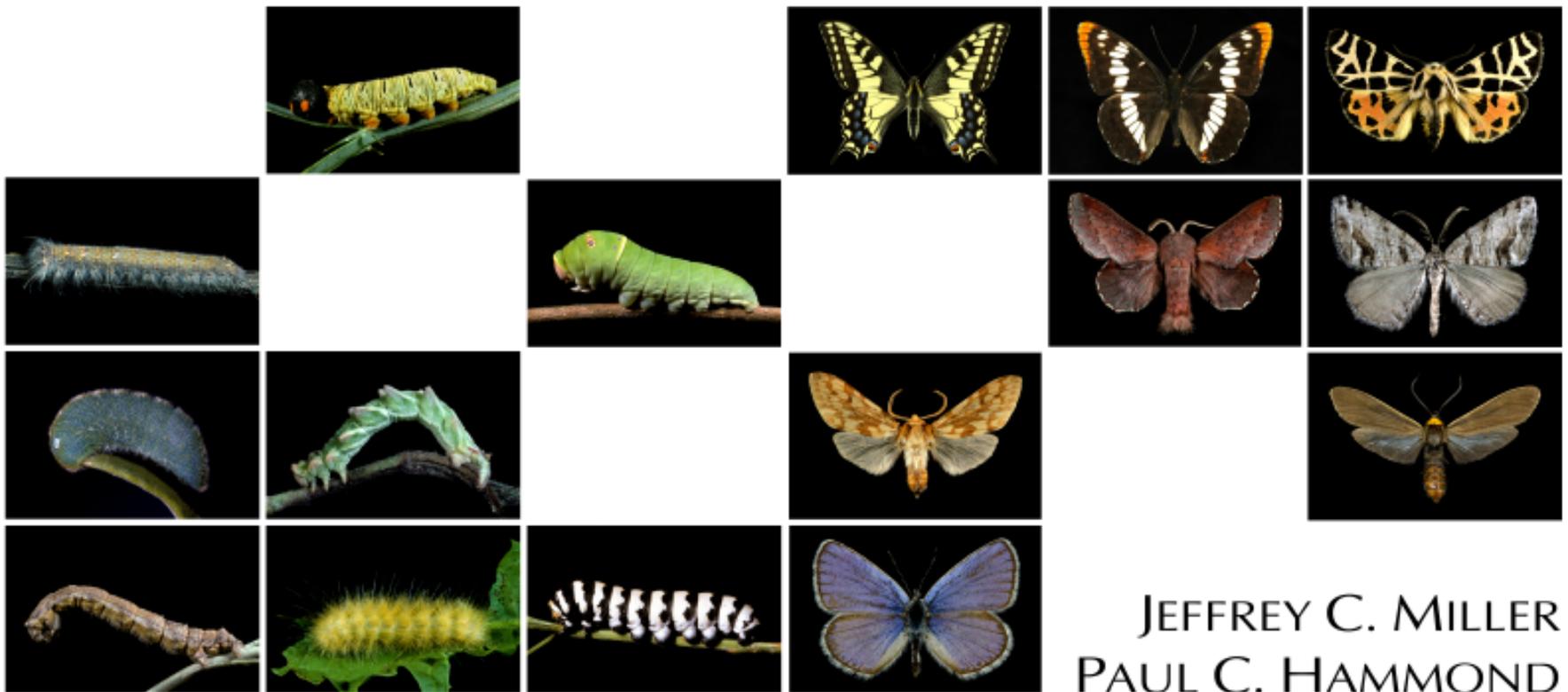

LEPIDOPTERA OF THE PACIFIC NORTHWEST: CATERPILLARS AND ADULTS



JEFFREY C. MILLER
PAUL C. HAMMOND

The Forest Health Technology Enterprise Team (FHTET) was created in 1995 by the Deputy Chief for State and Private Forestry, USDA, Forest Service, to develop and deliver technologies to protect and improve the health of American forests. This book was published by FHTET as part of the technology transfer series.

<http://www.fs.fed.us/foresthealth/technology/>

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Cover Photo Top left to bottom right: *EPARGYREUS CLARUS*, *PAPILIO BAIRDII*, *LIMENITIS LORQUINI*, *GRAMMIA ORNATA*, *PHYLLODESMA AMERICANA*, *PAPILIO RUTULUS*, *PHYLLODESMA AMERICANA*, *ITAME COLATA*, *ATLIDES HALESUS*, *CHLOROSEA BANKSARIA*, *LOPHOCAMPA MACULATA*, *CISSEPS FULVICOLLIS*, *SYNAXIS FORMOSA*, *SPILOSOMA VIRGINICA*, *PAPILIO INDRA*, *CELASTRINA ARGIOLUS*.

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DEDICATION AND ACKNOWLEDGMENTS

DEDICATED TO DOUG FERGUSON

This book about Lepidoptera of Pacific Northwest caterpillars and their adults is dedicated to the late Doug Ferguson. Doug played a very important role in the conduct of our studies. He offered his expertise in taxonomy, which was critical to the identification of many of our geometrid species, and encouraged us to keep up the sometimes arduous task of field collecting and rearing caterpillars from various foodplants.

We will miss him.

ACKNOWLEDGMENTS

The following individuals provided their expertise in identifying adults reared from the field-collected caterpillars: Paul Hammond, Doug Ferguson, Jerry Powell, Don LaFontaine, Jim Troubridge, Paul Opler, Jon Shepard, and Lars Crabo. The following people helped collect and rear caterpillars: Paul Hanson, Jean Miller, Mike LaMana, Carolyn ver Linden, Dana Ross, Norm Anderson, Jack Lattin, Maret Pajute, Gary Parsons, Emma Rossi, Pete Oboyski, and Rich Bowden. Dave McCorkle provided the photographs of caterpillars of *Parnassius clodius*, *Parnassius smintbeus*, *Phyciodes pulchellus*, and *Atlides halesus*. Rick Westcott took the photograph of the caterpillar of *Catocala ilia*. All other photographs were taken by the senior author, JCM. Chuck Benedict, INTECS International/USDA Forest Service, Forest Health Technology Enterprise Team, deserves special thanks for shepherding the manuscript through to final draft and layout. Jean Miller spent many hours helping collect, rear, curate, and organize data during the preparation of this manuscript.

The Oregon Department of Agriculture, Plant Division, kindly provided specimens for photography, in particular we would like to thank Jim LaBonte, Kathleen Johnson, and Dan Hilburn. The Department of Botany and Plant Pathology at Oregon State University, specifically Scott Sundberg and Thea Cook, assisted us by loaning us parts to a digital scanner.

Also, this booklet would not have been produced without the encouragement and support of Richard “Dick” Reardon and the USDA Forest Service, National Center of Forest Health Management, Morgantown, West Virginia. This is the sixth book in a series on the Lepidoptera of forests and woodlands. Dick has been the driving force and producer for the entire series. Those in the series written by senior author Dave Wagner covered the species of the northeastern United States, while those written by senior author Jeff Miller covered species of the Pacific Northwest. We are very grateful for the opportunity to produce this book, and extend our sincere thanks to Dick for his support.

Partial funding was provided by NSF LTER grants in support of the H.J. Andrews Experimental Forest: DEB 80-12122, and DEB 96-32921; the USDA Forest Service Pacific Northwest Forest and Range Experiment Station, Willamette Institute for Biological Control, the USGS; and the Oregon State University College of Agricultural Sciences.

ABOUT THIS BOOK

The subjects and their accompanying photographs of Lepidoptera are organized alphabetically by family and then by genus within the categories of butterflies, skippers, and moths. While many of the species illustrated here are common, only a small percentage of the species in the Northwest are represented.

If the identity of a macromoth from the western United States cannot be determined by matching a specimen with a description or photo in this book then look in Miller and Hammond 2000 or Covell 1984. Covell 1984 provides an extensive assortment of photographs for species that occur in the eastern United States so the probability of a match to a western species is limited to those species that are widespread across the North American continent. Also, serious students of moths should look in the references following the discussion of all families in the section on macromoths.

For each of the 239 species presented we provide a narrative that includes three sections: Caterpillar, Adult, and Ecology. The caterpillar and adult sections are descriptive for general identification purposes. The ecology section presents information on abundance, foodplants, seasonality, flight, and biogeography.

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INTRODUCTION

Insects are notably abundant in a wide variety of habitats. In particular, the moths and butterflies (Lepidoptera) are some of the most obvious insect species in a variety of environments. The adult moth or butterfly is likely the most familiar life stage to the casual observer. Moths and butterflies are easily seen on the wing during the day while visiting flowers or at night while hovering about lights. However, for every adult there once existed a caterpillar that fed on one or another species of foodplant. The caterpillars are the actively feeding immature stages of moths and butterflies and are less obvious at first glance. But they can be abundant on certain plants at certain times of the year, most notably in the spring. In addition, caterpillars are diverse in the number of species present, their appearance, behavior, and developmental requirements.

Identifying field-collected Lepidoptera to the species level is essential to performing natural history observations and conducting detailed ecological studies on associating caterpillars to their adults, foodplant relationships, parasitoids, and using caterpillars as indicator species to assess environmental impacts. Diagnostic keys are not available for identifying species of caterpillars and their adults, in the Pacific Northwest. In fact few scientific papers and books can be found that illustrate caterpillars of this region. Prior to Miller (1995), Stevens et al. (1984) was one of the few sources available for illustrations of caterpillars in the Pacific Northwest. Pyle (2002) provides some photographs of caterpillars of Pacific Northwest butterflies. However, many books are available that illustrate the adult butterfly, Pyle (2002) being the most recent. Photographs of moths in Pacific Northwest forests and woodlands were published by Miller and Hammond (2000). Certain books provide excellent photographs of common caterpillar species of regions outside of the Pacific Northwest, including the Canadian Provinces (Ives and Wong 1988), the Appalachians (McCabe 1991), and eastern deciduous forests (Wagner et al. 1995, Wagner et al. 2001). Some of the species illustrated in these

books also occur in the Pacific Northwest; however, Oregon alone contains over 2,000 species of Lepidoptera, and a majority of these species do not occur east of the Rocky Mountains.

This booklet is a field guide to assist in the identification of caterpillars and their adult stage, and emphasizes the fauna of the Pacific Northwest. In this work we have revised and expanded the coverage of caterpillars of Pacific Northwest forests and woodlands (Miller 1995) and adults of Pacific Northwest forests and woodlands (Miller and Hammond 2000). We have selected 239 species for diagnostic narratives and photographs of caterpillars and their adults. We have limited the photographic presentation to select taxa of butterflies and macromoths, but have not included the micromoths. The species included here are either common to the forests and woodlands of the Pacific Northwest, or they exhibit a special life history trait, such as endemism or extreme rarity. The geographical range extends beyond the Pacific Northwest States and includes regions west of the Rocky Mountains, from northern California to southern British Columbia. We present a brief section on the natural history of Lepidoptera and describe variations in morphology, color, and pattern that are used to identify caterpillars. Also, we provide details on how to collect and rear caterpillars, and how to photograph and preserve specimens. As well, there is a section on nomenclature and a narrative of the families most commonly found in the Pacific Northwest.

THE PACIFIC NORTHWEST

The Pacific Northwest includes California north of San Francisco, all of Oregon, and Washington, southern British Columbia, the northwest corner of Nevada, most of Idaho, and western Montana. In the context of the flora and fauna of North America, the Pacific Northwest contains portions



Figure 1. The Pacific Northwest.

of, or is contiguous with, four major biogeographic regions: California, the Great Basin, the Rocky Mountains, and the Canadian Provinces. The Pacific Northwest includes numerous mountain ranges, high desert, the Columbia River Basin, part of the Snake River, the Puget and Willamette Valleys, and the northern Pacific coast.

The vegetation in the Pacific Northwest is diverse and includes a flora adapted to an array of habitats including coastal, desert, and alpine environments. The prevalent forest trees include the conifers Douglas-fir, ponderosa pine, lodgepole pine, and redwoods. Other conifers include spruce, hemlock, larch, true fir, cedar and numerous species of pine. The prevalent woodland trees include oak, alder, poplar, ash, aspen, maple,

and juniper. The understory vegetation in these forests and woodlands is also very rich in species. Included among some of the more prevalent species of flowering trees and shrubs are the genera: *Acer*, *Alnus*, *Amelanchier*, *Arbutus*, *Arctostaphylos*, *Artemisia*, *Baccharis*, *Ceanothus*, *Celtis*, *Cercocarpus*, *Chrysolepis*, *Cornus*, *Corylus*, *Crataegus*, *Fraxinus*, *Gaultheria*, *Holodiscus*, *Juniperus*, *Lithocarpus*, *Myrica*, *Oemleria*, *Pachistima*, *Philadelphus*, *Physocarpus*, *Populus*, *Prunus*, *Purshia*, *Quercus*, *Rhamnus*, *Rhododendron*, *Ribes*, *Rubus*, *Salix*, *Sambucus*, *Sorbus*, *Spiraea*, *Symphoricarpos*, *Umbellularia*, and *Vaccinium*.

The forests and woodlands of the Pacific Northwest possess many types of habitats based on tree species, geographical location, and climatic conditions. We have placed these habitats into five categories: subalpine forest, rain-wet-moist forest, dry forest, dry woodland, and riparian forest and woodland.

Subalpine forest Occurs at high elevation (above 1,500 meters) in the Cascade Mountains, Rocky Mountains, Sierra Nevada Mountains, and on isolated montane islands in the Great Basin and the southwest states. Dominant tree species are Engelmann spruce, subalpine fir, lodgepole pine, and quaking aspen.

Rain-wet-moist forest Dominated by conifers, particularly Douglas-fir, western hemlock, redwoods, and Sitka spruce. The major hardwood trees are red alder and big-leaf maple. Forest types transition subtly from one to the other based on precipitation. Rainforests may receive in excess of 254 centimeters (100 inches) of rain per year, wet forests receive between 152 and 254 centimeters (60 to 100 inches), and moist forests receive between 89 and 152 centimeters (35 to 60 inches).

Dry forest Dominated by ponderosa pine. The associated hardwood trees are quaking aspen at high elevations and cherry and serviceberry at lower elevations.

Dry woodland Characterized by oak woodlands west of the Cascade and Sierra Nevada Mountains, and juniper woodlands to the east of the Cascade Mountains. Dry woodlands in the Southwest and Great Basin are characterized by piñon pine.

Riparian forest and riparian woodland Occurs in dry regions along rivers, creeks, and gullies. The dominant trees are poplars, willow, alder, cherry, and elderberry.

THE LEPIDOPTERA

The Order Lepidoptera is divided into three groups: butterflies and skippers, macromoths, and micromoths. Each group consists of numerous families. The family as a taxonomic unit is a grouping of genera which are taxonomic units of related species. The differences between groups of Lepidoptera include obvious morphological features, technical anatomical characteristics, and some behavioral ecological traits.

A majority of the described and documented Lepidoptera in the Pacific Northwest are macromoths. Over 1,200 species of macromoths have been recorded to date. Between 180 and 200 species of butterflies and skippers, and 700 to 900 species of micromoths are listed as well. However, the scientific effort that goes into understanding the Lepidoptera fauna is not evenly distributed among the species. Much is known about the presence and identity of butterfly and skipper species in the Pacific Northwest; less is known about the presence and identity of macromoths. Even less is known about the micromoths. The macromoth fauna of the Northwest has never been the subject of a comprehensive study, and many species remain to be discovered and described. As more studies are conducted we expect the butterfly species count will remain nearly the same, but the macromoth species count could increase another 25 percent, to around 1,500 species. The micromoth species count is likely to equal or exceed the number of macromoths.

The butterflies and skippers are known as the Rhopalocera. There are seven families: Hesperidae, Lycaenidae, Nymphalidae, Papilionidae, Pieridae, Riodinidae, and Satyridae. The butterflies and skippers are distinguished by swollen areas at or near the end of the antennae. Butterflies have a swollen area at the tip of the antennae. Skippers have a swollen area near the end, but the enlargement is slightly expanded and tapers into a hooked tip. Nearly all adult butterflies and skippers are diurnal, meaning they are active during the day. Associated with their diurnal behavior,

butterflies and skippers tend to bask in sunlight which is a behavior involved in thermoregulation.

Adults tend to be brightly colored, at least in one of the sexes. Depending on the species, the male or female is the more colorful, and the color serves to attract a mate. For instance, in many of the blue Lycaenidae the male is an iridescent blue/purple and the female is mostly brown. The bright and obvious colors and patterns on the wings might be associated with aposematism, a mechanism which serves to warn predators that the individual is poisonous. While at rest, but not while basking in the sun, the wings of butterflies are typically held pressed together above the body. The underside of a butterfly wing is often marked in colors and patterns that allow the individual to blend into the substrate upon which it is resting, a morphological and behavioral condition known as crypsis. Skippers differ slightly from butterflies in their resting posture. Typically they hold their wings at an oblique angle, or laterally, while at rest.

Adult butterflies and skippers are readily seen at flowers where they are sucking up nectar to obtain the energy required for flight. Caterpillars of butterflies and skippers do not exhibit any general traits that separate them from the caterpillars of macromoths.

Macromoths and micromoths differ from the Rhopalocera in the morphology of the antennae, flight activity patterns, and coloration. The tip of the antennae in macromoths and micromoths is not knobbed or swollen with a hook, although some Sphingidae may exhibit slightly swollen antennae that taper to a point which is curved. Most species of moths fly at night, their nocturnal flight behavior is one of the reasons moths are readily seen at lights. Unlike the Rhopalocera, moths at rest do not press their wings together vertically above their bodies. Rather, they hold their wings flat over their abdomens in a near horizontal position. The top surface of the wings is typically colored and patterned to blend into the environment. Thus, bright colors are the exception rather than the rule in moths. However, in a few species of moths the upper surface of the hindwing is brightly colored; a sudden exposing of the hindwing, which is typically covered by the forewing when at rest, may serve to startle a predator.

Adults of many moth species do not feed. Typically, those that do feed seek the carbohydrate- and energy-rich nectar of flowers.

Contrary to what the names suggest, overall size is not what distinguishes the macromoths from micromoths. Rather, the distinction is in the details of the wing venation and the female reproductive tract. These details are discussed and illustrated in most texts on general entomology (Borror et al. 1989) and in books about Lepidoptera (Covell 1984).

The macromoths in the woodlands and forests of the Pacific Northwest are comprised of 1,200 species in twelve families: Arctiidae, Dioptriidae, Drepanidae, Epiplemididae, Geometridae, Lasiocampidae, Lymantriidae, Noctuidae, Notodontidae, Saturniidae, Sphingidae, and Thyatiridae. The micromoths in the woodlands and forests of the Pacific Northwest are represented by at least 500 species in over 20 families, the four most common being the Tortricidae, Pyralidae, Gelechiidae, and Pterophoridae.

COMMON FAMILIES OF LEPIDOPTERA IN FORESTS AND WOODLANDS OF THE PACIFIC NORTHWEST

In general, about 21 families of Lepidoptera are common in the Pacific Northwest, and are briefly described, below. Due to the dynamics of name changes, recognized species status, and the nature of incomplete records, species numbers are estimates.

Butterflies

Hesperiidae Skippers; 40 species. Caterpillars are external leaf feeders but can be found within tied leaves on broadleaf plants and grasses. The most obvious diagnostic trait for identification of caterpillars is that the first segment of the thorax is constricted. A full grown caterpillar may reach 50 millimeters in length. Adults are day-flying.

Lycaenidae Hairstreaks, elfins, blues and coppers; 60 species. Caterpillars are external leaf feeders, and occur primarily on broadleaf plants. The body is covered with many short hairs, giving a velvet-like appearance. The head is usually concealed from above by the

prothorax. The dorsal aspect of the body is humped, a feature best seen in lateral view. A full grown caterpillar may reach 30 millimeters in length. Adults are day-flying.

Nymphalidae Brush-footed butterflies, fritillaries, commas, admirals, crescents, checkerspots, and tortoiseshells; 50 species. Caterpillars are external leaf feeders, and occur primarily on broadleaf plants. Many species have middorsal spines on A7 but not on A9. The head of nymphalid caterpillars may possess non-stinging spines. A full grown caterpillar may reach 75 millimeters in length. Adults are day-flying.

Papilionidae Swallowtails and parnassians; 10 species. Caterpillars are external leaf feeders. Body color in swallowtail caterpillars is a mixture of green, yellow, and black. Body color in Parnassians is black. Caterpillars of Papilionidae possess an osmeterium, which is an eversible forked pouch on the prothorax. A full grown caterpillar may reach 70 millimeters in length. Adults are day-flying.

Pieridae Whites and sulphurs; 20 species. Caterpillars are external leaf feeders, and occur primarily on broadleaf plants. The body is covered with many very short hairs, giving the appearance of velvet. A full grown caterpillar may reach 50 millimeters in length. Adults are day-flying.

Satyridae Satyrs; 12 species. Caterpillars are external leaf feeders, and occur on grasses. The body is covered with many very short hairs, giving a velvet-like appearance. A full grown caterpillar may reach 40 millimeters in length. Adults are day-flying.

Macromoths

Arctiidae Woollybear caterpillars, tiger moths; 30 species. Caterpillars are external leaf feeders and occur on conifers and broadleaf plants. Typical arctiid caterpillars have dense coats of long hairs, giving the caterpillars a woolly appearance, hence the common name. Many species are covered with densely packed, wispy hairs that are longer than the width of the body. Some species are covered by densely packed hairs that are shorter than the width of the body. A majority

of the species overwinter in the caterpillar stage. A full grown caterpillar may reach 60 millimeters in length. Caterpillars among the species of arctiids may feed on the foliage of conifers, flowering trees and shrubs, herbs, or grasses. Adult moths of most of the species are night-flying. However, some arctiids fly during the day. One of the day-flying species is the cinnabar moth, *Tyria jacobaeae*, which was intentionally introduced as a biological control agent because the caterpillar feeds on flowers and leaves of the noxious weed tansy ragwort, *Senecio jacobaea*. Adults exhibit a wide range of colors and patterns of markings. Some species have immaculate wings while others show large spots or extensive crisscrossing bands. Some of the species are considered pests, such as the fall webworm and the silver spotted tiger moth. Adult Arctiidae of North America are illustrated in Covell (1984).

Diptoridae Oak worm moths; 1 species. *Phryganidia californica* is our only species in this family and occurs in forests and woodlands containing live oaks and chinquapin, upon which the caterpillars are leaf feeders. Because caterpillars overwinter, and may feed on warmer days, they require an evergreen host, such as live oaks and chinquapin. The species is considered a pest because it can severely defoliate its hosts. Adults are not strongly attracted to light and may fly during the day or at night.

Drepanidae Hook-tip moths; 2 species. *Drepana arcuata* is common, *D. bilineata* is not. Caterpillars are external leaf feeders and occur primarily on broadleaf plants, especially alder species. Two features are characteristic in the caterpillar: the rearward projecting knob on A10, and the prolegs on A10 which project backwards and lack crochets. Full grown caterpillars may reach 30 millimeters in length. Adults are night-flying and attracted to light.

Epiplemidae Epiplemid; 1 species. *Callizyxia amorata* is the only species in this family. It is most common in the wet forests in the Pacific Western States, but is widely distributed in North America. Caterpillars feed on the foliage of honeysuckle. Adults fly at night and are attracted to light.



Figure 2 Wingless female adult.

Geometridae Inchworms, loopers, and geometer moths; 400 species. This family is second only to the noctuids in number of species. Typically, inchworms possess one pair of midabdominal prolegs on segment A6. The presence of two pairs of midabdominal prolegs is less common. If two pair of prolegs do appear, they occur on segments A5 and A6 (see *Campaea perlata*). Also, the presence of four pairs of midabdominal prolegs is very uncommon. If they do appear, they occur on A3-A6 (see *Archibearis infans*). Many species have caterpillars that feed on the foliage of conifers. The most common hosts are species of Pinaceae, but a few moths prefer the Cupressaceae as their primary host. A majority of the inchworm species feed on the foliage of flowering trees and shrubs, and less frequently on herbaceous plants. Adults of most species fly at night and are readily attracted to light. Females of some species (*Phigalia plumogeraria*, *Operopthera bruceata* and *Operopthera danbyi*) are wingless (Figure 2). Generally, filiform antennae are present in both sexes. However, males in certain species have pectinate antennae (see *Protoarmia porcelaria* or *Drepanulatrix foeminaria*). Full grown caterpillars

in small species may reach only 20 millimeters in length, while large species may reach 80 millimeters. Ferguson (1985) provides detailed illustrations and references to the green geometers, Geometrinae, of North America.

Lasiocampidae Tent caterpillars and lappet moths; 6 species. Caterpillars are external leaf feeders, and occur primarily on broadleaf plants. Biordinal crochets of lasiocampids are unique among the common hairy caterpillars of the Pacific Northwest.

Caterpillars of lasiocampids may be found feeding on the foliage of conifers or flowering trees and shrubs. Adults are night-flying. The lappet moth body is notably hairy. Colors and markings on the forewings and hindwings of lappet moths do not create strongly contrasting or intricate patterns. Adults fly at night and are readily attracted to light. Lappet moths do not have functional mouthparts and therefore do not feed. A full grown caterpillar may reach 100 millimeters in length. Franclemont (1973) includes illustrations of North American lappet moths.

Lymantriidae Tussock moths; 8 species. Caterpillars are external leaf feeders, and occur on conifers and broadleaf plants. Typically, caterpillars exhibit tufts of dense hairs on middorsal segments A1 through A4, and a brightly colored (red or orange) gland on middorsal segments A6 and A7. An introduced species, *Leucoma salicis*, lacks the tufts of dense hairs and thus does not fit the description of a “typical” Pacific Northwest lymantriid caterpillar.

Caterpillars in most of the species feed on the foliage of conifers or flowering trees and shrubs. Many species are considered pests, the most notable being the gypsy moth, *Lymantria dispar*, and the Douglas-fir tussock moth, *Orgyia pseudotsugata*. The gypsy moth has created problems, but has not established permanent residence in the Pacific Northwest. A gypsy moth infestation can prompt an eradication project involving pesticides, which in turn may lead to unintended ecological impacts on other Lepidoptera species (Miller 1990a,b).

Orgyia pseudotsugata is a native pest of conifer forests. Adults of most

species fly at night and are readily attracted to light. However, the males of some species, such as *Orgyia antiqua* and *Orgyia pseudotsugata*, are day flyers. The females of many of the lymantriids are wingless/flightless. A full grown caterpillar may reach between 60 and 70 millimeters in length. Ferguson (1978) provides illustrations and references to the tussock moths of North America.

Noctuidae Cutworms, armyworms, semi-loopers, and underwings; 850 species, more than any other family of Lepidoptera in the Pacific Northwest. Habits and habitats vary among species. Some species occur in the soil, others bore in stems, and many are external leaf feeders. Host plants include conifers, broadleaf trees and shrubs, herbs, and grasses. Caterpillars may be hairy, nearly naked, brightly colored or cryptic. All noctuids, except the Plusiinae, have four pairs of midabdominal prolegs. The Plusiinae have only two pairs of midabdominal prolegs, occurring on segments A5 and A6. Most of the caterpillars of noctuid species feed on the foliage of flowering trees, shrubs, or herbs. Numerous species are considered pests of agricultural crops, but none are considered chronic pests of woodlands and forests. Adults range in size from the very small *Nola minna*, with a wingspan of 2.3 centimeters, to the relatively large *Catocala ilia*, with a wingspan of 7.9 centimeters.

Noctuid moths exhibit a broad array of colors and markings, but generally the forewings, hindwings and bodies exhibit varying hues of white, silver, gray, tan, brown, and black. Most noctuid species fly at night and are readily attracted to light. Certain species, such as *Oncocnemis dunbari*, rarely show up at lights at night, yet collections of caterpillars from the foliage of ocean spray, *Holodiscus discolor*, suggest the species is very abundant. Full grown caterpillars of the smaller species reach between 15 and 20 millimeters, while large species may be 70 millimeters in length. Eichlin and Cunningham (1978), Lafontaine (1987), Lafontaine and Poole (1991), Poole (1995), and Lafontaine (1998) provide illustrations and references to the noctuids of North America.

Notodontidae Prominents; 20 species. With only 20 of the 136 species known to occur in the United States and Canada, the prominents are not well represented in the Pacific Northwest. Typically, caterpillars feed on the foliage of flowering trees and shrubs. On occasion *Schizura concinna* may be a pest on ornamental trees and in orchards. Prolegs of A10 may be either extremely short or extremely long relative to the midabdominal prolegs, and are often elevated above the plant. Caterpillars may reach 60 millimeters when full grown. Adults fly at night and are readily attracted to light.

Saturniidae Silk moths; 12 species. Although called “silkworms,” these are not the caterpillars used in commercial silk production. Caterpillars are external leaf feeders, occurring primarily on conifers and broadleaf plants. Many species exhibit middorsal scoli on segments A8 and A9, but not A7. Caterpillars of many species have stinging hairs that inflict a sharp pain similar to that inflicted by species of stinging nettle, *Urtica*. The forewings and hindwings of silk moths are very large; wingspans in many of the species can extend between 10 - 15 centimeters. Accordingly, the wingbeat of most silk moths is much like that of most butterflies; it is relatively slow and each beat easily seen. Wing colors and markings typically occur in distinct and sometimes intricate patterns, making identification of certain species rather easy. However, many silk moths are known to have hybrid populations in areas where two closely related species can interbreed. The adults of most species fly at night and are readily attracted to light. A few species, notably *Hemileuca eglanterina* and *Saturnia mendocino*, will fly during the day. The morphology of silk moth antennae is unique; they resemble fern fronds, with two to four branches along their lengths. The branched antennae are particularly noticeable in the males. Adults possess atrophied mouthparts and do not feed. Typically, they are not long-lived. A full grown saturniid caterpillar may exceed 100 millimeters in length. Ferguson (1971, 1972) and Tuskes et al. (1996) provide illustrations and references to the silk moths of North America.

Sphingidae Hornworms, sphinx moths; 25 species. Caterpillars are external leaf feeders, occurring primarily on broadleaf plants. A notable exception being the caterpillars of *Sphinx sequoiae* which feed on junipers, *Juniperus*, and western red cedar, *Thuja plicata*. A single middorsal horn usually occurs on segment A8.

Caterpillars often rest in a prayer-like pose, with the head and true legs raised above the plant surface. Sphinx moths are very strong fliers; their wingbeat produces a sound similar to that of a hummingbird. The adults of most species fly at night and are readily attracted to light. Sphinx moths are attracted to nectar-producing flowers that have long tubular corollas. Many of these flowers are aromatic, white, and flower at night. A full grown caterpillar may exceed 100 millimeters in length. See Hodges (1971) for illustrations and references to the sphinx moths of North America.

Thyatiidae Thyatirids; 10 species. Caterpillars are external leaf feeders, and may be found in loosely tied leaves on broadleaf plants. The tail end (prolegs are reduced) is often raised above the plant surface. Line patterns on the forewings and hindwings of thyatirids often are wavy, curled, or zigzagged. Adults of thyatirids fly at night and are attracted to light. When full grown, caterpillars may be 40 millimeters long.

Micromoths

Gelechiidae Gelechiids; 200 species, but poorly documented. Habits and habitats vary among species. Caterpillars occur on conifers and broadleaf plants. They are external leaf feeders, borers and tunnelers, and leaf tiers, and are found in flowers and seeds. Caterpillars are fairly nondescript, making field identification difficult. Identification is best achieved using keys which rely on the arrangement of hairs. Most full grown caterpillars are less than 15 millimeters long. Adults are night-flying.

Plutellidae Plutellids or diamondback moths; 25 species, but poorly documented. Caterpillars occur primarily on broadleaf plants, are usually external leaf feeders, and may tie leaves loosely together. Body color varies from yellow to green. They are relatively small, rarely exceeding 15 millimeters when full grown.

Pyralidae Snout moths; 200 species, but poorly documented. Caterpillars typically occur on conifers, broadleaf plants, and in nests of other insects. They are borers in plant stems and fruits. Identification is best achieved using keys that rely on the arrangement of hairs. The caterpillar is usually less than 30 millimeters long when full grown. Adults are night-flying.

Tortricidae Leaf-tiers; 300 species, but poorly documented. Caterpillars are typically external leaf feeders but often found in rolled leaves. Many species are leaf miners as early instars, and occur on conifers and broadleaf plants. Some species are distinctively marked and identifiable in the field, but identification is best achieved using keys that rely on the arrangement of hairs. A large, full grown tortricid caterpillar will measure between 20 and 25 millimeters in length. Adults are night-flying.

NOMENCLATURE

The common names of Lepidoptera often describe their appearance or where they live. Typical examples are: linden looper, alfalfa semilooper, western spruce budworm, green oak caterpillar, fall webworm, cabbage white, pine white, and chinquapin hairstreak. Whereas a species will have a unique scientific name, a caterpillar, moth, butterfly, or skipper, might have many common names, and some common names might be used for more than one species. The common names used here were found in Essig (1929), Ives and Wong (1988), Hinchliff (1994), and Wagner et al. (1995), and the list of common names that has been officially adopted by the Entomological Society of America (Stoetzel 1989). Most of the moths of western North America do not have recognized common names, whereas butterflies are well known by their common names.

The scientific name of all organisms is derived from Latin or Greek and consists of at least two parts and often a third. Also, the last name of the author who described the species is sometimes included in the presentation of the name (not in this book). The first name refers to the genus and is always capitalized. The second name, not capitalized, represents the species epithet. In combination, the genus and species epithet represent a binomen that is the full name of the species. Some species have a third name that denotes a subspecies. Subspecies status is applied to distinct populations that are geographically separated. Individuals of different subspecies within a species are capable of interbreeding and producing fertile offspring. With few exceptions, individuals of different species do not naturally interbreed or produce fertile offspring.

No two animals are allowed to have the same scientific name. A species might possess a list of invalid scientific names (synonyms) due to a history of taxonomic revisions.

BIODIVERSITY STUDIES

Understanding the biodiversity of Lepidoptera is essential to understanding many important ecological issues, such as: recognizing special, rare, or endangered species and habitats; assessing the impact of land management practices; and determining food web relationships and the interdependence of plants, Lepidoptera as herbivores and pollinators, and predators of Lepidoptera.

Two important indicators of biodiversity are species richness (number of species in a community) and abundance of individuals (population numbers). Because Lepidoptera function as defoliators, decomposers and pollinators, and are both prey and hosts to carnivores (Miller 1993), species richness and abundance of individuals should be measured and evaluated within the context of the ecosystems in which they are found. To that end, various sampling techniques can be used, including light traps and aerial net collecting for flying moths and butterflies, and clipping or beating foliage to capture caterpillars.

A list of plant and animal species is the foundation of any biodiversity study. Such a list is most meaningful when the species are evaluated within the context of their ecological functions. That is, a species list can become the foundation for an ecological database. One way to do this would be to relate the life history attributes of the species to each name, and then create functional groups according to those attributes and the number of species exhibiting them.

For example, for western Oregon we have found an average of 350 species of macromoths in a typical forested site dominated by Douglas-fir. Our record high collection of species from a single trap night was 104, but a count of 20-50 species per trap night is more typical. Similarly, a typical forested habitat will support 80 butterfly species, on any good day at the peak of the season up to 32 species may be seen.

By categorizing the listed species of macromoths according to the host plants (an attribute of ecological function) of their respective caterpillar, we can qualify the importance of plant communities on biodiversity of the macromoths (Hammond and Miller 1998, Miller et al. 2003). The macromoth species were assigned to one of three major vegetation groups: conifers, hardwood trees and shrubs, and herbs and grasses. The results showed that conifers supported only 10 to 12 percent of the species, whereas flowering trees and shrubs supported 52 to 66 percent of the species, and herbs-grasses supported 20 to 33 percent of the species.

LIFECYCLE OF LEPIDOPTERA

The typical life cycle follows a holometabolous, four-stage sequence—adult, egg, caterpillar (larva), and pupa—in which development during the pupal stage involves the metamorphosis from a caterpillar to an adult.

ADULT

Moths and butterflies are the sexually mature adult life stage of Lepidoptera. The adult serves three main functions in the life cycle: mating, dispersal, and oviposition. Many moths feed on nectar or a liquid sugar source for energy required for flight. Some species of macromoths do not have functional mouthparts and cannot feed. Consequently, they are relatively short-lived and will exhibit a short flight period.

Dispersal and flight activity Not all moths have wings, and not all moths with wings can fly. Typically, moths with wings have two pairs: a pair of forewings and a pair of hindwings. The forewings are attached to the second thoracic segment, the mesothorax. The hindwings are attached to the third thoracic segment, the metathorax. Individuals that do not have wings do not have flight muscles and typically are female. The absence of flight muscles is associated with a higher capacity for egg production. The males of species with flightless females have fully developed wings and can fly. Examples of species with wingless females are the lymantriids, *Orgyia antiqua* and *Orgyia pseudotsugata*, and the geometrids, *Erannis tiliaria*, *Operophtera bruceata*, *Operophtera danbyi*, and *Phigalia plumogeraria*.

The period for flight may be characteristic for a species. The daily rhythm and the seasonal pattern are the two temporal components to flight behavior. A minority of moth species, and nearly all butterfly and skipper species may fly during the day. Generally, moths fly

during the night, but some of the night-flying species fly during the evening. No night-flying butterflies occur in the Pacific Northwest.

The time of season and the length of time for the flight period of a species may also exhibit a diagnostic pattern. Most species fly at certain times of the year and may be active for a period of 3 to 6 weeks, whereas a few species may have individuals in flight throughout much of the year. For instance, the arctiid *Lophocampa argentata* will be in flight during the last few days of July and the first 3 weeks of August, with a peak in flight around the end of the first week in August. The males of the geometrids *Operophtera bruceata* and *Operophtera danbyi* will be in flight only from the middle of November to the last week of December. The geometrid *Sabulodes aegrotata* has been observed in flight beginning the last week of January through the spring, summer, and fall, and up to the last week in November.

Mating and oviposition Typically, mating occurs soon after adults emerge from the pupae. The search for a mate is facilitated by volatile chemicals, called pheromones, which are emitted by a virgin female and act as a sex attractant. Males detect the pheromone molecules with their antennae and fly upwind to locate the chemical's female source. The act of mating may take many hours, but a female may begin laying fertile eggs immediately after mating. Pheromones are often species specific and help to isolate closely related species from each other.



Figure 3 Eggs of Lepidoptera. (A) *Phyllodesma americana*, (B) *Acronicta funeralis*, (C) *Coloradia pandora*, (D) *Phryganidia californica*, (E) *Spodoptera praefica*.

EGG

Females may lay eggs singly or in clusters, depending on the species. Most species attach their eggs to the vegetation that will serve as the foodplant for the caterpillar. For instance, *Phyllodesma americana* will attach a single egg to the leaf of various flowering trees that will then serve as food for the caterpillar. Some species, such as *Orgyia antiqua*, will deposit eggs on the silk surrounding the pupal skin. Other species scatter eggs on the soil surface. Egg production ranges from fewer than 100 eggs to more than 1,000 eggs per female.

CATERPILLAR (Larva)

Caterpillars are the active, feeding, immature stage of moths and butterflies. With few exceptions, caterpillars are herbivorous. Few species of caterpillars are predaceous, feeding on animals. Most caterpillars feed on foliage, but some feed on roots, seeds and flowers, and within branches and woody stems. Caterpillars of many species are monophagous or foodplant specialists, meaning they have restricted ranges of plants upon which they can feed. Specialist species may feed either on only one plant species, on only a few related plant species, or on many species within one genus of plant.

Many caterpillars are polyphagous, or generalist feeders. That is, the caterpillar can feed upon a wide range of plant species, typically covering five or six plant families, and still develop into a normal-sized adult in the usual period of time.

While caterpillars might be less obvious at first glance, they can be very abundant on certain plants at certain times of the year. Within a given environment caterpillars can be found in a variety of habitats and microhabitats. In general, they may be aquatic or terrestrial. They can be found in fruits, roots and stems as borers or miners; in foliage as miners; on the surface of foliage as skeletonizers or chewers; in galls; or in the nests of other insects, such as ants and bees.

Caterpillars develop in the egg and then emerge through the eggshell, which they sometimes eat. They increase in size each time they molt or shed their skins. The period between molts is termed an instar, and typically a caterpillar passes through five instars as it eats and grows (see Figure 7, page 17). In certain species a caterpillar that will develop into an adult female may develop through an additional instar and thus grow bigger than the male. However, based on external morphology, it is usually very difficult to distinguish between the sexes prior to pupation.

Most caterpillars feed and develop as solitary individuals, but a few species aggregate. Some aggregating caterpillars construct nests. For instance, the caterpillars of *Lophocampa argentata* aggregate on branches of Douglas-fir but do not construct nests. The caterpillars of *Hyphantria cunea* and *Malacosoma californicum* live in large colonies in silk nests they spin among the twigs and branches of trees.

Caterpillar growth rates are strongly influenced by temperature and the nutritional quality of foodplants. Generally, the cooler the temperature, the slower the growth rate. The nutritional value of vegetation depends on its protein (nitrogen), water, and allelochemical content. Most plants

contain between 1% and 7% nitrogen by weight, and the higher the content, the more nutritious it is. The same holds for water content. The closer water content is to the higher end of the plant's normal range, the more nutritious it is. Allelochemicals are plant-derived chemicals—terpenes, alkaloids, phenolics, and various proteins—that can stimulate or deter feeding. Some are toxic to caterpillars and some are not. Some that are not toxic to caterpillars, are toxic to one or more of their predators. In turn, some unaffected caterpillars have developed mechanisms whereby they store toxins as a defense against their predators. Many of the poisonous caterpillars are aposematic, meaning they are brightly colored, with the colors serving to warn away would-be predators. Two examples are the brightly colored caterpillars of the cinnabar moth, *Tyria jacobaeae*, and the monarch butterfly, *Danaus plexippus*.

