Staff Summary for October 8-9, 2025

## 13. Gerry's Curly-Leaved Monardella

**Today's Item** **Information ☐** **Action ☒**

Consider and potentially act on the petition, the Department's evaluation report, and comments received to determine whether listing Gerry's curly-leaved monardella (*Monardella sinuata* subsp. *gerryi*) as an endangered species under the California Endangered Species Act (CESA) may be warranted.

### Summary of Previous/Future Actions

| | |
|---|---|
| • Received petition | February 19, 2025 |
| • Transmitted petition to Department | February 28, 2025 |
| • Public receipt of petition | April 16-17, 2025 |
| • Received Department's 90-day evaluation report | July 10, 2025 |
| • **Today potentially determine petitioned action may be warranted** | **October 8-9, 2025** |

### Background

In February 2025, the Commission received from the California Native Plant Society a CESA petition to list Gerry's curly-leaved monardella (*Monardella sinuata* subsp. *gerryi*) as endangered; the Commission transmitted the petition to the Department for an evaluation and recommendation.

California Fish and Game Code Section 2073.5 requires that the Department evaluate the petition and submit a written evaluation with a recommendation to the Commission; the Commission publicly received the Department's evaluation report (exhibits 2 and 3) at its August 2025 meeting. The evaluation report delineates each of the categories of information required for a petition, evaluates the sufficiency of the available scientific information for each of the required components, and incorporates additional relevant information that the Department possessed or received during the review period. Based on the information contained in the petition and other relevant information, the Department concludes that there is sufficient information to indicate the petitioned action may be warranted.

At today's meeting, the Commission will receive a presentation on the Department's petition evaluation, receive a presentation from the petitioners, and hold a public hearing to receive oral testimony. If the Commission determines listing may be warranted, pursuant to Section 2074.2 of the Fish and Game Code, the Department will undertake a one-year status review of Gerry's curly-leaved monardella before the Commission can make a final decision on listing.

CESA and the Commission's listing regulation require that the petition contain specific scientific information related to the status of the species. CESA and case law interpreting it make clear that the Commission must accept a petition when the petition contains sufficient information to lead a reasonable person to conclude there is a substantial possibility the requested listing could occur; the requested listing is tied to the species' status, that is,

whether the species' continued existence is in serious danger or is threatened by a number of factors, and in no way relates to economic consequences that might result from listing.

If the Commission determines the petitioned action may be warranted, Gerry's curly-leaved monardella becomes a candidate species pursuant to Fish and Game Code Section 2074.2. Candidate species are protected during the remainder of the listing process pursuant to Fish and Game Code Section 2085.

**Significant Public Comments (N/A)**

**Recommendation**

***Commission staff:*** Determine that listing may be warranted; direct staff to issue a notice reflecting this finding and indicating that Gerry's curly-leaved monardella is a candidate species.

***Department:*** Accept the petition for further consideration under CESA.

**Exhibits**

1. Petition, received February 19, 2025
2. Department memo, received July 10, 2025
3. Department 90-day evaluation report, dated June 2025
4. Department presentation
5. Petitioner presentation

**Motion**

Moved by _____ and seconded by _____ that the Commission, pursuant to Section 2074.2 of the California Fish and Game Code, finds that the petition to list Gerry's curly-leaved monardella as an endangered species does provide sufficient information to indicate that the petitioned action may be warranted based on the information in the record before the Commission, and directs staff to issue a notice reflecting this finding and indicating that Gerry's curly-leaved monardella is a candidate species.

***OR***

Moved by _____ and seconded by _____ that the Commission, pursuant to Section 2074.2 of the California Fish and Game Code, finds that the petition to list Gerry's curly-leaved monardella as an endangered species does not provide sufficient information to indicate that the petitioned action may be warranted based on the information in the record before the Commission.

# PETITION TO THE CALIFORNIA FISH AND GAME COMMISSION TO LIST GERRY'S CURLY-LEAVED MONARDELLA (*MONARDELLA SINUATA* SUBSP. *GERRYI*) UNDER THE CALIFORNIA ENDANGERED SPECIES ACT

**Figure 1:** *Monardella sinuata* subsp. *gerryi* (Photograph by M. Elvin; iNaturalist 2024)

February 6, 2025

***The California Native Plant Society***

**FGC – 670.1 (3/94)**

# NOTICE OF PETITION TO THE STATE OF CALIFORNIA FISH AND GAME COMMISSION

For action pursuant to Section 670.1, Title 14, California Code of Regulations (CCR) and Sections 2072 and 2073 of the Fish and Game Code relating to listing and delisting endangered and threatened species of plants and animals.

## I. SPECIES BEING PETITIONED

**Common name:** Gerry's curly-leaved monardella
**Scientific name:** *Monardella sinuata* subsp. *gerryi*

## II. RECOMMENDED ACTION

a. **List** **X**
**As endangered**
b. Change Status ☐
c. Or Delist ☐

## III. AUTHORS OF PETITION

Name: Nick Jensen, PhD

Address: 2707 K Street, Suite 1, Sacramento, CA 95816

Phone: [redacted]

Email: [redacted]

*I hereby certify that, to the best of my knowledge, all statements made in this petition are true and complete.*

**Signature**

[redacted]

**Date** 19-February-2025

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# EXECUTIVE SUMMARY

*Monardella sinuata* subsp. *gerryi* (Gerry's curly-leaved monardella) is an annual herb in the mint family, Lamiaceae (Elvin et al. 2015). It was described in 2015 and occurs in the Camarillo and Las Posas hills of Ventura County (Elvin et al. 2015, CCH2 2024, CNDDB 2024). Prior to being described as *Monardella sinuata* subsp. *gerryi* in 2015, it was only known from two historical herbarium specimens (Elvin et al. 2015, CCH2 2024). The discovery of an extant population in 2013, which would become Element Occurrence (EO) #3, supported the description by Elvin et al. (2015) as a taxon new to science. Recent genetic research supports its treatment as a full species distinct from *Monardella sinuata* (Drew 2024 pers. comm.). *Monardella sinuata* subsp. *gerryi* grows in open sandy patches within coastal sage scrub (Elvin et al. 2015). It only occurs on the Las Posas Sand, a Pleistocene geological formation with a distribution limited to central Ventura County (Tan et al. 2004a, Elvin et al. 2015, CCH2 2024). It has been documented from three

occurrences, one of which is presumed extirpated by development, and its total distribution is less than 2 square kilometers (Elvin et al. 2015, CNDDB 2024). Since 2013, only one additional extant site has been documented when a population was rediscovered in the Camarillo Hills in 2024 (EO#2; CNDDB 2024). Given the extremely limited collection record, the historical distribution of *Monardella sinuata* subsp. *gerryi* is unknown but may have included much of the southern slope of the Camarillo and Las Posas hills in areas with suitable geological conditions and microhabitat. While additional occurrences may exist in remnant coastal sage scrub of the Camarillo and Las Posas hills, all potentially suitable habitat is highly fragmented and threatened by development and conversion to agriculture. Agricultural conversion, development, land clearing and grading, maintenance and construction of roads or trails, nonnative plants, vegetation succession, and erosion are direct threats to *Monardella sinuata* subsp. *gerryi* (CNDDB 2024). Its fragmented distribution, limited number of occurrences/populations (both of which are threatened with extirpation), and small population sizes further increases its risk of extinction from stochastic events and low genetic diversity (Shaffer 1981, Newman and Pilson 1997, Aguilar et al. 2006, Ouborg et al. 2006).

CESA defines "endangered species" as a "native species or subspecies… which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease" (FGC Sec. 2062). *Monardella sinuata* subsp. *gerryi* is already extremely rare throughout its very limited range, is at imminent risk of extinction, and warrants listing as Endangered pursuant to the California Endangered Species Act (CESA).

# LIFE HISTORY

## TAXONOMIC HISTORY

*Monardella sinuata* Elvin & A. C. Sanders subsp. *gerryi* Elvin, A.C. Sanders & R.A. Burgess is an annual herb in the Lamiaceae (Elvin et al. 2015). It was not included in *The Jepson Manual* (Jokerst 1993) or *Jepson eFlora* (Sanders et al. 2012) as it was described after their publication. The *Flora of North America* Lamiaceae treatment is not yet published. Prior to 2013, there were only two collections of the annual, wavy-leaved *Monardella* that is now called *Monardella sinuata* subsp. *gerryi*: one from 1934 (*French 311*) and one from1976 (*Howe 4924*) (Elvin et al. 2015, CCH2 2024). The collections were originally identified as *Monardella undulata* Benth. and *Monardella breweri* Gray, respectively (CCH2 2024). For over 100 years, the name *Monardella undulata* Benth. was erroneously applied to wavy-leaved annual *Monardella* from coastal Ventura County to Marin County (Elvin and Sanders

2009, Sanders et al. 2012). The *M. undulata* type specimen is a wavy-leaved shrubby perennial, not an annual (Elvin and Sanders 2009). To resolve this situation, *Monardella sinuata* Elvin & A. C. Sanders was described to include the wavy-leaved annual *Monardella* that occur along the coast from Ventura County to Marin County (Elvin and Sanders 2009). *M. undulata* was applied to the shrubby perennial taxa of coastal dunes of central California (Elvin and Sanders 2009, Sanders et al. 2012). Elvin and Sanders (2009) and Sanders et al. (2012) included two subspecies within *M. sinuata*: subspecies *sinuata*, which ranges from the Purisima Hills in Santa Barbara County north to Morro Bay in San Luis Obispo County, and subspecies *nigrescens* Elvin & A. C. Sanders, which ranges from Monterey Bay in Monterey County north to Pt. Reyes in Marin County (Sanders et al. 2012, Elvin et al. 2015).

Prior to 2013, the two historical collections from Ventura County were considered a disjunct population of *M. sinuata* subsp. *sinuata* (Elvin and Sanders 2009, Sanders et al. 2012). In 2013, M. Elvin and R. Burgess discovered a population in the Las Posas Hills east of Camarillo (Elvin et al. 2015). They found morphological differences between the Camarillo plants and subspecies *sinuata*, including differences in calyx size and hairs, stem glands, and nutlet size (Elvin et al. 2015; see *Similar Species*, below, for more details and for differentiation from other taxa). They considered describing the Ventura County plants as a new species, but conservatively described it as a new subspecies (Elvin et al. 2015). They also suggested that further research was needed to determine whether subsp. *gerryi* warranted treatment as a full species. Recent phylogenetic analyses of *Monardella* by B. Drew (2024 pers. comm.) support the treatment of *M. sinuata* subsp. *gerryi* and *M. sinuata s.s.* as separate species. Samples of subsp. *gerryi* are sister to a group that contains multiple taxa including other annuals such as *Monardella sinuata s.s.*, and perennials such as *M. undulata* subsp. *crispa* and *M.* subsp. *undulata*. The results of this research, including suggested taxonomic and nomenclatural changes, are being prepared for publication.

## SPECIES DESCRIPTION

The following description of *Monardella sinuata* subsp. *gerryi* is taken from Elvin et al. (2015):

> Annual, erect, gracile, 7–30(43) cm tall, simple to moderately branched, +/- glabrous to very sparsely pubescent, stem with 1 type of trichome, non-glandular, 0.1–0.2 mm, retrorse, stems stramineous to tan, with conoideus glands sparsely present. Leaves 10–35 × 2–6 mm, with length-to-width (L:W) ratios of 5–7:1, blades narrowly elliptic, +/- glabrous to very sparsely pubescent, with 1 type of trichome on adaxial surface, non-glandular, 0.1–0.2 mm (rare), with 1 type of trichome on abaxial

surface, non-glandular, 0.1–0.2 mm (sparse), leaves subsessile to decurrent (rarely cuneate), margins generally slightly undulate, occasionally strongly undulate, bases acute, apices acute. Inflorescence solitary to an open compound cyme; flowers in terminal glomerules; glomerules 1 to 7 per plant, glomerules on main stem 10–17 mm wide, glomerules on axillary branches, 7–12 mm wide; glomerule bracts 7–9(12) × 33.5–6 mm; with 1 type of trichome, non-glandular, 0.1–0.2 mm, and with 2 types of cilia, (1) non-glandular, 0.1–0.2 mm and (2) non-glandular, 0.3–0.5 mm (sparse), bracts elliptic to widely lanceolate, veins green, +/- translucent between veins, apices acute to acuminate, purple tinged or not, less than or equaling calyces. Flowers with pedicels 1–1.5 mm; calyx 5.5–6mm, rapidly caducous after anthesis, +/- glabrous to very sparsely pubescent; with 2 types of trichomes, (1) glandular, 0.02–0.04 mm, and (2) non-glandular, 0.3–0.6 mm; calyx teeth with 1 type of trichome, non-glandular, 0.3–0.6 mm; corolla 11–14 mm, upper 2 corolla lobes gland-tipped, purple; stigma 13–17 mm, exserted; stamens 13–17 mm, exserted. Fruit a nutlet, light brown with dark brown spots and streaks, oblong, 1.5–1.6 × 0.8 mm.


**Figure 2:** Isotype of *Monardella sinuata* subsp. *gerryi* (*Elvin 7121*, SBBG CC BY-NC 4.0) (CCH2 2024)

## SIMILAR TAXA

*Monardella sinuata* subsp. *gerryi* is morphologically most similar to *Monardella sinuata* subspp. *sinuata* and *nigrescens*, neither of which occurs in Ventura County (Sanders et al. 2012, Elvin et al. 2015, CCH2 2024). The nearest populations of *M. sinuata* subsp. *sinuata* are approximately 125 km northwest of Camarillo near Lompoc in Santa Barbara County and the nearest occurrences of subsp. *nigrescens* are much further north in Monterey County (Sanders et al. 2012, Elvin et al. 2015, CNDDB 2024). The only other annual *Monardella* taxa known from Ventura County are *Monardella breweri* subspp. *breweri* and *lanceolata* (Sanders et al. 2012, Calflora 2024, CCH2 2024, Jepson 2024).

