

Rare Plant Status Review: *Castilleja schizotricha*
Proposed Change from California Rare Plant Rank 4.3, G4 / S3 to 1B.3, G3 / S3

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Changes to original document are in blue font

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.

Castilleja schizotricha Greenm. is a California Rare Plant Rank (CRPR) 4.3 plant in Orobanchaceae that has been included in the CNPS Inventory since 1984 (CNPS 2021, see <http://www.rareplants.cnps.org/Plants/Details/430.html>). It is being proposed to change to CRPR 1B.3 due to having only 43 occurrences, with 29 of them being historical [During review, it became known that some of the occurrences are based upon erroneous specimen identification, and this species has fewer occurrences (Dana York in Forum Review)].

Castilleja schizotricha was proposed for rank change by D. York (pers. comm. 2021) due to its very limited range and scattered distribution. *Castilleja schizotricha* is only found in Siskiyou County, California ~~and Trinity counties in~~ and in Jackson and Josephine counties in Oregon, where it is a List 2/S2 species (ORBIC 2019). This species grows as scattered individuals, usually less than 50 at any given site, and its distribution could be limited by a number of factors, including host species distribution (D. York pers. comm. 2021) or resource competition. Multiple observations of *Castilleja schizotricha* have been made along the Pacific Crest Trail near Marble Rim and between Marble Gap and Black Marble Mountain in the Marble Mountains Wilderness. The earliest of these records is from 1939 (by J.T. Howell) and the most recent are from 2020 and posted on iNaturalist. These observations suggest populations are persisting through time, but more information is needed to determine overall population trends for this species. Climate change may be the biggest threat to this species. It generally grows on peaks and ridges, limiting available habitat for migration if climate change results in hostile biotic or abiotic conditions within its current range (D. York pers. comm. 2021). Most *Castilleja* species appear to be generalist hemiparasites, though some host plants may be more beneficial than others (Matthies 1997, Adler 2001, Adler and Wink 2003, Sclafani 2006). Where host preferences have been documented in *Castilleja*, bunchgrasses and plants in the genera *Artemisia*, *Lupinus*, and *Eriogonum* were often preferred (FNA 1993+). Most *Castilleja* can grow without a host plant but will be larger and more productive with a host plant, particularly those that can fix nitrogen or provide chemical defenses against herbivores (Walsh 1993, Alder 2001, Alder and Wink 2003). The host species for split-hair paintbrush have not been studied, but it has been observed growing from *Sedum marmorense* and *Phlox diffusa* (D. York pers. comm. 2021). Whether split-hair paintbrush requires a host to survive is unknown.

As a CRPR 4 plant, *Castilleja schizotricha* has not been mapped at the occurrence level by the California Natural Diversity Database (CNDDDB) and all occurrences presented herein are an estimate of those that would be mapped in the CNDDDB if its status is changed. There are currently an estimated 43 occurrences of *C. schizotricha*, of which 29 are considered historical (occurrences not seen in over 20 years are considered historical by CNDDDB) with 13 of 29 being

over 50 years old. [During review, it became known that some of the occurrences are based upon erroneous specimen identification, and this species has fewer occurrences (Dana York in Forum Review)]. All records are on National Forest lands (31 on the Klamath National Forest and eleven on the Rogue River-Siskiyou National Forest, ~~and one on the Shasta-Trinity National Forest~~). [Shasta-Trinity NF record in Trinity County is in error (Dana York 2022 pers comm)]. Thirty-six of the 43 records are within Wilderness Area boundaries, with two additional records within 0.25 miles of a Wilderness boundary. While this means the majority of known occurrences of this species are in areas that are afforded some additional protections, the small number of occurrences combined with the small range suggests this species is susceptible to stochastic events.

With only 43 known occurrences and a restricted range, we propose to change *Castilleja schizotricha* from CRPR 4.3 to 1B.3 in the CNPS Inventory and CNDDDB. If new research and information on the status of *C. schizotricha* becomes available, we will reevaluate its status at that time.

Recommended Actions

CNPS: Change *Castilleja schizotricha* from CRPR 4.3 to 1B.3

CNDDDB: Change *Castilleja schizotricha* from G4 / S3 to G3 / S3

Revised CNPS Inventory Record (changes from original record are in green text)

Castilleja schizotricha Greenm.

split-hair paintbrush

Orobanchaceae

USDA Symbol: CASC20

CRPR: 1B.3

Other Status: None

States: California, Oregon

Counties: Siskiyou, ~~Trinity~~

Quads: Boulder Peak (4112351), Figurehead Mtn. (4112383), ~~Grider Valley (4112362)~~, Kangaroo Mtn. (4112382), Marble Mountain (4112352), ~~McCloud (4112232)~~ Preston Peak (4112375), ~~Rush-Creek-Lakes (4012278)~~, Ukonom Lake (4112353)

Upper montane coniferous forest; elevation 1500 - 2300 meters.

Microhabitat: carbonate (often), decomposed granitic, marble (often), serpentinite (often)

Perennial herb (hemiparasitic).

Blooms July to August.

Original description: *Botanical Gazette* 53(6): 511 (1912)

Literature Cited

Adler, L. S. 2003. Host species affects herbivory, pollination, and reproduction in experiments with parasitic *Castilleja*. *Ecology* 84(8): 2083–2091.

Adler, L. S. and M. Wink. 2001. Transfer of quinolizidine alkaloids from hosts to hemiparasites in two *Castilleja-Lupinus* associations: analysis of floral and vegetative tissues. *Biochemical Systematics and Ecology* 29: 551–561.

[CNPS] California Native Plant Society, Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website <http://www.rareplants.cnps.org> [accessed June 2021].

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Greenman, J. M. 1912. Some plants of western America. *Botanical Gazette* 53(6): 511.

Kaye, T. N. and B. Lawrence. 2003. Fitness effects of inbreeding and outbreeding on golden paintbrush (*Castilleja levisecta*): Implications for recovery and reintroduction. Washington Department of Natural Resources and Institute for Applied Ecology, Corvallis, OR. 22 pp.

Matthies, D. 1997. Parasite–host interactions in *Castilleja* and *Orthocarpus*. *Canadian Journal of Botany* 75(8): 1252–1260.

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Sclafani, C. J. 2006. *Castilleja cinerea*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Website: <https://www.fs.fed.us/database/feis/plants/forb/cascin/all.html> [accessed May 2021].

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Personal Communications

York, Dana. 2021. Senior Environmental Planner, CALTRANS North Region Environmental. Phone conversation regarding distribution and threats to *Castilleja schizotricha*. Personal communication 10 May 2021.

York, Dana. 2022. Senior Environmental Planner, CALTRANS North Region Environmental. Phone conversation regarding reidentification of Trinity County specimen of *Castilleja schizotricha*. Personal communication 19 Jan 2022.