

**Added to California Rare Plant Rank 1B.2 of CNPS Inventory on
April 20, 2015**

Rare Plant Status Review: *Sedum citrinum*
Proposed Addition to California Rare Plant Rank 1B.2, G2 / S2
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 March 9, 2015

Changes made to original document appear in blue text.

Background

Sedum citrinum is a perennial succulent herb in the Crassulaceae that is endemic to southern Del Norte County. It was recently described by Zika (2014) and was therefore not included in *The Jepson Manual* (Denton 1993), *The Jepson Manual, Second Edition* (Boyd and Denton 2012), or the *Flora of North America* (Ohba 2009). Prior taxonomic work in the genus *Sedum* has been hindered by the very poor quality of most pressed specimens, so a taxonomic study of *Sedum* sect. *Gormaniana* in northern California was initiated by the U.S. Forest Service. This study involved extensive field and herbarium work, including the use of photography, the development of a microwave treatment to prepare specimens for drying, as well as a freezing treatment for specimens that allows for future molecular work. This study indirectly led to the discovery of *S. citrinum* (Zika 2014).

Zika (2014) separated *Sedum citrinum* from other members of *Sedum* sect. *Gormaniana* based on morphological, habitat, and distribution information, but did not perform molecular work on the group. Zika (2014; p. 115) provides a table that distinguishes *S. citrinum* from related taxa in section *Gormaniana* from northern California and southern Oregon; we did not reproduce the table here because it is freely available online. Among the taxa that are compared, *Sedum kiersteadiae* (formerly recognized as *Sedum obtusatum* subsp. *boreale*; Wilson et al. 2014) is morphologically most similar to *S. citrinum*. Both taxa have widely spaced leaves on their sterile shoots, elongate, truncate-based stem leaves, and narrow divergent petals. They are separated by differences in inflorescence shape and width, as well as the corolla and anther color (Zika 2014). The two taxa are also separated phenologically, as *S. citrinum* finishes flowering in late June, around the time when *S. kiersteadiae* ~~*obtusatum* subsp. *boreale*~~ begins flowering. According to B. Wilson (pers. comm. 2015), *S. citrinum* is morphologically quite distinct from other taxa. Preliminary molecular work on the group does not suggest that *S. citrinum* individuals from nearby populations form a cohesive group (J. Van Susteren pers. comm. 2015). However, diversification within *Sedum* sect. *Gormaniana* is relatively recent and may not involve changes in many genes, so phylogenetic work may not reflect the species' evolutionary history well (B. Wilson pers. comm. 2015).

Sedum citrinum is restricted to serpentine outcrops in North Coast coniferous forest. Its habitat is generally rocky, including microhabitats such as talus or scree, crevices between boulders, and roadcuts. It grows on flats as well as gentle east- and west-

facing slopes. The restriction of *S. citrinum* to serpentinite is another factor that separates it from *S. kiersteadiae obtusatum* subsp. ~~boreale~~. While the latter is sometimes known from serpentinite, it is a substrate-generalist that also grows on volcanics and metamorphics. *Sedum citrinum* grows at elevations between 1050 and 1235 meters (Zika 2014). To date, *S. citrinum* has only been observed flowering in the month of June (Zika 2014).

There are currently only six known occurrences of *Sedum citrinum*. However, S. Darington's (pers. comm. 2015) experience with the plant suggest that there are likely more plants in the general area, but more surveys are needed. Additional surveys could actually result in a fewer total number of occurrences, as some occurrences that are currently separated by less than a mile could be lumped together. Zika (2014) estimated that the species is limited to fewer than 2,000 individuals over a 4 km² area, but additional surveys by S. Darington (pers. comm. 2015) nearly doubled the known area of occupancy, bringing it to approximately 7 km², and we estimate the potential habitat of this species to be about 13 km². Darington (pers. comm. 2015) did not provide data on population size, but presumably the total known global population has significantly increased as well. Darington (pers. comm. 2015), for example, states, "this is the most enduring and prolific population of *Sedum* section *Gormanina* I know of on any mountain". Because of the extensive recent work done on the group, Zika (pers. comm. 2015) feels that the discovery of additional specimens of *S. citrinum* beyond this vicinity is very unlikely.

Several potential threats to *S. citrinum* have been noted by Zika (2014) and D. Brainerd (pers. comm. 2015), including road-widening, road maintenance, off-road vehicles, and mining (due to evidence of past mining at one site). Darington (pers. comm. 2015) suggested that these potential threats are over-stated, given that the deteriorating state of the access road discourages use, and that the very rugged terrain and lack of water prevent use by OH riders and campers. Darington mentioned climate change and fire suppression as the only significant threats.

Based on the available information, CNPS and CNDDDB recommend adding *Sedum citrinum* to California Rare Plant Rank (CRPR) 1B.2. If more information on this plant becomes available in the future, we will re-evaluate its status at that time.

Recommended Actions

CNPS: Add *Sedum citrinum* to CRPR 1B.2

CNDDDB: Add *Sedum citrinum* to G2 / S2

New CNPS Inventory Record

Sedum citrinum Zika
Blue Creek stonecrop
Crassulaceae
CRPR 1B.2
Del Norte

Sent to: NW, D. Brainerd, S. Darington, N. Otting, J. Van Susternen, B. Wilson, P. Zika, NW on 03/09/2015

Summit Valley (722D) 4112357

North Coast coniferous forest/ serpentinite, rocky; talus, scree, or boulder crevices, sometimes roadsides; elevation 1050-1235 meters

Perennial succulent herb. Blooms June.

Potentially threatened by fire suppression and horticultural collecting. Possibly threatened by road widening and maintenance, and vehicles. Similar to and allopatric with *S. kiersteadiae obtusatum* ssp. ~~boreale~~. See *Phytotaxa* 159(2):111-121 (2014) for original description.

Literature Cited

Boyd, S. and M.F. Denton. 2012. *Sedum*. Pp. 674-676 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* (2nd ed.). University of California Press, Berkeley and Los Angeles.

Denton, M.F. 1993. *Sedum*. Pp. 531-534 in Hickman, J.C. (ed.), *The Jepson Manual: Higher Plants of California*. University of California Press, Berkeley.

Ohba, H. 2009. *Sedum*. Pp. 199-222 in *Flora of North America* Editorial Committee (eds.), *Flora of North America North of Mexico*, Vol. 8. New York and Oxford.

Wilson, B.L., R.E. Brainerd, and N. Otting. 2014. *Sedum kiersteadiae* (Crassulaceae), a newly described species from the Klamath Region of California, U.S.A. *Journal of the Botanical Research Institute of Texas* 8(1):9.

Zika, P.F. 2014. A new species of stonecrop (*Sedum* section *Gormaniana*, Crassulaceae) from northern California. *Phytotaxa* 159(2): 111-121. Available online at <http://biotaxa.org/Phytotaxa/article/view/phytotaxa.159.2.5>.