

# Moths of Western North America

## 2. Distribution of Sphingidae of Western North America, revised



Contributions of the  
C. P. Gillette Insect Biodiversity Museum  
Department of Entomology, Colorado State University

Moths of Western North America  
2. Distribution of Sphingidae  
of Western North America, revised edition

by

Michael J. Smith  
Research Associate  
Nevada State Museum, Las Vegas  
7428 Holworthy Way  
Sacramento, Calif. 95842-4165

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Cover: Larva of *Manduca florestan*, Sonora, Mexico. Photograph by Michael J. Smith.

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and some data from northern Mexico and Southwestern Canada near the  
border with the U.S.

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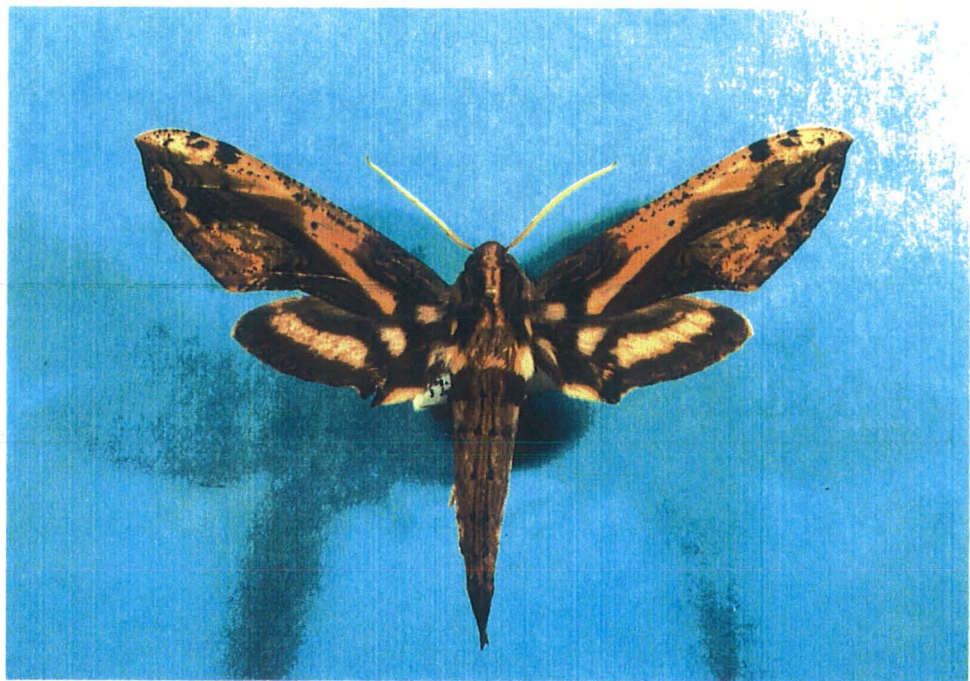
## FRONTISPIECE

### Sphingidae from Western North America

Top: *Amblypterus blanchardorum* Hodges, Green Gulch, Big Bend National Park, Brewster County, Texas, leg Donald A. Bowman. This species was described subsequent to the publication of Hodges (1971), and is known only from the type locality. It has not been illustrated in color in any North American publication.

Center: *Dolbogone hartwegii* (Butler), Green Gulch, Big Bend National Park, Brewster County, Texas, leg. Donald A. Bowman. This is the first verified record for western North America. The species is found south of the U.S. border in Sonora.

Bottom: *Xylophanes ceratomoides* (Grote & Robinson), 7 miles northwest of Yecora, 1550 m., Sonora, Mexico, leg. Michael J. Smith. This species has recently been collected in Santa Cruz County, Arizona for the first United States record. This species was not illustrated in Hodges (1971).



## Introduction to Series

This is the second number of a series of atlases detailing the distributional occurrence of the moths of North America. The atlas of Sphingidae by Michael Smith covers the documented distribution of a well-known group.

Knowledge about western moths has accumulated rapidly, but is not generally available. Such knowledge exists in the form of collected specimens in curated institutional and private collections, and has not usually been synthesized except in the form of sporadic papers and a few monographs on specific species groups, genera, and subfamilies. Familial treatments are rare.

In this atlas the presence of a dot in a county is based on a specimen in an institutional or private collection or a reliable literature record such as a citation in an original description, a monograph, or a state compilation. Records may represent either resident or stray status, and, although most records are recent, some may be quite old. Hence, the presence of a dot does not necessarily imply current residence of the species.

The purpose of this series is to provide in an expedient manner at least a draft synthesis of the distributional status of as many moth families as possible. For the families already covered by fascicles in the Moths of North America, these atlases may be considered an appendix or update. In some cases North American species additional to those treated in MONA are included. In other cases, authors of an atlas may decide to include moths that occur in northern Mexico, but not north of the U.S.-Mexico boundary.

It is anticipated that these atlases might be used for many purposes. These include, but are probably not limited to (1) compiling state or regional lists of moths, (2) curating a collection of western species, (3) initial inventory of species that may be of conservation concern, (4) for use in National or state assessments such as GAP analysis.

Persons interested in organizing or authoring atlases for specific moth groups should contact Dr. Paul A. Opler, National Biological Service, 1201 Oak Ridge Drive, Suite 200, Fort Collins, CO 80525-5589, Phone 970/223-9709 ext.234, FAX 970/226-9455 for preparation instructions and further information.

## DISTRIBUTION OF WESTERN MOTHS FAMILY SPHINGIDAE (SPHINX MOTHS)

The following distribution maps reflect the currently known range of all of the species of sphinx moths (family Sphingidae) documented from the western half of the United States, excluding Alaska and Hawaii. Only moths documented from this portion of the United States are listed; when the distribution of these moths includes Canadian provinces or Mexican states, that distribution is marked. Those species documented from adjacent Mexico or Canada but not documented from this portion of the United States are not listed in these maps.

The purpose of this project, created by Dr. Paul Opler of Fort Collins, Colorado, is to provide a forum that gives the currently known distribution of all species of Sphingidae documented from the western half of the United States. These data should be of use and interest to both professionals and amateurs alike. The maps will let lepidopterists know what moths can be expected in their home regions, and what moths would be new distribution records if found. When used in conjunction with Hodges (1971), these maps will allow lepidopterists to recognize those species they find in the field. Note that I have added a frontispiece that illustrates in color two species discovered in the United States since the publication of Hodges (1971). For researchers working on specific groups of sphinx moths, these maps will provide a foundation of currently known ranges of these species and the opportunity to expand on these ranges.

