

Beneficial Insects and Spiders of Alaska



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Photographer information can be found on page 36.

Cover photos left to right:

Top row: crab spider (*Misumena vatia*), Dave Guinn; three-banded lady beetle (*Coccinella trifasciata perplexa*) eating aphids, Aaron Hagerty; green lacewing (Chrysopidae), Dave Guinn

Bottom row: parasitoid wasp (Ichneumonidae), Dave Guinn; aerial yellowjacket (*Dolichovespula arenaria*), Derek Sikes

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Introduction

Gardens and agricultural systems support a community of pests and their natural enemies. Natural enemies are a component of integrated pest management. They provide benefits to farmers and gardeners by keeping pests below damaging levels. Natural enemies are particularly important in low input and organic systems, where their populations can increase in the absence of conventional insecticides. They are also important in conventional farming systems, where broad-spectrum insecticides can kill pests and beneficial insects. With their natural enemies gone, pests can rebound quickly, and increase to levels higher than before the insecticide application.

Natural enemies can be divided in to three broad categories: **predators**, **parasitoids** and **pathogens**.

Predators hunt and consume other species to survive. Adult parasitoids deposit eggs in or on the body of the host or on foliage consumed by the host. Eggs hatch and feed on the host's body. Adult parasitoids are generally free living, feeding on nectar or pollen. Pathogens are microorganisms (fungi, bacteria or viruses) that produce disease and death.

This guide provides information on identification and habits of predators and parasitoids. There is limited information on beneficial insects in Alaska. The following work should be viewed as preliminary and will be revised as more information becomes available. Additional information on identification and control options are available through your local Cooperative Extension Service.

Alaska Beneficial Spiders

1



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2

Beneficial Spiders and their Relatives

Identification

Spiders are characterized by four pairs of walking legs and two body regions, the cephalothorax (head and thorax combined) and abdomen, usually separated by a waist constriction.

Spiders are distinguished by spinnerets, the silk and web spinning organs at the rear of the abdomen. All are predaceous. Most are docile and harmless to humans.

Habits

Some spiders construct webs to ensnare prey; others do not spin webs, but actively pursue prey on the ground or on plant foliage.

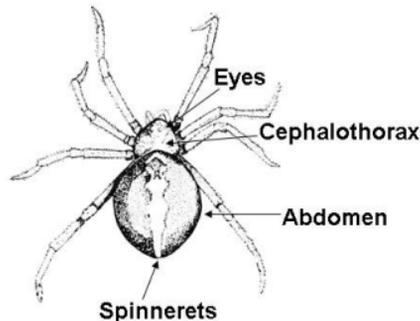
Dangerously venomous spiders, such as the black widow or brown

recluse, are not native to Alaska and cannot survive in natural Alaska settings.

Spiders outlined in this booklet are included because of their likelihood to be present in a garden or crop setting in Alaska.

Exclusion of any family of spiders does not indicate their absence from the state or a lack of beneficial qualities.

Attract spiders by planting a “wild area” with sufficient foliage to provide protected habitat.



Daddy-long-legs or Harvestman

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Harvestman

Opilones sp.

Identification

Small pea-sized body and eight slender legs. Legs can be either long or short.

The upper surface of the body is usually a mottled grey and brown coloration, while the underside is a cream color.

Eggs are deposited in soil, in cracks and under bark.

Harvestmen species are not spiders, but are close relatives to the spiders. They lack a constricted waist and spinnerets.

Web Type

Does not spin a web.

Habits

Harvestmen are generalist predators, feeding on soft bodied insects, leaf beetle larvae, slugs and snails, as well as decaying organic matter.

They have special glands for defense which produce strong smelling secretions.

There are several species native to Alaska most frequently found in undisturbed forest sites.

The type most likely to be found in disturbed sites such as a garden or crop setting is a nonnative *Opilones* species.

Ground or Wolf Spiders (Lycosidae)

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6

Ground or Wolf Spiders

Lycosidae

Identification

Ground spiders have highly variable grey and brown color patterns to match their surroundings.

The egg sac is round and carried by the female under her spinnerets.

After hatching, the tiny spiderlings climb onto the abdomen of the mother, where they remain for a considerable amount of time.