In addition to the characters provided in Table 1, *Monardella sinuata* subsp. *gerryi* differs from subsp. *sinuata* by its nearly complete lack of pubescence on the adaxial leaf surfaces, presence of minute glandular trichomes on the calyces (vs. none in subsp. *sinuata*), contains bracts that do not exceed the calyces (vs. exceeding them in subsp. *sinuata*), and contains multiseriate-multicellular (MSMC) trichomes (conoideous glands) on the stems (vs. lacking them in subsp. *sinuata*) (Elvin et al. 2015).

| | **Leaf L:W ratio** | **Leaf width (mm)** | **Primary glomerule size (mm)** | **Bract width (mm)** | **Pedicel length (mm)** | **Calyx length (mm)** | **Corolla length (mm)** | **Nutlet length (mm)** |
|---|---|---|---|---|---|---|---|---|
| subsp. *gerryi* | 5 – 7:1 | 2 – 6 | 10 – 17 | 3.5 – 6 | 1 – 1.5 | 5.5 – 6 | 11 – 14 | 1.6 |
| subsp. *sinuata* | 3 – 6:1 | (3)4 – 10 | 10 – 35 | 3 – 12 | 0.5 – 1 | 7 – 8 | 13 – 16 | 1.1 |

**Table 1:** Morphometric characters separating *Monardella sinuata* subspp. *gerryi* and *sinuata* (Elvin et al. 2015). Parenthetical values are outliers.

See Elvin et al. (2015) for characters differentiating *Monardella sinuata* subsp. *gerryi* from *M. sinuata* subsp. *nigrescens*. *Monardella sinuata s.l.* is differentiated from *Monardella breweri s.l.* by its leaves which have wavy margins that are usually entire (or occasionally serrate) versus *M. breweri* leaves which are slightly wavy or not wavy, and entire to serrate (Elvin and Sanders 2009, Sanders et al. 2012). *M. breweri* occurs across a broader range of elevations, substrates, and habitat types than *M. sinuata* and it is not known to co-occur with *M. sinuata* subsp. *gerryi* (Sanders et al. 2012).

## REPRODUCTION AND GROWTH

No publications on pollination, reproduction, or seed dispersal in *Monardella sinuata* subsp. *gerryi* or *Monardella sinuata s.l.* were found. *Monardella sinuata* subsp. *gerryi* flowers have been observed from April through June (Elvin et al. 2015, CCH2 2024, CNPS 2024, iNaturalist 2024). Confirmed and potential pollinators of other *Monardella* taxa include hummingbirds, bees, butterflies, and flies (CPC 2024). *Monardella venosa* (CRPR

1B.1) is a rare annual known from two extant occurrences in the Sierra Nevada foothills (CNDDB 2024, CNPS 2024). Hanson (2012) recorded the following bee taxa with *M. venosa* pollen grains adhered to their bodies; *Anthophora urbana*, *Apis mellifera*, *Bombus* spp., and *Xeromelecta californica*. Self-pollination was confirmed for *M. venosa*, but cross pollination is likely required for maximum seed yield (Hanson 2012). *Monardella venosa* seedbank studies found that most seedlings germinated very close to parent plants and no specialized dispersal mechanisms were found (Hanson 2012). Seed dispersal mechanisms of *Monardella sinuata* subsp. *gerryi* are unknown but seeds probably exhibit similar short-distance dispersal. Elvin et al. (2015) observed that the calyces of subsp. *gerryi* are more rapidly deciduous than in the other two *M. sinuata* subspecies. How this characteristic may relate to reproductive biology is unknown. The presence of nonnative forbs has significant impacts on the growth and reproductive output of *Monardella venosa* (Hanson 2012). Plots with experimental removal of nonnative forbs exhibited higher growth rates and produced more flowers and almost three times as many seeds as plants in control plots with nonnative forbs (Hanson 2012). While not confirmed experimentally, the low numbers of *Monardella sinuata* subsp. *gerryi* observed during wet years such as 2023 were presumably caused by higher levels of competition from nonnative plants (Drew 2024 pers. comm.). The impacts on its growth and reproduction are probably similar to those documented by Hanson (2012) for *Monardella venosa*.

## HABITAT

Occurrences of *Monardella sinuata* subsp. *gerryi* range in elevation from 150 to 245 m (490-–805 ft) above sea level (Elvin et al. 2015, CCH2 2024, CNDDB 2024). All occurrences are on soils derived from the Las Posas Sand, an unlithified or weakly lithified sandstone prone to high rates of erosion and landsliding (Tan et al. 2004a, Gutierrez et al. 2008, Devecchio et al. 2012, Elvin et al. 2015). The Las Posas Sand was formed during the Pleistocene as sediment from the Santa Clara River was deposited in a shallow marine environment (DeVecchio et al. 2012). The formation was uplifted with the Camarillo and Las Posas hills over the last ~ 200,000 years (Devecchio et al. 2012). The two other subspecies of *Monardella sinuata* are also limited to sandy substrates of marine origin including active coastal dunes, inactive dune sands of Pleistocene age, and sands derived from much older marine sandstones of Miocene age (McGraw and Levin 1998, USFWS 1998). *Monardella sinuata* subsp. *gerryi* occurs within coastal sage scrub characterized by plant taxa such as *Acmispon glaber*, *Artemisia californica*, *Eriogonum fasciculatum*, and *Salvia mellifera* (Elvin et al. 2015). Within the coastal sage scrub, it occupies a microhabitat of sandy openings with associates such as *Croton californicus*, *Eriastrum densifolium* subsp. *elongatum*, *Euphorbia polycarpa*, *Horkelia cuneata* var. *puberula* (CRPR 1B.1), *Mucronea californica* (CRPR 4.2), and *Stillingia linearifolia* (Elvin et al. 2015, CNPS 2024).

# DISTRIBUTION

## ELEMENT OCCURRENCE INFORMATION

### EXTIRPATED OCCURRENCES

**ELEMENT OCCURRENCE #1**

Occurrence #1 is based on an herbarium specimen collected in 1976 in the Santa Rosa Valley "on Las Posas Road, 0.5-mile north of Santa Rosa Valley Blvd" (*Howe 4924*) (Elvin et al. 2015, CCH2 2024, CNDDB 2024). The exact collection location is unknown, and the occurrence is mapped as a 'best guess' by the CNDDB approximately 3 km east of EO #3. Much of the Santa Rosa Valley has been developed and this EO is presumed extirpated (CNDDB 2024).

### EXTANT OCCURRENCES

**ELEMENT OCCURRENCE #2**

Until 2024, when a population was rediscovered, occurrence #2 was presumed extirpated (CNDDB 2024). The occurrence was based on a single herbarium specimen (*French 311*) collected in 1934 "2 miles north of Camarillo" (CCH2 2024, CNDDB 2024). The exact collection location is unknown, and until July 2024, the occurrence was mapped as a 'best guess' with an uncertainty of 1,300 meters (CNDDB 2024). The rediscovered population is approximately 0.3-mile east-southeast of the previously georeferenced location of *French 311* (CNDDB 2024). Since the most recent CNDDB update to *Monardella sinuata* subsp. *gerryi* in July 2024, this EO is mapped at the rediscovered population and *French 311* is now attributed to this site (CNDDB 2024).

**ELEMENT OCCURRENCE #3**

Occurrence #3 was discovered in 2013 and is the type locality of *Monardella sinuata* subsp. *gerryi* (Elvin et al. 2015, CNDDB 2024). The population is mapped as a polygon approximately 650 meters long by 200 meters wide, although plants are not distributed continuously within this polygon (CNDDB 2024). Herbarium collections from the site include *Elvin 7121*, *Elvin 7131*, *Burgess 9378*, and *Burgess 10035* (Elvin et al. 2015, CCH2 2024, CNDDB 2024). In 2024, this EO comprised approximately 20 individuals in an area approximately 4 X 15 m (M. Elvin 2024 pers. comm.).

| CNDDB EO # | Status | Latitude | Longitude | Elevation (ft) | Land Ownership |
|---|---|---|---|---|---|
| 1 | Presumed extirpated | 34.2456 | -118.9067 | 700 | Private |
| 2 | Extant | 34.2489 | -119.0304 | 520 | Private |
| 3 | Extant | 34.2521 | -118.9378 | 650 | Private |

**Table 2:** *Monardella sinuata* subsp. *gerryi* occurrence locations and ownership (CCH2 2024, Elvin 2025 pers. comm.)

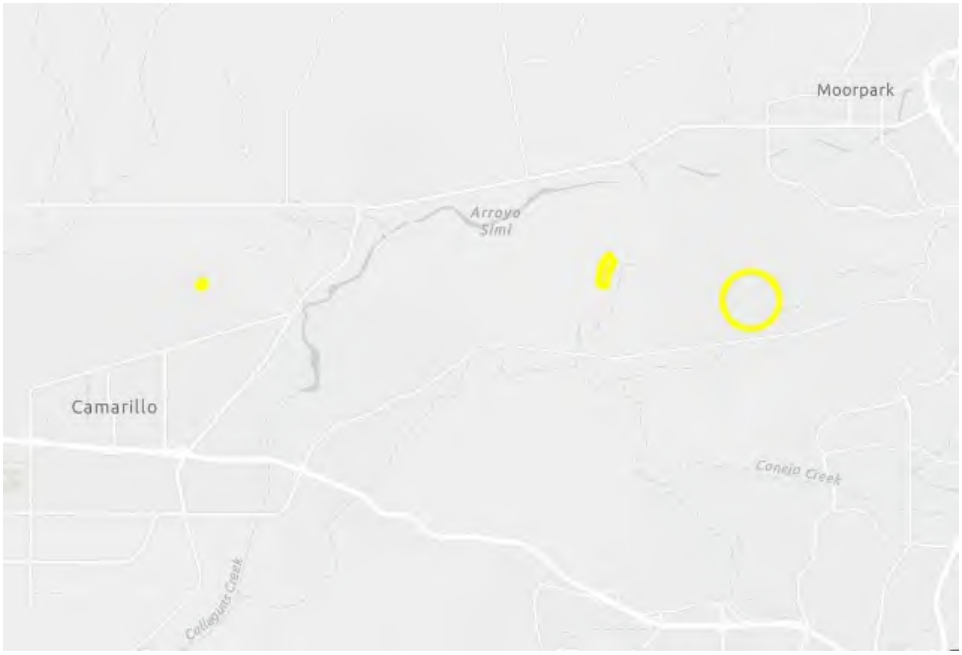


**Figure 3:** CNDDB (2024) map of all three occurrences in the Camarillo and Las Posas hills (left to right; EO #s 2, 3, and 1).


**Figure 4:** Aerial imagery map of all three occurrences in the Camarillo and Las Posas hills.


**Figure 5:** Aerial map of occurrence #2 in the Camarillo Hills showing encroaching development.


**Figure 6:** Aerial map of the Las Posas Hills showing occurrence #3 with encroaching agricultural conversion.

## CURRENT DISTRIBUTION

*Monardella sinuata* subsp. *gerryi* is endemic to Ventura County, California, where it is only known from the Camarillo and Las Posas hills (Elvin et al. 2015, CNDDB 2024). The Camarillo Hills lie immediately north of the city of Camarillo and run from near the intersection of Springville Drive and Highway 101 east-northeast for approximately 8 km to the town of Somis. They range in elevation from approximately 100 to 880 feet above sea level. The Las Posas Hills run from the northeastern edge of Camarillo east-northeast for approximately 12 km to the Tierra Rejada Valley. They range in elevation from approximately 200 to 1,020 feet above sea level. The two ranges are separated by the floodplain and channel of Arroyo Las Posas/Calleguas Creek, which runs through eastern Camarillo.

The current distribution of *Monardella sinuata* subsp. *gerryi* is limited to two extant occurrences, one in the Camarillo Hills (EO #2) and one in the Las Posas Hills (EO #3) (CNDDB 2024). EO #2 was based on a collection from 1934 (*French 311*) from "2 miles north of Camarillo" and was considered extirpated until a population was discovered in 2024 (Elvin et al. 2015, CNDDB 2024). EO #3 was the site where the taxon was rediscovered in 2013, and plants were confirmed present there through spring of 2024 (Elvin et al. 2015,

CNDDB 2024). The extent and population size at this occurrence has declined considerably since 2013 (CNDDB 2024).

Based on the single extant occurrence known at the time, Elvin et al. (2015) reported both the Area of Occupancy (AOO; sum of 1 $km^2$ grid squares) and EOO (Extent of Occurrence) to be less than 1 $km^2$. Based on the two extant populations, the current AOO of *Monardella sinuata* subsp. *gerryi* is estimated at 2 $km^2$ (Bachman et al. 2011). The decision to use 1 × 1 km cells for the AOO follows the cell size chosen by Elvin et al. (2015). The EOO of extant populations cannot be calculated, as a minimum of three sites are required to create a polygon. AOO and EOO calculations usually overestimate the actual and potentially occupied ranges of taxa due to the inclusion of unoccupied or unsuitable habitat (Burgman and Fox 2003). In the case of *Monardella sinuata* subsp. *gerryi*, most of the area included in these estimates has unsuitable substrate/microhabitat or has been developed and no longer supports native vegetation (Elvin et al. 2015, Google Earth 2024). Based on site visits to both occurrences in 2024, the actual occupied area of *Monardella sinuata* subsp. *gerryi* is approximately 540 square meters (Elvin 2024 pers comm.).