PUPA

Metamorphosis occurs inside the pupa. A butterfly pupa is called a “chrysalis.” A moth pupa, called a “cocoon,” may be covered in silk, or naked, and can be encased in rolled foliage or in the soil. Once a caterpillar

has attained a critical size, it changes behavior and stops feeding and begins searching for or creating a site to pupate. Pupation can be quick, lasting 2 to 3 weeks, or prolonged, lasting more than one year. The pupa is the overwintering life stage in many species. Typically, overwintering pupae are in diapause, a state within which development of the adult is arrested or slowed down to a low rate. The adult will not mature and emerge from a pupa in diapause unless the pupa is first exposed to a period of cold, followed by a period of increased warmth.

Overwintering A majority of the species of Lepidoptera in the Pacific Northwest overwinter either in the pupal or egg stage. Only a few of the common species in the Pacific Northwest overwinter as caterpillars, including the arctiids *Gnophaela vermiculata*, *Lophocampa argentata*, and *Pyrrharctia isabella*; the geometrid *Neocalcis californiaria*; and the dioptid *Phryganidia californica*. Species with overwintering caterpillars tend to occur in regions with a mild winter. Some species, such as the mourning cloak butterfly, *Nymphalis antiopa*, overwinter in the adult stage.



Figure 4 Pupae of Lepidoptera. The pupa of a butterfly (A) is known as a chrysalis. The chrysalis of *Danaus plexippus* hangs head down; the chrysalis of *Papilio zelicaon* is recumbent, head up, and held by a silken belt. The pupa of a moth (B) may be naked (no silk), or variously enveloped in silk (cocoon). The noctuid pupa lacks silk, and could be found in leaf litter on the ground, buried in the soil in a small cell, or in a rolled leaf. The cocoon of *Nola minna* is attached to a twig of its foodplant.



Figure 5 Parasitoids of Lepidoptera. (A) A female *Cotesia yakutatensis* laying eggs in an early instar of *Autographa californica*; (B) larvae of *Cotesia yakutatensis* emerging from the host caterpillar; (C) pupae within a silken mass, spun by the parasitoid larvae, around the shriveled remains of the host caterpillar.

Natural Enemies Lepidoptera have many natural enemies including predators and pathogens. Predators of many types devour Lepidoptera, often in great quantities. These predators include rodents, reptiles, bats, birds, spiders, nematodes, beetles, true bugs, and parasitoids. Pathogens cause fatal diseases in Lepidoptera. The more important pathogens are viruses, bacteria, protozoa, microsporidia, and fungi.

Lepidoptera are equipped with physical and physiological defense mechanisms against such natural enemies, including stinging hairs on caterpillars, as in *Hemileuca eglanterina*, camouflage, or crypsis, evidenced in the white, gray, and black tones in the forewings and hindwings of adults such as *Semiothisa* and *Itame*. Behavioral protective features include flashing bright colors or eyespots, which startle predators and are evidenced in the hindwings of the noctuid *Catocala ophelia*, the sphingid *Paonias excaecatus*, and the saturniid *Antheraea polyphemus*.



Figure 6 Parasitoids of Lepidoptera. (A) A pair of tachinid eggs on *Papilio bairdii*; (B) larvae of an ectoparasitic wasp on the caterpillar of *Drepanulatrix* sp.; (C) a trio of tachinid maggots (note swollen areas) inside the caterpillar of *Trichoplusia ni* (note dark spots where respiratory funnels of the parasitoid larvae have pierced the caterpillar's exoskeleton); (D) solitary pupa of a parasitoid that had fed on the hemolymph and internal organs of *Papilio zelicaon*; (E) quartet of pupae attached to the exoskeleton of *Nadata gibbosa*; (F) a multitude of pupae of *Copidosoma* sp. inside the cadaver of *Euxoa* sp.

MORPHOLOGY OF LEPIDOPTERA



Figure 7 The second through fifth instars of *Hyalophora euryalus*.

CATERPILLAR

Initially, caterpillars develop in the egg then emerge (eclose) from the egg. After emergence, the caterpillar is called a first instar until it molts. The caterpillar enters the second instar after the molt and increases in size. Each molt distinguishes another instar. Typically, a caterpillar passes through five instars as it eats and grows. The general appearance of the caterpillar can change dramatically from one instar to the next. For instance, typically the first instar is unmarked and simple in body form. The second instar may exhibit varied colors and alterations deviating from a simple cylindrical shape. Thereafter, caterpillars of certain species exhibit broad shifts in color patterns between the third and fourth, or fourth and fifth instars (see Figure 7).

Caterpillars can be distinguished from other immature insects by a combination of the following features:

Adfrontal suture on the head capsule;

Six stemmata (eyespot) on the head capsule;

Silk gland on the labium (mouthparts);

Prolegs on abdominal segments A3, A4, A5, A6, and A10; or A5, A6, and A10; or A6 and A10;

Crochets (hooks) on prolegs.

There are other terrestrial, caterpillar-like insects that feed on foliage. These are the larvae of sawflies. Sawflies usually have only one or a few stemmata, no adfrontal suture, and no crochets on the prolegs, which may occur on abdominal segments A1, A2 through A8, and A10 (see Figure 9, page 19).

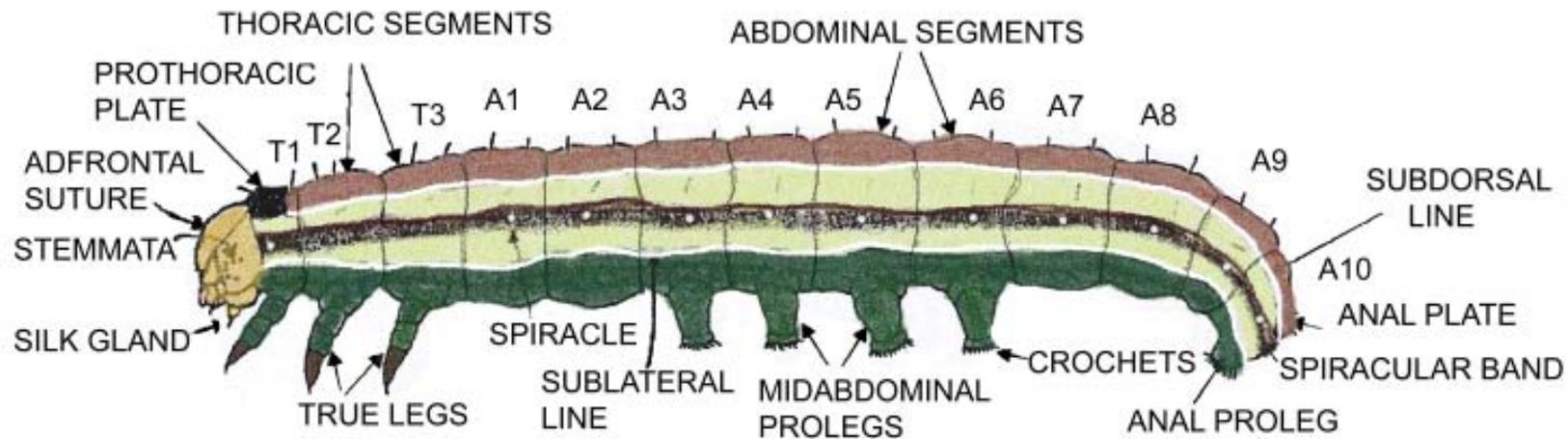


Figure 8 Caterpillar morphology.

The variety of form in the body parts plays an important role in distinguishing among and identifying caterpillar species. The caterpillar's body is divided into three sections: head, thorax, and abdomen.

Head Caterpillars have a well sclerotized head capsule, which in most species is marked with an adfrontal suture and typically contains six stemmata or eyespots. The head has one pair of small, three-segmented antennae located close to the base of the mouthparts.

Mouthpart components include a labrum, mandibles, maxillae, and a labium. The labrum serves as an upper lip and may be notched to function as a leaf guide and assist in orienting food between the mandibles. The mandibles, located below the labrum, are paired, opposable, hardened tooth-like structures used to bite and crush food. The maxillae are located behind the mandibles and contain sensory organs that distinguish between food and non-food foliage. The labium is located behind the maxillae and contains the silk gland, which emits a strand of silk used for producing pads, life lines (see *Pero mizon*), and cocoons. The overall shape of the head capsule, color patterns, the location of hairs on the head, and the morphology of the mouthparts are helpful in identifying species of caterpillars.

However, these features require the aid of a microscope and will not be emphasized here.

Thorax The three thoracic segments include the prothorax, nearest the head (T1); mesothorax, in the middle (T2); and metathorax, which connects to the abdomen (T3). Each thoracic segment has a pair of segmented legs. The thoracic legs assist in locomotion and clinging to substrates. Some caterpillars—in particular certain leaf mining species—have no segmented legs on the thorax. Each side of the prothorax has a spiracle, which is an external opening of the respiratory system. The presence or absence and shape of sclerotized plates, the location of primary setae (and setal clusters), the location, color and shape of the prothoracic spiracle, and morphology of the legs also aid in identifying caterpillar species (see Peterson [1962] and Stehr [1987] for further details).

Abdomen Typically, the abdomen has ten segments, A1-A10. Segments A1-A8 possess spiracles, and an anal plate may occur on A10. Depending on the family group, certain abdominal segments have fleshy prolegs bearing crochets (hooks). The typical pattern for

prolegs is one pair per segment on A3-A6 (midabdominal prolegs), and A10 (anal prolegs). Exceptions include the Plusiinae of the Noctuidae, which have prolegs only on A5, A6 and A10, and the Geometridae, which have prolegs on A6 and A10. Some leaf mining caterpillars have reduced prolegs, the remnants of which are merely crochets on the abdominal wall, while other leaf miners may have no prolegs. If prolegs occur on segments A1, A2 or A7-A9, the specimen is most likely a sawfly (Figure 9).



Figure 9 Sawfly larva. Note the eyespots and midabdominal prolegs.

The prolegs on the abdomen are not true legs; they are fleshy extensions of the body wall and not segmented appendages. The crochets at the ends of the prolegs occur in a variety of configurations and can be characteristic of specific family groups. The crochets may occur as a closed or open circle, an ellipse, paired longitudinal lines, or a transverse line. Also, the base of the crochets might be inserted into the flesh of the prolegs in single rows (uniserial), double rows (biserial), or triple rows (triserial). Likewise, the tips of the crochets might form a single row (uniordinal), a double row (biordinal), or a triple row (triordinal).

Projections An array of projecting features may occur on various caterpillars. The location and number of many of the following traits may allow for a quick and accurate identification of a particular caterpillar. The projections may be attached to the body wall such as soft and flexible hairs, or modified hairs that are sclerotized and hard or stiffened into spines. Also, projections may be extensions of the body wall in the form of warts, tubercles, or horns.

Hairs The types and arrangements of hairs are helpful in identifying caterpillars. Hairs may be multicolored; short or long; single in clusters (hair pencils) or tufts (tussocks); end in a tapered point or a “club”. In most of the Noctuidae and Geometridae, a few single, short hairs (the primary setae) may be the only hairs present; in these species the caterpillar is essentially naked.

The primary setae occur in specific locations on the body segments. Secondary setae do not occur in specific locations and are scattered over the body. Caterpillars of certain families, e.g., Lycaenidae and Satyridae, are covered by a dense pile of very short secondary setae, giving them a velvet-like appearance. The presence of long hairs usually is indicative of a relatively dense array of hairs. Also, long hairs may occur in clusters or in densely packed tufts in the middorsal area. Tufts usually are associated with glands, serving as a wick for the gland exudate. Species of Arctiidae, Lasiocampidae and Lymantriidae have notably hairy caterpillars.

Spines A single pointed spine is a chalaza; a spine with multiple points is a scolus. Spines typically occur at defined positions along a certain region of the body, e.g. dorsal, subdorsal, lateral, at the locations of the primary setae. Numerous species, such as Saturniidae and Nymphalidae, have spines of various kinds and colors.

Warts Small bumps or very short finger-like projections that extend from the body wall are called warts. In caterpillars warts can occur in specific locations and exhibit recognizable patterns which assist in identification.

Tubercles The length and location of extensions of longer finger-like projections (tubercles) of the body wall also assist in identification. Tubercles will often occur in pairs or in a series encircling one or more segments.

Horns The body wall can be drawn into relatively short, pointed, fleshy projections (horns). As found in sphingid caterpillars, commonly called hornworms, the horn occurs singly, typically in the middorsal area of segment A8.

Body Shape

Typically, caterpillars are cylindrical. Variations in this shape include bodies that are flattened, humped, otherwise swollen, or constricted. The flattened shape is indicative of a leaf-mining habit while the cylindrical shape is characteristic of borers, tunnelers, and external leaf-feeders. The humps, swellings, and constrictions serve as camouflage and help caterpillars blend into their surroundings. The location and size of humps and constrictions help identify certain species.

Humps Obvious bulges in the body profile can be found in many species. Large, dorsal, pyramid-like, posterior swellings are typical of *Amphipyra pyramidoides* and *Feralia februalis*. Thoracic and midabdominal swellings are typical of *Catocala*, *Schizura*, and *Zale lunata*.

Constrictions A distinctive narrowing of the body. The neck region is noticeably constricted among the Hesperiidae.

Colors and Patterns

Caterpillars display a wide range of colors and patterns. The location of a color and its pattern is helpful in identifying caterpillars. Common colors are brown, tan, cream, white, silver, gray, black, red, pink, orange, yellow, green, blue, and purple. These colors are displayed in a wide assortment of patterns that can be categorized as bands, lines, rings, streaks, dashes, circles, dots, saddles, and patches. However, the pattern may differ subtly

or markedly from one instar to another. The most common locations of definitive patterns are middorsal, subdorsal, lateral, sublateral, and ventral.

Middorsal longitudinal bands Wide lines extending from head to tail along the middle of the back.

Lateral longitudinal bands Wide lines extending from head to tail along the sides where the spiracles occur. In some species the top edge of the band barely touches the spiracles and may appear to be a subspiracular band.

Middorsal longitudinal lines Narrow lines extending from head to tail along the middle of the back.

Subdorsal longitudinal lines Narrow lines extending from head to tail more or less halfway between the middle of the back and the spiracular area.

Lateral longitudinal lines Narrow lines extending from head to tail along the sides where the spiracles occur. In some species the top edge of the line barely touches the spiracles and may appear to be a subspiracular line.

Rings Bands of color around the body segment, often in two or three alternating colors, typically black, white, and or orange. Also, the intersegmental area may be colored in a manner that shows a faint ring pattern.

Streaks Narrow lines of color longer than half the width of a body segment.

Middorsal dashes Narrow lines of color shorter than half the width of a body segment and located along the middle of the back.

Subdorsal dashes Narrow lines of color shorter than half the width of a body segment and located along the subdorsal area of the body.

Middorsal line of circular or elliptical spots Relatively large spots of a solid color (or middle of spot of variable color) located along the middle of the back.

Scattered speckles Small dots or specks, usually white or black, randomly and usually densely scattered over the body. Some species may show black specks at the base of primary hairs, which are not scattered.

Midabdominal saddles Irregularly shaped patches of color extending across multiple segments along the middorsal area.

Dorsal transverse bands or lines Colored bands or lines that extend from side to side across the back but not all the way around the body.

Anal transverse bands or lines Colored bands or lines that extend from side to side across the dorsum of A9 or A10.

Oblique lines on midabdominal segments Lines, usually white, yellow, or black, that extend between anterior lateral areas, and posterior subdorsal or dorsal areas.

ADULT

The field identification of adult Lepidoptera is done by comparing combinations of features including colors, patterns, wingspan and shape, head, thorax, and abdomen (Figure 10). Taxonomists rely strongly on the morphology of genitalia and, more recently, DNA sequences.

Wings Two general criteria distinguish wings among species: span/size and color/pattern. For the purposes of this guide, wingspan measurements were taken from properly spread specimens of representative size for each species. The distance from the tip of the left forewing to the tip of the right forewing was used and is presented with a resolution to within 1 millimeter. We did not attempt to assess the statistical distribution of wingspan values for each species; in general most species exhibit a size range of 15 - 20 percent above and below the average value. Thus, it would not be unusual to collect a specimen slightly smaller or larger than the dimensions presented in the species diagnostic traits. (**Note:** The photographs in Chapter 5 of this guide were printed to maximize the size of the individual to the print dimensions of the image. In print the

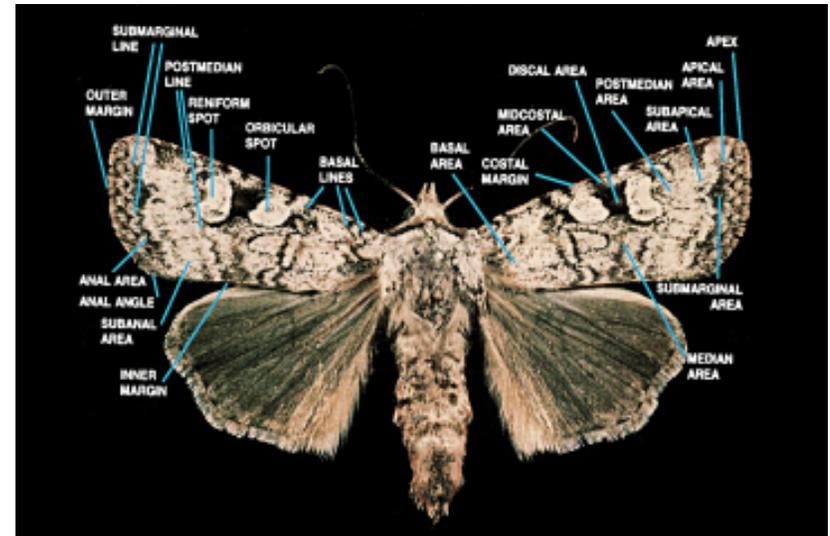


Figure 10 The areas, lines, and spots on the forewing on *Euxoa vetusta*, a typical adult Lepidoptera.

small species appear to be the same size as the large species. Thus, it is not possible to directly compare sizes among the species. Numerical measurements of a typical wingspan are included for each species.)

The specific terms we use to describe wing patterns, and their usefulness in distinguishing species, are dashes, lines, bands, patches, special spots, and special areas.

Dashes Narrow, short marks extending less than half the distance along the width or length of the wing.

Lines Narrow marks extending more than half the distance along the width or length of the wing, and associated with a specific area on the wing. The postmedian line may be broken or continuous and occurs distal to the reniform spot (see below) and demarks the proximal edge of the postmedian band. The submarginal line may be broken or continuous and is proximal to the outer margin.

Bands Wide areas typically extending more than half the distance along the width or length of the wing, often demarked by lines, and associated with a specific area on the wing.

Patches Small, restricted areas of the wing demarked by distinct colors but not delimited by lines. Basal patches occur in the basal area.

Special spots The orbicular spot is a single irregularly shaped (typically near-round shaped) spot that occurs just short of half way along the front edge of the forewing. The reniform spot is a single irregularly shaped (often kidney shaped) spot that occurs just past half way along the front edge of the forewing. The discal spots are the combination of the reniform and orbicular spots.

Special areas The basal area is the area of the wing nearest the thorax. The midcostal area is in the center of the front edge of the wing below the costal margin. The discal area is bounded by the orbicular and reniform spots. The median area is the central area of the wing. The postmedian area is distal to the reniform spot and proximal to the subapical area. The subapical area is proximal to the apical area. The apical area is immediately below the apex of the wing. The submarginal area is proximal to the outer margin. The anal area is between the outer margin and the inner margin, proximal to the anal angle. The subanal area is proximal to the anal area.

Head The most obvious features are the eyes, mouthparts, and antennae. However, with the exception of pectinate antennae, which aid in identifying similar-looking species, these features are not the most useful for field identification.

Thorax Three segments: prothorax, nearest the head; mesothorax, in the middle; and metathorax, connecting to the abdomen. Forewings attach to the mesothorax, hindwings attach to the metathorax. Like-colored hairs of similar lengths might be arranged in collars and tufts on the thorax. Each thoracic segment has one pair of legs. The colors of leg hairs vary among species. In some species, the forelegs are shorter than the mid- and hindlegs.

Abdomen The general size and shape of the abdomen is useful in identifying families. For example, the abdomen of geometrids is typically thin and appears small relative to the wing area, whereas the abdomen of sphingids is robust and distinctly tapered. The abdomen is the body segment that contains the genitalia, which are used in describing and differentiating species.

HANDLING LEPIDOPTERA

COLLECTING

Caterpillars

There are many techniques for collecting caterpillars. The most basic approach is to visually search through plants where feeding damage and perhaps feces (frass) are evident. Another method of search involves clipping and collecting foliage and inspecting it indoors, under controlled lighting, with a magnifying glass or perhaps a microscope. Other collection techniques require sifting soil to find pupating or root-feeding caterpillars, or the use of sweep nets, beating sheets, burlap skirts, and funnel traps. The sweep net is similar to an aerial net, and is used to brush over vegetation and dislodge and capture caterpillars. Beating sheets are held under plants and collect caterpillars as they fall from shaken or beaten foliage. Burlap skirts can be tied around tree trunks to trap caterpillars while they are moving between feeding, resting or hiding places. Funnel traps can be set under plants to collect caterpillars as they drop from the foliage.

An excellent means of acquiring caterpillars is to capture live adult females and rear the caterpillars from their eggs. This can be difficult, however. Many species require specific and unique conditions of light, temperature, humidity, flying space, and a substrate for oviposition before the female will lay her eggs.

Adults

There are many ways to observe and collect moths and butterflies. The best way to collect day-flying moths is with an aerial net similar to one used to collect butterflies. One of the simplest and most productive methods is to place a white sheet under or behind an ultraviolet, white or halide light at night. Moths will rest on the sheet after being attracted to the light. Light traps can be purchased or assembled to collect moths throughout the night (Figure 11). Attractants other than light include



Figure 11 A light trap setup includes a containment bucket (a killing agent optional for unattended sampling), funnel, plastic veins holding the UV lightbulb, top fastened down with bungee cords, and electrical wires equipped with a photoswitch attached to a 12-volt battery. This setup can be used to sample night-flying moths for up to four consecutive nights.

fermented baits, commercially available (manufactured) pheromones, and live virgin females.

As with caterpillars, a good way to acquire adults—and in excellent condition—is to capture live adult females and rear the caterpillars that hatch from their eggs through metamorphosis to emergence. Another way is to locate caterpillars on host plants in the field and either (1) place screen sleeves over the foliage, or (2) collect them from host plants and rear them through emergence indoors in containers. In either case, caterpillars will require suitable foliage for feeding, an appropriate site for

pupation, and frequent observation to note the time of adult emergence to prevent the moths from damaging their wings while being contained.

In all cases, take care to protect Lepidoptera habitat. Avoid trampling plants and disturbing unstable soils. Try to grow the foodplants the caterpillars need. If you can't, prune wild foodplants with care and an eye to the future; you might need to return to the plants for more food. Collect as few moths as your study requires for accurate and proper documentation. If possible, upon completing your study, release specimens back into the environment from which they came. Be aware of any Federal and local regulations regarding collecting and releasing Lepidoptera. Take extra care to protect rare and endangered species, and **do not release exotic species into the wild.**

REARING

The rearing of caterpillars is helpful in: associating field-collected larvae with the adult, testing foodplants for suitability, or associating parasitoids and diseases with the caterpillar stage of respective species. Caterpillars can be reared in cages in the field or indoors.

There are advantages and disadvantages to rearing caterpillars indoors. One advantage is that you are not likely to lose the specimen. Another is that, because of warmer temperatures, caterpillars will likely grow faster indoors. Faster growth will allow you to observe changes in size and color patterns for each instar sooner than you might observe them in the field. A disadvantage to indoor rearing is that food must be provided by potted plants, clipped foliage from the field, or replaced through artificial diets. Another is that unsuitable rearing conditions will result in high mortality. Temperature control, dehydration, fungal growth, starvation, cannibalism, and overcrowding are common problems. Closed containers may cause problems due to excessive condensation and poor sanitation. Cannibalism and disease may be reduced by raising the caterpillars individually. Placing slightly moistened peat moss in containers will provide a suitable medium within which the caterpillar can bury itself prior to pupation, and the moisture helps to prevent desiccation, a common and avoidable problem when rearing in dry indoor conditions.

PRESERVING

Caterpillars

Preserved specimens are useful for eventual study of traits that photographs do not reveal. (**Note:** Improperly preserved caterpillars will rot and turn black, a condition unsuitable for archival material and identification.) The simplest method for preservation is a two-step process involving hot water and ethyl alcohol. Step one: heat water to 180°C. If you do not have a thermometer you can obtain an appropriate temperature by bringing the water to a boil, removing it from heat, and letting it stand for a couple of minutes. Place the caterpillar in the hot water for 3 to 4 minutes. (**Note:** Extremely hot water may cause the caterpillar to burst.) Remove the caterpillar and place it in a specimen vial filled with 70% ethyl alcohol (isopropyl alcohol is less desirable). Although this technique will provide a properly inflated specimen, an unfortunate side effect is that the caterpillar will lose most or all of its color. “Color” is best preserved through photographs (see Photographing, page 24). Labels placed inside the specimen vials should include information on place, date, and foodplant at time of collection. Additional information regarding preserving caterpillars, including freeze drying and blow drying, is presented in Peterson (1962) and Stehr (1987).

Adults

A properly mounted specimen involves placing an insect pin through the top of the thorax and spreading the forewings and hindwings: the hind edge of the forewing should be at a 90° angle to the body; the front edge of the hindwing should be under the forewing, such that the tip of the hindwing creates a small notch with the outer edge of the forewing (See chapter 5).

The pinned and spread moth or butterfly must be allowed to dry for a few days at room temperature on a spreading board. Once dried the forewings and hindwings will stay in place and the moth may be removed from the spreading board and placed in an enclosed drawer or cabinet for storage or display. A note of caution is in order—the specimens will rot if they are damp when placed in compartments; some colors will fade if subjected to direct sunlight; and museum beetles (dermestids),

which eat dead insects, may turn perfect specimens to dust. These and other problems can be minimized if the adults are stored in sealed containers and kept in a dark and dry location. Labels on the pinned specimens should include at least the details of the place and date that the specimen was collected. Additional label information could include collecting and rearing facts, such as emergence dates, and who collected the specimen. See Covell (1984) for additional information on preserving moths.

PHOTOGRAPHING

A color slide or print will provide a record of adults and caterpillars at various times of development. An excellent photograph can be acquired by using all of the following: (1) A 35 mm, single lens reflex camera with exchangeable lenses. Instamatic type cameras will not allow the photographer to get close to the subject or to fill the frame with the subject. A majority of the photographs presented here were taken with a 50 mm macro lens mounted on a 25 mm extension tube. (2) Film with a low ASA rating. A majority of the photographs in this handbook were taken with color slide film ASA 25. This film speed provides superior quality in grain but requires more light than faster films. (3) A flash system, either a bracket or a ring flash. I (JCM) use a bracket system which consists of two flash units that are mounted on opposite sides of the camera. The lens, film, and flash units allow shooting pictures at $f/16$ and $f/22$ at a distance of about 20 mm from camera lens to caterpillar. Photographs can be taken in the field but shadows, wind, cluttered backgrounds, and other unwanted features (like other insects) may interfere with obtaining the best picture. Most of the caterpillars illustrated in this booklet were field-collected but photographed in a staged indoor setting. Some of the photographs of adult Lepidoptera were obtained by using a digital camera equipped with a 90mm macro lens. The butterflies and moths were placed on a spreading board and properly mounted on a pin and dried. The spread adult was then photographed in a studio setting.

PHOTOGRAPHS OF THE SPECIES: SKIPPERS, BUTTERFLIES & MOTHS



The photographs of Lepidoptera are organized alphabetically by family and then by genus within the categories of skippers, butterflies, and moths. While many of the species illustrated here are common, only a small percentage of the species in the Northwest are represented.

If the identity of a macromoth from the western United States cannot be determined by matching a specimen with a description or photo in this book, then look in Miller and Hammond (2000) or Covell (1984). Covell (1984) provides an extensive assortment of photographs for species that occur in the eastern United States so the probability of a match to a western species is limited to those species that are widespread across the North American continent. Also, serious students of moths should look in the references cited at the end of the discussion of each family in the section on macromoth families. If the identity of a butterfly from the Pacific Northwest cannot be determined by matching a specimen with a description or photo in this book, then look in Pyle (2002) or Neill (2001).

For each of the 239 species presented with a photograph of the caterpillar/adult we provide a narrative that includes three sections: Caterpillar, Adult, and Ecology. The caterpillar and adult sections are descriptive for general identification purposes. The ecology section presents information on abundance, foodplants, seasonality, flight, and biogeography. (**Note:** The photographs contained in this guide were printed to maximize the size of the subject to the print dimensions of the image. Thus, in print the small species appear to be the same size as the large species. Therefore, it is not possible to compare sizes among the species. Numerical measurements of a typical wingspan are included for each species.)

A note about the organization. Black type in the chapter title heading indicates whether you are on a page containing information about a skipper, butterfly, or moth.

HESPERIIDAE

EPARGYREUS CLARUS - SILVERSPOTTED SKIPPER



CATERPILLAR Yellow with transverse subdorsal black streaks; T1 black and narrower than head and T2; true legs and midabdominal prolegs orange. Head black with two prominent anterior orange spots.

ADULT Wingspan 4.5 centimeters. Forewings dark brown; each forewing has a large yellow-orange medial patch. Hindwings dark brown, ventrally each hindwing with a large silver medial patch.

ECOLOGY Caterpillars are uncommon in most of our area; feed on Fabaceae, particularly lotus, in the Pacific Northwest during July and August. Adults are diurnal; fly from early to midsummer. Found in open wet forests and riparian habitats at lower elevations; widely distributed throughout North America.

HESPERIIDAE

PROPERTIUS DUSKY WING - *ERYNNIS PROPERTIUS*



CATERPILLAR Pale green with white speckles and a faint yellow subdorsal longitudinal line. Head brown with tan patches.

ADULT Wingspan 4.2 centimeters. Forewings dark black-brown with extensive pale gray scales and a row of small white postmedian spots. Hindwings dark black-brown.

ECOLOGY Caterpillars are common; feed on oak and chinquapin during late spring. Adults are diurnal; fly in spring. Found in dry, open forests and oak woodlands from southern California to British Columbia.

HESPERIIDAE

PYRGUS COMMUNIS - CHECKERED SKIPPER



CATERPILLAR Light brown with small white dots and densely covered with short white hairs; T1 black and narrower than head and T2. Head black.

ADULT Wingspan 2.6 centimeters. Forewings black with white discal spots, a white median band, and white submarginal spots. Hindwings black with a white median band and white submarginal spots.

ECOLOGY Caterpillars are common; feed on Malvaceae during late spring. Adults are diurnal; fly throughout the summer. Found in open meadows and disturbed forest habitat at lower elevations; widely distributed in western North America.

LYCAENIDAE

GREAT PURPLE HAIRSTREAK - *ATLIDES HALEUS*

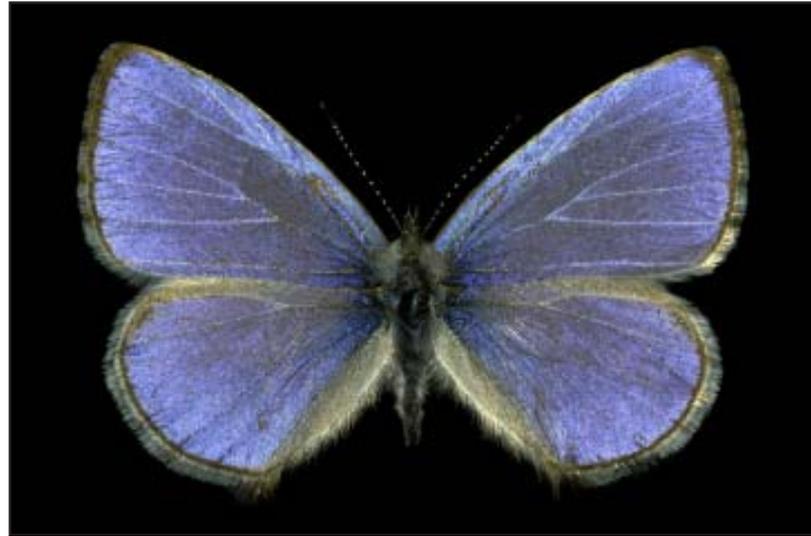
CATERPILLAR Blue-green with short, fine, white hairs; a white diamond-shaped blaze middorsally on T2.

ADULT Wingspan 3.5 centimeters. Wings iridescent blue with black borders. Hindwings have thin wispy tails of nearly equal length; two-tailed in female and one-tailed in male.

ECOLOGY Caterpillars are uncommon; feed on mistletoe growing on oaks during spring. Adults are diurnal; fly from late spring to midsummer. Found in oak woodlands of the Southwest and the Pacific western states.

LYCAENIDAE

CELASTRINA ARGIOLUS - ECHO BLUE



CATERPILLAR White, each segment slightly swollen, immaculate.

ADULT Wingspan 2.8 centimeters. Wings violet-blue. Hindwings ventrally white with small, black, median spots and submarginal spots.

ECOLOGY Caterpillars are common; feed on many broadleaf trees, such as snowbrush and spiraea, during spring. Adults are diurnal; fly in spring and summer. Found in forest and riparian habitats; widely distributed in western North America.

LYCAENIDAE

CHINQUAPIN HAIRSTREAK - *HABRODAIS GRUNUS*

CATERPILLAR Yellow-green with a pale-yellow subdorsal line.

ADULT Wingspan 3.0 centimeters. Forewings yellow-orange with a black apical border. Hindwings ventrally yellow with rows of fine brown spots; each hindwing has a short, wispy tail.

ECOLOGY Caterpillars are common; feed during spring on evergreen Fagaceae, such as chinquapin, canyon live oak, and tan oak. Adults are diurnal; fly from mid- to late summer. Found in oak woodlands and distributed from Arizona and southern California to western Oregon.

LYCAENIDAE

ICARICIA ICARIOIDES - LUPINE BLUE



CATERPILLAR Light green, immaculate.

ADULT Wingspan 3.0 centimeters. Wings are violet-blue with a silver sheen. Hindwings ventrally white to gray with rows of black median and submarginal spots.

ECOLOGY The subspecies *I. icarioides fenderi* (featured in the photos) is rare (listed as an endangered species) and endemic to the Willamette Valley of Oregon; *I. i. fenderi* only feeds on a rare lupine, *Lupinus sulphureus kincaidii*, during April and May. Adults are diurnal; fly in early summer.

Caterpillars of the nominate species are common; feed on lupines during the spring. Adults are diurnal; fly from spring to midsummer. Found in montane meadows, open forests, and sagebrush rangelands; widely distributed in western North America.

LYCAENIDAE

WESTERN BROWN ELFIN - *INCISALIA AUGUSTINUS*

CATERPILLAR Light green; subdorsally off-white to golden triangular patches with pale red shading, similar coloring laterally in streaks.

ADULT Wingspan 2.6 centimeters. Wings gray-brown to red-brown. Hindwings ventrally red-brown with black median spots and patches, and black postmedian spots.

ECOLOGY Caterpillars are common; feed on snowbrush and manzanita during spring. Adults are diurnal; fly in spring. Found in montane forests; widely distributed in western North America.

LYCAENIDAE

LYCAEIDES MELISSA - MELISSA BLUE



CATERPILLAR Green with a white lateral line, otherwise immaculate.

ADULT Wingspan 2.6 centimeters. Wings are violet-blue. Hindwings ventrally light gray with rows of black discal, median, postmedian, and submarginal spots, and a broad red-orange submarginal band.

ECOLOGY Caterpillars are common; feed on various Fabaceae, such as lupine, during spring. Adults are diurnal; fly from spring to midsummer. Found in montane meadows, riparian habitats, and sagebrush rangelands; widely distributed east of the Cascade Mountains.

LYCAENIDAE

TAILED COPPER - *LYCAENA AROTA*

CATERPILLAR Green, with prominent, anterior middorsal white dashes.

ADULT Wingspan 3.0 centimeters. Wings copper to purple-brown. Hindwings ventrally gray with small black spots, white postmedian and submarginal spots; each hindwing has a thin, wispy tail.

ECOLOGY Caterpillars are uncommon; feed on currant during late spring. Adults are diurnal; fly from mid- to late summer. Found in dry woodlands, canyon lands, and riparian habitats; widely distributed in western North America.

LYCAENIDAE

MITOURA GRYNEA - CEDAR HAIRSTREAK



CATERPILLAR Green with chevron or circular subdorsal patches of white; lateral white streaks.

ADULT Wingspan 2.7 centimeters. Wings gray-brown to red-brown. Hindwings ventrally red-brown to purple-brown with a white and black median line, black postmedian spots, and blue submarginal patches; each hindwing has a small, wispy tail.

ECOLOGY Caterpillars are common; feed on western juniper, incense cedar, and western red cedar during spring. Adults are diurnal; fly from spring to midsummer. Found in conifer forests and juniper woodlands; widely distributed in western North America.

LYCAENIDAE

THICKET HAIRSTREAK - *MITOURA SPINETORUM*

CATERPILLAR Tan-brown to green-brown with rosy-red, subdorsal chevron markings, and lateral patches of rosy-red spots.

ADULT Wingspan 2.7 centimeters. Wings dull steel blue with black borders. Hindwings ventrally dark brown with a white and black median line, black postmedian spots; each hindwing has two, thin, wispy tails of unequal length.

ECOLOGY Caterpillars are common, and during spring feed on dwarf mistletoe growing on conifers, such as ponderosa pine. Adults are diurnal; fly from spring to midsummer. Found in conifer forests; widely distributed in western North America.

LYCAENIDAE

SATYRIUM BEHRII - BEHR'S HAIRSTREAK



CATERPILLAR Various shades of green with white hue and white streaks; dorsal segments ridged; lateral dashed line and subdorsal oblique lines with pale yellow shading above.

ADULT Wingspan 2.7 centimeters. Wings yellow-orange with black borders broadened at the apex into a large patch. Hindwings ventrally gray with rows of black median, postmedian, and submarginal spots.

ECOLOGY Caterpillars are uncommon; feed on bitterbrush during late spring. Adults are diurnal; fly from early to late summer. Found in open, dry, pine forests, juniper woodlands, and sagebrush rangelands east of the Cascade Mountains; widely distributed in western North America.

LYCAENIDAE

CALIFORNIA HAIRSTREAK - *SATYRIUM CALIFORNICUM*

CATERPILLAR Mix of dark and light brown; discontinuous dorsal gray-green longitudinal band; discontinuous subdorsal white longitudinal line; lateral oblique white lines.

ADULT Wingspan 3.2 centimeters. Wings gray-brown. Hindwings with an orange spot near the subanal margin, ventrally gray-brown with a row of small black median spots, red submarginal spots; each hindwing has two, thin, wispy tails of unequal length.

ECOLOGY Caterpillars are common; feed on bitterbrush during late spring. Adults are diurnal; fly from early to late summer. Found in dry forests and woodlands; widely distributed in western North America.

LYCAENIDAE

SATYRIUM SAEPIUM - RUSSET HAIRSTREAK



CATERPILLAR Green with subdorsal and lateral discontinuous yellow line.

ADULT Wingspan 3.0 centimeters. Wings red-brown. Hindwings ventrally red-brown, with a narrow black median line, small black postmedian spots, blue subanal spots; each hindwing has a short, thin, wispy tail.

ECOLOGY Caterpillars are very common; feed on species of *Ceanothus* during spring. Adults are diurnal; fly from early to late summer. Found in dry forests and woodlands; widely distributed in western North America.

LYCAENIDAE

GRAY HAIRSTREAK - *STRYMON MELINUS*

CATERPILLAR Light green to pink-brown, with lighter-colored to nearly white, subdorsal, oblique dashes.

ADULT Wingspan 3.0 centimeters. Wings dark gray. Hindwings with a red-orange subanal spot containing a black spot; ventrally light gray with a black and white median line, small black postmedian spots, a red subanal spot, and a pair of thin wispy tails of unequal length.

ECOLOGY This caterpillar will tend to be the same color as the foodplant (The photograph here used a caterpillar removed from a pink-red flower and placed on the stem of the same plant.) Caterpillars are common and during spring feed on many flowering plants, such as legumes and mallows, during spring. This species may cause economic damage in commercial bean production. Adults are diurnal; fly from spring to fall. Found in open areas associated with oak woodlands and agricultural habitats; widely distributed in western North America.

NYMPHALIDAE

ADELPHA BREDOWII - CALIFORNIA SISTER



CATERPILLAR Dorsum green with fine white speckles; ventrally light brown; elongate light brown scoli on T2, T3, A2, A4, A7, and A9. Head light brown with multiple small spines, including one pair of spines at the top of the head capsule.

ADULT Wingspan 6.3 centimeters. Forewings black-brown, each with a narrow white median band, and a large, round, orange apical patch. Hindwings black-brown, each with a white median band.

ECOLOGY Caterpillars are common; feed on oak during late spring. Adults are diurnal; fly throughout the summer. Found in montane forests and oak woodlands in the Pacific western states from southern California to western Oregon.

NYMPHALIDAE

MONARCH BUTTERFLY - *DANAUS PLEXIPPUS*

CATERPILLAR Black, white, and yellow rings; a distinctive pair of long, thin, black tubercles on T2 and A8. Head with oblique bands of black and yellow.

ADULT Wingspan 9.5 centimeters. Forewings elongate, orange with black veins, a black submarginal border, and small white submarginal spots.

ECOLOGY This caterpillar sequesters cardiac glycosides from its milkweed hostplant and is poisonous to potential vertebrate predators; the adult is migratory. Caterpillars are common east of the Cascade Mountains, very uncommon on the west side; feed on milkweed during early summer. Adults are diurnal; fly from spring to fall when they migrate south. Found in open habitats, particularly along roadsides and fencerows; widely distributed in North America.

NYMPHALIDAE

EUPHYDRYAS CHALCEDONA - CHALCEDON CHECKERSPOT



CATERPILLAR Mottled with black and white markings; three longitudinal rows of short black spines on an orange base. Head black.

ADULT Wingspan 4.4 centimeters. Wings are black with white discal, median, and postmedian spots; red marginal spots. Hindwings ventral with alternating red and white bands or spots.

ECOLOGY Caterpillars are common; feed on penstemon and snowberry in spring. Adults are diurnal; fly from early to midsummer. Found in open forests, riparian habitats, and mountain meadows in the Pacific western states and northern Rocky Mountains.

