

NINE-MILE CANYON PHACELIA

Phacelia novemmillensis Munz

Author: Scott D. White, Scott White Biological Consulting, 99 East C St., No. 206, Upland, CA 91786

Management Status: Federal: USFWS Species of Concern
California: G2/S2.2 (CDFG, 1998)
CNPS: List 1B; R-E-D Code 3-2-3 (Skinner and Pavlik, 1994)

General Distribution:

Nine-mile canyon phacelia is a very narrowly endemic species of the mountain crest in the headwaters of the Kern River watershed (Chimney Creek) and on upper slopes of the adjacent east-facing canyons, southern Sierra Nevada Mountains. Elevations range from about 5400 ft. (1650 m) at Chimney Creek to at least 7700 ft. (2350 m) at several sites on the Pacific Crest Trail. All confirmed records are within 5 miles (8 km) of the point where Inyo, Kern, & Tulare Counties meet. It has also been reported about 25 miles (40 km) northwest, in Dark Canyon (Shevock, 1977), at about 8200 ft. (2500 m) elevation, though its occurrence there needs to be confirmed. All or most specimens have been collected near roads or along trails; these presumably represent only the most accessible populations, and the plant's distribution almost certainly extends several miles around the known population centers, on poorly accessible slopes both east and west of the mountain crest.

The Dark Canyon report is based on two specimens: one collected by Ernest Twisselmann (his no. 13905, presumably in the California Academy of Sciences collection) and one collected by James Shevock (no. 5600, kept in his personal collection). Since the earlier report, Shevock has determined that his specimen was mis-identified, and was unsure whether the Twisselmann specimen had been reexamined since its original determination (James Shevock, pers. comm.). These two specimens are evidently the only reports of Nine-mile canyon phacelia's occurrence outside the area described above. CNDDDB location 4 is based on the misidentified Shevock specimen; locations 5 and 8 are from the same general area and evidently are not supported by vouchers. The reidentification of the Shevock specimen casts doubt on Nine-mile Canyon phacelia's occurrence in the Dark Canyon area.

Distribution in the West Mojave Planning Area:

The type locality, CNDDDB occurrence no. 3, is in Nine-Mile Canyon (Munz 19463; [Munz & Roos, 1955]) at 6500 ft. (ca. 1980 m) elev. near the northwestern WMPA boundary "in pinyon-juniper woodland, dry, half-shaded disturbed bank; Nine-Mile Canyon, E. slope of S. Sierra Nevada, extreme S. Inyo Co." Follow-up surveys have not relocated the plant and it is probably best considered extirpated at this location, though it is likely extant in the canyon's uppermost slopes, near the mountain crest.

CNDDDB occurrence no. 10 is on the Pacific Crest Trail, about two miles south-southwest of the type location, in Tulare County, just west of the WMPA boundary. CDFG reports this only as an observation by Ertter et al., but it is supported by a specimen (Ertter 6391 RSA) collected on the same date at nearly the identical site. The observation and voucher likely represent the most accessible portion of a more widespread population, which may well extend east into the WMPA in adjacent Inyo County. CNDDDB occurrence no. 11 is about 2 miles (3.5 km) farther south, in Kern County, and also is very near (but outside) the WMPA. CNDDDB data indicates that the record needs to be verified, but the mapped location is very near a voucher collected in 1987 (Ertter 7005 RSA; note that this voucher may also represent an unnumbered occurrence in CNDDDB dated 26 May 1987). Again, this population is likely to extend into the WMPA.

CNDDDB occurrence nos. 6 and 7 are on the east slope of Owens Peak, in the Indian Wells Canyon watershed, just within the WMPA. Both locations are based on reports by Shevock et al. in 1985. There evidently are no vouchers for these locations.

There also may be a population in Sand Canyon, within the WMPA, about midway between the Owens Peak and Nine-mile Canyon locations. Plants resembling *Phacelia novemmillensis* were observed there by G. Harris (pers. comm.), but were not keyed and no specimen was made. The site has not been revisited.