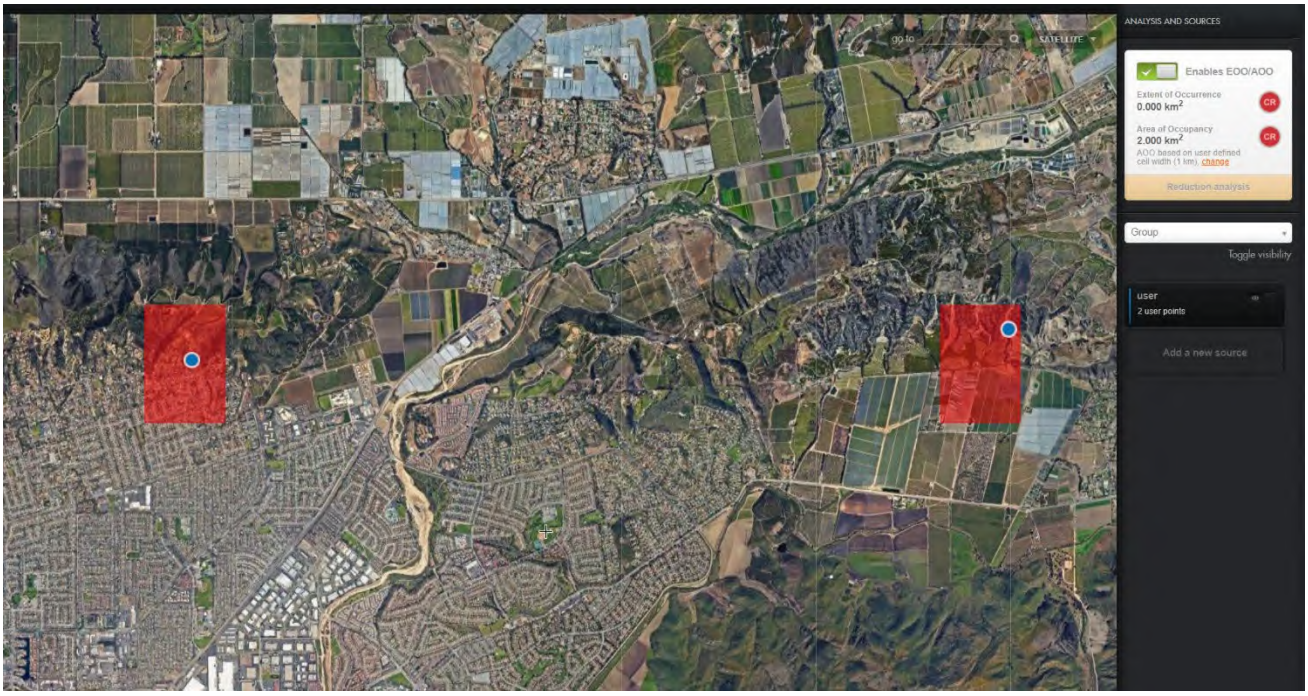


**Figure 7:** The estimated Area of Occupancy (AOO) of the two extant occurrences is 2 $km^2$ (GeoCAT, Bachman et al. 2011; CNDDB 2024). Much of the area within the estimated AOO (in red) has been converted to housing or agriculture.

## POTENTIAL FOR ADDITIONAL OCCURRENCES

*Monardella sinuata* subsp. *gerryi* is a substrate specialist that occurs on soils derived from the Las Posas Sand (Elvin et al. 2015). Las Posas Sand is mapped on approximately 12 $km^2$ of the Camarillo and Las Posas hills, including approximately 8.5 $km^2$ that have been developed or converted to agriculture (Table 3; Dibblee and Ehrenspeck 1990a, 1990b, 1992; Tan et al. 2004a, Guttierez et al. 2008). The Las Posas Sand also occurs on the southern slopes of South Mountain near Saticoy, and on the north side of the Santa Clara River as a narrow, discontinuous exposure from the Ventura River mouth to the vicinity of the Sespe and Santa Clara River confluence in Fillmore (Dibblee and Ehrenspeck 1990b, Tan et al. 2004a, 2004b, 2004c; Tan and Irvine 2005, Guttierez et al. 2008, DeVecchio et al. 2012). Whether or not the Las Posas Sand exposures on South Mountain and in the Santa Clara River valley have suitable microhabitat and climatic conditions for *Monardella sinuata* subsp. *gerryi*, is unknown; however, these areas are further inland, fragmented, and disjunct from the known occurrences, decreasing their likelihood of occupancy. Regardless, any undeveloped sites in these areas should be surveyed for appropriate habitat and new occurrences, and surveys should be conducted over multiple years.

Nearly all mapped exposures of the Las Posas Sand in the Camarillo and Las Posas Hills are on private land, approximately 72% of which has already been converted to agriculture or housing (Google Earth 2024). Further surveys should be conducted on any undeveloped exposures of Las Posas Sand during the appropriate time of year for detection of *Monardella sinuata* subsp. *gerryi*, which has a short blooming window from late May through June (CNPS 2024, Elvin 2024 pers. comm.).

Substrates adjacent to Las Posas Sand exposures or known *Monardella sinuata* subsp. *gerryi* sites are composed of substrates such as the Conejo volcanics, non-marine sedimentary rocks, or various alluvial deposits (Dibblee and Ehrenspeck 1990a, Guttierez et al. 2008, Elvin et al. 2015). *Monardella sinuata* subsp. *gerryi* is only known from sands derived from marine environments, so these non-marine or non-sedimentary substrates are unsuitable habitat for the taxon.

## FORMER DISTRIBUTION

Given the sparse collection record of *Monardella sinuata* subsp. *gerryi*, its historical distribution can only be inferred by estimating the former extent of potentially suitable habitat. There are only two historical collections, one from 1934 (*French 311*) and one from 1976 (*Howe 4924*), neither of which provide any information on the extent or size of populations (CCH2 2024). Using GeoCAT and all three known occurrences, presumed

extant or extirpated, the estimated extent of occurrence (EOO) is 3.2 km$^2$ and the area of occupancy (AOO; sum of 1 km$^2$ grid squares) is 3 km$^2$ (Bachman et al. 2011).

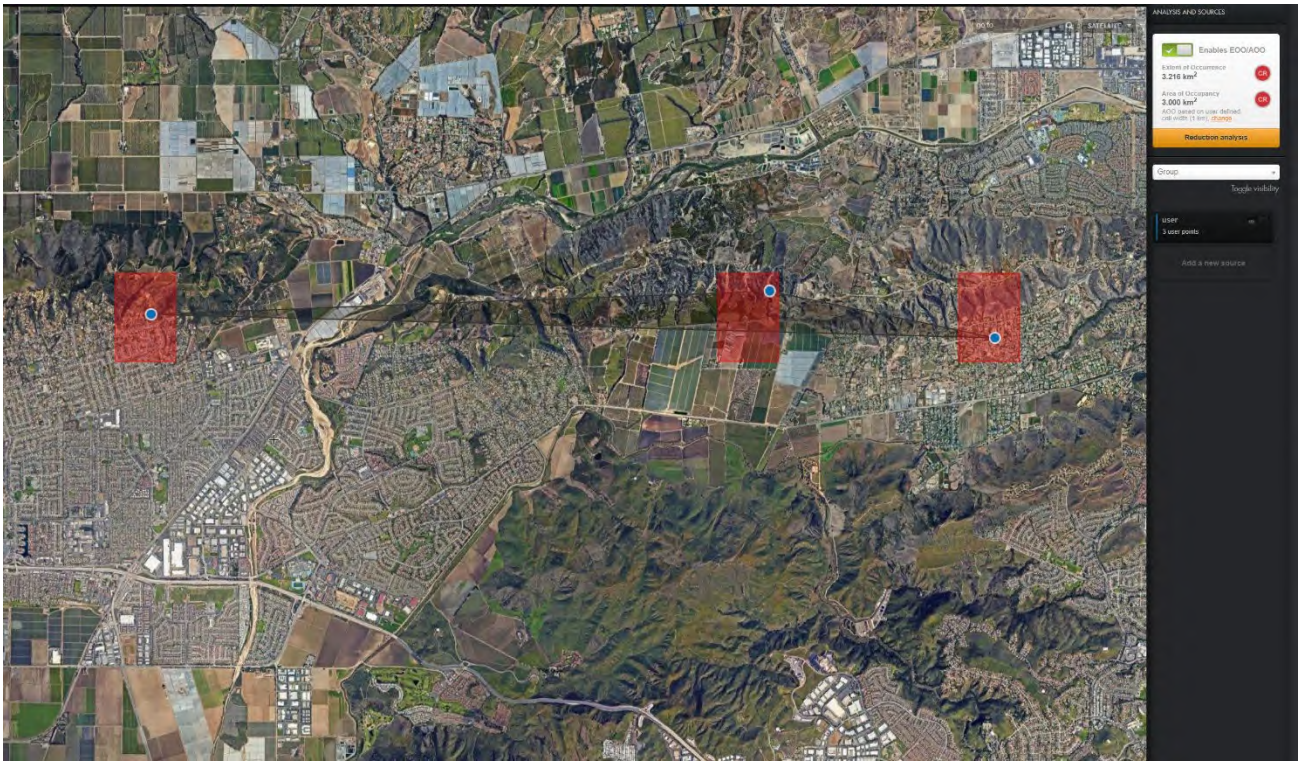


**Figure 8:** Estimated EOO and AOO (using a 1 km$^2$) of extant and presumed extirpated occurrences is 3.2 km$^2$ (gray polygon) and 3 km$^2$ (red rectangles), respectively (GeoCAT; Bachman et al. 2011). Large amounts of unsuitable and developed habitat are visible in both the EOO and AOO.

The historical extent of suitable habitat was likely much larger than the EOO and AOO estimates. Since it is impossible to estimate either the historically occupied area or the former extent of suitable microhabitat, the most useful metric for estimating the potential historical range of *Monardella sinuata* subsp. *gerryi* is the extent of the Las Posas Sand within the taxon's known range in the Camarillo and Las Posas hills.

To estimate the potential historical range, geological maps of the Camarillo and Las Posas hills were examined, and the total area mapped as Las Posas Sand was estimated (Dibblee and Ehrenspeck 1990a, 1992; Tan et al. 2004a, 2004b; Guttierez et al. 2008). The maps were overlaid onto aerial imagery and the amount of developed and undeveloped Las Posas Sand was mapped in both the Camarillo and Las Posas hills (Google Earth 2024). Most imagery was from 2023, but some imagery was taken in 2019 or 2020, so the amount of developed or altered habitat in those areas may be higher than the estimates reported here.

The Las Posas Sand is mapped over approximately 9 km$^2$ of the Camarillo Hills and approximately 3 km$^2$ of the Las Posas Hills for a total of approximately 12 km$^2$ (Dibblee and Ehrenspeck 1990a, 1992; Tan et al. 2004a, 2004b; Guttierez et al. 2008). Approximately 8.5 km$^2$ have been converted to agriculture or housing and approximately 3.3 km$^2$ still support native vegetation and could be suitable habitat for *Monardella sinuata* subsp. *gerryi* (Google Earth 2024). This represents a loss of approximately 72% of potentially suitable former habitat. These estimates are coarse, and many areas appear densely vegetated and probably lack the microhabitat required by *Monardella sinuata* subsp. *gerryi*. Table 3 includes estimates of potential former habitat, developed and undeveloped habitat, and percentage of habitat lost in each range of hills. The approximately 0.5–0.75 km$^2$ of undeveloped Las Posas Sand on the north side of the Camarillo Hills was excluded from the totals reported here: the northern slope is more mesic and supports different vegetation than the southern slope, and while the geology may be suitable for the taxon, all known records of *Monardella sinuata* subsp. *gerryi* are from the more xeric slopes on the south facing sides of the Camarillo or Las Posas hills (CNDDB 2024).

| | **Total Las Posas Formation (km$^2$)** | **Developed Las Posas Formation (km$^2$)** | **Undeveloped Las Posas Formation (km$^2$)** | **Percent loss** |
|---|---|---|---|---|
| **Camarillo Hills** | 8.77 | 7.19 | 1.58 | ~ 82% |
| **Las Posas Hills** | 3 | 1.27 | 1.73 | ~ 42% |
| **Totals:** | **11.77** | **8.46** | **3.31** | **~ 72%** |

**Table 3:** Total area of the Camarillo and Las Posas Hills mapped as Las Posas Sand and estimated area lost to development. The extent of development was estimated using the most recent Google Earth imagery from 2019, 2020, and (mainly) 2023 (Google Earth 2024).

The estimated former extent of approximately 12 km$^2$ of potentially suitable habitat reported differs from the estimate reported by Elvin et al. (2015) (15.64 km$^2$). The discrepancy is likely the result of finer scale substrate mapping reported here (Elvin 2025 pers. comm.).

As noted above under Potential for Additional Occurrences, geologists have mapped Las Posas Sand in the westernmost Santa Susana Mountains on the southern slopes of South Mountain (near Saticoy) and on the north side of the Santa Clara River in a discontinuous band from near Ventura to an area just west of Fillmore (Dibblee and Ehrenspeck 1990, Tan and Irvine 2005, Guttierez et al. 2008). Approximately 2.4 km$^2$ of Las Posas Sand is mapped on South Mountain and approximately 14.75 km$^2$ is mapped on the north side of the Santa Clara River (Dibblee and Ehrenspeck 1990, Tan and Irvine 2005, Guttierez et al. 2008), approximately 2.6 km$^2$ of which has been converted to agriculture or housing (Google Earth 2024). It is not known whether the correct microhabitat exists in these areas, but the vegetation in the vicinity of South Mountain is more like that found in the Camarillo and Las

Posas Hills while much of the vegetation north of the Santa Clara River is dominated by different plant taxa (A. Searcy 2025 pers. comm.). Unless *Monardella sinuata* subsp. *gerryi* is confirmed to occur in these areas, they should not be included in estimates of the taxon's current or historical range.

# ABUNDANCE AND POPULATION TRENDS

Due to the lack of collection records or other historical data, the former population size of *Monardella sinuata* subsp. *gerryi* is unknown. Given the losses of habitat due to development and agriculture, the long-term population trend is presumably negative. Population data for all three occurrences are provided in Table 4. When it was rediscovered in 2024, the population at EO #2 had 350 to 400 plants (CNNDB 2024). The population at EO #3 had 50 to 100 plants in 2013 and only 21 plants in 2024 (CNDDB 2024). The population size and extent at this occurrence has been declining since 2013 (Table 4) (CNDDB 2024). Additional surveys of extant occurrences should be conducted annually to monitor their reproductive status, population sizes, and threats.

| CNDDB EO # | Historical Population Size | 2013 | 2015 | 2023 | 2024 |
|---|---|---|---|---|---|
| 1 | Historical size unknown: Presumed extirpated | N/A | N/A | N/A | N/A |
| 2 | Historical size unknown | N/A | N/A | N/A | **350 – 400** |
| 3 | Historical size unknown | **50 – 100** | **Present*** | **None found** | **21** |

**Table 4**: **Occurrence population information** (CNDDB 2024). ***No population size estimate was reported in 2015, but observers noted "fewer than in previous years due to drought" (CNDDB 2024).