NYMPHALIDAE

LORQUIN'S ADMIRAL - *LIMENITIS LORQUINI*

CATERPILLAR Dorsum with humps on T1 (white), T2 (white), A2 (orange and large), A3 (orange and small), A7, and A8, and white patches most extensive on T1, T2, A4 through A6; laterally white patches extend from T1 through A10 along the lateral line; a pair of prominent scoli on T1.

ADULT Wingspan 6.0 centimeters. Forewings black with a white discal bar, a white median band, and an orange apical margin. Hindwings black with a white median band.

ECOLOGY Caterpillars are common; feed on willow, poplar, and certain Rosaceae, during spring. Adults are diurnal; fly throughout the summer. Found in moist forests and riparian habitats; distributed throughout the Pacific western states and the northern Rocky Mountains.

NYMPHALIDAE

NYMPHALIS ANTIOPA - MOURNINGCLOAK BUTTERFLY



CATERPILLAR Black with fine white hairs; middorsal longitudinal black line, red-orange spots, numerous small white spots and black spines.

ADULT Wingspan 7.0 centimeters. Wings black-burnt brown with a tint of purple; metallic blue postmedian spots within a black band, and a broad yellow submarginal border. Hindwings ventrally black, mottled with fine lines, and yellow borders.

ECOLOGY Caterpillars are common on willows from May to July. Adults are diurnal; fly throughout the year. Found in moist forests and riparian habitats; widely distributed in western North America.

NYMPHALIDAE

CALIFORNIA TORTOISESHELL - *NYMPHALIS CALIFORNICA*

CATERPILLAR Mostly black with two pale yellow dorsal stripes and dense short white hairs; yellow-orange dorsal spines from A1 through A7 and laterally from A1 through A6; remaining spines black.

ADULT Wingspan 6.0 centimeters. Forewings yellow-orange with black spots and bars and a black border. Hindwings ventrally dark black-brown and mottled with fine lines.

ECOLOGY This species will occasionally occur in very large numbers, defoliating snowbrush over many acres. Caterpillars are common; feed on various broadleaf shrubs, particularly snowbrush, from June to August. Adults are diurnal; fly in midsummer. Found in conifer forests; widely distributed in western North America.

NYMPHALIDAE

PHYCIODES PULCHELLUS - FIELD CRESCENT



CATERPILLAR Black with a white lateral band containing red-brown speckles; faint white subdorsal line. Head black.

ADULT Wingspan 3.4 centimeters. Wings are mostly black with yellow and orange bands or spots. Hindwings ventrally yellow-orange with fine brown lines and spots.

ECOLOGY Caterpillars are common; feed on asters during June and July. Adults are diurnal; fly from early to midsummer. Found in montane meadows; widely distributed in western North America.

NYMPHALIDAE

FAUN ANGLEWING - *POLYGONIA FAUNUS*

CATERPILLAR Yellow-orange with an extensive dorsal patch of white, irregularly bordered in black, on A3 through A9. Multi-branched spines occur from T2 through A9. Dorsal spines on T2 through A2 are light orange; dorsal spines are mostly white on A3 through A9, and the subspiracular spines on A1 through A9. Head black and mottled with orange.

ADULT Wingspan 4.5 centimeters. Forewings yellow-orange with black median spots, yellow postmedian spots, and a broad black margin. Hindwings yellow-orange with black median spots, yellow postmedian spots, and a broad black margin, ventrally mottled gray-brown with green postmedian spots.

ECOLOGY Caterpillars are common; feed on Salicaceae and Betulaceae, particularly willows, during June and July. Adults are diurnal; fly throughout the year. Found in moist montane and riparian forests; widely distributed in western North America.

NYMPHALIDAE

POLYGONIA GRACILIS - ZEPHYR ANGLEWING



CATERPILLAR Yellow-orange with separate dorsal patches of white on A3 through A9; multi-branched spines occur from T2 through A9; dorsal spines on T2 through A2 are light orange; dorsal spines are mostly white on A3 through A9 and the subspiracular spines on A1 through A9. Head black and mottled with orange.

ADULT Wingspan 4.8 centimeters. Forewings yellow-orange with black median spots, yellow postmedian spots, black margin. Hindwings yellow-orange with black median spots, yellow postmedian spots, margin mostly orange, ventrally mottled gray-brown with yellow postmedian spots.

ECOLOGY Caterpillars are common; feed on currant during June and July. Adults are diurnal; fly throughout the year. Found in dry forests, woodlands, riparian habitats, and sagebrush rangelands; widely distributed in western North America.

NYMPHALIDAE

ATLANTIS FRITILLARY - *SPEYERIA ATLANTIS*

CATERPILLAR Black with faint off-white streaks; a dual longitudinal line along the middorsum; subdorsal and lateral scoli gray to tan. Head black.

ADULT Wingspan 5.5 centimeters. Wings are orange with heavy black basal suffusion and rows of black spots and bars. Hindwings ventrally black-brown or red-brown with a narrow, yellow, submarginal band, and metallic silver or cream-white spots.

ECOLOGY Caterpillars are common; feed on violets, particularly *Viola adunca*, *V. nuttallii*, and *V. canadensis*, during spring. Adults are diurnal; fly in midsummer. Found in wet forests, bogs, and meadows at high elevations; widely distributed in western North America.

NYMPHALIDAE

SPEYERIA CYBELE - GREAT SPANGLED FRITILLARY



CATERPILLAR Black with tan middorsal, subdorsal, and lateral scoli. Head black.

ADULT Wingspan 7.0 centimeters. Wings orange with heavy black basal suffusion and rows of black spots and bars. Hindwings ventrally dark red-brown with a wide, yellow, submarginal band, and small metallic silver spots.

ECOLOGY Caterpillars are common; feed on violets, particularly *Viola glabella*, *V. palustris*, and *V. adunca*, during spring. Adults are diurnal; fly in midsummer. Found in wet forests and riparian habitats at lower elevations; widely distributed in western North America.

NYMPHALIDAE

ZERENE FRITILLARY - *SPEYERIA ZERENE*

CATERPILLAR Light black to dark gray with faint off-white mottling; gray-black dorsal and subdorsal scoli; lateral scoli on A1 through A8 cream-white. Head black.

ADULT Wingspan 6.0 centimeters. Wings orange with wide black discal and median bars, and rows of black postmedian and submarginal spots. Hindwings ventrally variable red-brown, purple-brown, or yellow, with metallic silver or white spots; narrow yellow to lavender submarginal band.

ECOLOGY This species has many described subspecies. Among them, *S. zerene hippolyta*, the Oregon silverspot, is a federally listed endangered species. Regarding the nominate species: caterpillars are common; feed on violets, particularly *Viola adunca* and *V. nuttallii*, during spring. Adults are diurnal, fly from mid- to late summer. Found in montane forests, juniper woodlands, and sagebrush rangelands; widely distributed in western North America.

NYMPHALIDAE

VANESSA ATALANTA - RED ADMIRAL



CATERPILLAR Dorsum black with white speckles; base of primary setae (which are spines in this species) black; venter black; broken yellow lateral line.

ADULT Wingspan 5.8 centimeters. Forewings black with a red-orange median band and white subapical spots. Hindwings black with a red-orange submarginal band and small black submarginal spots; ventrally mottled black, gray, and brown with dark postmedian spots.

ECOLOGY Caterpillars are common; feed on nettles during spring. Adults are diurnal; fly from spring to fall. Found in open habitats and along woodland edges; widely distributed in western North America.

NYMPHALIDAE

PAINTED LADY - *VANESSA CARDUI*

CATERPILLAR Dorsum black with small white spots; base of primary setae (which are spines in this species) orange; venter gray white with irregular black markings; white hairs covering the body.

ADULT Wingspan 6.0 centimeters. Forewings orange with black median spots and a black apex with white subapical spots. Hindwings ventrally mottled green-brown with white spots, and blue postmedian eyespots ringed with yellow.

ECOLOGY Caterpillars are common; feed on thistles, lupines, and various Malvaceae during July and August. Adults are diurnal; fly from spring to fall. Found in open grassland, roadsides, and montane meadows; widely distributed in western North America.

PAPILIONIDAE

BATTUS PHILENOR - PIPEVINE SWALLOWTAIL



CATERPILLAR Black with distinct orange tubercles of varying lengths along rows positioned subdorsally, laterally, and sublaterally. The lateral pair of tubercles on the prothorax is much longer than the others. Head orange-black.

ADULT Wingspan 8.0 centimeters. Forewings black with white submarginal spots. Hindwings metallic blue with white submarginal spots and a scalloped wing margin; each hindwing has a single tail.

ECOLOGY Caterpillars are common south of the Pacific Northwest; feed on Dutchman's pipevine during spring and fall. Adults are diurnal; fly from spring to late fall. Larvae are found in riparian habitats where the hostplant grows; adults are strong fliers and can be found far from rivers and streams. Widely distributed in the Southwestern States; locally distributed in northern and central California, straying into southwest Oregon.

PAPILIONIDAE

OREGON SWALLOWTAIL - *PAPILIO BAIRDII*

CATERPILLAR Light green, shades of blue green in dorsal, subdorsal, and lateral patches; alternating black dashes with yellow spots create a broken transverse band across the middle of each thoracic and abdominal segment. Head green with oblique black lines encompassing a yellow patch with a black dash in the center.

ADULT Wingspan 8.0 centimeters. Forewings yellow with black discal bars and a black border. Hindwings yellow, with blue postmedian spots, yellow submarginal spots, a scalloped wing margin; each hindwing has one long tail, and lacks a black median stripe.

ECOLOGY Caterpillars are common; feed on green sagebrush during late spring. Adults are diurnal; fly from spring to fall. Found in dry canyon lands east of the Cascade Mountains and typically distributed near patches of the hostplant; widely distributed in western North America.

PAPILIONIDAE

PAPILIO EURYMEDON - PALE TIGER SWALLOWTAIL



CATERPILLAR Dorsum yellow-green transitioning to a light blue tone laterally and ventrally; thorax enlarged; T2 with a broken transverse band of yellow marked with a black line and circle encompassing a blue spot; the intersegmental region between A1 and A2 with a broad black band counter-shaded with yellow along the anterior edge; A1 with light blue spots dorsally and subdorsally; A4 with a subdorsal dark blue spot; A5 to A7 with dark blue spots dorsally and subdorsally; A2 to A7 with dark blue dots below the spiracles.

ADULT Wingspan 8.5 centimeters. Forewings white with broad black discal bars and a black border. Hindwings white with a black median stripe, blue postmedian spots, white submarginal spots, a scalloped wing margin; each hindwing has one long tail.

ECOLOGY Caterpillars are common; feed on many species of hardwoods, particularly *Ceanothus*, during the spring. Adults are diurnal; fly from late spring to early summer. Found in montane forests; widely distributed in western North America.

PAPILIONIDAE

INDRA SWALLOWTAIL - *PAPILIO INDRA*

CATERPILLAR Contrasting white and black rings with a small spot of orange dorsally.

ADULT Wingspan 6.5 centimeters. Forewings black with a yellow median band and submarginal spots. Hindwings black with a broad yellow median band, blue postmedian spots, yellow submarginal spots, and a scalloped wing margin; each hindwing has one short tail.

ECOLOGY Caterpillars are common; feed on Apiaceae, particularly *Lomatium* and *Cymopterus*, during late spring. Adults are diurnal; fly from late spring to early summer. Found in dry, rocky habitats east of the Cascade Mountains, where it is widely distributed.

PAPILIONIDAE

PAPILIO RUTULUS - WESTERN TIGER SWALLOWTAIL



CATERPILLAR Dorsum yellow-green with only a subtle transition into a light blue tone ventrally; thorax enlarged; T2 with a broken transverse band of yellow marked with a brown line and black circle encompassing a faint blue spot; A1 with a transverse yellow band along the anterior edge; A1 with blue spots dorsally and subdorsally; A4 with a subdorsal faint blue spot; A5 to A7 with blue spots dorsally and subdorsally; A2 to A7 with faint blue dots below the spiracles.

ADULT Wingspan 8.5 centimeters. Forewings yellow with black discal bars and a black border. Hindwings yellow with a black median stripe, blue postmedian spots, yellow submarginal spots, a scalloped wing margin; each hindwing has one long tail.

ECOLOGY Caterpillars are common; feed on many hardwoods, particularly poplar, willow, alder, and maple, during late spring. Adults are diurnal; fly from late spring to late summer. Found in montane and riparian forests; widely distributed in western North America.

PAPILIONIDAE

ANISE SWALLOWTAIL - *PAPILIO ZELICAON*

CATERPILLAR Variable color depending on age. Early instars are mostly black with some white markings, and have the appearance of bird droppings. Later instars, as shown here, are green with black streaks between orange spots on T1 through A8; midabdominal prolegs with black spots.

ADULT Wingspan 7.5 centimeters. Forewings yellow with black discal bars and a black border. Hindwings yellow, with blue postmedian spots, yellow submarginal spots, and a scalloped wing margin; each hindwing has one long tail and no black median stripe.

ECOLOGY Caterpillars are common; feed on Apiaceae, including cow parsnip and fennel, during late spring. Adults are diurnal; fly from early spring to fall. Found in coastal forests, subalpine meadows, and sagebrush rangelands; widely distributed in western North America.

PAPILIONIDAE

PARNASSIUS CLODIUS - CLODIUS PARNASSIAN



CATERPILLAR Black; single row of yellow subdorsal spots on A1 through A8.

ADULT Wingspan 6.5 centimeters. Forewing white with elongate black discal bars and a black border. Hindwings white with round red spots.

ECOLOGY Caterpillars are not commonly seen, but adults can be very common. Caterpillars feed on bleeding heart during late spring to early summer. Adults are diurnal; fly from early to midsummer. Found in coastal rainforests, riparian forests, and subalpine meadows; widely distributed in western North America.

PAPILIONIDAE

SMINTHEUS PARNASSIAN - *PARNASSIUS SMINTHEUS*

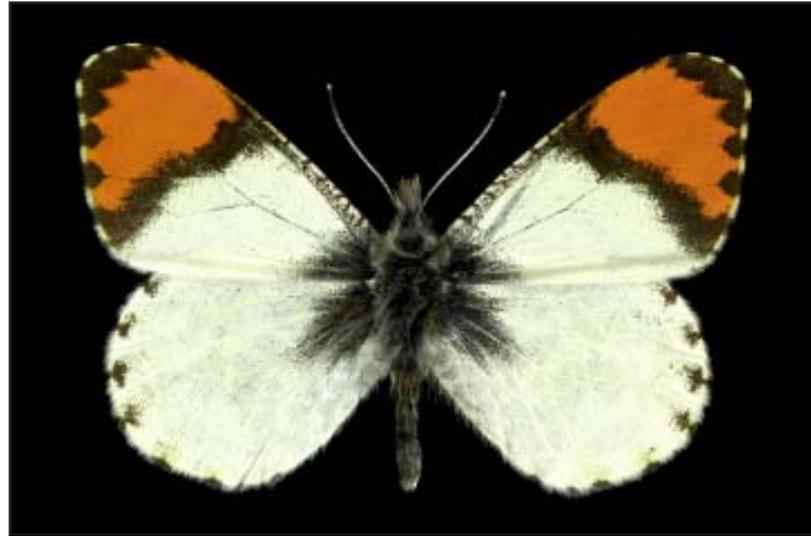
CATERPILLAR Black; single row of yellow subdorsal spots on A1 through A8; another single row of a triplet of yellow subdorsal spots on A1 through A8, the anterior spot with a smaller yellow dot to the lateral side.

ADULT Wingspan 6.0 centimeters. Forewings white with round black discal spots, a pair of red spots. Hindwings white with round red spots.

ECOLOGY Caterpillars are not commonly seen, but adults can be very common. Caterpillars feed on stonecrop during late spring to early summer. Adults are diurnal; fly from early to midsummer. Found in montane meadows and along rocky ridge tops; widely distributed in western North America.

PIERIDAE

ANTHOCARIS SARA - SARA ORANGETIP



CATERPILLAR Two tones of green, dorsally light green ventrally dark green, separated by a white lateral band. Head green.

ADULT Wingspan 4.0 centimeters. Forewings white with a black discal bar and a red-orange subapical patch. Hindwings white with marginal brown-black markings.

ECOLOGY Caterpillars are common; feed on Brassicaceae, particularly rockcress and tumbled mustard, during spring. Adults are diurnal; fly in spring. Found in wet forests, subalpine meadows, and sagebrush rangelands; widely distributed in western North America.

PIERIDAE

PINE WHITE - *NEOPHASIA MENAPIA*

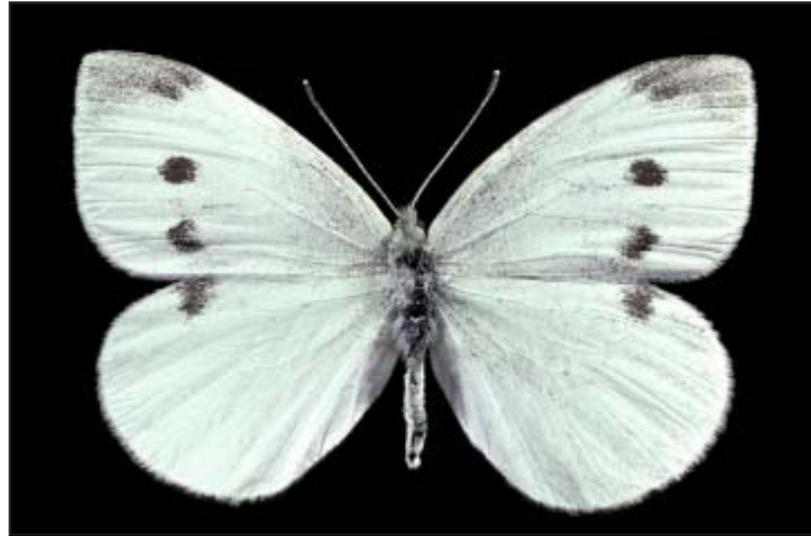
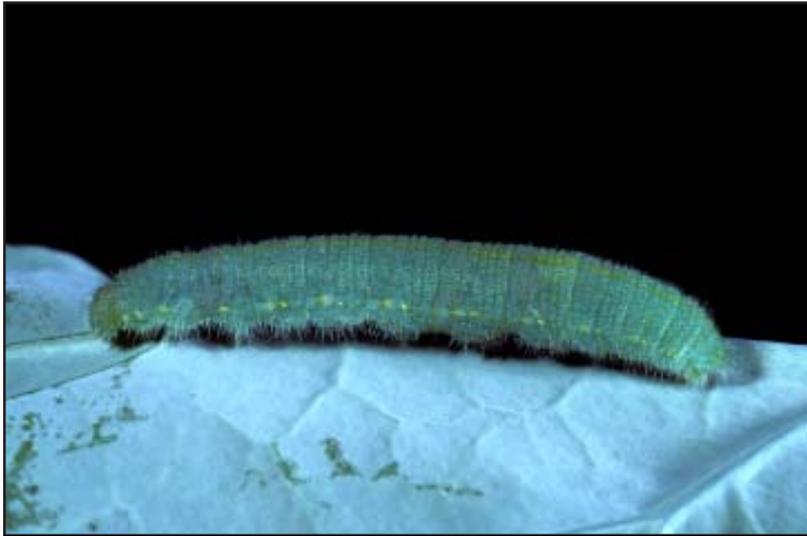
CATERPILLAR Dark velvet green over entire body; subdorsal cream-white longitudinal line; a sublateral white line may be present. Head green.

ADULT Wingspan 4.5 centimeters. Forewings white with a curved black discal bar and black apical patch with white spots. Hindwings white, immaculate.

ECOLOGY The pine white is the most abundant butterfly in mixed Douglas-fir/western hemlock forests. Caterpillars are very common but normally not encountered, because they occur in the higher reaches of the forest canopy; feed on conifers, such as Douglas-fir and pines, during late spring. Adults are diurnal; fly in late summer. Found in coniferous forests; widely distributed in western North America.

PIERIDAE

PIERIS RAPAE - CABBAGE WHITE



CATERPILLAR Velvet green appearance over entire body with a middorsal yellow longitudinal line and a broken yellow lateral line.

ADULT Wingspan 4.2 centimeters. Forewings white with two black median spots and a black apical patch. Hindwings white; each hindwing has a marginal black spot.

ECOLOGY This species is an exotic pest of vegetable crops. Caterpillars are very common; feed on Brassicaceae during spring and summer. Adults are diurnal; fly from early spring to fall. Found in agricultural and urban areas; widely distributed in western North America.

SATYRIDAE

LARGE WOOD NYMPH - *CERCYONIS PEGALA*

CATERPILLAR Light green with a dense covering of short hairs; lateral line yellow; faint subdorsal longitudinal yellow lines; light orange spiracles.

ADULT Wingspan 4.8 centimeters. Wings dark brown with variably sized postmedian black spots encompassing a central small white dot. Hindwings ventrally dark brown with a row of small postmedian spots and fine wavy lines.

ECOLOGY Caterpillars are common; feed on grasses in June and July. Adults are diurnal; fly from mid- to late summer. Found in dry forests and woodlands, riparian environments, and wet meadows; widely distributed in western North America.

ARCTIIDAE

ARCTIA CAJA - GARDEN TIGER MOTH



CATERPILLAR Thoracic and lateral abdominal hairs mostly golden orange; dorsal and subdorsal abdominal hairs black with numerous longer white hairs.

ADULT Wingspan 6.5 centimeters. Forewings brown with irregular white bands. Hindwings orange with round black spots. Abdomen orange with middorsal black markings.

ECOLOGY Caterpillars are common, generalist feeders on foliage of herbaceous plants and small flowering shrubs, such as vetch and willow; present in fall; overwintering, with development completed by May or June. Adults are nocturnal; fly in midsummer. Found in open habitats, such as meadows and forest edges; widely distributed at lower elevations in western North America.

ARCTIIDAE*CISSEPS FULVICOLLIS*

CATERPILLAR Hairs gray-white with longer lateral black tufts. Head orange.

ADULT Wingspan 3.6 centimeters. Forewings brown. Hindwings brown along outer margin with a light blue tint in the middle of the wing. Body is black with an orange-yellow collar behind the head.

ECOLOGY Caterpillars are common; feed on foliage of grasses, sedges, and rushes during late spring. Adults are diurnal; fly from early to midsummer. Found in grasslands among coniferous forests; widely distributed in western North America.

ARCTIIDAE

CLEMENSIA ALBATA



CATERPILLAR Cryptically patterned with mottled green and black; thin middorsal white line.

ADULT Wingspan 2.4 centimeters. Forewings white with a mottled pattern of fine black lines and spots. Hindwings off-white and diffusely mottled with light brown.

ECOLOGY Caterpillars are common; feed on lichens in trees and large shrubs during spring; most common on Oregon white oak upon foliage they might eat, as well. Adults are nocturnal; fly in late summer. Found in woodlands and forests west of the Cascade Mountains.

ARCTIIDAE*CTENUCHA RUBROSCAPUS*

CATERPILLAR White hairs on a black and white body. Head orange.

ADULT Wingspan 4.5 centimeters. Wings black, edged with white distally. Thorax black, laterally with two red longitudinal lines, prothorax with a red apical patch. Head red and black. Abdomen iridescent blue.

ECOLOGY Caterpillars are common; feed on grasses during spring. Adults are diurnal; fly in midsummer. Found in wet meadows along the West Coast in California and Oregon.

ARCTIIDAE

GNOPHAELA LATIPENNIS



CATERPILLAR Yellow with dorsal, lateral, and ventral black patches; clusters of white hairs originate from black bases with blue spots. Head red-brown.

ADULT Wingspan 5.4 centimeters. Wings black with white markings in a distinctive pattern. Each forewing with a single, small, basal, white spot; the medial and distal clusters consist of four white spots. Each hindwing with one medial cluster of three white spots, and one distal cluster of two white spots.

ECOLOGY Caterpillars are common; feed on foliage of hound's tongue during late spring and early summer. Adults are diurnal; fly from mid- to late summer. Found in open pine forests from California to western Oregon.

ARCTIIDAE

GRAMMIA ORNATA

CATERPILLAR Longer white hairs interspersed among black hairs located dorsally and laterally; ventrally hairs orange. Head black.

ADULT Wingspan 4.3 centimeters. Forewings black with narrow yellow streaks. Hindwings red-orange with a black border and central black spots of variable proportions. Head is yellow with the thorax striped in yellow and black.

ECOLOGY Caterpillars are common, generalist feeders on foliage of herbaceous plants during spring. Adults are nocturnal; fly in early summer. Found in meadows and clearcuts; widely distributed in western North America.

ARCTIIDAE

HEMIHYALEA EDWARDSII



CATERPILLAR Tan hairs on thorax; long white hairs interspersed among black abdominal hairs dorsally and tan hairs laterally.

ADULT Wingspan 6.5 centimeters. Wings semitransparent, creamy yellow-orange with faint black markings. Thorax yellow; abdomen red-pink.

ECOLOGY Caterpillars are not commonly encountered; feed on oak foliage during late spring and summer. Adults very common at lights, nocturnal, fly in late summer. Found in oak woodlands in California and western Oregon.

ARCTIIDAE

FALL WEBWORM - *HYPHANTRIA CUNEA*

CATERPILLAR Long white hairs originate from red spots on a black body with yellow markings.

ADULT Wingspan 3.4 centimeters. Wings white with no other markings. Abdomen yellow-white; ventral side of prothorax and femur of foreleg with orange hairs.

ECOLOGY The communal caterpillars are very common, forming large silk tents on the branches of broadleaf trees; at times considered a pest. Caterpillars feed on numerous plants, particularly willow, alder, and black cottonwood, during August and September. Adults are nocturnal; fly in midsummer. Found in woodlands, riparian, and urban environments; widely distributed in western North America.

ARCTIIDAE

LOPHOCAMPA ARGENTATA - SILVER SPOTTED TIGER MOTH



CATERPILLAR Clusters of short yellow hairs are concentrated subdorsally with clusters of short orange hairs located laterally; middorsal clusters of short black hairs. Body black.

ADULT Wingspan 4.1 centimeters. Forewings gold-brown with silvery white spots. Hindwings off-white, nearly immaculate. Abdomen yellow.

ECOLOGY This species is abundant, sometimes considered a pest. Caterpillars are very common; feed on conifers, particularly Douglas-fir. Early instars are gregarious, present in August; overwintering, with development complete by May or June the following spring. Adults are nocturnal; fly from late July to early August. Found in moist conifer forests along the West Coast from California to British Columbia.

ARCTIIDAE

SPOTTED TUSSOCK MOTH (MID INSTARS) - *LOPHOCAMPA MACULATA*

CATERPILLAR (Mid instars) This is one of many caterpillars that develops through more than one color phase, either by stage of development, genetic polymorphism, or other environmental factors; in this species color phases differ according to age. Mid instar: Midabdominal segments with middorsal clusters of red hairs among bright yellow hairs; anterior and posterior with long wisps of white hairs and shorter yellow and black hairs.

ARCTIIDAE

LOPHOCAMPA MACULATA - SPOTTED TUSSOCK MOTH (LAST INSTAR)



CATERPILLAR (Last instar) midabdominal segments with wisps of long white hairs among red-orange hairs; anterior and posterior with long wisps of white hairs among short black hairs.

ADULT Wingspan 4.5 centimeters. Forewings yellow with brown bands. Hindwings immaculate. Abdomen yellow.

ECOLOGY Caterpillars are very common; feed on many broadleaf trees, such as big-leaf maple, oak, and red alder, during July and August. Adults are nocturnal; fly in midsummer. Found in low elevation woodlands and wet forests; widely distributed in western North America.

ARCTIIDAE

PLATYPREPIA VIRGINALIS

CATERPILLAR Black with orange hairs at the anterior and posterior ends; middle portion of the body with long white hairs.

ADULT Wingspan 6.2 centimeters. Forewings black with many large, round, pale-yellow to off-white spots. Hindwings variable, either orange with black bands or mostly black with orange spots. Thorax black with dorsal-anterior patches of yellow.

ECOLOGY Caterpillars are common; feed on herbs and grasses, present in fall; overwintering, with development completed by June the following spring. Adults are diurnal; fly in early summer. Found in wet meadows of coniferous and hardwood forests throughout western North America.

ARCTIIDAE

PYRRHARCTIA ISABELLA - BANDED WOOLLYBEAR



CATERPILLAR Dense cover of hairs over body, midabdominal segments with reddish orange hairs, anterior and posterior segments with black hairs.

ADULT Wingspan 5.3 centimeters. Forewings mustard-yellow with numerous small, dark spots. Hindwings yellow-orange with a few small, dark spots.

ECOLOGY This is the species of folklore in predicting the weather based on the extent of the orange band; the more black covering the body (less orange), the colder the upcoming winter. Caterpillars are very common; feed on herbs, such as nettles, during fall and spring; overwintering, with development completing in the spring. Adults are nocturnal; fly in midsummer. Found at lower elevations in woodlands and wet forests; widely distributed in western North America and particularly common west of the Cascade Mountains.

ARCTIIDAE*SPILOSOMA VESTALIS*

CATERPILLAR Black hairs dorsally; white hairs laterally. Head black.

ADULT Wingspan 5.2 centimeters. Wings and abdomen white with small black spots. Femur of foreleg with red hairs.

ECOLOGY Caterpillars are common, generalist feeders on foliage of flowering trees, particularly oak, during spring. Adults are nocturnal; fly from late May through June. Found in moist hardwood and coniferous forests west of the Cascade Mountains.

ARCTIIDAE

SPILOSOMA VIRGINICA - YELLOW WOOLLYBEAR



CATERPILLAR Long hairs white; short hairs white and yellow-orange; colors uniformly dispersed over body except for lateral region of A4 through A6 where hairs appear white.

ADULT Wingspan 4.2 centimeters. Wings white with a few small spots toward the outer margin. Hindwings white with submarginal spots. Femur orange-yellow on foreleg. Abdomen white and orange with dorsal patches of black spots.

ECOLOGY Caterpillars are common; feed on herbs, such as dandelion and Queen Anne's lace, present in fall; overwintering, with development completed by June or July. A second generation occurs during the summer. Adults are nocturnal; fly in midsummer. Found in wet forests and meadows; widely distributed in western North America.

ARCTIIDAE

CINNABAR MOTH - *TYRIA JACOBAEAE*

CATERPILLAR Hairs are sparse, atypical for arctiids. Alternating orange and black rings occur along the entire length of the body.

ADULT Wingspan 3.7 centimeters. Forewings dark gray-black, each forewing with a red costal stripe and two red submarginal spots. Hindwings nearly all red with gray margins. Abdomen black.

ECOLOGY This species feeds on tansy ragwort, a noxious weed for which it was intentionally introduced into the western United States as a biological control agent. Caterpillars are very common, and with rare exception feed only on species of *Senecio*, particularly *S. jacobaea*, during July and August. The gregarious caterpillars are poisonous to vertebrate predators due to the sequestration of pyrolizidine alkaloids from the hostplant. Adults are diurnal; fly in May and June. Found in open habitats west of the Cascade Mountains.

DIOPTIDAE

PHRYGANIDIA CALIFORNICA - CALIFORNIA OAKWORM



CATERPILLAR Two middorsal white bands bordered in purple; yellow subdorsal and spiracular bands separated by a gray-purple band bordered in black; transverse black stripe on T1, A1, and A8; A5 with a middorsal black spot. Head tan with a faint tint of orange.

ADULT Wingspan 4.0 centimeters. Forewings tan-light brown with a yellow median patch. Hindwings tan and immaculate.

ECOLOGY This species is an occasional pest on live oak and chinquapin. Caterpillars are common; feed on live oak and chinquapin during fall, winter, and spring. Adults are nocturnal; fly in midsummer. Found in dry woodlands in western Oregon and California.

DREPANIDAEARCHED HOOKTIP - *DREPANA ARCUATA*

CATERPILLAR Dorsum with shades of brown, purple, and black on green; knobby warts most prominent on T2 through A2.; anal segment extended into a single point. Head white-tan with two dark brown transverse bands.

ADULT Wingspan 3.7 centimeters. Forewings pale yellow-brown with smooth outer margins and noticeably hooked (falcate) at the apex, postmedian line is narrow.

ECOLOGY Caterpillars are uncommon; feed on red alder during July and August. Adults are nocturnal; fly from May to August. Found in riparian habitats and moist forests; widely distributed in North America.

GEOMETRIDAE

AETHALOIDA PACKARDARIA



CATERPILLAR Uniformly gray; dorsal tubercles on A2, A4, and A8; ventral tubercle on A3. Third pair of true legs much larger than other true legs. Head silver-gray, slightly cleft.

ADULT Wingspan 3.5 centimeters. Wings dark gray with fine black wavy lines.

ECOLOGY Caterpillars are common on buckbrush during June and July. Adults are nocturnal, typically with two observable flight periods; the first from March to June, the second in August and September. Found in dry forests in California and southwestern Oregon.

GEOMETRIDAE

ANACAMPTODES CLIVINARIA

CATERPILLAR Silver-gray; a subtle hump on dorsum of A2 and A8.

ADULT Wingspan 4.0 centimeters. Forewings mottled white and gray, wavy black and yellow medial lines. Hindwings with nearly straight medial lines.

ECOLOGY Caterpillars are common; feed on snowbrush and bitterbrush during late spring. Adults are nocturnal; fly from late spring to early summer. Found in open dry forests and woodlands; widely distributed in western North America.

GEOMETRIDAE

ANAGOGA OCCIDUARIA - AMERICAN BARED UMBER



CATERPILLAR Yellow-tan with diffuse red-brown shading; small hump on middorsum of A5.

ADULT Wingspan 2.8 centimeters. Forewings pale yellow to brown with a jagged dark brown median band.

ECOLOGY Caterpillars are common; feed on flowering trees and shrubs, particularly maple, blueberry, and ocean spray. Adults are nocturnal; fly in early summer. Found in wet conifer forests; widely distributed in western North America.

GEOMETRIDAE

APODREPANULATRIX LITARIA

CATERPILLAR Green with a wide middorsal white band.

ADULT Wingspan 3.5 centimeters. Forewings mottled dark gray or brown with two wavy dark medial lines and a row of black postmedian spots.

ECOLOGY Caterpillars are uncommon; feed on *Ceanothus* during spring. Adults are nocturnal; fly from late summer to fall. Found in moist coniferous forests; widely distributed in western North America.

GEOMETRIDAE

ARCHIEARIS INFANS



CATERPILLAR Green; dorsally with yellow spots at the location of primary setae (pinaculae); subdorsally two faint yellow longitudinal lines; laterally a distinct yellow line. The presence of four pairs of midabdominal prolegs is a very unusual feature for inchworms. Head yellow-green.

ADULT Wingspan 3.5 centimeters. Forewings dark red-brown to black with a white median band and white subapical patch. Hindwings red-orange with a black anal band and discal spot.

ECOLOGY Caterpillars are uncommon; feed on alder during late spring. Adults are diurnal; fly in early spring. Found in wet forests; widely distributed in northern North America.

GEOMETRIDAE

PEPPER MOTH - *BISTON BETULARIA*

CATERPILLAR Intermixed shades of tan and light green; cone-like humps on head and T1.

ADULT Wingspan 4.8 centimeters. The wings are variable in color from pale gray to a dark black-brown, with wavy black lines and heavily speckled with dark gray spots.

ECOLOGY This species is the pepper moth that has been cited as an example of industrial melanism in England. Caterpillars are common, generalist feeders on flowering trees and shrubs, particularly alder, willow, and chinquapin. Adults are nocturnal; fly from early to midsummer. Found in wet forests and riparian habitats; widely distributed in western North America.

GEOMETRIDAE

CAMPAEA PERLATA - FRINGED LOOPER



CATERPILLAR The presence of two pairs of midabdominal prolegs is an unusual feature for inchworms. In this species the prolegs on A5 are slightly reduced. In contrast, the midabdominal prolegs on A5 and A6 in plusiines (Noctuidae) are nearly equal in size (see *Autographa californica*). The body color is variable in this species but is generally drab, such as the gray-brown depicted here. The ventral fringe of knobby hairs is unique among inchworms in the Pacific Northwest.

ADULT Wingspan 3.9 centimeters. Forewings pale green-white with two white lines counter-shaded with darker green.

ECOLOGY Caterpillars are common; feed on many broadleaf trees, such as serviceberry, red and mountain alder, and hazel, during April and May. Adults are nocturnal; fly in summer. Found in moist forests; widely distributed in western North America.

GEOMETRIDAE

CHESIADODES CINEREA

CATERPILLAR Yellow-green; middorsal white band encompassing a golden central longitudinal line with black edged gray dashes on A2 through A8; broken scalloped white lateral line.

ADULT Wingspan 3.0 centimeters. Forewings elongate, light to dark gray with thin black lines.

ECOLOGY Caterpillars are common; feed on rabbitbrush during June and July. Adults are nocturnal; fly in midsummer. Found in dry sagebrush rangelands and juniper woodlands; widely distributed in western North America.

GEOMETRIDAE

CHLOROCHLAMYS TRIANGULARIS



CATERPILLAR Yellow-green. Head more strongly yellow.

ADULT Wingspan 1.9 centimeters. Forewings pale green with thin white lines that may fade to yellow as the moth ages.

ECOLOGY Caterpillars are common; feed on rabbitbrush during June and July. Adults are nocturnal; fly in late summer. Found in dry sagebrush rangelands and juniper woodlands; widely distributed in western North America.

GEOMETRIDAE

CHLOROSEA BANKSARIA

CATERPILLAR The lateral flanges on A2 through A5 are characteristic of three common inchworms (see *Nemoria darviniata*; the third species, *Synchlora aerata*, is not illustrated in this volume). Green with minute white dots and oblique yellow-white stripes; enlarged lateral flanges on A2 through A5.

ADULT Wingspan 3.4 centimeters. Wings green with a single white line. This moth may be distinguished from other green geometers by its large size and the single white line.

ECOLOGY Caterpillars are common; feed on ocean spray during May and June. Adults are nocturnal; fly in midsummer. Found in wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

COCHISIA SINUARIA



CATERPILLAR Yellow with an undertone of green; T1 with a pair of minute bumps. Head red-brown with two cone-like projections.

ADULT Wingspan 5.0 centimeters. Wings pale gray with narrow wavy black lines.

ECOLOGY Caterpillars are common; feed on manzanita during late spring to early summer. Adults are nocturnal; fly in fall. Found in dry woodlands and forests from western Oregon to Arizona.

GEOMETRIDAE

CYCLOPHORA DATARIA

CATERPILLAR The colors of this inchworm vary in the intensity of contrast between light and dark markings. Colors range from tan, to brown, to gray, but always with the darker middorsal semicircle countered by the anterior lateral light markings, particularly on A2 through A5.

ADULT Wingspan 2.4 centimeters. Wings yellow to pale brown with fine black speckles and a small round white spot near the discal cell.

ECOLOGY Caterpillars are common; feed on white oak during July and August. Adults are nocturnal; fly in summer. Found in oak woodlands ranging from California to British Columbia.

GEOMETRIDAE

DASYFIDONIA AVUNCULARIA



CATERPILLAR Red-brown with shades of dark pink; broken yellow spiracular line; lateral patches of dark red-brown on each abdominal segment.

ADULT Wingspan 3.0 centimeters. Forewings brown with black lines and a white subapical spot. Hindwings red-orange, each with two black lines.

ECOLOGY Caterpillars are uncommon; feed on bitter cherry during late spring to early summer. Adults are diurnal; fly in spring. Found in montane forests; widely distributed in western North America.

GEOMETRIDAE

DREPANULATRIX CARNEARIA

CATERPILLAR Yellow-green with pale-yellow speckles; multiple discontinuous, longitudinal lines, and ten middorsal red spots.

ADULT Wingspan 2.5 centimeters. The wings vary from cream-white, to pink or orange; each forewing has three narrow, nearly straight red lines.

ECOLOGY Caterpillars are uncommon; feed on *Ceanothus* during July and August. Adults are nocturnal; fly in early summer. Found in wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

DREPANULATRIX FALCATARIA



CATERPILLAR A patchwork of white, silver, gray, tan, and black; a thin yellow spiracular line, counter shaded with black patches, is broken by patches of gray-white.

ADULT Wingspan 3.0 centimeters. Forewings slightly falcate, red-orange to pink, each with three lines. Hindwings white.

ECOLOGY Caterpillars are common; feed on *Ceanothus* during spring. Adults are nocturnal; fly in early spring. Found in wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

DREPANULATRIX FOEMINARIA

CATERPILLAR Body color variable, green or brown; lateral yellow band with ragged edges on light green body with faint white longitudinal markings; spiracles orange.

ADULT Wingspan 3.1 centimeters. Wings brown, speckled with black, and show amorphous gray-black markings.

ECOLOGY Caterpillars are common; feed on *Ceanothus* from June through August. Adults are nocturnal; fly in spring. Found in wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

DREPANULATRIX MONICARIA



CATERPILLAR Green with a velvet appearance; small middorsal white spots or patches may occur on midabdominal segments; middorsal red-brown streak on thorax and anterior abdomen.

ADULT Wingspan 2.8 centimeters. Forewings pink to light red, finely mottled with black flecks, postmedian line of black spots.

ECOLOGY Caterpillars are common; feed on species of *Ceanothus* from May through July. Adults are nocturnal; fly from spring to fall. Found in wet and dry forests; distributed along the West Coast from southern California to British Columbia.

GEOMETRIDAE

DREPANULATRIX UNICALCARARIA

CATERPILLAR Mottled brown and gray-black; faint scalloped subspiracular line.

ADULT Wingspan 4.0 centimeters. Forewings gray to red-orange with a narrow, sharply angled postmedian line.

ECOLOGY Caterpillars are common; feed on *Ceanothus* during spring. Adults are nocturnal; fly during two distinct periods: late spring to early summer and late summer to fall. Found in wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

DYSSTROMA CITRATA



CATERPILLAR Yellow-green; no other markings.

ADULT Wingspan 3.2 centimeters. Forewings with a black median band, a dark brown basal band, and a yellow apical patch.

