Rare Plant Status Review: *Oenothera deltoides* subsp. *julpunensis*
Proposed Addition to California Rare Plant Rank 1B.1, G1 / S1

Ellen A. Dean (CNPS), Adam J. Searcy (CNPS), and Katie Ferguson (CNDDB)
29 April 2025

Background and Taxonomy

Oenothera deltoides Torr. & Frém. subsp. *julpunensis* S.F. Jones is a recently described annual to short-lived perennial herb in the Onagraceae known only from a small area of Contra Costa County, California. It is one of six subspecies of *O. deltoides*, five of which occur in California (Wagner 2017, Jones et al. 2024). Populations included in this new subspecies were previously assigned to *O. deltoides* subsp. *cognata* or thought to be morphological intergrades (or hybrids) between subsp. *cognata* and *O. deltoides* subsp. *howellii* (the rare Antioch evening primrose, CRPR 1B.1) (Jones et al. 2024). This subspecies is not included in *The Jepson Manual* (Wagner 1993), *Jepson eFlora* (Wagner 2017), or *Flora of North America* (Wagner 2022). Subspecies *julpunensis* differs from the other subspecies of *O. deltoides* in the following combination of characters: annual or short-lived perennial; glabrous or sparsely villous pubescence; flower buds with attenuated "free" sepal tips greater than 2 mm long; and endemic to the eastern edge of the Antioch Dunes sand sheet (subsp. *howellii* is on the western side of the Antioch Dunes sand sheet). Subspecies *julpunensis* is also genetically distinct from the other subspecies (Jones et al. 2024).

The "subspecific epithet is in honor of the Julpun (pronounced: hul-pun) village site of the Bay Miwok people, indigenous to the outflow of the stream now called Marsh Creek, Contra Costa County, CA, where the small range of this plant occurs" (Jones et al. 2024).

Ecology

Subspecies *julpunensis* is a strict edaphic endemic of the loose sandy soils of the eastern edge of the Antioch Dunes sand sheet; all of the known populations and potential habitat sites are in discontinuous patches of sandy soil of the Delhi soil series at 4 to 17 m in elevation (13 to 58 ft) (Jones et al. 2024, CCH2 2025).

> [Locations where this taxon is found are] subject to moderate disturbance from wind. Although specific ecological studies have not been undertaken for this subspecies, it likely shares ecological requirements common to other *O. deltoides* [subspecies] […]. These requirements include frequent soil disturbance to mobilize sand and reduce competition of other herbaceous plant species, especially non-native annual grasses […]. Wind disturbance likely facilitates these subspecies by increasing seedling germination, survival and/or establishment in the population, as reduced plant competition exerts stronger negative effects on juveniles than adults […]. The dune habitat at Dutch Slough that supports the largest population of [subspecies] *julpunensis* contains species such as *Croton californicus*, *Camissoniopsis micrantha*, *Lupinus albifrons*, and *Heterotheca grandiflora*. Additional local populations on remnant wind-blown sand habitat fragments may contain species that are strict sandy soil endemics, including *Camissonia contorta*, *Camissonia campestris* subsp. *campestris*, *Deinandra kelloggii*, *Layia glandulosa*, *Lessingia pectinata* var. *tenuipes*, and *Mentzelia affinis* (Jones et al. 2024).

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This subspecies has been observed in flower April through June, and in bud in late March (CCH2 2025).

Distribution and Abundance
Subspecies *julpunensis* is endemic to a small (<50 km2) area near the towns of Oakley and Knightsen in the San Francisco Bay-Delta of the northern San Joaquin Valley of California (Jones et al. 2024, Jones 2025 pers. comm.). Based on herbarium specimens and observations (Jones et al. 2024, Calflora 2025, CCH2 2025, CNDDB 2025, Jones 2025 pers. comm.) subspecies *julpunensis* has at most six known natural populations, with two extant; three records are historical (not seen for over 20 years). Examination of aerial imagery indicates that unsurveyed potential habitat for the subspecies exists, especially near Knightsen.

One extant population is large (> 1500 plants in 2023; record #4 on California Department of Water Resources land). The other extant population is small (ca. 50 plants in 2024; record #6 along Rose Avenue in Oakley). A third population on private land along Byron Hwy in Knightsen (record #5) was last seen in 2016, and in 2011 had dozens of plants; this population has not been absolutely confirmed to be subsp. *julpunensis* but is likely this subspecies based on soils and geography (Jones 2025 pers. comm.). A seventh population (record #7 at Big Break Regional Shoreline) is very small (six or seven plants in 2024) and is an introduction, outplanted from seed collected from other extant and extirpated populations (Jones et al. 2024, Jones 2025 pers. comm.). The three historical records (#s 1, 2, 3) are based on herbarium specimens last collected in 1994 (#1) and 2000 (#s 2 and 3). The location where record #1 was collected is private land that is now developed, although there are vacant lots still in the vicinity. Sandy agricultural fields of unknown ownership are still present near record #2, and plants could still grow there, if seed is still present. Record #3 is a very vague location (between Oakley and Brentwood); this record is CNDDB EO 12 of *O. deltoides* subsp. *howellii* and has such a large georeferencing uncertainty (1 mile) that its polygon includes some of the other records. The only protected natural population is record #4 on California Department of Water Resources land.

