



Butterflies and Moths at John Muir National Historic Site

The Question: What species of Lepidoptera (moths and butterflies) are present on the Mt. Wanda unit of the John Muir National Historic Site?

Data from an inventory of the vascular flora at John Muir National Historic Site (JOMU) completed in 2002 suggest that Mt. Wanda may be home to a rich array of Lepidoptera due to an abundance of nectar and host plants (over 280 native and non-native vascular plants). There is some concern that the lack of grazing on Mt. Wanda is increasing the biomass of non-native grasses resulting in a decrease of native flowering plant abundance through shading and competition. These mechanisms may impact the insects that use these species as a host, nectar and/or pollen source. This survey was designed as a baseline inventory which may be used for future local and regional studies.



Butterflies and moths were collected using a variety of methods during 2003 and 2004.

The natural area at JOMU, Mt. Wanda, is approximately 325 acres and is unable to support populations of many large animals due to the small size. However, populations of small animals such as invertebrates may endure and even thrive on small patches of intact habitat. Lepidoptera is an ideal group of invertebrates to inventory because the species are relatively well-described, easy to identify, and well-liked by the public. Furthermore, their close association with plants makes them good indicators of the health of vegetation, so they may be a key component of a vital signs monitoring program.

The Project: Use multiple methods of sampling to detect as many moths and butterflies as possible over different seasons and in different habitats.

Method for butterflies: Butterflies on Mt. Wanda were inventoried in a variety of ways from April 2003 to October 2004. In most instances, butterflies were collected opportunistically by National Park Service biologists. In some instances, habitat, season and time of day were used to find certain butterfly species that were not as easy to locate as the common or showy species. Three butterfly counts were held during the inventory, often resulting in new species (July 2003, June 2004, & 2005). Volunteers from the North American Butterfly Association have been active participants in the butterfly counts each year.

Method for moths: Moths were captured and identified from September 2003 to September 2004 during two to three nights surveys coinciding with the new moon of each month. One light-trap consisting of a black light, collection bucket and ethyl acetate was installed at various sampling sites on Mt. Wanda (normally 2–3 sites per night). All collected Lepidoptera were examined, sorted, and pinned for identification to species when possible.



The rural skipper (*Ochlodes agricola*) is one of 35 species of butterflies documented at John Muir National Historic Site.

The Results: 35 species of butterflies and over 147 species of moths have been identified on Mt. Wanda.

Thirty-five species of butterflies were detected on Mt. Wanda during the survey. Over 2,800 individual moths were captured during the year of repeated sampling on Mt. Wanda. Eighty-three collection events at 26 locations on Mt. Wanda took place during the sampling period for moths. Specialists documented at least 194 unique taxa and positively identified 147 species. Of the specimens identified to the species level, 31 are new records for Contra Costa County. One of the moth specimens collected on Mt. Wanda is likely a new species to science in the genus *Amydria*.

Acknowledgements

Paul Johnson, PINN wildlife biologist, confirmed butterfly identification. Moth identification was conducted through Jerry Powell at UC Berkeley, and included assistance from Peter Jump.

Additional Resources

San Francisco Bay Area Inventory and Monitoring Program:
www1.nature.nps.gov/im/units/sfan/index.htm

North American Butterfly Association:
<http://www.naba.org>

For More Information

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Family	Scientific Name	Common Name
Herperiidae	<i>Erynnis propertius</i>	Propertius duskywing
	<i>Erynnis tristis</i>	Mournful duskywing
	<i>Ochlodes agricola</i>	Rural skipper
	<i>Ochlodes sylvanoides</i>	Woodland skipper
	<i>Poanes melane</i>	Umber skipper
	<i>Pyrgus communis</i>	Common check'd skipper
Lycaenidae	<i>Callophrys augustinus</i>	Brown elfin
	<i>Celastrina ladon</i>	Spring azure
	<i>Glaucopsyche lygdam</i>	Silvery blue
	<i>Lycaena xanthoides</i>	Great copper
	<i>Plebejus acmon</i>	Acmon blue
	<i>Strymon melinus</i>	Gray hairstreak
Nymphalidae	<i>Adelpha bredowii</i>	California sister
	<i>Cercyonis pegala</i>	Common wood nymph
	<i>Chlosyne palla</i>	Northern checkerspot
	<i>Coenonympha tullia</i>	Common ringlet
	<i>Danaus plexippus</i>	Monarch
	<i>Euphydryas chalcedon</i>	Variable checkerspot
	<i>Junonia coenia</i>	Common buckeye
	<i>Limenitis lorquini</i>	Lorquin's admiral
	<i>Nymphalis antiopa</i>	Mourning cloak
	<i>Phyciodes mylitta</i>	Mylitta crescent
	<i>Vanessa annabella</i>	West Coast lady
	<i>Vanessa atalanta</i>	Red admiral
Papilionidae	<i>Vanessa cardui</i>	Painted lady
	<i>Vanessa virginiensis</i>	American lady
	<i>Battus philenor</i>	Pipevine swallowtail
	<i>Papilio eurymedon</i>	Pale swallowtail
	<i>Papilio multicaudata</i>	Two-tailed swallowtail
	<i>Papilio rutulus</i>	Western tiger swallowtail
Pieridae	<i>Papilio zelicaon</i>	Anise swallowtail
	<i>Anthocharis sara</i>	Sara orange-tip
	<i>Colias eurytheme</i>	Orange sulfur
	<i>Euchloe ausonides</i>	Large marble
	<i>Pieris rapae</i>	Cabbage white

Table 1. Butterfly species documented for Mt. Wanda during Lepidoptera Inventory.