U.S. Fish & Wildlife Service
Sacramento Fish & Wildlife Office
Species Account
LANGE'S METALMARK BUTTERFLY
Apodemia mormo langei

CLASSIFICATION: Endangered
Federal Register 41:22044; June 1, 1976
http://ecos.fws.gov/docs/federal_register/fr99.pdf

5-Year Review, September 10, 2008: We have determined that the species needs to remain classified as endangered.

CRITICAL HABITAT: None designated

RECOVERY PLAN: Final
Revised Recovery Plan for Three Endangered Species Endemic to Antioch Dunes, California. April 25, 1984
This plan is now out of date. Contact us if you need a copy.

CAPTIVE BREEDING
With Moorpark College and the Urban Wildlands Group, we have successfully released captive bred butterflies at Antioch Dunes. See story.

DESCRIPTION
Lange's metalmark is a fragile, brightly colored butterfly in the Riodinidae (metalmark) family. Adult wingspan varies from 1 to 1.5 inch. Dorsal wings are largely black with white spots. Red-orange coloration extends through the inner forward half of the forewing, the hindwing bases, and a small central patch subtended by black. Below, the wings have a more muted pattern of gray, white, black, and orange.

All the life stages of Lange's metalmark butterflies are found close to the larval food plant, naked-stem buckwheat (*Eriogonum nudum* ssp. *auriculatum*). The eggs are deposited on buckwheat leaves near the leaf petiole throughout the mating flight that occurs during August and September. Larvae hatch during the rainy months. Larvae are known to feed only on buckwheat. The adults may use buckwheat, butterweed *(Senecio douglasii*) and snakeweed (*Gutierrezia divergens*) for nectar. Lange's metalmark butterfly also use lupine (*Lupinus albifrons*), for mating.

Unlike the many butterfly species that have several generations a year, Lange's metalmark has only one. The fecundity of the wild individuals is low. Detailed life history and physiological requirements of this species are unknown.

DISTRIBUTION
Lange's metalmark butterfly was historically restricted to sand dunes along the southern bank of the Sacramento-San Joaquin River, and is currently found only at Antioch Sand Dunes in Contra Costa County. Most of the habitat is now part of the Antioch Dunes National Wildlife Refuge (administered by the Don Edwards San Francisco Bay National Wildlife Refuge Complex). Recent

population counts have ranged from several hundred to more than a thousand individuals, however; a steeply declining trend in the last ten years, with a peak flight count of only 45 individuals in 2006 led to the implementation of several recovery actions including aggressive habitat restoration and captive propagation of the butterfly.

THREATS

In the early 1900s, the isolated dune habitat in the delta began to experience a dramatic change as human development expanded. The easily-accessible sand was harvested to make bricks. Large-scale sand mining and industrial development fragmented the sand dune habitat until only a small portion of the original ecosystem remained. Nonnative grasses and vegetation encroached on the sand dunes to crowd the few remaining endangered plants. By the time the Antioch Dunes Refuge was established, only a few acres of remnant dune habitat supported the last natural populations of Antioch Dunes evening-primrose, Contra Costa wallflower and Lange's metalmark.

Moving sand is essential to maintain the dune ecology. Moving sand opens areas for seedling plants. Roto-tilling has contributed to the invasion of exotic vegetation that stabilizes the remaining sand-dune habitat and competes with native dune vegetation. Habitat improvement activities have included dune restoration, hand-clearing nonnative plant species, planting buckwheat seedlings and restriction of public access to avoid trampling and fire. Recently, more aggressive measures were deemed necessary and include using a tractor to remove top soil and invasives, herbicides, and experimental grazing.

An invasive vetch species threatens the butterfly's habitat. The vetch is difficult to remove by hand because it wraps around the species' native host plant. Herbicides would make control easier. Our office is having the potential herbicides tested to determine if they are toxic to the eggs or larvae.

REFERENCES FOR ADDITIONAL INFORMATION

Arnold, R. A. 1980. Ecological studies of 6 endangered butterflies: island biogeography, patch dynamics, and the design of nature preserves. PhD thesis. Univ. of Calif., Berkeley. Berkeley, CA.

Howe, W. H. (ed.). 1975. The butterflies of North America. Doubleday and Co. Garden City, NY.

Opler, P. A. and J. A. Powell. 1962. Taxonomic and distributional studies on the western components of the *Apodemia mormo* complex (Riodinidae). Journal of the Lepidoptera Society 15:145-171.

Thelander, C. ed. 1994. Life on the edge: a guide to California's endangered natural resources. BioSystem Books. Santa Cruz, CA. p 432-433.

U.C. Berkeley, Essig Museum of Entomology. California's Endangered Insects.

Credits: Lange’s metalmark butterfly, Al Donner, U.S. Fish & Wildlife Service

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825
Phone (916) 414-6600
FAX (916) 414-6713

Last updated September 15, 2008