Data for these maps are drawn from many sources. Publications listing specific or local data were used when the data were considered accurate. Private collections and institutional collections were reviewed wherever possible. All questionable data were personally reviewed by Mike Smith or Paul Opler whenever possible to verify identifications. Most records from the Lepidopterists' Society annual Season Summaries were not used unless the records could be confirmed. While this undoubtedly excludes valid records of *Sphinx* species, it was the desire of the compilers to make the distribution maps as accurate as possible. Some dubious records, either mislabelling or perhaps transported to the locality artificially, are marked on the maps with an open circle. Many colleagues and curators graciously gave much of their time to locate records and collections and they are acknowledged later in this paper.

Some ground rules were established for the distribution maps to ensure maximum accuracy and to minimize controversy. Hodges *et al.* (1983) was used for taxonomy, except where changed by Jean-Marie Cadiou (pers. comm.) of Belgium. Although there are a few subspecies recognized in the Sphingidae, subspecies are not used for these maps. Controversial species/subspecies such as *Smerinthus cerisyi/saliceti* and *Pachysphinx modesta/occidentalis* follow Hodges' (1971), and Hodges *et al.* (1983) taxonomy even though various opinions on their status exists. Some records still may be incorrect identifications and some of these confusing species are discussed below.

This is the first revision of this atlas. Additional distributional data are added for most species, and three species are newly documented for the western United States. *Xylophanes ceratomoides* is newly recorded for the United States. The first documented western specimens of *Dolbogene hartwegii* and *Perigonia lusca* are reported from Texas.

It is hoped that these maps will be of interest and use to all lepidopterists. Much work remains to be accomplished in this group. Life histories of many of the species are unknown or undocumented. Ranges and distributions are clearly incomplete for many species. Several species complexes have confusing relationships and need further research along their border or overlapping regions. Relatively few regional annotated lists of sphingids exist, some exceptions being McFarland (1969), Fors (1981), Richards and Fors (1983), Rosche (1989), and Brown and Donahue (1989).

The following are species of Sphingidae that are often misidentified in the field and occasionally in collections. This possibility of misidentification should be kept in mind when these distribution maps are used and when these species are collected or observed in the field. For those who prefer to observe, rather than collect Lepidoptera; these species should be photographed or a single specimen collected to aid in the accuracy of the identification.

***Manduca sexta/quinquemaculata*:** The uniform medium gray of *sexta* and the more variable, lighter gray of *quinquemaculata* can usually be readily separated, but are often misidentified. This confusion can also include *M. occulta* in southwestern United States.

***Manduca florestan/Ceratomia sonorensis*:** The common, highly variable *florestan* and the scarcer, more consistent *sonorensis* can be easily misidentified.

***Isognathus rimosus/Erynnis alope*:** These two variable, migratory species are common tropical species in Mexico and southward and are occasionally collected in the borderlands of the United States.

***Sphinx separata/istar*:** These two species fly together in much of their ranges and they are very similar in appearance.

***Sphinx chersis/asella/libocedrus*:** These medium to large gray sphingids are also very similar in appearance. Hodges (1971) gives good identification marks for the first two species and the crepuscular *libocedrus* is usually smaller than the other two.

***Sphinx dollii/sequoiae*:** In southern California and the Arizona/Nevada/Utah/California area, these two species become very similar in appearance, while the genitalia apparently remain distinct. Donahue (in litt.) is working on this situation and I follow his guidelines here.

***Lapara phaeobrachycerous*:** This species was described by Brou (1994), and may be expected in extreme Southeastern Texas.

***Smerinthis cerisyi/saliceti*:** The status of these two species remains controversial. Right now, *saliceti* occurs in southern Arizona/New Mexico and south into Mexico. All specimens I have examined from southern Arizona are *saliceti* and Cadiou feels that any *cerisyi* record from this area is suspect. Specimens examined from the White Mountains of eastern Arizona seem to be intermediate between the two species and may represent a blend or hybrid zone.

***Pachysphinx modesta/occidentalis*:** These two are considered separate species and are consistently marked within their respective ranges. They overlap in the western Rocky Mountain area of the western United States, but seem to remain distinct. For example in Larimer County, Colorado, *P. occidentalis* is common near plains cottonwood on the plains all the way to the base of the mountains, while typical *P. modesta* is found in quaking aspen groves near 8,000' in the canyons. Specimens from that region especially should be carefully evaluated.

***Proserpinus juanita/gaurae*:** These two little known species can be easily mistaken for each other.

***Euproserpinus wiesti/phaeton/euterpe*:** These three species are also very similar and are usually separated primarily by range and locality. The relationship between the three remains largely unknown, especially for the endangered *euterpe* which is surrounded by populations of the similar, but more common *phaeton*.

***Eumorpha satellitia/pandorus*:** Some specimens of the highly variable and often common *satellitia* often resemble *pandorus*. *Eumorpha intermedia* is considered a synonym of *pandorus* by Hodges (1971).

***Erynnis obscura/domingonis*:** These two species have overlapping ranges and can be easily misidentified. Cadiou (pers. comm.) and others feel they may be forms of the same species. Rearing studies are needed to validate their respective status'.

***Allopos titan/clavipes*:** Two other very similar species. Records from the western portion of their range are probably all *clavipes*.



***Callionima falcifera/parce*:** These names have been misused, with *parce* used incorrectly for the specimens found in our area (see Brown & Donahue 1989). Per Cadiou (pers. comm.), our specimens are likely to be all *falcifera*. Specimens of *parce* tend to be bigger and are primarily found in southern Mexico and southward.

***Hemaris species*:** This confusing complex is subject to much misidentification. Hodges (1971) should be consulted carefully on all specimens of this genera.

***Darapsa pholus/myron*:** Two other similar species that are often misidentified. Again, Hodges (1971) should be consulted carefully on these two species.

***Hyles lineata/Eumorpha vitis/fasciata*:** These three species are superficially similar, and the latter two species may often get lost in a series of the frequently abundant *lineata*. Black-light sheets or collections with a long series of *lineata* should be carefully studied for the presence of *vitis* and *fasciata*. The latter two species are similar and should be compared to Hodges (1971) to ensure accuracy.