Natural History:

Nine Mile Canyon phacelia is an annual with one or several ascending to erect stems 5-10 cm tall, short soft-hairy and sparsely glandular. The lower leaves are generally pinnately lobed or compound, ca. 0.8-3.1 in. (2-8 cm) long (rarely longer); upper leaves are reduced, simple, and entire. Leaves are on long petioles, the blades or lobes lanceolate, oblanceolate, or narrow-elliptic; short-hairy on veins of the undersides. Inflorescences are of ca. 8-14 flowers in compact cymes, about 0.8 in. (2 cm) long. Flowers are on short (0.04-0.2 in [1-5 mm]) pedicels; sepals are linear, with long straight hairs along margins; roughly equal in length, ca. 0.08-0.16 in (2-4 mm) long at flowering, expanding to ca. 0.3-0.4 in. (8-10 mm) in fruit. The petals are fused into a lavender bell-shaped corolla, 0.12-0.16 in. (3-4 mm) long with five rounded lobes. The filaments are fused to the corolla, along with a series of narrow scales. The entire corolla falls early from the flower. The stamens and style are glabrous and reach to or just beyond the corolla lobes. The mature fruit is 0.08-0.12 in. (2-3 mm) long, ovoid, covered by short hairs, and surrounded by the expanded calyx. Roughly 2-4 seeds are produced by each fruit. An illustration of the fruit and calyx is provided by Wilken et al. (1993: 707). Important identification characters are the simple, entire upper leaves; relatively long sepals (in fruit); deciduous corolla with narrow scales and glabrous outer petal surfaces; glabrous filaments; and few ovules and seeds.

Munz (1959) reported Nine-mile Canyon phacelia flowering in May, probably based only on the type specimen. Since then, at least two flowering specimens have been collected in early June. Both these specimens were also fruiting. Barbara Ertter's collection no. 7005 was in flower but not yet fruit in late May.

No information is available on pollination vectors or self-compatibility, seed dispersal, mycorrhizal associates, population fluctuations with climatic variables, or other aspects of Nine-mile Canyon phacelia's natural history. The plant's flower form and color suggest a generalist insect pollinator. Its annual habit and occurrence on arid mountain slopes suggests that its numbers may vary widely with precipitation.

Habitat Requirements:

Nine-mile Canyon phacelia is generally found in sandy, gravelly, or rocky soils, sometimes disturbed, in the understory of pinyon (*Pinus monophylla*) and/or canyon live oak (*Quercus chrysolepis*) woodland. Barbara Ertter noted on herbarium labels that it was "locally common under oaks," (no. 6391) and "locally abundant, especially beneath [pinyon?] pines" (no. 7005). Steve Boyd & David Bramlet did not note on their label (no. 1954) whether the plant was beneath trees, but the specimen itself has an elongated habit, suggesting a shaded location. Shevock (pers. comm., 1998) recalled that it generally occurs around the dripline of pinyons and oaks, and also in open sun, but not in full shade. Specimens have been collected on flat sites (Ertter et al. 6391 RSA) and on steeper banks (Munz 19463 POM). Parent material has not been noted on labels, but based on location, most specimens have presumably been collected from granitic substrates. No labels or other sources mention talus as Nine-mile Canyon phacelia habitat, but plants at the unconfirmed Sand Canyon location were on talus (G. Harris, pers. comm.) and habitat descriptions on some labels are consistent with talus.

Population Status:

The type locality in Nine-mile Canyon and several Chimney Creek/LaMont Meadow sites have reportedly been completely or nearly extirpated by grazing (within the WMPA) and campground construction (outside the WMPA) (Anon., 1981; Bowen, 1984; CDFG, 1997b). A 1986 collection (Boyd and Bramlet 1954 RSA) was collected upstream from CNDDDB occurrences 1 and 2 in 1986, suggesting that remnant populations may still be extant near the extirpated populations. Pacific Crest Trail locations from Owens Peak to Sawtooth Peak probably are not threatened by human activity. Some of the populations have reportedly been very small, but two were described as "locally common" or "locally abundant" on Barbara Ertter's herbarium labels. It is unclear whether populations may fluctuate widely from year to year, or whether the plant is significantly more common in some locations than in others. Most populations are in Wilderness areas and are poorly accessible due to topography and paucity of roads or trails.

