://ucjeps.berkeley.edu/eflora/, accessed May 2017. Copyright © Regents of the University of California.

Species In Genus: +- 600 species: temperate, tropics, generally +- arid, +- worldwide; many species valuable cattle forage, cordage, some weedy. Etymology: (Greek: stupe or stuppeion, for fiber or cordage, referring to plumose awns of Eurasian species or fibers from especially *Stipa tenacissima* L.) Note: Floret, lemma lengths and shapes in key and text exclude awn. Many related and some poorly defined genera placed here in a broadly treated genus. Hybrids not rare. 4 waifs in California, *Stipa caudata* Trin. [*Amelichloa caudata* (Trin.) Arriaga & Barkworth], *Stipa clandestina* Hack. [*Amelichloa clandestina* (Hack.) Arriaga & Barkworth], *Stipa plumosa* Trin. [*Jarava plumosa* (Spreng.) S.W.L. Jacobs & J. Everett], *Stipa tenuissima* Trin. [*Nassella tenuissima* (Trin.) Barkworth]. *Stipa viridula* Trin. [*Nassella viridula* (Trin.) Barkworth], possibly in California but records unclear.

Genus Description Habit: Generally perennial herb, tufted or occasionally rhizomatous. Stem: generally erect, generally unbranched at distal nodes, persistent or not. Leaf: basal or cauline, sheaths open, auricles 0, ligules scarious to membranous, generally ciliate, blade flat to inrolled. Inflorescence: generally panicle-like, generally narrow. Spikelet: generally 1-flowered; glumes generally > floret except awn, membranous, flexible, veins 1--10, awns 0; floret 1(6), generally round (compressed) in ×-section; axis breaking between glumes and floret; callus blunt to sharp,

glabrous to hairy; lemma membranous to leathery or hardened, glabrous to hairy, obscurely 3--7-veined, margins overlapping or not, tip entire to 2-lobed or forked, occasionally fused into a crown, 1-awned at or near tip (mucronate), awn (0)3--225(300) mm, unbranched, straight to bent or curled, twisted or not, persistent or not; palea < to > lemma, generally flat, glabrous to hairy, veins (0)2(3). Fruit: ovoid to fusiform, beak 0.

Species Description Stem: 1.2--4 dm. Leaf: sheaths +- glabrous, occasionally scabrous distally; blade 9--30 cm, 0.6--1.4 mm wide, generally folded. Inflorescence: 3.5--9 cm, dense, branches +- appressed to main axis. Spikelet: glumes 3.5--6 mm, ovate; floret 3--6 mm; callus 0.2--0.5 mm, blunt; lemma +- = glume length, hairy throughout, awn 3.9--7 mm, bent 1 ×, persistent. Chromosomes: 2n=22. eFlora Treatment Author: J. Travis Columbus, James P. Smith, Jr. & Douglas H. Goldman.

Status:

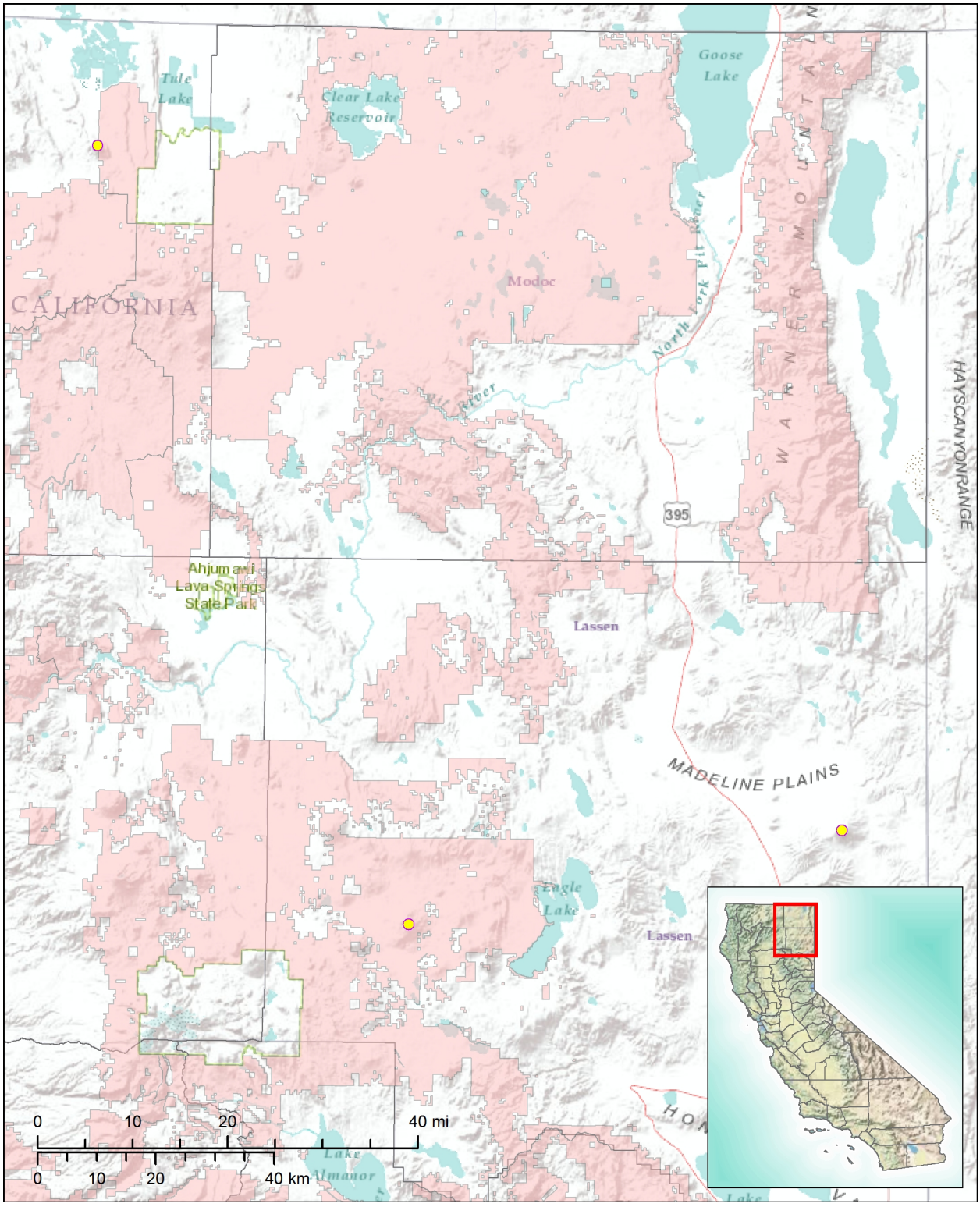
Note: Federally recognized Endangered, Threatened, Proposed, or Candidate species under the Endangered Species Act are omitted as they do not meet the definition of a Species of Conservation Concern (FSH 1909.12 § 12.52).

State Listing	G-rank	S-rank	CRPR	R5 FSS	NFP SM	CA BLM
CA: Not listed NV: Not listed OR: Not listed	G4G5	CA: S2 NV: SNR OR: S2?	2B.3	Not listed	Not listed	Sensitive

SWAP:	NNHP:	NNPS:	ORBIC:	OCS:	IUCN:
Not listed	Do not track	Not listed	2: Threatened, Endangered or Extirpated from Oregon, but Secure or Abundant Elsewhere	Not listed	Not listed

Expanded abbreviations and citations: State Listing=California Endangered Species Act Listing (CDFW 2017b), Nevada Division of Forestry Fully Protected Plant Species (NAC 527) (NDF 2012), Oregon Department of Agriculture Listed Plants (ODA 2014); G-rank=Global Conservation Status (CDFW 2017a; NatureServe 2017); S-rank=Subnational (state or province-level) Conservation Status (CDFW 2017a; NatureServe 2017; NNHP 2017; ORBIC 2016); CRPR=California Rare Plant Rank (CNPS 2017); R5 FSS=USDA Forest Service Region 5 Regional Forester Sensitive Plant Species List (USDA 2013); NFP SM=Forest Service and Bureau of Land Management Northwest Forest Plan Survey and Manage Species (USDA 2001); CA BLM=California Bureau of Land Management Designated Sensitive Species (BLM 2010); SWAP=California State Wildlife Action Plan Status (CDFW 2015); NNHP=Nevada Natural Heritage Program Status (NNHP 2017); NNPS=Nevada Native Plant Society Status (NNHP 2017); ORBIC=Oregon Biological Information Center Status (ORBIC 2016); OCS=Oregon Conservation Strategy Species (ODFW 2016); IUCN=International Union for Conservation of Nature Red List Status (IUCN 2017).