ECOLOGY Caterpillars are common; feed on flowering trees and shrubs, such as alder and thimbleberry. Adults are nocturnal; fly from midsummer to fall. Found in moist forests; widely distributed in western North America.

GEOMETRIDAE

DYSSTROMA FORMOSA

CATERPILLAR Light green with a white hue, and white subdorsal longitudinal lines.

ADULT Wingspan 3.1 centimeters. Forewings with a gray median band and a dark brown basal band.

ECOLOGY This species is the most common inchworm on currants and gooseberries; feeds on many species of *Ribes* during June and July. Adults are nocturnal; fly in midsummer. Found in dry forests; widely distributed in western North America.

GEOMETRIDAE

DYSSTROMA SOBRIA



CATERPILLAR Head and body yellow green with ten middorsal red spots.

ADULT Wingspan 3.8 centimeters. Forewings with a white median band and dark brown basal and postmedian bands.

ECOLOGY Caterpillars are uncommon; feed on species of Ericaceae, such as salal and rhododendron, during April and May. Adults are nocturnal; fly in midsummer. This species is limited to moist forests of the Pacific West.

GEOMETRIDAE

SADDLEBACK LOOPER - *ECTROPIS CREPUSCULARIA*

CATERPILLAR Mottled white, gray, tan, brown, and golden; a black subdorsal dual striped longitudinal line extends from the head to A8; A8 with a pair of small dorsal warts.

ADULT Wingspan 4.1 centimeters. Forewings white with fine, dentate black lines.

ECOLOGY Caterpillars are very common, generalist feeders occurring in the spring and early summer on numerous flowering trees and shrubs, such as alder, willow, and snowberry, and conifers, such as Douglas-fir and western hemlock. Adults are nocturnal; fly in spring. Found in wet forests, riparian habitats and woodlands; widely distributed in western North America.

GEOMETRIDAE

ELPISTE LORQUINARIA



CATERPILLAR Body may be either green or brown; prominent lateral yellow band and faint yellow longitudinal markings are consistent in both body colors.

ADULT Wingspan 2.8 centimeters. Forewings with falcate apex, pale yellow or brown; each forewing has two narrow lines and three black marks in the submarginal area.

ECOLOGY Caterpillars are common; feed on red alder and willow from June through August. Adults are nocturnal; fly in late summer. Found in rain forests of the Pacific Northwest.

GEOMETRIDAE

MAPLE SPANWORM - *ENNOMOS MAGNARIA*

CATERPILLAR Green with yellow shading; tan-brown circumsegmental swellings around the posterior edge of A2, A3, and A5. Head green.

ADULT Wingspan 5.2 centimeters. Forewings yellow-orange with many small dark spots and a sharply angular outer margin.

ECOLOGY Caterpillars are uncommon; feed on alder and willow in late spring. Adults are nocturnal; fly in fall. Found in moist forests; widely distributed in western North America.

GEOMETRIDAE

ERANNIS TILIARIA - LINDEN LOOPER



CATERPILLAR Dorsum brown with black longitudinal lines; yellow laterally with faint to distinct red-brown shading around the spiracles; ventral part of body off-white.

ADULT Females are wingless. Male wingspan 4.0 centimeters. The wings are cream colored to pale yellow with fine speckles and dark wavy bands, the outer bands varying from solid black to pale brown.

ECOLOGY Caterpillars are very common; feed on many broadleaf trees and shrubs, such as serviceberry, white oak, and hazel, during May and June. Adults are nocturnal; fly in late fall. Found in oak woodlands; widely distributed in western North America.

GEOMETRIDAE

EUCHLAENA JOHNSONARIA

CATERPILLAR Small dorsal warts on A1 and A5, body with swirls of cream and light brown colors.

ADULT Wingspan 4.0 centimeters. Forewings falcate with a scalloped margin, dark brown to pale yellow with thin lines and black postmedian spots. Hindwings with a strongly scalloped margin.

ECOLOGY Caterpillars are uncommon; feed on cascara and mock orange during May and June. Adults are nocturnal; fly in midsummer. Found in moist forests; widely distributed in western North America.

GEOMETRIDAE

EUCHLAENA TIGRINARIA



CATERPILLAR Silver and gray with dorsal patches of red-brown; posterior of A1 and A5 with a subdorsal wart.

ADULT Wingspan 3.9 centimeters. Wings pale orange and speckled with many dark spots.

ECOLOGY Caterpillars are common; feed on many broadleaf trees and shrubs, particularly serviceberry and hazel, during April and May. Adults are nocturnal; fly in midsummer. Found in moist forests; widely distributed in western North America.

GEOMETRIDAE

EUDREPANULATRIX RECTIFASCIA

CATERPILLAR Brown head and light green body with faint white lines; small middorsal reddish brown spots or patches may occur on midabdominal segments; middorsal reddish brown streak on thorax and anterior abdomen.

ADULT Wingspan 2.8 centimeters. Forewings white to pink with fine gray mottling and a narrow postmedian line.

ECOLOGY Caterpillars are common; feed on species of *Ceanothus* from June through August. Adults are nocturnal; fly from early to late summer. Found in wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

EULITHIS XYLINA



CATERPILLAR Red-brown-amber; black collar around T2; intersegmental rings are pale gray-brown.

ADULT Wingspan 3.4 centimeters. Forewings with a dark brown median band with a smooth outer margin.

ECOLOGY Caterpillars are very common; feed on many broadleaf trees and shrubs, such as ocean spray, red stem osier, ninebark, and azalea, during June and July. Adults are nocturnal; fly in midsummer. Found in moist forests and riparian habitats; widely distributed in western North America.

GEOMETRIDAE

EUPITHECIA ANNULATA

CATERPILLAR Golden-yellow-green dorsally and laterally; venter olive green, no other markings.

ADULT Wingspan 2.3 centimeters. Forewings gray-brown with faint dark bands and a black discal spot. Hindwings with a checkered margin.

ECOLOGY Caterpillars are common; feed on conifers, such as hemlock and Douglas-fir, during late spring and early summer. Adults are nocturnal; fly in early spring. Found in coastal rain forests of the Pacific western states.

GEOMETRIDAE

EUPITHECIA GILVIPENNATA



CATERPILLAR Yellow-green with a dark red middorsal line from the head to A10.

ADULT Wingspan 2.6 centimeters. Forewings black, often with orange medial spots and an orange subapical patch.

ECOLOGY Caterpillars are common; feed on manzanita during late spring and early summer. Adults are nocturnal; fly in early spring. Found in dry forests and oak woodlands in the Pacific western states.

GEOMETRIDAE

EUPITHECIA GRAEFII

CATERPILLAR Color variable from solid green, a rosy pink, to red-pink, typically matching color with the hostplant.

ADULT Wingspan 2.3 centimeters. Forewings brown with a red-yellow cast; each forewing has an elongate, black discal spot.

ECOLOGY Caterpillars are common; feed on manzanita and madrone from April through June. Adults are nocturnal; fly in summer. Found in dry forests and woodlands; widely distributed in western North America.

GEOMETRIDAE

EUPITHECIA MAESTOSA



CATERPILLAR Light green throughout; immaculate.

ADULT Wingspan 2.0 centimeters. Forewings with brown basal and medial lines; each forewing has a faint transverse yellow band.

ECOLOGY Caterpillars are common, generalist feeders occurring in the spring on hardwood trees and shrubs, such as serviceberry, ash, ocean spray, and elderberry. Adults are nocturnal; fly from spring to midsummer. Found in moist forests; widely distributed in western North America.

GEOMETRIDAE

EUPITHECIA MISTURATA

CATERPILLAR Variable in color from white to rosy brown; A1 through A6 with distinct darker transverse band that is expanded anteriorly in the center and along each side near the subdorsal area.

ADULT Wingspan 1.8 centimeters. Forewings pale gray; each forewing has a small black discal spot.

ECOLOGY Caterpillars are very common, generalist feeders occurring in late spring and early summer on the foliage and flowers of flowering trees and shrubs, particularly ocean spray, manzanita, snowberry, and oak. Adults are nocturnal; fly in summer. Found in woodlands and wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

EUPITHECIA NEVADATA



CATERPILLAR Darker green dorsally with small white dots; lighter green ventrally with a white hue and small white dots; lateral off-white band bordered with streaks of red, mostly on thorax and posterior abdominal segments.

ADULT Wingspan 2.6 centimeters. Forewings white to gray with red to brown costal and submarginal patches.

ECOLOGY Caterpillars are common; feed on bitterbrush and species of *Ceanothus* during June and July. Adults are nocturnal; fly in early spring. Found in dry forests and juniper woodlands; widely distributed in western North America.

GEOMETRIDAE

EUPITHECIA RAVOCOSTALIATA

CATERPILLAR Dorsum and venter green; lateral off-white band bordered by a solid red line below.

ADULT Wingspan 2.3 centimeters. Forewings elongate and pointed with white and black costal and submarginal patches.

ECOLOGY Caterpillars are common; feed on cascara from June to August. Adults are nocturnal; fly in early spring. Found in woodlands and wet and dry forests in the Pacific western states.

GEOMETRIDAE

EUPITHECIA UNICOLOR



CATERPILLAR Green with shades of yellow, matching foliage of the foodplant for a cryptic appearance.

ADULT Wingspan 2.5 centimeters. Forewings red-brown to yellow-orange with a thin black medial line, often with black streaks along the submarginal border.

ECOLOGY Caterpillars are common; feed on western red cedar from May to July. Adults are nocturnal; fly in late summer. Found in wet coniferous forests from southern California to British Columbia.

GEOMETRIDAE

EUSTROMA SEMIATRATA

CATERPILLAR Red-brown; T3 with a transverse black line.

ADULT Wingspan 3.3 centimeters. Forewings with a black median band that has a jagged outer margin.

ECOLOGY Caterpillars are common; feed on herbaceous plants, such as fireweed, during spring. Adults are nocturnal; fly in fall. Found in open habitats associated with wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

GABRIOLA DYARI



CATERPILLAR Mostly brown, dorsum with light caramel-colored patches; subdorsally and laterally abdomen with slightly swollen areas; white dorsal patches on A1, A3, and A8. This caterpillar can contort its body into a configuration that looks like a male cone of conifers.

ADULT Wingspan 2.8 centimeters. Forewings dark, mottled gray to black; each forewing has a narrow, wavy, black median line and a curved, black basal line.

ECOLOGY Caterpillars are uncommon; feed on conifers, such as Douglas-fir and western hemlock, during late spring. Adults are nocturnal; fly in summer. Found in wet and dry coniferous forests; widely distributed in western North America.

GEOMETRIDAE

HESPERUMIA LATIPENNIS

CATERPILLAR Gray mixed with white-gray; small dorsal tubercles on A2 and A2 slightly bulging laterally; small ventral tubercles on A3.

ADULT Wingspan 3.5 centimeters. Forewings a uniform pale gray; each forewing has a narrow, sharply dentate median line.

ECOLOGY Caterpillars are common; feed on ocean spray and currants during spring. Adults are nocturnal; fly in midsummer. Found in wet and dry forests; most common west of the Cascade Mountains, ranging from California to British Columbia.

GEOMETRIDAE

HESPERUMIA SULPHURARIA



CATERPILLAR The body color of this species is highly variable, often matching its background. The subdorsal wart on A2 is the best trait for tentative field identification.

ADULT Wingspan 3.5 centimeters. Forewings pale to dark yellow with purple-brown median and basal bands and a broad purple-brown discal spot; markings are variable from very prominent bands to nearly no marks except for the discal spot.

ECOLOGY Caterpillars are very common; feed on many broadleaf trees and shrubs, such as species of *Ceanothus*, manzanita, ocean spray, and bitterbrush, from May through July. Adults are nocturnal; fly in midsummer. Found in woodlands and wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

HYDRIOMENA MANZANITA

CATERPILLAR Off-white, almost translucent; middorsal black line from T2 through A9. Head light brown.

ADULT Wingspan 3.2 centimeters. Forewings elongate and pale gray with obscure markings forming dark curved bands.

ECOLOGY Caterpillars are common; feed on manzanita and madrone during June and July. Adults are nocturnal; fly in spring. Found in dry conifer forests and oak woodlands along the West Coast from California to British Columbia.

GEOMETRIDAE

HYPAGYRTIS UNIPUNCTATA



CATERPILLAR Tan and brown; A4 and A5 with a diffuse patch of white.

ADULT Wingspan 3.3 centimeters. Forewings white, mottled with yellow and brown; each forewing has a small black discal spot. Hindwings with margin slightly scalloped.

ECOLOGY Caterpillars are common; feed on alder during spring. Adults are nocturnal; fly in late summer. Found in wet forests; widely distributed in western North America.

GEOMETRIDAE

IRIDOPSIS EMASCULATA

CATERPILLAR Dorsal red markings with irregular borders, noticeably expanded and constricted on A3 through A6; subdorsally and laterally green.

ADULT Wingspan 3.5 centimeters. Forewings pale gray-cream with narrow wavy black lines and a brown patch bordered by two black tooth-like marks in the subapical area.

ECOLOGY Caterpillars are common; feed on maple, alder, and *Vaccinium* during spring. Adults are nocturnal; fly in midsummer. Found in woodlands, riparian habitats, and wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

ITAME BITACTATA

CATERPILLAR Green to gray-brown with white and brown shading on each segment separated at an oblique angle.

ADULT Wingspan 3.1 centimeters. Forewings gray with black dashes and lines.

ECOLOGY Caterpillars are common; feed on currants and gooseberries during late spring. Adults are nocturnal; fly in midsummer. Found in dry forests; widely distributed in western North America.

GEOMETRIDAE

ITAME COLATA

CATERPILLAR Mottled silver, gray, and white; darker patch near spiracles.

ADULT Wingspan 2.3 centimeters. Forewings gray; each forewing has a broad brown postmedian band curved and outlined in black.

ECOLOGY Caterpillars are common; feed on bitterbrush and sagebrush during spring. Adults are nocturnal; fly from mid- to late summer. Found in pine forests and juniper woodlands; widely distributed in western North America.

GEOMETRIDAE

ITAME GUENEARIA



CATERPILLAR Light red to orange-pink; lateral yellow patches on A1 and A2.

ADULT Wingspan 2.8 centimeters. Forewings pale gray; each forewing has a yellow postmedian band outlined with brown. Hindwings white to yellow.

ECOLOGY Caterpillars are common; feed on California coffeeberry during spring. Adults are nocturnal; fly in midsummer. Found in dry open forests and woodlands; distributed in the Pacific western states and the Southwestern states.

GEOMETRIDAE

ITAME QUADRILINEARIA

CATERPILLAR Green with dark brown patches sublaterally.

ADULT Wingspan 2.8 centimeters. Forewings gray with fine dark lines; each forewing has a bright yellow patch along the costal margin on the venter (not shown) of the forewing.

ECOLOGY Caterpillars are common; feed on snowbrush during spring. Adults are nocturnal; fly in midsummer. Found in wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

LAMBDA FISCCELLARIA - OAK (HEMLOCK) LOOPER



CATERPILLAR Color highly variable, typically white, gray, and light brown; longitudinal lines in different shades of typical body colors; paired black dorsal spots.

ADULT Wingspan 3.7 centimeters. Forewings slightly falcate, gray to yellow-tan, each with narrow black postmedian and basal lines edged with orange, and a small black discal spot.

ECOLOGY This caterpillar is very common and may cause heavy defoliation of its principal host, white oak; present from June to September. Adults are nocturnal; fly in fall. Found in oak woodlands and coniferous forests; widely distributed in western North America.

GEOMETRIDAE

MELANOLOPHIA IMITATA

CATERPILLAR Green with multiple white lines creating a middorsal longitudinal band; lateral white line extends from T1 to A10.

ADULT Wingspan 3.7 centimeters. Forewings a dull mottled brown with narrow wavy lines and small black marginal spots.

ECOLOGY Caterpillars are common; feed on Pinaceae, particularly Douglas-fir, during spring and early summer. Adults are nocturnal; fly in early spring. Found in wet and dry coniferous forests; widely distributed in western North America.

GEOMETRIDAE

NEMATOCAMPA RESISTARIA - FILAMENT BEARER



CATERPILLAR Mottled caramel, brown, and gray-white. Two very long filaments middorsal on A2 and A3, each forked creating two smaller filaments with white tips.

ADULT Wingspan 2.5 centimeters. Forewings falcate, pale cream to deep yellow with broad purple-brown borders and narrow wavy lines.

ECOLOGY Caterpillars are common; feed on the foliage of flowering trees, shrubs, and herbaceous plants such as maple, alder, snowberry, oak, and mint, during spring and early summer. Adults are nocturnal; fly in late summer. Found in open habitats, woodlands, and forests; widely distributed in western North America.

GEOMETRIDAE

NEMORIA DARWINIATA

CATERPILLAR The lateral flanges on A2 through A5 are characteristic of three common inchworms (see *Chlorosea banksaria*; the third species, *Synchlora aerata*, is not illustrated). Coloration in this species varies among light green, yellow, tan, and brown.

ADULT Wingspan 2.9 centimeters. Wings green with narrow, curved, white basal and median lines.

ECOLOGY Caterpillars are common; feed on many broadleaf trees and shrubs, such as white oak, myrica, ocean spray, bitterbrush, and snowbrush, during March to September. Adults are nocturnal; fly in midsummer. Found in woodlands, and wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

NEOALCIS CALIFORNIARIA



CATERPILLAR This caterpillar is variable in color (shades of off-white, brown, and gray) and pattern. In fact, the lack of notable features in combination with the presence of mature larvae occurring in early spring serve as the best clue to the identity of this species.

ADULT Wingspan 3.6 centimeters. Forewings mottled cream to dark brown with wavy dark median and basal lines.

ECOLOGY This is the most abundant moth species that is capable of feeding extensively on foliage of numerous species of conifers and angiosperms in the fall and into the early summer of the following year. Caterpillars are very common; feed on broadleaf trees, such as big-leaf maple and serviceberry; shrubs, such as myrica and blueberry; as well as many conifers, such as pines and Douglas-fir. Adults are nocturnal; fly from late summer into fall. Found in woodlands, and wet and dry forests, particularly common west of the Cascade Mountains; distributed from California to British Columbia.

GEOMETRIDAE

NEPYTIA UMBROSARIA

CATERPILLAR Middorsal white band edged with a thin black line; laterally golden brown with a faint white spiracular line.

ADULT Wingspan 3.6 centimeters. Forewings mostly gray with jagged median and basal lines; each forewing has a small black discal spot.

ECOLOGY This is one of the most abundant conifer-feeding caterpillars in western forests. Caterpillars are very common; feed on conifers in spring. Adults are nocturnal; fly from mid- to late summer. Found in wet and dry coniferous forests; widely distributed in western North America.

GEOMETRIDAE

OPEROPHTERA BRUCEATA - BRUCE SPANWORM



CATERPILLAR Green; prominent subdorsal white bands.

ADULT Females are wingless. The male wingspan is 2.9 centimeters. Forewings solid dark gray to pale cream with fine dark lines.

ECOLOGY This species was previously known as *O. occidentalis* and is very similar in appearance to an exotic pest, *O. brumata*, the winter moth. This is one of just a few species of moths exhibiting a limited flight period restricted to November and December. Caterpillars are very common; feed on many broadleaf trees, such as big-leaf maple, oak, red alder, bitter cherry, hazel, and willow, from March to June. Adults are nocturnal, males fly in early winter. Found in low elevation woodlands and wet forests; widely distributed in western North America.

GEOMETRIDAE

OPEROPHTERA DANBYI

CATERPILLAR Green with white spots demarking the location of primary setae and three dorsal white longitudinal lines, lateral line light yellow.

ADULT Females are wingless. The male wingspan is 3.4 centimeters. Forewings elongate and gray with dark lines.

ECOLOGY This is one of just a few species of moths exhibiting a limited flight period restricted to November and December. Caterpillars are uncommon, generalist feeders on the foliage of flowering trees and shrubs, particularly ash, cherry, and oak, during the spring. Adults are nocturnal, males fly in early winter. Found in woodlands in the Pacific Northwest.

GEOMETRIDAE

PERIZOMA COSTIGUTTATA



CATERPILLAR Red-brown; immaculate.

ADULT Wingspan 2.5 centimeters. Forewings gray with three black costal bars.

ECOLOGY Caterpillars are common; feed on ocean spray during spring. Adults are nocturnal; fly from spring to midsummer. Found in woodlands, and wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

PERO MIZON

CATERPILLAR Body color is highly variable, often gray with faint black markings; A2 through A4 swollen ventrally. Head slightly cleft.

ADULT Wingspan 4.1 centimeters. Forewings pale red-brown with a darker median area, wing edge dentate.

ECOLOGY Caterpillars are common; feed on many broadleaf trees, such as snowbrush, hazel, Pacific dogwood, and madrone, from April to August. Adults are nocturnal; fly from mid- to late summer. Found in wet conifer forests of the Pacific Northwest, especially abundant west of the Cascade Mountains.

GEOMETRIDAE

PERO OCCIDENTALIS



CATERPILLAR Mottled light yellow, tan, and brown; no other distinctive markings.

ADULT Wingspan 3.4 centimeters. Forewings dark gray-brown, wing edges dentate; each forewing with a red-black median band. Males have slightly dentate antennae with minute antennal branches.

ECOLOGY Caterpillars are common; feed on the foliage of Pinaceae and some hardwood shrubs, such as ocean spray, during spring. Adults are nocturnal; fly from late spring to midsummer. Found in woodlands, and wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

PHIGALIA PLUMOGERARIA

CATERPILLAR Gray-brown; lateral golden yellow patches on A1 through A3 apparent, faint on A4 through A7; a pair of small dorsal warts on A1 through A3, and A8.

ADULT Females are wingless. Male wingspan 4.5 centimeters. Forewings pale gray; each forewing with four thin black lines. Hindwings pale gray, each with a small black discal spot. Antennae pectinate.

ECOLOGY Caterpillars are common; feed on oak and serviceberry during spring. Adults are nocturnal, males fly in early spring. Found in oak woodlands along the Pacific coast from California to British Columbia.

GEOMETRIDAE

PROBOLE AMICARIA



CATERPILLAR Pale green and brown to red-brown; A5 with a slightly raised transverse ridge.

ADULT Wingspan 3.5 centimeters. Forewings falcate, pale mottled brown with a darker brown submarginal area, the subapical part of the median line extends to the wing margin in an abrupt, concave curve.

ECOLOGY Caterpillars are common; feed on dogwood and huckleberry during spring. Adults are nocturnal; fly from late spring to early summer. Found in wet conifer forests of the Pacific Northwest.

GEOMETRIDAE

PROTITAME MATILDA

CATERPILLAR Yellow-green to light red-brown; no other notable markings.

ADULT Wingspan 2.1 centimeters. Forewings white to pale yellow with a thin, straight basal line and postmedian line. Hindwings with a curved postmedian line.

ECOLOGY Caterpillars are common; feed on willow and poplar during spring. Adults are nocturnal; fly from spring to midsummer. Found in woodlands, and wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

RHEUMAPTERA SUBHASTATA



CATERPILLAR Black; prolegs and spiracular area pale orange. Head orange.

ADULT Wingspan 3.1 centimeters. Forewings white with black borders and mottled black basal and median areas.

ECOLOGY This caterpillar lives in folded leaf tents and is common on mountain alder during August and September. Adults are diurnal; fly from late spring to midsummer. Found in montane forests; widely distributed in western North America.

GEOMETRIDAE

OMNIVOROUS LOOPER - *SABULODES AEGROTATA*

CATERPILLAR Dorsum and lateral region of T1 through A9 with longitudinal stripes of black, orange, gray, and white; mostly light yellow below the spiracular line. Head orange with a pair of black spots near the top of the head capsule.

ADULT Wingspan 4.4 centimeters. Forewings slightly falcate, pale yellow to darker brown with converging, dentate median and postmedian lines.

ECOLOGY This is one of just a few species that may occur 'on the wing' any month of the year, a behavior connected to its distribution along relatively mild coastal environments. Caterpillars are common; feed on red elderberry, salmonberry, red alder, and ocean spray, from May to September. Adults are nocturnal; fly throughout the year. Found in wet coastal forests in the Pacific western states.

GEOMETRIDAE

SELENIA ALCIPHEARIA



CATERPILLAR Head, thorax and parts of A5 and A6 streaked with white and gray; A1 through A4 golden yellow; A6 through A10 darker brown; A5 and A6 with a pair of dorsal humps.

ADULT Wingspan 4.2 centimeters. Forewings falcate, mottled pale yellow to brown; each forewing has three narrow, black lines and an apical orange patch.

ECOLOGY The caterpillar in this photo was reared in the lab from eggs obtained from a female moth field-collected live at a blacklight and then placed in a container for a couple of days. Caterpillars are uncommon; feed on the foliage of maple, alder, and birch. Adults are nocturnal; fly from early spring to midsummer. Found in wet forests; widely distributed in western North America.

GEOMETRIDAE

SEMIOTHISA BURNEYATA

CATERPILLAR Green mottled with white patches and spots, the dark and light green hues of the caterpillar result in a remarkable example of cryptic coloration.

ADULT Wingspan 3.0 centimeters. Forewings light red-pink-brown; each forewing has two to three nearly straight black lines.

ECOLOGY Caterpillars are common; feed on cedars during late spring and early summer. Adults are nocturnal; fly from early to late summer. Found in wet coniferous forests; distributed in the Pacific western states.

GEOMETRIDAE

SEMIOTHISA SUBMINIATA



CATERPILLAR Green with faint white dorsal longitudinal lines; cream-white lateral line.

ADULT Wingspan 2.8 centimeters. Forewings pink to red-pink; each forewing has a broad, curved, black postmedian band and a smaller black basal band.

ECOLOGY Caterpillars are uncommon; feed on willow during late spring. Adults are nocturnal; fly in midsummer. Found in riparian habitats of dry forest and woodlands; widely distributed in western North America.

GEOMETRIDAE

SERICOSEMA JUTURNARIA

CATERPILLAR Poorly defined patches of alternating light and dark gray-brown; minute warts subdorsally on A2 through A5; yellow spiracles.

ADULT Wingspan 3.5 centimeters. Forewings pale tan with a curved black postmedian line and a variable black submarginal border.

ECOLOGY This species may be the most abundant moth in post-fire regeneration habitats, where snowbrush is the dominant vegetation. Caterpillars are very common; feed on *Ceanothus* from May to July. Adults are nocturnal; fly in midsummer. Found in woodlands, and wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

SICYA CROCEARIA



CATERPILLAR Green with red-brown highlights; middorsum of A3 and A5 with a dual pronged horn the length of which is equal to the body width; a third shorter horn occurs middorsally on A8.

ADULT Wingspan 3.4 centimeters. Forewings slightly falcate, yellow with narrow basal and median lines, pink-red in the postmedian areas.

ECOLOGY Caterpillars are uncommon; feed on red alder during June and July. Adults are nocturnal; fly in midsummer. Found in wet conifer forests; widely distributed in western North America.

GEOMETRIDAE

SPARGANIA MAGNOLIATA

CATERPILLAR Yellow-green with a lateral diffuse band of rosy red.

ADULT Wingspan 3.0 centimeters. Forewings gray with wavy black lines and bands; each forewing has a small black discal spot. Hindwings pink-gray.

ECOLOGY Caterpillars are common; feed on fireweed during spring. Adults are nocturnal; fly from spring to late summer. Found in open habitats associated with wet forests; widely distributed in western North America.

GEOMETRIDAE

STAMNODES COENONYMPHATA



CATERPILLAR Green with a tint of yellow along a subdorsal longitudinal band.

ADULT Wingspan 3.1 centimeters. Forewings pale yellow with a white postmedian band and gray-black median and apical patches.

ECOLOGY Caterpillars are common; feed on mountain mahogany during late spring. Adults are nocturnal; fly in early spring. Found in dry oak woodlands; distributed in southern California and southwestern Oregon.

GEOMETRIDAE

SYNAXIS CERVINARIA

CATERPILLAR Light green to green-brown to red-orange; dorsally T2 swollen into a transverse ridge; minute middorsal wart on A4 and A8.

ADULT Wingspan 4.3 centimeters. Forewings strongly falcate, red-brown to gray, with narrow basal and median lines.

ECOLOGY Caterpillars are common; feed on willow, cascara, bitterbrush, and species of *Ceanothus* from June to August. Adults are nocturnal; fly from spring to midsummer. Found in woodlands, and wet and dry forests; widely distributed in western North America.

GEOMETRIDAE

SYNAXIS FORMOSA



CATERPILLAR Dorsally gray-brown with thin longitudinal lines; ventrally gray-yellow with patches of gray-brown; a pair of small dorsal warts on A2 through A5; A8 with a small hump.

ADULT Wingspan 4.2 centimeters. Forewings gray with jagged black postmedian and basal lines outlined in white. Hindwings white with a scalloped gray margin.

ECOLOGY Caterpillars are common; feed on rabbit brush during late spring. Adults are nocturnal; fly in fall. Found in dry juniper woodlands and sagebrush rangelands in western North America.

GEOMETRIDAE

SYNAXIS JUBARARIA

CATERPILLAR Mottled gray to light brown-red; a pair of prominent dorsal warts on T1, A4, and A5; a pair of very small warts on A3, A6, and A7.

ADULT Wingspan 4.0 centimeters. Forewings strongly falcate, pale yellow to orange, with narrow basal and median lines.

ECOLOGY Caterpillars are common; feed on many broadleaf trees and shrubs, such as big-leaf maple, ash, red alder, and snowberry, during late spring. Adults are nocturnal; fly in fall. Found in wet conifer forests; widely distributed in western North America.

GEOMETRIDAE

THALLOPHAGA TAYLORATA



CATERPILLAR One of very few species found on sword fern. This caterpillar is easily identified by its orange, brown, and tan body with faint white subdorsal longitudinal lines; midabdominal intersegmental areas orange brown.

ADULT Wingspan 3.3 centimeters. Forewings slightly falcate, lightly speckled brown with a dark brown median band and postmedian line, or separate small postmedian spots.

ECOLOGY This is the most abundant caterpillar on sword fern. Caterpillars are common; feed on sword fern during May and June. Adults are nocturnal; fly in early spring. Found in wet conifer forests in the Pacific western states.

GEOMETRIDAE

TRIPHOSA CALIFORNIATA

CATERPILLAR Numerous longitudinal lines and bands of pink-gray, black, yellow, and light brown; the most distinctive trait is the lateral yellow band edged dorsally by a black line.

ADULT Wingspan 3.3 centimeters. Forewings dark gray with a wavy median band and thin lines. Hindwings white with gray borders and scalloped margins.

ECOLOGY Caterpillars are common; feed on coffeeberry during late spring and early summer. Adults are nocturnal; fly in early spring. Found in open habitats, woodlands, and wet forests in the Pacific western states.

GEOMETRIDAE

TRIPHOSA HAESITATA



CATERPILLAR Translucent green; lateral off-white band; dorsal and lateral cream-white lines.

ADULT Wingspan 3.9 centimeters. Forewings variable red-brown with darker and lighter wavy bands. Hindwings with the margin strongly dentate.

ECOLOGY This is the most abundant caterpillar on cascara. Caterpillars are common; feed on cascara during June and July. Adults are nocturnal, overwinter, fly from late summer into next spring. Found in woodlands and wet conifer forests; widely distributed in western North America.

LASIOCAMPIDAE

WESTERN TENT CATERPILLAR - *MALACOSOMA CALIFORNICUM*

CATERPILLAR White dorsal patches bordered in black surrounded by orange; an off-white spiracular line with two blue patches per segment above it; dense white hairs laterally.

ADULT Wingspan 2.9 centimeters. Forewings of male (see photo) variably red-brown to yellow with two thin lines. Hindwings of male red-brown. Female wings are more yellow than those of the male, with red-brown shading.

ECOLOGY The extensive blue coloring is unusual in caterpillars and typical of the genus *Malacosoma*. Caterpillars are very common; feed on many broadleaf trees, such as big-leaf maple, oak, and red alder, during early summer. Adults are nocturnal; fly in midsummer. Found in a wide variety of habitats, particularly oak woodlands; widely distributed in western North America.

LASIOCAMPIDAE

MALACOSOMA CONSTRICTUM - PACIFIC TENT CATERPILLAR



CATERPILLAR Blue and black; dense white hairs laterally.

ADULT Wingspan 3.0 centimeters. Forewings of male (see photo) variably yellow with two thin dark lines. Hindwings of male yellow. Female wings with red-brown shading.

ECOLOGY Caterpillars are very common; feed on oak during late spring to early summer. Adults are nocturnal; fly in midsummer. Found in oak woodlands from southern California to western Oregon.

LASCIOCAMPIDAE

FOREST TENT CATERPILLAR - *MALACOSOMA DISSTRIA*

CATERPILLAR Blue and black; silvery-white dorsal patches bordered in black; a yellow orange subdorsal and lateral longitudinal line also bordered in black; dense white hairs laterally.

ADULT Wingspan 2.8 centimeters. Forewings of male (see photo) variably yellow to red-brown with two thin lines; female forewings are darker red-brown than those of male. Hindwings of male and female red-brown.

ECOLOGY This species does not construct a tent. Caterpillars are very common; feed on many broadleaf trees such as madrone, oak, and red alder, during early summer. Adults are nocturnal; fly in midsummer. Found in a wide variety of habitats, particularly oak woodlands; widely distributed in western North America.

LASIOCAMPIDAE

PHYLLODESMA AMERICANA - LAPPET MOTH



CATERPILLAR Silver and gray with black tones; soft, fuzzy, gray hairs; transverse orange yellow line across A1 and A2; small middorsal raised area on A8.

ADULT Wingspan 3.6 centimeters. Forewings red-brown with fine spots and a deeply notched anal margins. Hindwings small with dentate margins.

ECOLOGY Caterpillars are very common; feed on many broadleaf trees, such as white oak, serviceberry, alders, chinquapin, and willows, during spring. Adults are nocturnal; fly between late spring and early summer. Found in woodlands, and wet and dry forests; widely distributed in western North America.

LASIOCAMPIDAE

TOLYPE DISTINCTA

CATERPILLAR Dark gray and bronze brown; soft, fuzzy, silver white hairs; transverse black line with orange spots across the intersegmental area between A1 and A2.

ADULT Wingspan 3.3 centimeters. Forewings pale gray with dark gray bands and white veins.

ECOLOGY The caterpillar in this photo was reared during the spring from eggs collected from a female attracted to a blacklight in October. Caterpillars are uncommon; feed on Pinaceae during spring. Adults are nocturnal; fly in late summer and fall. Found in wet and dry coniferous forests; widely distributed in western North America.

LYMANTRIIDAE

DASYCHIRA GRISEFACTA



CATERPILLAR Dense covering of white, gray, and black hairs of varying lengths, including thick tufts of gray hairs on A1 through A4; a pair of long tufts of black hairs project laterally anterior from A1 and laterally posterior from A8; also a single tuft of long black hairs projects dorsally posterior from A8; clusters of short white clubbed hairs occur dorsally and laterally; bright red glands middorsal on A6 and A7; a row of single long, black, clubbed hairs point laterally.

ADULT Wingspan 4.2 centimeters. Forewings light gray to black with a small white subanal spot in the postmedian area.

ECOLOGY We have reared field-collected larvae that resulted in the emergence of wingless females. Caterpillars are uncommon; feed on Pinaceae, particularly Douglas-fir and grand fir, during April and May. Adults are nocturnal; fly from mid- to late summer. Found in coniferous forests; widely distributed in western North America.

LYMANTRIIDAE

VARIABLE TUSSOCK MOTH - *DASYCHIRA VAGANS*

CATERPILLAR Dense covering of white, gray, and black hairs of varying lengths, including thick tufts of gray hairs on A1 through A4; a pair of long tufts of black hairs project laterally anterior from A1 and laterally posterior from A8; also a single tuft of long black hairs projects dorsally posterior from A8; clusters of short white clubbed hairs occur dorsally and laterally; red middorsal glands on A6 and A7; a row of paired long, black, clubbed hairs point laterally.

ADULT Wingspan 4.5 centimeters. Forewings gray with pale mottling, no white subanal spot.

ECOLOGY Caterpillars are common on many species of broadleaf trees, particularly white oak, during May and June. Adults are nocturnal; fly from early to late summer. Found in oak woodlands and low elevation forests; widely distributed in western North America.

LYMANTRIIDAE

LEUCOMA SALICIS - SATIN MOTH



CATERPILLAR Creamy yellow highlighted with black; midline of dorsum with irregular yellow circles; subdorsally a broken stripe of yellow bordered in black; laterally and ventrally light creamy color speckled with irregular black markings; base of hair tufts red-orange; dorsal hairs red-orange; lateral and ventral hairs mostly white.

ADULT Wingspan 5.2 centimeters. Wings with a silk white, satin sheen, and light yellow costal and basal areas. Leg hairs colored in black and white rings.

ECOLOGY This is an accidentally introduced species and on occasion is considered a pest on quaking aspen in Oregon's central Cascade Mountains. Caterpillars are common on willow and quaking aspen during late spring. Adults are nocturnal; fly in midsummer. Found in urban areas, riparian habitats, and montane forests; widely distributed in North America.

LYMANTRIIDAE

GYPSY MOTH - *LYMANTRIA DISPAR*

CATERPILLAR Long tan hairs rise from subdorsal tufts; T1 through A2 with a pair of dorsal blue warts; A3 through A7 with a pair of dorsal red warts. Head with two wide, black, oblique lines and mottled with black spots.

ADULT Male (see photo): Wings brown with prominent zigzag black lines on the forewings; each forewing has a single discal spot. Female: Wings white with prominent zigzag black lines on the forewings; each forewing has a single discal spot.

ECOLOGY Introduced from Europe, the gypsy moth is now widely distributed in North America. This species is a notorious pest, which is why we have illustrated it here. Although it is not established in the Pacific Northwest, it is a chronic pest problem in the region. Caterpillars feed on numerous broadleaf trees, particularly oaks, as well as some conifers, including Douglas-fir and Colorado blue spruce, likely to occur during May and June. Adults are diurnal; females possess wings but are flightless, males fly in midsummer. Historically, the gypsy moth in the Pacific Northwest has been found in metropolitan and rural areas, including orchards and surrounding low elevation oak woodlands and conifer forests.

LYMANTRIIDAE

ORGYIA ANTIQUA - RUSTY TUSSOCK MOTH



CATERPILLAR Densely covered with light yellow hairs originating from a pale red base; middorsal tufts of off-white hairs on A1 through A4; tufts of long black hairs project forward and laterally from A1; a single tuft of long black hairs projects dorsally and posterior from A8; pale red middorsal glands on A6 and A8.

ADULT Females are wingless; the male wingspan is 3.0 centimeters. Forewings red-brown with a large white subanal spot in the postmedian area. Hindwings red-orange to orange-brown.

ECOLOGY Caterpillars are very common on many broadleaf trees and shrubs, such as willow, white oak, and black cottonwood, during June and July. Adults are nocturnal, males fly from late summer to fall. Found in low elevation woodlands and forests; widely distributed in North America.

LYMANTRIIDAE

DOUGLAS-FIR TUSOCK MOTH - *ORGYIA PSEUDOTSUGATA*

CATERPILLAR Densely covered with white hairs that originate from a red base; middorsal tufts of golden-tipped white hairs on A1 through A4 and A8; tufts of long black hairs project laterally and anterior from A1; a single tuft of long black hairs project dorsally and posterior from A8; bright red middorsal glands on A6 and A7.

ADULT Females are wingless. The male wingspan is 3.3 centimeters. Forewings gray to black with a small subanal spot. Hindwings dark red-brown.

ECOLOGY This species is known as the Douglas-fir tussock moth and is considered a forest pest causing severe defoliation of certain conifer species. Caterpillars are very common; feed on Pinaceae during late spring. Adults are diurnal, males fly from late summer to fall. Found in coniferous forests; widely distributed in western North America.

NOCTUIDAE

ABAGROTIS DUANCA



CATERPILLAR Gray, brown, and black with subdorsal patches of orange; white scalloped spiracular band (mostly on A4 through A6) with brown markings within the band.

ADULT Wingspan 2.4 centimeters. Forewings dark gray-black with a pale gray postmedian border, and small reniform and orbicular spots that are obscure or outlined in white.

ECOLOGY Caterpillars are common; feed on big sagebrush during spring. Adults are nocturnal; fly from mid- to late summer. Found in dry juniper woodlands and sagebrush rangelands; widely distributed in western North America.

NOCTUIDAE

ABAGROTIS GLENNI

CATERPILLAR Variable shades of green to pink-brown, later instars mostly pink-brown; white dashed line below black shading along dorsum of T1 through A10 and laterally on T1 through T3.

ADULT Wingspan 3.4 centimeters. Forewings pale gray-brown with a large white reniform spot and black basal and discal streaks.

ECOLOGY Caterpillars are uncommon; feed on western juniper during early summer. Adults are nocturnal; fly in late summer. Found in juniper woodlands; widely distributed in western North America.

NOCTUIDAE

ACHYTONIX EIPASCHIA



CATERPILLAR Green, middorsal, subdorsal, and subspiracular white longitudinal bands extend from T1 through A10. Head green.

ADULT Wingspan 3.4 centimeters. Forewings dark gray to black with gray to red-brown discal spots and the reniform spot at the end of the discal cell slightly curved.

ECOLOGY Caterpillars are uncommon; feed on various conifers, including Douglas-fir, during early summer. Adults are nocturnal; fly in late summer. Found in moist conifer forests; widely distributed in western North America.

NOCTUIDAE*ACRONICTA CYANESCENS*

CATERPILLAR Extremely long and dense white hairs obscure the green body.

ADULT Wingspan 4.7 centimeters. Forewings gray with black basal and subanal streaks.

ECOLOGY Only one individual caterpillar of this species has been field-collected during the fifteen years of our projects. Caterpillars are rare; feed on snowbrush during late spring. Adults are nocturnal; fly in midsummer. Found in dry forests of western North America.

NOCTUIDAE

ACRONICTA FUNERALIS



CATERPILLAR Early instars brown with white markings; fourth instar black with middorsal light yellow markings triangular to elliptical with transverse black streaks in the center and black sparse long hairs with flattened tips.