Web Type

Wolf spiders do not spin webs. Females spin silk to make egg sacs.

Habits

Wolf spiders are fast and are often seen running from disturbances or danger. They have excellent eyesight and are active predators.

Some species of ground spiders make tunnels in the ground or use natural depressions such as rocks or cracks for retreat, while others are found in grass, leaf litter or stony areas.

In Alaska, wolf spiders are encountered around the yard and garden and sometimes even in homes.

Attract by maintaining a few permanent plantings; edging, wooden walkways and mulch also provide shelter.

Crab Spiders (Thomisidae)

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Crab Spiders

Thomisidae

Identification

Crab spiders have their first and second pairs of legs much longer than the last two pairs, giving them a crab-like appearance.

Their abdomen is often much wider than it is high. They are usually light in color and rely on camouflage to hunt.

Females produce large egg sacs that they hide and guard for long periods.

Web Type

Crab spiders do not spin webs, snares or nests. They spin egg sacs.

Habits

Crab spiders secure their prey by ambush and stealth. They are often found on flowers in the garden setting. Camouflaged, they lie in wait for prey — sometimes for days.

Some species slowly change color to match their flower perch. They also stalk their prey on the ground.

This family of spiders relies more on touch than eyesight to detect prey.

Orb Weaver Spiders (Araneidae)

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Orb Weaver Spiders

Araneidae

Identification

Orb weavers are highly varied in size and coloration. The Alaska example shown is a large species with a brightly patterned abdomen and distinctive leg markings.

Males are often much smaller than females. Egg sacs are camouflaged within the web or sometimes buried in leaf duff.

Web Type

Orb weavers are so named because they construct a web made up of concentric circles of silk anchored to the surrounding vegetation.

Most people are familiar with this “Charlotte’s Web” pattern.

Habits

Orb weavers are most famous for their web engineering. They and their webs are commonly found on or near plants in the garden, as well as on the exteriors of homes and decks.

With greatly reduced eyes, orb weavers rely on the vibration of the web to indicate when prey has been captured.

Members of this group are some of the largest spiders likely to be encountered in Alaska gardens.

Alaska Beneficial Insects

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Insect Introduction

Insects are characterized by three pairs of walking legs, generally two pairs of wings and three body regions: head, thorax and abdomen.

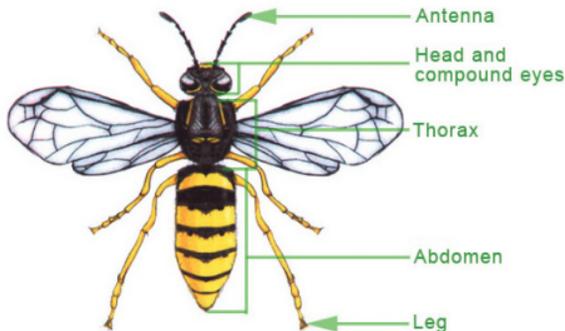
Body type, size and coloration vary dramatically among insects. Insects feed on plants, other insects, fungi, detritus and, in some cases, animals. Most are harmless to humans and our crops.

Insects occupy a wide range of habitats and possess a vast array of habits. Insects have colonized the great majority of Earth's ecosystems with one main exception, salt water environments.

A great many are beneficial or benign, pollinating both wild and cultivated plants; feeding on pest organisms; and serving as food sources for birds, fish and mammals. Some

others, unfortunately, are important agricultural and human health pests.

Insect growth and development occurs in a variety of ways. The beneficial insects described in this booklet, with the exception of nabids, undergo a complete metamorphosis. They develop through four life stages including egg, immature, pupa and adult. Nabids undergo a simple metamorphosis with three life stages including egg, immature and adult. Each life stage is described for the beneficial groups presented.



Damsel Bugs or Nabids (Hemiptera: Nabidae)



Damsel Bugs, Nabids

Damsel bugs (a.k.a. nabids) have mouthparts that are elongated into a beak, which is held folded under the head. When prey is captured, the beak is extended and sharp stylets puncture the prey and inject saliva. This saliva helps to break down the prey's tissues.

Nabids are known to feed on agricultural pests such as aphids, plant bugs, mites, moth eggs and small caterpillars. Although beneficial in general, nabids can produce a painful bite if handled.

