

**Added to California Rare Plant Rank 2B.2 of the CNPS Inventory on  
October 10, 2013**

**Rare Plant Status Review: *Heteranthera dubia***

**Proposed Addition to California Rare Plant Rank 2B.2, G5 / S1**

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**Background**

*Heteranthera dubia* is a perennial aquatic herb in the Pontederiaceae. It has a widespread distribution across North America from Canada to Mexico, as well as Cuba (Horn 2003). It was included in *The Jepson Manual* (McClintock 1993), *The Jepson Manual, Second Edition* (Horn and McClintock 2012; available online at [http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=28058](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=28058)), and the *Flora of North America* (Horn 2003; available online at [http://www.efloras.org/florataxon.aspx?flora\\_id=1&taxon\\_id=242101659](http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242101659)). It was first described as *Commelina dubia* by Jacquin in 1768, and then moved to the genus *Heteranthera* by MacMillan in 1892. *Heteranthera dubia* is probably the only member of its family and genus that is native to California, (Horn and McClintock 2012; C. Horn pers. comm. 2013). The native status of *H. dubia* in California is evidenced by its occurrence in nearby states, its occurrence in natural habitats within California, and an early, pre-1880 collection date in Mendocino County (Mason 1957; C. Horn pers. comm. 2013; Watson 1880). Three other members of the genus are found in California, including *H. limosa*, *H. multiflora*, and *H. rotundifolia*. All three of these species are native to the eastern United States and are found primarily as weeds in rice fields in California (Consortium of California Herbaria, CCH, 2013; Horn 2003). They were probably introduced after the beginning of rice cultivation in California in 1912 as contaminants in rice seed (C. Horn pers. comm. 2013; Barrett 1980). *Heteranthera dubia* is easily separated from the other taxa, as it is the only perennial species in the genus. It has narrower, more linear leaves than the other taxa (Horn 2003), and was even described by Mason (1957) as “grasslike.” *Heteranthera dubia* is also unique in the genus in having stamens of equal length, despite its generic name, which implies stamens of different lengths (Horn and McClintock 2012). It is similar to species of *Potamogeton* in its vegetative state, except that the leaves of *H. dubia* lack a distinct midrib (Horn and McClintock 2012). *Heteranthera dubia* blooms in California from July to October (CCH 2013).

*Heteranthera dubia* occurs in both still and moving alkaline waters. It requires a pH of 7 or higher and can grow extremely well in slightly eutrophic waters (Horn and McClintock 2012; C. Horn pers. comm. 2013). In California, populations have been documented from both moving and still water. Plants found growing in still vs. moving water show some differences in genetics and leaf morphology, but the two growth forms have never been described as distinct taxa (Horn 2003). *Heteranthera dubia* grows between approximately 30 and 1495 meters in California (based on collections in CCH 2013 and data submitted by B. Keelan).

There are currently only approximately 11 documented occurrences of *Heteranthera dubia* in California, none of which have been recently seen (occurrences not seen in the past 20 years are considered historical by the CNDDDB). Three of these occurrences are from collections that are over 50 years old and contain very vague location data, and only one occurrence has been seen more recently than 1979. The plant is found in the Modoc Plateau, the northern Sacramento Valley, and the north/central coast region of San Francisco, San Mateo, Marin, and Mendocino counties. One occurrence is found on the Modoc National Forest (*Savage 1275*), one is in the Glenn-Colusa Irrigation District (*Yeo s.n.*), and three occurrences are on or adjacent to a private ranch (*Grant 8349*, *Grant and Schneider 8345*, and *True 1007*; B. Keelan pers. comm. 2013). Landownership for the remaining occurrences is unknown. A pair of amateur botanists who are familiar with *H. dubia* from New York State, B. Keelan and E. Keelan (pers. comm. 2013) searched for historical occurrences of *Heteranthera dubia* along the Pit River near Canby and near Triangle in the Modoc National Forest in July of 2012, but did not find any plants. Although it is possibly extirpated from these areas, B. Keelan and E. Keelan suggest that *H. dubia* could possibly be detected if surveys were conducted at a later date. Lack of public access, specifically at Butte Sink (*Mason 13401*), and vague location data (for Lassen, Mendocino, and San Francisco/San Mateo County occurrences) would make future attempts at relocating some occurrences challenging. The occurrences north of Williams (*Yeo s.n.*) and at Fall River Mills (*Mason 14660*) should still be searched for. Additionally, if the Pit River passes through any calcareous substrates, those sections may have more alkaline waters that could support populations of *H. dubia* (B. Keelan pers. comm. 2013). Overall, however, *H. dubia* is apparently very rare and uncommon in California, and is likely mistaken as a pondweed (T. Barr pers. comm. 2013).