Distribution: Western North America, from California and Nevada in the south, to British Columbia and Alberta in the north. Plants occur as far east as Wyoming, Montana, and Colorado (NatureServe 2017). There are three California occurrences that are restricted to Northeastern California in Lassen and Siskiyou counties. Plants in Lassen County are found near Observation Peak (BLM lands) and at the base of Crater Mountain (Lassen NF). Plants in Siskiyou County are found on Mount Dome on BLM lands within five miles of the Modoc National Forest. The three California occurrences are all greater than 40 miles from one another (CNDDB 2017; CCH 2017).



Map Sources: *Layers*: USDA Forest Service, Pacific Southwest National Forests: CPAD 2016. California counties: CDF 2009. *Basemaps*: California inset map: © 2013 National Geographic Society, i-cubed (Esri 2017a). Main map: Esri, DeLorme, USGS, NPS (Esri 2012) and Esri, USGS, NOAA (Esri 2017b).

Locations within California:

(Note: Record numbers indicate sites that contain an individual, population, or groups of populations located within ¼ mile of each other (per the California Natural Diversity Database (CNDDB) definition of Element Occurrences in California). Official Element Occurrence (EO) numbers for plants in California are determined solely by the CNDDB and are included within the Reference (Source) column for CNDDB data. Duplicate records from the same site are given the same record number and included in red. The Population Info column includes total number of individuals and total number and size of populations/sub-populations when provided. Elevations in meters from source were converted to feet. If not provided in original source, Land Manager information was obtained using the California Protected Areas Database (CPAD 2016) and Quad information was obtained using 24K Quads, SDE Feature Class (CDFG 2013). All other information is directly from the Reference (Source) column unless additional citation is given.)

Rec. #	Locality	County	Quad	Reference (Source)	Date Last Observed	Population Info	Threats	Land Manager	Elev. (ft.)
1	OBSERVATION PEAK.	Lassen	Observation Peak (4012072)	CNDDB, May 2017 (EO 1)	17-Jul-1996	25+ PLANTS SEEN IN 1996.	SOME GRAZING IN THE AREA.	BLM	7700
1	East-northeast of the lookout on Observation Peak located east of Ravendale	Lassen	Observation Peak (4012072)	CCH, Jan 2017 (CHSC78408)	18-Jun-2000			BLM	7799
1	E of Ravendale (E-NE of the lookout on Observation Peak)	Lassen	Observation Peak (4012072)	CCH, Jan 2017 (JEPS98391)	18-Jun-2000			BLM	7799
1	North slope of Observation Mtn., T34N R16 E sec28	Lassen	Observation Peak (4012072)	Calflora, May 2017 (xr87752)	11-Jul-1979	1+ individuals		BLM	7336
2	BASE OF CRATER MOUNTAIN.	Lassen	Harvey Mtn. (4012161)	CNDDB, May 2017 (EO 2)	16-Jun-1935	NEEDS FIELDWORK, ONLY SOURCE OF INFORMATION IS 1935 COLLECTION BY L. WHITNEY.		Lassen NF	

Rec. #	Locality	County	Quad	Reference (Source)	Date Last Observed	Population Info	Threats	Land Manager	Elev. (ft.)
2	base Crater Mt.	Lassen	Harvey Mtn. (4012161)	CCH, Jan 2017 (UC140903)	16-Jun-1935			Lassen NF	
2	base of Crater Mt. Crater Mt.	Lassen	Harvey Mtn. (4012161)	CCH, Jan 2017 (UC589864)	16-Jun-1935			Lassen NF	
3	MOUNT DOME.	Siskiyou	Mount Dome (4112176)	CNDDB, May 2017 (EO 3)	Unknown	NEEDS FIELDWORK, "SITE ON MT. DOME" ACCORDING TO M. DOLAN.		BLM	

Distribution on National Forest System (NFS) Lands:

(Please see Reference column of Locations table above for references pertaining to Record Numbers indicated on NFS lands.)

