Added to California Rare Plant Rank 1B.2 in the CNPS Inventory on October 15, 2015

Rare Plant Status Review: *Puccinellia simplex*
Proposed Addition to California Rare Plant Rank 1B.2, G2G3 / S2S3

Aaron E. Sims (CNPS), Caroline Tippets (CNPS), and Roxanne Bittman (CNDDB)
September 1, 2015

Changes made to the original document are in blue text.

Background

Puccinellia simplex Scribn. is an annual herb in the Poaceae known in California mostly throughout alkaline soils of the Great Central Valley, and from Utah, where it is possibly not native. It is included in *The Jepson Manual* (Davis 1993), *The Jepson Manual, Second Edition* (Davis 2012), the Flora of North America (Davis and Consaul 2007), and other local and regional floras and botanical checklists (see "Literature Review" section of attached "NewAdd_PuccinelliaSimplex" spreadsheet for additional botanical references). *Puccinellia simplex* is most similar to *P. parishii*, a California Rare Plant Rank (CRPR) 1B.1 taxon that is known in California only from Rabbit Springs in the western Mojave Desert. *Puccinellia* simplex is distinguished from *P. parishii* in having a smaller lowest lemma (1.8-2.2 mm vs. 2.5-4 mm), lemma tips that are obtuse to truncate (vs. acute), and lemma veins that are glabrous or hairy, with short hairs that are sparsely and evenly distributed between the veins (vs. veins densely hairy and glabrous between the veins in *P. parishii*) (Davis and Consaul 2007; Davis 2012). It flowers from March to May (Munz 1959; Davis 2012).

Puccinellia simplex is known from moist alkaline soils in vernal pools, alkali sinks, alkali flats, dry lake edges, and meadows and seeps (Jepson 1912; Hitchcock 1950; Jepson 1923; Munz 1959; Twisselmann 1967; Davis 1993; Davis 2002; Davis and Consaul 2007; Taylor 2010; Davis 2012; Neubauer 2013; Consortium of California Herbaria 2015). About half of the occurrences of *P. simplex* are known from approximately 2 to 35 meters in elevation. The other half of occurrences range from about 35 to 930 ~~875~~ meters~~, with one occurrence (#31) at 2,550 meters in elevation~~ (Consortium of California Herbaria 2015; Google Inc. 2015).

Puccinellia simplex is currently known from approximately 73 ~~66~~ occurrences, mostly throughout the Great Central Valley. Three of its documented occurrences are in the western Mojave Desert, one of which is at Rabbit Springs (EO #64 ~~#65~~) at the same location of *P. parishii*. The Rabbit Springs occurrence of *P. simplex* was suspected by D. Keil (pers. comm. 2015) to be a misidentification of *P. parishii*; however, its presence there has been confirmed by A. Sanders and T. Thomas (pers. comms. 2015). One specimen from Riverside County was originally identified as *P. simplex* (*Roche and Korfhage s.n.*, UTC00241087; SEINet 2015), but is actually not a *Puccinellia* taxon (A. Sanders pers. comm. 2015). Of the 73 ~~66~~ occurrences of *P. simplex*, approximately 51 ~~50~~ are historical (having not been seen in over 20 years), and 31 of the historical occurrences have not been seen in over 50 years (occurrences with unknown collection

dates are considered historical based on when the collectors were active). Not only are nearly 70% ~~over 75%~~ of its occurrences historical, but approximately 10 of its occurrences are presumed extirpated and an additional 8 are possibly extirpated, leaving only 55 ~~48~~ presumed extant occurrences. Additionally, due to the historical status and vagueness of many of its occurrences, *P. simplex* is possibly known from even fewer occurrences, as some vague locations may actually be from the same vicinity. Other occurrences within close proximity of each other, particularly those located on Madera Irrigation District lands (EO #'s 68-73), could turn out to be a single occurrence if additional surveys took place between known populations after a favorable precipitation event. At the same time, it is equally possible that additional occurrences of *P. simplex* exist. Plants in the East Bay are usually pretty small and often somewhat depauperate, and can be confused with *Parapholis incurva* (minus the curve) (D. Lake pers. comm. 2015). However, *P. simplex* is generally distinctive overall, and unlikely to be overlooked (E. Dean, D. Lake, R. Morgan, and R. Preston pers. comms. 2015). Unlike many native annual grasses, it can form monoculture patches (R. Morgan pers. comm. 2015), and rather than being overlooked, it is probably more likely to be under-collected due to access (R. Preston pers. comm. 2015). As an annual, it is also not always up; populations at Edwards Air Force Base were observed to only come up after heavy rains, particularly in years with at least 10 inches of annual rainfall (D. Charlton pers. comm. 2015). More surveys of *P. simplex* should be conducted in attempts to find additional occurrences, and to update the historical and potential extirpated status of many of its known occurrences.

