

U.S. Fish and Wildlife Service. 1984. Kern Primrose Sphinx Moth Recovery Plan. Portland, Oregon.

<http://fwie.fw.vt.edu/WWW/esis/lists/e501006.htm>

(DRAFT) - Taxonomy

**Species MOTH, SPHINX, KERN PRIMROSE**

Species Id ESIS501006

Date 13 MAR 96

**TAXONOMY**

**NAME -** MOTH, SPHINX, KERN PRIMROSE

**OTHER COMMON NAMES -** MOTH, SPHINX and KERN PRIMROSE

**ELEMENT CODE -**

**CATEGORY -** Terrestrial Insects

**PHYLUM AND SUBPHYLUM -** ARTHROPODA,

**CLASS AND SUBCLASS -** INSECTA,

**ORDER AND SUBORDER -** LEPIDOPTERA,

**FAMILY AND SUBFAMILY -** SPHINGIDAE,

**GENUS AND SUBGENUS -** EUPROSERPINUS,

**SPECIES AND SSP -** EUTERPE,

**SCIENTIFIC NAME -** EUPROSERPINUS EUTERPE

**AUTHORITY -**

**TAXONOMY REFERENCES -**

**COMMENTS ON TAXONOMY -**

Kern Primrose Sphinx Moth

Euproserpinus euterpe Hy. Edwards, 1888

KINGDOM:	Animal	GROUP:	Insect
PHYLUM:	Arthropoda	CLASS:	Insecta
ORDER:	Lepidoptera	FAMILY:	Sphingidae

Euproserpinus euterpe Henry Edwards 1888 (06) is a small, day flying sphinx moth in the genus Euproserpinus that is shared by only

two other species. These are *E. wiesti* and *E. phaeton* (01). *E. euterpe* is distinguished by the "labial palpus that is mixed pale and dark gray, not bordered dorsally with a distinct black line; middle portion of the forewing with numerous, transverse lines and dark gray pattern (02)."

The following is taken from the Recovery Plan (01):

The type specimen of *E. euterpe* was collected by H. K. Morrison and given to Henry Edwards to describe. Edwards (1888) gave the type locality as San Diego County; however, this is certainly incorrect. Edwards published so many incorrect type localities for material he had received from Morrison that Morrison felt compelled to publish a short note

Taxonomy - 1

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in 1883 correcting the errors Edwards had made. Unfortunately, Morrison died prior to the description of *E. euterpe*. Two of his 1883 corrections are of special interest for they are for a moth and butterfly collected near the present Kern primrose sphinx moth colony. These and other records (Hoover et al 1966 (07), Morrison 1883 (08)) indicate that Morrison passed through the Walker Basin on his way to the Kern River during the flight season of *E. euterpe*. In addition, intensive collecting in San Diego County by many collectors has failed to locate the species there. Kern primrose sphinx moth may have been confined to the Walker Basin even at the time of its original discovery.

The species was thought to be extinct until its rediscovery in 1974 in Kern Co., CA.

Most amateur and professional lepidopterists refer to the species by the binomial scientific name and therefore no common names besides Kern primrose sphinx moth exist for this species.

*E. euterpe* specimens are housed at the California Academy, Golden Gate Park, San Francisco, CA.

Taxonomy - 2

(DRAFT) - Status  
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## STATUS

### Coded Status

T: Federal Threatened  
Commercial  
Game (Consumptive Recreational)  
Ornamental

### COMMENTS ON STATUS -

#### U.S. STATUSES AND LAWS:

The Kern primrose sphinx moth is listed as Threatened pursuant to the Endangered Species Act of 1973, as amended (50 CFR 17.11). Under this law the species is protected wherever found. It is currently and historically known only from Kern County, CA. No Critical Habitat has been designated.

This species is protected by the Lacey Act (P.L. 97-79, as amended; 16 U.S.C. 3371 et seq.) which makes it unlawful to import, export, transport, sell, receive, acquire, or purchase any wild animal (alive or dead including parts, products, eggs, or offspring):

- (1) in interstate or foreign commerce if taken, possessed, transported or sold in violation of any State law or regulation, or foreign law; or
- (2) if taken or possessed in violation of any U.S. law, treaty, or regulation or in violation of Indian tribal law.