National Forest System (NFS) lands	Record #s (from Locations table above)	CNDDB EOs	Non-CNDDB Records	Recent (seen in past 20 yrs.)	Historic (not seen in past 20 yrs.)	Most Recent Obs.	EOs/ Recs. (5 mile buffer)	Total Records on NFS lands
Angeles:	-	-	-	-	-	-	-	0
Cleveland:	-	-	-	-	-	-	-	0
Eldorado:	-	-	-	-	-	-	-	0
Inyo:	-	-	-	-	-	-	-	0
Klamath:	-	-	-	-	-	-	-	0
Lake Tahoe Basin MU:	-	-	-	-	-	-	-	0
Lassen:	2	1	-	-	1	16-Jun-1935	-	1
Los Padres:	-	-	-	-	-	-	-	0
Mendocino:	-	-	-	-	-	-	-	0
Modoc:	-	-	-	-	-	-	1	0
Plumas:	-	-	-	-	-	-	-	0
San Bernardino:	-	-	-	-	-	-	-	0
Sequoia:	-	-	-	-	-	-	-	0
Shasta-Trinity:	-	-	-	-	-	-	-	0
Sierra:	-	-	-	-	-	-	-	0
Six Rivers:	-	-	-	-	-	-	-	0
Stanislaus:	-	-	-	-	-	-	-	0
Tahoe:	-	-	-	-	-	-	-	0
Totals:	N/A	1	0	0	1	N/A	1	1

Demographic and Population Trends: A limited number of plants were observed at element occurrence one (EO 1) in 1979. Later, in 1996, over 25 plants were observed at its respective site (CNDDB 2017). Plants from the remaining two occurrences lack population or demographic information.

Life History: *Stipa exigua* (*Piptatherum exiguum*) is an herbaceous perennial that blooms from June until August (CNPS 2017). It is an erect perennial and tightly cespitose herb. Leaves are basally concentrated. Spikelets develop and only produce one floret (Backworth 2007). An allied

species, *S. pulchra*, is wind pollinated, associated with arbuscular mycorrhizae, and has a rooting depth at least 25 inches. *Stipa pulchra* also holds great importance as a food source to herds of foraging animals that once occupied substantially greater regions of California (Steinberg 2002).

Diversity: *Stipa exigua* (*Piptatherum exiguum*) is a member of the Stipeae within the Pooideae. The Stipeae is a group of C3 grasses that represents 572-670 species (Romaschenko et al. 2012). Of this entire group, roughly 170 species have been lumped into *Oryzopsis* or *Piptatherum* at one time. Researchers refer to this group as the *Oryzopsis/Piptatherum* complex (Romaschenko et al. 2011). Taxonomy within this group has been challenging and controversial. Plants in the genera *Stipa, Agrostis, Milium, Urachne, Achnatherum, Panicum, Dilepyrum, Eriocoma, Fendleria, Garnotia, Caryochloa, Ptilagrostis, Piptochaetium, Anatherostipa, Anemanthele*, and *Nasella* have all been considered part of this complex at some point. This complex was ultimately restricted to a group of taxa that have short spikelets, florets with a blunt callus, and leathery-cartilaginous lemmas with caducous awns. Molecular phylogenies demonstrated these morphological criteria as polyphyletic and representative of an artificial group. Lemma epidermal patterns more accurately reflect the evolution of this group (Romaschenko et al. 2011; Romaschenko et al. 2012). California members of the Stipeae were all assigned to the genus *Stipa* in 2010 as a preliminary effort in preparation for publication of *The Jepson Manual, 2nd Edition*. Assigning all California Stipeae to one large group, and referring to it as *Stipa*, was intended to curtail identification issues and adhere to nomenclatural principles grounded in monophyly (Columbus and Smith 2010).

Habitat: Records from within California indicate that *Stipa exigua* occurs in Great Basin scrub (CNPS 2017; CNDDB 2017), and indicate that *S. exigua* grows alongside *Ericameria bloomeri, Ribes cereum, Festuca idahoensis, Artemisia tridentata* subsp. *vaseyana*, and *Symphoricarpos* sp. (CNDDB 2017). General accounts indicate that *Stipa exigua* (*Piptatherum exiguum*) occurs on dry, open ground and open woods, to areas in mountain meadows among mixed coniferous vegetation (NatureServe 2017). Records that are strictly from outside California document *Stipa exigua* (*Piptatherum exiguum*) growing in rocky areas, seasonally inundated lake bottoms, loamy soils under lodgepole pine, and thin granitic soil in burned areas. Many of these records from outside California indicate that *Stipa exigua* grows alongside *Cymopterus* sp., *Antennaria* sp., *Pseudotsuga menziesii, Achnatherum webberi, Eriogonum heracleoides, Penstemon fruticosus, Aconogonon* sp., *Phlox* sp., *Carex greyeri, Symphoricarpos oreophilus, Shepherdia canadensis, Juncus parryi, Abies lasiocarpa, Drymocallis glandulosa, Carex rossii, Arenaria kingii, Phyllodoce empetriformis, Vaccinium scoparium, Ivesia tweedyi, Glyceria striata, Aquilegia formosa, Catabrosa aquatica, Ribes cereum, Arnica rydbergii, Amelanchier* sp., *Balsamorhiza* sp., *Elymus spicatus, Penstemon fruticosus, Purshia tridentata, Rubus idaeus*, and in dry places among *Populus tremuloides* (CPNWH 2017).

