

common green darner  
(*Anax junius*)



# flying jewels

## of New York

by Erin White, Vici Zaremba and Stephen Diehl  
Photos by Stephen Diehl and Vici Zaremba unless noted

Creeping along the water's edge, poking through vegetation and looking under rocks with our hands immersed in the cool water, we couldn't help but smile. It was the first warm day in early June, and we'd come seeking dragonflies. Our quest: to find and document the generally dull-colored, flattened aquatic nymphs, as well as the spectacular multi-hued bodies of the adults, their wings glistening in the sun.

We arrived mid-morning at the Upper Hudson River, outfitted with the tools of our trade: sweep nets, dip nets, rakes, waders, field guides, GPS units, magnifiers, bughouses and viewing trays. Self-proclaimed odonate (dragonfly and damselfly) enthusiasts, we'd anxiously waited for a day such as this, when dragonfly nymphs emerge from their aquatic nursery to begin the last, brief chapter of their lives.

We were part of a larger group of staff and volunteers with the New York Natural Heritage Program (NYNHP)

*Watching a dragonfly transform from nymph to adult, "ugly duckling" to "flying jewel," is a tremendous thrill.*

and NYS Department of Environmental Conservation (DEC), out to survey the state's dragonfly populations. While our backgrounds range from landscaper to photographer, dog groomer to biologist, we have one thing in common: we are all dedicated dragonfly naturalists. And that day, we were in our element.

Motivating the group was the rich diversity and large numbers of riverine dragonflies that can be observed at this site. Six species of snaketails tend to dominate the scene in early June, but others, such as clubtails, cruisers, and darners, are also present. Watching a dragonfly transform from nymph to adult, "ugly duckling" to "flying jewel," is a tremendous thrill.

The fun began as we, our legs clad in neoprene, waded into the "refreshing" waters, searching for nymphs. Yells and shouts traveled the shoreline as bugs

were found and identified; laughter rose as cold water topped waders and nymphs crawled up roots, deciding conditions were not quite perfect for adulthood, and so re-submerged. Many hours later, fatigue set in and the group retired to a local ice cream stand to compare notes, share stories, and plan our next adventure. All agreed it was a great day.

saffron-winged meadowhawk  
(*Sympetrum costiferum*)



Prehistoric looking, dragonflies and damselflies have been part of our landscape since long before dinosaurs. Evolving from ancestors with 2.5-foot wingspans, today's odonates range in size from the one-inch-long sphagnum sprite to the 3.5-inch-long swamp darner. While most people are not familiar with the names of individual species, young and old alike are enchanted by dragonflies and damselflies. Many people can relate stories of these insects landing on them—being tickled by the tiny barbs on their feet (tarsi), being fascinated by the hair on their bodies, and being enthralled by their large, colorful, compound eyes. Few are aware of the three smaller simple eyes (ocelli) atop the head. Those barbs that tickle are used to capture and secure prey. Black flies, mosquitoes and deer flies all become victims of these flying, eating machines.

Beautiful predators, dragonflies and damselflies are essential components of the food web, both as nymphs and adults. During the course of its lifetime, a large darner can consume thousands of mosquitoes and other insects. Some of the larger dragonflies eat while flying; those with “table manners” land to dine.

Of the slightly more than 400 odonate species documented in North America, 193 have been found in New York—the second highest richness of any state, behind only Texas! New York's huge expanse and numerous wetland types contribute to this wealth of species. Wherever sufficiently clean water is found—bogs and fens, ponds and lakes, rivers and streams, marshes and seeps—you'll find damselflies and dragonflies. Nearby fields and trees provide foraging and roosting areas. Because these insects reproduce in fresh water, water pollutants, shoreline modifications, increases in sediment loads, alteration of natural hydrology, and other disturbances adversely affect their populations.



calico pennant  
(*Celithemis elisa*)

Jeremy Martin



four-spotted skimmer  
(*Libellula quadrimaculata*)



blue dasher  
(*Pachydiplax longipennis*)

variable dancer  
(*Argia fumipennis violacea*)



Like many insects, odonates are relatively short-lived. Adults only fly for a single warm season, usually one to three months; long enough to mate and begin the life cycle again. Most of their lives are actually spent under water in the benthic neighborhood among crayfish, caddisflies, mayflies and stoneflies.

Female dragonflies and damselflies deposit their fertilized eggs in or near water. Eggs hatch into aquatic larvae when conditions are favorable; some eggs overwinter. Depending on the species, the newly hatched larvae (nymphs) develop for a period of a

few months to several years, going through multiple aquatic larval stages (instars) during that period. When ready to emerge as adults, the larvae leave their watery environs and crawl onto the shoreline, emergent vegetation, rocks, or a bridge abutment to shed their skin. This process, in which the change is gradual and lacks a pupal stage (such as a cocoon or chrysalis), is called incomplete metamorphosis.

Newly emerged odonates are soft-bodied with shimmering wings. Until hardened and able to fly, they are highly susceptible to predators such as birds,

eastern pondhawk (dragonfly)  
(*Erythemis simplicicollis*)

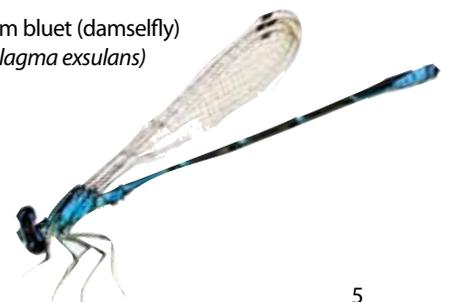


## Dragonfly or damselfly... Which is it?

While many people commonly refer to any toothpick-shaped insect with four wings as a dragonfly, there are actually two types—dragonflies and damselflies. Both have large multifaceted eyes and belong to the order Odonata (hence the name “odonates”), but there is an obvious difference in the way they hold their wings at rest: dragonflies hold their wings open flat horizontally, perpendicular to their bodies (see photo above), whereas damselflies hold their wings over their backs, either closed (see photo below) or in a v-shape. As their front and rear wings are not linked together, both dragonflies and damselflies can operate them independently.