## ACKNOWLEDGMENTS

The following institutional collections were consulted for specimens in this study: Albertson College of Idaho, Caldwell; Boise State University, Boise, Idaho; California Academy of Sciences, San Francisco; California Department of Food and Agriculture, Sacramento; Chadron State College, Chadron, Nebraska; Colorado State University, Fort Collins; Denver Museum of Natural History, Denver, Colorado; Kearney State College, Kearney, Nebraska; Nevada State Museum and Historical Society, Las Vegas; New Mexico State University, Las Cruces; Oregon Department of Agriculture, Salem; Oregon State University, Corvallis; Pike's Peak Research Station, Florissant, Colorado; Royal Ontario Museum, Ontario, Canada; San Diego Natural History Museum, San Diego; San Jose State University, San Jose, California; United States National Museum (smithsonian), Washington, D.C.; University of Arizona, Tucson; University of California, Berkeley; University of California, Davis; University of Colorado, Boulder; University of Idaho, Moscow; University of Nebraska, Lincoln; Utah State University, Logan; Washington State University, Pullman.

The following private collections were consulted: George Austin, Las Vegas, Nevada; Andre Blanchard (deceased), Houston, Texas; Don Bowman, Golden, Colorado; Jim Brock, Tucson, Arizona; Neil Dankert, Kearney, Nebraska; Scott Ellis, Fort Collins, Colorado; Clifford Ferris, Laramie Wyoming, Greg Forbes, Las Cruces, New Mexico; Chuck Harp, Luther, Oklahoma; Richard Holland, Albuquerque, New Mexico; Roy Kendall, San Antonio, Texas; Ed Knudson, Bellaire, Texas; Robert Langston, Kensington, California; Douglas Long (deceased), North Dakota; David McCorkle, Monmouth, Oregon; Stephanie McCown, Boise, Idaho; Noel McFarland, Sierra Vista, Arizona; Stephen Miller, Grass Valley, California; Raymond Neck, Austin, Texas; John Nelson, Tulsa, Oklahoma; William D. Petterson, Sacramento, California; Kelly Richers, Bakersfield, California; Richard Rosche, Chadron, Nebraska; David Russell, Davis, California; John Shepard, Nelson, British Columbia; Jeffrey Smith, Rocklin, California; Michael Smith, Sacramento, California; Stephen Spomer, Lincoln, Nebraska; Ray Stanford, Denver, California.

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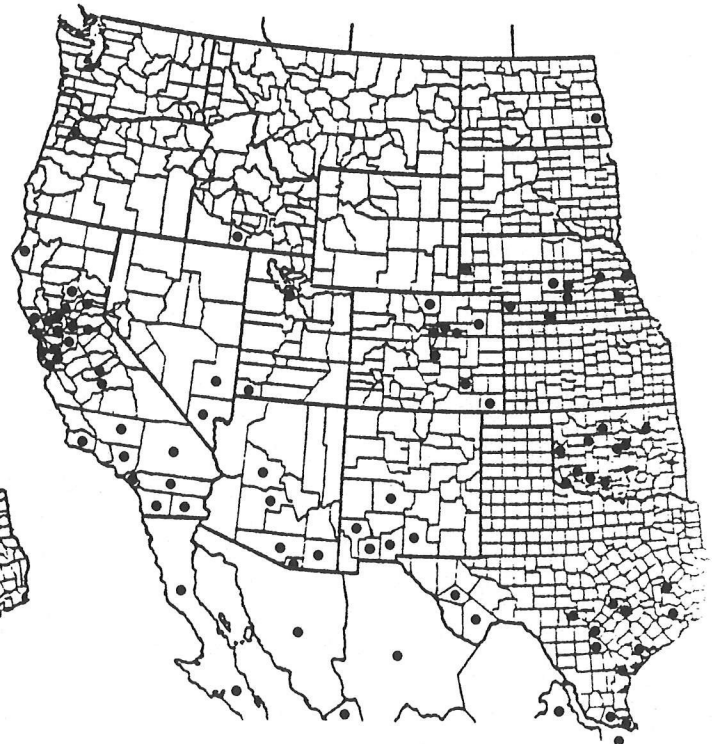
7771. *Agrius cingulata* (F.)



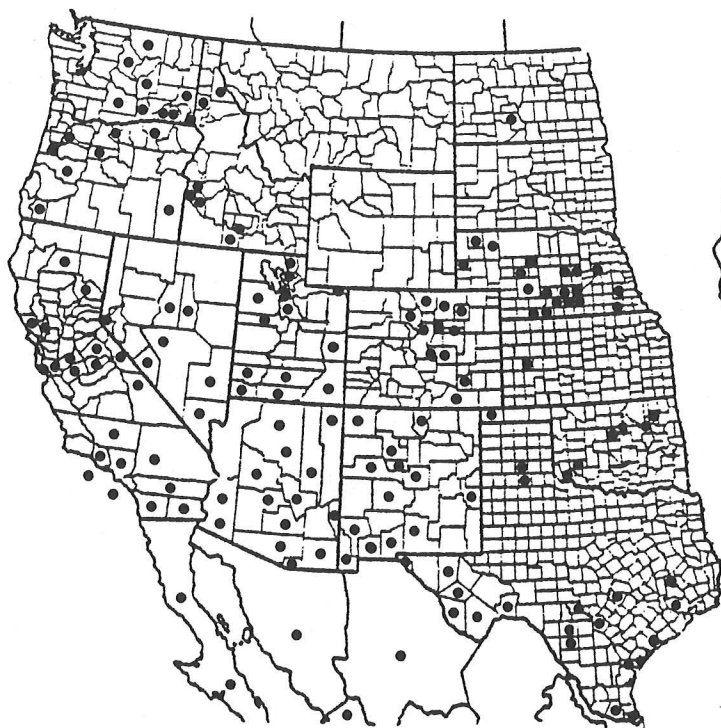
7772. *Cocytius antaeus* (Drury)



7773. *Cocytius duponchel* (Poey)



7775. *Manduca sexta* (L.)



7776. *Manduca quinquemaculata* (Haw.)



7777. *Manduca occulta* (R.&J.)



7778. *Manduca rustica* (F.)



7779. *Manduca albiplaga* (Wlk.)