# FACTORS IMPACTING SURVIVAL AND REPRODUCTION

The two extant populations of *Monardella sinuata* subsp. *gerryi* are both small and isolated. Populations at both occurrences are at risk of extirpation due to numerous anthropogenic threats, especially development, road maintenance, vegetation succession, and agricultural conversion (CNDDB 2024). Occurrence #2 was rediscovered within the footprint of a proposed housing project and is threatened by proposed development, land clearing and grading, and vegetation succession (CNDDB 2024, CVRMA 2025). Occurrence #3 is threatened by agriculture, construction and maintenance of roads and trails, vegetation succession, and erosion (CNDDB 2024). Occurrence #1 is presumed extirpated since the habitat at the collection locality has been converted to housing and agriculture (CNDDB 2024, Google Earth 2024).

| CNDDB EO # | EO Rank | Threats |
|---|---|---|
| 1 | X - Possibly Extirpated | Development, Agriculture |

| | | |
|---|---|---|
| 2 | C – Fair. Presumed Extant | Development, Clearing/grading, vegetation succession |
| 3 | D – Poor. Presumed Extant | Agriculture, Non-native plant impacts, Road/trail construction/maintenance, Erosion/runoff |

**Table 5:** Element Occurrence Rank and Threat Information (CNDDB 2024)

# DEGREE AND IMMEDIACY OF THREAT

*Monardella sinuata* subsp. *gerryi* is extremely rare and is at serious risk of imminent extinction. The taxon has an extremely small range of less than 2 $km^2$ and a total population of fewer than 500 plants, approximately 95% of which occur at one site (occurrence #2) within the footprint of a proposed development project which has permits pending with the County of Ventura (CNDDB 2024, CVRMA 2025). A third occurrence based on a single herbarium specimen from 1976 is presumed extirpated by development (CNDDB 2024). Both extant occurrences are on privately owned land and are highly threatened by agricultural conversion, land clearing and grading, construction and maintenance of roads and trails, nonnative plants, vegetation succession, and erosion (CNDDB 2024). Potential habitat for new occurrences is extremely limited, fragmented, and restricted to private land. Since the time the taxon was rediscovered, the population at occurrence #3 has steadily declined, and some habitat has been converted to agriculture (Elvin et al. 2015, CNDDB 2024).

Even active protection and management of the extant occurrences of *Monardella sinuata* subsp. *gerryi* would not guarantee the long-term survival of the taxon. Plant taxa with small, fragmented populations are at greater risk of extinction from genetic, demographic, or environmental stochasticity (Shaffer 1981, Brito and Fernandez 2000). Fragmented populations may suffer from inbreeding depression and pollen limitation which may in turn lead to decreased germination rates, decreased genetic variability, and higher probability of extinction (Menges 1991, Newman and Pilson 1997, Aguilar et al. 2006, Ouborg et al. 2006). Plant taxa with small populations are also at higher risk of extinction from climate change (Loarie et al. 2008, Smith and Kay 2018). These risks are exacerbated for edaphic specialists such as *Monardella sinuata* subsp. *gerryi*, which may be unable to migrate to new sites as the climate changes (Loarie et al. 2008).

# MANAGEMENT

## IMPACT OF EXISTING MANAGEMENT EFFORTS

*Monardella sinuata* subsp. *gerryi* was added to the CNPS Rare Plant Inventory and CNDDB in 2015 (Sims and Bittman 2015, CNDDB 2024, CNPS 2024). It has a current conservation

status of CRPR 1B.1 G3T1 / S1 (CNDDB 2024, CNPS 2024, NatureServe 2024). It is not listed under either the federal or California Endangered Species Acts. No conservation management plans have been written, and no direct conservation actions have been taken to protect *Monardella sinuata* subsp. *gerryi*. Seed has been collected from at least one occurrence (CNDDB 2024, H. Schneider 2025 pers. comm.).

As a CRPR 1B taxon, *Monardella sinuata* subsp. *gerryi* is included on the CDFW Special Vascular Plants, Bryophytes, and Lichens list. Per the California Environmental Quality Act (CEQA), any project-level impacts to this taxon must be characterized and mitigation measures should be adopted to reduce impacts to less than significant. However, the consideration afforded by CEQA does not necessarily prevent projects from severely impacting or even extirpating populations of critically imperiled taxa. While CEQA requires that an analysis of impacts be presented to the public and decision makers, and that feasible mitigation measures be adopted, lead agencies routinely propose and approve mitigation measures that result in the degradation or loss of rare plant populations. In a worst-case scenario, a lead agency could adopt a statement of overriding considerations, even if impacts to a critically imperiled plant are significant and unavoidable but they wish to see a project proceed, nonetheless. Of particular concern is the potential for a lead agency to approve the use of compensatory mitigation in the form of transplantation, relocation or reintroduction in lieu of selecting an alternative that avoids impacts to a population, as allowed under CEQA. In nearly every case, impact avoidance, onsite conservation, and onsite management are preferrable to other mitigation measures. A review of mitigation-related transplantation, relocation, and reintroduction attempts (Fiedler 1991) showed that only 8% of these attempts were successful, and that only 33% of projects reviewed included specific success criteria. Another review (Fahselt 2007) offers multiple examples of recreated populations failing after multiple years of maintenance and monitoring. This occurred even when multiple receptor sites were used, as no receptor site will be identical to the original site and habitat and the soil microbiome for endangered species cannot be duplicated (Fahselt 2007). This review also found that the introduction of transplants can potentially damage the ecosystems and surrounding environments they are introduced into. CNPS has an extensive history of commenting on environmental documents prepared under CEQA, and our decades of experience on hundreds of projects leads us to conclude that mitigation required under CEQA is simply insufficient for some of our rarest plant taxa. Avoidance of special status species should be the standard given the evidence that transplantation, relocation, and new site creation are largely ineffective, and the fact that these unsubstantiated mitigation techniques have become widely accepted has led to the loss of countless populations and individuals of special-status plant taxa.

Should CDFW consider this petition to be sufficient and the Fish and Game Commission accepts the petition for consideration, *Monardella sinuata* subsp. *gerryi* would then be considered a candidate under CESA. Candidates under CESA are afforded the same protections provided to threatened or endangered species. The increased protection afforded by candidate status and subsequent potential listing of *Monardella sinuata* subsp. *gerryi* as a threatened or endangered species would give this taxon the best hope for survival given current and potential future threats. Specifically, the Fish and Game Code requires full mitigation of all impacts to CESA-listed taxa that can be considered "take". The measures a project must enact to ensure that impacts are fully mitigated are outlined in an Incidental Take Permit (ITP), which is completed following CEQA review. In general, an ITP must be adopted prior to any project proponent breaking ground; as a result, ITPs can be a very important requirement to ensure that CESA-listed taxa are conserved. Specifically, an ITP must ensure that take does not jeopardize the continued existence of a species (Fish & G. Code § 2081 (b); Cal. Code Regs., tit. 14, §§ 783.2-783.8). In the case of *Monardella sinuata* subsp. *gerryi*, where population size and area of occupancy are incredibly small, potential project-level impacts could lead to the extirpation of one or more occurrences which could result in extinction. The protections afforded by CESA are well aligned to ensure that *Monardella sinuata* subsp. *gerryi* does not go extinct.

Outside of potential impacts associated with projects reviewed under CEQA, *Monardella sinuata* subsp. *gerryi* may be impacted by other land management actions. For example, EO #3 occurs on private land where land use and management activities have led to degradation of habitat and are likely linked to a decline in population numbers. Unfortunately, these actions are not subject to discretionary approval by lead agencies or natural resource agencies, so even with the protection afforded by CESA, the habitat and populations of listed taxa may degrade over time. Taxa like *Monardella sinuata* subsp. *gerryi* need comprehensive management and conservation strategies which are sometimes only afforded to CESA-listed taxa. Collaboration and cooperation between private landowners and natural resource agencies is essential for the success of such conservation strategies.

## SUGGESTIONS FOR FUTURE MANAGEMENT

Currently there are no management efforts in place for *Monardella sinuata* subsp. *gerryi*. Below we provide some suggestions for potential future management actions.

- **Conservation of all occurrences**: The two known populations of *Monardella sinuata* subsp. *gerryi* occur on private land, where there are ongoing and immediate threats. Neither of these populations are being managed for the conservation of this taxon. Efforts should be made to protect both known populations and management actions should ensure their long-term survival. The destruction, removal, or

transplantation of *Monardella sinuata* subsp. *gerryi* plants and habitat should not be accepted as mitigation for any project that proposes to impact extant occurrences. Habitat buffers should be created around known occurrences to allow for natural vegetation and population dynamics and to increase the habitat and food plants of potential pollinators. Furthermore, suitable habitat corridors should also be created beyond buffers to allow natural vegetation and population dynamics and ecosystem processes to continue to occur.

- **Conservation seed banking**: Maternal-line seed collections should be made from both occurrences. This will ensure that sufficient propagules are available for emergency reintroduction efforts should one or more occurrences become extirpated, while also being available to augment existing occurrences as well as preventing them from further decline. Seeds stored in conservation seed banks may also be made available for scientific research that could be necessary to prepare for emergency reintroduction actions. The potential use of seeds in scientific research can also lead to a better understanding of the ecology and life history of this taxon, resulting in more informed management actions. Seeds collected may also be used for seed bulking, which can increase the number of seeds available for conservation actions.
- **Surveys of potential habitat**: Surveys should be conducted in all potentially suitable habitat to search for additional populations. Known occurrences should be surveyed annually at the proper time of year and landowners should be made aware of the presence of the taxon and its imperiled status.
- **Additional Scientific research**: Currently, we lack information on the basic biology and ecology of this taxon, which may be helpful in informing conservation and management actions. Specifically, we suggest the following studies:
    - Genomic studies
    - Pollination studies
    - Seedbank studies
    - Dispersal ecology
    - Population Viability Analysis
    - Substrate affinity studies
    - Microhabitat studies
- **Monitoring and maintenance**: Population trends at existing occurrences should be evaluated with annual monitoring. This will help to identify if/when management actions are required. Efforts should be made to ensure that existing occurrences are managed for their long-term persistence/expansion. This may include the management of invasive plant species, and/or the management of vegetation to ensure that the microhabitat characteristics required by *Monardella sinuata* subsp.

*gerryi* are maintained. Management actions should be informed by the scientific research outlined above.

- **Enhance existing/establish new populations**: Efforts should be made to determine if enhancing the populations at existing occurrences is feasible. This could, for example, take the form of management actions to alleviate competition followed by seeding from seeds bulked from conservation seedbank collections. Efforts should also be made to determine if suitable sites for the establishment of new populations within the range of this taxon are available. Scientific research on microhabitat requirements could inform if this measure is possible and help to inform site selection if it is.
- **Education**: The public should be educated about *Monardella sinuata* subsp. *gerryi* and why its conservation is important. People will not be able to stand up for the conservation of a species if they don't even know it exists.

# CONCLUSION

*Monardella sinuata* subsp. *gerryi* is at risk of imminent extinction. It is extremely rare throughout its very limited range where it is only known from two extant occurrences with a global distribution of less than two square kilometers (Elvin et al. 2015, CNDDB 2024). Its distinctive morphological characters and unpublished genetic results support its treatment as a full species (Drew 2024 pers. comm.). One occurrence has already been extirpated by development, and the two remaining extant occurrences are on private land and are threatened by development, agricultural conversion, land clearing and grading, maintenance and construction of roads or trails, nonnative plants, vegetation succession, and erosion (CNDDB 2024). While its former population size and range extent are unknown, the current population size is extremely small with a total estimated population of 360 to 420 plants distributed at two occurrences (CNDDB 2024). Since it was rediscovered in 2013, it has declined at the rediscovery site where no plants were seen in 2023 and only 21 plants were seen in 2024, leaving approximately 95% of the global population at one site where a planned development would impact all plants present (CNDDB 2024). Due to its fragmented small populations, *Monardella sinuata* subsp. *gerryi* is at increased risk of extinction from stochastic events, low genetic diversity, and climate change (Shaffer 1981, Newman and Pilson 1997, Aguilar et al. 2006, Ouborg et al. 2006, Loarie et al. 2008, Smith and Kay 2018). Potential habitat for new occurrences is extremely limited, fragmented, and restricted to private lands. Approximately 70% of the potentially suitable habitat has already been lost to agriculture and development.

Based on the available information presented in this petition, *Monardella sinuata* subsp. *gerryi* warrants listing as Endangered pursuant to the California Endangered Species Act (CESA).

# REFERENCES


Aguilar, R., L. Ashworth, L. Galetto, and M. A. Aizen. 2006. Plant reproductive susceptibility to habitat fragmentation: review and synthesis through a meta-analysis. *Ecology Letters* 9: 968–980.

Bachman, S., J. Moat, A. W. Hill, J. de la Torre, and B. Scott. 2011. Supporting Red List threat assessments with GeoCAT: geospatial conservation assessment tool. *ZooKeys* 150: 117–126.

Brito, D., and F. A. S. Fernandez. 2000. Dealing with extinction is forever: Understanding the risks faced by small populations. *Journal of the Brazilian Association for the Advancement of Science* 52(3): 161–170.

Burgman, M. A., and J. C. Fox. 2003. Bias in species range estimates from minimum convex polygons: implications for conservation and options for improved planning. *Animal Conservation* 6: 19–28.

