Rare Plant Status Review: *Mentzelia ravenii*
Proposed Addition to California Rare Plant Rank 1B.3, G2 / S2

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Changes to the original record are in blue text

This status review is being expedited through an agreement between the California Native Plant Society and the Utom Conservation Fund. Aside from being advanced as part of this agreement, the process, content, and information provided herein is not altered, modified, or developed differently in any way or form compared to other status reviews developed by CNPS.

Background and Taxonomy

Mentzelia ravenii H.J. Thomps. & J.E. Roberts, an annual herb in the Loasaceae, is a Californian endemic restricted to the western edge of the Mojave Desert in northeastern Los Angeles County (Zavortink 1966, Thompson and Roberts 1971). In *The Jepson Manual* (Prigge 1993), it was treated as a taxonomic synonym of *M. gracilenta* Torr. & A. Gray, but it has since been recognized in both the *Flora of North America* (Brokaw 2016) and the *Jepson eFlora* (Brokaw et al. 2023). It is a member of *Mentzelia* section *Trachyphytum*, a group in which species identifications are difficult due to recent diversification, hybridization, allopolyploidy, and overlapping morphological and geographical distributions (Zavortink 1966; Thompson and Roberts 1971; Brokaw 2009; Brokaw and Hufford 2010a, 2010b; J. Brokaw 2024, pers. comm.). *Mentzelia ravenii* and *M. gracilenta* are morphologically similar in having capsules mostly erect and floral bracts lobed and ± white at the base, but *M. ravenii* has flowers somewhat smaller than those of *M. gracilenta* (petals 5–10 vs. 7–17 mm long, style 4–7 vs. 6–11 mm long) (Zavortink 1966, Thompson and Roberts 1971). These two species are also ecogeographically isolated, *M. ravenii* being limited to desert foothills and *M. gracilenta* found more widely in woodland or grassland habitats of the South Coast Ranges, approaching *M. ravenii* on the northern slope of the San Gabriel Mountains (Zavortink 1966, Brokaw et al. 2023, CCH2 2024). *Mentzelia ravenii* commonly co-occurs with *M. veatchiana* Kellogg, which differs in having habit strictly erect (vs. spreading or candelabriform), petals usually deep orange in desert populations (vs. yellow with orange spot at base), and floral bracts narrow and not clasping (vs. much broader and often somewhat clasping) (Thompson and Roberts 1971). *Mentzelia mojavensis* H.J. Thomps. & J.E. Roberts is another member of *Mentzelia* section *Trachyphytum* that co-occurs with *M. ravenii* and occasionally forms hybrid swarms with *M. veatchiana* (Zavortink 1966, Thompson and Roberts 1971); plants of *M. mojavensis* are hard to distinguish from *M. albicaulis* (Douglas ex Hook.) Douglas ex Torr. & A. Gray and would likely key to that species in the *Flora of North America* (Brokaw 2016) or the *Jepson eFlora* (Brokaw et al. 2023). The species-name *ravenii* honors eminent botanist Peter H. Raven.

Ecology

The habitat of *Mentzelia ravenii* is in Mojavean desert (*Larrea tridentata*) scrub, Joshua tree (*Yucca brevifolia*) woodland, or juniper (*Juniperus californica*) woodland in sandy or gravelly soil of canyon slopes, flats, washes and gullies, or road embankments (Thompson and Roberts 1971, CCH2 2024). The elevational range is from approx. 2,600 to 3,500 feet (800–1,100 m). Noted plant associates include the shrubs or subshrubs *Ambrosia salsola*, *Cylindropuntia echinocarpa*, *Encelia actoni*, *Ephedra nevadensis*, *Ericameria linearifolia*, *E. nauseosa*, *E. cooperi*, *Eriogonum fasciculatum* var. *polifolium*, *Lepidospartum squamatum*, *Quercus john-*

tuckeri, *Salvia dorrii*, and *Scutellaria mexicana*, plus *M. veatchiana* and other annuals in genera such as *Acmispon*, *Amsinckia*, and *Chaenactis*. The flowering-period is from March to May (Brokaw 2016, Brokaw et al. 2023).

Distribution and Abundance

Mentzelia ravenii has 13 known occurrences in a limited area of about 78 square miles in northeastern Los Angeles County, from near Acton eastward to near Valyermo at the western edge of the Mojave Desert and northern base of the San Gabriel Mountains (CCH2 2024, CPNWH 2024). Eight of the known occurrences are historical, and five are recently documented (within the past 20 years). Occurrence #13 is on land owned by The Nature Conservancy in Arrastre Canyon; the remaining twelve occurrences are evidently on private property, though in many cases the original locality description is vague and the georeferencing is only approximate. Additional field-work is needed to locate these occurrences more precisely and gather site-specific data on plant abundance and area of occupancy.

