

**Added to California Rare Plant Rank 1B.2 of the CNPS Inventory on  
September 14, 2015**

**Rare Plant Status Review: *Erythronium shastense*  
Proposed New Add to California Rare Plant Rank 1B.2, G2 / S2**

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Changes made to the original document appear in blue text.

### **Background**

*Erythronium shastense* D.A. York, J.K. Nelson, & D.W. Taylor is a perennial bulbiferous herb in the Liliaceae that is mostly restricted to limestone outcrops circumscribing the McCloud River and Pit River arms of Shasta Lake in northwestern Shasta County, California. It was recently described by York et al. (2015) and is therefore not included in *The Jepson Manual, Second Edition* (Allen 2012). *Erythronium shastense* was first collected as *E. californicum* by C. F. Rose in 1935 (Rose 30), but was not accessioned at JEPS until decades later (York et al. 2015). It was subsequently collected by D. Taylor nearly 60 years later in 1993 (Taylor 13302), and only recently recognized as a novel taxon based on recent collections and photographs from three distinct populations (York et al. 2015). *Erythronium shastense* is named for Shasta Lake, Shasta County, where the only known populations occur in close proximity to the reservoir (York et al. 2015). *Erythronium shastense* is distinguished in having “large (to 26 cm long) mottled leaves and large spreading flowers (tepals to 41 mm long)” and “[a]t anthesis, the style tends to be strongly declined and away from the anthers, resulting in herkogamy” (York et al. 2015). The orientation of flowers at anthesis in *E. shastense* is also a subtle, yet significant feature: “[m]any taxa of *Erythronium* L. offer flowers that are pendant atop a strongly geniculate (distally recurved) scape, with the dehiscing anthers and receptive style dangling below”, but “*E. shastense* flowers are significantly more often oriented laterally (spreading), with the tepals forming a parabola that is significantly more often oriented horizontally” (York et al. 2015). *Erythronium shastense* is morphologically most similar to *E. helenae* and *E. californicum*. It is distinct from *E. helenae* in having longer styles (8-14 mm versus 5-8 mm), longer leaves (12-26 cm versus 10-20 cm), and stamens up to 3 mm longer. Even though it was previously identified as *E. californicum*, *E. shastense* differs from this species in having bright yellow anthers (versus white to cream), larger leaves (12-26 cm long x 7-6.5[11] cm wide versus 7-15 cm long x 2.5-5 cm wide), and declined style (York et al. 2015). Although *E. shastense* is morphologically most similar to *E. helenae* and *E. californicum*, in phylogenetic studies these two latter species often pair together in a clade with *E. hendersonii*, *E. howellii*, *E. citrinum*, and *E. multiscapideum* (Clennett et al. 2012; Allen et al. 2003), and are keyed in similar fashion (Allen & Robertson 2002) (York et al. 2015). The recognition of *E. shastense* requires that the phylogeny of the North American clade be revisited, and genetic data could help verify if these three taxa form a monophyletic group. *Erythronium shastense* usually flowers from March to April, developing mature fruits in May (York et al. 2015), but recent observations by K. Heidel, L. Lindstrand III, and G. Youngblood (CNDDDB Field Survey Forms) have noted it flowering in early February.

*Erythronium shastense* occurs on north-facing or shaded limestone rock outcrops in lower montane coniferous forests and cismontane woodlands that are dominated by combinations of the following species: *Ceanothus cuneatus* var. *cuneatus*, *Cercocarpus betuloides*, *Chrysolepis sempervirens*, *Garrya fremontii*, *Holodiscus discolor*, *Pinus sabiniana*, *Pseudotsuga menziesii*, *Quercus chrysolepis*, *Q. garryana* var. *breweri*, *Q. kelloggii*, *Toxicodendron diversilobum*, and *Umbellularia californica*. It can form clumps like *E. helenae*, due to bulb offsets; an adaptation that is well suited for taxa that tend to grow in rocky conditions with little soil development. Known populations of *E. shastense* include one or more of the following species associates: *Adiantum shastense* (proposed addition to California Rare Plant Rank, CRPR, 4; see Huiet et al. 2015), *Ageratina shastensis*, *Boechera breweri* subsp. *shastaensis*, *Cercis occidentalis*, *Cheilanthes cooperae*, *Cymopterus terebinthinus* var. *californicus*, *Delphinium nudicaule*, *Erythranthe taylori*, *Sedum spathulifolium*, and *Selaginella wallacei*. *Adiantum shastense*, *Ageratina shastensis*, *Erythranthe taylori*, and *Neviusia cliftonii* are other Shasta Lake region-endemic rare plants that occur sympatric with or near *E. shastense* (CNPS 2014; York et al. 2015). *Erythronium shastense* is known from an approximate elevation of 350 to 1,020 meters (York et al. 2015).

