

Deleted from CNPS Inventory on May 6, 2013

**Rare Plant Status Review: *Carex albida*
Proposed Deletion from California Rare Plant Rank 1B.1, G1 / S1**

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Background

Carex albida is a perennial rhizomatous herb in the Cyperaceae that has been included in the CNPS Inventory since the 1st Edition (1974). It is currently a California Rare Plant Rank 1B.1 taxon and is also State- and Federally- listed as Endangered. *Carex albida* is known from only one confirmed extant occurrence in the world; from Pitkin Marsh, Sonoma County, where it is threatened by competition with other plants and hydrological alterations, and potentially threatened by road maintenance and widening. It is included in *The Jepson Manual* (Mastroggiuseppe 1993) and the *Flora of North America, Vol. 23* (Ball and Mastroggiuseppe 2002), but is treated as a synonym of *C. lemmonii* in *The Jepson Manual, Second Edition (TJM 2)*; available online at: http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=17548) (Zika et al. 2012). *Carex albida* was first collected by J. M. Bigelow on May 1, 1854, who was the only botanist to collect it in the 1800's. Unfortunately the type material he collected was immature and for many decades there were no additional collections, leading botanists to eventually question its taxonomic validity (Zika and Wilson 2012). Following its collection, *C. albida* went through numerous taxonomic revisions, being first combined with *C. luzulina* by Mackenzie (1922), and then treated as a synonym of *C. lemmonii* by Mackenzie (1935, 1940) in his later work. His broad circumscription, however, was not accepted by Stacey (1937), who resurrected *C. albida* as *C. sonomensis*. Later, Howell (1957, 1965) included *C. sonomensis* within *C. albida* and retained *C. lemmonii* as a distinct species, as seen in Munz (Zika and Wilson 2012). This treatment was then followed by *The Jepson Manual* (Mastroggiuseppe 1993) and the *Flora of North America* (Ball and Mastroggiuseppe 2002); however, these different taxonomies were difficult to reconcile while preparing the *Carex* treatment for *TJM 2* (Zika et al. 2012) and an in-depth evaluation was required (Zika and Wilson 2012).

After submitting the final manuscript of the *Carex* treatment for *TJM 2*, first author P. Zika (pers. comm. 2011) provided six major reasons for why he decided to treat *C. albida* as a synonym of *C. lemmonii*, which are summarized as follows:

1. In a general sense, the plants comprising the single known extant population of *C. albida* at Pitkin Marsh do not look any different from many populations of *C. lemmonii*.
2. An argument can be made that low elevation plants in Sonoma County are highly disjunct from high elevation populations of *C. lemmonii*; however, this reasoning is weakened by a collection of *C. lemmonii* in Lake County at relatively low elevation (*Milo S. Baker 10931, UC728669*).

3. P. Zika interviewed or corresponded with more than 20 botanists working with California sedges or sedge taxonomy, including national experts, and none could provide a compelling reason to retain *C. albida* as a distinct species.
4. P. Zika had examined types or type images and many herbarium specimens labeled *C. albida* (or *C. sonomensis*) from over 10 major herbaria, and more than a century of botanical collecting showed no substantial morphological differences between *C. lemmonii* and *C. albida/sonomensis*.
5. It seems reasonable that a montane species like *C. lemmonii* could be found in a cold marshy or boggy habitat at low elevations, like many other montane plants. Slight differences in basal leaf widths of Pitkin Marsh plants from plants of higher elevations has no taxonomic significance, and is merely a phenotypic response to growing conditions. (Provided examples that were not included here).
6. P. Zika is fully aware that strong conservation arguments have been made in the past to continue to recognize *C. albida*, has a conservation background and is strongly conservation minded, but cannot in good conscience ask the state of California or the US Fish and Wildlife Service to continue expending time, money, and political capital on *C. albida*. It is not a distinct species, and he is not alone in the profession with this opinion.

In attempts to more definitively outline the taxonomic distinctiveness between *C. albida* and *C. lemmonii*, Zika and Wilson (2012) later compared and summarized 13 morphological characters that have been used to differentiate these species in the past century. They did this by reviewing 39 herbarium specimens of *C. albida* and 270 sheets of *C. lemmonii* that were collected across all of California, including all available types. Zika and Wilson (2012) then performed a principal components analysis (PCA), non-metric multidimensional scaling (NMS), and ANOVA to evaluate 18 morphological characters on a subset of 64 herbarium specimens. Multiple field visits to wild populations of *C. lemmonii*, and visits to cultivated plants of *C. albida* were also made in order to perform measurements on live plants. The results of Zika and Wilson's (2012) study were conclusive: "critical perigynium features, selected morphological characters, as well as statistical testing with ANOVA, PCA, and NMS all fail to distinguish *Carex albida* from *C. lemmonii* in the herbarium and in the field," and they therefore found no reason to retain *C. albida* as a distinct species.

Based on the comments from P. Zika followed by the results and recommendation in Zika and Wilson (2012), CNPS and CNDDDB recommend deleting *Carex albida* from California Rare Plant Rank 1B.1 of the CNPS Inventory (it will be treated as a synonym of *C. lemmonii* and placed on the Considered But Rejected list). *Carex albida* should also be evaluated for removal from the state and federal endangered species lists.

Recommended Actions

CNPS: Delete from 1B.1

CNDDDB: Delete from G1 / S1

Current CNPS Inventory Record

Carex albida Bailey

Sonoma white sedge

Cyperaceae

CRPR 1B.1

Sonoma (SON)

Santa Rosa (501B)?* 38122D6, Sebastopol (502A) 38122D7, Camp Meeker (502B)* 38122D8

Bogs and fens, marshes and swamps (freshwater); elevation 15 – 90 meters.

Perennial rhizomatous herb. Blooms May to June.

Known from only one confirmed extant occurrence at Pitkin Marsh; three historical occurrences extirpated by wetland drainage and spraying of chemical effluents.

Threatened by competition with other plants and hydrological alterations. Potentially threatened by road maintenance and widening. See *Memoirs of the Torrey Botanical Club* 1:9 (1889) for original description, and *Leaflets of Western Botany* 8(7):178-180 (1957) for taxonomic discussion.

Literature Cited

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