

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Invertebrate Abstract

Element Code: IILEX0B240

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Sphinx smithi* Cadiou

COMMON NAME: Smith's Sphinx, Smith's Sphinx Moth

SYNONYMS:

FAMILY: Sphingidae

AUTHOR, PLACE OF PUBLICATION: J.M. Cadiou, Lambillionea (Tervuren) 98: 620-628?. 1998.

TYPE LOCALITY: Unknown.

TYPE SPECIMEN: Unknown.

TAXONOMIC UNIQUENESS: Species *smithi* is 1 of 10 in the genus *Sphinx* in Arizona, the other eight include: *S. asellus* (Asella sphinx), *S. chersis* (Great ash sphinx), *S. dollii* (Doll's sphinx), *S. istar* (Istar sphinx), *S. libocedrus* (Incense cedar sphinx), *S. perelegans* (Elegant sphinx), *S. separatus* (Separated sphinx), *S. sequoiae* (Sequoia sphinx), and *S. vashti* (Vashti sphinx). Worldwide, there are 1,269 described species of Sphinx/Hawk moth, classified into around 200 genera.

DESCRIPTION: These moths have an elongate (bullet shape), robust body and long, relatively narrow forewings. Their wingspan is approximately 9 cm (3.5 in). The long or very long proboscis (used to imbibe nectar from flowers and water from streams and puddles) is curled under the head when not in use. At rest, the wings are held back at a distinctive angle. These moths lack hearing organs, or tympana. For the family, the antennae are relatively short, clubbed, and hooked at the apex. The legs are sturdy, and armed with sharp spurs. The adults are strong fliers.

The larvae are mottled white and gray-brown with a purplish tint. Caterpillars of most species have a process (horn) at the end of the abdomen, thus in North America, the hawk moth caterpillar is often known as hornworms.

AIDS TO IDENTIFICATION: Similar to *Sphinx istar*, except *S. istar* has a longer wing span (10.2-11.4 cm [4-4.5 in]), and flies at least from July-September. Their forewing is dark gray with brown tinges, a series of narrow dashes running from the tip to the cell spots, and a wide black band running from the middle of the outer margin to the base of the wing. (Struttman, accessed 2005). The hindwing is black with 2 white bands. The family

Sphingidae is usually divided into two subfamilies, the Sphinginae and the Macroglossinae. The Sphinginae are separated from other hawk moths on the technical grounds of having no sensory hairs on the inner surface of the first segment of the labial palps.

ILLUSTRATIONS: Color photo of moth and caterpillar (Bruce Walsh in <http://www.silkmoths.bizland.com/ssmithi.htm>).

Color photos (in <http://nitro.biosci.arizona.edu/zeeb/butterflies/figs/moths/Sphingidae/istar-vs-smithi.jpg>).

TOTAL RANGE: Southern Arizona, southeastern New Mexico, and Sonora, Mexico (northwestern Mexico).

RANGE WITHIN ARIZONA: Santa Cruz County (Huachuca Mountains) and Cochise County Arizona.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: For species in the Family Sphingidae, hibernation occurs during either the pupal or adult instar, and occasionally there may be a long diapause, the adults emerging only after two or three years. If there were a diapause stage for the genus, it would be pupae underground. Pupae probably wiggle to surface from subterranean chambers just prior to eclosion. The adults are probably nocturnal and crepuscular, feeding on strong-smelling flowers that open at dusk and close at dawn. For the family, Sphinx (Hawk) moths are some of the fastest flying insects, capable of flying at over 50 km/h (30 miles per hour). Their flight allows sphingids to hover, so they can explore and exploit flower nectar.

REPRODUCTION: Females call in the males with a pheromone released from a gland at the tip of the abdomen. Female sphingids hover to lay their eggs, usually singly. Single eggs are laid on plants, where the eggs hatch within a week; caterpillars eat the foliage of the plants from where they hatched. For the Family: larval development takes from 2-5 weeks; pupation is normally underground or in a weak silk cocoon in the surface litter; pupation can be short, or last for many months.

FOOD HABITS: Immatures are herbivorous and the adults are nectarivores. Adults of this genus typically visit flowers, often-tubular ones. Larvae eat leaves, usually of one or a few related woody species. The larvae feed on mints also. For the family, larval food plants are varied ranging from grasses to trees, but they show a certain preference for Euphorbiaceae, Solanaceae, and Apocynaceae.

HABITAT: Madrean oak woodland with other woody broad-leafed shrubs.

ELEVATION: Unknown.

PLANT COMMUNITY: Madrean oak woodland.

POPULATION TRENDS: Unknown. Known from about two or three locations in Arizona and one location in Mexico. Extremely vulnerable.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None

STATE STATUS: None

OTHER STATUS: None

MANAGEMENT FACTORS: Threats include only having a few populations and a relative lack of protection.

PROTECTIVE MEASURES TAKEN: One EO is protected near Pena Blanca Lake in Coronado National Forest.

SUGGESTED PROJECTS: Studies to determine life history factors, population status and range need to be performed.

LAND MANAGEMENT/OWNERSHIP: USFS-Coronado National Forest.

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:**ADDITIONAL INFORMATION:**

These moths are also known as hawk moths.

Revised: 2005-05-06 (AMS)
2005-08-18 (SMS)

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