Calflora. 2024. Information on wild California plants for conservation, education, and appreciation. Website http://www.calflora.org/ [accessed July 2024].

[CaPR] California Plant Rescue. 2024. Conservation collections database. Website https://www.caplantrescue.org/caseedbanks.html [accessed July 2024].

[CNDDB] California Department of Fish and Wildlife, Natural Diversity Database. 2024. RareFind 5 [Internet application] and CNDDB Maps and Data, Version 5.3.0. Available at: https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data [Government Version, July 2024].

[CNPS] California Native Plant Society, Rare Plant Program. 2024. Inventory of Rare and Endangered Plants of California (online edition, v9.5). Website https://www.rareplants.cnps.org [accessed July 2024].

[CCH2] Consortium of California Herbaria Portal 2. 2024. Data provided by the participants of the Consortium of California Herbaria and the California Phenology Thematic Collections Network (CAP-TCN). Regents of the University of California, Berkeley and Cal Poly, San Luis Obispo. Website http//:www.cch2.org/portal/index.php [accessed July 2024].

[CPC] Center for Plant Conservation. 2024. CPC National Collection Rare Plant Database. Website https://saveplants.org/national-collection/pollinator-search/ [accessed July 2024].

[CVRMA] County of Ventura Resource Management Agency. 2025. Pending permit ID PL24-0132. Available from https://vcrma.org/wp-content/uploads/2024/07/pending-projects.pdf and map viewer https://rma.maps.arcgis.com/apps/webappviewer/index.html?id=b8ad6075638a40f8bf9c7ec4897fb825

DeVecchio, D. E., R. V. Heermance, M. Fuchs, and L. A. Owen. 2012. Climate-controlled landscape evolution in the Western Transverse Ranges, California: Insights from Quaternary geochronology of the Saugus Formation and strath terrace flights. *Lithosphere* 4(2): 110–130.

Dibblee, T. W., and H. E. Ehrenspeck. 1990a. Geologic map of the Camarillo and Newbury Park quadrangles, Ventura County, California. Dibblee Geological Foundation. Available from https://ngmdb.usgs.gov/mapview/?center=-118.926,34.264&zoom=11

Dibblee, T. W., and H. E. Ehrenspeck. 1990b. Geologic map of the Fillmore quadrangle, Ventura County, California. Dibblee Geological Foundation. Available from https://ngmdb.usgs.gov/mapview/?center=-118.926,34.264&zoom=11

Dibblee, T. W., and H. E. Ehrenspeck. 1992. Geologic map of the Simi quadrangle, Ventura County, California. Dibblee Geological Foundation. Available from https://ngmdb.usgs.gov/mapview/?center=-118.926,34.264&zoom=11

Elvin, M. A. and A. C. Sanders. 2009. Nomenclatural changes for *Monardella* (Lamiaceae) in California. *Novon* 19(3): 315–343.

Elvin, M. A., A. C. Sanders, R. A. Burgess, and B. H. Hellenthal. 2015. Three new subspecies of *Monardella* (Lamiaceae) from Southern California, U.S.A. *Novon* 23(4): 416–431.

Fahselt, D. 2007. Is transplanting an effective means of preserving vegetation? *Botany* 85(10): 1007–1017.

Fiedler, P.L., 1991. Mitigation-related transplantation, relocation and reintroduction projects involving endangered and threatened, and rare plant species in California. Final report submitted to Department of Fish & Game Endangered Plant Program.

FGC § 2062 and § 2067 California Code, Fish and Game Code. Available from: https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=FGC&sectionNum=2062 and

https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=FGC&sectionNum=2067 [accessed 3 July 2024].

Google Earth. 2024. Desktop application. Available from https://www.google.com/earth/about/versions/#earth-pro

Guttierez, C. I, S. S. Tan, and K. B. Clahan. 2008. Geologic map of the east half Santa Barbara 30' × 60' quadrangle, California. California Geological Survey. Available from https://ngmdb.usgs.gov/mapview/?center=-118.926,34.264&zoom=11

Hanson, T. M. 2012. Research on the ecology and life-history of a rare California endemic mint, *Monardella venosa*. Master's thesis, California State University Chico.

iNaturalist. 2024. Available at: https://inaturalist.org [accessed July 2024].

[Jepson] Jepson Flora Project (eds.) 2024, *Jepson eFlora*, https://ucjeps.berkeley.edu/eflora/, accessed on July 18, 2024.

Jokerst, J. D. 1993. *Monardella* (Lamiaceae). In Hickman, J. C. (ed.), *The Jepson manual*: *Higher plants of California*. University of California Press, Berkeley, CA.

Loarie, S. R., B. E. Carter, K. Hayhoe, S. McMahon, R. Moe, C. A. Knight, and D. D. Ackerly. 2008. Climate change and the future of California's endemic flora. *PLoS ONE* 3(6): 1–10.

McGraw, J. M., and A. L. Levin. 1998. The roles of soil type and shade intolerance in limiting the distribution of the edaphic endemic *Chorizanthe pungens* var. *hartwegiana* (Polygonaceae). *Madroño* 45(2): 119–127.

Menges, E. S. 1991. Seed germination percentage increases with population size in a fragmented prairie species. *Conservation Biology* 5(2): 158–164.

NatureServe. 2024. NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Website http://explorer.natureserve.org [accessed July 2024].

Newman, D. and D. Pilson. 1997. Increased probability of extinction due to decreased genetic effective population size: experimental populations of *Clarkia pulchella*. *Evolution* 51(2): 354–362.

Ouborg, N. J., P. Vergeer, and C. Mix. 2006. The rough edges of the conservation genetics paradigm for plants. *Journal of Ecology* 94:1233–1248.

Sanders, A. C., M. A. Elvin, and M. S. Brunell. 2012. *Monardella* (Lamiaceae). In: Jepson Flora Project (eds.), *Jepson eFlora*. Website: https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=91094 [accessed July 2024].

Shaffer, M. L. 1981. Minimum population sizes for species conservation. *BioScience* 31(2): 131–134.

Sims, A. E., and R. Bittman. 2015. Rare Plant Status Review: *Monardella sinuata* subsp. *gerryi*. Proposed addition to California Rare Plant Rank 1B.1, G1 / S1. California Native Plant Society and California Natural Diversity Database.

Smith, B., and K. M. Kay. 2018. Differing patterns of genetic diversity and inbreeding in two rare serpentine *Monardellas* in the northern Sierra Nevada. *Madroño* 65(1): 10–21.

Tan, S. S., K. B. Clahan, and C. S. Hitchcock. 2004a. Geologic map of the Camarillo 7.5' quadrangle Ventura County, California: A digital database. Version 1.0. United States Geological Survey. Available from https://ngmdb.usgs.gov/mapview/?center=-118.926,34.264&zoom=11

Tan, S. S., K. B. Clahan, and P. J. Irvine. 2004b. Geologic map of the Santa Paula 7.5' quadrangle Ventura County, California: A digital database. Version 1.0. United States Geological Survey. Available from https://ngmdb.usgs.gov/mapview/?center=-118.926,34.264&zoom=11

Tan, S. S., K. B. Clahan, and Rosinski, A. M. 2004c. Geologic map of the Saticoy 7.5' quadrangle Ventura County, California: A digital database. Version 1.0. United States Geological Survey. Available from https://ngmdb.usgs.gov/mapview/?center=-118.926,34.264&zoom=11

Tan, S. S., and P. J. Irvine. 2005. Geologic map of the Santa Paula Peak 7.5' quadrangle Ventura County, California: A digital database. Version 1.0. United States Geological Survey. Available from https://ngmdb.usgs.gov/mapview/?center=-118.926,34.264&zoom=11

[USFWS] United States Fish and Wildlife Servive.1998. Recovery plan for insect and plant taxa from the Santa Cruz Mountains in California. Prepared by Connie Rutherford and Kim Touneh, Ventura Fish and Wildlife Office. Published by Region 1, USFWS, Portland Oregon.

**Personal Communications**

Drew, Bryan. Professor, University of Nebraska Kearney. Plant taxonomist studying phylogenetics and evolution of *Monardella* and other Lamiaceae. Online communication regarding genetic research and relationships in the *Monardella sinuata* complex. 31 July 2024.

Elvin, Mark. Professional botanist and *Monardella* expert. Telephone communication regarding *Monardella* ecology, range, and natural history. 17 December 2024.

Schneider, Heather. Senior Rare Plant Conservation Scientist. Santa Barbara Botanic Garden. Email communication regarding *Monardella* seed collections. 21 January 2025.

Searcy, Adam. Rare Plant Botanist, California Native Plant Society. Phone conversation regarding habitat/vegetation north of Santa Clara River. 21 January 2025.

**State of California**
**Department of Fish and Wildlife**

**Signed original on file, received July 10, 2025**

# Memorandum

**Date:** July 2, 2025

**To:** Melissa Miller-Henson
Executive Director
Fish and Game Commission

**From:** Charlton H. Bonham
Director

**Subject:** **Initial Evaluation of the Petition to List Gerry's Curly-Leaved Monardella (*Monardella sinuata* subsp. *gerryi*) as Endangered under the California Endangered Species Act**

The California Department of Fish and Wildlife (Department) has completed its initial evaluation of the petition to list Gerry's curly-leaved monardella (*Monardella sinuata* subsp. *gerryi*) as an endangered species under the California Endangered Species Act (CESA), Fish and Game Code section 2050 et seq. The Fish and Game Commission (Commission) received the petition from the California Native Plant Society on February 19, 2025. Pursuant to Fish and Game Code section 2073, the Commission referred the petition to the Department on February 28, 2025. On June 12, 2025, the Commission approved a Department request for a 30-day extension to further analyze the petition and complete its evaluation report in accordance with Fish and Game Code section 2073.5, subdivision (b).

The Department completed the attached petition evaluation report as required by Fish and Game Code section 2073.5. The Department's petition evaluation report delineates the categories of information required in a petition, evaluates the sufficiency of the available scientific information, and incorporates additional relevant information that the Department possessed or received during the review period. Based upon the information contained in the petition, and other relevant information in the Department's possession, the Department has determined that there is sufficient scientific information to indicate that the petitioned action may be warranted. The Department recommends that the Commission accept the petition for further consideration pursuant to CESA.

If you have any questions or need additional information, please contact Ryan Mathis, Acting Branch Manager, Habitat Conservation Planning Branch at (916) 704-6177 or by email at NativePlants@wildlife.ca.gov.

Attachments

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CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

# California Endangered Species Act

## Petition Evaluation for Gerry's Curly-Leaved Monardella (*Monardella sinuata* subsp. *gerryi*)

Report to the Fish and Game Commission
June 2025

Cover page photo credit: Gerry's curly-leaved monardella by Mark Elvin © 2024

Suggested citation: California Department of Fish and Wildlife (CDFW). 2025. Report to the Fish and Game Commission, petition evaluation for Gerry's curly-leaved monardella (*Monardella sinuata* subsp. *gerryi*). California Department of Fish and Wildlife, P.O. Box 944209, Sacramento CA 94244-2090. 18 pp.

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## LIST OF ABBREVIATIONS, ACRONYMS, AND TERMS

CEQA – California Environmental Quality Act
CESA – California Endangered Species Act
CNDDB – California Natural Diversity Database
CNPS – California Native Plant Society
Commission – California Fish and Game Commission
Department – California Department of Fish and Wildlife
et al. – "and others"
subsp. – subspecies

## EXECUTIVE SUMMARY

This petition evaluation for Gerry's curly-leaved monardella (*Monardella sinuata* subsp. *gerryi*) has been prepared by the California Department of Fish and Wildlife (Department) in response to the petition to list Gerry's curly-leaved monardella as endangered under the California Endangered Species Act (CESA). The purpose of this petition evaluation is to provide a recommendation to the Fish and Game Commission (Commission) on whether the petition provides sufficient information to indicate the petitioned action may be warranted.

Gerry's curly-leaved monardella is an erect, annual herb in the mint family (Lamiaceae). The petition describes Gerry's curly-leaved monardella as being known from three occurrences in the Camarillo and Las Posas hills in Ventura County and restricted to Las Posas Sand soil. The petition provides an abundance estimate of fewer than 500 individuals of Gerry's curly-leaved monardella and provides information to suggest a declining population trend. The petition lists several threats to Gerry's curly-leaved monardella including development, land clearing and grading, vegetation succession, agriculture, construction and maintenance of roads and trails, and erosion. The most significant and immediate threat, as mentioned in the petition, is a proposed development that could impact the largest occurrence of the species. Existing management efforts were reviewed and suggestions for future management actions discussed in the petition. Information sources and a detailed distribution map were also provided in the petition.

The Department has determined that the petition addresses each of the required petition components listed in Fish and Game Code section 2072.3 and California Code of Regulations, title 14, section 670.1, subdivision (d)(1):

- Life history
- Range
- Distribution
- Detailed distribution map
- Kind of habitat necessary for survival
- Abundance
- Population trend
- Factors affecting the ability to survive and reproduce
- Degree and immediacy of threat
- Impact of existing management efforts
- Suggestions for future management
- Availability and sources of information

In completing its petition evaluation, the Department considered the information in the petition and other relevant information the Department possesses. The Department has determined that there is sufficient scientific information to indicate that the petitioned action to list Gerry's curly-leaved monardella as endangered under CESA may be warranted. Therefore, the Department recommends that the Commission accept the petition for further consideration pursuant to CESA.

# 1 INTRODUCTION

## 1.1 Petition Evaluation Overview

This petition evaluation serves as the basis for the California Department of Fish and Wildlife's (Department) recommendation to the California Fish and Game Commission (Commission) on whether the petition to list Gerry's curly-leaved monardella (*Monardella sinuata* Elvin & A. C. Sanders subsp. *gerryi* Elvin, A.C. Sanders & R.A. Burgess) as endangered under the California Endangered Species Act (CESA) should be accepted and considered. The recommendation is based on the sufficiency of scientific information in the petition, as well as other relevant information possessed or received by the Department during the evaluation period.