ADULT Wingspan 3.4 centimeters. Forewings pale gray with an irregular black band across the inner wing margin.

ECOLOGY Caterpillars are uncommon; feed on broadleaf plants, such as blueberry, hazel, and white oak, during early summer. Adults are nocturnal; fly from late spring to early summer. Found in low elevation forests west of the Cascade Mountains; widely distributed in western North America.

NOCTUIDAE

GRAY DAGGER MOTH - *ACRONICTA GRISEA*

CATERPILLAR Green, dorsal brown patch wider on T1 and A4 through A8; outside edge of dorsal brown patches counter-shaded with yellow. Head brown with two conical points.

ADULT Wingspan 4.0 centimeters. Forewings dark gray with black basal and anal margin dashes, postmedian band with a sharply dentate margin. Hindwings white.

ECOLOGY Caterpillars are common; feed on red alder during late summer. Adults are nocturnal; fly in midsummer. Found in moist forests; widely distributed in western North America.

NOCTUIDAE

ACRONICTA HESPERIDA



CATERPILLAR Covered with tufts of dense orange hairs on dorsum and white hairs laterally; anterior and posterior a few longer white and black “wild” hairs stick out beyond the tufts of shorter hairs.

ADULT Wingspan 5.3 centimeters. Forewings pale gray with reniform and orbicular discal spots strongly outlined.

ECOLOGY Caterpillars are uncommon; feed on red alder and mountain alder during late summer. Adults are nocturnal; fly in midsummer. Found in moist forests; widely distributed in western North America.

NOCTUIDAE

YELLOW-HAIRED DAGGER MOTH - *ACRONICTA IMPLETA*

CATERPILLAR Two prominent tufts of hairs on thorax, partially encircled with white hair tufts; two gray hair pencils on dorsum of A8.

ADULT Wingspan 4.8 centimeters. Forewings dark black-gray with the postmedian band outlined as small white spots.

ECOLOGY Caterpillars are uncommon; feed on red alder during spring. Adults are nocturnal; fly in early summer. Found in coastal rainforests; widely distributed in western North America.

NOCTUIDAE

ACRONICTA IMPRESSA - IMPRESSED DAGGER MOTH



CATERPILLAR The brown-black color of the body provides a strong contrast to the clusters of white hairs that originate from reddish orange spots.

ADULT Wingspan 3.8 centimeters. Forewings dark, mottled with gray, discal spots outlined and filled with darker gray. Hindwings gray.

ECOLOGY Caterpillars are common; feed on wild roses and bitterbrush during midsummer. Adults are nocturnal; fly in early summer. Found in many forest habitats; widely distributed in western North America.

NOCTUIDAE

ACRONICTA MARMORATA



CATERPILLAR Yellow and brown; dark brown middorsal line. Head dark brown.

ADULT Wingspan 4.3 centimeters. Forewings mottled black, gray, and white with black basal and subanal dashes.

ECOLOGY Caterpillars are very common; feed on oak during midsummer. Adults are nocturnal; fly from spring to early summer. Found in oak woodlands; widely distributed in Pacific western states.

NOCTUIDAE

ACRONICTA PERDITA



CATERPILLAR A broad white spiracular band constricts at each spiracle from T1 through A8; clusters of off-white and black hairs originate from pale orange-yellow spots on a brown-black body.

ADULT Wingspan 4.4 centimeters. Forewings gray and heavily suffused with black. Hindwings white in male (shown here) and gray in female.

ECOLOGY Caterpillars are common; feed on bitterbrush during midsummer. Adults are nocturnal; fly from late spring to early summer. Found in dry forests including oak and juniper woodlands; widely distributed in western North America.

NOCTUIDAE

ALYPIA LANGTONI

CATERPILLAR Yellow-orange with irregular black markings on a white body; relatively long primary setae; dorsum of A9 with a brighter yellow streak. Head yellow with black spots.

ADULT Wingspan 3.0 centimeters. Forewings black; each forewing has two round, cream-yellow spots. Hindwings also with one or two round cream-yellow spots.

ECOLOGY Caterpillars are common; feed on fireweed during midsummer. Adults are diurnal; fly from late spring to midsummer. Found in open habitats associated with montane forests; widely distributed in western North America.

NOCTUIDAE

AMPHIPYRA PYRAMIDOIDES - COPPER UNDERWING



CATERPILLAR Light green with sparse white spots; black spiracles; white spiracular line with shades of yellow; A8 with large dorsal hump.

ADULT Wingspan 5.1 centimeters. Forewings light brown to black-brown with a pale submarginal border and the discal spots greatly reduced. Hindwings orange to red-copper.

ECOLOGY Caterpillars are common; feed on many broadleaf trees and shrubs, particularly big-leaf maple and manzanita, during spring. Adults are nocturnal; fly from late summer to fall. Found in wet conifer forests in western regions of California to British Columbia.

NOCTUIDAE

ANDROPOLIA AEDON

CATERPILLAR Light brown and a shade of light green, with a black scalloped sublateral line; A8 with a transverse black line; venter light gray.

ADULT Wingspan 4.6 centimeters. Forewings gray with distinct discal spots outlined in black, including a jagged, dentate black submarginal line.

ECOLOGY Caterpillars are common; feed on alder, maple, ocean spray, and ninebark during spring. Adults are nocturnal; fly from mid- to late summer. Found in wet conifer forests in the Pacific West.

NOCTUIDAE

ANDROPOLIA DIVERSILINEATA



CATERPILLAR Gray-brown with a black scalloped sublateral line; thoracic and abdominal segments with a subdorsal black patch; A8 with a transverse black line; venter gray-brown.

ADULT Wingspan 4.4 centimeters. Forewings gray with very obscure markings except for a jagged, dentate black submarginal line. Males have pectinate antennae.

ECOLOGY Caterpillars are common; feed on bitterbrush during early summer. Adults are nocturnal; fly in late summer. Found in pine forests and juniper woodlands; widely distributed in western North America.

NOCTUIDAE*ANDROPOLIA THEODORI*

CATERPILLAR Dark brown with a black scalloped sublateral line; A8 with a transverse black line; venter pink-white.

ADULT Wingspan 5.2 centimeters. Forewings gray with shades of red and a black, sharply dentate submarginal line. Hindwings faint red-tan; each hindwing has a dark medial line and discal spot.

ECOLOGY Caterpillars are common; feed on snowbrush and ocean spray during spring. Adults are nocturnal; fly from mid- to late summer. Found in dry forests and woodlands in western North America.

NOCTUIDAE

ASEPTIS BINOTATA



CATERPILLAR Dark green dorsum and light green venter with off-white speckles; white spiracular band, dorsal edge with a red line; faint discontinuous off-white subdorsal line. Head green.

ADULT Wingspan 3.4 centimeters. Forewings dark brown; each forewing has a round yellow mark on the outer margin of the reniform spot.

ECOLOGY This species possesses the broadest foodplant range among the Pacific Northwest Lepidoptera. Caterpillars are very common, generalist feeders on numerous flowering trees and shrubs, such as maple, alder, madrone, hazelnut, Indian plum, ocean spray, currant, willow, and snowberry, during spring. Adults are nocturnal; fly in midsummer. Found in moist forests; widely distributed in western North America.

NOCTUIDAE

ASEPTIS ETHNICA

CATERPILLAR Body and head mottled in shades of green; a yellow-white spiracular band extends from A7 to anal prolegs. Head green.

ADULT Wingspan 3.9 centimeters. Forewings dark brown to black with the only noticeable markings the white flecks along the postmedian line.

ECOLOGY Caterpillars are common; feed on manzanita and madrone during spring. Adults are nocturnal; fly in midsummer. Found in dry forests and woodlands in western Oregon and California.

NOCTUIDAE

Aseptis fumosa



CATERPILLAR Dark green dorsum and light green venter; white spiracular line, dorsal edge with a red line; faint discontinuous yellow longitudinal line and oblique subdorsal lines. Head green.

ADULT Wingspan 3.8 centimeters. Forewings brown with the reniform and orbicular spots distinctly outlined in dark brown.

ECOLOGY Caterpillars are common; feed on bitterbrush and species of *Ceanothus* during spring. Adults are nocturnal; fly in midsummer. Found in dry forests in the Pacific Northwest.

NOCTUIDAE

ALFALFA SEMILOOPER - *AUTOGRAPHA CALIFORNICA*

CATERPILLAR Two pair of midabdominal prolegs, a trait indicative of the Plusiinae. Green; distinct white spiracular line and faint discontinuous longitudinal dorsal white lines.

ADULT Wingspan 4.2 centimeters. Forewings mottled gray with a large white comma-shaped stigma. Hindwings yellow with a broad black submarginal border.

ECOLOGY This species is an economic pest in vegetable crops and also occurs on native plants in forests and woodlands. Caterpillars are common; feed on numerous herbaceous plants from early spring to midsummer. Adults are nocturnal; fly from spring to fall. Found in agricultural and urban areas, and open habitats associated with lowland and montane forests; widely distributed in western North America.

NOCTUIDAE

CATOCALA AHOLIBAH - AHOLIBAH UNDERWING



CATERPILLAR Gray- tan with a subtle rosy pink hue and covered with minute black speckles; small tubercles middorsum on A5 and A8; ventral row of short whisker-like hairs; true legs pink-red. Head is cream colored with reticulated lines.

ADULT Wingspan 7.9 centimeters. Forewings mottled black, gray, and red-brown with jagged black lines. Hindwings rosy red with a black median band narrowly constricted in the center and broad black submarginal borders.

ECOLOGY Caterpillars are common; feed on white oak during spring. Adults are nocturnal; fly in late summer. Found in oak woodlands; widely distributed in western North America.

NOCTUIDAE

CATOCALA BRISEIS

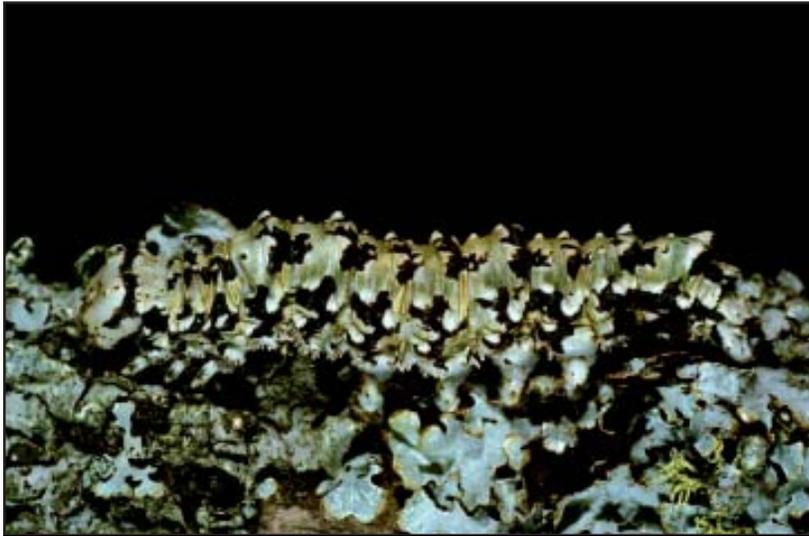
CATERPILLAR Gray and tan with finely reticulated markings; A5 and A8 with small warts tipped in orange; subdorsal orange spots in a line; intersegmental area between A5 and A6 with an orange and black patch; ventral row of short whisker-like hairs. Top of head with two orange spots; a black arc extends from the base of the mandibles over the top of the head.

ADULT Wingspan 6.8 centimeters. Forewings gray-black, often with white markings, and a jagged postmedial line. Hindwings red with black submarginal borders and black median bands that are not narrowly constricted.

ECOLOGY Caterpillars are uncommon; feed on willow during late spring. Adults are nocturnal; fly in late summer. Found in wet forest and riparian habitats; widely distributed in northern North America, southernmost portion of its distribution extending into the northern Rocky Mountains and the Pacific Northwest.

NOCTUIDAE

CATOCALA ILIA - ILIA UNDERWING



CATERPILLAR Mottled with green and black.

ADULT Wingspan 7.9 centimeters. Forewings mottled black and gray with jagged black lines. Hindwings orange, the black median band and submarginal border with wavy undulations.

ECOLOGY Cryptic coloration and pattern match the lichens on oak branches. Caterpillars are uncommon; feed on white oak during late spring. Adults are nocturnal; fly in late summer. Found in oak woodlands ranging from California to the Pacific Northwest.

NOCTUIDAE

CATOCALA VERRILLIANA

CATERPILLAR Uniformly gray white with a pale pink hue; middorsum of A5 and A8 with tubercles; ventral row of short whisker-like hairs. Head same color as body but with reticulated lines.

ADULT Wingspan 4.6 centimeters. Forewings pale gray with jagged black lines. Hindwings orange-red with the black median band constricted in the center and a broad black submarginal border with red marginal patches.

ECOLOGY Caterpillars are common; feed on oak during spring. Adults are nocturnal; fly in late summer. Found in oak woodlands in the Pacific western states.

NOCTUIDAE

CISSUSA INDISCRETA



CATERPILLAR Mottled with silver, gray, and black; subdorsal and lateral longitudinal lines scalloped and nearly entire.

ADULT Wingspan 4.0 centimeters. Forewings light to dark brown with fine wavy lines and a black discal bar.

ECOLOGY Caterpillars are common; feed on oak during spring. Adults are nocturnal; fly in early spring. Found in dry oak woodlands from southern California to western Oregon and Washington.

NOCTUIDAE

COSMIA CALAMI



CATERPILLAR Green with extensive faint white markings; single white middorsal stripe. Head pale green.

ADULT Wingspan 3.2 centimeters. Forewings pale yellow to light brown with small discal spots, basal line strongly transverse and nearly touching the postmedian line along the inner margin. Hindwings white.

ECOLOGY Caterpillars are very common; feed on oak during late spring. Adults are nocturnal; fly in midsummer. Found in oak woodlands in the Pacific western states.

NOCTUIDAE

CUCULLIA PULLA



CATERPILLAR Green with six prominent longitudinal white lines; the lateral line with a yellow dot just below and posterior to the spiracle.

ADULT Wingspan 4.2 centimeters. Forewings elongate and sharply pointed, black with fine gray streaks and jagged lines. Hindwings black.

ECOLOGY This species was previously placed in the genus *Lathosea*. Caterpillars are uncommon; feed on rabbitbrush during late spring. Adults are nocturnal; fly in early spring. Found in dry juniper woodlands and sagebrush rangelands; widely distributed in western North America.

NOCTUIDAE

EGIRA CRUCIALIS

CATERPILLAR Color highly variable, mottled silver, gray, and black to bi-colored with rosy pink-red; dorsum darker than venter separated at the lateral line. Head red.

ADULT Wingspan 4.0 centimeters. Forewings gray with a small orbicular spot and a broken line of black postmedian dashes.

ECOLOGY Caterpillars are common; feed on numerous trees and shrubs, including alder, snowbrush, bitterbrush, and oak, during spring. Adults are nocturnal; fly in spring. Found in moist forests; widely distributed in western North America.

NOCTUIDAE

EGIRA CURIALIS



CATERPILLAR Mottled with silver, gray, and black; lateral longitudinal band white with mottled markings between faint black borders. Head mottled tan, brown, and black.

ADULT Wingspan 4.0 centimeters. Forewings dark gray with obscure markings. Hindwings mostly white.

ECOLOGY Caterpillars are common; feed on bitter cherry and hackberry during spring. Adults are nocturnal; fly in spring. Found in dry forests; widely distributed in western North America.

NOCTUIDAE

EGIRA FEBRUALIS

CATERPILLAR White with blue-gray shading; subdorsal yellow streaks; black spots; black spiracles. Head mottled tan and black with a dorsal black triangular patch.

ADULT Wingspan 3.7 centimeters. Forewings mottled black and white. Hindwings pale cream.

ECOLOGY Caterpillars are uncommon; feed on oak during late spring. Adults are nocturnal; fly in early spring. Found in dry forests in the Pacific western states.

NOCTUIDAE

EGIRA PERLUBENS



CATERPILLAR Color highly variable, mottled silver, gray, and black to bi-colored with rosy tan-brown; dorsum faintly darker than venter. Head mottled tan and black.

ADULT Wingspan 4.0 centimeters. Forewings dark gray-black with a red subapical patch and a white or pale gray orbicular spot. Hindwings white.

ECOLOGY Caterpillars are common; feed on many broadleaf trees, such manzanita, snowbrush, bitterbrush and ocean spray, during spring. Adults are nocturnal; fly in spring. Found in dry forests; widely distributed in western North America.

NOCTUIDAE

FERALIA DECEPTIVA

CATERPILLAR Green with subdorsal and lateral white longitudinal lines; the lateral line broken with dashes of red along the upper border; white dashes sublaterally on T1 through A8. Head green.

ADULT Wingspan 4.0 centimeters. Forewings dark green with black and white markings. Hindwings solid black.

ECOLOGY Caterpillars are uncommon; feed on Douglas-fir during late spring. Adults are nocturnal; fly in early spring. Found in wet coastal forests in the Pacific western states.

NOCTUIDAE

FERALIA FEBRUALIS



CATERPILLAR Light green with sparse white spots; tan spiracles; white spiracular line with red dorsal edge which is more obvious on T1; A8 with large dorsal hump; true legs red.

ADULT Wingspan 3.4 centimeters. Forewings pale green with large discal spots. Hindwings white.

ECOLOGY Caterpillars are uncommon; feed on white oak, during spring. Adults are nocturnal; fly from late winter to early spring. Found in dry forests and oak woodlands in the Pacific western states.

NOCTUIDAE

FISHIA EVELINA

CATERPILLAR Green to rosy brown; dorsum dark green with a faint white subdorsal longitudinal line; a thin off-white spiracular line; venter light green.

ADULT Wingspan 4.3 centimeters. Forewings elongate, dark gray; each forewing has a red median patch and the submarginal line strongly dentate. Hindwings mostly white in males, gray in females.

ECOLOGY Caterpillars are common; feed on many broadleaf trees and shrubs, such as manzanita, snowbrush, cherry, bitterbrush, and elderberry, during late spring. Adults are nocturnal; fly in fall. Found in dry forests; widely distributed in western North America.

NOCTUIDAE

HYPENA CALIFORNICA



CATERPILLAR Dark green with longitudinal subdorsal white line.

ADULT Wingspan 3.4 centimeters. Forewings narrow and highly variable in color, mottled yellow and brown or solid red-brown with small black discal spots. Labial palps long.

ECOLOGY Caterpillars are common; feed on nettles during late spring. Adults are nocturnal; fly from early spring to fall. Found in wet forests from California to British Columbia.

NOCTUIDAE

LACANOBIA LILACINA

CATERPILLAR Yellow-green with a prominent subdorsal yellow longitudinal line; gray-green lateral longitudinal line; venter yellow. Head mostly yellow with two gray-green lines.

ADULT Wingspan 3.5 centimeters. Forewings pale violet-brown with obscure markings or with black spots and pale streaks.

ECOLOGY Caterpillars are common; feed on red alder during spring. Adults are nocturnal; fly in midsummer. Found in riparian habitats and wet forests; widely distributed in western North America.

NOCTUIDAE

LITHOMOIA GERMANA



CATERPILLAR Dark brown; white lateral band. Head tan with two black oblique bands.

ADULT Wingspan 5.0 centimeters. Forewings pale gray with gray streaks; each forewing has a large white reniform spot. Hindwings light to dark gray.

ECOLOGY Caterpillars are common; feed on blueberries during spring. Adults are nocturnal; fly in fall. Found in wet forests and bogs across the northern regions of North America, extending south into the northern Rocky Mountains and the Pacific Northwest.

NOCTUIDAE

LITHOPHANE AMANDA



CATERPILLAR Light green with a frosty white hue; lateral line off-white; faint dorsal and subdorsal white line. Head with white spots.

ADULT Wingspan 4.0 centimeters. Forewings pale gray; each forewing has an orange subapical patch and red-brown submarginal spots. Hindwings pale brown.

ECOLOGY Caterpillars are common; feed on willow during spring. Adults are nocturnal; fly in fall and early spring. Found in wet forests and bogs across the northern regions of North America, extending south into the northern Rocky Mountains and the Pacific Northwest.

NOCTUIDAE

LITHOPHANE ATARA



CATERPILLAR Green with a velvet appearance; sublateral yellow longitudinal band. Head green.

ADULT Wingspan 4.6 centimeters. Forewings dark gray-black with well defined streaks. Hindwings pink with a dark submarginal band and discal spot.

ECOLOGY Caterpillars are common; feed on conifers, such as ponderosa pine, during late spring. Adults are nocturnal; fly in fall and early spring. Found in coniferous forests; widely distributed in western North America.

NOCTUIDAE*LITHOPHANE CONTENTA*

CATERPILLAR Dark green with white mottled spots; spiracular band white to yellow, with an uneven bottom edge, and pink patches around the spiracles in later instars. Head green; labrum and area around stemmata white.

ADULT Wingspan 4.1 centimeters. Forewings gray with obscure discal spots. Hindwings pale gray.

ECOLOGY Caterpillars are common; feed on oak during spring. Adults are nocturnal; fly in fall and early spring. Found in oak woodlands in Pacific western states.

NOCTUIDAE

LITHOPHANE GEORGII



CATERPILLAR Green; lateral line white to yellow with parallel edges.

ADULT Wingspan 4.8 centimeters. Forewings pale gray with a submarginal line of small black spots. Hindwings dark gray.

ECOLOGY Caterpillars are common; feed on many broadleaf trees and shrubs, such as spiraea, hawthorn, maple, oak, red alder and ocean spray, during spring. Adults are nocturnal; fly in fall and early spring. Found in a wide variety of habitats; widely distributed in western North America.

NOCTUIDAE*LITHOPHANE INNOMINATA*

CATERPILLAR Mottled yellow, gray, and light green. Head tan with two darker gray-green patches dorsally.

ADULT Wingspan 3.8 centimeters. Forewings yellow to light brown with black medial and submarginal spots. Hindwings black.

ECOLOGY Caterpillars are common; feed on many broadleaf trees, such as red alder, hawthorn, ocean spray, and willow, during spring. Adults are nocturnal; fly in fall and early spring. Found in woodlands and wet forests; widely distributed in North America.

NOCTUIDAE

LITHOPHANE LONGIOR



CATERPILLAR Irregularly shaped white spots forming a discontinuous dorsal and subdorsal band; laterally white spots behind the spiracles with patches of light green above; white circles at the base of each true leg and midabdominal prolegs.

ADULT Wingspan 4.2 centimeters. Forewings pale gray with obscure markings and a dark median band. Hindwings light to dark gray.

ECOLOGY Caterpillars are uncommon; feed on western juniper during late spring and early summer. Adults are nocturnal; fly in fall and early spring. Found in juniper woodlands; widely distributed in western North America.

NOCTUIDAE*LITHOPHANE THAXTERI*

CATERPILLAR Green with a thin subdorsal yellow longitudinal line; yellow speckles. Head green.

ADULT Wingspan 4.2 centimeters. Forewings gray with black basal and medial dashes and a jagged black submarginal line. Hindwings dark pink-gray.

ECOLOGY Caterpillars are uncommon; feed on spiraea during spring. Adults are nocturnal; fly in fall and early spring. Found in wet forests and bogs across northern regions of North America, extending south into the northern Rocky Mountains and the Pacific Northwest.

NOCTUIDAE

LITOCALA SEXSIGNATA



CATERPILLAR Brown with subdorsal scalloped dashes; a fluffy fringe of hairs along the sublateral area.

ADULT Wingspan 3.3 centimeters. Forewings gray-black with white medial and subapical spots. Hindwings black; each hindwing has three white spots, thereby providing the basis for the specific epithet “sexsignata,” meaning six-spotted.

ECOLOGY Caterpillars are common; feed on oak and chinquapin during spring. Adults are diurnal; fly in spring. Found in oak woodlands from the Southwestern states to Washington.

NOCTUIDAE

MESOGONA RUBRA

CATERPILLAR Mottled gray, silver, black, and pink to dark brown; a distinct dark brown prothoracic shield. Head brown.

ADULT Wingspan 4.2 centimeters. Forewings red, pink-gray, or pale pink, with obscure discal spots. Hindwings red.

ECOLOGY Caterpillars are common; feed on manzanita during spring. Adults are nocturnal; fly in fall. Found in dry forests in the Pacific western states.

NOCTUIDAE

NOLA MINNA



CATERPILLAR Mottled pink-white, gray, and green-brown; clusters of hairs originate from raised areas.

ADULT Wingspan 2.3 centimeters. Forewings elongate, pale gray; each forewing has a black basal spot and a narrow black postbasal line.

ECOLOGY Caterpillars are common; feed on *Ceanothus* during late spring. Adults are nocturnal; fly in early spring. Found in wet forests in the Pacific western states.

NOCTUIDAE

OLIGIA ILLOCATA

CATERPILLAR Orange-tan to green-gray with dorsum darker than the venter; lateral line off-white.

ADULT Wingspan 4.0 centimeters. Forewings mottled red-brown; each forewing has a large white reniform spot and a black medial bar.

ECOLOGY Caterpillars are common; feed on red alder, rhododendron, and red blueberry during spring. Adults are nocturnal; fly in late summer and fall. Found in wet forests across northern regions of North America, extending south into the northern Rocky Mountains and the Pacific Northwest.

NOCTUIDAE

ONCOCNEMIS CHALYBDIS



CATERPILLAR Golden brown with faint off-white wavy longitudinal lines; middorsum of T1 with white streak bordered by dark brown; A8 and A9 swollen dorsally.

ADULT Wingspan 3.4 centimeters. Forewings pale gray; each forewing has a black median band and irregular black submarginal band. Hindwings white with broad black submarginal borders.

ECOLOGY We previously believed this species to be the closely related species *Oncocnemis piffardi* of northeastern North America. The abdomen for the moth shown here is missing because it was used for dissection of genitalia to provide confirmation of the species identity. Caterpillars are uncommon; feed on spiraea during late spring. Adults are nocturnal; fly in late summer. Found in moist montane forests and bogs of the Pacific Northwest.

NOCTUIDAE

ONCOCNEMIS NEAR COLUMBIA

CATERPILLAR Gray to light brown; longitudinal lines discontinuous and with irregular edges; dorsum of A8 swollen.

ADULT Wingspan 3.8 centimeters. Forewings light to dark gray with small discal spots and thin black basal and postmedial lines. Hindwings white with gray submarginal borders.

ECOLOGY We previously believed this specimen to be *Oncocnemis columbia* but Jim Troubridge suggests it is an undescribed species. Caterpillars are common; feed on ocean spray during late spring and early summer. Adults are nocturnal; fly in late summer. Found in dry forests ranging from northern California to Washington.

NOCTUIDAE

ONCOCNEMIS DUNBARI



CATERPILLAR Light green with faint discontinuous white markings along longitudinal lines; intersegmental area pale yellow. Top of head with lateral red dash.

ADULT Wingspan 3.4 centimeters. Forewings mottled gray with large round discal spots. Hindwings white with gray submarginal borders.

ECOLOGY Moths of this species are not attracted to UV blacklight. Caterpillars are common; feed on ocean spray during late spring and early summer. Adults are nocturnal; fly in late summer and fall. Found in wet coastal forests west of the Cascade Mountains.

NOCTUIDAE

SPECKLED GREEN FRUITWORM - *ORTHOSIA HIBISCI*

CATERPILLAR Light green with small white spots; white dorsal, subdorsal, and spiracular longitudinal lines. Head green.

ADULT Wingspan 3.8 centimeters. Forewings with a varying mix of colors of pale lavender, purple-gray, and dark red-brown with large round discal spots. Hindwings gray.

ECOLOGY This species is an occasional pest in orchards. Caterpillars are very common; feed on many broadleaf trees and shrubs, such as maple, cherry, oak, and willow. Adults are nocturnal; fly in early spring. Found in orchards, woodlands, and forests; widely distributed in western North America.

NOCTUIDAE

ORTHOSIA MYS



CATERPILLAR Brick red with dark brown shading; faint transition demarcation between a darker dorsum and a lighter venter on A7 through A10. Head black.

ADULT Wingspan 3.5 centimeters. Forewings falcate, pale to dark red with few markings. Hindwings pink-white. Males with pectinate antennae.

ECOLOGY Caterpillars are common; feed on manzanita during spring. Adults are nocturnal; fly in fall. Found in dry forests in the Pacific western states.

NOCTUIDAE

ORTHOSIA PACIFICA

CATERPILLAR Green with many small white spots; broad transverse white streak on A8; white spiracular line thicker at posterior; small black spots mark the primary setae.

ADULT Wingspan 3.9 centimeters. Forewings mottled yellow-brown with a narrow dark reniform spot. Hindwings pale brown.

ECOLOGY Caterpillars are common; feed on white oak, madrone, and snowbrush during late spring. Adults are nocturnal; fly in early spring. Found in dry forests in the Pacific western states.

NOCTUIDAE

ORTHOSIA PULCHELLA



CATERPILLAR Mottled cream, pink, and tan, otherwise nearly immaculate; black prothoracic shield. Head dark red-brown.

ADULT Wingspan 3.6 centimeters. Forewings falcate and highly variable in color and pattern, gray, red, or brown, often with a black median band. Hindwings dark gray. Male antennae are strongly pectinate.

ECOLOGY Caterpillars are common; feed on manzanita during late spring. Adults are nocturnal; fly in early spring. Found in dry forests; widely distributed in western North America.

NOCTUIDAE

ORTHOSIA TRANSPARENS



CATERPILLAR Golden-yellow and green-brown, middorsum lighter than subdorsum. Head orange-brown.

ADULT Wingspan 3.7 centimeters. Forewings falcate, light red to dark red-brown with a black reniform spot. Hindwings dark gray to black. Males with filiform antennae.

ECOLOGY Caterpillars are common; feed on madrone and rhododendron during spring. Adults are nocturnal; fly in early spring. Found in dry forests in the Pacific western states.

NOCTUIDAE

PANTHEA PORTLANDIA



CATERPILLAR Black with red spots and light brown hairs. Head black.

ADULT Wingspan 5.0 centimeters. Forewings white to dark black-gray with jagged, dentate black lines. Hindwings white with a dark submarginal band or pure gray. Males with pectinate antennae.

ECOLOGY Caterpillars are common; feed on conifers, such as Douglas-fir, during spring. Adults are nocturnal; fly in summer. Found in coniferous forests; widely distributed in western North America.

NOCTUIDAE

PERIGONICA ANGULATA

CATERPILLAR Body color may be a mixture of shades from green to yellow; faint off-white to yellow longitudinal lines, barely apparent at the subdorsal and lateral position; a few small black spots mark the primary setae.

ADULT Wingspan 3.6 centimeters. Forewings strongly falcate, pale yellow to red with faint markings. Hindwings white. Males with filiform antennae.

ECOLOGY Caterpillars are common; feed on live oak, tan oak, and chinquapin during late spring. Adults are nocturnal; fly in spring. Found in dry forests in the Pacific western states.

NOCTUIDAE

PERIGONICA PECTINATA



CATERPILLAR Green with faint white longitudinal lines and black pinaculae.

ADULT Wingspan 3.5 centimeters. Forewings slightly falcate, variable pale yellow, pink, orange or gray, often with a black reniform spot. Hindwings black. Males with pectinate antennae.

ECOLOGY Caterpillars are common; feed on chinquapin and canyon live oak during late spring. Adults are nocturnal; fly in early spring. Found in dry forests in the Pacific western states.

NOCTUIDAE

PHLOGOPHORA PERICULOSA

CATERPILLAR Color varies from a bright green to tan-brown; middorsal dashed white line with subdorsal white spots.

ADULT Wingspan 4.5 centimeters. Forewings pale pink-orange with a darker red-brown median band and the discal spots joined together.

ECOLOGY Caterpillars are common; feed on sword fern and many broadleaf trees shrubs, such as red alder, and willow, during early spring. Adults are nocturnal; fly in midsummer. Found in wet coastal forests.

NOCTUIDAE

PLATYPOLIA CONTADINA



CATERPILLAR Green with a subtle tone of yellow and mottled with white; subdorsal longitudinal line dotted white and faint; lateral longitudinal line white. Head pale green.

ADULT Wingspan 4.0 centimeters. Forewings black with large discal spots and other markings strongly outlined in white; submarginal line strongly dentate. Hindwings black; populations in wet coastal forests have a white postmedian band, but populations from the high Cascade Mountains east to the Rocky Mountains have a black postmedian band.

ECOLOGY Caterpillars are uncommon; feed on the foliage of flowering trees and shrubs, particularly huckleberry, during spring. Adults are nocturnal; fly in fall. Found in wet conifer forests; widely distributed in western North America.

NOCTUIDAE

PLEROMELLOIDA CINEREA

CATERPILLAR Dark brown with parallel wavy white and brown lines laterally on A2 through A6; dorsum with middorsal white line most distinct on A7 and A8; A7 and A8 swollen.

ADULT Wingspan 3.3 centimeters. Forewings with pale gray streaks and a thin black postmedian line and submarginal spots.

ECOLOGY Caterpillars are common; feed on snowberry during spring. Adults are nocturnal; fly in fall. Found in woodlands, and wet and dry forests; widely distributed in western North America.

NOCTUIDAE

PSEUDORTHODES IRRORATA



CATERPILLAR Light brown and tan coloration slightly darker above the spiracles; dorsum of A1 through A8 with white streaks. Colors are variable during development and among individuals. Therefore, noctuids with this appearance should be reared for reliable identification of the species.

ADULT Wingspan 3.0 centimeters. Forewings red-brown; each forewing has a small white or gray reniform spot and a thin black submarginal line. Hindwings black.

ECOLOGY Caterpillars are common; feed on hazel and red alder during spring. Adults are nocturnal; fly from spring to late summer. Found in wet forests in Pacific western states.

NOCTUIDAE

HERALD MOTH - *SCOLIOPTERYX LIBATRIX*

CATERPILLAR Green with white lateral line.

ADULT Wingspan 4.7 centimeters. Forewings strongly falcate, scalloped, gray to pale brown with a red-orange median band and white postmedian line.

ECOLOGY Caterpillars are common; feed on willow and black cottonwood during spring. Adults are nocturnal; fly throughout the year, hibernating in winter. Found in woodlands, riparian habitats, and wet and dry forests; widely distributed in western North America.

NOCTUIDAE

STRETCHIA MURICINA



CATERPILLAR Green with a dorsal and subdorsal longitudinal white line. Head yellow-green.

ADULT Wingspan 3.2 centimeters. Forewings with the orbicular and reniform spots fused together to form a large, white v-shaped spot, the median area dark gray to red with the discal spots outlined in black, the postmedian and submarginal area white to pale gray. Males with pectinate antennae.

ECOLOGY Caterpillars are common; feed on currant and gooseberry during late spring. Adults are nocturnal; fly in early spring. Found in wet conifer forests; widely distributed in western North America.

NOCTUIDAE*SYNEDOIDA OCHRACEA*

CATERPILLAR Longitudinal bands of various shades of yellow and tan bordered in darker shaded lines, especially the subdorsal band. Head with six distinct bands.

ADULT Wingspan 4.6 centimeters. Forewings light to dark brown with a narrow black reniform spot. Hindwings orange; each hindwing has a black median band, submarginal border, and discal spot.

ECOLOGY Caterpillars are common; feed on blue and red elderberry during spring. Adults are nocturnal; fly in midsummer. Found in wet forests west of the Cascade Mountains and in riparian woodlands and forests east of the Cascade Mountains.

NOCTUIDAE

SYNGRAPHA RECTANGULA



CATERPILLAR Green with five white distinct longitudinal white bands; midabdominal prolegs only on A5 and A6. Head green.

ADULT Wingspan 3.5 centimeters. Forewings black; each forewing has contrasting white basal and submarginal areas and a large white, bifurcate stigma. Hindwings pale brown with broad black submarginal borders.

ECOLOGY Caterpillars are common; feed on conifers, primarily Pinaceae such as Douglas-fir, during spring. Adults are nocturnal; fly in midsummer. Found in wet conifer forests of the Pacific Northwest and northern Rocky Mountains, and is common in wet coastal forests.

NOCTUIDAE

TESAGROTIS CORRODERA

CATERPILLAR Light brown and green-brown with a darker green-brown scalloped lateral line edged in white below; dorsum with oblique dark green-brown bands edged in white behind. Head tan.

ADULT Wingspan 4.0 centimeters. Forewings with red-brown streaks with a yellow streak at the reniform spot. Hindwings white with gray margin.

ECOLOGY Caterpillars are uncommon; feed on bitterbrush during late spring. Adults are nocturnal; fly in late summer. Found in open pine forests, juniper woodlands, and sagebrush rangelands; widely distributed in western North America.

NOCTUIDAE

XESTIA MUSTELINA



CATERPILLAR Brown; broad white lateral band.

ADULT Wingspan 3.6 centimeters. Forewings pink-gray with very large gray discal spots outlined in black.

ECOLOGY Previously known as *Anomogyna mustelina*. Caterpillars are common; feed on many broadleaf trees and conifers, such as Douglas-fir, madrone, huckleberry, and myrica, during spring. Adults are nocturnal; fly in late summer. Found in wet conifer forests; widely distributed in western North America.

NOCTUIDAE

XYLENA BRUCEI



CATERPILLAR Brown with lateral white line edged in black above; dorsum mottled with white streaks and a faint subdorsal longitudinal white line; venter light brown to brown-green. Head tan with two oblique black lines.

ADULT Wingspan 5.2 centimeters. Forewings pale gray with discal spots and wing margins outlined in black. Hindwings dark brown.

ECOLOGY Caterpillars are uncommon; feed on bitterbrush during spring. Adults are nocturnal; fly from fall, through the winter, and into the spring. Found in open pine forests and juniper woodlands; widely distributed in western North America.

NOCTUIDAE

ZALE LUNATA - LUNATA MOTH



CATERPILLAR Gray with shades of brown to solid tan; A1 and A8 swollen dorsally with two minutely pointed tips; middorsally a light longitudinal band bordered by a darker band.

ADULT Wingspan 4.8 centimeters. Forewings may have a varying mix of yellow, red-brown and black mottled with fine dark lines, apical part of the postmedian line is strongly dentate.

ECOLOGY Caterpillars are common; feed on blackberry and willow during spring. Adults are nocturnal; fly in spring and late summer. Found in wet coastal forests west of the Cascade Mountains and in riparian environments east of the Cascade Mountains.

NOCTUIDAE

ZALE TERMINA

CATERPILLAR Light gray with dark gray longitudinal lines; subdorsal line nearly black and scalloped; prolegs on A3 smaller than on A6.

ADULT Wingspan 3.7 centimeters. Forewings dark gray with fine lines and black basal and postmedian bands. Hindwings dark gray with fine black lines and scalloped margins.

ECOLOGY Caterpillars are common; feed on live oak and chinquapin during spring. Adults are nocturnal; fly from early to midsummer. Found in dry forests and oak woodlands of the southwest and Pacific western states.

NOCTUIDAE

ZOTHECA TRANQUILLA



CATERPILLAR Middorsal line of yellow circles bordered in black; subdorsal pale purple band; lateral-ventral area solid yellow with black spots.

ADULT Wingspan 3.6 centimeters. Forewings white with green highlights and a (very) few tan tones (more on the thorax), with a background of off-white with faint, light green tones. Hindwings are whiter than the forewings.

ECOLOGY Caterpillars are common; feed on blue and red elderberry during spring. Adults are nocturnal; fly in midsummer. Found in wet coastal forests west of the Cascade Mountains and in riparian habitats associated with coniferous forests east of the Cascade Mountains.

NOTODONTIDAE

FURCULA CINEREA

CATERPILLAR Yellow-green; dorsum with brown saddles edged in red on T1, A4, A5, A8, and A9; elongate anal prolegs create the appearance of a forked tail and ringed with brown, green and red.

ADULT Wingspan 4.0 centimeters. Forewings pale to dark gray with dark gray or black bands and fine black spots along the margins.

ECOLOGY Caterpillars are uncommon; feed on willow during July and August. Adults are nocturnal; fly from spring to midsummer. Found in wet forests and riparian habitats; widely distributed in western North America.

NOTODONTIDAE

FURCULA SCOLOPENDRINA



CATERPILLAR Yellow; dorsum with brown black saddles on T1 through T3, A2 through A7, and A8 through A10; elongate anal prolegs create the appearance of a forked tail.

ADULT Wingspan 3.5 centimeters. Forewings elongate and white with black bands and fine black spots along the wing margins.

ECOLOGY Caterpillars are uncommon; feed on willow and poplar during spring. Adults are nocturnal; fly throughout the summer. Found in wet forests; widely distributed in North America.

NOTODONTIDAE

GREEN OAK CATERPILLAR - *NADATA GIBBOSA*

CATERPILLAR Late instar: green with yellow spots; red spiracles; transverse yellow streak across A9; pale yellow middorsal longitudinal line.

ADULT Wingspan 5.6 centimeters. Forewings yellow with brown-tan shading; each forewing has an orange discal cell; the reniform spot consists of two small white dots, and narrow dark basal and postmedian lines.

ECOLOGY This is one of many caterpillars that exhibit more than one color phase, either by stage of development, genetic polymorphism, or other environmental factors. Color phases differ according to age. Caterpillars common on white oak during July and August. Adults are nocturnal; fly in midsummer. Found in oak woodlands; widely distributed in North America.

NOTODONTIDAE

SCHIZURA CONCINNA - REDHUMPED CATERPILLAR



CATERPILLAR Yellow with multiple white bands separated by black stripes along the subdorsal region; white streaks bordered in black at the base of the midabdominal prolegs; middorsum of T3 red. Head red.

ADULT Wingspan 3.5 centimeters. Forewings pale yellow with shades of lavender and few markings except for a dark purple band across the inner margin. Hindwings white in males (see photo) and brown in females.

ECOLOGY Early instars are gregarious and solid yellow with black spines. When agitated the odor of glacial acetic acid is emitted from the larvae. Caterpillars are common on many broadleaf trees and shrubs, particularly snowbrush and white oak, during July and August. Adults are nocturnal; fly in midsummer; moths are not as commonly collected relative to the common presence of caterpillars. Found in oak woodlands and forests; widely distributed in western North America.