It is also unlawful to possess any wild animal (alive or dead including parts, products, eggs, and offspring) within the U.S. territorial or special maritime jurisdiction (as defined in 18 U.S.C. 7) that is taken, possessed, transported, or sold in violation of any State law or regulation, foreign law, or Indian tribal law.

#### RESPONSIBLE FEDERAL AGENCIES:

USFWS -Responsible for the management/recovery, listing, and law enforcement/protection of this species.

All Federal agencies have responsibility to ensure that any action authorized, funded, or carried out by that agency is not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of Critical Habitat (50 CFR 402), and to utilize their authorities to carry out programs for the conservation of the species.

STATE STATUSES AND LAWS:

This species is not protected under California law.

INTERNATIONAL STATUSES, TREATIES, AND AGREEMENTS:

None.

ECONOMIC STATUSES:

Status - 1

(DRAFT) - Status

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This species has value as a part of California's natural history and diversity. The species is also attractive to collectors, who sometimes take the species illegally. There is a high monetary value associated with the Kern primrose sphinx moth with both commercial and private collectors (01).

78/07/03:43 FR 28938/28945 - Proposed rule, list as Threatened  
80/04/08:45 FR 24090/ - Final rule, listed as Threatened  
85/07/22:50 FR 29901/29909 - Five year review

Status - 2

## HABITAT ASSOCIATIONS

**HABITAT - TERRESTRIAL**  
TERRESTRIAL

**LAND USE -**  
Cropland and Pasture  
Herbaceous Rangeland

### COMMENTS ON HABITAT ASSOCIATIONS -

The following is taken from the Kern primrose sphinx moth Recovery Plan (01):

The Walker Basin is at an elevation of 1,470 m in the southern Sierra Nevada of Kern County, California. The basin is surrounded by mountains over 2000 m in elevation. Currently, a large portion of the basin is devoted to agriculture (primarily barley cultivation and cattle pasture). The dominant vegetation in the sandy washes in which the colony occurs includes filaree (*Erodium cicutarium*), baby blue-eyes (*Nemophila menziesii*), and rabbit brush (*Chrysothamnus nauseosus*), as well as goldfield (*Lasthenia chrysostoma*) and bromegrass (*Bromus arenarius*). The soil originates from decomposed granite and is largely alluvial in nature. Its texture is coarse to fine sand with very little silt.

The annual evening-primrose, on which the larvae of Kern primrose sphinx moths feed, occurs in dry, disturbed and sandy-gravelly areas below 3000 m elevation in many plant communities from Oregon to Baja California. Since the 1969 revision of the genus *Camissonia* the taxonomic status of the host plant is unclear and it is possible that this moth is able to utilize several sympatric and closely related *Camissonia* species. In the Walker Basin, the evening primrose is frequently found along the edge of sandy washes adjoining fallow fields. Seeds begin to germinate in February and March, but the young seedlings are frequently difficult to locate and identify during the flight season of the moth.

At the sphinx moth site in 1983 (09), the food plant was patchily distributed. In some of the patches, it was found with Lindley's

annual lupine (*Lupinus bicolor*) and filaree and not in association with high densities of goldfield.

The plant community surrounding the basin floor is dominated by

juniper (*Juniperus californica*), oak (*Quercus douglassii*, *Q. turbinella*, and *Q. wislizenii*), rabbitbrush (*Chrysothamnus nauseosus*), sagebrush (*Artemisia* sp.), and pine (*Pinus monophylla*).

The distribution of the moth may be limited because the host plant does not occur in these plant communities. South of the Basin the plant community is oak-grassland and appears unsuitable for the moth.