A petition to list a species under CESA must include "information regarding the population trend, range, distribution, abundance, and life history of a species, the factors affecting the ability of the population to survive and reproduce, the degree and immediacy of the threat, the impact of existing management efforts, suggestions for future management, and the availability and sources of information. The petition shall also include information regarding the kind of habitat necessary for species survival, a detailed distribution map, and any other factors that the petitioner deems relevant" (Fish & G. Code, § 2072.3; Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1)).

Once a petition is submitted to the Commission, the Department has 90 days (120 days with extension) to prepare a petition evaluation that evaluates each of the petition components and makes a recommendation to the Commission as to whether there is sufficient scientific information to indicate that the petitioned action to list the species under CESA may be warranted (Fish & G. Code, § 2073.5, subds. (a)-(b)). Once completed by the Department, the petition evaluation is delivered to the Commission and placed on the agenda for receipt at the next available meeting of the Commission. At that time, the petition evaluation will be made available to the public for a 30-day public comment period prior to the Commission taking any action on the petition. The Commission then considers the petition, the Department's petition evaluation, written comments received, and oral testimony to make a finding at the next available meeting of the Commission as to whether the petition provides "sufficient information to indicate that the petitioned action may be warranted" (Fish & G. Code, § 2074.2, subd. (e)(2)). The standard for accepting a petition for consideration and assessing sufficiency of information is addressed in *Center for Biological Diversity v. California Fish and Game Commission* (2008) 166 Cal.App.4th 597.

If the Commission determines that the petitioned action may be warranted, it accepts the petition, and the species becomes a candidate for CESA listing and proceeds to the status review stage of the CESA listing process. The Department then prepares a peer-

reviewed report that advises the Commission on whether the petitioned action is warranted, based upon the best scientific information available (Fish & G. Code, § 2074.6). Finally, the Commission determines whether the petitioned action to list the species as threatened or endangered is warranted, based on the Department's status review and other relevant information in the administrative record (Fish & G. Code, § 2075.5).

## 1.2 CESA Petition History

On February 19, 2025, the California Native Plant Society (CNPS) submitted a petition to the Commission to list Gerry's curly-leaved monardella as endangered under CESA. On February 28, 2025, the Commission referred the petition to the Department for evaluation. At its meeting on April 16-17, 2025, the Commission officially acknowledged receipt of the petition. At its meeting on June 11-12, 2025, the Commission granted the Department's request for a 30-day extension of the period to review the petition and prepare this petition evaluation.

## 1.3 Federal Endangered Species Act Petition History

Gerry's curly-leaved monardella has no federal status under the federal Endangered Species Act.

## 1.4 Additional Species Status Designations

### *1.4.1 NatureServe Conservation Status Ranks*

NatureServe's conservation status ranks are a way to assess the conservation status of species across geographic scales using standard methods. These conservation status ranks are typically assigned by natural heritage programs. There is a nationwide network of natural heritage programs, with more than 80 programs throughout the western hemisphere, overseen by an organization called NatureServe (CNDDB 2020). The California Natural Diversity Database (CNDDB) is California's natural heritage program.

All natural heritage programs use the same ranking methodology originally developed by The Nature Conservancy, and subsequently revised and maintained by NatureServe, to assign conservation status ranks (Master et al. 2012). For subspecies and varieties, these conservation status ranks consist of three components: 1) a global conservation status rank (global rank, G rank) describing the status of a given species over its entire distribution; 2) a trinomial conservation status rank (trinomial rank, T rank) describing the status of a given subspecies or variety over its entire distribution; and 3) a subnational conservation status rank (subnational rank, S rank) describing the status of

a given subspecies or variety over its state distribution (Master et al. 2012). Global, trinomial, and subnational ranks are calculated using NatureServe's rank calculator which uses a combination of rarity, threats, and trends to assign a conservation status rank for the taxon in question (Master et al. 2012). The CNDDB has assigned Gerry's curly-leaved monardella a global rank of G3, a trinomial rank of T1, and a subnational rank of S1, indicating that the full species, *Monardella sinuata*, is vulnerable globally, whereas the subspecies *gerryi* is critically imperiled both globally and within California due to one or more of the following: very high risk of extinction due to a very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors (CNDDB 2020, 2025).

### *1.4.2 California Rare Plant Rank*

CNPS works in collaboration with botanical experts throughout the state, including Department biologists, to assign rare plants a California Rare Plant Rank reflective of their rarity status (CNDDB and CNPS 2020). Gerry's curly-leaved monardella has been assigned a California Rare Plant Rank of 1B.1 (CNPS 2025). Plants with a California Rare Plant Rank of 1B are considered rare, threatened, or endangered throughout their range with the majority endemic to California (CNDDB and CNPS 2020). The threat code extension of ".1" indicates that the species is seriously threatened in California with over 80% of occurrences threatened and a high degree and immediacy of threat (CNDDB and CNPS 2020).

# 2 SPECIES DESCRIPTION AND TAXONOMY

CESA defines the "species" eligible for listing to include "species or subspecies" (Fish & G. Code, §§ 2062, 2067, 2068) and courts have held that the term "species or subspecies" includes "evolutionarily significant units" (Central Coast Forest Assn. v. Fish & Game Com. (2018) 18 Cal.App.5th 1191, 1236, citing Cal. Forestry Assn., *infra*, 156 Cal.App.4th at pp. 1542, 1549). Gerry's curly-leaved monardella is a subspecies of *Monardella sinuata*; however, for convenience, the term "species" is used herein to refer to Gerry's curly-leaved monardella.

## 2.1 Species Description

The information in this section covers the main characters used to identify Gerry's curly-leaved monardella and is based on the original description of the species from Elvin et al. 2015 unless otherwise noted; additional information is available in Elvin et al. (2015).

Gerry's curly-leaved monardella is an erect, annual herb in the mint family (Lamiaceae). Gerry's curly-leaved monardella typically grows between 7 and 30 cm (2.7 and 11.8 in) tall but can get as tall as 43 cm (16.9 in). The plant is simple to moderately branched.

Stems are straw-colored to tan with sparse cone-shaped glands. Leaf blades are narrowly elliptic measuring greater than 10 mm (0.39 in) in length and 2 to 6 mm (0.08 to 0.24 in) in width. The leaf margins are generally wavy.

Gerry's curly-leaved monardella flowers are purple and 11 to 14 mm (0.43 to 0.55 in) long. The flowers are weakly bilateral with an upper petal lip that is erect and 2-lobed and a lower petal lip that is recurved and 3-lobed (Sanders et al. 2012). In Gerry's curly-leaved monardella, the calyx (outermost group of flower parts) is 5.5 to 6 mm (0.22 to 0.24 in) long and has glandular trichomes (hair-like growths) that are 0.02 to 0.04 mm long. Flowers are arranged in a tightly condensed, head-like cluster called an inflorescence with one to seven inflorescences per plant. Inflorescences are 7 to 17 mm (0.28 to 0.67 in) wide, with those on the main stem larger than those on the axillary stems. Gerry's curly-leaved monardella produces dry fruits called nutlets that are 1.5 to 1.6 mm (0.06 in) long.

## 2.2 Species Taxonomy

Gerry's curly-leaved monardella was first described by Mark Elvin, Andrew Sanders, Richard Burgess, and Barbara Hellenthal in 2015 (Elvin et al. 2015). Prior to its recognition as a distinct subspecies, Gerry's curly-leaved monardella was considered a disjunct population of southern curly-leaved monardella (*M. sinuata* subsp. *sinuata*) (Elvin et al. 2015). Southern curly-leaved monardella occurs from Morro Bay in San Luis Obispo County south to the Purisima Hills in Santa Barbara County, but the plants now described as Gerry's curly-leaved monardella are from Ventura County, greater than 125 km (78 mi) south of other southern curly-leaved monardella populations (Elvin et al. 2015). Gerry's curly-leaved monardella is not currently included in the Jepson eFlora because the species was described in 2015 after the Jepson eFlora treatment for the mint family (which includes the genus *Monardella*) was published (Sanders et al. 2012, Elvin et al. 2015).

When initially described in 2015, Elvin et al. considered describing Gerry's curly-leaved monardella as a full species due to its geographic isolation and distinct morphological characters but decided to classify it as a subspecies based on similarities to *M. sinuata* (Elvin et al. 2015). The petition states that recent phylogenetic analyses support elevating Gerry's curly-leaved monardella to a full species, and that these findings are anticipated to be published in the future. Whether Gerry's curly-leaved monardella is recognized as a full species or a subspecies, the entity proposed for listing in the petition is the same and elevating it to a full species would not affect its rarity status.

## 2.3 Similar Taxa

Gerry's curly-leaved monardella is similar to southern curly-leaved monardella and northern curly-leaved monardella (*M. sinuata* subsp. *nigrescens*), but there are stem, leaf, flower, and fruit characteristics that distinguish Gerry's curly-leaved monardella from the other two subspecies as shown in Table 1. The petition mentions that the only other annual *Monardella* species from Ventura County is Brewer's monardella (*Monardella breweri*) which has leaf margins that are slightly wavy or not wavy, compared to Gerry's curly-leaved monardella which has wavy leaf margins. Brewer's monardella has not been documented to co-occur with Gerry's curly-leaved monardella.

*Table 1. Key traits to distinguish between Monardella sinuata subspecies (Elvin et al. 2015).*

| | Gerry's curly-leaved monardella | Southern curly-leaved monardella | Northern curly-leaved monardella |
|---|---|---|---|
| Subspecies | subsp. *gerryi* | subsp. *sinuata* | subsp. *nigrescens* |
| Leaf width (mm) | 2–6 | 4–10 (occasionally 3) | 4–10 |
| Leaf length to width ratio | 5–7:1 | 3–6:1 | 3–6:1 |
| Calyx length (mm) | 5.5–6 | 7–8 | 7–9 |
| Calyx trichomes (mm) | 0.02–0.04, glandular | None | 0.6–1.2, non-glandular |
| Corolla length (mm) | 11–14 | 13–16 | 14–16 |
| Stem glands | Present | Absent | Absent |
| Fruit length (mm) | 1.6 | 1.1 | 1.1 |
| County distribution | Ventura | San Luis Obispo, Santa Barbara | Monterey |

# 3 SUMMARY OF PETITION COMPONENTS

Pursuant to Fish and Game Code section 2072.3 and California Code of Regulations, title 14, section 670.1, subdivision (d)(1), the Department evaluated whether the petition contained information on each of the following petition components:

- Life history;
- Range;
- Distribution;
- Detailed distribution map;
- Kind of habitat necessary for survival;
- Abundance;
- Population trend;
- Factors affecting the ability to survive and reproduce;
- Degree and immediacy of threat;
- Impact of existing management efforts;
- Suggestions for future management; and
- Availability and sources of information.

The Commission did not receive new information from the public during the petition evaluation period (Fish & G. Code, § 2073.4). Pursuant to Fish and Game Code section 2073.5, the Department evaluated the petition to determine whether there is, or is not, sufficient information to indicate that the petitioned action may be warranted. A summary of the relevant information from the petition for each of the petition components is presented below. In some instances, the Department has grouped similar components together and renamed components to create a more cohesive and readable document.

## 3.1 Life History

This section summarizes the information in the petition regarding the species' life history (Fish & G. Code, § 2072.3; Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1)).

The petition discusses the life history of Gerry's curly-leaved monardella in the "Reproduction and Growth" section on pages 9 and 10. The petition notes that Gerry's curly-leaved monardella has been observed blooming from April through June; however, there have been no studies on pollination, reproduction, or seed dispersal specific to the species. The petition mentions studies and observations of other *Monardella* species. Pollinators mentioned in the petition for other *Monardella* species include hummingbirds, bees, butterflies, and flies. A seedbank study for a different

species of *Monardella*, mentioned in the petition, found that most seedlings germinate close to the parent plant and no specialized dispersal mechanisms were found.

## 3.2 Range and Distribution

This section summarizes the information in the petition regarding the species' range and distribution and provides a detailed distribution map (Fish & G. Code, § 2072.3; Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1)). A species' range for the purposes of CESA and this petition evaluation is the species' range within California (Cal. Forestry Assn. v. Cal. Fish and Game Com. (2007) 156 Cal.App.4th 1535, 1551). Range describes the general geographical area in which a species occurs. Distribution describes the actual sites where individuals and populations of the species occur within the species' range.

The petition discusses the range and distribution of Gerry's curly-leaved monardella in the "Distribution" section on pages 11 through 19. The petition also provides detailed distribution maps for Gerry's curly-leaved monardella as Figures 3 through 6 on pages 12 through 14. Figure 3 of the petition is included as Figure 1 on page 8 of this petition evaluation. The petition describes Gerry's curly-leaved monardella as being endemic to the Camarillo and Las Posas hills of Ventura County, California. There are three occurrences of Gerry's curly-leaved monardella documented in the CNDDB and described in the petition. One of the occurrences (CNDDB occurrence 1) is based on a 1976 herbarium collection from the Santa Rosa Valley and is presumed extirpated by development. The remaining two occurrences are presumed extant, with one occurrence located in the Camarillo Hills (CNDDB occurrence 2) and the other occurrence located in the Las Posas Hills (CNDDB occurrence 3). The petition reports that based on site visits in 2024, the area occupied by Gerry's curly-leaved monardella is approximately 540 $m^2$ (0.13 ac). The petition also mentions that there is some potential to find additional occurrences of Gerry's curly-leaved monardella but much of the appropriate habitat in the Camarillo and Las Posas hills has been developed or converted to agriculture and the undeveloped areas may not have suitable microhabitat or climatic conditions.

