

## Amazing Insects

**I**t is not hard to find an insect. Just go outside to a field, woods or garden and sit in one spot for five to ten minutes. With more than 15,000 different kinds of insects found in New Hampshire, you are sure to see one – even in winter. The key to insects' success is having short lives, lots of young and special ways of catching prey, raising their young and protecting themselves.

Insects are fun to watch, but they also play an important role in the environment. Believe it or not, insects are really helpful! So turn the page to get more of the buzz on insects!

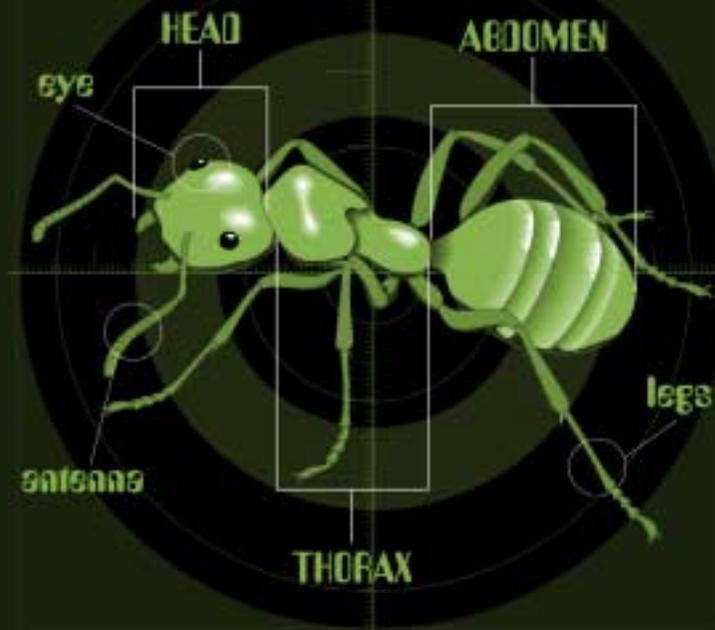
*Short-horned grasshoppers are abundant throughout New Hampshire, especially in late summer when mating begins.*

# Anatomy of an Insect

Don't confuse insects with other small animals you might see, like daddy longlegs, millipedes and spiders. These aren't insects at all. Just remember — with six legs and three parts, it's an insect! All adult insects have two distinct characteristics:

1. Three major divisions to their bodies — the head, thorax and abdomen (stomach).
2. Three pairs of legs, all attached to the thorax or second body division.

Many adult insects also have one or two pairs of wings attached to the thorax. Identification gets trickier when it comes to the immature stages of insects, which can look very different from the adults.



# CHANGING FORM Insect Life Cycles

Insects change form throughout their lives. These changes are called metamorphosis. There are two ways these changes take place:

In complete metamorphosis, like we see in butterflies and moths, the insect hatches from an egg and is then called a larva. The larvae begin to grow, shedding their skins as they outgrow them. They usually look like small worms during this stage. After a certain number of times they have shed their skin, their outer skin hardens; this is called a pupa. In some cases, insects will construct a covering over their pupa, called a cocoon. During the

pupal stage, also called pupation, there is a radical change in form. When the insect has finished this stage, it emerges from the pupal case. It is now an adult and able to reproduce.

In gradual metamorphosis, when the egg hatches, it is called a nymph. As nymphs grow, they also shed their skin. The difference is that a nymph looks like the adult, but without wings. When the insect has fully functional wings and has stopped growing and is able to reproduce, it is called an adult (see game on back page).



Adult Karner, emergence sequence, egg close-up and larva, © Geoffrey Niswander; mating Karner blues, © Donald Leopold; finger and tiny egg on lupine, © NHF&G

# Insect Roles

## IN THE ENVIRONMENT

When mosquitoes and black flies are buzzing and biting us, we often think, "What good are they?" Well, without insects we wouldn't have a lot of the food we eat, and we would be up to our necks in rotting plants. Let's take a closer look at some of the things insects do for us.

### Insects as Pollinators

In their daily search for food, bees, butterflies and other insects move pollen from one plant to another. While stopping at a flower for a sip of sweet nectar, they get dusted with pollen. When they fly to another flower, some of the pollen brushes off and the flower becomes pollinated to make seeds. Pollination is not only important to wild plants, but to crops we eat, like apples.

