Kept *Lepidium jaredii* ssp. *album* and ssp. *jaredii* as California Rare Plant Rank 1B.2 taxa in the CNPS Inventory on March 27, 2013

Rare Plant Status Review: *Lepidium jaredii* ssp. *album* and ssp. *jaredii*
ssp. *album*: proposal to keep as 1B.2, G2T2 / S2
ssp. *jaredii*: proposal to ~~change from~~ keep as B.2, G2T1T2 / S1S2 ~~to 1B.3, G2T2 / S2~~

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Changes made to the original document appear in blue text.

Background

Lepidium jaredii sspp. *album* and *jaredii* are annual herbs in the Brassicaceae that are endemic to the San Joaquin Valley and inner South Coast Ranges. The species as a whole was first added to the CNPS Inventory in 1974 (1st Edition), and both subspecies were first recognized in the CNPS Inventory in 1994 (5th Edition). Both subspecies currently have a California Rare Plant Rank (CRPR) of 1B.2. Major treatments of the California flora, including Munz's (1968) *Supplement to the California Flora*, *The Jepson Manual* (*TJM* 1993), *The Jepson Manual, Second Edition* (*TJM 2*), and the *Flora of North America* (*FNA*), as well as Rollins's (1993) *The Cruciferae of Continental North America* have all treated *Lepidium jaredii* at the species level only, with no recognition of infraspecific taxa. None of these treatments reference ssp. *album* as a synonym, so it is possible that the authors were not aware of its existence. However, the Jepson eFlora notes ssp. *album* as being unresolved, and Kartesz and Meacham (1999) treat ssp. *album* as a rare California endemic. When *L. jaredii* was first described by T.S. Brandegee (1894), it was known from both the Carrizo Plain and Fresno County. Hoover (1966) first described *L. jaredii* ssp. *album* to apply to the plants from Fresno County, but the name has seen limited acceptance, appearing in the Hoover's (1970) flora of San Luis Obispo County but no major flora to date. Despite the limited acceptance of ssp. *album* in the published literature, sspp. *album* and *jaredii* are considered very distinct by several experienced California field botanists (R. Buck and D. Taylor pers. comm. 2012).

The two subspecies were first delineated based on flower color, plant size, and geography; subsequent observations and the lack of intermediate specimens provide further support for their distinctiveness. In its original description, Hoover (1966) separated ssp. *album* from the typical subspecies based on its white (vs. yellow) flowers and taller, stouter stems. Other treatments accounted for the color variation differently, noting that flowers of the species are lemon-yellow, fading to white in age (*TJM* 1993, *TJM 2*, *FNA*). According to R. Buck (pers. comm. 2012), this description of change in flower color only applies to ssp. *jaredii*, as petals of ssp. *album* are white with no trace of yellow. Hoover (1966) noted that ssp. *jaredii* is a shorter, more compact plant, and PGT-PG&E (1990) added that ssp. *jaredii* is less highly branched than ssp. *album*. Buck (pers. comm. 2012) and Taylor (pers. comm. 2013) also noted differences in habitat preference that separate the two taxa: ssp. *album* grows mostly on distinctive

white-gray lenses of heavy clay soil on hill slopes, while ssp. *jaredii* grows in alkaline valley bottoms. Some early collections of ssp. *album* were made near the mouths of large canyons, but they were likely transitory populations that established from seed originating on the clay lenses (R. Buck pers. comm. 2012). To our knowledge, no intermediate populations have been reported. However, both subspecies have been reported within 15 km of each other, near the "Four Corners" intersection of Monterey, Kings, Kern, and San Luis Obispo Counties (CNDDB EO#11 of ssp. *album* and EO#2 of ssp. *jaredii*). This region is at the southern limit of ssp. *album*, and the northern limit of ssp. *jaredii*. Buck (pers. comm. 2013) has notified staff at the Jepson Herbarium to update the Jepson eFlora so that it recognizes both subspecies; CNPS and CNDDB support this recommendation.