7781. *Manduca muscosa* (R.&J.)



7782. *Manduca florestan* (Cram.)



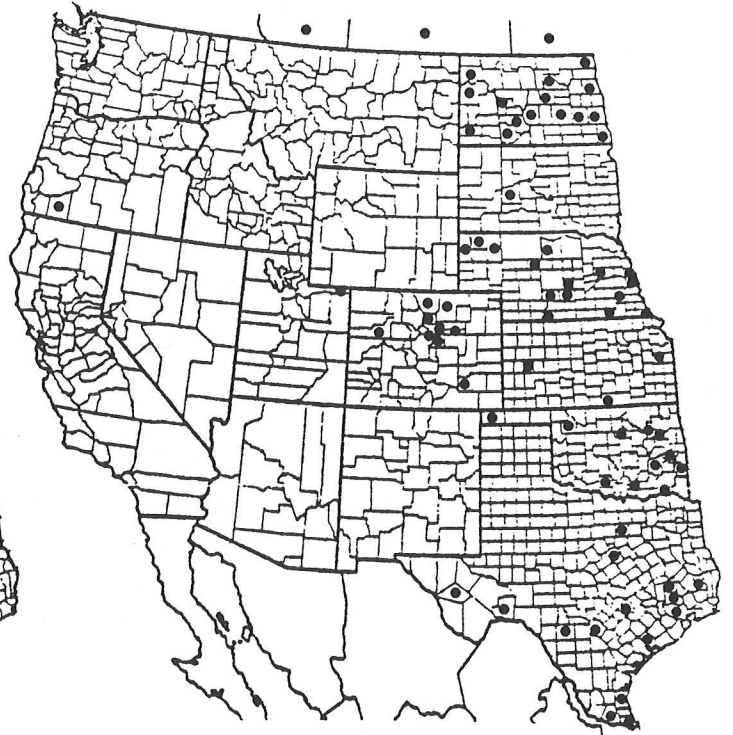
7784. *Dolba hyloeus* (Drury)



7785. *Dolbogone hartwegii* (Butler)



7786. *Ceratomia amyntor* (Geyer)



7787. *Ceratomia undulosa* (Wlk.)



7788. *Ceratomia sonorensis* Hodges



7789. *Ceratomia catalpae* (Bdv.)



7790. *Ceratomia hageni* Grt.



7791. *Isoparce cupressi* (Bdv.)



7792. *Sagenosoma elsa* (Stkr.)



7793. *Paratreia plebeja* (F.)



7795. *Sphinx geminus* R.&J.



7796. *Sphinx eremitus* (Hbn.)



7797. *Sphinx eremitoides* Stkr.



7798. *Sphinx separata* Neum.





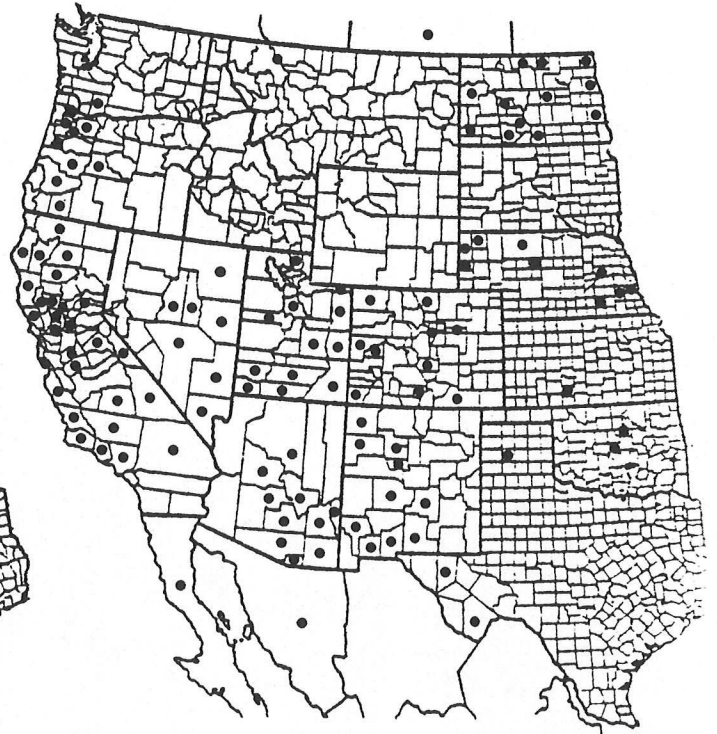
7799. *Sphinx istar* (R.&J.)



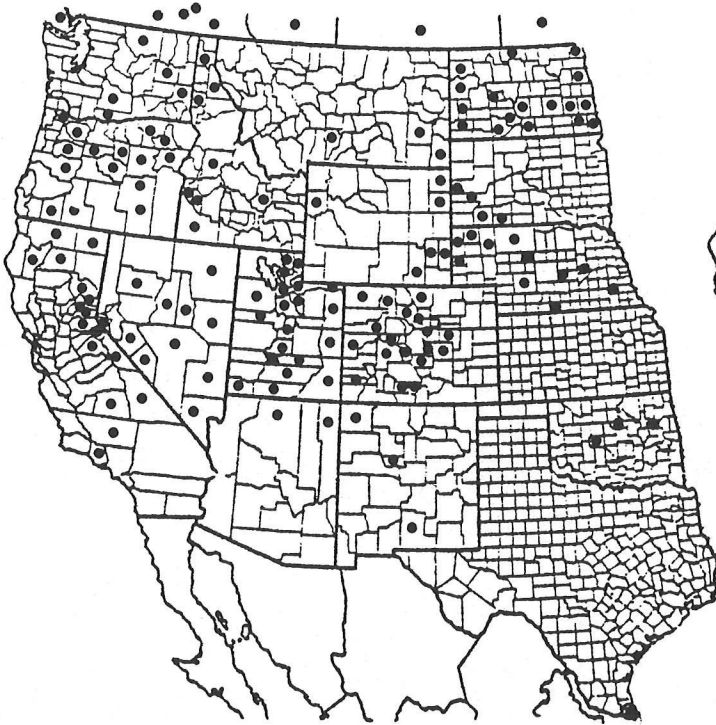
7800. *Sphinx chisoya* (Schaus)



7801. *Sphinx leucophaeta* Clem.