One record has been placed in a pink row at the bottom of the location table. This record is *O. deltoides* subsp. *howellii* at the City of Oakley Legless Lizard Preserve. This location is very close to record #7, the outplanting at the East Bay Regional Parks Big Break Regional Shoreline. The two populations are not related. We placed this one record in pink to explain that it is not subsp. *julpunensis*.

Status and Threats
Oenothera deltoides subsp. *julpunensis* currently has no conservation status (NatureServe 2025). As explained above, one occurrence (record #3) is equivalent to CNDDB subsp. *howellii* EO 12 (CNDDB 2025). It is a strict edaphic specialist endemic to a small area, and the remaining suitable habitat is subject to intense development pressure; several potential habitat sites have recently been developed or are planned for commercial or residential development in Oakley (Jones et al. 2024). Of the known natural populations of subsp. *julpunensis*, all but one are on private land without conservation protection.

> The largest and only conserved known population occurs on California Department of Water Resources' Dutch Slough property. This property is a 1178-acre project focused

primarily on tidal wetland restoration, formerly used as cattle grazing and dairy operations for over 100 years. On the westernmost parcel, however, along the edges of a historical dryland wine grape (Carignane) vineyard and prehistoric indigenous habitation site, *O. d. julpunensis* was found growing on berms of sandy soil. Since 2015, this approximately 1-acre dune area has been incorporated into the restoration project (Jones et al. 2024).

Best current estimates of total population size for subsp. *julpunensis* is ca. 1600 plants, lower than recent estimates of the federal- and state-endangered subsp. *howellii* (5436 adults in 2019) (Jones et al. 2024).

Summary

Based on the available information, CNPS and CNDDB propose adding *Oenothera deltoides* subsp. *julpunensis* to California Rare Plant Rank 1B.1 of the CNPS Inventory. If knowledge of the distribution, threats, or rarity status of *Oenothera deltoides* subsp. *julpunensis* changes in the future, it may be re-evaluated at that time.

Recommended Actions

CNPS: Add *Oenothera deltoides* subsp. *julpunensis* to CRPR 1B.1
CNDDB: Add *Oenothera deltoides* subsp. *julpunensis* to G1 / S1

Draft CNPS Inventory Record

Oenothera deltoides Torr. & Frém. subsp. *julpunensis* S.F. Jones
common name: Bay Miwok evening primrose
Family: Onagraceae
USDA Plants Symbol: none
Synonym(s)/Other Name: none
CRPR 1B.1
Counties: Contra Costa
States: CA
Quad name (code): Brentwood (3712186), Jersey Island (3812116)
General Habitat: Inland dunes
Microhabitat Details: Endemic to the loose sandy soils of the eastern edge of the Antioch Dunes sand sheet.
Microhabitat: Sandy, openings
Elevation: elevation 5–15 meters (15–60 ft)
Life form: annual, perennial herb
Blooms April to June
Threats: Threatened by development, urbanization, and agriculture.
Taxonomy: Populations included in ssp. *julpunensis* were previously assigned to *O. deltoides* ssp. *cognata* or thought to be morphological intergrades (or hybrids) between sspp. *cognata* and ssp. *howellii.*
Selected References:

- CNPS Status Review: Proposed addition to CRPR 1B.1, G1 / S1 (2025)
- Original Description: *Madroño*, 71(2): 84-104 (2024)

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[CNDDB] California Department of Fish and Wildlife, Natural Diversity Database. 2025. 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] [accessed February 2025].

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[CCH2] Consortium of California Herbaria Portal 2. 2025. 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 February 2025].

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Personal Communications

Ferrell, Molly. 2025. Senior Environmental Scientist, California Department of Water Resources. Email about distribution and population sizes of *Oenothera deltoides* subsp. *julpunensis*, including link to Open-File Report 2021-1017 (Distribution, abundance, and genomic diversity of the endangered Antioch Dunes evening primrose surveyed in 2019). Personal communication 3 March 2025.

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Jones, Scott. 2025. Assistant Professor, University of North Florida and lead author on paper on *Oenothera deltoides* ssp. *julpunensis*. Email about distribution and population sizes of *Oenothera deltoides* subsp. *julpunensis*. Personal communication 3 March 2025.

Kelch, Dean. 2025. Primary Botanist and Environmental Program Manager, California Department of Food and Agriculture. Email about collection of *Oenothera deltoides* subsp. *julpunensis*. Personal communication 27 February 2025.