NOTODONTIDAE

FALSE UNICORN CATERPILLAR - *SCHIZURA IPOMOEAE*

CATERPILLAR Head, T1, and A1 through A10 tan or light brown with red veined markings; T2 and T3 a distinctive green with a reddish middorsal line; A1, A5, and A8 with dorsal humps tipped with a pair of small wart-like tubercles; A1 through A4, and A6 with middorsal white patch; A7 with an oblique middorsal white band; small spots of yellow at the base of dorsal setae on A2 through A4, A6, and A8; primary setae long. Head tan with two oblique bands.

ADULT Wingspan 4.5 centimeters. Forewings a mottled brown and pale gray; each forewing has a small pale reniform spot, narrow dentate basal and postmedian lines, and black marginal dashes. Hindwings white in males (see photo) and brown in females.

ECOLOGY Caterpillars are common on white oak, madrone, dogwood, and hawthorn from July to September. Adults are nocturnal; fly from late spring to late summer. Found in woodlands, and wet and dry forests; widely distributed in North America.

NOTODONTIDAE

SCHIZURA UNICORNIS - UNICORN CATERPILLAR



CATERPILLAR Head, T1, and A1 through A10 dark to gray black; T2 and T3 a distinctive green; A1, A5, and A8 with dorsal humps tipped with a single elongate tubercle; A7 with an oblique middorsal white band; primary setae short.

ADULT Wingspan 3.5 centimeters. Forewings pale pink and gray; each forewing has a small black reniform spot, a broad yellow subapical patch, and small black subapical dashes.

ECOLOGY Caterpillars are common; feed on cherry, apple, hawthorn, oak, and dogwood during spring. Adults are nocturnal; fly from late spring to late summer. Found in woodlands, and wet and dry forests; widely distributed in North America.

SATURNIIDAE

POLYPHEMUS MOTH - *ANTHRAEA POLYPHEMUS*

CATERPILLAR Green; base of primary setae red, subdorsal and lateral setae have a silver shading below; end of prolegs with yellow ring and tipped in black; diagonal streak of black and silver on A9. Head and true legs brown.

ADULT Wingspan 12.2 centimeters. Forewings tan-brown with pink edges to the basal and submarginal lines, reniform spot is round and translucent, apical spot is small and black. Hindwings tan-brown; each hindwing has a broad black submarginal line and a large black, blue, and yellow discal eyespot.

ECOLOGY Caterpillars are common; feed on many broadleaf trees, such as white oak and big-leaf maple, during late spring. Adults are nocturnal; fly between late spring and early summer. Found in wet forests; widely distributed in western North America.

SATURNIIDAE

Coloradia pandora - PANDORA MOTH



CATERPILLAR Dark brown with white spots and light yellow-mustard green transverse bands at the anterior of each segment; middorsal, subdorsal and lateral white longitudinal dashed bands.

ADULT Wingspan 8.1 centimeters. Forewings black-brown with gray scales, basal and postmedian lines are black and jagged to dentate, reniform spot is small, black, and round. Hindwings pink; each hindwing has a round, black reniform spot and black postmedian line and submarginal border.

ECOLOGY Caterpillars are very common; feed on conifers, particularly ponderosa pine, during late summer; overwintering, with development completed in June. Pupae remain in the soil for one year. Adults are crepuscular/nocturnal, fly in midsummer. Found in dry coniferous forests, particularly abundant in ponderosa pine forests where it is considered a pest; widely distributed in western North America.

SATURNIIDAE

BROWN DAY MOTH - *HEMILEUCA EGLANTERINA*

CATERPILLAR This brownish black caterpillar has whorls of orange hairs on dorsal and subdorsal black spines. Black spines also occur laterally and sublaterally with off-white hairs; white spiracular band. Gregarious early instars are solid black.

ADULT Wingspan 6.4 centimeters. Forewings rose-pink and orange; each forewing has black basal and postmedian bands, a round reniform spot and submarginal dashes. Hindwings orange with a similar pattern of black as on forewings. Abdomen orange with black bands. Color variants may lack all black markings, with pure unmarked rose-pink and orange wings or the black markings may be distinct, or greatly enlarged covering most of the wing.

ECOLOGY The hairy spines of this caterpillar are urticating. Caterpillars are common, generalist feeders on flowering trees and shrubs, particularly Rosaceae, such as rose, hawthorn, cherry, serviceberry, and bitterbrush, during spring. Adults are diurnal; fly in midsummer. Found in woodlands, and wet and dry forests; widely distributed in western North America.

SATURNIIDAE

HYALOPHORA EURYALUS - CEANOTHUS SILK MOTH



CATERPILLAR This caterpillar changes colors as it develops and molts (see Chapter 3, page 20). Mid-instars are the most brilliantly colored with nine pairs of dorsal yellow spines, the first three pairs with partial to complete black rings; a middorsal yellow spine on A8; two rows of lateral blue spines tipped with white along T1 through A8; white-tipped blue spines also occur on the head, at the base of the true legs, and in the anal region; body ranges from green to white-green. Later instars white-green with white spines.

ADULT Wingspan 10.3 centimeters. Forewings variable rose-red, purple-red or dark red-brown; each forewing has a large white, comma-shaped reniform spot, white basal and postmedian lines, and a round black subapical spot. Hindwings similar to the forewings, but each hindwing has an extremely elongate reniform spot.

ECOLOGY Caterpillars are common on snowbrush and bitterbrush, sometimes found on Douglas-fir, during July and August. Adults are nocturnal; fly in spring. Found in woodlands, and wet and dry forests; widely distributed in the Pacific Northwest.

SATURNIIDAE

SATURNIA MENDOCINO

CATERPILLAR Highly variable through the various instars. Late instars (shown here) are dorsally yellow with fine wispy white hairs and some patches of shorter densely packed orange hairs; ventrally black anterior to the prolegs. Head brown.

ADULT Wingspan 6.5 centimeters. Forewings dark brown; each forewing has a round black reniform spot. Hindwings yellow-orange; each hindwing has a black postmedian band and round reniform spot.

ECOLOGY The hairs on the caterpillar are urticating. Caterpillars are uncommon; feed on the foliage of manzanita, madrone, and species of *Ceanothus*. Adults are diurnal; fly in early spring. Found in dry forests, ranging from California to western Oregon.

SPHINGIDAE

PACHYSPHINX OCCIDENTALIS



CATERPILLAR Light green dotted with white; oblique white band extends from subventral area of A6 to tip of horn on A8; oblique white lines on A1 through A6 extend from in front of the spiracle to the dorsum of the adjacent posterior segment; transverse white band at the base of the anal prolegs. Head green with converging yellow bands.

ADULT Wingspan 12.5 mm. Forewings pale yellow or gray; each forewing has a brown medial band. Hindwings have a central patch of purple-red, and a blue anal spot crossed with a black dash.

ECOLOGY Caterpillars are uncommon; feed on willow and black cottonwood during July and August. Adults are nocturnal; fly from mid- to late summer. Found in riparian habitats in low elevation desert regions of western North America.

SPHINGIDAE

BLIND EYED SPHINX - *PAONIAS EXCAECATUS*

CATERPILLAR Yellow-green with dense white speckles; oblique yellow line extends from the base of proleg on A6 to dorsal horn on A8; also six oblique yellow lines from A1 through A6; white spiracles with black rim. Head green, edged in white along posterior margin.

ADULT Wingspan 7.8 centimeters. Forewings pale to dark brown with the outer margins scalloped. Hindwings rose-red; each hindwing has a round black anal spot containing a solid blue pupil.

ECOLOGY Caterpillars are common; feed on foliage of trees and shrubs, particularly oaks and ocean spray, during July and August. Adults are nocturnal; fly from late spring to midsummer. Found in dry forests west of the Cascade Mountains and in riparian forests east of the Cascade Mountains.

SPHINGIDAE

SMERINTHUS CERISYI



CATERPILLAR Green with white speckles, yellow lines dorsally are longitudinal and laterally they are oblique stripes just above the spiracles; a prominent oblique white stripe extends to the tip of the horn which is purple. Head green with two lateral yellow lines.

ADULT Wingspan 7.8 centimeters. Forewings falcate, pale gray with darker red or black-brown lines and bands, the outer margins not scalloped. Hindwings rose-red with gray-tan margins; each hindwing has a blue ring on a round black anal spot, creating the appearance of an eyespot.

ECOLOGY Caterpillars are common; feed on the foliage of willow and poplar. Adults are nocturnal; fly from spring to early summer. Found in wet forests in western North America, particularly in coastal forests, riparian forests east of the Cascade Mountains, and quaking aspen forests of the Rocky Mountains.

SPHINGIDAE

SEQUOIA SPHINX - *SPHINX SEQUOIAE*

CATERPILLAR Dark green with bright white patches dorsally and subdorsally; lateral white patches on thorax without brown shading; lateral white patches on abdomen with brown shading above; black spiracles with white rim. Head green with faint oblique yellow-green lines.

ADULT Wingspan 5.0 centimeters. Forewings gray with narrow black lines. Hindwings solid gray without markings. Thorax gray with two narrow black lines. Abdomen with black and gray lateral spots or bands.

ECOLOGY Caterpillars are common; feed on foliage of western juniper during July and August. Adults are nocturnal; fly in midsummer. Found in dry forests with cedars in the Pacific West, and particularly abundant in juniper woodlands east of the Cascade Mountains.

THYATIRIDAE

CERANEMOTA FASCIATA



CATERPILLAR Mottled white, tan, black, and yellow; tail-end of abdomen typically held above the substrate.

ADULT Wingspan 4.0 centimeters. Forewings white to gray with wavy, black lines in the basal band and postmedian band.

ECOLOGY Caterpillars are common; feed on serviceberry during late spring. Adults are nocturnal; fly in late fall. Found in coastal wet forests in the Pacific western states.

THYATIRIDAE

LETTERED HABROSYNE - *HABROSYNE SCRIPTA*

CATERPILLAR Tan-golden orange and light brown mottled pattern; abdomen with a middorsal, longitudinal black line and transverse black bands, laterally with slightly curved black dashes. Head gold-orange.

ADULT Wingspan 3.8 centimeters. Forewings gray-brown with faint pink basal and submarginal lines and a zigzag postmedian line. Hindwings pale gray-brown and immaculate.

ECOLOGY Caterpillars are uncommon; feed on salmonberry. Adults are nocturnal; fly from midsummer to fall. Found in wet coastal forests; widely distributed in western North America.

THYATIRIDAE

PSEUDOTHYATIRA CYMATOPHOROIDES



CATERPILLAR Tan-gold-orange and light brown mottled pattern; abdomen with middorsal longitudinal black line. Head gold-orange.

ADULT Wingspan 4.2 centimeters. Forewings angular, pale gray-brown with narrow dentate basal, postmedian, and submarginal lines, some moths with a black basal band and subanal spot. Hindwings transition from light to dark gray toward the margin, immaculate.

ECOLOGY Caterpillars are uncommon; feed on thimbleberry. Adults are nocturnal; fly from late spring to late summer. Found most often in wet coastal forests; widely distributed in western North America.

COMMON AND SCIENTIFIC NAMES OF HOSTPLANTS

A

Abies amabilis - Pacific silver fir
Abies grandis - grand fir
Acer macrophyllum - big-leaf maple
 alfalfa - *Medicago sativa*
Alnus incana - mountain alder
Alnus rubra - red alder
Amelanchier alnifolia - serviceberry
Arabis - rockcress
Arbutus menziesii - madrone
Arceuthobium - dwarf mistletoe
Arctostaphylos manzanita - manzanita
Arctostaphylos viscida - whiteleaf manzanita
Aristolochia californica - Dutchman's pipevine
Artemisia dracuncululus - green sagebrush
Artemisia tridentata - big sagebrush
Asclepias spp. - milkweed
Aster - aster
 azalea - *Rhododendron occidentale*

B

big-leaf maple - *Acer macrophyllum*
 big sagebrush - *Artemisia tridentata*
 bitter cherry - *Prunus emarginata*
 bitterbrush - *Purshia tridentata*
 black cottonwood - *Populus trichocarpa*
 black oak - *Quercus kelloggii*
 bleeding heart - *Dicentra formosa*
 blue elderberry - *Sambucus cerulea*
 blueberry - *Vaccinium* spp.
 buckbrush - *Ceanothus cuneatus*

C

cascara - *Rhamnus purshiana*
 Canadian thistle - *Cirsium arvense*
 canyon live oak - *Quercus chrysolepis*
Ceanothus cuneatus - buckbrush
Ceanothus integerrimus - tobaccobrush
Ceanothus velutinus - snowbrush
 chinquapin - *Chrysolepis chrysophylla*
Chrysolepis chrysophylla - chinquapin
Ceanothus cordulatus - snowbush
Cirsium arvense - Canadian thistle
 clover - *Trifolium*
Cornus nuttalli - Pacific dogwood
Cornus stolonifera - red-stem osier
Corylus cornuta - hazel
 cow parsnip - *Heracleum lanatum*
Crataegus douglasii - hawthorn
 currant - *Ribes* spp.
 Cusick's checker-mallow - *Sidalcea cusickii*
Cymopterus - cymopterus
Cynoglossum occidentale - hound's tongue

D

Dacus carota - Queen Anne's lace
 dandelion - *Taraxicum officinale*
Dicentra formosa - bleeding heart
 dogwood - *Cornus* spp.
 Douglas-fir - *Pseudotsuga menziesii*
 Dutchman's pipevine - *Aristolochia californica*
 dwarf mistletoe - *Arceuthobium*

E

Epilobium angustifolium - fireweed

F

fennel - *Foeniculum vulgare*
 fireweed - *Epilobium angustifolium*
Foeniculum vulgare - fennel

G

Gaultheria shallon - salal
 gooseberry - *Ribes* spp.
 grand fir - *Abies grandis*
 green sagebrush - *Artemisia dracuncululus*

H

hawthorn - *Crataegus douglasii*
 hazel - *Corylus cornuta*
Heracleum lanatum - cow parsnip
Holodiscus discolor - ocean spray
 hound's tongue - *Cynoglossum occidentale*

J

Juniperus occidentalis - western juniper

K

Kincaid's lupine - *Lupinus sulphureus kincaidii*

L

Lithocarpus densiflorus - tan oak
Lomatium - lomatium
Lonicera ciliosa - orange honeysuckle
Lonicera involucrata - twinberry
 lotus - *Lotus*
Lotus - lotus
Lupinus sulphureus kincaidii - Kincaid's lupine

M

madrone - *Arbutus menziesii*
 manzanita - *Arctostaphylos manzanita*
Medicago sativa - alfalfa
 milkweed - *Asclepias*
 mock orange - *Philadelphus lewisii*
 mountain alder - *Alnus incana*
 myrica - *Myrica californica*
Myrica californica - myrica

N

nettle - *Urtica* spp.
 ninebark - *Physocarpus capitatus*

O

oak - *Quercus* spp.
 ocean spray - *Holodiscus discolor*
 Orange honeysuckle - *Lonicera ciliosa*

P

Pacific dogwood - *Cornus nuttallii*
 Pacific silver fir - *Abies amabilis*
 penstemon - *Penstemon*
Penstemon - penstemon
Philadelphus lewisii - mock orange
Phoradendron - mistletoe
Physocarpus capitatus - ninebark
 pine - *Pinus* spp.
Pinus contorta - lodgepole pine, shore pine
Pinus monticola - western white pine
Pinus ponderosa - ponderosa pine
Polystichum munitum - sword fern
 Ponderosa pine - *Pinus ponderosa*
Populus tremuloides - quaking aspen
Populus trichocarpa - black cottonwood
Prunus emarginata - bitter cherry
Pseudotsuga menziesii - Douglas-fir
Purshia tridentata - bitterbrush

Q

quaking aspen - *Populus tremuloides*
 Queen Anne's lace - *Dacus carota*
Quercus chrysolepis - canyon live oak
Quercus garryana - white oak

R

red alder - *Alnus rubra*
 red elderberry - *Sambucus racemosa*
 red stem osier - *Cornus stolonifera*
Rhamnus purshiana - cascara
 rhododendron - *Rhododendron macrophyllum*
Rhododendron macrophyllum - rhododendron
Rhododendron occidentale - azalea
Ribes cereum - squaw currant
Ribes viscosissimum - sticky currant
 rockcress - *Arabis*
 Rosa - rose
 rose - *Rosa*
Rubus spectabilis - salmonberry

S

salal - *Gaultheria shallon*
 Salix - willow
 salmonberry - *Rubus spectabilis*
Sambucus cerulea - blue elderberry
Sambucus racemosa - red elderberry
Sedum - stonecrop
Senecio jacobaeae - tansy ragwort
 serviceberry - *Amelanchier alnifolia*
Sidalcea cusickii - Cusick's checker-mallow
Sisymbrium - tumbledustard
 snowberry - *Symphoricarpos albus*
 snowbrush - *Ceanothus velutinus*
 snowbush - *Ceanothus cordulatis*
 spiraea - *Spiraea douglasii*
Spiraea douglasii - spiraea
 sticky currant - *Ribes viscosissimum*
 stonecrop - *Sedum* spp.

sword fern - *Polystichum munitum*
Symphoricarpos albus - snowberry

T

tan oak - *Lithocarpus densiflorus*
 tansy ragwort - *Senecio jacobaeae*
Taraxicum officinale - dandelion
Thuja plicata - western red cedar
 tobaccobrush - *Ceanothus integerrimus*
Trifolium - clover
Tsuga heterophylla - western hemlock
 tumbledustard - *Sisymbrium*
 twinberry - *Lonicera involucrata*

V

vetch - *Vicia villosa*
Vicia villosa - vetch

W

western hemlock - *Tsuga heterophylla*
 western juniper - *Juniperus occidentalis*
 western red cedar - *Thuja plicata*
 western white pine - *Pinus monticola*
 whiteleaf manzanita - *Arctostaphylos viscida*
 white oak - *Quercus garryana*
 willow - *Salix*

HOSTPLANTS RECORDED FOR FIELD-REARED CATERpillARS

(includes species not featured in photographs)

A**ALUCITIDAE**

Alucita hexadactyla
Symphoricarpos albus

ARCTIIDAE

Arctia caja
Salix sp.

Cisseps fulvicollis
Poaceae

Clemensia albata
Quercus garryana

Ctenucha rubroscapus
Dactylus glomerata

Gnophaela latipennis
Cynoglossum occidentale

Grammia ornata
Centaurea montana (ornamental)

Hyphantria cunea
Alnus incana
Alnus rubra
Crataegus douglasii
Populus trichocarpa
Salix sp.

Lophocampa argentata
Pinus contorta
Pseudotsuga menziesii
Tsuga heterophylla

Lophocampa maculata
Acer circinatum
Alnus rubra
Holodiscus discolor
Salix sp.

Platyrepia virginalis
Amsinckia retrorsa
Poaceae

Spilosoma virginica
Holodiscus discolor
Sambucus cerulea

Tyria jacobaeae
Senecio jacobaea

C**CHOREUTIDAE**

Choreutis diana
Alnus sinuata

COCHYLIDAE

Cochyliis sp.
Baccharis pilularis

COPROMORPHIDAE

Lotisma trigonana
Arctostaphylos columbica

COSMOPTERYGIDAE

Sorhagenia nimbosa
Rhus diversiloba

D**DANAIDAE**

Danaus plexippus
Asclepias sp.

DIOPTIDAE

Phryganidia californica
Chrysolepis chrysophylla
Lithocarpus densiflorus
Quercus chrysolepis
Quercus garryana

DREPANIDAE

Drepana arcuata
Alnus rubra
Alnus sinuata

G**GELECHIIDAE**

Athrips rancidella
Cotoneaster (ornamental)

GELECHIIDAE, *Chionodes* spp. - GEOMETRIDAE, *Cochisea sinuaria*

Chionodes spp.
Alnus sinuata
Arctostaphylos columbiana
Quercus garryana

Gelechia dromicella
Ribes lobii

Gelechia panella
Arctostaphylos patula

Pseudochelaria manzanitae
Arctostaphylos columbiana
Arctostaphylos patula

Pseudochelaria scabrella
Arctostaphylos columbiana

Telphusa sedulitella
Arctostaphylos sp.
Chrysolepsis chrysophylla
Quercus garryana
Quercus kelloggii

GEOMETRIDAE

Aethaloida packardaria
Ceanothus cuneatus
Ceanothus integerrimus

Aethalura intertexta
Alnus incana
Rhamnus purshiana

Anacamptodes clivinaria
Ceanothus cuneatus
Ceanothus integerrimus
Purshia tridentata
Quercus garryana

Anagoga occiduaria
Acer circinatum
Alnus sinuata
Holodiscus discolor
Vaccinium membranaceum

Anavitrinella pampinaria
Ceanothus cuneatus
Ceanothus integerrimus

Apodrepanulatrix litaria
Ceanothus velutinus

Archiearis infans
Alnus incana
Alnus rubra

Besma quercivoraria
Quercus garryana

Biston betularia
Alnus rubra
Holodiscus discolor
Salix sp.
Vaccinium parvifolium

Cabera erythemaria
Salix spp.

Campaea perlata
Acer circinatum
Acer macrophyllum
Alnus rubra
Alnus sinuata
Amelanchier alnifolia
Cornus stolonifera
Corylus cornuta
Holodiscus discolor
Prunus emarginata
Quercus garryana
Rhamnus purshiana
Ribes sanguineus
Salix sp.
Sambucus racemosa
Symphoricarpos albus
Vaccinium parvifolium

Caripeta divisata
Pseudotsuga menziesii
Tsuga heterophylla

Chesiadodes cinerea
Chrysothamnus viscidiflorus

Chlorochlamys triangularis
Chrysothamnus naseosus
Chrysothamnus viscidiflorus

Chlorosea banksaria
Holodiscus discolor
Purshia tridentata

Cochisea sinuaria
Arctostaphylos viscida

GEOMETRIDAE, *Cyclophra dataria* - G., *Epirrhoe alternata*

Cyclophora dataria
Chrysolepsis chrysophylla
Quercus chrysolepis
Quercus garryana

Cyclophora pendulinaria
Alnus rubra
Alnus sinuata

Dasyfidonia avuncularia
Prunus emarginata

Drepanulatrix carneararia
Ceanothus velutinus

Drepanulatrix falcataria
Ceanothus cuneatus
Ceanothus integerrimus
Ceanothus sanguineus
Ceanothus velutinus

Drepanulatrix foeminaria
Ceanothus cordulatus
Ceanothus cuneatus
Ceanothus integerrimus
Ceanothus sanguineus
Ceanothus velutinus

Drepanulatrix monicaria
Ceanothus cuneatus
Ceanothus integerrimus
Ceanothus thyrsiflorus
Ceanothus velutinus

Drepanulatrix quadraria
Ceanothus velutinus

Drepanulatrix secundaria
Ceanothus sanguineus
Ceanothus velutinus

Drepanulatrix unicalcararia
Ceanothus cuneatus
Ceanothus integerrimus
Ceanothus velutinus

Dysstroma brunneata
Ribes cereum
Ribes sanguineus
Ribes viscosissimum

Dysstroma citrata
Alnus sinuata
Rubus parviflorus

Dysstroma formosa
Ribes cereum
Ribes cruentum
Ribes sanguineus
Ribes viscosissimum

Dysstroma ochrofuscaria
Corylus cornuta

Dysstroma sobria
Gaultheria shallon
Rhododendron macrophyllum

Dysstroma walkerata
Ribes cereum

Ectropis crepuscularia
Ceanothus integerrimus
Pseudotsuga menziesii
Rhamnus purshiana
Rubus spectabilis
Salix sp.
Symphoricarpos albus
Tsuga heterophylla
Vaccinium membranaceum

Elpiste lorquinaria
Alnus incana
Alnus rubra
Alnus sinuata
Populus tremuloides
Salix sp.

Elpiste metanemaria
Baccharis pilularis

Ennomos magnaria
Alnus rubra
Salix sp.

Enypia packardata
Abies grandis
Pseudotsuga menziesii
Tsuga mertensiana

Epirrhoe alternata
Galium sp.

GEOMETRIDAE, *Erannis tiliaria* - G., *Eupithecia misturata**Erannis tiliaria*

Acer circinatum
Alnus rubra
Amelanchier alnifolia
Corylus cornuta
Crataegus douglasii
Prunus emarginata
Quercus garryana
Rosa sp.
Salix sp.

Euchlaena johnsonaria

Philadelphus lewisii
Rhamnus purshiana
Vaccinium parvifolium

Euchlaena tigrinaria

Alnus sinuata
Amelanchier alnifolia
Balsamorhiza sagittata
Cornus stolonifera
Corylus cornuta
Crataegus douglasii
Quercus chrysolepis
Rhamnus purshiana
Salix sp.

Eudrepanulatrix rectifascia

Ceanothus integerrimus
Ceanothus sanguineus
Ceanothus velutinus

Eulithis destinata

Vaccinium membranaceum
Vaccinium ovatum

Eulithis propulsata

Ribes cruentum

Eulithis xylina

Alnus incana
Amelanchier alnifolia
Cornus stolonifera
Corylus cornuta
Crataegus douglasii
Holodiscus discolor
Physocarpus capitatus
Populus trichocarpa
Prunus emarginata
Prunus virginiana
Rhododendron occidentale
Rosa sp.
Salix sp.
Sorbus scopulina
Spiraea douglasii
Vaccinium alaskense
Vaccinium membranaceum
Vaccinium parvifolium

Eupithecia annulata

Abies grandis
Tsuga heterophylla

Eupithecia columbiata

Quercus garryana

Eupithecia formosa

Adenocaulon bicolor

Eupithecia georgii

Alnus sinuata
Ceanothus velutinus

Eupithecia gilvipennata

Arctostaphylos columbiana
Arctostaphylos patula

Eupithecia graefii

Arbutus menziesii
Arctostaphylos columbiana

Eupithecia harveyata

Ceanothus sanguineus

Eupithecia luteata

Quercus garryana

Eupithecia maestosa

Amelanchier alnifolia
Ceanothus cuneatus
Fraxinus latifolia
Holodiscus discolor
Sambucus cerulea

Eupithecia misturata

Acer circinatum
Amelanchier alnifolia
Arctostaphylos patula
Baccharis pilularis
Ceanothus cuneatus
Ceanothus integerrimus
Ceanothus sanguineus
Ceanothus thyrsoiflorus

GEOMETRIDAE, *Eupithecia misturata* - G., *Hydriomena perfracta**Eupithecia misturata* (continued)

Ceanothus velutinus
Chrysothamnus naseosus
Cornus stolonifera
Holodiscus discolor
Lithocarpus densiflorus
Quercus garryana
Rubus discolor
Salix sp.
Senecio jacobaea
Sorbus scopulina
Spiraea douglasii
Vaccinium alaskense
Vaccinium membranaceum

Eupithecia nevadata
Ceanothus velutinus
Crataegus douglasii
Purshia tridentata

Eupithecia olivacea
Abies grandis

Eupithecia ravocostaliata
Rhamnus occidentalis
Rhamnus purshiana

Eupithecia sabulosata
Arbutus menziesii
Calocedrus decurrens
Pseudotsuga menziesii
Thuja plicata

Eupithecia subapicata
Arbutus menziesii
Vaccinium parvifolium

Eupithecia subcolorata
Vaccinium parvifolium

Eustroma fasciata
Abies grandis

Eustroma semiatrata
Vaccinium parvifolium

Gabriola dyari
Abies grandis
Pseudotsuga menziesii
Tsuga heterophylla

Hesperumia latipennis
Ceanothus cuneatus
Ceanothus sanguineus
Corylus cornuta
Holodiscus discolor
Quercus garryana
Ribes cereum
Sambucus cerulea
Symphoricarpos albus
Vaccinium parvifolium

Hesperumia sulphuraria
Amelanchier alnifolia
Arbutus menziesii
Arctostaphylos patula
Arctostaphylos viscida

Ceanothus cuneatus
Ceanothus integerrimus
Ceanothus sanguineus
Ceanothus velutinus
Corylus cornuta
Holodiscus discolor
Purshia tridentata
Ribes cereum
Ribes cruentum
Salix spp.
Vaccinium alaskense
Vaccinium membranaceum
Vaccinium parvifolium

Hydriomena edenata
Quercus garryana

Hydriomena expurgata
Quercus kelloggii

Hydriomena irata
Quercus garryana
Pseudotsuga menziesii

Hydriomena manzanita
Arbutus menziesii
Arctostaphylos patula

Hydriomena nubilofasciata
Quercus garryana

Hydriomena perfracta
Quercus garryana

GEOMETRIDAE, *Hydriomena renunciata* - G., *Neoalcis californiaria**Hydriomena renunciata*

Alnus rubra
Quercus garryana

Hypagyrtis unipunctata

Acer macrophyllum
Alnus rubra
Amelanchier alnifolia
Corylus cornuta
Physocarpus capitatus
Quercus garryana

Iridopsis emasculata

Acer circinatum
Alnus rubra
Ceanothus integerrimus
Sambucus sp.
Vaccinium membranaceum
Vaccinium parvifolium

Itame anataria

Physocarpus capitatus

Itame bitactata

Ribes cereum
Ribes viscosissimum

Itame colata

Artemisia tridentata
Purshia tridentata

Itame exauspicata

Acer circinatum
Physocarpus capitatus

Itame guenearia

Rhamnus occidentalis

Itame plumosata

Acer glabrum

Itame quadrilinearia

Ceanothus integerrimus
Ceanothus velutinus

Lambdina fiscellaria

Acer circinatum
Alnus rubra
Alnus sinuata
Gaultheria shallon
Holodiscus discolor
Prunus emarginata
Quercus garryana
Tsuga heterophylla

Mesoleuca gratulata

Corylus cornuta

Nematocampa resistaria

Acer macrophyllum
Alnus rubra
Arctostaphylos sp.
Ceanothus integerrimus
Ceanothus velutinus
Cornus nuttallii
Mentha piperita
Quercus garryana
Ribes lobbii

Nemoria darwiniata

Arctostaphylos columbiana
Arctostaphylos patula
Ceanothus cuneatus
Ceanothus integerrimus
Ceanothus sanguineus
Ceanothus velutinus
Chrysothamnus viscidiflorus
Myrica californica
Purshia tridentata
Quercus garryana

Neoalcis californiaria

Abies grandis
Acer circinatum
Alnus rubra
Amelanchier alnifolia
Arbutus menziesii
Arctostaphylos columbiana
Arctostaphylos viscida
Calocedrus decurrens
Ceanothus integerrimus
Ceanothus sanguineus
Ceanothus velutinus
Cedrus atlanticus
Chamaecyparis lawsoniana
Chrysolepsis chrysophylla
Corylus cornuta
Crataegus douglasii
Gaultheria shallon
Holodiscus discolor
Myrica californica
Picea sitchensis
Pinus contorta

GEOMETRIDAE, *Neocalcis californiaria* - G., *Protitame matilda**Neocalcis californiaria* (continued)

Pinus monticola
Pinus sylvestris
Polystichum munitum
Pseudotsuga menziesii
Quercus chrysolepis
Quercus garryana
Quercus kelloggii
Rhamnus purshiana
Rhododendron macrophyllum
Rosa sp.
Salix sp.
Symphoricarpos albus
Thuja plicata
Tsuga heterophylla
Umbellularia californica
Vaccinium ovatum
Vaccinium parvifolium

Neoterpes trianguliferata

Ribes cereum
Ribes viscosissimum

Nepytia umbrosaria

Abies grandis
Pseudotsuga menziesii
Tsuga heterophylla

Operophtera bruceata

Acer circinatum
Acer macrophyllum
Amelanchier alnifolia
Holodiscus discolor
Oemleria cerasiformis

Prunus avium
Prunus virginiana
Ribes cereum
Rosa sp.

Operophtera brumata

Corylus avellana

Operophtera danbyi

Fraxinus latifolia
Prunus avium
Quercus garryana

Perizoma costiguttata

Holodiscus discolor

Perizoma curvilinea

Holodiscus discolor

Pero mizon

Acer circinatum
Amelanchier alnifolia
Arbutus menziesii
Arctostaphylos columbiana
Baccharis pilularis
Ceanothus integerrimus
Ceanothus sanguineus
Ceanothus velutinus
Cornus nuttallii
Corylus cornuta
Holodiscus discolor
Pachistima myrsinites
Pseudotsuga menziesii
Purshia tridentata

Quercus chrysolepis
Quercus garryana
Ribes sp.
Rosa sp.
Symphoricarpos albus
Tsuga heterophylla
Vaccinium parvifolium

Pero occidentalis

Abies grandis

Phigalia plumogeraria

Quercus garryana

Plagodis phlogosaria

Alnus rubra

Plemyria georgii

Acer circinatum
Acer macrophyllum
Alnus sinuata

Probole alienaria

Alnus rubra
Cornus nuttallii

Probole amicaria

Cornus nuttallii
Cornus stolonifera
Vaccinium parvifolium

Protitame matilda

Populus trichocarpa
Salix sp.

GEOMETRIDAE, *Protoboarmia porcelaria* - G., *Triphosa californiata*

<i>Protoboarmia porcelaria</i> <i>Pseudotsuga menziesii</i>	<i>Semiothisa respersata</i> <i>Quercus garryana</i>	<i>Synaxis formosa</i> <i>Chrysothamnus nauseosus</i>
<i>Rheumaptera subhastata</i> <i>Alnus rubra</i> <i>Alnus sinuata</i>	<i>Semiothisa signaria</i> <i>Tsuga heterophylla</i>	<i>Synaxis jubararia</i> <i>Acer circinatum</i> <i>Alnus incana</i> <i>Amelanchier alnifolia</i> <i>Ceanothus cuneatus</i> <i>Ceanothus integerrimus</i> <i>Fraxinus latifolia</i> <i>Gaultheria shallon</i> <i>Holodiscus discolor</i> <i>Rhododendron macrophyllum</i> <i>Rhododendron occidentale</i> <i>Ribes cereum</i> <i>Sambucus cerulea</i> <i>Symphoricarpos albus</i> <i>Vaccinium parvifolium</i>
<i>Sabulodes aegrotata</i> <i>Alnus rubra</i> <i>Holodiscus discolor</i> <i>Rubus spectabilis</i> <i>Sambucus racemosa</i> <i>Spiraea douglasii</i> <i>Umbellularia californica</i>	<i>Semiothisa subminiata</i> <i>Salix</i> sp.	
<i>Selenia alciphearia</i> <i>Acer circinatum</i> <i>Acer macrophyllum</i> <i>Rubus spectabilis</i>	<i>Sericosema juturnaria</i> <i>Ceanothus cordulatus</i> <i>Ceanothus cuneatus</i> <i>Ceanothus integerrimus</i> <i>Ceanothus sanguineus</i> <i>Ceanothus velutinus</i>	
<i>Semiothisa burneyata</i> <i>Calocedrus decurrens</i>	<i>Sicya crocearia</i> <i>Alnus rubra</i>	<i>Synaxis pallulata</i> <i>Picea engelmannii</i> <i>Pseudotsuga menziesii</i>
<i>Semiothisa continuata</i> <i>Juniperus occidentalis</i>	<i>Spargania magnoliata</i> <i>Epilobium angustifolium</i>	<i>Synchlora aerata</i> <i>Ceanothus integerrimus</i>
<i>Semiothisa curvata</i> <i>Chrysothamnus nauseosus</i>	<i>Stamnodes coenonympha</i> <i>Cercocarpus montanus</i>	<i>Thallophegma taylorata</i> <i>Polystichum munitum</i> <i>Vaccinium membranaceum</i>
<i>Semiothisa denticulata</i> <i>Purshia tridentata</i>	<i>Synaxis cervinaria</i> <i>Alnus sinuata</i> <i>Arbutus menziesii</i> <i>Arctostaphylos</i> sp. <i>Ceanothus integerrimus</i> <i>Purshia tridentata</i> <i>Rhamnus purshiana</i> <i>Salix</i> sp.	<i>Triphosa californiata</i> <i>Rhamnus occidentalis</i> <i>Rhamnus purshiana</i>
<i>Semiothisa neptaria</i> <i>Salix</i> sp.		

GEOMETRIDAE, *Triphosa haesitata* - LYCAENIDAE, *Mitoura grynea*

Triphosa haesitata
Rhamnus purshiana

Venusia pearsalli
Alnus rubra
Chrysolepsis chrysophylla
Quercus garryana

Xanthorhoe macdunnoughi
Symphoricarpos albus

GRACILARIIDAE

Caloptilia diversilobiella
Rhamnus purshiana

H**HELIOZELIDAE**

Coptodisca arbutiella
Arctostaphylos sp.
Gaultheria shallon

HESPERIIDAE

Epargyreus clarus
Lotus crassifolius

Erynnis propertius
Quercus chrysolepis
Quercus garryana

Pyrgus communis
Sidalcea cusickii

L**LASIOCAMPIDAE**

Malacosoma californicum
Acer circinatum
Alnus rubra
Arbutus menziesii
Ceanothus velutinus
Corylus cornuta
Physocarpus capitatus
Populus tremuloides
Purshia tridentata
Pyrus malus
Quercus garryana

Malacosoma constrictum
Quercus garryana

Malacosoma disstria
Alnus rubra
Populus trichocarpa
Quercus garryana
Salix sp.

Phyllodesma americana
Alnus incana
Alnus rubra
Alnus sinuata
Amelanchier alnifolia
Ceanothus integerrimus
Ceanothus velutinus
Chrysolepsis chrysophylla
Holodiscus discolor
Populus tremuloides
Quercus garryana

LIMACODIDAE

Tortricidea testacea
Quercus garryana

LYCAENIDAE

Celastrina argiolus
Arctostaphylos patula
Ceanothus integerrimus
Ceanothus velutinus
Cornus stolonifera
Holodiscus discolor
Physocarpus capitatus
Prunus virginiana

Habrodais grunus
Chrysolepsis chrysophylla
Quercus chrysolepis
Quercus vaccinifolia

Icaricia icarioides fenderi
Lupinus sulphureus kinkaidii

Incisalia augustinus
Arctostaphylos patula
Ceanothus integerrimus
Ceanothus velutinus
Prunus emarginata

Lycaena arota
Ribes cruentum

Mitoura grynea
Juniperus occidentalis

LYCAENIDAE, *Mitoura spinetorum* - NOCTUIDAE, *Acronicta grisea*

Mitoura spinetorum
Arceuthobium sp.

Satyrium behrii
Purshia tridentata

Satyrium californicum
Purshia tridentata

Satyrium saepium
Ceanothus cuneatus
Ceanothus integerrimus
Ceanothus velutinus

Satyrium sylvinum
Salix sp.

Strymon melinus
Sidalcea cusickii

LYMANTRIIDAE

Dasychira griseifactor
Abies grandis
Pseudotsuga menziesii

Dasychira vagans
Acer macrophyllum
Alnus rhombifolia
Amelanchier alnifolia
Corylus cornuta
Populus trichocarpa
Pyrus malus
Quercus garryana

Leucoma salicis
Populus tremuloides
Salix sp. (ornamental)

Orgyia antiqua
Arctostaphylos uva-ursi
Pseudotsuga menziesii
Quercus garryana
Salix sp.
Vaccinium sp.

Orgyia pseudotsugata
Abies grandis
Ceanothus cuneatus
Quercus kelloggii

LYONETIIDAE

Bucculatrix separabilis
Baccharis pilularis

Bucculatrix spp.
Alnus rhombifolia
Quercus garryana

N**NOCTUIDAE**

Abagrotis apposita
Arbutus menziesii
Ceanothus sanguineus

Abagrotis duanca
Artemisia tridentata

Abagrotis erratica
Symphoricarpos albus

Abagrotis glenni
Juniperus occidentalis

Abagrotis trigona
Arbutus menziesii
Vaccinium parvifolium

Abagrotis variata
Salix sp.

Abrostola urentis
Urtica dioica

Achytonix epipaschia
Pseudotsuga menziesii

Acronicta cyanescens
Ceanothus velutinus

Acronicta fragilis
Prunus sp.

Acronicta funeralis
Acer macrophyllum
Vaccinium parvifolium

Acronicta grisea
Alnus rhombifolia
Alnus rubra
Alnus sinuata

NOCTUIDAE, *Acronicta hesperida* - N., *Aseptis binotata*

Acronicta hesperida
Alnus rubra

Acronicta impressa
Purshia tridentata
Rosa sp.

Acronicta impleta
Alnus rubra

Acronicta marmorata
Quercus garryana

Acronicta perdita
Ceanothus cuneatus
Ceanothus velutinus
Purshia tridentata

Adelphagrotis indeterminata
Ceanothus integerrimus
Ceanothus velutinus
Holodiscus discolor
Symphoricarpos albus

Adelphagrotis stellaris
Ceanothus velutinus
Cornus nuttallii
Holodiscus discolor
Physocarpus capitatus
Rhamnus purshiana
Rubus discolor

Agrochola pulchella
Quercus garryana

Agrochola purpurea
Verbascum thapsus

Agrotis epsilon
Medicago sativa

Alypia langtoni
Epilobium angustifolium
Spiraea douglasii

Amphipyra pyramidoides
Acer circinatum
Alnus rubra
Arctostaphylos sp.
Corylus cornuta
Holodiscus discolor
Symphoricarpos albus
Tilia sp.

Amphipyra tragopoginis
Medicago sativa

Andropolia aedon
Acer macrophyllum
Alnus incana
Alnus rubra
Holodiscus discolor
Physocarpus capitatus

Andropolia diversilineata
Purshia tridentata

Andropolia theodori
Ceanothus velutinus
Holodiscus discolor

Anhimella perbrunnea
Holodiscus discolor
Symphoricarpos albus

Apharetra californiae
Arctostaphylos patula

Aseptis adnixa
Oemleria cerasiformis
Ribes sp.

Aseptis binotata
Acer circinatum
Acer macrophyllum
Alnus rubra
Amelanchier alnifolia
Arbutus menziesii
Ceanothus cuneatus
Ceanothus sanguineus
Ceanothus velutinus
Cornus stolonifera
Corylus cornuta
Holodiscus discolor
Lonicera ciliosa
Oemleria cerasiformis
Prunus emarginata
Quercus garryana
Rhododendron macrophyllum
Ribes aureum
Ribes cereum
Ribes niveum
Rubus parviflorus
Rubus spectabilis
Salix spp.