Habitat Status or Trend: The few *S. exigua* records from within California represent the southwest fringe of this taxon's distribution (CPNWH; USDA 2017). Within California, *S. exigua* is ranked S2 and is considered imperiled given the few number of occurrences in the region. One of the three element occurrences for *S. exigua* reports that grazing occurs the nearby. The remaining two occurrences declare that more field work is needed (CNDDB 2017). It is also

possible that *S. exigua* occurs elsewhere in California where conditions are favorable, possibly in the northeastern portion of the state (CNPS 2017; Columbus et al. 2017). It is critically imperiled (S1) in Alberta, secure in British Columbia (S5), vulnerable (S3) in Wyoming, and is not ranked in the remaining regions of its distribution (NatureServe 2017).

Capacity for the Species to Disperse: Reports from landscape cultivation indicate that seeds of *Stipa pulchra*, an allied species, are known to get lodged in the fur of domestic dogs (Tilley et al. 2009). *Stipa exigua* has fruit that are 2.4mm long and 1mm thick (Barkworth 2007). Wind dispersal is possible given the small and lightweight nature of these propagules.

Threats: One of three element occurrences was last seen in 1996 and reports that grazing occurs nearby (CNDDB 2017). Other potential and possible threats are not included in the available literature on this taxon.

Literature Cited

Columbus et al. 2017; Steinberg 2002; Barkworth 2007; Romaschenko et al. 2011; Romaschenko et al. 2012; Columbus and Smith 2010; Tilley et al. 2009;

[BLM] Bureau of Land Management. 2010. Special Status Plants in California, Including BLM Designated Sensitive Species. February 8, 2010. Available at: https://www.blm.gov/ca/dir/pdfs/2010/im/CAIM2010-008ATT2B.pdf [accessed 25 May 2017].

Calflora. 2017. Information on wild California plants for conservation, education, and appreciation. Website http://www.calflora.org/ [accessed 14 June 2017].

[CDFG] California Department of Fish and Game. 2013. 24K Quads, SDE Feature Class. Index for 1:24,000-scale (24K), 7.5-minute by 7.5-minute, paper U.S. Geological Survey maps in California.

[CDFW] California Department of Fish and Wildlife. 2015. California State Wildlife Action Plan, 2015 Update: A Conservation Legacy for Californians; Volume II, Appendix C: Species of Greatest Conservation Need. Gonzales, A. G. and J. Hoshi (eds.). Prepared with assistance from Ascent Environmental, Inc., Sacramento, CA. Available at: https://www.wildlife.ca.gov/swap/final [accessed 11 May 2017].

[CNDDB] California Department of Fish and Wildlife, Natural Diversity Database. 2017. RareFind 5 [Internet application] and CNDDB Maps and Data. Available at: https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data [Government Version, June 2017].

[CDFW] California Department of Fish and Wildlife, Natural Diversity Database. 2017a. Special Vascular Plants, Bryophytes, and Lichens List. Quarterly publication. 126 pp.

____. 2017b. State and Federally Listed Endangered, Threatened, and Rare Plants of California. July 2017. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109390&inline [accessed 11 September 2017].

[CNPS] California Native Plant Society, Rare Plant Program. 2017. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed May 17, 2017].

[CPAD] California Protected Areas Database. 2016. Version 2016b1. GreenInfo Network. Available at: http://www.calands.org/.

[CCH] Consortium of California Herbaria. 2017. Data provided by the participants of the Consortium of California Herbaria. Regents of the University of California, Berkeley. Website http://ucjeps.berkeley.edu/consortium/ [accessed 16 May 2017].

[CPNWH] Consortium of Pacific Northwest Herbaria. 2017. Data provided by the participants of the Consortium of Pacific Northwest Herbaria. University of Washington Herbarium. Website http://www.pnwherbaria.org/data/search.php [accessed 11 August 2017].