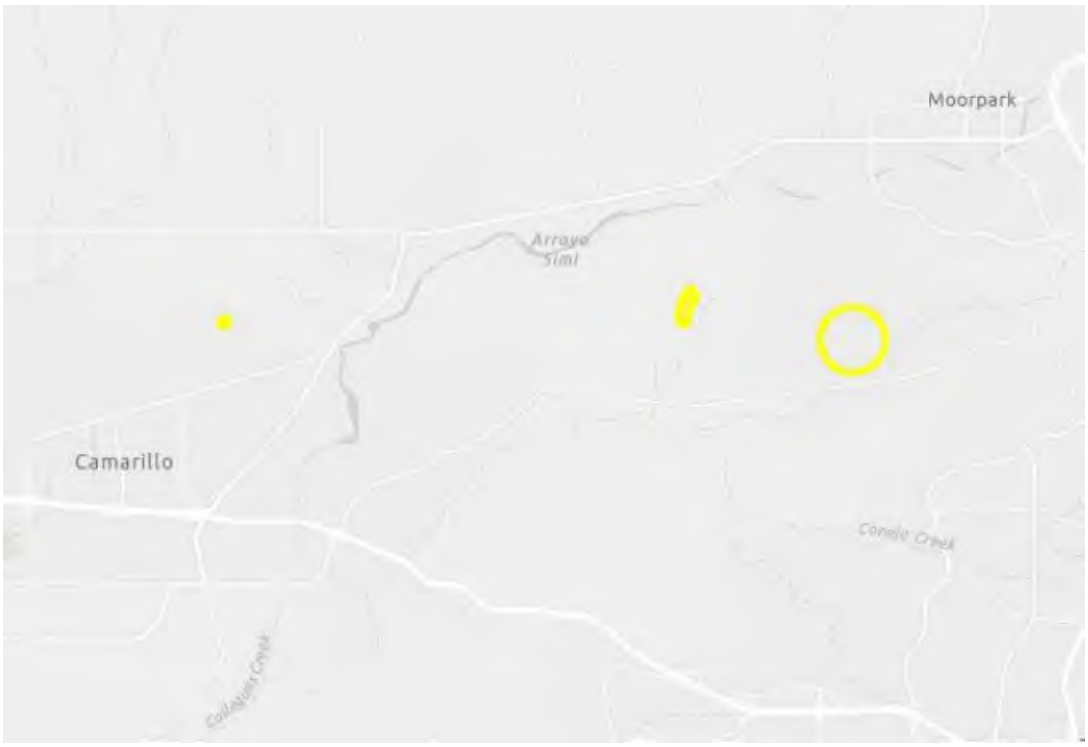



*Figure 1. Map of the range and distribution of Gerry's curly-leaved monardella as provided in Figure 3 of the petition. Yellow polygons are 2024 CNDDB occurrences (left to right; occurrences 2, 3, and 1).*

## 3.3 Habitat

This section summarizes the information in the petition regarding the kind of habitat necessary for species survival (Fish & G. Code, § 2072.3; Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1)).

The petition discusses the kind of habitat necessary for Gerry's curly-leaved monardella survival in the "Habitat" section on page 10. The petition describes Gerry's curly-leaved monardella as being restricted to soils derived from Las Posas Sand at elevations from 150 to 245 m (490 to 805 ft) above sea level. The petition states that Gerry's curly-leaved monardella occurs in sandy openings within coastal sage scrub and provides a list of plant associates.

## 3.4 Abundance and Population Trend

This section summarizes the information in the petition regarding the species' abundance and population trend (Fish & G. Code, § 2072.3; Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1)).

The petition discusses abundance and population trend for Gerry's curly-leaved monardella in the "Abundance and Population Trends" section on pages 19 and 20. The petition states that Gerry's curly-leaved monardella is known from three CNDDB occurrences. One occurrence (CNDDB occurrence 1) is presumed extirpated while the remaining two occurrences are extant. The petition reports that in 2024, there were 350 to 400 plants at one of the extant occurrences (CNDDB occurrence 2) and 21 plants at the other extant occurrence (CNDDB occurrence 3). The petition states that Gerry's curly-leaved monardella is likely experiencing a declining population trend based on loss of habitat in the area from agriculture and development. In addition, the petition notes that one of the extant occurrences (CNDDB occurrence 3) appears to be declining with 50 to 100 plants reported in 2013, but just 21 plants reported in 2024.

## 3.5 Threats

This section summarizes the information in the petition regarding the factors affecting the ability of the species to survive and reproduce, and the degree and immediacy of threats (Fish & G. Code, § 2072.3; Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1)).

The petition discusses threats affecting the ability of Gerry's curly-leaved monardella to survive and reproduce in the "Factors Impacting Survival and Reproduction" section on pages 19 and 20 and discusses the degree and immediacy of threat for Gerry's curly-leaved monardella in the "Degree and Immediacy of Threat" section on page 20. The petition identifies the following factors as threats to Gerry's curly-leaved monardella: proposed development, land clearing and grading, vegetation succession, agriculture, construction and maintenance of roads and trails, and erosion. The petition notes that both extant occurrences of Gerry's curly-leaved monardella are on privately-owned land with the most immediate threat being a proposed development project that could impact the largest occurrence of the species.

The petition mentions that small, fragmented populations are at an increased risk of extinction. The petition states that fragmented populations may experience inbreeding depression and pollen limitation which may then lead to decreased germination rates, decreased genetic variability, and higher probability of extinction. The petition also discusses climate change as having the potential to increase the extinction risk for plants with small populations and these risks are exacerbated for soil specialist species, such as Gerry's curly-leaved monardella, which may be unable to migrate to new sites as the climate changes.

## 3.6 Existing Management

This section summarizes the information in the petition regarding the impact of existing management efforts on the species (Fish & G. Code, § 2072.3; Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1)).

The petition discusses existing management for Gerry's curly-leaved monardella in the "Impact of Existing Management Efforts" section on pages 20 through 22. The petition states that there is currently no conservation management plan or conservation actions that have been taken to protect Gerry's curly-leaved monardella. While Gerry's curly-leaved monardella may be afforded some protection through the California Environmental Quality Act (CEQA), the petition notes that CEQA does not necessarily prevent rare plants from being severely impacted or extirpated from a project site. CEQA-approved mitigation measures can include moving a rare plant to another area; however, the petition cites a paper that reviews transplantation, relocation, or reintroduction attempts of rare plants and finds that only 8% of these attempts are successful. The petition mentions that Gerry's curly-leaved monardella needs the increased protection afforded by CESA to ensure the species does not go extinct.

## 3.7 Future Management

This section summarizes the information in the petition regarding suggestions for future management (Fish & G. Code, § 2072.3; Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1)).

The petition discusses future management actions for Gerry's curly-leaved monardella in the "Suggestions for Future Management" section on pages 22 through 24. The petition recommends the following specific actions:

- Protect and manage both extant occurrences to ensure long-term survival and conservation of the species.
- Collect seed at both extant occurrences for potential future use in scientific research, reintroduction efforts, and/or other conservation actions.
- Survey all potentially suitable habitat for additional populations of the species.
- Conduct additional scientific research on the biology and ecology of the species to help inform conservation and management actions.
- Monitor population trends at existing occurrences and identify management actions that may be required to ensure long-term persistence and expansion of the species.
- Enhance existing populations if feasible and determine if new populations could be established at other suitable locations.
- Educate the public about conservation of the species.

## 3.8 Availability and Sources of Information

This section summarizes the information in the petition regarding availability and sources of information (Fish & G. Code, § 2072.3; Cal. Code Regs., tit. 14, § 670.1, subd. (d)(1)).

The petition provides a list of sources for Gerry's curly-leaved monardella in the "References" section on pages 25 through 29. The petitioner provided electronic copies of sources from the petition to the Commission.

# 4 OTHER RELEVANT INFORMATION AVAILABLE TO THE DEPARTMENT

Pursuant to Fish and Game Code section 2073.5, the Department also evaluates petitions in relation to other relevant information the Department possesses or receives.

The Department has not been able to locate any additional information in its possession on Gerry's curly-leaved monardella that was not already provided by the petitioner, and no additional information was received by the Department at the time this report was submitted to the Commission. If the Commission accepts the petition for consideration, all reasonable attempts will be made by the Department to notify affected and interested parties and to solicit data and comments on the petitioned action (Fish & G. Code, § 2074.4). At that time, the Department will commence a review of the status of the species and produce a written peer reviewed report, based upon the best scientific information available to the Department, which indicates whether the petitioned action is warranted (Fish & G. Code, § 2074.6).

# 5 SUFFICIENCY OF SCIENTIFIC INFORMATION AND RECOMMENDATION TO THE COMMISSION

The Department evaluated the petition components set forth in Fish and Game Code section 2072.3 and California Code of Regulations, title 14, section 670.1, subdivision (d)(1) for sufficiency of information pursuant to Fish and Game Code section 2073.5. Based upon the information contained in the petition and other relevant information, the Department determined there is sufficient information to indicate that the petitioned action may be warranted (Fish & G. Code, § 2073.5). Therefore, the Department recommends the Commission accept the petition for further consideration under CESA. If the Commission accepts the petition for further consideration, the Department will commence a review of the status of the species at that time pursuant to Fish and Game Code section 2074.6 and California Code of Regulations, title 14, section 670.1, subdivision (f).

## ACKNOWLEDGEMENTS

This petition evaluation was prepared by Kristi Lazar in the Department's Habitat Conservation Planning Branch, Native Plant Program.

## LITERATURE CITED

CNDDB (California Natural Diversity Database). 2020. California Natural Diversity Database (CNDDB) Management Framework. California Department of Fish and Wildlife. Sacramento, CA, USA.

CNDDB (California Natural Diversity Database). 2025. RareFind 5 [internet]. Government version- dated March 2025. California Department of Fish and Wildlife. Sacramento, CA, USA.

CNDDB (California Natural Diversity Database), and CNPS (California Native Plant Society). 2020. The CNDDB and CNPS cooperative relationship and rare plant status review process. Sacramento, CA, USA. Available from: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=175695&inline (Accessed: 2 August 2024).

CNPS (California Native Plant Society). 2025. CNPS inventory of rare and endangered plants of California: *Monardella sinuata* ssp. *gerryi*. Available from: https://rareplants.cnps.org/Plants/Details/3890 (Accessed: 5 March 2025).

Elvin, M., A. Sanders, R. Burgess, and B. Hellenthal. 2015. Three new subspecies of *Monardella* (Lamiaceae) from Southern California, U.S.A. Novon 23(4):416-431.

Master, L., D. Faber-Langendoen, R. Bittman, G. Hammerson, B. Heidel, L. Ramsay, K. Snow, A. Teucher, and A. Tomaino. 2012. NatureServe conservation status assessments: factors for evaluating species and ecosystem risk. NatureServe. Arlington, VA, USA.

Sanders, A., M. Elvin, and M. Brunell. 2012. *Monardella sinuata* in Jepson Flora Project, editor. Jepson eFlora. Available from: https://ucjeps.berkeley.edu/eflora/eflora_display.php?name=Monardella%20sinuata (Accessed: 10 March 2025).


Photo Credit: Mark Elvin 2024

# Petition Evaluation for Gerry's Curly-Leaved Monardella

**Presentation to the California Fish and Game Commission**

October 8, 2025

Kristi Lazar

Native Plant Program,
Habitat Conservation Planning Branch

# Presentation Overview

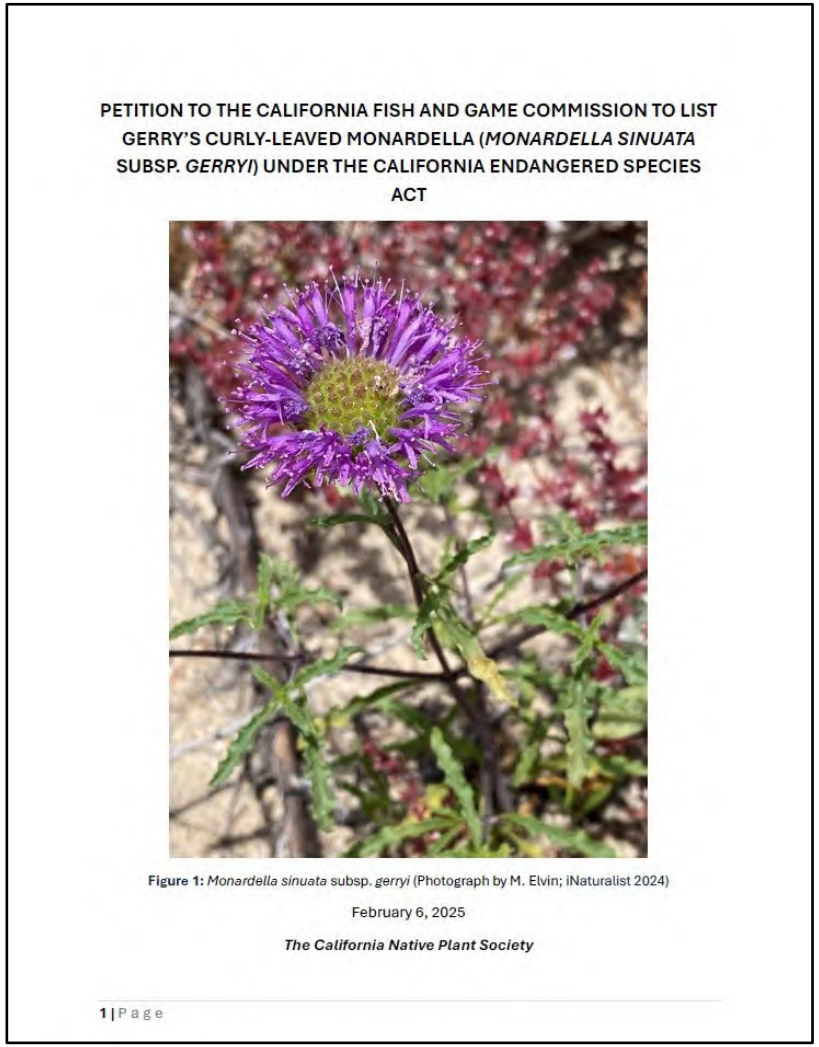
- Petition History
- Species Taxonomy
- Review Key Petition Components
- Department Recommendation