In Utah, *P. simplex* is ranked S1 by NatureServe (2015); however, it is ranked "Status Uncertain" by the Utah Native Plant Society (UNPS), as it is unknown whether *P. simplex* should be considered native in Utah (J. Alexander and T. Frates pers. comm. 2015). According to J. Alexander (pers. comm. 2015), "The two vouchers for Utah were collected in Weber Co. (*Arnow 3986*, 21 May 1974, UTC; *Arnow 4411*, 8 June 1975, UTC). This taxon is reported for Box Elder, Cache, Grand, Duchesne, Millard, San Juan, Sanpete, and Weber Counties in Barkworth et al. 2007 (Manual of Grasses for North America). It is only reported for Weber Co. in A Utah Flora. This taxon may be non-native in Utah, since Barkworth states that the populations in Utah are likely introductions. Its main range is in California only. At least in the Weber County location, it has not been collected in Utah since 1975."

Threats to *P. simplex* mostly include habitat fragmentation, alteration, loss, and habitat disturbance, as well as hydrological alterations. An occurrence recently found in San Luis Obispo County (EO #63 ~~#64~~) is threatened by a large-scale solar energy development project (D. Keil pers. comm. 2015). The majority of the presumed extirpated occurrences of *P. simplex* have been lost to development, urbanization, and agricultural conversion (EO #s 17, 18, 19, 26, 28, 46 ~~47~~, 53 ~~54~~, 61 ~~62~~, 62 ~~63~~) (E. Dean, R. Preston, D. Taylor, C. Witham pers. comms. 2015; Google Inc. 2015), while one occurrence in the Los Vaqueros Watershed (EO #13) is presumed extirpated due to reservoir flooding (J. Greenhouse pers. comm. 2015; Google Inc. 2015). Occurrences that are possibly extirpated (EO #s 11, 45 ~~46~~, 52 ~~53~~, 54, 55, 56, 57, 58~~, 59~~) are conceivably gone from development, urbanization, and agriculture as well (E. Dean, R.

Preston, D. Taylor C. Witham pers. comms. 2015; Google Inc. 2015). Documented threats to *P. parishii* at Rabbit Springs include ground water pumping, cattle grazing, flood control, and proximity to roads (CNDDB 2015). By proximity, the occurrence of *P. simplex* at Rabbit Springs (EO #64 ~~#65~~) is also threatened by these factors.

Based on the available information, CNPS and CNDDB recommend adding P. simplex to CRPR 1B.2 of the CNPS Inventory. Although it is currently known from 73 ~~66~~ occurrences, its high number of historical and presumed/possibly extirpated occurrences, and significant number and degree of threats, indicate it should be added to CRPR 1B.2 instead of CRPR 4 at this time. If additional information becomes available in the future which might constitute a change in the rarity or threat status of *P. simplex*, we will re-evaluate its status at that time.

Recommended Actions
CNPS: Add *Puccinellia simplex* to CRPR 1B.2
CNDDB: Add *Puccinellia simplex* to G2G3 / S2S3

Draft CNPS Inventory Record
Puccinellia simplex Scribn.
California alkali grass
Poaceae
CRPR 1B.2
Utah
Alameda, Butte, Colusa, Contra Costa, Fresno, Glenn, Kern, Los Angeles, Kings*, Lake, Madera, Merced, Napa, San Bernardino, San Luis Obispo, Santa Clara, Santa Cruz, Solano, Stanislaus, Tulare, Yolo
Lucerne Valley (131B) 3411648, Redman (185C) 3411778, Rosamond Lake (186D) 3411871, Mud Hills (207D) 3511711, Weed Patch (214B)* 3511828, Lokern (242A) 3511945, West Elk Hills (242D) 3511935, Lake Isabella South (260C) 3511854, Lost Hills (265C) 3511956, Cholame Valley (292D) 3512073, Cairns Corner (310B) 3611922, Taylor Weir (311C) 3611914, Monson (334A) 3611943, Traver (334B) 3611944, Goshen (334C) 3611934, Remnoy (335D)* 3611935, Riverdale (336A) 3611947, Kerman (359A)* 3612061, Jamesan (359B) 6312062, Helm (359D)* 3612051, Bonita Ranch (380B) 3612082, Gravelly Ford (380C) 3612072, Firebaugh NE (381A) 3612083, Ortigalita Peak NW (383B) 3612088, Los Banos Valley (384A) 3612181, Chittenden (386A) 3612185, El Nido (401B) 3712024, San Luis Ranch (403A) 3712027, Los Banos (403D) 3712017, Arena (422C) 3712036, Hatch (423B) 3712048, Crows Landing (424A) 3712141, Milpitas (427B) 3712148, Mammoth Mtn. (435A) 3711961, Ripon (443B) 3712162, Altamont (445B) 3712166, La Costa Valley (446D) 3712157, Byron Hot Springs (463C) 3712176, Clifton Court Forebay (463D) 3712175, Denverton (481B) 3812128, Fairfield South (482A)(?) 3812221, Saxon (497B)* 3812146, Dozier (498D) 3812137, Grays Bend (513B) 3812166, Davis (513C)(?) 3812156, Woodland (514A)* 3812167, Merritt (514D)* 3812157, Calistoga (517D) 3812255, Eldorado Bend (530D)(?) 3812177, Williams (546B)(?) 3912222, Arbuckle (546D) 3912211, Wilbur Springs (547C) 3912214, Pennington (561D) 3912137, Logandale (562B) 3912242