### Insects as Decomposers

Some insects help keep dead organisms from piling up. They also break down the nutrients in dead plants or animals. Nutrients insects use to build their own bodies become available to other animals that eat them. Nutrients passing through insects as waste end up in the soil in a simpler form that plants can absorb through their roots.

### Food For Others

Imagine what it would be like if we didn't have frogs in the ponds, fish in the lakes or birds in the air. An important part of food webs, insects are important sources of protein for all these creatures, as well as snakes, small mammals like moles and other insects.

*The hummingbird moth is a pollinator. It hastily zips from flower to flower beating its wings like a hummingbird, creating a soft buzzing sound.*



### Pests and Predators

Many insects are considered pests, especially those that eat garden plants, crops and the leaves on trees and shrubs, but they all play a role in the system. Insect predators may help keep these pests in check. For example, dragonflies eat millions of insects that might otherwise gobble up crops or give us itchy bites.

*Many insects eat other insects, like this damselfly munching on a mosquito.*



*The scarlet lily beetle is a garden pest that arrived here from Europe. The larva destroys lily gardens by eating most of the plant.*





© Donald Leopard Photo

snapshots

kanner blue butterfly



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snapshots

cecropia moth



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eyed click beetle



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blackwing damselfly



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eastern tent caterpillar



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predacious diving beetle



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northern walking stick



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snapshots

squash bug



## KARNER BLUE BUTTERFLY

**EATS:** Larvae eats only wild lupine; adults feed on nectar from plants such as dogbane, New Jersey tea, butterfly weed, and orange hawkweed

**FAST FACTS:** **HABITAT:** Pine barrens

- On the federal endangered species list
- Small populations in New Hampshire and New York; slightly larger populations found in Wisconsin and Michigan
- Two complete life cycles per calendar year (see page 2)
- Important flower pollinator



## EASTERN TENT CATERPILLAR

**EATS:** Prefers black cherry, but will also eat other fruit trees and a variety of shade trees  
**HABITAT:** Forest

**FAST FACTS:**

- Gets name from tent-like nests that they spin on crotches of host trees
- Caterpillars survive over the winter in egg masses
- Emerges as a moth in July to mate, lay eggs and die
- More of a nuisance than a threat



## CECROPIA MOTH

**EATS:** Leaves of many trees and shrubs, including ash, birch, alder, elm, maple, wild cherry, willow, apple and lilac

**HABITAT:** All of North America, often in open areas in and around cities

**FAST FACTS:**

- Referred to as silkworm moths
- Wingspan 5-6 inches
- Adult females live only about 2 weeks
- Caterpillars grow up to 5 inches long



## PREDACIOUS DIVING BEETLE

**EATS:** Mainly insects, but occasionally a tadpole or small fish

**HABITAT:** Wetlands, lakes, ponds, rivers

**FAST FACTS:**

- Adults are excellent swimmers; larvae are well camouflaged
- Injects captured insects with juices that dissolve their insides and then sucks out the juices
- Emits a distasteful chemical that keeps it from being eaten



## EYED CLICK BEETLE

**EATS:** Larvae called wireworms feed on roots and stems, including many in the garden, like corn, potatoes, grasses and ornamental flowers

**HABITAT:** Gardens and fields

**FAST FACTS:**

- Large spots on the thorax look like eyes, but they're not
- When placed on its back or grabbed, bends its head and prothorax backward and suddenly straightens out in a snapping motion, making a clicking sound and launching itself into the air
- More than 800 species of click beetles are found in U.S.