Identification

Adults: (approx. 1 cm) Narrow-oval body, usually yellowish brown in color. Legs and antennae are long and head appears pointed.

Hemiptera: Nabidae

Immatures: (1–7 mm) Similar in appearance to the adults but lack wings.

Eggs: Small, cream colored to white, laid on foliage or inserted in plant tissue.

Habits

Damsel bugs are found in the garden, in tall grass and other vegetative cover. Maintain natural grassy areas around the garden to encourage this predator.

**Brown Lacewings
(Neuroptera: Hemerobiidae)**
**Green Lacewings
(Neuroptera: Chrysopidae)**

Brown
Lacewing

21



Green Lacewing



16

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Green Lacewings

Brown Lacewings

Green and brown lacewings are important predators of aphids, mites, whiteflies and eggs of some economically destructive caterpillars.

Several species are found in Alaska, but they are very difficult to tell apart. Fortunately, they are all beneficial and easy to identify as a group.

Neuroptera: Chrysopidae

Neuroptera: Hemerobiidae

Habits

Green lacewings are commonly found around bushes, grasses and weeds. Adults are night flyers; immatures are found on plant foliage.

Adults of some species feed on soft-bodied insects and others feed on honeydew, pollen or nectar. Immatures are commonly referred to as “aphid lions”; they feed primarily on aphids and other soft-bodied insects.

Immatures of some species cover themselves with debris, including the skins of their prey, for camouflage.

Brown lacewings are common in wooded areas. Green lacewings are commonly encountered in garden settings. Both adults and larvae prey on soft-bodied insects.

Green Lacewings (Neuroptera: Chrysopidae) Brown Lacewings (Neuroptera: Hemerobiidae)

Eggs



23

Lacewing Larva



24

Lacewing Adult



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18

Green Lacewings

Brown Lacewings

Identification

Adults

Green: (15–25 mm) Body green (some species appear pink in the fall). Wings clear with greenish tint, held roof-like over the back, eyes gold or copper metallic. Give off a disagreeable odor when handled.

Brown: (6–12 mm) Similar in general appearance to green lacewings, but smaller in size, brownish and hairy.

Pupae

Green: Small, round cocoon attached to foliage.

Brown: Small, elongate cocoon attached to foliage or under bark.

19 Lacewings

Neuroptera: Chrysopidae

Neuroptera: Hemerobiidae

Immatures

Green and Brown: Body grey-green in color, with bumps or knobs, “alligator-like” in appearance with long sickle-shaped jaws.

Eggs

Small and cream colored.

Green: Laid at the end of long, delicate stalks attached to leaves or stems near prey.

Brown: Oval, laid on leaves.

Ground Beetles (Coleoptera: Carabidae)



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Ground Beetles

Ground beetles are a large group of insects that can be found in a variety of habitats. Some sources list as many as 237 species in the state of Alaska.

Identification

Adults: Range in size from very small to about 3 cm. Body form usually oval with long walking legs. Coloration is usually black or brown, but some have striking blue or green iridescence.

Immatures: Body resembles a flattened caterpillar with long legs; head with hooked jaws.

Eggs and pupae: Found in soil and under debris.

Coleoptera: Carabidae

Habits

As generalist predators, adults and larvae actively hunt a variety of other insect prey. Adults of some species feed on seeds, while the larvae are predaceous. Almost any insect that spends a portion of its life close to the ground is fair game.

Permanent plantings, wooden terraces, walkways and mulch can provide shelter and increase populations around the yard and garden.

Lady Beetles (Coleoptera: Coccinellidae)

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Lady Beetles

Lady beetles are a well known and diverse group of primarily predaceous beetles. The beneficial status of lady beetles has been known for hundreds of years and they are considered a harbinger of good tidings in many cultures.

Adults and immatures are voracious, active predators of aphids, scale insects and other soft bodied pests.

Since the early 1900s, their populations have been encouraged and species have been introduced into new areas for control of agricultural and garden pests.

Coleoptera: Coccinellidae

In recent years, it has been shown that introduction of “foreign” species can be detrimental to the ecosystem and some introduced lady beetles tend to out-compete native species and reduce their numbers.