Of the two taxa, *L. jaredii* ssp. *album* is ~~currently~~ potentially of greater conservation concern. Threats to ssp. *album* may be increasing, with the proposal of a 9,400-acre wind energy project on Bureau of Land Management (BLM) lands in the Tumey Hills (R. Buck pers. comm. 2012), and a resurgence in oil and gas extraction in that region (D. Taylor pers. comm. 2013). The wind energy project is currently in a preliminary stage, and it is possible that the project will not go through (R. O'Dell pers. comm. 2013). Therefore, it is unknown which, if any, occurrences may be impacted by these threats. *Lepidium jaredii* ssp. *album* is currently known from 16 occurrences in the CNDDB; only two of which are recent (occurrences not documented in the past 20 years are considered historical by the CNDDB), with two occurrences presumed extirpated and one considered to be possibly extirpated by the CNDDB. Five occurrences of *L. jaredii* ssp. *album* are ranked "good" or "excellent" in the CNDDB; however, three of the excellent or good occurrences are historical and should be surveyed for and re-assessed since their current condition is unknown. Of the 16 occurrences, ten are at least partially on BLM lands (CNDDB 2013). In addition to these 16 occurrences, there are several collections and observations of *L. jaredii* ssp. *album* included in the Consortium of California Herbaria (CCH), Calflora, and personal observations by R. O'Dell, Natural Resource Specialist, BLM Hollister Field Office. Many of these additional records are included in the CCH and Calflora as *L. jaredii* without designation of subspecies; however, the majority can easily be determined based on the discrete ranges of the two subspecies (R. O'Dell pers. comm. 2013). O'Dell (pers. comm. 2013) recently analyzed these additional records of ssp. *album* and mapped them in relation to the 16 known CNDDB occurrences according to the quarter mile distance protocol used by the CNDDB to delineate separate element occurrences. This resulted in 6 to 9 additional occurrences documented from CCH. In addition to these 6 to 9 occurrences currently not documented in the CNDDB, R. O'Dell (pers. comm. 2013) discovered 38 new occurrences of ssp. *album* in the Tumey Gulch area as the result of two days of field work. These additional records will be further analyzed and mapped by the CNDDB, and it is apparent that additional field surveys may result in the discovery of new occurrences of *L. jaredii* ssp. *album*.

Lepidium jaredii ssp. *jaredii* is possibly less threatened, owing to the occurrence of most populations on the Carrizo Plain, as well as its great abundance in years with high rainfall (D. Taylor pers. comm. 2013; Calphotos 2013); however, the Carrizo Plains and

adjacent private lands are subject to cattle grazing, the same impact as the lands in which *L. jaredii* ssp. *album* occurs (R. O'Dell pers. comm. 2013). Furthermore, *L. jaredii* ssp. *jaredii* is threatened by solar energy development as seen by the recent California Solar Ranch power plant, and other potential solar power development projects to come to the Carrizo Plains (R. O'Dell pers. comm. 2013). The CNDDB's records of ssp. *jaredii* are not current, so the following statistics also reflect a review of more recent data (Consortium of California Herbaria, CCH, 2013; Calphotos 2013) and are summarized in the attached "Locations_LepidiumJaredii Jaredii" spreadsheet. Many records of *L. jaredii* in the CCH are not identified to subspecies, but all can easily be assigned based on habitat and/or location. It is currently known from about 13 occurrences, six of which are recently documented. Eight of those occurrences are ranked "good" or "excellent", while the remaining five have an unknown occurrence rank (based on current CNDDB ranks and ranks inferred from the CCH 2013). Many of the good and excellent occurrences include modifiers such as "locally common", "dominant", "abundant", or "50,000 plants". One collection of *L. jaredii* ssp. *jaredii* (*Marr 222, CHSC93996*) should probably be attributed to ssp. *album*, as it occurs at the site of a known occurrence of ssp. *album* (CNDDB EO # 18, based on *Taylor 14836*).

