



U.S. Fish & Wildlife Service  
Sacramento Fish & Wildlife Office



Species Account  
ANTIOCH DUNES EVENING PRIMROSE  
*Oenothera deltoides* ssp. *howellii*

**CLASSIFICATION:** Endangered  
Federal Register Notice 43:17910; April 26, 1978  
[http://ecos.fws.gov/docs/federal\\_register/fr208.pdf](http://ecos.fws.gov/docs/federal_register/fr208.pdf)  
(1.2 MB)

**STATE LISTING STATUS AND CNPS CODE:**  
This species was listed as endangered by the California Department of Fish and Game in November 1978. The California Native Plant Society has placed it on List 1B (rare or endangered throughout its range).

**CRITICAL HABITAT:** Designated in Federal Register notice 43:39042; August 31, 1978  
[Notice not available online. See Code of Federal Regulations [section on plants.](#)]

**RECOVERY PLAN:** Revised recovery plan for three endangered species endemic to Antioch Dunes, California. 1984  
[http://ecos.fws.gov/docs/recovery\\_plan/840425.pdf](http://ecos.fws.gov/docs/recovery_plan/840425.pdf)

**5-YEAR REVIEW:** Completed June 2008. No change.  
[http://ecos.fws.gov/docs/five\\_year\\_review/doc1928.pdf](http://ecos.fws.gov/docs/five_year_review/doc1928.pdf)

**DESCRIPTION:**

The Antioch Dunes evening-primrose is a short-lived perennial plant in the evening-primrose family (Onagraceae). It forms large tufts with coarse drooping stems 4-40 inches long, much branched.

Leaves are lance-like in outline, 1-5 inches long, 0.4-1.2 inches wide, with grayish hairs. White flowers open in early evening and close in the morning, and bloom from March to September. The petals are about one inch long and the stamens are yellow.

The Antioch Dunes evening primrose may be confused with *Oenothera deltoides* ssp. *cognata*, which grows in the Oakley area southeast of the Antioch Dunes. See Jepson Manual, below, for a detailed description of these species.

**DISTRIBUTION:**

Natural stands of the Antioch Dunes evening-primrose are found only on the riverine dune habitat located on and immediately adjacent to the [Antioch Dunes National Wildlife Refuge](#). The refuge is closed to the public. Docents lead one-hour guided tours at 10 a.m. the second Saturday of every month. Call 510-521-9624 for more information.



Antioch Dunes Evening Primrose  
Walter Knight © California Academy of Sciences

The subspecies has been introduced to other locations but successfully persists only at the Antioch Dunes NWR and several other places: Tilden Regional Park in Alameda County, and within some low riverine dunes at Brannan Island State Recreational Area just east of the refuge in Sacramento County.

#### THREATS:

At Antioch Dunes NWR, dust from the Georgia-Pacific gypsum plant adjacent to the Antioch Dunes NWR may be a threat to the listed species there. Georgia-Pacific allows access to their property for surveys, and the company has made attempts to reduce airborne gypsum dust beyond the standards for air pollution control. However, dust still enters the refuge.

Recreational use of the refuge and pedestrian traffic are no longer a significant threat due to the installation of a chain link fence. However, trespassers still illegally access the refuge and inadvertently trample rare plants.

A bigger threat is from inadvertently started wildfires. On several occasions a trespasser's campfire has started wildfires. Antioch Dunes evening primrose has life stages vulnerable to fire. This includes the period from germination during the beginning of the wet season in December through the deposition of seeds in mid-summer.

Invasive plants are one of the primary threats because they cause habitat loss. The most common invasive non-native grasses and forbs found at the refuge include rip gut brome (*Bromus diandrus*), winter vetch, (*Vicia villosa*) and star thistle (*Centaurea solstitialis*). Recently, a more aggressive eradication effort is underway, which includes removal of stabilized top soil with a small tractor to expose the underlying sandy substrate.

Low number of populations of any organism are also threatened by extinction through a single catastrophic event, such as an abnormally violent storm, a prolonged drought or other climatic event; or from an infectious disease; or from "stochastic" demographic fluctuations.

#### REFERENCES FOR ADDITIONAL INFORMATION:

##### [General references about California plants](#)

[www.fws.gov/sacramento/es/plant\\_spp\\_accts/plant\\_references.htm](http://www.fws.gov/sacramento/es/plant_spp_accts/plant_references.htm)

For larger images and permission information see CalPhotos <http://calphotos.berkeley.edu/>.

Anonymous. 1971. Antioch primrose sown out of range. *Four Seasons* 4(1):21.

Howard, A. Q., and R. A. Arnold. 1980. The Antioch Dunes - Safe at last? *Fremontia* 8:3-12.

[The Jepson Manual: Higher Plants of California](#). This is the standard reference about California plants. The Manual is available in an [online version](#). See also the [Jepson Online Interchange](#) for updates.

Klein, W. M. 1962. New taxa and recombinations in *Oenothera* (*Anogra*). *Aliso* 5:179-180.

Klein, W. M. 1970. The evolution of three diploid species of *Oenothera* subgenus *Anogra* (Onagraceae). *Evolution* 24:578-579.

Munz, P. A. 1931. Studies in Onagraceae VI. The subgenus *Anogra* of the genus *Oenothera*.  
Amer. J. Bot. 18:314.

Roof, J. B. 1969. In memoriam: The Antioch Dunes. *Four Seasons* 3(1):2-4

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