## NORTHERN WALKING STICK

**EATS:** Leaves of deciduous trees and shrubs, especially oaks and hazelnuts

**HABITAT:** Deciduous forests

**FAST FACTS:**

- Resemblance to slender twigs camouflages it from birds
- Eggs overwinter among ground litter and hatch in spring
- Nymphs crawl up woody vegetation at night to reach the leaves



## BLACKWING DAMSELFLY

**EATS:** Adults feed on flying insects they catch in flight

**HABITAT:** Small, shady streams

**FAST FACTS:**

- Overwinter as nymphs underwater
- Females' wings have a small white dot
- Nymphs have three featherlike projections at the tip of their abdomen



## SQUASH BUG

**EATS:** Juices of cultivated cucumber, squash, melon, pumpkin and other gourds

**HABITAT:** Fields and gardens

**FAST FACTS:**

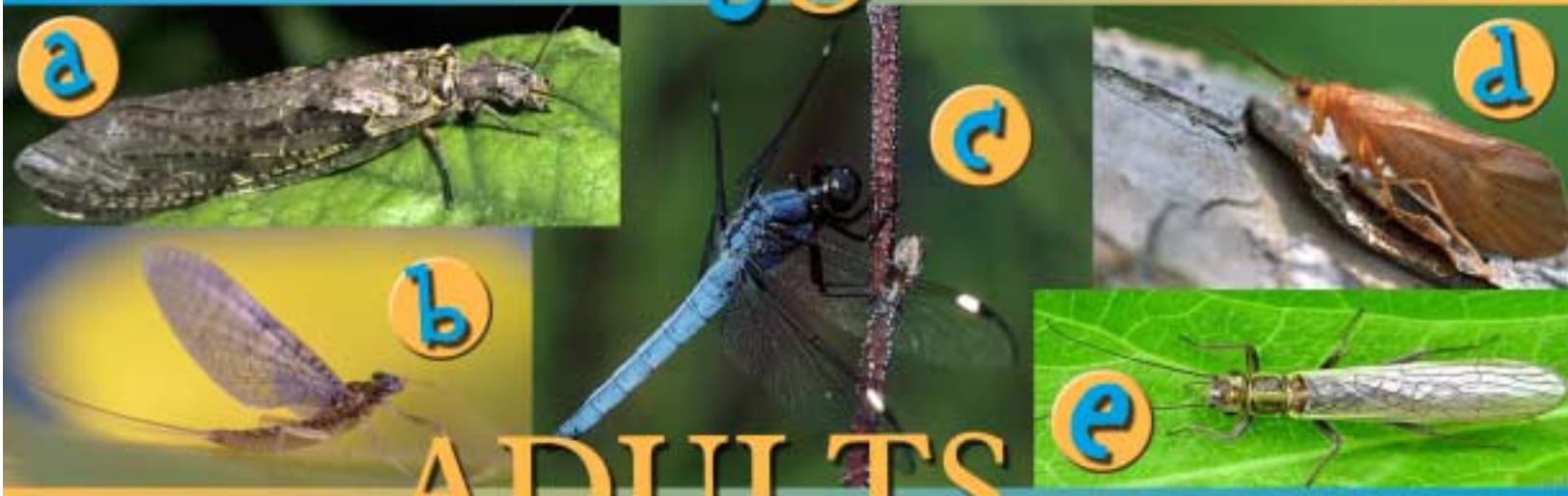
- Shiny, three-sided eggs
- Feeding nymphs cause leaves to wilt, blacken and dry to a crisp
- Adults overwinter among dead leaves



# morphing FROM nymphs



# to



# ADULTS

About 5,000 species of insects spend part of their lives in water. They are an abundant and important part of the food webs of ponds, lakes and streams. See if you can match the immature stage (nymphs) to the adult insect it becomes. We've already matched one to help you get started.

- 1. To hide, I like to hold onto stones and lay flat.
  - 2. I build a little case out of sticks and pebbles to live in.
  - 3. Just add wings and I'll look almost like my adult stage.
  - 4. I eat anything that moves, even small fish!
  - 5. Careful, I have a nasty bite! With my big jaws, I still bite when I'm an adult! As a nymph I'm called a hellgrammite.
- a. I'm a dobsonfly. I'm the biggest fly around with big jaws!
  - b. As an adult mayfly, I look a lot like I did when I was a nymph.
  - c. As a great flyer, I snatch mosquitos out of mid-air. I'm a dragonfly.
  - d. I'm a caddisfly. Just in "case" you pick me up, I'll warn you, I make a stink!
  - e. I'm big and harmless. I'm an adult stonefly.

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ANSWERS TO MORPH MATCH GAME

1 = e; Stonefly  
2 = d; Caddisfly  
3 = b; Mayfly  
4 = c; Dragonfly  
5 = a; Dobsonfly

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