[IUCN] International Union for Conservation of Nature. 2017. The IUCN Red List of Threatened Species. Website http://www.iucnredlist.org/ [accessed 26 May 2017].

NatureServe. 2017. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Website http://explorer.natureserve.org [accessed 17 May 2017].

[NDF] Nevada Division of Forestry. 2012. NAC 527.010 List of fully protected species of native flora. April 2012. Available at: https://www.leg.state.nv.us/NAC/NAC-527.html#NAC527Sec010 [accessed 12 May 2017].

[NNHP] Nevada Natural Heritage Program. 2017. Species Lists. Department of Conservation and Natural Resources. Available at: http://heritage.nv.gov/species/lists.php [accessed 25 May 2017].

[ODA] Oregon Department of Agriculture. 2014. Oregon listed and candidate plants - complete list. Native Plant Conservation Program. August 13, 2014. Available at: https://data.oregon.gov/Natural-Resources/Oregon-listed-and-candidate-plants-complete-list/8s3k-ygh2 [accessed 25 May 2017].

[ODFW] Oregon Department of Fish and Wildlife. 2016. Oregon Conservation Strategy, Chapter 6: Strategy Species. Oregon Department of Fish and Wildlife, Salem, Oregon. PDF content last updated December 30, 2016. Available at: http://oregonconservationstrategy.org/ [accessed 25 May 2017].

[ORBIC] Oregon Biodiversity Information Center. 2016. Rare, Threatened and Endangered Species of Oregon. Institute for Natural Resources, Portland State University, Portland, OR. 130 pp. Available at: http://inr.oregonstate.edu/sites/inr.oregonstate.edu/files/2016-rte-book.pdf [accessed 25 May 2017].

Tropicos. 2017. Missouri Botanical Garden. Website http://www.tropicos.org [accessed 16 May 2017].

[USDA] U.S. Department of Agriculture Forest Service, Pacific Southwest Region. 2013. Regional Forester Sensitive Species List. Available at: http://www.fs.usda.gov/main/r5/plants-animals/plants [accessed 9 May 2017].

[USDA] U.S. Department of Agriculture Forest Service and U.S. Department of Interior Bureau of Land Management. 2001. List of Survey and Manage Species in Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures; as amended by Annual Species Reviews 2001-2003. Available at: https://www.blm.gov/or/plans/surveyandmanage/files/sm-fs-enc3-table1-1-dec2003wrtv.pdf [accessed 12 September 2017].

[USDA] U.S. Department of Agriculture, Natural Resources Conservation Service. 2017. PLANTS Database. Website http://plants.usda.gov/ [accessed 16 May 2017].

Persons Contacted:

Columbus, T. 2017. Research Scientist, Rancho Santa Ana Botanic Garden; Professor of Botany, Claremont Graduate University. Email correspondence about nomenclatural inconsistencies between regions (CA, NV, OR), and Tropicos/PlantList.

Sanger, A., K. Bovee, D. Lepley, W. Boes, and H. Guenther. 2017. Lassen and Modoc National Forest botanists. Information submitted at Modoc/Lassen FS-SCC and IPA Workshop, Susanville, CA. 25-26 July 2017.

Taylor, D. Wm. 2017. Environmental contractor, Aptos, CA. Information submitted at Modoc/Lassen FS-SCC and IPA Workshop, Susanville, CA. 25-26 July 2017.

Author(s) and Date:

Steven Serkanic, Assistant Rare Plant Botanist, California Native Plant Society, (916) 447-2677 x218, sserkanic@cnps.org

Aaron E. Sims, Rare Plant Botanist, California Native Plant Society, (916) 324-3816, asims@cnps.org

January 18, 2018

Reviewer(s) and Date:

David Magney, Rare Plant Program Manager, California Native Plant Society, (916) 447-2677 ext. 205, dmagney@cnps.org. January 18, 2018.

Formatting: Form is set up as 508 compliant. Please use the "styles" if further formatting is necessary.

Purpose: This is to maintain the best available science on a species that could be used by the Forest Service in a variety of functions. Specifically, there would be additional steps and evaluations to determine whether or not this species would be considered a Species of Conservation Concern under the 2012 Planning Rule or a Sensitive Species under the 1982 Planning Rule.

Additional Considerations at the Forest Level: Habitat amount and juxtaposition of both the species and habitat locations.