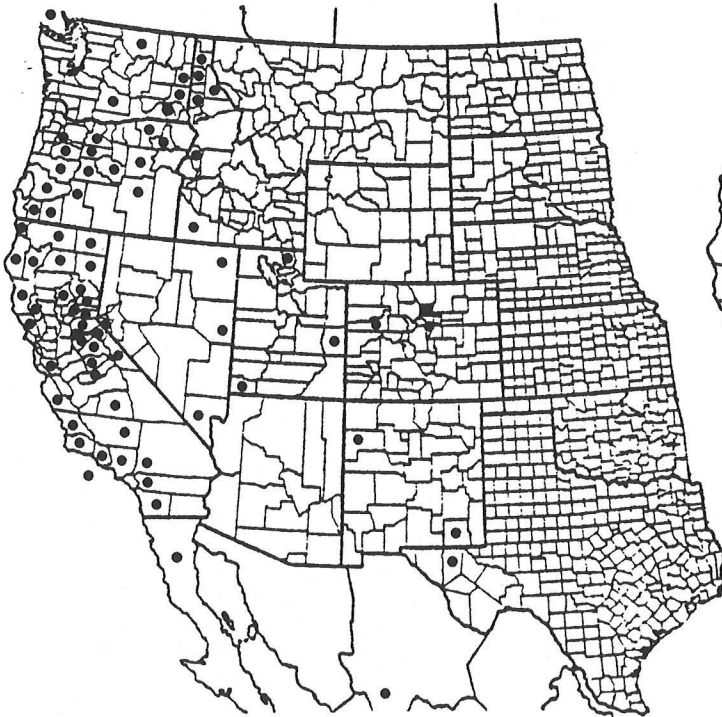
7802. *Sphinx chersis* (Hbn.)



7803. *Sphinx vashti* Stkr.



7804. *Sphinx libocedrus* Hy. Edw.



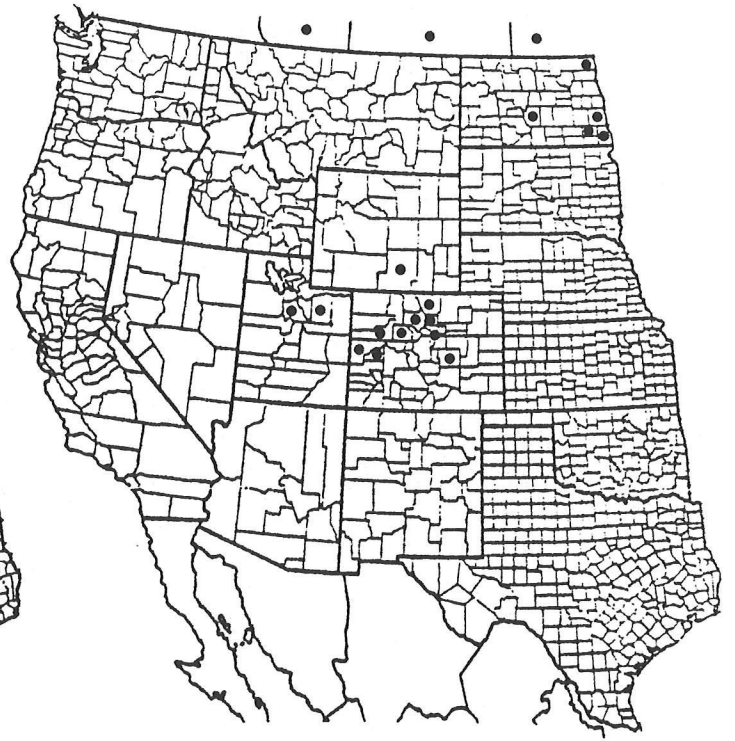
7805. *Sphinx perelegans* Hy. Edw.



7806. *Sphinx asella* (R.&J.)



7809. *Sphinx kalmiae* J.E. Smith



7810. *Sphinx gordius* Cram.



7811. *Sphinx luscitiosa* Clem.



7812. *Sphinx drupiferarum* J.E. Smith



7813. *Sphinx dollii* Neum.



7814. *Sphinx sequoiae* Bdv.



7815. *Sphinx pinastri* L.



7846. *Perigonia lusca* (F.)



7816. *Lapara coniferarum* (J.E. Smith)



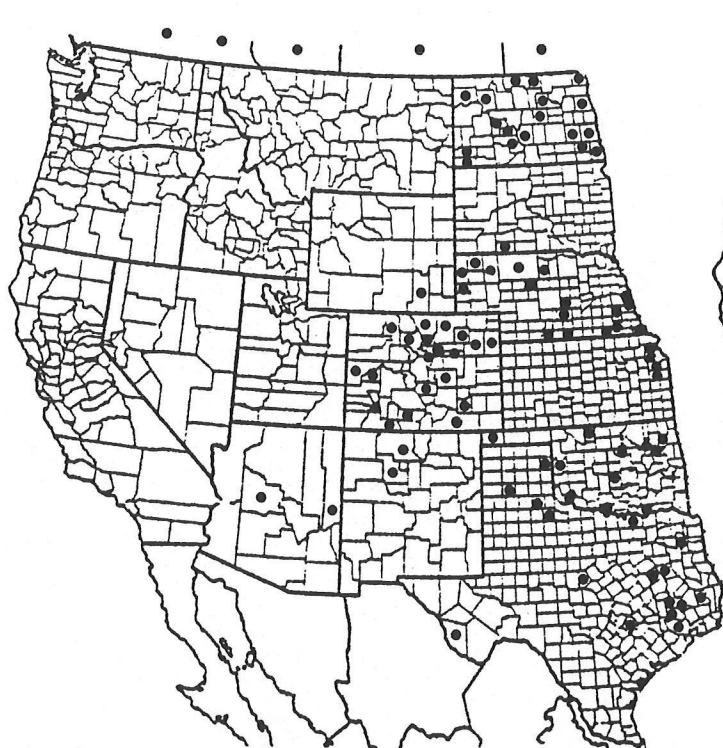
7817. *Lapara bombycoides* Wlk.