(DRAFT) - Food Habits  
Species MOTH, SPHINX, KERN PRIMROSE  
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## FOOD HABITS

TROPHIC LEVEL -  
HERBIVORE

<u>LIFESTAGE</u>	<u>FOOD</u>	<u>FOOD PART</u>
General	Forb Leaves/Stems	
General	Forb Flowers/Fruit/Seed	

Food Habits - 1

(DRAFT) - Environment Associations  
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## **ENVIRONMENTAL ASSOCIATIONS**

Environment Associations - 1

(DRAFT) - Life History  
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## LIFE HISTORY

### FOOD HABITS:

Adult Kern primrose sphinx moths utilize nectar from filaree (*Erodium cicutarium*) and baby blue-eyes (*Nemophila menziesii*) (01).

Larval sphinx moths feed on the *Camissonia* (evening-primrose) that also is an obligate host plant (01). Larvae prefer to consume the flowers and new apical growth (05).

### HOME RANGE/TERRITORY:

This species is presumably non-territorial (05).

### PERIODICITY:

The sphinx moth is a day flier. The flight season lasts from the last week of February to the first week of April with the maximum during the second or third week of March (05).

### MIGRATION PATTERNS:

This species is non-migratory.

### COVER/SHELTER REQUIREMENTS:

The following is taken from *The Life History and Behavior of Euproserpinus euterpe* (Sphingidae) (05):

In the morning, males and females frequently bask on bare patches of soil, dirt roads, or rodent mounds. . . . As the afternoon winds increase, adult basking locations change to areas protected from wind such as washes, behind knolls, or on the ground among bushes.

Pupation occurs in the soil, and a pupation chamber is constructed near the surface, perhaps under rocks or other objects.

### REPRODUCTIVE SITE REQUIREMENTS:

Adults fly during the warmer parts of the day, usually between 1000 hours and 1430 hours (05). Correct oviposition is on *Camissonia* (evening-primrose) that occur in sandy-gravelly areas near washes in the Basin (05).

However, female moths consistently deposit eggs on the filaree (*Erodium cicutarium*) a naturalized exotic plant. Larvae hatched from eggs deposited on filaree do not feed and subsequently die of starvation within a few days. Such ovipositional errors may be a significant factor in reproductive success and subsequently contribute to the scarcity of the moth (01).

### REPRODUCTIVE CHARACTERISTICS:

The breeding period is coincident with the adult flight season,

i.e., from the last week of February to the first week of April.  
"At least 11 days are required for the eggs to hatch. There are five larval instars before pupation occurs in May. The adults may emerge the following year, or may remain in the pupal stage for an undetermined number of years (01)".

**PARENTAL CARE:**

No parental care is known for this species (01).

Life History - 1

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POPULATION BIOLOGY:

Ecological and life history studies must be undertaken before establishment of additional colonies (as proposed) can be considered because little is known about the biology and requirements of the moth and its habitat.

Larvae eat the flowers of *Camissonia* sp. Those eggs that are mistakenly laid on another plant, *filaree*, hatch but do not survive because the larvae do not feed (05). Very little is known about the ecology and population biology of the host plant species.

Flight characteristics of the moth cause collectors to capture a greater proportion of females than males, which adversely affects the population's reproductive potential. Of the 74 specimens known to have been collected prior to the species' listing 54 (73%) were females, which probably represents the loss of 1600 eggs (01). The difference in sex ratio of captured moths is attributable to the fact that females fly slower than males and stop to oviposit, thereby making them more susceptible to collection (01). Actual sex ratios of the population are unknown.

SPECIES INTERRELATIONSHIPS:

*Camissonia* sp. (evening-primrose) is the obligate host plant for the larvae of the sphinx moth (05).

OTHER LIFE HISTORY DESCRIPTORS:

None.

Life History - 2

(DRAFT) - Management Practices  
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## MANAGEMENT PRACTICES

<u>RESULT</u>	<u>MANAGEMENT PRACTICE</u>
Beneficial	Land Acquisition
Beneficial	Controlling/Restricting Pesticide Use
Beneficial	Controlling/Restricting Agricultural Practice
Beneficial	Reforestation
Beneficial	Controlling/Removing Nonnative Vegetation
Beneficial	Stocking captive-reared wild-strain animals
Beneficial	Transplanting Wild Eggs/Wild Seeds
Beneficial	Restricting Poaching
Beneficial	Controlling/Removing Domestic Animals
Adverse	Collecting
Existing	Collecting
Adverse	Exotic/Feral/Introduced Species
Existing	Exotic/Feral/Introduced Species
Adverse	Grazing
Existing	Grazing
Adverse	
Existing	

