

Dragonfly Survey information and Guide

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Adapted from: 'Life Cycle of a Dragonfly'¹

Dragonfly Life Cycle

Dragonflies have been around for 300 million years, making them one of the oldest species of insects in the world. Dragonflies have been so successful over the years that the only difference between modern and ancient dragonflies is size. One of the secrets to their success is how they mature. Dragonflies have three stages to their life: egg, nymph and adult. The length of each stage depends on the species of dragonfly.

Why do Dragonflies Matter to our Environment?

Since dragonflies eat mosquitoes and other insects, they help gardeners and outdoor enthusiasts. Dragonflies help the environment because by eating insects this allows humans to reduce the use of pesticides to kill these insects. They are natural pest controllers. Dragonflies can also be used to help diminish diseases spread by mosquitoes, horseflies and deer flies by releasing dragonflies in areas where infestations of these insects exist.

The Egg Stage

The life cycle of a dragonfly starts with eggs. After breeding, a female dragonfly selects a pond or marsh in which to lay her eggs. Dragonfly eggs are only laid in still water, as eggs laid in quickly moving water will wash into fish-feeding areas.

Female dragonflies lay their eggs on submerged aquatic plants, mud banks submerged in water, or if they can't find a better spot, directly in the water. Depending on the species, a female can lay hundreds or thousands of eggs during her lifespan.

In tropical regions, dragonfly eggs may hatch in as little as five days. In temperate (areas where winter temperatures drop near or below freezing) regions, dragonfly eggs usually won't hatch until the following spring.

In tropical regions, two to three generations of dragonflies may mate and lay eggs each year. In temperate regions, usually only one generation mates and lays eggs. For dragonflies living in temperate regions, mating and egg laying typically occurs in mid to late summer.

The Nymph Stage

When dragonflies hatch they are called nymphs. Dragonfly nymphs are hungry predators that have no resemblance to their adult forms. They molt (shed their skin) up to 12 times, depending on the species, and can spend as long as four years as nymphs.

Dragonflies living in tropical regions spend less time in the nymph form while dragonflies living in temperate regions will spend longer as nymphs as the onset of winter delays maturation.

Dragonfly nymphs are aquatic, living in ponds and marshes until emerging to molt for one final time. During the final molting, the nymph's skin splits and the nymph emerges as an adult dragonfly. Dragonfly nymphs are hemimetabolous, meaning they don't form a cocoon or pupate before emerging as an adult.

The Adult Stage

After the final molt from nymph to adult, occurring in late spring or early summer in temperate regions and at any time of the year in tropical regions, most dragonfly species spend the next month fully maturing. Their gonads (sex organs) finish developing, their color becomes brighter with their final markings emerging and they disperse, sometimes hundreds of miles, from the pond or marsh where they developed.

Adult dragonflies are also voracious (hungry) predators eating small insects, primarily mosquitoes and flies, which they catch while flying. Dragonflies can hover, fly backwards, forwards and sideways.

Once fully developed, a female dragonfly can mate with several males before she is ready to lay her eggs. Both female and male dragonflies only live two to four months as adults before dying.

The Dragonfly Life Span

From egg to adult, a dragonfly can live for five years before dying. Dragonflies in tropical regions don't live as long as dragonflies in temperate regions. The reason? Dragonflies in temperate regions overwinter as eggs or nymphs for several years before finally emerging as adults.

How to Attract Dragonflies

Dragonflies as nymphs and adults are voracious predators eating anything they can catch, including adult and larval mosquitoes. This is why any permanent water feature will attract dragonflies

To encourage dragonflies to lay eggs in your pond, grow reeds and lilies that emerge from the water to give the female a place to perch while laying her eggs. Remember fish can eat dragonfly nymphs and eggs. Sectioning off part of the pond from fish will give nymphs a safe place to mature.

Dragonflies and Climate Change:

As we can see from the information above, the dragonfly life cycle is very affected by temperature and climate. Dragonflies in warmer climates lay their eggs much more quickly and go through the nymph stage in a much shorter time span. In general, dragonflies in hotter, tropical climates have a much shorter lifespan than dragonflies in cooler climates. Like monarch butterflies, some dragonflies migrate based on temperature and their migrations may help us learn about climate change²

Based on climate change experiments, dragonfly larval mortality increases with warming temperatures. This may indicate that as the climate continues to warm, dragonflies will not only live for a shorter time in warmer climates but the water may even become too hot for the dragonflies to successfully lay their eggs in the warm water³.

Today as field scientists, we have to think about what will happen to the ecosystems in the areas that lose dragonflies due to climate change. If the dragonflies stay more north because of the warming temperatures, it can disrupt the insect food webs in the area with more dragonflies and also in areas that are losing their dragonfly populations. If dragonfly populations decrease in warmer areas, this could lead to a variety of issues, including an increase in human made pesticides in order to control pest populations. What else do you think could occur in the ecosystem due to the impact of climate change on dragonflies?

To read more about dragonfly impacts due to climate change check out the articles below.

How to Catch Dragonflies

1. Area

Locate the area where dragonflies are found. Observe the area carefully. You will find many dragonflies near small bodies of water as they like to eat mosquitoes. Do a little research to find the best place where the most dragonflies are present.

2. Position

After locating the area you need to position yourself properly in order to catch the dragonfly. You need to stand slightly behind where they are flying. You can even stand behind a plant or greenery in order to keep out of sight of dragonflies. Be sure not to make any sudden movements and remain very patient. It might take some time before you see dragonflies flying past you.

3. Holding the net

Next you need to hold the net in a way that you require less amount of movement for catching dragonflies. In order to avoid swinging the net you can hold it with its opening slightly tilted up. You will want to basically scoop up a dragonfly from behind. You will need to be extremely careful so that you do not injure the dragonfly in any way.

4. Swing the net

In the end you should make your move from behind. Swing your dark-coloured net under the dragonfly so that the insect does not notice your movements and fly away. Twist the end of the net so that the dragonfly does not find its way out.

5. Hold and observe the dragonfly

To hold a dragonfly without injuring it, fold its wings upward into a vertical position relative to its body so that the left and right side wings are touching, and then hold the wings between the thumb and index finger near the wingtips.

References:

1. <https://sciencing.com/life-cycle-dragonfly-5398237.html>
2. [Dragonflies Make Epic Migrations, But Climate Change Could Foil Their Itineraries' NRDC.](#)
3. [Simulated climate change increases larval mortality, alters phenology, and affects flight morphology of a dragonfly.](#)