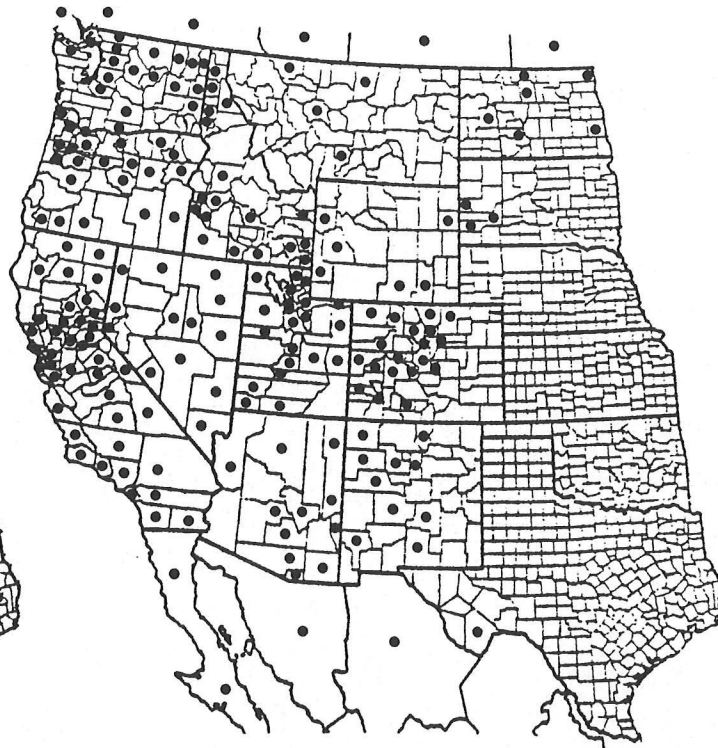
7818. *Protabulyx strigilis* (L.)



7820.1 *Amplypterus blanchardorum* Hodg.



7821. *Smerinthus jamaicensis* (Drury)

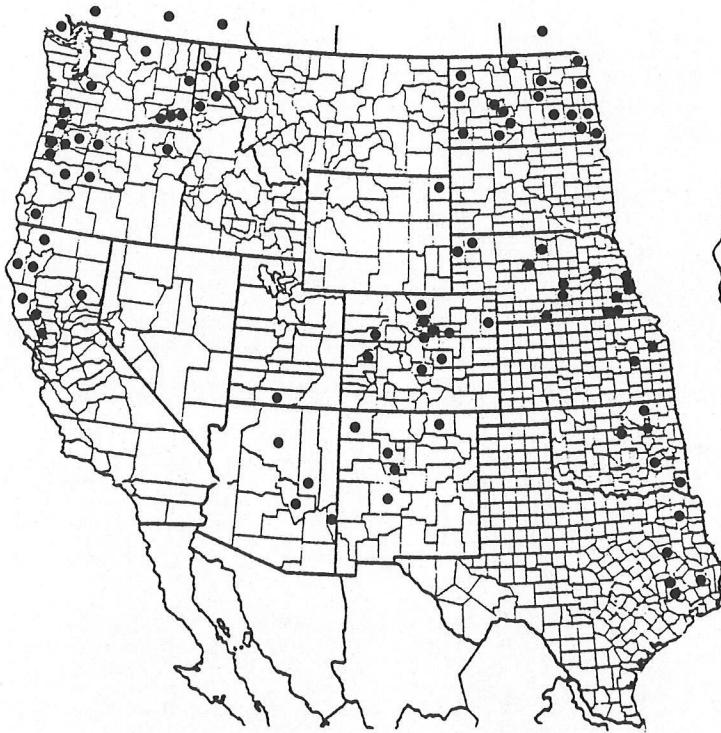


7822. *Smerinthus cerisyi* Kby.

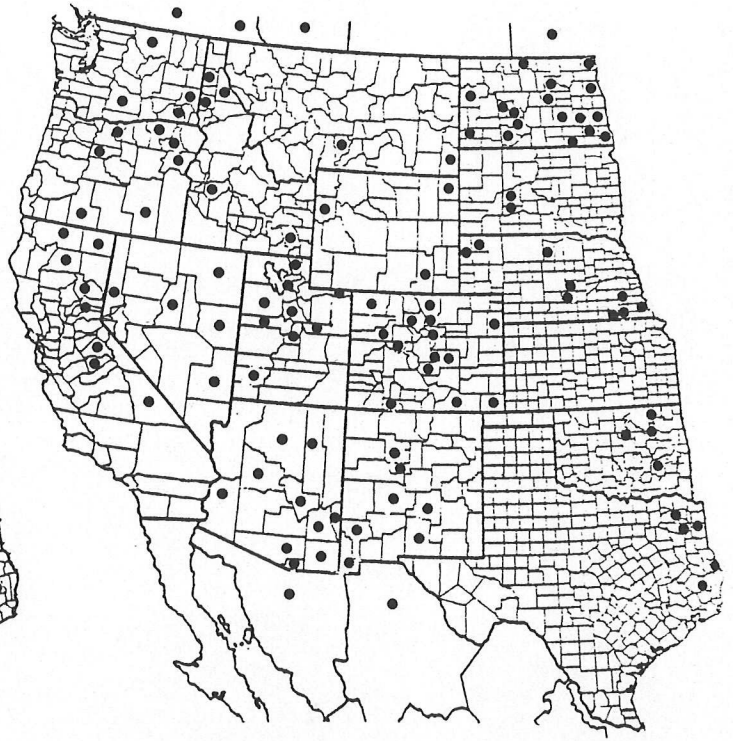


7823. *Smerinthus saliceti* Bdv.





7824. *Paonias excaecatus* (J.E. Smith)

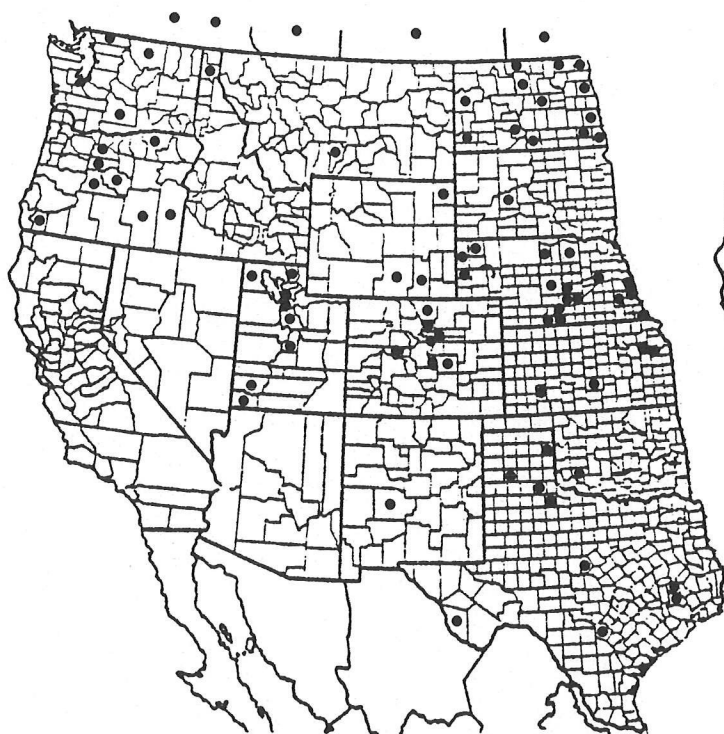


7825. *Paonias myops* (J.E. Smith)