### COMMENTS ON MANAGEMENT PRACTICES -

The following is taken from the Kern primrose sphinx moth Recovery Plan (01):

Human activity probably has affected the population levels of the Kern primrose sphinx moth in at least three ways: 1) the introduction and establishment of non-native plants may have had a significant impact on the ability of the moth to locate and oviposit on the correct host plant; 2) land use practices probably have directly influenced the survival of the moth and/or its host plant (*Camissonia*); and 3) flight characteristics of the moth result in capturing a greater proportion of females than males, which adversely affects the population's reproductive potential.

Female moths consistently deposit eggs on the filaree (*Erodium cicutarium*) a naturalized exotic plant. Filaree was introduced to California with the arrival of the Spanish. Records indicate that by 1775 it was well established from San Francisco to Baja California (Handry and Bellue 1936 (03), Robbins 1940 (04)). Larvae hatched from eggs deposited on filaree do not feed and die of starvation within a few days. Such ovipositional errors may be a significant factor in reproductive success and subsequently contribute to the scarcity of the moth.

Land use practices are the second major threat to the population. Evening-primrose (*Camissonia*) occurs in sandy soil along washes and in fallow fields in somewhat ruderal habitats. Much of the land in the Walker Basin that was appropriate habitat for the moth has been developed for agricultural purposes, and is used as cropland or pasture for cattle. In 1974, a portion of a fallow field served as part of the colony site. Since the rediscovery of the moth, the field has not been plowed and it appears that the host plant is becoming

Management Practices - 1

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less common in that area, possibly because of succession to plants better suited to a more stable habitat.

Collection of the moth is a concern. For the first five years after its rediscovery, the Kern primrose sphinx moth was observed only in one small area. Intensive collecting during the flight seasons resulted in the capture of at least 27 moths during this period. In 1979 another 47 specimens were collected. Because the colony is so restricted, it is subject to overexploitation by collectors. Prior to the 1980 listing of the animal, 74 specimens were known to be collected during a six year period.

APPROVED PLAN:

U.S. Fish and Wildlife Service. 1984. Recovery Plan for the Kern Primrose Sphinx Moth. U.S. Fish and Wildlife Service, Portland, OR. 39 pp.

The primary objective for the Kern primrose sphinx moth is to delist the species by protecting the presently known population and establish three additional secure colonies. A combined total of 5000 acres of habitat must be maintained for 10 years before delisting may be considered.

Recovery may be accomplished through:

1. Utilizing existing laws and regulations (to protect against illegal collecting, i.e. poaching);
2. Protecting and enhancing Kern primrose sphinx moth populations by developing strategy to minimize pupal/larvae mortality (possibly by augmentation of the host plant (Camissonia) through planting seed and/or controlling/removing filaree, an exotic plant, (via controlled grazing, mechanical means or possibly herbicides), increasing nectar sources, examining limiting factors, and developing strategy to protect the habitat (e.g., against pesticides, grazing, adverse agricultural practices, etc.);
3. Establishing additional colonies in the Walker Basin. This requires securing habitat for protection from development and developing captive propagation techniques, and;
4. Informing the public about the Kern primrose sphinx moth and its habitat.

Management Practices - 2

(DRAFT) - References  
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## References

\*\*\*\*\* REFERENCES FOR ALL NARRATIVES EXCEPT N-OCCURRENCE \*\*\*\*\*

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\*\*\*\*\* REFERENCES FOR N-OCCURRENCE NARRATIVE ONLY \*\*\*\*\*

- 01 Hodges, R. 1971. Moths of America North of Mexico including  
Greenland. Fascicle 21, E.W. Classey Ltd. and R.B.D.  
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- 04 Tuskes, P. March 5, 1977. [Letter to the files with information on the distribution and life history of the Kern primrose sphinx moth.] Available from: Sacramento Endangered Species Office, Sacramento, CA.
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