Outside of California, *Heteranthera dubia* is rare in parts of its range, but can be weedy in other locations. It is only known from historical occurrences in Oklahoma (SH), and is ranked "critically imperiled" (S1, generally 5 or fewer occurrences) in Colorado, Montana, and North Carolina, and "imperiled" (S2, generally 6 to 20 occurrences) to "vulnerable" (S3, generally 21 to 80 occurrences) in Delaware, Illinois, Iowa, Kansas, Kentucky, Maine and Massachusetts. It is also "imperiled" to "vulnerable" in several Canadian provinces (NatureServe 2013). However, in Arizona, *Heteranthera dubia* can grow "so profusely in canals and ditches as to obstruct the flow of water" (Kearney and Peebles 1951).

Threats to *Heteranthera dubia* in California are mostly unknown, given our lack of recent data on this plant. The reason for the possible extirpation of several occurrences is not known, as the waters appeared to have good potential habitat (B. Keelan pers. comm. 2013). If pH levels dropped at the sites of historical occurrences, the acidity of the water could have led to extirpations. Keelan (pers. comm. 2013) noted that several small dams had been constructed on the Pit River near Canby, but he believes this probably would have improved the habitat for *H. dubia*. Some of the known occurrences are from remote areas, and collection of aquatic plants can present an unusual challenge to botanists, so they may still be extant.

Based on the available information, CNPS and CNDDDB recommend adding *Heteranthera dubia* to California Rare Plant Rank 2B.2 of the CNPS Inventory. If more surveys at historical collection sites are conducted and the plant is not found, we will consider adjusting its rank to 2A, indicating its extirpation from California.

### Recommended Actions

CNPS: Add *Heteranthera dubia* to 2B.2

CNDDDB: Add *Heteranthera dubia* to G5 / S1

### Draft CNPS Inventory Record

*Heteranthera dubia* (Jacq.) MacMill.

water star-grass

Pontederiaceae

Rank 2B.2

Butte, Colusa, Lassen, Marin, Mendocino, Modoc, San Mateo, San Francisco, Shasta  
Alabama, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia,  
Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine,  
Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana,  
Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North  
Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Dakota, Tennessee, Texas,  
Vermont, Virginia, Washington, West Virginia, Wisconsin; Sonora

Sanborn Slough (561C) 3912138, Williams (546B) 3912222, Washington Mountain  
(693B) 4112048, Canby (693A) 4112047, Boles Meadow East (710A) 4112067, San  
Francisco North (466C) 3712274, San Francisco South (448B) 3712264, Fall River Mills  
(678C) 4112114, Hogback Ridge (661B) 4012184, Inverness (485D) 3812217

Marshes and swamps (alkaline, still or slow-moving water) / requires a pH of 7 or  
higher, usually in slightly eutrophic waters; elevation 30-1495 meters.

Perennial aquatic herb. Blooms July to October.

All occurrences are historical and some are possibly extirpated; need field surveys.

Need quads for LAS, MEN, SMT, and SFO cos. See *Observationum Botanicarum*  
3(9):59 (1768) for original description and *The metaspermae of the Minnesota Valley*,  
pp. 138 (1892) by C. MacMillan for taxonomic treatment.

### Literature Cited

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Sent to: on AQ, CW, GV, NW, MP, T. Barr, C. Horn, B. Keelan on 09/04/2013

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