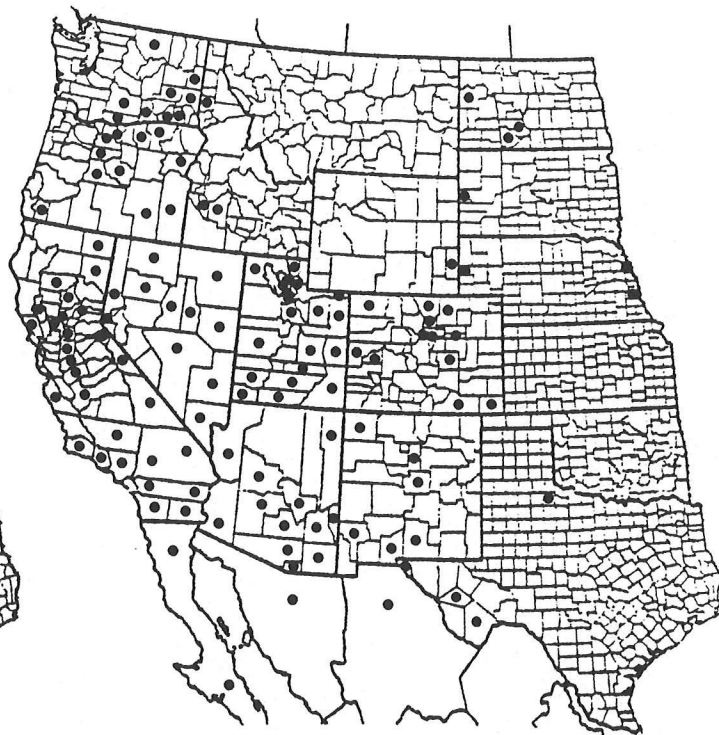


7827. *Laothoe juglandis* (J.E. Smith)





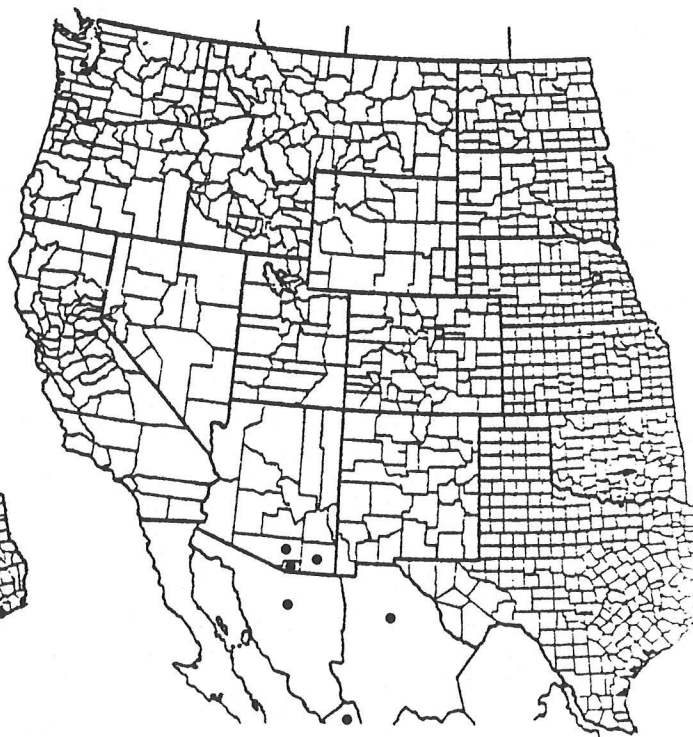
7828. *Pachysphinx modesta* (Harr.)



7829. *Pachysphinx occidentalis* (Hy. Edw.)



7830. *Pseudosphinx tetrio* (L.)



7831. *Isognathus rimosus* (Grt.)





7832. *Erinnyis alope* (Drury)



7833. *Erinnyis lassauxii* (Bdv.)



7834. *Erinnyis ello* (L.)



7835. *Erinnyis oenotrus* (Cram.)



7836. *Erinnyis crameri* (Schaus)



7837. *Erinnyis obscura* (F.)



7838. *Erinnyis domingonis* (Butler)



7841. *Pachylia ficus* (L.)



7842. *Pachylioides resumens* (Wlk.)



7845. *Callionima falcifera* (Gehlen)



Aellopos clavipe



7849. *Aellopos titan* (Cram.)



7850. *Aellopos fadus* (Cram.)



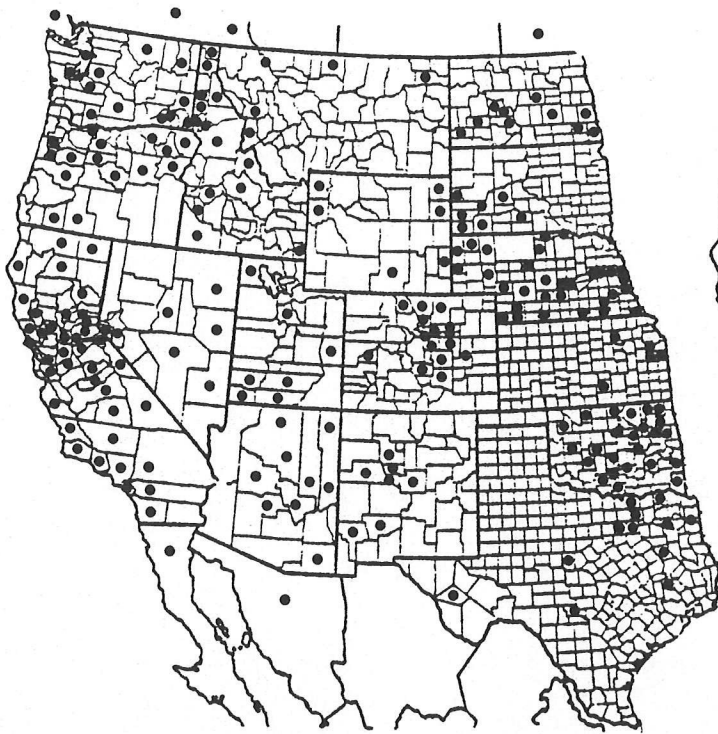
7851. *Enyo lugubris* (L.)