Three of the recent occurrences (#s 4, 11, and 13) come with anecdotal observations on abundance, i.e., "fairly common," "scarce," and "very bountiful this year," respectively. Zavortink (1966) noted that population size among members of *Mentzelia* section *Trachyphytum* in arid regions may fluctuate widely from year to year in response to highly variable environmental conditions (particularly the amount and timing of rainfall). In dry years, the populations may consist of only a few, scattered individuals, mainly in soils with enhanced moisture beneath desert shrubs or on roadsides that may receive additional runoff.

Additional records attributed to *M. ravenii* are from outlying areas, including three collections from western Riverside County (Zavortink 1966, Thompson and Roberts 1971), another from near Gorman in northwestern Los Angeles County (Brokaw 2009, 2010b), plus other reported localities extending eastward to Kern and San Bernardino counties and southward to San Diego County (Anza-Borrego and Jacumba Hot Springs, the latter just north of the Mexican border) (Calflora 2024, CCH2 2024, iNaturalist 2024). Further study of these outlying populations is needed (Brokaw 2016; J. Brokaw 2024, pers. comm.), and they are considered here as unconfirmed reports. Plants from higher elevations in the San Gabriel Mountains may be referable to *M. gracilenta*. Chromosome counts and phylogenomic analyses of outlying populations would help determine whether plants in outlying populations are tetraploids like *M. ravenii* and help determine whether a more broadly circumscribed *M. ravenii* may be warranted or if the outliers might represent a new species different from *M. ravenii* (Stone et al. pers. comm. 2025).

Status and Threats

Mentzelia ravenii has had no prior conservation status in California, though previous authors have considered it to be rare or worthy of conservation attention (Zavortink 1966; Thompson and Roberts 1971; J. Brokaw 2024, pers. comm.). Possible threats to this species include property development, road maintenance, off-highway vehicles, and habitat loss. The Western Joshua Tree Conservation Act, passed by the California state legislature in July 2023, established a permit system regulating the "take" of *Yucca brevifolia*; this law might indirectly provide a degree of protection for *M. ravenii* on privately owned land. Additional field-work is needed to assess site-specific threats.

Summary
Based on the available information, CNPS and CNDDB recommend adding *Mentzelia ravenii* to California Rare Plant Rank 1B.3 of the CNPS Inventory. If knowledge on the distribution, threats, or rarity status of *M. ravenii* changes in future, then we will re-evaluate its status at that time.

Recommended Actions
CNPS: Add *Mentzelia ravenii* to CRPR 1B.3
CNDDB: Add *Mentzelia ravenii* to G2 / S2

Draft CNPS Inventory Record
Mentzelia ravenii H.J. Thomps. & J.E. Roberts
Raven's blazing-star
Loasaceae
USDA Plants Symbol: MERA
CRPR 1B.3
Counties: Los Angeles
Quad name (code): Acton (3411842), Juniper Hills (3411748), Littlerock (3411758), Palmdale (3411851), Valyermo (3411747)
General Habitat: Mojavean Desert scrub, Pinyon and juniper woodland, Joshua tree woodland
Microhabitat: decomposed granitic, flats, gravelly, roadsides, sandy, slopes, washes
Elevation: elevation 800-1,100 meters
Life form: annual herb
Blooms: March – May
Threats: Potentially threatened by development, habitat loss, road maintenance, and vehicles.
Taxonomy: An allotetraploid with *Mentzelia congesta* being the maternal parent and the paternal parent unresolved. Similar to *M. gracilenta* but differing eco-geographically and by its somewhat smaller flowers. Often co-occurs with *M. veatchiana* but differing by its habit spreading or candelabriform (vs. strictly erect), petals yellow with orange spot at base (vs. usually deep orange in desert populations), and floral bracts broad and often somewhat clasping (vs. narrow and not clasping). Populations from RIV and SDG cos. need further study to determine whether they should be included in *M. ravenii* or are distinct taxa.

Selected References:
- CNPS Status Review: Proposed addition to CRPR 1B.3, G2 / S2 (2025)
- Original Description: *Phytologia* 21(4): 285

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[CPNWH] Consortium of Pacific Northwest Herbaria. 2024. Data provided by the participants of the Consortium of Pacific Northwest Herbaria. University of Washington Herbarium, Seattle. Website https://www.pnwherbaria.org/data/search.php [accessed August 2024].

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Personal Communications

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