Based on the available information, CNPS and CNDDB recommend retaining *Lepidium jaredii* ssp. *album* and ssp. *jaredii* as ~~a~~ CRPR 1B.2 ~~taxon~~ taxa~~, but elevating its threat rank from .2 to .1. We also recommend retaining ssp. *jaredii* as a CRPR 1B taxon, but suggest a threat rank of .3 instead of .2. *Lepidium jaredii* ssp. *jaredii* has slightly fewer occurrences, but their large size and occurrence in protected areas suggest that a threat rank of .3 is more appropriate for this plant at this time. As an alternative, *L. jaredii* ssp. *jaredii* could be down-ranked to CRPR 4 due to its abundance and dominance throughout its known, protected distribution~~. Given the differences in morphology, habitat preference, and their non-overlapping geographic ranges, the two subspecies are easily distinguishable and should be afforded protection as two separate entities. If more information regarding their taxonomy or abundance becomes available in the future, CNPS and CNDDB will re-evaluate their status at that time.

Recommended Changes
Lepidium jaredii ssp. *album*
CNPS: Keep ~~and re-rank from~~ as 1B.2 ~~to 1B.1~~
CNDDB: Keep ~~and re-rank from~~ as G2T2 / S2 ~~to G2G3T1T2 / S1S2~~

Lepidium jaredii ssp. *jaredii*
CNPS: Keep ~~and re-rank from~~ as CRPR 1B.2 ~~to 1B.3~~
CNDDB: Keep ~~and re-rank from~~ as G2T1T2 / S1S2 ~~to G2G3T2T3 / S2S3~~

Revised CNPS Inventory Records
Lepidium jaredii Bdg. ssp. *album* Hoov.
Panoche perrer-grass
Brassicaceae
Rank 1B.2

Sent to: CW, GV, I. Al-Shehbaz, S. Markos, R. Buck, R. O'Dell, S. Richardson, T. Rosatti, T. Stoughton on 02/12/2013

Fresno, San Benito, San Luis Obispo
Orchard Peak (267B) 35120F2, Riverdale (336A)* 36119D7, Lillis Ranch (338B)* 36120D4, Ciervo Mtn. (339A) 36120D5, Idria (339B) 36120D6, Hernandez Reservoir (340A) 36120D7, Chounet Ranch (361B) 36120F6, Tumey Hills (361C) 36120E6, Mercey Hot Springs (362A)* 36120F7, Panoche (362D)* 36120E7, Laguna Seca Ranch (383D) 36120G7
Valley and foothill grassland (steep slopes, clay); elevation 185-275 meters.
Annual herb. Blooms February to June.
~~Threatened by gravel mining and cattle grazing.~~ Potentially threatened by wind energy development. Possibly threated by grazing and vehicles. Not in *TJM* (1993) and *TJM 2*. See *Leaflets of Western Botany* 10:345 (1966) for original description.

Lepidium jaredii Bdg. ssp. *jaredii*
Jared's pepper-grass
Brassicaceae
Rank 1B.3
Kern, San Luis Obispo
Valley and foothill grassland (alkaline, adobe); elevation 335 – 1005 meters.
Annual herb. Blooms March to May
Wells Ranch (217C) 35119A6, Elkhorn Hills (217D) 3511915, Painted Rock (218A) 35119B7, Chimineas Ranch (218B) 35119B8, Caliente Mtn. (218D) 3511917, Sawtooth Ridge (267A) 35120F1, Estrella (269A)* 35120F5
Known only from near Soda Lake on the Carrizo Plain (SLO Co.) and Devil's Den (KRN Co.). Threatened by solar energy development. Possibly threatened by grazing. See *L. jaredii* in *TJM* (1993) and *TJM 2.* See *Zoë* 4(4):398 (1894) for original description, and *Leaflets of Western Botany* 10:345 (1966) for taxonomic treatment.

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