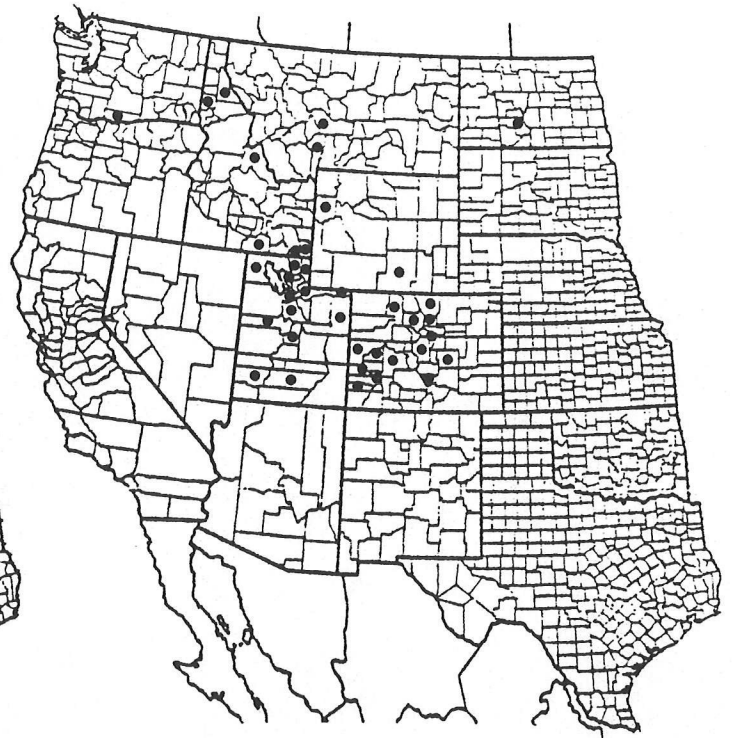
7853. *Hemaris thysbe* (F.)



7854. *Hemaris gracilis* (G.&R.)



7855. *Hemaris diffinis* (Bdv.)



7856. *Hemaris senta* (Stkr.)



7857. *Eumorpha anchemola* (Cram.)



7858. *Eumorpha satellitia* (L.)



7859. *Eumorpha pandorus* (Hbn.)



7861. *Eumorpha achemon* (Drury)



7862. *Eumorpha eacus* (Cram.)



7863. *Eumorpha typhon* (Klug)



7864. *Eumorpha vitis* (L.)



7865. *Eumorpha fasciata* (Sulz.)



7866. *Eumorpha labruscae* (L.)



7868. *Cautethia spuria* (Bdv.)



7870. *Sphecodina abbottii* (Swainson)



7871. *Deidamia inscripta* (Harr.)



7872. *Arctonotus lucidus* Bdv.



7873. *Amphion floridensis* B.P. Clark





7874. *Proserpinus gaurae* (J.E. Smith)



7875. *Proserpinus juanita* (Stkr.)



7876. *Proserpinus clarkiae* (Bdv.)



7877. *Proserpinus flavofasciata* (Wlk.)



7878. *Proserpinus vega* (Dyar)



7879. *Proserpinus terlooii* Hy. Edw.



7880. *Euproserpinus phaeton* G.&R.



7881. *Euproserpinus euterpe* Hy. Edw.



7882. *Euproserpinus wiesti* Sperry



7884. *Darapsa versicolor* (Harr.)



7885. *Darapsa myron* (Cram.)



7886. *Darapsa pholus* (Cram.)



7887. *Xylophanes pluto* (F.)



7889. *Xylophanes falco* (Wlk.)



7890. *Xylophanes tersa* (L.)



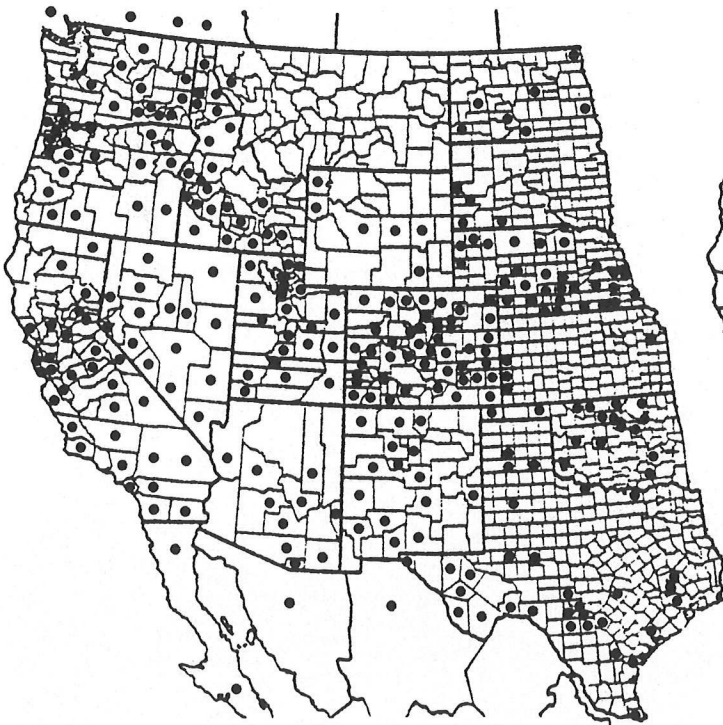
7891. *Xylophanes libya* (Druce)



7892. *Hyles euphorbiae* (L.)



7893. *Hyles gallii* (Rottemburg)



7894. *Hyles lineata* (F.)



7891.1. *Xylophanes ceratomoides* (Grote & Robinson)