

Changes to original are in blue text**Rare Plant Status Review: *Sedum marmorense*****Proposed Addition to California Rare Plant Rank 1B.2, G12 / S1S2**

Ellen A. Dean (CNPS), Aaron E. Sims (CNPS), and Katie Ferguson (CNDDDB)
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This species review is being expedited through a challenge cost share agreement between the California Native Plant Society and the USDA Forest Service, Pacific Southwest Region. Aside from being advanced as part of this agreement, the process, content, and information provided herein is not altered, modified, or developed differently in any way or form compared to other status reviews developed by CNPS.

Background and Taxonomy

Sedum marmorense Otting & R. E. Brainerd is a perennial herb in the Crassulaceae endemic to California and known only from the Marble Mountains in the Klamath Ranges bioregion of Siskiyou County (Zika et al. 2018). It is not included in *The Jepson Manual* (Denton 1993), *Jepson eFlora* (Boyd and Denton 2012) or *Flora of North America* (Ohba 2009). In their recent paper on *Sedum* section *Gormaniana* of western North America, the members of the Carex Working Group examined populations belonging to section *Gormaniana* and redefined species limits (Zika et al. 2018). Several populations, some of which were previously identified as *Sedum obtusatum* subsp. *boreale*, were placed in *Sedum marmorense*.

In their work on *Sedum*, both Denton and the Carex Working Group emphasized visiting populations in the field and the study of living material (Denton 1982, Zika et al. 2018). The characters that separate *Sedum* species, such as corolla color, petal orientation, inflorescence orientation, and leaf color, shape, and orientation, are best seen in fresh material, and many herbarium collections are difficult to identify (Zika et al. 2018). *Sedum marmorense* can be separated from the other members of section *Gormaniana* by its combination of dense rosettes, relatively wide rosette leaves, much smaller stem leaves than rosette leaves, often globose to subglobose inflorescences that are nodding in bud, waxy granules on the calyxes and inflorescence branches (which can be missing due to weathering or drying at high heat), ascending, white to light yellow petals (aging pink), and yellow anthers that dry red-orange or red-brown (Zika et al. 2018). It is most similar to *S. oregonense*, a more common California native which also occurs in Siskiyou County; *Sedum oregonense* differs in having looser rosettes and lacking waxy granules on the calyxes and inflorescence branches (Zika et al. 2018).

Sedum marmorense, was named for the Marble Mountains and for the marble substrate on which it sometimes grows (Zika et al. 2018).

Ecology

This species grows in open upper montane coniferous forest and subalpine coniferous forest on dry, sunny ridgelines, ledges, or outcrops, as well as on talus among boulders between 1874 and 2345 m in elevation (Otting 2021 pers. comm., Zika et al. 2018). Within that rocky habitat, plants are found in cracks and crevices or soil pockets. The underlying bedrock can be metasedimentary, metavolcanic, or ultramafic, including limestone and marble (York 2021 pers. comm., Zika et al. 2018). Plants have been observed in flower in July and August (CalPhotos 2021, CCH2 2021, Zika et al. 2018). Some common associates include: *Abies concolor*, *Abies*

magnifica, *Tsuga mertensiana*, *Amelanchier alnifolia*, *Arctostaphylos* sp., *Holodiscus discolor*, *Draba pterosperma* (CRPR 4.3), *Achillea millefolium*, *Calamagrostis* sp., *Eriogonum umbellatum*, *Festuca roemerii*, *Heuchera* sp., *Lomatium macrocarpum*, *Myriopteris gracillima*, *Penstemon deustus*, *Polystichum* sp., and *Pseudoroegneria spicata* (York 2021 pers. comm., Zika et al. 2018).

Distribution and Abundance

We assembled location records for *Sedum marmorense* from four sources for this account: the Zika et al. (2018) paper; a spreadsheet of *Sedum* section *Gormaniana* species locations compiled by the Carex Working Group (CWG 2016); online specimen data for specimens identified as *S. marmorense* and *S. obtusatum* subsp. *boreale* (CCH2 2021, CPNWH 2021); and CalPhotos (2021) observations of *S. marmorense*. The final list of locations was vetted by authors of the Zika et al. (2018) paper as well as collectors who have visited the sites (Brainerd 2021 pers. comm., Otting 2021 pers. comm., York 2021 pers. comm., and Zika 2021 pers. comm.).

Sedum marmorense is endemic to a narrow zone in the Marble Mountains in the Klamath Ranges of Siskiyou County, California (Zika et al. 2018). At this time, there are only five location records for this species; all of the records occur on the Klamath National Forest, and three of these are within the Marble Mountain Wilderness Area. Only one of the location records is historical; the other four have been visited since 2013. For three of the records (#s 1, 2, and 3) populations were estimated to have several hundred plants over less than one hectare of area, although an exhaustive search was not carried out. Record #4, however, consists of thousands of plants along the east-facing ridge of Marble Mountain.

Two online specimen records of *Sedum obtusatum* subsp. *boreale* located within the Marble Mountain Wilderness (CCH2 2021) were not included in the list of records and are pink highlighted; one (*Howell 14905*) has been examined by an expert and determined to be *S. oregonense*, and the other (*Butler 139*) cannot be assumed to be *S. marmorense* and needs further study (Brainerd 2021 pers. comm., Zika 2021 pers. comm.).

Status and Threats

The name *Sedum marmorense* does not have any conservation status in California or elsewhere (NatureServe 2021). Within the Marble Mountain Wilderness, there are no imminent human-caused threats to this species (Brainerd 2021 pers. comm., York 2021 pers. comm.). Of the location records to the north of the Wilderness, only Record #3 (along a road near the top of Lake Mountain) has a location that is easily accessible and could be threatened by horticultural collectors (Otting 2021 pers. comm.). *Sedum marmorense* occurs near or at the summits of the mountains where it occurs. This means that as the climate of California warms due to climate change, this species cannot adjust its range upward in elevation (Anacker et al. 2013). This species could also be threatened by increased fire frequency due to climate change; *Sedum* species likely do not respond well to fire, and the heat of the fire can kill entire populations (Kierstead 2021 pers. comm.). However, most of the records of this species are not located in areas with tree cover where fire can spread easily; only one site (Record #2 at Tom Martin Peak) is partly covered by tree canopy (Brainerd 2021 pers. comm., Otting 2021 pers. comm., York 2021 pers. comm.).

Summary

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

Recommended Actions

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

CNDDDB: Add *Sedum marmorense* to G1G2 / S1S2

Draft CNPS Inventory Record

Sedum marmorense Otting & R. E. Brainerd

Marble Mountains stonecrop

Crassulaceae

CRPR 1B.2

Siskiyou

Boulder Peak (4112351), Marble Mountain (4112352), Scott Bar (4112361)

Upper montane coniferous forest, subalpine coniferous forest / openings, rocky, talus, rock crevices; elevation 1875-2345 meters

Perennial herb. Blooms July to August

Possibly threatened by horticultural collecting. Previously identified as *S. obtusatum* ssp. *boreale*, in part. Similar to *S. oregonense*; differs in having dense rosettes and waxy granules on calyxes and inflorescence branches vs. looser rosettes and lacking waxy granules in *S. oregonense*. See *Phytotaxa* 368: 1–61 (2018) for original description.

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