NOCTUIDAE, *Aseptis binotata* - N., *Feralia deceptiva**Aseptis binotata* (continued)

Symphoricarpos albus
Vaccinium parvifolium

Aseptis ethnica

Arbutus menziesii
Arctostaphylos columbiana
Arctostaphylos patula
Arctostaphylos viscida

Aseptis fumosa

Ceanothus integerrimus
Purshia tridentata

Autographa californica

Brassica oleracea
Medicago sativa
Mentha piperita
Mertensia ciliata

Autographa corusca

Achlys triphylla

Bomolocha bijugalis

Ceanothus velutinus
Cornus nuttallii

Caenurgina erechthea

Medicago sativa

Catocala aholibah

Quercus garryana

Catocala briseis

Salix sp.

Catocala ophelia

Quercus chrysolepis

Catocala verrilliana

Quercus garryana

Cissusa indiscreta

Quercus garryana

Cosmia calami

Corylus cornuta
Quercus garryana

Dargida procincta

Medicago sativa
Mentha piperita

Diarsia esurialis

Polystichum munitum

Draudtia lunata

Chrysothamnus nauseosus

Dryotype opina

Amelanchier alnifolia

Egira crucialis

Alnus rubra
Ceanothus velutinus
Cornus stolonifera
Purshia tridentata
Quercus garryana
Spiraea douglasii

Egira curialis

Celtis reticulata
Prunus virginiana

Egira hiemalis

Corylus cornuta
Fraxinus latifolia

Egira perlubens

Arctostaphylos patula
Ceanothus integerrimus
Ceanothus velutinus
Holodiscus discolor
Purshia tridentata

Egira rubrica

Ceanothus integerrimus
Ceanothus velutinus
Holodiscus discolor

Enargia infumata

Populus tremuloides

Euxoa ochrogaster

Mentha piperita

Euxoa olivia

Mentha piperita

Euxoa recula

Mentha piperita

Feralia deceptiva

Pseudotsuga menziesii

NOCTUIDAE, *Fishia* nr. *bettsia* - N., *Lithophane innominata*

<i>Fishia</i> nr. <i>bettsia</i> <i>Chrysothamnus naseosus</i>	<i>Lacanobia lilacina</i> <i>Alnus rubra</i>	<i>Lithophane contenta</i> <i>Holodiscus discolor</i> <i>Quercus garryana</i>
<i>Fishia evelina</i> <i>Arctostaphylos patula</i> <i>Ceanothus velutinus</i> <i>Prunus virginiana</i> <i>Purshia tridentata</i> <i>Sambucus cerulea</i>	<i>Lacanobia lutra</i> <i>Alnus rubra</i> <i>Ceanothus cuneatus</i> <i>Ceanothus integerrimus</i> <i>Ceanothus velutinus</i> <i>Salix</i> sp. <i>Vaccinium membranaceum</i> <i>Vaccinium parvifolium</i>	<i>Lithophane dilatocula</i> <i>Alnus incana</i> <i>Lithophane gausapata</i> <i>Calocedrus decurrens</i>
<i>Graphiphora haruspica</i> <i>Ribes</i> sp. <i>Rubus discolor</i>	<i>Lacanobia subjuncta</i> <i>Holodiscus discolor</i>	<i>Lithophane georgii</i> <i>Acer circinatum</i> <i>Acer glabrum</i> <i>Alnus rubra</i> <i>Amelanchier alnifolia</i> <i>Chrysolepsis chrysophylla</i> <i>Cornus stolonifera</i> <i>Crataegus douglasii</i> <i>Fraxinus latifolia</i> <i>Heracleum lanatum</i> <i>Holodiscus discolor</i> <i>Prunus emarginata</i> <i>Purshia tridentata</i> <i>Ribes cereum</i> <i>Rosa</i> sp. <i>Sorbus scopulina</i> <i>Spiraea douglasii</i>
<i>Heliothis phloxiphagus</i> <i>Mentha piperita</i>	<i>Lacanobia tacoma</i> <i>Vaccinium membranaceum</i>	
<i>Hemigraphiphora plebeia</i> <i>Rubus discolor</i>	<i>Lacinipolia stricta</i> <i>Mentha piperita</i>	
<i>Homoglaea carbonaria</i> <i>Populus tremuloides</i> <i>Salix</i> sp.	<i>Litholomia napaea</i> <i>Salix</i> sp.	
<i>Homoglaea dives</i> <i>Populus tremuloides</i> <i>Populus trichocarpa</i> <i>Salix</i> sp.	<i>Lithomoia germana</i> <i>Vaccinium</i> sp.	
<i>Hypena californica</i> <i>Urtica dioica</i>	<i>Lithophane amanda</i> <i>Salix</i> sp.	<i>Lithophane innominata</i> <i>Alnus rubra</i> <i>Crataegus douglasii</i> <i>Holodiscus discolor</i> <i>Salix</i> sp. <i>Sorbus scopulina</i>
<i>Hypena humuli</i> <i>Urtica dioica</i>	<i>Lithophane atara</i> <i>Pinus ponderosa</i> <i>Lithophane baileyi</i> <i>Vaccinium parvifolium</i>	

NOCTUIDAE, *Lithophane longior* - N., *Orthosia pacifica*

Lithophane longior
Juniperus occidentalis

Lithophane pertorrida
Acer macrophyllum
Holodiscus discolor
Prunus virginiana

Lithophane petulca
Alnus rubra
Alnus sinuata

Lithophane thaxteri
Spiraea douglasii

Litocala sexsignata
Chrysolepsis chrysophylla
Quercus chrysolepis

Mamestra configurata
Medicago sativa
Mentha piperita

Melanchra picta
Medicago sativa

Mesogona olivata
Ceanothus velutinus
Crataegus douglasii
Purshia tridentata
Quercus garryana
Ribes aureum
Ribes velutinum

Mesogona rubra
Arctostaphylos columbiana
Quercus garryana

Nola minna
Ceanothus cordulatus
Ceanothus cuneatus
Ceanothus integerrimus
Ceanothus velutinus

Nycteola columbiana
Salix sp.

Nycteola frigidana
Salix sp.

Oligia illocata
Alnus rubra
Rhododendron macrophyllum
Vaccinium parvifolium

Oncocnemis chalybdis
Spiraea douglasii

Oncocnemis columbia
Holodiscus discolor
Holodiscus dumosa

Oncocnemis dunbari
Holodiscus discolor

Oncocnemis homogena
Holodiscus discolor

Oncocnemis youngi
Holodiscus discolor

Orthosia hibisci
Acer macrophyllum
Acer palmatum
Alnus rubra
Ceanothus integerrimus
Ceanothus velutinus
Cornus stolonifera
Corylus cornuta
Crataegus douglasii
Lonicera ciliosa
Physocarpus capitatus
Quercus garryana
Prunus emarginata
Prunus virginiana
Quercus garryana
Rhamnus purshiana
Salix sp.
Sambucus cerulea

Orthosia mys
Arctostaphylos columbiana
Arctostaphylos manzanita
Arctostaphylos patula
Arctostaphylos viscida

Orthosia pacifica
Arbutus menziesii
Arctostaphylos sp.
Ceanothus velutinus
Quercus garryana

NOCTUIDAE, *Orthosia praeses* - N., *Synedoida ochracea*

Orthosia praeses
Ceanothus integerrimus
Spiraea douglasii

Orthosia pulchella
Arctostaphylos patula

Orthosia transparens
Arbutus menziesii
Rhododendron macrophyllum

Palthis angulalis
Ceanothus cuneatus

Panthea portlandia
Pseudotsuga menziesii

Papestra invalida
Arctostaphylos patula

Peridroma saucia
Mentha piperita

Perigonica angulata
Chrysolepsis chrysophylla
Lithocarpus densiflorus
Quercus chrysolepis
Quercus vaccinifolia

Perigonica pectinata
Chrysolepsis chrysophylla

Perigonica tertia
Quercus garryana

Phlogophora periculosa
Corylus cornuta
Polystichum munitum
Prunus emarginata
Salix sp.
Tsuga heterophylla
Vaccinium ovatum
Vaccinium parvifolium

Platypolia contadina
Dicentra formosa
Ribes cereum
Ribes lacustre
Vaccinium alaskense
Vaccinium parvifolium

Platypolia loda
Pseudotsuga menziesii
Ribes cereum

Pleromelloida cinerea
Symphoricarpos albus

Pleromelloida obliquata
Quercus garryana

Polia discalis
Alnus rubra

Polia purpurissata
Purshia tridentata

Pseudaletia unipuncta
Medicago sativa

Pseudorthodes irrorata
Alnus rubra
Corylus cornuta
Holodiscus discolor
Polystichum munitum
Quercus garryana
Rubus spectabilis
Symphoricarpos albus

Scoliopteryx libatrix
Populus trichocarpa
Salix spp.

Spodoptera praefica
Medicago sativa

Stretchia muricina
Ribes cruentum
Ribes viscosissimum

Stretchia plusiaeformis
Ribes cereum
Ribes cruentum

Sunira decipiens
Acer macrophyllum
Symphoricarpos albus

Synedoida divergens
Sambucus cerulea

Synedoida ochracea
Sambucus cerulea

NOCTUIDAE, *Syngrapha rectangula* - NYMPHALIDAE, *Nymphalis californica*

Syngrapha rectangula
Pseudotsuga menziesii

Tesagrotis atrifrons
Purshia tridentata

Tesagrotis corrodera
Purshia tridentata

Tesagrotis piscipellis
Purshia tridentata

Trichoplusia ni
Brassica oleracea
Medicago sativa
Mentha piperita
Mertensia ciliata

Xestia dolosa
Medicago sativa
Mentha piperita

Xestia mustelina
Arbutus menziesii
Myrica californica
Pseudotsuga menziesii
Tsuga heterophylla
Vaccinium parvifolium

Xylena brucei
Purshia tridentata

Xylena cineritia
Rosa sp.
Sambucus cerulea
Spiraea douglasii

Zale lunata
Rubus parviflorus
Salix sp.

Zale minerea
Ceanothus integerrimus

Zale termina
Chrysolepsis chrysophylla
Quercus chrysolepis

Zothea tranquilla
Sambucus racemosa

NOTODONTIDAE
Clostera apicalis
Salix sp.

Crataegus douglasii
Quercus garryana

Nadata gibbosa
Acer circinatum
Acer macrophyllum
Quercus garryana

Nadata oregonensis
Quercus garryana

Schizura concinna
Ceanothus integerrimus
Ceanothus velutinus
Malus sp. (crabapple)
Quercus garryana

Schizura ipomoeae
Arbutus menziesii
Cornus nuttallii

Schizura unicornis
Cornus nuttallii
Crataegus douglasii
Malus sp.
Prunus sp.
Quercus garryana

NYMPHALIDAE
Adelpha bredowii
Chrysolepsis chrysophylla
Quercus chrysolepis

Euphydryas chalcedona
Penstemon cardwellii

Limenitis lorquini
Populus hybrid
Salix sp. (pussywillow)

Nymphalis antiopa
Salix spp.

Nymphalis californica
Ceanothus cuneatus
Ceanothus velutinus

NYMPHALIDAE, *Nymphalis milberti* - PYRALIDAE, *Herpetogramma pertextalis*

Nymphalis milberti
Urtica dioica

Polygonia faunus
Salix spp.

Polygonia gracilis zephyrus
Ribes cereum
Ribes viscosissimum
Ribes watsonianum

Polygonia satyrus
Urtica dioica

Vanessa annabella
Althaea rosa
Urtica dioica

Vanessa atalanta
Urtica dioica

Vanessa cardui
Althaea rosa
Artemisia vulgaris
Cirsium arvense

Vanessa virginiensis
Anaphalis margaritacea

O

OECOPHORIDAE

Agonopterix alstroemeriana
Conium maculatum

Depressaria pastinacella
Heracleum lanatum

Depressaria sp.
Artemisia douglasiana

P

PAPILIONIDAE

Papilio bairdii oregonius
Artemisia dracunculus

Papilio eurymedon
Ceanothus velutinus

Papilio zelicaon
Heracleum lanatum

PIERIDAE

Colias philodice
Medicago sativa

Neophasia menapia
Pinus contorta
Pinus ponderosa

Pieris rapae
Brassica oleracea
Nausturtium sp.

PLUTELLIDAE

Eucratia castella
Quercus garryana
Symphoricarpos albus

Eucratia securella
Lonicera involucrata
Symphoricarpos albus

Plutella xylostella
Brassica oleracea

Ypsolopha cervella
Quercus garryana

Ypsolopha dentiferella
Symphoricarpos albus

Ypsolopha walsinghmiella
Prunus virginiana
Purshia tridentata

PTEROPHORIDAE

Emmelina monodactyla
Convolvulus nyctagineus

PYRALIDAE

Acrobasis tricolorella
Amelanchier alnifolia

Ambesa walsinghmi
Prunus emarginata

Herpetogramma pertextalis
Alnus rubra
Vancouveria hexandra

PYRALIDAE, *Udea profundalis* - TORTRICIDAE, *Archips rosana*

Udea profundalis
Mentha piperita
Sidalce cusickii
Urtica dioica

S
SATURNIIDAE

Antheraea polyphemus
Alnus rubra
Quercus garryana

Coloradia pandora
Pinus ponderosa

Hemileuca eglanterina
Ceanothus integerrimus
Ceanothus sanguineus
Ceanothus velutinus
Purshia tridentata

Hyalophora euryalus
Ceanothus velutinus
Pseudotsuga menziesii
Purshia tridentata

SPHINGIDAE

Hemaris diffinis
Symphoricarpos albus

Paonias excaecatus
Crataegus douglasii

Sphinx sequoiae
Juniperus occidentalis

T

THYATIRIDAE

Ceranemota fasciata
Amelanchier alnifolia

Ceranemota improvisa
Crataegus douglasii
Prunus sp.

Ceranemota tearlei
Amelanchier alnifolia
Sorbus scopulina

Euthyatira lorata
Cornus stolonifera

Habrosyne scripta
Rubus spectabilis

Pseudothyatira cymatophoroides
Rubus parviflorus
Rubus spectabilis

TORTRICIDAE

Acleris cornana (species complex)
Cornus stolonifera

Acleris gloverana
Abies amabilis
Picea engelmannii
Tsuga heterophylla

Acleris hastiana
Salix hookeriana

Acleris maxima
Salix sp.

Acleris senescens
Arctostaphylos patula
Salix sp.

Amorbia cuneana
Arctostaphylos patula

Archips argyrospila
Alnus incana
Ceanothus cuneatus
Ceanothus velutinus
Cornus stolonifera
Holodiscus discolor
Quercus kelloggii
Salix sp.

Archips rosana
Acer circinatum
Acer macrophyllum
Alnus rubra
Amelanchier alnifolia
Arctostaphylos patula
Ceanothus velutinus
Cornus stolonifera
Corylus cornuta
Crataegus douglasii
Quercus garryana
Vaccinium parvifolium

TORTRICIDAE, *Argyrotaenia citrana* - T., *Pseudexentera habrosana*

<i>Argyrotaenia citrana</i>	<i>Decodes montanus</i>	<i>Epinotia solandriana</i>
<i>Baccharis pilularis</i>	<i>Chrysolepsis chrysophylla</i>	<i>Alnus rubra</i>
<i>Rubus discolor</i>		
<i>Rubus spectabilis</i>	<i>Ditula angustiorana</i>	<i>Epinotia subplicana</i>
	<i>Abies grandis</i>	<i>Arctostaphylos columbiana</i>
<i>Argyrotaenia dorsalana</i>	<i>Corylus cornuta</i>	<i>Arctostaphylos manzanita</i>
<i>Pinus ponderosa</i>	<i>Quercus garryana</i>	<i>Arctostaphylos patula</i>
<i>Cacoecimorpha pronubana</i>	<i>Epinotia albangulana</i>	<i>Epinotia terracoctana</i>
<i>Arctostaphylos columbiana</i>	<i>Alnus rubra</i>	<i>Arbutus menziesii</i>
<i>Arctostaphylos patula</i>	<i>Alnus sinuata</i>	<i>Arctostaphylos columbiana</i>
		<i>Arctostaphylos patula</i>
<i>Choristoneura occidentalis</i>	<i>Epinotia arctostaphylana</i>	
<i>Abies grandis</i>	<i>Arctostaphylos patula</i>	<i>Epinotia vagana</i>
<i>Picea engelmannii</i>		<i>Ribes viscosissimum</i>
<i>Picea sitchensis</i>	<i>Epinotia columbia</i>	<i>Rosa</i> sp.
<i>Pseudotsuga menziesii</i>	<i>Salix</i> sp.	
		<i>Griselda radicana</i>
<i>Choristoneura rosaceana</i>	<i>Epinotia emarginana</i>	<i>Tsuga heterophylla</i>
<i>Acer circinatum</i>	<i>Heracleum lanatum</i>	
<i>Betula</i> sp.	<i>Quercus garryana</i>	<i>Melissopus latiferreanus</i>
<i>Fraxinus latifolia</i>	<i>Quercus kelloggii</i>	<i>Quercus garryana</i> (in galls of <i>Besbicus mirabilis</i>)
<i>Holodiscus discolor</i>		
<i>Mentha piperita</i>	<i>Epinotia fumoviridiana</i>	
<i>Physocarpus capitatus</i>	<i>Chrysolepsis chrysophylla</i>	<i>Pandemis pyrusana</i>
<i>Prunus</i> sp.	<i>Quercus vaccinifolia</i>	<i>Alnus incana</i>
<i>Quercus garryana</i>		<i>Alnus rubra</i>
<i>Salix</i> sp.	<i>Epinotia johnsonana</i>	<i>Cornus stolonifera</i>
	<i>Holodiscus discolor</i>	<i>Physocarpus capitatus</i>
<i>Clepsis persicana</i>		<i>Quercus sadleriana</i>
<i>Corylus cornuta</i>	<i>Epinotia rectiplicana</i>	<i>Salix</i> sp.
<i>Ribes lacustre</i>	<i>Quercus garryana</i>	
		<i>Pseudexentera habrosana</i>
<i>Croesia curvalana</i>	<i>Epinotia signiferana</i>	<i>Quercus garryana</i>
<i>Vaccinium membranaceum</i>	<i>Ceanothus velutinus</i>	

TORTRICIDAE, *Sparganothis senecionana* - YPOMEUTIDAE, *Zelleria gracilariella**Sparganothis senecionana**Holodiscus discolor**Quercus garryana**Ribes cereum**Ribes lobbii**Ribes viscosissimum**Sparganothis tunucana**Purshia tridentata**Spilonota ocellana**Crataegus douglasii**Prunus avium**Quercus garryana**Synnona lynosynana**Chrysothamnus viscidiflorus***Y****YPOMEUTIDAE***Zelleria gracilariella**Ribes lacustra**Ribes viscosissimum*

HOSTPLANTS BY FAMILY AND SPECIES

A

***Abies amabilis* [Pinaceae]**

Pacific silver fir

Tortricidae

Acleris gloverana

***Abies grandis* [Pinaceae]**

Grand fir

Geometridae

Enypia packardata
Eupithecia annulata
Eupithecia olivacea
Eustroma fasciata
Gabriola dyari
Neoalcis californiaria
Nepytia umbrosaria
Pero occidentalis

Lymantriidae

Dasychira griseifacta
Orgyia pseudotsugata

Tortricidae

Choristoneura occidentalis
Ditula angustiorana

***Acer circinatum* [Aceraceae]**

Vine maple

Arctiidae

Lophocampa maculata

Geometridae

Anagoga occiduaria
Campaea perlata
Erannis tiliaria
Eupithecia misturata
Iridopsis emasculata

Itame exauspicata

Lambdina fiscellaria

Neoalcis californiaria

Operophtera bruceata

Pero mizon

Plemyria georgii

Selenia alciphearia

Synaxis jubararia

Lasiocampidae

Malacosoma californica

Noctuidae

Amphipyra pyramidoides

Aseptis binotata

Lithophane georgii

Notodontidae

Nadata gibbosa

Tortricidae

Archips rosana

Choristoneura rosaceana

***Acer glabrum* [Aceraceae]**

Rocky Mountain maple

Geometridae

Itame plumosata

Noctuidae

Lithophane georgii

***Acer macrophyllum* [Aceraceae]**

Big-leaf maple

Geometridae

Campaea perlata

Hypagyrtis unipunctata

Nematocampa resistaria

Operophtera bruceata

Plemyria georgii

Selenia alciphearia

Sunira decipiens

Lymantriidae

Dasychira vagans

Noctuidae

Acronicta funeralis

Andropolia aedon

Aseptis binotata

Lithophane pertorrada

Orthosia hibisci

Sunira decipiens

Notodontidae

Nadata gibbosa

Schizura unicornis

Tortricidae

Archips rosana

***Acer palmatum* [Aceraceae]**

Japanese maple

Noctuidae

Orthosia hibisci

***Achlys triphylla* [Berberidaceae]**

Vanilla leaf

Noctuidae

Autographa corusca

***Adenocaulon bicolor* [Asteraceae]**

Pathfinder

Geometridae

Eupithecia formosa

Pterophoridae

unknown spp.

Alnus incana* - *Alnus sinuata***Alnus incana* [Betulaceae]****Mountain alder****Arctiidae**

Hyphantria cunea
Lophocampa maculata

Geometridae

Aethalura intertexta
Archiearis infans
Elpiste lorquinaria
Eulithis xyliina
Synaxis jubararia

Lasiocampidae

Phyllodesma americana

Noctuidae

Acronicta grisea
Andropolia aedon
Egira crucialis
Lithophane dilatocula

Tortricidae

Archips argyrospila
Pandemis pyrusana

Alnus rhombifolia* [Betulaceae]*White alder****Lymantriidae**

Dasychira vagans

Lyonetiidae

Bucculatrix sp.

Noctuidae

Acronicta grisea

Alnus rubra* [Betulaceae]*Red alder****Arctiidae**

Hyphantria cunea
Lophocampa maculata

Drepanidae

Drepana arcuata

Geometridae

Archiearis infans
Biston betularia
Campaea perlata
Cyclophora pendulinaria
Elpiste lorquinaria
Ennomos magnaria
Erannis tiliaria

Hydriomena renunciata

Hypagyrtis unipunctata

Iridopsis emasculata

Lambdina fiscellaria

Nematocampa resistaria

Nealcis californiaria

Plagodis phlogosaria

Probole alienaria

Rheumaptera subhastata

Sabulodes aegrotata

Sicya crocearia

Venusia pearsalli

Gracillariidae

Caloptilia sp.

Lasiocampidae

Malacosoma californicum

Malacosoma disstria

Phyllodesma americana

Noctuidae

Acronicta grisea

Acronicta hesperida

Amphipyra pyramidoides

Andropolia aedon

Aseptis binotata

Egira crucialis

Lacanobia lilacina

Lacanobia lutra

Lithophane georgii

Lithophane innominata

Lithophane petulca

Oligia illocata

Orthosia hibisci

Polia discalis

Pseudorthodes irrorata

Pyralidae

Herpetogramma pertextalis

Saturniidae

Antheraea polyphemus

Tortricidae

Acleris sp.

Archips rosana

Epinotia albangulana

Epinotia solandriana

Pandemis pyrusana

Alnus sinuata* [Betulaceae]*Sitka alder****Choreutidae**

Choreutis diana

Drepanidae

Drepana arcuata

Alnus sinuata - *Arbutus menziesii****Alnus sinuata* [Betulaceae]** (continued)**Gelechiidae***Chionodes* sp.**Geometridae***Anagoga occidentaria**Campaea perlata**Cyclophora pendulinaria***Geometridae***Dysstroma citrata**Echlaena tigrinaria**Elpiste lorquinaria**Eupithecia georgii**Lambdina fiscellaria**Plemyria georgii**Rheumaptera subhastata**Synaxis cervinaria***Lasiocampidae***Phyllodesma americana***Noctuidae***Acronicta grisea**Lithophane petulca***Tortricidae***Acleris senescens**Caloptila* spp.*Epinotia albangulana****Althaea rosea* [Rosaceae]****Hollyhock****Nymphalidae***Vanessa annabella**Vanessa cardui****Amelanchier alnifolia* [Rosaceae]****Serviceberry****Geometridae***Campaea perlata**Erannis tiliaria**Euchlaena tigrinaria**Eulithis xyliana**Eupithecia maestosa**Eupithecia misturata**Hesperumia sulphuraria**Hypagyrtis unipunctata**Nealcis californiaria**Operophtera bruceata**Pero mizon**Synaxis jubararia***Lasiocampidae***Phyllodesma americana***Lymantriidae***Dasychira vagans***Noctuidae***Aseptis binotata**Dryotype opina**Lithophane georgii***Pyralidae***Acrobasis tricolorella***Thyatiridae***Ceranemota fasciata**Ceranemota tearlei***Tortricidae***Archips rosana****Amsinckia retrorsa* [Boraginaceae]****Rigid fiddleneck****Arctiidae***Platyprepia virginalis****Anaphalis margaritacea* [Asteraceae]****Pearly-everlasting****Nymphalidae***Vanessa virginiensis****Arbutus menziesii* [Ericaceae]****Madrone****Geometridae***Eupithecia graefii**Eupithecia subapicata**Eupithecia subulosata**Hesperumia sulphuraria**Hydriomena manzanita**Nealcis californiaria**Pero mizon**Synaxis cervinaria***Lasiocampidae***Malacosoma californica***Lymantriidae***Orgyia vetusta***Noctuidae***Abagrotis apposita**Abagrotis trigona**Aseptis binotata**Aseptis ethnica**Orthosia pacifica**Orthosia transparens**Xestia mustelina*

Arbutus menziesii* - *Arctostaphylos* spp.**Arbutus menziesii* [Ericaceae] (continued)****Notodontidae***Schizura ipomoeae***Tortricidae***Epinotia terracoctana****Arceuthobium* spp. [Loranthaceae]****Dwarf mistletoe****Lycaenidae***Mitoura spinetorum****Arctostaphylos columbiana* [Ericaceae]****Bristly manzanita****Copromorphidae***Lotisma trigonana***Gelechiidae***Pseudochelaria manzanitae**Pseudochelaria scabrella***Geometridae***Eupithecia gilvipennata**Eupithecia graefii**Nemoria darwiniata**Neoalcis californiaria**Pero mizon***Noctuidae***Aseptis ethnica**Mesogona rubra**Orthosia mys***Pterophoridae**

unidentified species

Tortricidae*Cacoecimorpha pronubana**Chionodes* sp.*Epinotia subplicana**Epinotia terracoctana****Arctostaphylos manzanita* [Ericaceae]****Manzanita****Noctuidae***Orthosia mys***Tortricidae***Epinotia subplicana****Arctostaphylos patula* [Ericaceae]****Green-leaf manzanita****Gelechiidae***Gelechia panella**Pseudochelaria manzanitae***Geometridae***Eupithecia gilvipennata**Eupithecia misturata**Hesperumia sulphuraria**Hydriomena manzanita**Nemoria darwiniata***Lycaenidae***Celastrina argiolus**Incisalia augustinus***Noctuidae***Apharetra californiae**Aseptis ethnica**Egira perlubens**Fishia evelina**Orthosia mys**Orthosia pulchella**Papestra invalida**Pleromella opter***Pterophoridae**

unidentified species

Sphingidae

unidentified species

Tortricidae*Acleris senescens**Amorbia cuneana**Archips rosana**Cacoecimorpha pronubana**Epinotia arctostaphylana**Epinotia subplicana**Epinotia terracoctana****Arctostaphylos uva-ursi* [Ericaceae]****Kinnikinnick****Lymantriidae***Orgyia antiqua****Arctostaphylos viscida* [Ericaceae]****Whiteleaf manzanita****Geometridae***Cochisea sinuaria**Hesperumia sulphuraria**Neoalcis californiaria***Noctuidae***Abagrotis trigona**Aseptis ethnica**Orthosia mys****Arctostaphylos* spp. [Ericaceae]****Manzanita****Gelechiidae***Telphusa sedulitella***Geometridae***Nematocampa resistaria**Neoalcis californiaria**Synaxis cervinaria***Heliozelidae***Coptodisca arbutiella*

Arctostaphylos spp. - *Chrysolepis chrysophylla***Arctostaphylos spp. [Ericaceae] (continued)****Noctuidae**

Amphipyra pyramidoides
Orthosia pacifica

Artemisia douglasiana [Asteraceae]**Douglas' sagebrush****Oecophoridae**

Depressaria sp.

Artemisia dracunculus [Asteraceae]**Dragon sagebrush****Papilionidae**

Papilio bairdii oregonius

Artemisia tridentata [Asteraceae]**Big sagebrush****Geometridae**

Itame colata

Noctuidae

Abagrotis duanca

Artemisia vulgaris [Asteraceae]**Mugwort****Nymphalidae**

Vanessa cardui

Asclepias sp. [Asclepiadaceae]**Milkweed****Danaiidae**

Danaus plexippus

B**Baccharis pilularis [Asteraceae]****Coyotebrush****Cochylidae**

Cochylis sp.

Geometridae

Elpiste metanemaria
Eupithecia misturata
Pero mizon

Lyonetiidae

Bucculatrix separabilis

Pterophoridae

unidentified species

Tortricidae

Argyrotaenia citrana

Balsamorhiza sagittata [Asteraceae]**Arrowleaf balsamroot****Geometridae**

Euchlaena tigrinaria

Betula sp. [Betulaceae]**Birch****Tortricidae**

Choristoneura rosaceana

Brassica oleraceae [Brassicaceae]**Mustards****Noctuidae**

Autographa californica
Trichoplusia ni

Pieridae

Pieris rapae

Plutellidae

Plutella xylostella

C**Chrysolepis chrysophylla [Fagaceae]****Chinquapin****Dipteridae**

Phryganidia californica

Gelechiidae

Telphusa sedulitella

Geometridae

Cyclophora dataria
Hydriomena irata
Nemoria darwiniata
Neocalcis californiaria
Venusia pearsalli

Lasiocampidae

Phyllodesma americana

Lycaenidae

Habrodais grunus

Noctuidae

Lithophane georgii
Litocala sexsignata
Perigonica angulata
Perigonica pectinata
Zale termina

Nymphalidae

Adelpha bredowii

Tortricidae

Decodes montanus
Epinotia fumoviridana

Calocedrus decurrens* - *Ceanothus integerrimus***Calocedrus decurrens* [Cupressaceae]****Incense-cedar****Geometridae**

Eupithecia sabulosata
Neoalcis californiaria
Semiothisa burneyata

Noctuidae

Lithophane gausapata

Ceanothus cordulatus* [Rhamnaceae]*Snow bush****Geometridae**

Drepanulatrix foeminaria
Sericosema juturnaria

Noctuidae

Nola minna

Ceanothus cuneatus* [Rhamnaceae]*Common buckbrush****Geometridae**

Aethaloida packardaria
Anacamptodes clivinaria
Anavitrinella pampinaria
Drepanulatrix falcata
Drepanulatrix foeminaria
Drepanulatrix monicaria
Drepanulatrix unicalcararia
Eupithecia maestosa
Eupithecia misturata
Eupithecia ravocostaliata
Hesperumia latipennis
Hesperumia sulphuraria
Nemoria darwiniata
Sericosema juturnaria
Synaxis jubararia

Lycaenidae

Satyrium saepium

Lymantriidae

Orgyia vetusta

Noctuidae

Acronicta perdita
Aseptis binotata
Egira sp.
Lacanobia lutra
Nola minna
Palthis angulalis

Nymphalidae

Nymphalis californica

Sphingidae

unidentified species

Tortricidae

Archips argyrospila

Ceanothus integerrimus* [Rhamnaceae]*Deerbrush****Geometridae**

Aethaloida packardaria
Anacamptodes clivinaria
Anavitrinella pampinaria
Cochisea sinuaria
Drepanulatrix falcata
Drepanulatrix foeminaria
Drepanulatrix monicaria
Drepanulatrix unicalcararia
Ectropis crepuscularia
Eudrepanulatrix rectifascia
Eupithecia misturata
Hesperumia sulphuraria
Iridopsis emasculata

Itame denticulodes

Nematocampa resistaria

Nemoria darwiniata

Neoalcis californiaria

Pero mizon

Sericosema juturnaria

Synaxis cervinaria

Synaxis jubararia

Synchlora aerata

Lasiocampidae

Phyllodesma americana

Lycaenidae

Celastrina argiolus

Incisalia augustinus

Satyrium saepium

Lymantriidae

Orgyia sp.

Noctuidae

Adelphagrotis indeterminata

Aseptis fumosa

Egira perlubens

Egira rubrica

Lacanobia lutra

Nola minna

Orthosia hibisci

Orthosia praeses

Zale minerea

Notodontidae

Schizura concinna

Saturniidae

Hemileuca eglanterina

Ceanothus sanguineus - Celtis reticulata**Ceanothus sanguineus [Rhamnaceae]****Oregon tea tree****Geometridae**

Drepanulatrix falcataria
Drepanulatrix foeminaria
Drepanulatrix secundaria
Eudrepanulatrix rectifascia
Eupithecia harveyata
Eupithecia misturata
Hesperumia latipennis
Hesperumia sulphuraria
Nemoria darwiniata
Nealcis californiaria
Pero mizon
Sericosema juturnaria

Noctuidae

Abagrotis apposita
Aseptis binotata
Egira crucialis

Saturniidae

Hemileuca eglanterina

Ceanothus thyrsoiflorus [Rhamnaceae]**Blue brush****Geometridae**

Drepanulatrix monicaria
Eupithecia misturata

Ceanothus velutinus [Rhamnaceae]**Tobacco-brush****Geometridae**

Drepanulatrix carneararia
Drepanulatrix falcataria
Drepanulatrix foeminaria

Drepanulatrix hulstii
Drepanulatrix monicaria
Drepanulatrix quadraria
Drepanulatrix secundaria
Drepanulatrix unicalcararia
Eudrepanulatrix rectifascia
Eupithecia georgii
Eupithecia misturata
Eupithecia nevadata
Eupithecia ravocostaliata
Hesperumia sulphuraria
Nematocampa resistaria
Nemoria darwiniata
Nealcis californiaria
Pero mizon
Sericosema juturnaria

Lasiocampidae

Malacosoma californicum
Phyllodesma americana

Lycaenidae

Celastrina argiolus
Incisalia augustinus
Satyrium saepium

Lymantriidae

Orgyia sp.

Noctuidae

Acronicta cyanescens
Acronicta perdita
Adelphagrotis indeterminata
Adelphagrotis stellaris
Andropolia theodori
Aseptis binotata
Bomolocha bijugalis
Egira crucialis

Egira perlubens
Egira rubrica
Fishia evelina
Lacanobia lutra
Mesogona olivata
Nola minna
Orthosia hibisci
Orthosia pacifica

Notodontidae

Schizura concinna

Nymphalidae

Nymphalis californica

Papilionidae

Papilio eurymedon

Saturniidae

Hemileuca eglanterina
Hyalophora euryalus

Tortricidae

Archips argyrospila
Archips rosana
Epinotia signiferana

Cedrus atlanticus [Pinaceae]**Atlantic cedar****Geometridae**

Nealcis californiaria

Celtis reticulata [Rosaceae]**Hackberry****Noctuidae**

Egira curialis

Centaurea montana* - *Corylus cornuta***Centaurea montana* [Asteraceae]**

Bachelor's button

Arctiidae*Grammia ornata****Cercocarpus montanus* [Rosaceae]**

Mountain mahogany

Geometridae*Stannodes coenonympha****Chamaecyparis lawsoniana* [Cupressaceae]**

Port Orford cedar

Geometridae*Neocalcis californiaria****Chrysothamnus nauseosus* [Asteraceae]**

Rubber rabbit-brush

Geometridae*Chlorochlamys triangularis**Eupithecia misturata**Semiothisa curvata**Synaxis formosa***Noctuidae***Draudtia lunata**Fishia nr. bettsia****Chrysothamnus viscidiflorus* [Asteraceae]**

Lanceleaf rabbit-brush

Geometridae*Chesiadodes cinerea**Chlorochlamys triangularis**Nemoria darwiniata***Noctuidae***Cucullia pulla***Tortricidae***Synnona lynosynana****Cirsium arvense* [Asteraceae]**

Canadian thistle

Nymphalidae*Vanessa cardui****Conium maculatum* [Apiaceae]**

Poison-hemlock

Oecophoridae*Agonopterix alstroemeriana****Convolvulus nyctagineus* [Convolvulaceae]**

Morning glory

Pterophoridae*Emmelina monodactyla****Cornus nuttallii* [Cornaceae]**

Pacific dogwood

Geometridae*Nematocampa resistaria**Pero mizon**Probole alienaria**Probole amicarica***Noctuidae***Adelphagrotis stellaris**Bomolocha bijugalis***Notodontidae***Schizura ipomoeae**Schizura unicornis****Cornus stolonifera* [Cornaceae]**

Red-osier

Geometridae*Campaea perlata**Euchlaena tigrinaria**Eulithis xyliina**Eupithecia misturata**Probole amicarica***Lycaenidae***Celastrina argiolus***Noctuidae***Aseptis binotata**Egira crucialis**Lithophane georgii**Orthosia hibisci***Thyatiridae***Euthyatira lorata***Tortricidae***Acleris cornana* (spp. complex)*Archips argyrospila**Archips rosana**Pandemis pyrusana****Corylus avellana* [Betulaceae]**

European hazelnut

Geometridae*Operophtera brumata****Corylus cornuta* [Betulaceae]**

Hazelnut

Geometridae*Campaea perlata**Dysstroma ochrofuscaria**Erannis tiliaria*

Corylus cornuta* - *Fraxinus latifolia***Corylus cornuta* [Betulaceae] (continued)****Geometridae**

Euchlaena tigrinaria
Eulithis xyliana
Hesperumia latipennis
Hesperumia sulphuraria
Hypagyrtis unipunctata
Mesoleuca gratulata
Neocalcis californiaria
Pero mizon

Lasiocampidae

Malacosoma californicum

Lymantriidae

Dasychira vagans

Noctuidae

Amphipyra pyramidoides
Aseptis binotata
Cosmia calami
Egira hiemalis
Orthosia hibisci
Phlogophora periculosa
Pseudorthodes irrorata

Tortricidae

Archips rosana
Clepsis persicana
Ditula angustiorana

Cotoneaster* sp. [Rosaceae]*Ornamental cotoneaster****Gelechiidae**

Athrips rancidella

Crataegus douglasii* [Rosaceae]*Hawthorn****Arctiidae**

Hyphantria cunea

Geometridae

Erannis tiliaria
Euchlaena tigrinaria
Eulithis xyliana
Eupithecia nevadata
Neocalcis californiaria

Noctuidae

Lithophane georgii
Lithophane innominata
Mesogona olivata
Orthosia hibisci

Notodontidae

Schizura ipomoeae
Schizura unicornis

Sphingidae

Paonias excaecatus

Thyatiridae

Ceranemota improvisa

Tortricidae

Archips rosana
Spilonota ocellana

Cynoglossum occidentale* [Boraginaceae]*Hounds tongue****Arctiidae**

Gnophaela latipennis

D***Dactylus glomerata* [Poaceae]****Orchard grass****Arctiidae**

Ctenucha rubroscapus

Dicentra formosa* [Fumariaceae]*Bleeding hearts****Noctuidae**

Platypolia contadina

E***Epilobium angustifolium* [Onagraceae]****Fireweed****Geometridae**

Spargania magnoliata

Noctuidae

Alypia langtoni

F***Fraxinus latifolia* [Oleaceae]****Oregon white ash****Geometridae**

Eupithecia maestosa
Operophtera danbyi
Synaxis jubararia

Noctuidae

Egira hiemalis
Lithophane georgii

Tortricidae

Choristoneura rosaceana

Gaultheria shallon* - *Juniperus occidentalis**G*****Gaultheria shallon* [Ericaceae]****Salal****Geometridae**

Dysstroma sobria
Lambdina fiscellaria
Neocalcis californiaria
Synaxis jubararia

Heliozelidae

Coptodisca arbutiella

Galium* spp. [Rubiaceae]*Bedstraw****Geometridae**

Epirrhoe alternata

H***Heracleum lanatum* [Apiaceae]****Cow-parsnip****Noctuidae**

Lithophane georgii

Oecophoridae

Depressaria pastinacella

Papilionidae

Papilio zelicaon

Tortricidae

Epinotia emarginana

Holodiscus discolor* [Rosaceae]*Ocean-spray****Arctiidae**

Lophocampa maculata
Spilosoma virginica

Geometridae

Anagoga occiduaria
Biston betularia
Campaea perlata
Chlorosea banksaria
Eulithis xyliana
Eupithecia maestosa
Eupithecia misturata
Hesperumia latipennis
Hesperumia sulphuraria
Lambdina fiscellaria
Neocalcis californiaria
Operophtera bruceata
Perizoma costiguttata
Perizoma curvilinea
Pero mizon
Sabulodes aegrotata
Synaxis jubararia

Lasiocampidae

Phyllodesma americana

Lycaenidae

Celastrina argiolus

Noctuidae

Adelphagrotis indeterminata
Adelphagrotis stellaris
Amphipyra pyramidoides
Andropolia aedon
Andropolia theodori
Anhimella perbrunnea
Aseptis binotata
Egira perlubens
Egira rubrica
Lacanobia subjuncta
Lithophane georgii