In addition, dragonflies generally have stocky bodies with stiffer wings, while damselflies have more slender bodies and are delicate in appearance. Both are impressive fliers, capable of amazing aerial acrobatics. However, damselflies are a bit weaker and usually stay close to the ground, while dragonflies will zoom high up into the air.

stream bluet (damselfly)  
(*Enallagma exulans*)



spiders, ants and reptiles. Some also perish from low temperatures and wind.

From 2005 through 2009, the NYNHP, in cooperation with DEC, coordinated the NY Dragonfly and Damselfly Survey (NYDDS) to study New York's dragonfly and damselfly populations. More than 300 participants braved heat, humidity, and bites from black flies, deer flies, horse flies and the occasional leech to conduct almost 4,400 surveys at approximately 2,170 sites. Participants counted more than 18,000 individual odonates, including five species not previously known to the state: the doubled-ringed pennant, horned clubtail, broad-tailed shadow-dragon, four-spotted pennant, and the

zigzag darner. The group also encountered other unique species including the subarctic darner and the elfin skimmer (North America's smallest dragonfly). There were also twenty-three species of small damselflies known as bluets identified, as well as a number of species whose populations were identified as relatively rare in our state, such as the comet darner and arrowhead spiketail.

With so many damselfly and dragonfly species found in New York, you don't need to be a dragonfly expert nor travel far to spot and identify these fascinating, flying, eating machines. Many species are readily seen during the warmer months. The variable dancer, powdered dancer, ebony jewelwing and

## Searching for Dragons Finding Myself

By Bill Chase

For several summers I volunteered to collect specimens for the NYDDS. My task was to collect specimens in my hometown of Oakfield, Genesee County, and also in neighboring Orleans County. I have always been an insect enthusiast and so when my mom saw an ad for the survey in our local paper, she cut it out and gave it to me. What made the project exceptionally appealing to me, however, was the discovery that "dragons and damsels" often stayed still long enough for me to take detailed digital photos of them. I was hooked.

Working on the survey, I traveled throughout the counties, documenting all the species I saw. I took tons of great photos—more than 100 of nearly 30 different species—and also discovered two new finds for my county—known species, but never reported here before.

Volunteering for the NYDDS rekindled my spirit of discovery. My days afield gave me new vision, a sense of accomplishment and a renewed determination to grow and discover. I'm excited to go forward and continue studying nature with my camera. Nature is full of endless opportunities for discovery and adventure.



lance-tipped darner  
(*Aeshna constricta*)

blue dasher (*Pachydiplax longipennis*)



Bill Chase

common green darner (*Anax junius*)



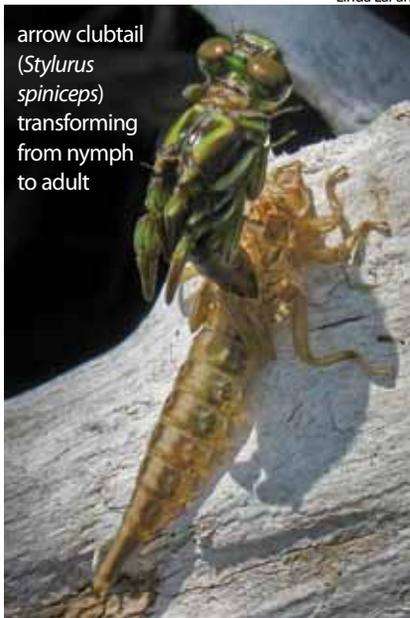
Bill Chase



hudsonian whiteface  
(*Leucorrhinia hudsonica*)

lancet clubtail are frequently spotted near rivers, and the Canada darner and a number of species of skimmers frequent wetland habitats. In addition, it's hard to miss the twelve-spotted skimmer and Halloween pennant with their distinctively marked wings.

Linda LaPan



arrow clubtail  
(*Stylurus spiniceps*)  
transforming  
from nymph  
to adult

While the NYDDS is over, the work continues through the New York Odonate Group, in conjunction with the Adirondack All-Taxa Biodiversity Inventory. Dedicated surveyors continue to focus efforts on flyers (adults) which can be observed from mid-April with the arrival of the common green darner (one of only a few migratory species), through mid-November when red or gold autumn meadowhawks are still flying even after the first frosts.

Science and surveys aside, the next time you see a dragonfly or damselfly, consider this: you are, in a way, witnessing what the dinosaurs saw: insects of ancient lineage, resplendent in color, with aerobic skills honed through millions of years of evolution.



**Erin White** (pictured above) is a zoologist with the New York Natural Heritage Program and coordinated the NYDDS from 2006-2009. **Vici Zaremba** and **Stephen Diehl** volunteered for the NYDDS and are professional photographers. Stephen also teaches photography at RIT.

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## More About Dragonflies and Damselflies

Next time you're out on a warm summer's day, be sure to notice those spectacular, flying, eating machines. The best time to spot them is from 10 a.m. to sundown, especially on or near water. And when you do see them, you may find it useful to have some close-focusing binoculars and a field guide, as well as a digital camera so you can capture their image, making them easier to identify later.

For additional information on dragonflies and damselflies, visit:

[www.dec.ny.gov/animals/31061.html](http://www.dec.ny.gov/animals/31061.html)

[www.odonatacentral.org](http://www.odonatacentral.org)

[www.dragonflywebsite.com](http://www.dragonflywebsite.com)