# Petition History for Gerry's Curly-Leaved Monardella

Petition Received: February 19, 2025

Petitioned Action: List as endangered under CESA

Petitioner: California Native Plant Society



PETITION TO THE CALIFORNIA FISH AND GAME COMMISSION TO LIST GERRY'S CURLY-LEAVED MONARDELLA (*MONARDELLA SINUATA* SUBSP. *GERRYI*) UNDER THE CALIFORNIA ENDANGERED SPECIES ACT

Figure 1: *Monardella sinuata* subsp. *gerryi* (Photograph by M. Elvin; iNaturalist 2024)

February 6, 2025

***The California Native Plant Society***

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# Species Taxonomy

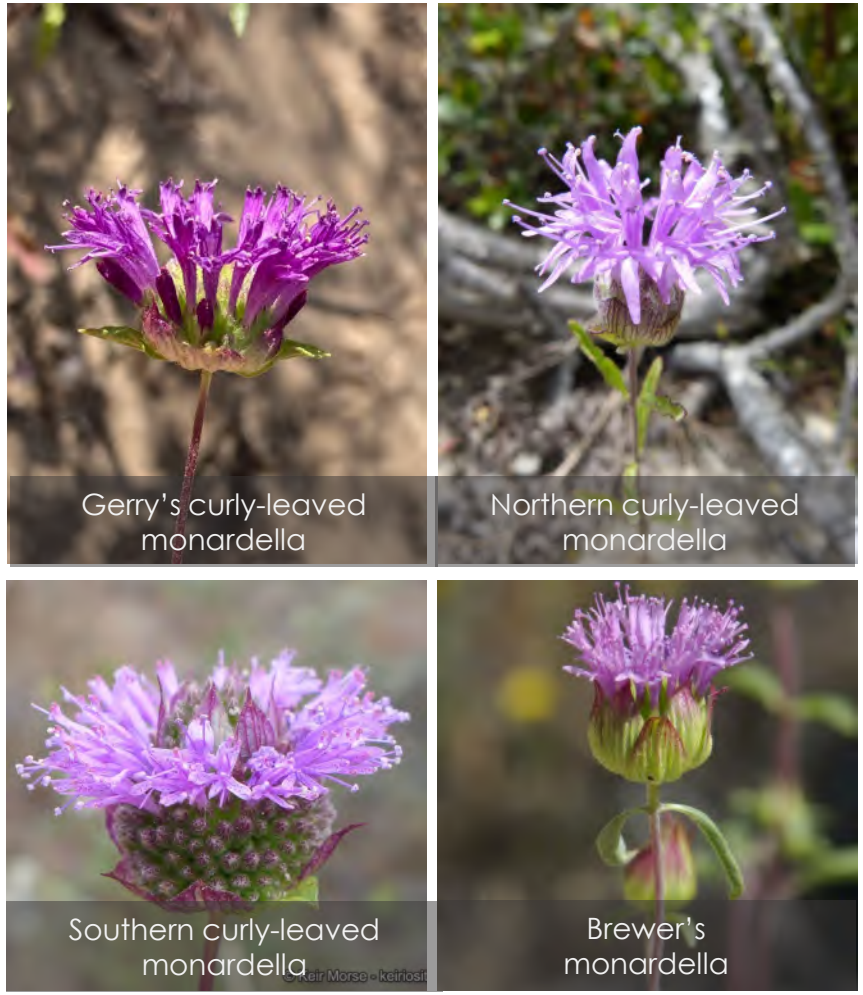
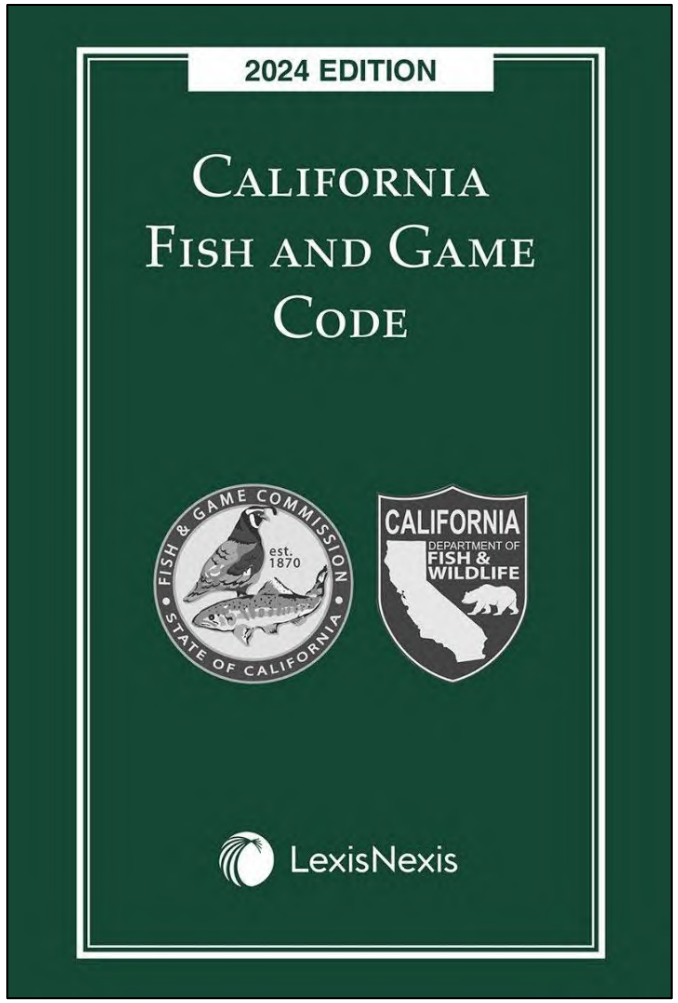



Photo Credit: Adam Searcy 2025 (upper left), Jason Matthias Mills 2018 (upper right), Keir Morse 2017 (lower left), Brent Miller 2005 (lower right)

- **Gerry's curly-leaved monardella (*Monardella sinuata* subsp. *gerryi*)**
  - Ventura County
- Northern curly-leaved monardella (*Monardella sinuata* subsp. *nigrescens*)
  - Monterey County
- Southern curly-leaved monardella (*Monardella sinuata* subsp. *sinuata*)
  - San Luis Obispo County
  - Santa Barbara County
- Brewer's monardella (*Monardella breweri*) is the only other similar Monardella species that occurs in the general vicinity

# Petition Components (Fish & Game Code §2072.3)




- **Life history**
- **Geographic range and distribution**
- **Habitat necessary for survival**
- **Population trend and abundance**
- **Factors affecting survival and reproduction**
- **Degree and immediacy of threat**
- Impact of existing management efforts
- Suggestions for future management
- Detailed distribution map
- Sources and availability of information

# Life History

Photo Credit: Adam Searcy 2025

- Annual herb
- Mint family (Lamiaceae)
- Blooms late May through June
- Purple flowers arranged in a tightly condensed cluster
- Leaf margins are wavy

# Geographic Range and Distribution

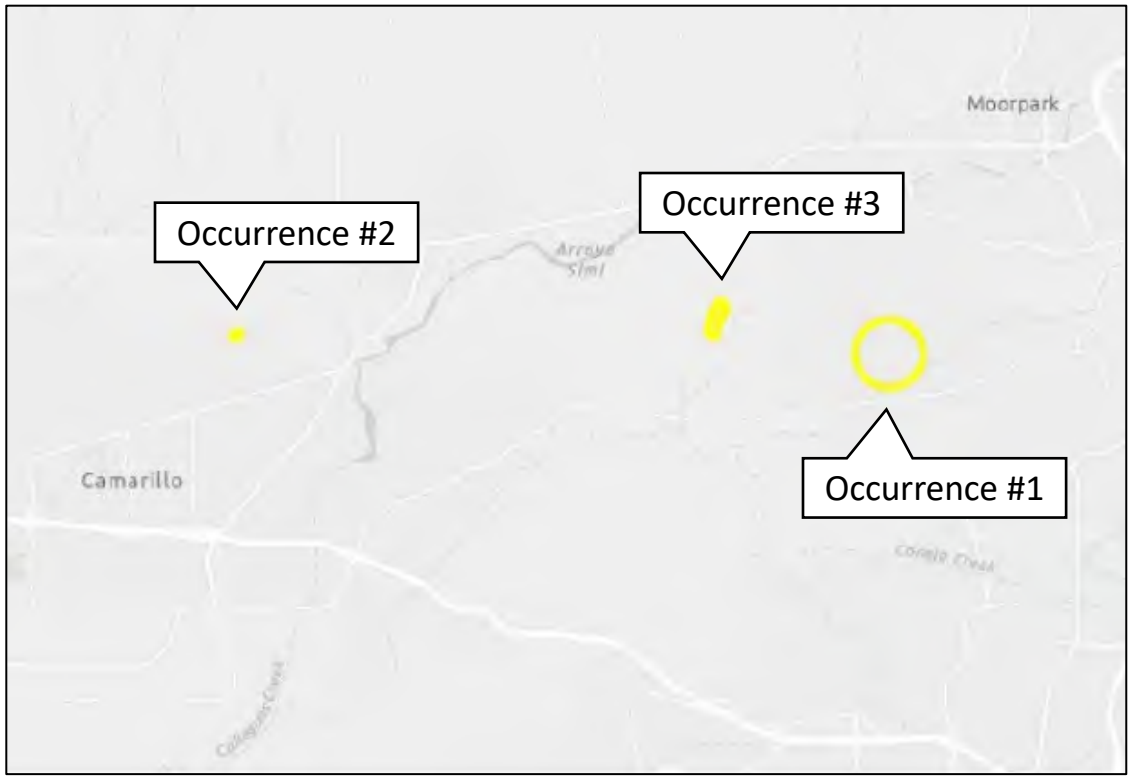



Figure 3 from the petition.
Occurrence numbers added by the Department for better visibility.

- Camarillo and Las Posas hills of Ventura County
- 3 documented occurrences
  - Occurrence #1 is presumed extirpated
- Area occupied is ~540 $m^2$ (0.13 acre)
- Figure shows the distribution of Gerry's curly-leaved monardella as yellow polygons

# Habitat Necessary for Survival

Photo Credit: Adam Searcy 2025

- Elevations 150 to 245 m (490 to 805 ft)
- Restricted to soils derived from Las Posas Sand
- Sandy openings within coastal sage scrub

# Population Trend and Abundance

- Known from three occurrences:
  - Occurrence #1: presumed extirpated
  - Occurrence #2: 350-400 plants in 2024
  - Occurrence #3: 21 plants in 2024
- Declining population trend based on:
  - Presumed extirpation of Occurrence #1
  - Occurrence #3 had 50-100 plants in 2013 but just 21 plants in 2024
  - Loss of habitat from agriculture and development

Photo Credit: Mark Elvin 2024

# Factors Affecting Survival and Reproduction

- Habitat Destruction
  - Development
  - Agriculture
  - Land clearing and grading
- Road/trail construction and maintenance
- Vegetation succession
- Erosion
- Non-native plants

Photo credit: Adam Searcy 2025

# Factors Affecting Survival and Reproduction

- **Habitat Destruction** (Development, Agriculture, Land Clearing and Grading)
  - Occurrence #1 was likely extirpated by development or agriculture
  - Occurrence #2 and #3 are on private property
    - Occurrence #2 is within a proposed housing project
    - Occurrence #3 is adjacent to agriculture


Portions of figures 5 and 6 from the petition

# Degree and Immediacy of Threat

- Serious risk of imminent extinction from previously mentioned threats

- Long-term threats
  - Small population size
  - Fragmented populations
  - Climate change

Photo Credit: Adam Searcy 2025

# Department Recommendation

The Department finds there is sufficient scientific information to indicate that the petitioned action to list the species as endangered may be warranted and recommends that the Commission accept and consider the petition.

# Thank You | Questions

Kristi Lazar

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Photo Credit: Mark Elvin 2024

# Summary

- Annual herb in the mint family
- Three occurrences in the Camarillo and Las Posas hills of Ventura County
- Restricted to soils derived from Las Posas Sand
- Declining population trend based on extirpation of one occurrence, declining population at a second occurrence, general habitat loss.
- Survival and reproduction affected by development, agriculture, land clearing and grading, road/trail construction/maintenance, vegetation succession, erosion, non-native plants
- Most imminent threat is from development
- The Department recommends the Commission accept the petition for further consideration under CESA

# Gerry's curly-leaved monardella

## *Monardella sinuata* subsp. *gerryi*

Nick Jensen, PhD
Conservation Program Director
California Native Plant Society

All Photos by Adam Searcy

# Rarity

- Gerry's curly-leaved monardella (GCLM) is among our state's rarest plants
- Only 2-3 extant occurrences
  - Newly discovered population (more on this later)
- Very small range
- Substrate specificity
  - Unlikely to find new populations
  - Las Posas Sands
- Very small population size
  - ~600 (incl. new population)
- Occupied habitat: 2 square km

# “New” Population

- Recently discovered population in Santa Rosa Valley (east of Camarillo)
- Could possibly be the same location as EO 1 (this would bring the # of extant EOs to 3)
- Approximately 100 plants
- Private land
- Erosion is a major concern
- Recent observation of plants in flower in September/October (extension of observed flowering time)

# Threats

- All EOs on Private Land
- Threats by EO
  - EO 1: Extirpated by development
  - EO 2 (largest population): proposed for development
  - EO 3 (21 plants in 2024): In decline, partially converted to agriculture
  - New EO: On private land and threatened by erosion and nonnative plants
- Other factors: stochastic events, non-native plants, erosion, road maintenance, land management

# Why CESA Listing is So Important

- **CEQA alone is not sufficient**
  - CESA affords the greatest level of protection possible for imperiled plants
    - Full mitigation standard
  - Mitigation measures routinely adopted via the CEQA process are often ineffective
  - The largest population of GCLM (EO 2) has been proposed for development

- **Need for Conservation Efforts/Management**
  - All EOs should be prioritized for protection and management for conservation purposes
  - Scientific study, monitoring, and management is necessary to ensure the survival of GCLM

- **Conclusion**
  - The best hope for the conservation of GCLM is via the protection measures and resources directed at CESA-listed taxa


Thank You! njensen@cnps.org