Lithophane innominata

Lithophane pertorrada

Oncocnemis nr. columbia

Oncocnemis dunbari

Oncocnemis homogena

Oncocnemis youngi

Pseudorthodes irrorata

Pterophoridae

unidentified species

Tortricidae

Archips argyrospila

Choristoneura rosaceana

Epinotia johnsonana

Sparganothis senecionana

J***Juniperus occidentalis* [Cupressaceae]****Juniper****Geometridae**

Semiothisa continuata

Lycaenidae

Mitoura grynea

Noctuidae

Abagrotis glenni

Lithophane longior

Sphingidae

Sphinx sequoiae

Lithocarpus densiflorus* - *Oemleria cerasiformis**L*****Lithocarpus densiflorus* [Fagaceae]****Tan oak****Dioptidae***Phryganidia californica***Geometridae***Eupithecia misturata***Noctuidae***Perigonica angulata****Lonicera ciliosa* [Caprifoliaceae]****Orange honeysuckle****Noctuidae***Aseptis binotata**Orthosia hibisci****Lonicera involucrata* [Caprifoliaceae]****Twinberry****Plutellidae***Euceratia securella****Lotus crassifolius* [Fabaceae]****Big deervetch****Hesperiidae***Epargyreus clarus****Lupinus sulphureus kincaidii* [Fabaceae]****Sulfur lupine****Lycaenidae***Icaricia icarioides fenderi***M*****Malus* sp. [Rosaceae]****Crabapple****Notodontidae***Schizura concinna**Schizura unicornis****Medicago sativa* [Fabaceae]****Alfalfa****Noctuidae***Agrotis ipsilon**Amphipyra tragopoginis**Autographa californica**Caenurgina erechtea**Dargida procincta**Mamestra configurata**Melanchnra picta**Pseudaletia unipuncta**Rhynchagrotis anchocelioides**Spodoptera praefica**Trichoplusia ni**Xestia dolosa***Pieridae***Colias philodice****Mentha piperita* [Lamiaceae]****Peppermint****Noctuidae***Autographa californica**Dargida procincta**Euxoa ochrogaster**Euxoa olivia**Euxoa reclusa**Heliothis phloxiphagus**Lacinipolia stricta**Mamestra configurata**Nematocampa resistaria**Peridroma saucia**Trichoplusia ni**Xestia dolosa***Pyralidae***Udea profundalis***Tortricidae***Choristoneura rosaceana****Mertensia ciliata* [Boraginaceae]****Broad-leafed blue bells****Noctuidae***Autographa californica**Trichoplusia ni****Myrica californica* [Myrtaceae]****Wax-myrtle****Geometridae***Nemoria darwiniata**Neocalcis californiaria***Noctuidae***Anomogyna mustelina***O*****Oemleria cerasiformis* [Rosaceae]****Osoberry****Geometridae***Operophtera bruceata***Noctuidae***Aseptis adnixa**Aseptis binotata*

Pachistima myrsinites* - *Populus tremuloides

- P**
- Pachistima myrsinites* [Celastraceae]**
Oregon boxwood
Geometridae
Pero mizon
- Penstemon cardwelli* [Scrophulariaceae]**
Cardwell's penstemon
Nymphalidae
Euphydryas chalcedona
- Philadelphus lewisii* [Rosaceae]**
Mock orange
Geometridae
Euchlaena johnsonaria
- Physocarpus capitatus* [Rosaceae]**
Pacific ninebark
Geometridae
Eulithis xyliina
Hypagyrtis unipunctata
Itame anataria
Itame exauspicata
Itame quadrilinearia
- Lasiocampidae**
Malacosoma californicum
- Lycaenidae**
Celastrina argiolus
- Noctuidae**
Adelphagrotis stellaris
Andropolia aedon
Lomographa semiclarata
Orthosia hibisci
- Tortricidae**
Pandemis pyrusana
- Picea engelmannii* [Pinaceae]**
Engelmans' spruce
Geometridae
Synaxis pallulata
Tortricidae
Acleris gloverana
Choristoneura occidentalis
- Picea sitchensis* [Pinaceae]**
Sitka spruce
Geometridae
Nealcis californiaria
Tortricidae
Choristoneura occidentalis
- Pinus contorta* [Pinaceae]**
Lodgepole/shore pine
Arctiidae
Lophocampa argentata
Geometridae
Nealcis californiaria
Pieridae
Neophasia menapia
- Pinus monticola* [Pinaceae]**
Western white pine
Geometridae
Nealcis californiaria
- Pinus ponderosa* [Pinaceae]**
Ponderosa/yellow pine
Noctuidae
Lithophane atara
- Pieridae**
Neophasia menapia
- Saturniidae**
Coloradia pandora
- Tortricidae**
Argyrotaenia dorsalana
- Pinus sylvestris* [Pinaceae]**
Scotch pine
Geometridae
Nealcis californiaria
- Polystichum munitum* [Aspidiaceae]**
Sword fern
Geometridae
Nealcis californiaria
Thalophaga taylorata
Noctuidae
Diarsia esurialis
Phlogophora periculosa
Pseudorthodes irrorata
- Populus tremuloides* [Salicaceae]**
Quaking aspen
Geometridae
Elpiste lorquinaria
Lasiocampidae
Malacosoma californicum
Phyllodesma americana
Lymantriidae
Leucoma salicis
Noctuidae
Enargia infumata
Homoglaea carbonaria
Homoglaea dives

Populus* hybrid - *Pseudotsuga menziesii***Populus* hybrid [Salicaceae]****Plantation cottonwood****Nymphalidae***Limenitis lorquini****Populus trichocarpa* [Salicaceae]****Black cottonwood****Arctiidae***Hyphantria cunea***Geometridae***Eulithis xyliina**Protitame matilda***Lasiocampidae***Malacosoma disstria***Lymantriidae***Dasychira vagans***Noctuidae***Homoglaea dives**Scoliopteryx libatrix****Prunus avium* [Rosaceae]****Sweet cherry****Geometridae***Operophtera bruceata**Operophtera danbyi***Tortricidae***Spilonota ocellana****Prunus emarginata* [Rosaceae]****Bittercherry****Geometridae***Campaea perlata**Erannis tiliaria**Eulithis xyliina**Lambdina fiscellaria***Lycaenidae***Incisalia augustinus***Noctuidae***Aseptis binotata**Lithophane georgii**Orthosia hibisci**Phlogophora periculosa***Pyralidae***Ambesa walsinghami****Prunus virginiana* [Rosaceae]****Bittercherry****Geometridae***Anavitrinella pampinaria**Dasyfidonia avuncularia**Eulithis xyliina**Operophtera bruceata***Lycaenidae***Celastrina argiolus***Noctuidae***Egira curialis**Fishia evelina**Lithophane pertorrida**Orthosia hibisci***Plutellidae***Ypsolopha walsinghamiella****Prunus* spp. [Rosaceae]****Cherry****Geometridae***Eulithis xyliina***Noctuidae***Acronicta fragilis***Notodontidae***Schizura unicornis***Thyatiridae***Ceranemota improvisa***Tortricidae***Choristoneura rosaceana****Pseudotsuga menziesii* [Pinaceae]****Douglas-fir****Arctiidae***Lophocampa argentata***Geometridae***Caripeta divisata**Ectropis crepuscularia**Enypia packardata**Eupithecia sabulosata**Gabriola dyari**Hydriomena irata**Neoalcis californiaria**Nepytia umbrosaria**Pero mizon**Protoarmia porcelaria**Synaxis pallulata***Lymantriidae***Dasychira grisefacta**Orgyia antiqua***Noctuidae***Achytonix epipaschia**Anomogyna mustelina**Feralia deceptiva**Panthea portlandia**Platypolia loda**Syngrapha rectangula*

Pseudotsuga menziesii* - *Quercus garryana***Pseudotsuga menziesii* [Pinaceae] (continued)****Saturniidae***Hyalophora euryalus***Tortricidae***Choristoneura occidentalis****Purshia tridentata* [Rosaceae]****Bitter-brush****Geometridae***Anacamptodes clivinaris**Anavitrinella pampinaria**Chlorosea banksaria**Eupithecia nevadana**Hesperumia sulphuraria**Itame colata**Nemoria darwiniata**Pero mizon**Semiothisa denticulata**Synaxis cervinaria***Lasiocampidae***Malacosoma californicum***Lycaenidae***Satyrium behrii**Satyrium californicum***Noctuidae***Acronicta impressa**Acronicta perdita**Andropolia diversilineata**Aseptis fumosa**Egira crucialis**Egira perlubens**Fishia evelina**Lithophane georgii**Mesogona olivata**Polia purpurissata**Tesagrotis atrifrons**Tesagrotis corrodera**Tesagrotis piscipellis**Xylena brucei***Plutellidae***Ypsolopha walsinghamiella***Saturniidae***Hemileuca eglanterina**Hyalophora euryalus***Tortricidae***Sparganothis tunicana****Pyrus malus* [Rosaceae]****Crabapple****Lasiocampidae***Malacosoma californicum***Lymantriidae***Dasychira vagans***Q*****Quercus chrysolepis* [Fagaceae]****Canyon live oak****Dioptidae***Phryganidia californica***Geometridae***Cyclophora dataria**Euchlaena tigrinaria**Neoalcis californiaria**Pero mizon***Hesperiidae***Erynnis propertius***Lycaenidae***Habrodais grunus***Lymantriidae***Orgyia vetusta***Noctuidae***Catocala ophelia**Litocala sexsignata**Perigonica angulata**Zale termina****Quercus garryana* [Fagaceae]****Oregon white oak****Arctiidae***Clemensia albata***Dioptidae***Phryganidia californica***Gelechiidae***Chionodes* sp.*Telphusa sedulitella***Geometridae***Anacamptodes clivinaris**Besma quercivoraria**Campaea perlata**Cyclophora dataria**Erannis tiliaria**Eupithecia columbiata**Eupithecia columbrata**Eupithecia luteata**Eupithecia misturata**Hesperumia latipennis**Hydriomena edenata**Hydriomena irata**Hydriomena nubilofasciata**Hydriomena perfracta**Hydriomena renunciata**Hypagyrtis unipunctata*

Quercus garryana - Quercus vaccinifolia**Quercus garryana [Fagaceae]** (continued)**Geometridae**

Lambdina fiscellaria
Nematocampa resistaria
Nemoria darwiniata
Nemoria pulcherrima
Neoalcis californiaria
Operophtera danbyi
Pero mizon
Phigalia plumogeraria
Semiothisa respersata
Venusia pearsalli

Gracillariidae

Caloptilia sp.

Hesperiidae

Erynnis propertius

Lasiocampidae

Malacosoma californica
Malacosoma constrictum
Malacosoma disstria
Phyllodesma americana

Limacodidae

Tortricidea testacea

Lymantriidae

Dasychira vagans
Orgyia antiqua
Orgyia vetusta

Lyonetiidae

Bucculatrix sp.

Noctuidae

Acronicta marmorata
Agrochola pulchella
Aseptis binotata
Catocala aholibah

Catocala verilliana
Cissusa indiscreta
Cosmia calami
Egira crucialis
Egira februalis
Lithophane contenta
Meganola miniscula
Mesogona olivata
Mesogona rubra
Orthosia hibisci
Orthosia pacifica
Perigonica tertia
Pleromelloida obliquata
Pseudorthodes irrorata

Notodontidae

Nadata gibbosa
Nadata oregonensis
Schizura concinna
Schizura ipomoeae
Schizura unicornis

Plutellidae

Eucratia castella
Ypsolopha cervella

Pyralidae

Epinotia emarginana
Epinotia rectiplicana

Saturniidae

Antheraea polyphemus

Tortricidae

Archips rosana
Choristoneura rosaceana
Ditula angustiorana
Melissopus latiferreanus
Pseudexentera habrosana

Sparganothis senecionana
Spilonota ocellana

Quercus kelloggii [Fagaceae]**Black oak****Gelechiidae**

Telphusa sedulitella

Geometridae

Hydriomena expurgata
Neoalcis californiaria

Noctuidae

Lithophane contenta

Plutellidae

Ypsolopha cervella

Tortricidae

Archips argyrospila
Epinotia emarginana

Quercus sadleriana [Fagaceae]**Sadlers oak****Tortricidae**

Pandemis pyrusana

Quercus vaccinifolia [Fagaceae]**Huckleberry oak****Lycaenidae**

Habrodais grunus

Noctuidae

Perigonica angulata

Tortricidae

Epinotia fumoviridana

Rhamnus occidentalis* - *Ribes lacustre**R*****Rhamnus occidentalis* [Rhamnaceae]****Coffee berry****Geometridae**

Eupithecia nevadata
Itame guenearia
Triphosa californiata

Rhamnus purshiana* [Rhamnaceae]*Cascara****Geometridae**

Aethalura intertexta
Campaea perlata
Ectropis crepuscularia
Euchlaena johnsonaria
Euchlaena tigrinaria
Eupithecia ravocostaliata
Nealcis californiaria
Synaxis cervinaria
Triphosa californiata
Triphosa haesitata

Gracillariidae

Caloptilia diversilobiella

Noctuidae

Adelphagrotis stellaris
Orthosia hibisci

Rhododendron macrophyllum* [Ericaceae]*Western rhododendron****Geometridae**

Dysstroma sobria
Eupithecia sp.
Nealcis californiaria
Synaxis jubararia

Noctuidae

Aseptis binotata
Oligia illocata
Orthosia transparens

Rhododendron occidentale* [Ericaceae]*Azalea****Geometridae**

Eulithis xyliina
Synaxis jubararia

Rhus diversiloba* [Anacardiaceae]*Poison oak****Cosmopterygidae**

Sorhagenia nimbosea

Ribes aureum* [Grossulariaceae]*Golden currant****Noctuidae**

Aseptis binotata
Mesogona olivata

Ribes cereum* [Grossulariaceae]*Squaw currant****Geometridae**

Dysstroma brunneata
Dysstroma formosa
Dysstroma walkerata
Hesperumia latipennis
Hesperumia sulphuraria
Itame bitactata
Neoterpes trianguliferata
Operophtera bruceata
Synaxis jubararia

Lasiocampidae

Malacosoma sp.

Noctuidae

Aseptis binotata
Lithophane georgii
Orthosia hibisci
Platypolia contadina
Platypolia loda
Stretchia plusiaeformis

Nymphalidae

Polygonia gracilis zephyrus

Tortricidae

Sparganothis senecionana

Ribes cruentum* [Grossulariaceae]*Shineyleaf currant****Geometridae**

Dysstroma formosa
Eulithis propulsata
Hesperumia sulphuraria

Lycaenidae

Lycaena arota

Noctuidae

Stretchia muricina
Stretchia plusiaeformis

Ribes lacustre* [Grossulariaceae]*Swamp currant****Noctuidae**

Platypolia contadina

Tortricidae

Clepsis persicana

Yponomeutidae

Zelleria gracilariella

Ribes lobbii - *Rubus spectabilis****Ribes lobbii* [Grossulariaceae]****Lobb's gooseberry****Gelechiidae***Gelechia dromicella***Geometridae***Nematocampa resistaria***Tortricidae***Sparganothis senecionana****Ribes niveum* [Grossulariaceae]****Snow gooseberry****Noctuidae***Aseptis binotata****Ribes sanguineus* [Grossulariaceae]****Red currant****Geometridae***Campaea perlata**Dysstroma brunneata**Dysstroma formosa****Ribes velutinum* [Grossulariaceae]****Plateau gooseberry****Noctuidae***Mesogona olivata****Ribes viscosissimum* [Grossulariaceae]****Sticky currant****Geometridae***Dysstroma brunneata**Dysstroma formosa**Itame bitactata**Neoterpes trianguliferata***Noctuidae***Stretchia muricina***Nymphalidae***Polygonia gracilis zephyrus***Tortricidae***Epinotia vagana**Sparganothis senecionana***Yponomeutidae***Zelleria gracilariella****Ribes watsonianum* [Grossulariaceae]****Spiny gooseberry****Nymphalidae***Polygonia gracilis zephyrus****Ribes* spp. [Grossulariaceae]****Currants****Geometridae***Pero mizon***Noctuidae***Aseptis binotata**Graphiphora haruspica****Rosa* spp. [Rosaceae]****Roses****Geometridae***Erannis tiliaria**Eulithis xyliana**Neocalcis californiaria**Operophtera bruceata**Pero mizon***Noctuidae***Acrionicta impressa**Lithophane georgii**Xylena cineritia***Tortricidae***Epinotia vagana****Rubus discolor* [Rosaceae]****Himalayan blackberry****Geometridae***Eupithecia misturata***Noctuidae***Adelphagrotis stellaris**Graphiphora haruspica**Hemigraphiphora plebeia***Tortricidae***Argyrotaenia citrana****Rubus parviflorus* [Rosaceae]****Thimbleberry****Geometridae***Dysstroma citrata***Noctuidae***Aseptis binotata**Zale lunata***Thyatiridae***Pseudothyatira cymatophoroides****Rubus spectabilis* [Rosaceae]****Salmonberry****Geometridae***Ectropis crepuscularia**Sabulodes aegrotata**Selenia alciphearia*

Rubus spectabilis* - *Sambucus racemosa***Rubus spectabilis* [Rosaceae]** (continued)**Noctuidae**

Aseptis binotata
Pseudorthodes irrorata

Thyatiridae

Habrosyne scripta
Pseudothyatira cymatophoroides

Tortricidae

Argyrotaenia citrana

S***Salix hookeriana* [Salicaceae]****Coast willow****Tortricidae**

Acleris hastiana

Salix* spp. [Salicaceae]*Willows****Arctiidae**

Arctia caja
Hyphantria cunea
Lophocampa maculata

Geometridae

Biston betularia
Cabera erythemaria
Campaea perlata
Ectropis crepuscularia
Elpiste lorquinaria
Ennomos magnaria
Erannis tiliaria
Euchlaena tigrinaria
Eulithis xyliana
Eupithecia misturata
Hesperumia sulphuraria

Neocalcis californiaria

Protitame matilda
Semiothisa neptaria
Subminiata snoviata
Synaxis cervinaria

Lasiocampidae

Malacosoma disstria

Lycaenidae

Satyrium sylvinum

Lymantriidae

Leucoma salicis
Orgyia antiqua

Noctuidae

Abagrotis variata
Aseptis binotata
Catocala briseis
Homoglaea carbonaria
Homoglaea dives
Lacanobia lutra
Litholomia napaea
Lithophane amanda
Lithophane innominata
Nycteola columbiana
Nycteola frigidana
Orthosia hibisci
Phlogophora periculosa
Scoliopteryx libatrix
Zale lunata

Notodontidae

Clostera apicalis

Nymphalidae

Nymphalis antiopa
Polygonia faunus

Tortricidae

Acleris maximana
Acleris senescens
Archips argyrospila
Choristoneura rosaceana
Epinotia columbia
Pandemis pyrusana

Sambucus cerulea* [Caprifoliaceae]*Blue elderberry****Arctiidae**

Spilosoma virginica

Geometridae

Eupithecia maestosa
Hesperumia latipennis
Synaxis jubararia

Noctuidae

Fishia evelina
Orthosia hibisci
Synedoida divergens
Synedoida ochracea
Xylena cineritia

Sambucus racemosa* [Caprifoliaceae]*Red elderberry****Geometridae**

Campaea perlata
Sabulodes aegrotata

Noctuidae

Zotheca tranquilla

Senecio jacobaea - Tsuga heterophylla**Senecio jacobaea [Asteraceae]****Tansy ragwort****Arctiidae***Tyria jacobaeae***Geometridae***Eupithecia harveyata**Eupithecia misturata***Sidalcea cusickii [Malvaceae]****Cusick's checker-mallow****Hesperiidae***Pyrgus communis***Lycaenidae***Strymon melinus***Pyralidae***Udea profundalis***Sorbus scopulina [Rosaceae]****Mountain ash****Geometridae***Eulithis xyliana**Eupithecia misturata***Lasiocampidae***Phyllodesma americana***Noctuidae***Lithophane georgii**Lithophane innominata***Notodontidae***Ceranemota tearlei***Spiraea douglasii [Rosaceae]****Douglas' spiraea****Geometridae***Eulithis xyliana**Eupithecia misturata**Sabulodes aegrotata***Noctuidae***Alypia langtoni**Egira crucialis**Lithophane georgii**Lithophane thaxteri**Oncocnemis chalybdis**Orthosia praeses**Xylena cineritia***Symphoricarpos albus [Caprifoliaceae]****Snowberry****Alucitidae***Alucita hexadactyla***Geometridae***Campaea perlata**Ectropis crepuscularia**Hesperumia latipennis**Nealcis californiaria**Operophtera bruceata**Pero mizon**Synaxis jubararia**Xanthorhoe macdunnoughi***Noctuidae***Abagrotis erratica**Adelphagrotis indeterminata**Amphipyra pyramidoides**Anhimella perbrunnea**Aseptis binotata**Pleromelloida cinerea**Pseudorthodes irrorata**Sunira decipiens***Plutellidae***Euceratia castella**Euceratia securella**Ypsolopha dentiferella***Sphingidae***Hemaris diffinis***T****Thuja plicata [Cupressaceae]****Western red cedar****Geometridae***Eupithecia sabulosata**Nealcis californiaria***Tilia sp. [Tiliaceae]****Lindens****Noctuidae***Amphipyra pyramidoides***Tsuga heterophylla [Pinaceae]****Western hemlock****Arctiidae***Lophocampa argentata***Geometridae***Caripeta divisata**Ectropis crepuscularia**Eupithecia annulata**Gabriola dyari**Lambdina fiscellaria*

Tsuga heterophylla* - *Vaccinium parvifolium***Tsuga heterophylla* [Pinaceae] (continued)****Geometridae**

Nealcis californiaria
Nepytia umbrosaria
Pero mizon
Semiothisa signaria

Noctuidae

Phlogophora periculosa
Xestia mustelina

Tortricidae

Acleris gloverana
Griselda radicana

Tsuga mertensiana* [Pinaceae]*Mountain hemlock****Geometridae**

Enypia packardata

U***Umbellularia californica* [Lauraceae]****California laurel****Geometridae**

Nealcis californiaria
Sabulodes aegrotata

Urtica dioica* [Urticaceae]*Stinging nettles****Noctuidae**

Abrostola urentis
Hypena californica
Hypena humuli

Nymphalidae

Nymphalis milberti
Polygonia satyrus

Vanessa annabella

Vanessa atalanta

Pyralidae

Udea profundalis

V***Vaccinium alaskense* [Ericaceae]****Alaska blueberry****Geometridae**

Eulithis xyliana
Eupithecia misturata
Hesperumia sulphuraria

Noctuidae

Platypolia contadina

Vaccinium membranaceum* [Ericaceae]*Thin-leaved blueberry****Geometridae**

Anagoga occiduaria
Ectropis crepuscularia
Eulithis destinata
Eulithis xyliana
Eupithecia misturata
Hesperumia sulphuraria
Iridopsis emasculata
Thallopaga taylorata

Noctuidae

Lacanobia lutra
Lacanobia tacoma

Tortricidae

Croesia curvalana

Vaccinium ovatum* [Ericaceae]*Evergreen blueberry****Geometridae**

Eulithis destinata
Nealcis californiaria

Noctuidae

Phlogophora periculosa

Nymphalidae

Polygonia faunus

Vaccinium parvifolium* [Ericaceae]*Red blueberry****Geometridae**

Biston betularia
Campaea perlata
Euchlaena johnsonaria
Eulithis xyliana
Eupithecia subapicata
Eupithecia subcolorata
Eustroma semiatrata
Hesperumia latipennis
Hesperumia sulphuraria
Iridopsis emasculata
Nealcis californiaria
Pero mizon
Probole amicaria
Synaxis jubararia

Noctuidae

Abagrotis trigona
Acronicta funeralis
Aseptis binotata
Lacanobia lutra
Lithophane baileyi
Xestia mustelina

Vaccinium parvifolium* - *Verbascum thapsus***Vaccinium parvifolium* [Ericaceae]**

(continued)

Noctuidae*Oligia illocata**Phlogophora periculosa**Platypolia contadina***Tortricidae***Archips rosana****Vaccinium* spp. [Ericaceae]****Blueberries****Geometridae***Eulithis destinata**Synaxis jubararia***Noctuidae***Lithomoia germana****Vancouveria hexandra* [Berberidaceae]****Inside-out flower****Pyralidae***Herpetogramma pertextalis****Verbascum thapsus* [Scrophulariaceae]****Mullein****Noctuidae***Agrochola purpurea*

GLOSSARY

- abdomen** one of the three primary body segments, along with the head and thorax, characteristic of insects. The abdomen in moths is typically elongate and contains the reproductive organs.
- adfrontal suture** a seam-like line on the frontal area of the caterpillar head capsule.
- allelochemical** a chemical derived from plants that may stimulate or deter feeding by caterpillars.
- anal angle** the angle along the edge of the wing created by the transition from the outer margin to the inner margin.
- anal area** see area, anal.
- anal proleg** a proleg on the last segment of the abdomen.
- antenna (pl. antennae)** variously shaped filamentous sensory organs located on the head.
- anterior** to be in front; the area that is the forward-most section of a body part.
- apical area** see area, apical.
- aposomatic** a brightly colored organism that is typically poisonous.
- area, anal** the area on the wing between the outer margin and the inner margin, proximal to the anal angle.
- area, apical** the area on the wing below the apex.
- area, basal** the area at the base of the wing where the wing is attached to the thorax.
- area, median** the central area of the wing.
- area, midcostal** the area in the center of the front edge of the wing.
- area, postmedian** the area on the wing immediately distal to the median area and proximal to the submarginal area.
- area, subanal** the area on the wing proximal to the anal area.
- area, subapical** the area on the wing proximal to the apical area.
- area, submarginal** the area on the wing proximal to the outer margin.
- band** a wide area typically extending more than half the distance along the width or length of the wing and often demarked by lines and associated with a particular area on the wing.
- basal area** see area, basal.
- basal line** see line, basal.
- biordinal** the tips of the crochets occur in a pattern of two rows.
- biserial** the base of the crochets occur in a pattern of two rows.
- bivoltine** two generations per year.
- butterfly** the adult of a species of Lepidoptera with knobbed antennae, day-flying, and typically brightly colored.
- caterpillar** the larva of Lepidoptera; one of four life stages of skippers, butterflies, and moths.
- cardiac glycoside** an allelochemical found in certain plants such as milkweed and poisonous to most animals.
- cell, discal** an area of the wing delineated by the discal veins in the discal area.

- chalaza (pl. chalazae)** a single hair arising from an elevated base.
- chrysalis** the pupa of a butterfly.
- cleft** notched.
- cocoon** the pupa of moths wrapped in silk.
- costal margin** see margin, costal.
- crochets** hooks present on the ends of the prolegs.
- cryptic** an organism that blends into its surroundings.
- dash** a narrow short mark extending less than half the distance along the width or length of the wing.
- dentate** tooth-like markings, typically along one side of a line.
- diapause** a condition of arrested development.
- discal area** see area, discal.
- discal cell** see cell, discal.
- discal spots** see spots, discal.
- diurnal** active during the day.
- dorsal** the top or back area of the body.
- dorsum** the upper side of the body.
- eclose** to emerge from.
- eyespot** a round multi-colored spot on the forewing or hindwing.
- falcate** curved into a sickle-shape, often used to describe a wing with the tip extended into an subtle or elongate, curved point.
- femur** the third segment of the true legs preceded by the coxa and the trochanter. The femur is the first leg segment that is elongate, followed by the tibia which is also elongate.
- foreleg** the first pair of true legs nearest the head. The forelegs are ventrally attached to the first thoracic segment.
- forewing(s)** the wing(s) attached to the second thoracic segment, the first pair of wings from the head.
- frass** insect feces.
- gregarious** living in a group.
- head** one of the three primary body segments characteristic of insects, along with the thorax and abdomen. The head contains the antennae, mouthparts, eyes, and brain.
- head capsule** the sclerotized (hardened) part of the head.
- herbivorous** feeding on foliage.
- hindwing(s)** the wing(s) attached to the third thoracic segment, the second pair of wings from the head.
- holometabolous** an insect whose development involves a pupal stage.
- inchworm** the caterpillar of geometrids which has only one pair of midabdominal prolegs, occurring on sixth abdominal segment.
- inner band** see band, inner.
- inner margin** see margin, inner.
- instar** an immature insect between molts.
- labial palps** see palps, labial.
- labium** the bottom-most part of the mouthparts upon which the caterpillar silk gland is located.
- labrum** a flap-like part of the mouthparts just below the face used as a feeding guide.

- larva** one of the immature stages in the life cycle of a holometabolous insect, a caterpillar is the larval life stage of Lepidoptera.
- lateral** an area along the side of a body part.
- line** a narrow mark extending more than half the distance along the width or length of the wing and associated with a particular area on the wing.
- line, basal** a line in the basal area near to where the wing attaches to the thorax.
- line, postmedian** a line in the postmedian area.
- line, submarginal** a line in the submarginal area.
- macromoth** the adult of a species of Lepidoptera with the tips of antennae tapered, in the Pacific Northwest the species occur in one of the following families: Arctiidae, Dioptriidae, Drepanidae, Epiplemididae, Geometridae, Lasiocampidae, Lymantriidae, Noctuidae, Notodontidae, Saturniidae, Sphingidae, and Thyatiridae.
- mandible** a component of the mouthparts used for cutting and chewing food.
- margin, costal** the front edge of the wing.
- margin, inner** the back edge of the wing.
- margin, outer** the distal edge of the wing.
- median area** see area, median.
- median line** see line, median.
- mesothorax** the second (middle) segment of the thorax from the head, abbreviated as T2.
- metathorax** the third (last) segment of the thorax from the head, abbreviated as T3.
- micromoth** the adult of a species of Lepidoptera with the tips of antennae tapered, typically small bodied, many families of micromoths occur in the Pacific Northwest; not a butterfly or a macromoth.
- midabdominal proleg** prolegs on the middle abdominal segments.
- midcostal area** see area, midcostal.
- middorsal** an area in the middle of the top region of a body part.
- monophagous** feeding on only one kind of plant.
- multiserial** the base of the crochets occur in a pattern of multiple rows.
- multivoltine** more than two generations per year.
- nocturnal** active during the night.
- occiput** the top portion of the head capsule.
- omnivorous** feeding on both plants and animals, and perhaps detritus.
- orbicular spot** see spot, orbicular.
- osmeterium** an eversible forked pouch in Papilionidae located middorsally on the prothorax.
- outer margin** see margin, outer.
- oviposition** the laying of an egg.
- palps, labial** small, segmented, filamentous appendages attached to the labium on the mouthparts.
- parasitoid** a specialized insect predator whose young develop entirely on a single host and kill the host.
- patch** a small restricted area of the wing demarked by a distinct color but not delimited by lines.

- pectinate** comb-like, often used to describe antennae with numerous fine branches arranged asymmetrically along one side of antennal segments.
- plumose** feather-like, often used to describe antennae with numerous fine branches arranged in opposition along the antennal segments.
- plusiine noctuids** a group of moths whose caterpillar typically has two pair of midabdominal prolegs, occurring on the fifth and sixth abdominal segments.
- polyphagous** feeding on many plant species.
- posterior** to be behind; the area that is the back end of a body part.
- postmedian area** see area, postmedian.
- postmedian line** see line, postmedian.
- predaceous** feeding on live animals.
- proleg** fleshy protuberance of body wall; creates a nonjointed leg.
- prothoracic shield** a sclerotized plate on the first thoracic segment.
- prothorax** the first segment of the thorax behind the head, abbreviated as T1.
- pupa** the life stage of a holometabolous insect that follows the larval stage and within which metamorphosis occurs.
- reniform spot** see spot, reniform.
- sclerotized** a hardened area of the body skin.
- scolus (pl. scoli)** a spine with multiple points.
- semilooper** the caterpillar of plusiine noctuids.
- setae** hairs.
- silk gland** a silk-excreting gland in caterpillars on the underside of the labium.
- skipper** the adult of a species of Lepidoptera in the family Hesperidae, antennae with a hooked-tip, day-flying, closely related to butterflies.
- spiracle** the opening of the respiratory system located along the lateral side of the body.
- spot, orbicular** a single near round-shaped spot that occurs just short of half way along the front edge of the forewing within the discal cell.
- spot, reniform** a single irregularly shaped spot, often kidney-shaped, that occurs just past half way along the front edge of the forewing at the distal end of the discal cell.
- spots, discal** a combination of the reniform and orbicular spots.
- stemma (pl. stemmata)** the eyes on the head capsule, also called eyespots.
- stigma** a distinct marking in the median area, of variable shape, often comma or v-shaped, usually silver or white, characteristic of Plusiinae: Noctuidae.
- subanal area** see area, subanal.
- subapical area** see area, subapical.
- subdorsal** the body area part way between dorsal and lateral.
- sublateral** the area below the lateral region of a body part.
- submarginal area** see area, submarginal.
- submarginal line** see line, submarginal.
- subspiracular** the body area immediately below the spiracles.

thorax one of the three primary body segments characteristic of insects, along with the head and abdomen. The thorax consists of three segments with a pair of wings attached dorsally to the second and third segments, and a pair of jointed legs attached ventrally to each segment.

triordinal the tips of the crochets occur in a pattern of three rows.

triserial the base of the crochets occur in a pattern of three rows.

uniordinal the tips of the crochets occur in one row.

uniserial the base of the crochets occur in one row.

univoltine one generation per year.

urticating stinging (hairs).

venter the underside of the body.

ventral the area on the underside of a body part.

warts small bumps or short finger-like projections extending from the body wall.

wingspan the distance between the tips of the front wings in a properly spread specimen.

REFERENCES

- Borror, D.J.; Triplehorn, C.A.; Johnson, N.F. 1983.** An introduction to the study of insects. Philadelphia: Saunders College Publ.; 875 p.
- Covell, C.V., Jr. 1984.** A field guide to the moths of eastern North America. Boston: Houghton Mifflin Co.; 496 p.
- Dornfeld, E.J. 1980.** The butterflies of Oregon. Forest Grove, OR: Timber Press; 276 p.
- Eichlin, T.D.; Cunningham, H.B. 1978.** The Plusiinae (Lepidoptera: Noctuidae) of America north of Mexico, emphasizing genitalic and caterpillar morphology. Technical Bulletin 1567. Washington, DC: U.S. Department of Agriculture; 122 p.
- Essig, E.O. 1929.** Insects of western North America. New York, NY: The MacMillan Co.; 1035 p.
- Ferguson, D.C. 1971.** Bombycoidea: Saturniidae (part). In Dominick, R.B. et al., The Moths of America North of Mexico, Fascicle 20.2A; 153 p.
- Ferguson, D.C. 1972.** Bombycoidea: Saturniidae (part). In Dominick, R.B. et al., The Moths of America North of Mexico, Fascicle 20.2B; 275 p.
- Ferguson, D.C. 1978.** Noctuoidea (part): Lymantriidae. In Dominick, R.B. et al., The Moths of America North of Mexico, Fascicle 22.2; 110 p.
- Ferguson, D.C. 1985.** Geometroidea: Geometridae (part) In Dominick, R.B. et al., The Moths of America north of Mexico, Fascicle 18.1; 131 p.
- Franclemont, J.G. 1973.** Mimallonoidea and Bombycoidea In Dominick, R.B. et al., The Moths of America north of Mexico, Fascicle 20.1; 86 p.
- Furniss, R.L.; Carolin, V.M. 1977.** Western forest insects. Miscellaneous Publication 1339. Washington, DC: U.S. Department of Agriculture, Forest Service; 654 p.
- Grimble, D.G.; Beckwith, R.C.; Hammond, P.C. 1992.** A survey of the Lepidoptera fauna from the Blue Mountains of eastern Oregon. Journal of Research on the Lepidoptera. 31: 83-102.
- Hammond, P.C.; Miller, J.C. 1998.** Comparison of the biodiversity of Lepidoptera within three forested ecosystems. Annals of the Entomological Society of America. 91: 323-328.
- Hinchliff, J. 1994.** An atlas of Oregon butterflies. Corvallis, OR: Oregon State University Bookstore; 176 p.
- Hinchliff, J. 1996.** An atlas of Washington butterflies. Corvallis, OR: Oregon State University Bookstore; 162 p.
- Hodges, R.W. 1971.** Sphingoidea. In Dominick, R.B. et al., The moths of America north of Mexico, Fascicle 21; 158 p.
- Hodges, R.W.; Dominick, T.; Davis, D.R.; Ferguson, D.C.; Franclemont, J.G.; Munroe, E.G.; Powell, J.A. 1983.** Checklist of the Lepidoptera of America North of Mexico. Washington, D.C.: The Wedge Entomological Research Foundation; 284 p.
- Ives, W.G.H.; Wong, H.R. 1988.** Tree and shrub insects of the prairie provinces. Information Report NOR-X-292. Edmonton, AB: Canadian Forestry Service, Northern Forest Centre; 327 p.
- Johnson, W.T.; Lyon, W.H. 1991.** Insects that feed on trees and shrubs. 2d ed. Ithaca, NY: Cornell University Press; 560 p.
- Lafontaine, J.D. 1987.** Noctuoidea: Noctuidae (part). In Dominick, R.B. et al., The Moths of America North of Mexico, Fascicle 27.2; 237 p.
- Lafontaine, J.D. 1998.** Noctuoidea: Noctuidae (part). In Dominick, R.B. et al., The Moths of America north of Mexico, Fascicle 27.3; 348 p.

- Lafontaine, J.D.; Poole, R.W. 1991.** Noctuoidea: Noctuidae (part). In Dominick, R.B. et al., *The Moths of America north of Mexico*, Fascicle 25.1; 182 p.
- McCabe, T. 1991.** Atlas of Adirondack caterpillars. Museum Bulletin 470. Albany, NY: State Education Department, New York State Museum; 114 p.
- McGugan, B.M. (compiler). 1958.** Forest Lepidoptera of Canada. Vol. 1: Papilionidae to Arctiidae. Publication 1034. Ottawa, ON: Canada Department of Agriculture, Forest Biology Division; p. 1-76.
- Miller, J.C. 1990a.** Field assessment of the effects of a microbial pest control agent on nontarget Lepidoptera. *American Entomologist*. 36: 135-139.
- Miller, J.C. 1990b.** Effects of a microbial insecticide, *Bacillus thuringiensis kurstaki*, on nontarget Lepidoptera in a sprucebudworm-infested forest. *Journal of Research on the Lepidoptera*. 29:267-276.
- Miller, J.C. 1993.** Insect natural history, multispecies interactions and biodiversity in ecosystems. *Biodiversity and Conservation*. 2: 233-241.
- Miller, J.C. 1995.** Caterpillars of Pacific Northwest forests and woodlands. FHM-NC-06-95. Morgantown, WV: U.S. Department of Agriculture, Forest Service, National Center of Forest Health Management; 80 p.
- Miller, J.C.; Hammond, P.C. 2000.** Macromoths of Northwest forests and woodlands. FHTET 98-18. Morgantown, WV: U.S. Department of Agriculture, Forest Service, National Center of Forest Health Management; 133 p.
- Miller, J.C.; Hammond, P.C.; Ross, D.N.R. 2003.** Distribution of functional roles of rare and uncommon moths (Lepidoptera: Noctuidae: Plusiinae) across a coniferous forest landscape. *Ann. entomol. Soc. Am.*, vol. 96; 847-855.
- Neill, W. 2001.** The guide to butterflies of Oregon and Washington. Westcliffe Publ.; 160 p.
- Peterson, A. 1962.** Larvae of insects. Part I: Lepidoptera and Hymenoptera. Ann Arbor, MI: Printed for the author by Edwards Bros.; 315 p.
- Poole, R.W. 1995.** Noctuoidea: Noctuidae (part) In Dominick, R.B. et al., *The Moths of America North of Mexico*, Fascicle 26.1; 249 p.
- Prentice, R.M. 1962.** Forest Lepidoptera of Canada. Part II: Nycteolidae, Notodontidae, Noctuidae, Liparidae. Bulletin 128. Ottawa, ON: Canada Department of Forestry; p. 77-281.
- Prentice, R.M. 1963.** Forest Lepidoptera of Canada. Part III: Lasiocampidae, Drepanidae, Thyatiridae, Geometridae. Publication 1013. Ottawa, ON: Canada Department of Forestry; p. 282-543.
- Prentice, R.M. 1965.** Forest Lepidoptera of Canada. Part IV: Microlepidoptera. Publication 1142. Ottawa, ON: Canada Department of Forestry; p. 544-840.
- Pyle, R.M. 2002.** The butterflies of Cascadia. Seattle Audubon Society; 420 p.
- Scoble, M.J. 1995.** The Lepidoptera: form, function and diversity. Oxford, UK: The Oxford University Press; 404 p.
- Stamp, N.E.; Casey, T.M. (eds.). 1993.** Caterpillars: ecological and evolutionary constraints on foraging. New York: Chapman and Hall; 587 p.
- Stehr, F.W. (ed.). 1987.** Immature insects. Vol. 1. Dubuque, IA: Kendall Hunt Publishing Co.; 754 p.
- Stevens, R.E.; Carolin, V.M.; Markin, P. 1984.** Lepidoptera associated with western spruce budworm. *Agric. Handbk.* 622. Washington, DC: U.S. Department of Agriculture, Forest Service; 63 p.
- Stoetzel, M.B. (compiler). 1989.** Common names of insects and related organisms. Lanham, MD: Entomological Society of America; 199 p.

- Tietz, H.M. 1972.** An index to the described life histories, early stages and hosts of the macrolepidoptera of the Continental United States and Canada. Sarasota, FL: Allyn Museum of Entomology; 1041 p.
- Tuskes, P.M.; Tuttle, J.P.; Collins, M.M. 1996.** The wild silk moths of North America. Ithaca, New York: Cornell Press; 250 p.
- Wagner, D.L.; Ferguson, D.C.; McCabe, T.L.; Reardon, R.C. 2002.** Geometrid caterpillars of northeastern and Appalachian forests. FHTET-2001-10. Morgantown, WV: U.S. Department of Agriculture, Forest Service, National Center of Forest Health Management; 239 p.
- Wagner, D.L.; Giles, V.; Reardon, R.C.; McManus, M.L. 1997.** Caterpillars of eastern forests. FHTET-96-34. Morgantown, WV: U.S. Department of Agriculture, Forest Service, National Center of Forest Health Management; 113 p.
- Wagner, D.L.; Henry, J.J.; Peacock, J.W.; McManus, M.L.; Reardon, R.C. 1995.** Common caterpillars of eastern deciduous forests. FHM-NC-04-95. Morgantown, WV: U.S. Department of Agriculture, Forest Service, National Center of Forest Health Management; 31 p.
- Wright, A.B. 1993.** Peterson's first guide to caterpillars. Boston: Houghton Mifflin Co.; 128 p.

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