Threats Analysis:

Skinner and Pavlik (1994) indicate that Nine-mile Canyon phacelia is "threatened by grazing and recreation," presumably based on unpublished notes and reports in California Dept. of Fish & Game files (Anon., 1981; Bowen, 1984). Both of these sources are worded strongly, indicating heavy

overgrazing at the type locality (the woodland understory completely or almost completely barren), repeated negative survey results in the early 1980s at the type locality and Chimney Creek sites, and loss of a population in Chimney Creek / Lamont Meadows. Herbarium labels have often indicated Nine-mile Canyon phacelia growing beneath pinyon pine and Canyon live oak. Regular occurrence in shaded sites may tend to place the plant in areas preferentially used by cattle for feeding or resting. If herbaceous vegetation is absent or sparse at the Nine-mile Canyon site, as reported (Anon., 1981; Bowen, 1984) then these areas may be inherently susceptible to overgrazing, and any *P. novemmillensis* populations growing within reach of cattle would likely be heavily impacted by grazing.

Biological Standards:

Ernest Twisselmann's Dark Canyon specimen should be reexamined to determine whether it was correctly identified. Dark Canyon is not within the WMPA, but the population, if it exists, represents a significant extension of Nine-mile Canyon phacelia's range and has direct bearing on understanding of the plant's narrow endemism.

The Sand Canyon site should be revisited and carefully surveyed to determine whether Nine-mile Canyon phacelia occurs there. If accessible, other east-facing canyons between Little Lake Canyon and Indian Wells Canyon should also be surveyed to determine whether additional populations occur within the WMPA. Botanists should view herbarium material in flower and fruit prior to surveys and familiarize themselves with the key characters so that dependable identifications can be made from late May through mid-July. Any new locations should be documented by voucher specimens and reported to the CNDDDB.

Range condition at the Nine-mile Canyon type locality should be evaluated. While the specific effects of grazing on Nine-mile Canyon phacelia are unknown, it is likely that heavy grazing would result in cattle feeding on the plant and/or regularly disturbing its habitat. It is unknown whether seeds survive passage through the bovine digestive tract, or if so, whether they can germinate from feces. Regular (or at least occasional) surveys at the Nine-mile Canyon site should be made, particularly if grazing pressure has been or is ever reduced.

Management actions planned within the species known and potential range (i.e., southern Sierra Nevada above about 5500 feet [1680 m] elev.) should consider potential effects to Nine-mile Canyon phacelia populations or habitat suitability. Potentially adverse actions include direct disturbance (e.g., road or trail construction); reductions in woodland canopy cover (e.g., logging or prescribed burning); and grazing.

No management standards for Nine-mile canyon phacelia can be recommended without an improved understanding of its population ecology, geographic distribution, and habitat requirements. Management conflicts should be minimal since its distribution is largely within wilderness areas and poorly accessible high mountain slopes.

Literature Cited:

- Anon. 1981. Sensitive Species Status Report: *Phacelia novemmillensis*. On file at California Department of Fish and Game, Sacramento, California.
- Bowen, C. 1984. Unpublished notes. On file at California, Department of Fish and Game, Sacramento, California.
- California Department of Fish and Game (CDFG). 1997a. Special Plants List. Natural Heritage Division, Natural Diversity Database, Sacramento, California.
- California Department of Fish and Game (CDFG). 1997b. *Phacelia novemmillensis* element occurrences. Natural Heritage Division, Natural Diversity Database, Sacramento, California.
- Munz, P.A. 1959. A California Flora. Univ. California Press, Berkeley, California.
- Munz, P.A. and J.C. Roos. 1955. California miscellany III. *Aliso* 3:111-129.
- Shevock, J. 1977. *Phacelia novemmillensis*. Unpublished status review, on file at Sequoia National Forest.
- Skinner, M.W. and B.M. Pavlik (eds.). 1994. Inventory of Rare and Endangered Vascular plants of California. Special Pub. No. 1 (5th ed.). California Native Plant Society, Sacramento, California.
- Wilken, D.H., R.R. Halse, and R.W. Patterson. 1993. *Phacelia*. pp. 691- 706 *In*: J. C. Hickman (ed.), The Jepson Manual: Higher Plants of California. Univ. California Press, Berkeley, California.