Meadows and seeps, chenopod scrub, valley and foothill grasslands, vernal pools / alkaline, vernally mesic; sinks, flats, and lake margins; elevation 2 to 930 ~~2,550~~ meters. Annual herb. Blooms March to May.
Threatened by hydrological alterations, urbanization, agricultural conversion, development, and habitat fragmentation, disturbance, alteration, and loss; resulting in extirpation of some occurrences. Potentially threatened by solar energy development. Possibly threatened by grazing and proximity to roads. Similar to *P. parishii*. See *Circular, United States Department of Agriculture, Division of Agrostology* 16:1 (1899) for original description.

Literature Cited

California Natural Diversity Database (CNDDB). 2015. RareFind 5 [Internet]. California Department of Fish and Wildlife [Government Version, 4 August 2015].

Consortium of California Herbaria. 2015. 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 8 July 2015].

Davis, J.I. 2002. *Puccinellia*. Pp. 595-596 *in* Baldwin, B.G., S. Boyd, B.J. Ertter, R.W. Patterson, T.J. Rosatti, D.H. Wilken, and M.E. Wetherwax (eds.), The Jepson Desert Manual: Vascular Plants of Southeastern California. University of California Press, Berkeley and Los Angeles.

___. 2012. *Puccinellia*. Pp. 1483-1484 *in* Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds.), The Jepson Manual: Vascular Plants of California, Second Edition. University of California Press, Berkeley and Los Angeles.

___. 1993. *Puccinellia.* Pp. 1292-1293 *in* Hickman, J.C. (ed.), The Jepson Manual: Higher Plants of California. University of California Press, Berkeley.

___ and L.L. Consaul. 2007. Puccinellia *in* Barkworth et al. (eds.), Flora of North America, vol. 24. Website http://herbarium.usu.edu/webmanual [accessed 8 July 2015].

Google Inc. 2015. Google Earth (Version 7.1.5.1557) [Software]. Available from at https://www.google.com/earth/.

Hitchcock, A.S. 1950. Manual of the Grasses of the United States. United States Department of Agriculture, Miscellaneous Publication No. 200. United States Government Printing Office, Washington, D.C. 1051 pp.

Jepson, W.L. 1912. A Flora of California, Vol. 1 (Part 3). Jepson Herbarium and Library, Berkeley. 578 pp.

Jepson, W.L. 1923. A Manual of the Flowering Plants of California. University of California Press, Berkeley and Los Angeles. 1238 pp.

Munz, P.A. 1959. A California Flora with Supplement. University of California Press, Berkeley and Los Angeles. 1681 pp.

NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Website http://explorer.natureserve.org/ [accessed 8 July 2015 2015].

Neubauer, D. 2013. Annotated Checklist of the Vascular Plants of Santa Cruz County, California, Second Edition. California Native Plant Society, Santa Cruz County Chapter, Santa Cruz, California. 166 pp.

Scribner, F.L. 1899. New Species of North American Grasses. Pp. 6 in Circular, United States Department of Agriculture, Division of Agrostology 16:1. Washington, D.C. (Original description.)

Southwest Ecological Information Network (SEINet). 2015. Website http://swbiodiversity.org/portal/index.php [Accessed 8 July 2015].

Taylor, D.W. 2010. Flora of the Yosemite Sierra. Lulu.com. 382 pp.

Twisselmann, E.C. 1967. A Flora of Kern County, California. University of San Francisco, California. 395 pp.