*Erythronium shastense* is currently known from approximately sixteen occurrences. Fifteen of its occurrences are recent; twelve are located around the McCloud River arm of Shasta Lake, two are located around the Squaw Creek arm, and one is along the Pit River arm of Shasta Lake. The single historical occurrence is also along the Pit River arm of Shasta Lake (Rose 30 JEPS61880), but is estimated to be roughly 11 air km south of all other known occurrences. Since *E. shastense* is confused with, and was originally identified as *E. californicum*, a search of herbarium records of *E. californicum* from Shasta County was performed in the Consortium of California Herbaria (2014) in order to identify potential additional misidentifications of *E. shastense*, and hence potential additional occurrences. This search resulted in only three collections not accounted for in York et al. (2015) (*Applegate 7045*, *Smith et al. 9613*, *Taylor et al. 19102*), and all were confirmed to be *E. californicum* based on location or specimen review (J. Nelson, D. Taylor, and D. York pers. comm. 2014). Due to its taxonomic similarity to *E. helenae*, a similar search was performed in the Consortium of California Herbaria (2014) for this taxon, but resulted in no records found. This is not surprising as *E. helenae* is a species of limited distribution (CRPR 4.2) that occurs on volcanic or serpentinite substrates and is restricted to the vicinity of Mount Saint Helena in Lake, Napa, and Sonoma counties (CNPS 2014), well outside of the known range of *E. shastense*.

Most of the distribution of *E. shastense* is restricted to the McCloud and Hosselkus limestone formations, which formed between the Early Permian and Upper Triassic. The McCloud limestone formation in the Shasta Lake region forms a narrow band that is approximately 1 km wide by about 30 km long in a north-south orientation (Demirman & Harbaugh 1965; York et al. 2015). Although the distribution and abundance of *E. shastense* is likely not fully known, there have been floristic surveys over a substantial portion of its suitable habitat in recent decades by York et al. (2015) as well as other

botanists from the region. This is mostly due to past and ongoing surveys of *Ageratina shastensis*, *Neviusia cliftonii*, and *Erythranthe taylorii* (York et al. 2015), which are all CRPR 1B species that are known from limestone and endemic to the Shasta Lake region (CNPS 2014). Nevertheless, many limestone outcrops in the Shasta Lake region are difficult to access as they are remote from roads, on very steep slopes, and infested by poison oak, owing to an incomplete floristic exploration of the region (York et al. 2015), and additional surveys for *E. shastense* should be conducted.

Threats to *Erythronium shastense* include past and ~~current~~ **potential** mining of limestone within its potential habitat, potential hydrological alterations and development from the reservoir expansion of Shasta Lake, trail and road maintenance/construction, invasive species (*Rubus armeniacus* was documented as being dense at some known sites), and climate change (York et al. 2015). **It is also possibly threatened by horticultural collecting** (L. Lindstrand III and J. Nelson pers. comms. 2015). Further documentation and analysis of threats to *E. shastense* are necessary in order to adequately determine its endangerment status throughout its known range.

Based on the available information, CNPS and CNDDDB recommend adding *Erythronium shastense* to California Rare Plant Rank 1B.2 of the CNPS Inventory. If knowledge on the distribution, threats, and rarity status of *E. shastense* changes in the future, we will re-evaluate its status at that time.

### Recommended Actions

CNPS: Add to 1B.2

CNDDDB: Add to G2 / S2

### Draft CNPS Inventory Record

*Erythronium shastense* D.A. York, J.K. Nelson, & D.W. Taylor

Shasta fawn lily

Liliaceae

CRPR 1B.2

Shasta

Bella Vista (646B) 4012262, Bollibokka Mountain (664B) 4012282, Minnesota Mountain (664C) 4012272, Devils Rock (664D) 4012271, Hanland Peak (665A) 4012283, O'Brien (665D) 4012273

Cismontane woodland, lower montane coniferous forest / **usually** carbonate, rocky, north-facing or shaded, can form clumps due to bulb offsets; elevation 350 to 1,020 meters.

Perennial bulbiferous herb. Blooms (February) March to April.

Potentially threatened by hydrological alterations, development, limestone mining, trail and road construction and maintenance, non-native plants, and climate change.

**Possibly threatened by horticultural collecting.** Previously identified, and similar to, *E. californicum*; also similar to *E. helenae*. See *Madroño* 62(3):158-166 (2015) for original description.

### Literature Cited

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