Twenty-three species of predaceous lady beetles have been recorded from Alaska.

Lady Beetles (Coleoptera: Coccinellidae)



Lady Beetles

Identification

Adults: (1–10 mm) Body convex, round to oval, often brightly colored red, orange or cream with dark spots or stripes. They can be distinguished from other colorful beetles by their short clubbed antennae and hidden head.

Pupae: (2–8 mm) Pupae are similar to larvae in coloration and are found attached to plants.

Immatures: Dark grey to black, often with bright bands or spots. Body flattened and “alligator-like” in appearance with spines or bumps on the back.

Eggs: Oval to spindle shaped, yellow-orange in color, often laid in clusters on plants.

Coleoptera: Coccinellidae

Habits

Lady beetles are commonly encountered in agricultural, garden and residential areas. Adults and immatures can be found on grasses, bushes, trees and garden plants.

Lady beetles pass the winter as adults under leaf litter and other debris.

Flower Flies (Diptera: Syrphidae)



Flower Flies

Flower flies are familiar, colorful insects that are often seen hovering around flowers like helicopters. Although adults closely resemble bees or wasps, they are harmless and do not sting or bite.

The immatures of some species are beneficial, feeding on aphids and other soft-bodied insects.

Identification

Adults: (1–2 cm) Medium to large flies; bodies usually brightly colored; yellow and black bands to mimic wasps and bees.

Pupae: Small, tan “cocoon” attached to foliage.

Immatures: Grey-green, slug-like maggots. Head end usually narrowed, posterior end with a large bump.

Diptera: Syrphidae

Eggs: Small, thinly oval and cream colored, often laid on foliage near aphid colonies.

Habits

Adults are not predaceous, but are important as pollinators. Adults feed primarily on pollen and nectar.

Eggs are laid singly or in groups, often among aphids. Immatures can be found on plants; black, tar-like spots of excrement in and around aphid colonies give away their presence.

Attract adults with flowering plants around the garden. Place dishes of sugar water out in the spring when flowers are not blooming.

Several species occur in Alaska, but the group is poorly studied.

Robber Flies (Diptera: Asilidae)



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Robber Flies

Robber flies are a predaceous group that feed on a wide variety of insects including wasps, bees, grasshoppers and other flies. Several species are known to occur in Alaska, but the group is poorly studied.

Identification

Adults: Medium to large flies. Eyes are large with a characteristic notch or depression between them. Some have bristles on their “face” that make them appear bearded. Most species are elongate with narrow abdomens; others are more robust, hairy and mimic bumblebees.

Diptera: Asilidae

Habits

Robber flies are found in a wide variety of habitats. However, they are most commonly encountered in grassy open areas or forest edges. Adults pursue and capture prey in the air or capture prey resting on foliage. Adults use piercing mouthparts to inject digestive saliva into prey and then suck out the body contents.

The immatures are poorly studied; they are thought to live in rotting wood, under bark or fallen leaves or in loose soil, where they are primarily predaceous.

Yellowjackets (Hymenoptera: Vespidae)



46



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48

Yellowjackets

Yellowjackets are social wasps living in colonial nests above or below ground. Some species are nuisance pests when their stinging and scavenging behavior puts them in contact with humans. The group as a whole is considered beneficial.

Identification

Adults: Medium to large wasps. Yellow and black or ivory and black. Distinguished from bees by their relatively hairless bodies, obvious waist constriction and wings that are held folded longitudinally over abdomen.

Habits

Yellowjacket colonies consist of a single queen and daughter workers.

Hymenoptera: Vespidae

They are efficient pollinators and voracious predators. Workers feed on nectar, but will eat flies, aphids, caterpillars and other pests. The larvae are fed chewed insects by workers. The colony can consume vast numbers of insects.

Mated queens overwinter in a protected site. They emerge in the spring, construct a small nest, lay eggs and care for the developing first brood of workers. Once the workers emerge, they expand the nest, forage for food, care for the young larvae and defend the colony. The queen then devotes all her time to laying eggs. New queens and males typically are produced in the fall. Males leave the colony, mate with new queens and die.

There are 11 species of yellowjackets reported from Alaska.

Parasitoid Wasps (Hymenoptera)



Parasitoid Wasps

Parasitoid wasps belong to several families of Hymenoptera and vary widely in appearance and habits. Immature life stages develop on or in insects or other invertebrates.

Many species of parasitoid wasps are host specific, making them useful for pest control in natural settings and greenhouses. All insect life stages (eggs, larvae and adults) can serve as hosts to parasitoids. Some species are available commercially for release as biocontrol agents.

Identification

Adults: Vary in size from 1 mm to several cm. Usually thin-bodied, elongate wasps, but some minute species are rather robust.

33 Parasitoid Wasps

Hymenoptera

Many parasitoid wasps have a very long, stinger-like ovipositor. While this structure looks impressive, it cannot be used to sting people. This appendage is used to deposit eggs into hosts.

Immatures: Found within body of host.

Habits

Adults feed on pollen or nectar and are beneficial as pollinators; others are predaceous. Adults lay eggs on, in or near potential host insects.

The larvae develop inside the host, feeding on body fluids, fat deposits and organs. Eventually, the host is killed once the parasitoid completes its development.

Some species form characteristic cocoons on or around the dead host.

Parasitoid Flies (Diptera: Tachinidae)

53



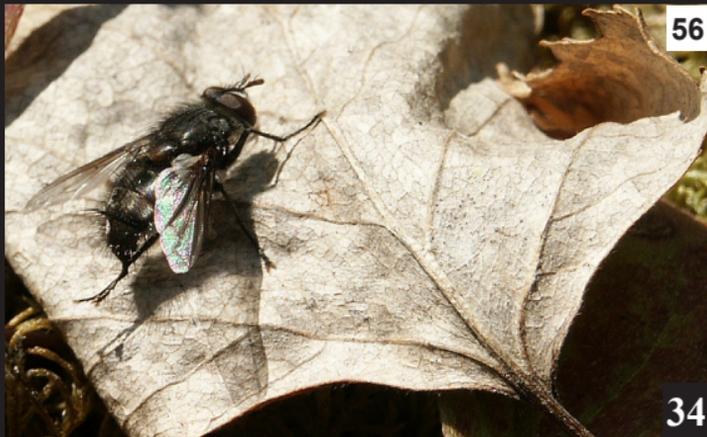
54



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Parasitoid Flies

Species of parasitoid flies most commonly encountered belong to the fly family Tachinidae. Tachinid fly maggots develop inside the bodies of various species of insects. They most commonly attack caterpillars, true bugs, beetles and grasshoppers.

Identification

Adults: Small to medium sized flies, often with many hairs or bristles. Many species appear very similar to common house or filth flies.

Immatures: Rarely seen due to their parasitic habits; maggots with spines or plates.

Diptera: Tachinidae

Habits

Adult flies lay eggs directly on the host or on something the host will eat. When the eggs hatch, the parasitoid larvae enter the host through the body wall or are consumed by the host as it feeds. The larvae develop inside the host, feeding on body fluids, fat deposits and organs.

Once parasitoid development is complete, the larvae will bore out of the host body, killing it, and pupate in the soil.

Most adult flies feed on honeydew, nectar or pollen.

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Identifications for Known Taxa

Photo number: Name

1,3,10: *Araneus trifolium*

5: *Phalangium opilio*

8–9: *Misumena vatia*

13: *Cicindella* sp.

14: Syrphidae, Flower Fly Maggot

15: *Dolichovespa arenaria*, Aerial
Yellowjacket

19–20: *Nabis* sp.

25: *Chrysoperla* sp.

26: *Carabus vietinghoffi*

27: *Pterostichus adstrictus*

28, 30: *Anatis mali*, Eye-Spotted Lady
Beetle

29: *Adalia bipunctata*, Two-Spotted
Lady Beetle

31: *Coccinella trifasciata perplexa*,
Three-Banded Lady Beetle

32: *Calvia quatuordecimguttata*,
Native Four-Spotted Lady Beetle

36: *Hippodamia quinquesignata*
quinquesignata, Five-Spotted
Lady Beetle

46: *Dolichovespa maculata*,
Baldfaced Hornet

47: *Vespula vulgaris*, Common
Yellowjacket

49: Brachonidae

50: *Gasteruption* sp.

51: *Ammophila* sp.

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