

# HUDSONIA HARLEM VALLEY BIODIVERSITY MANUAL SUPPLEMENT

## Damselflies and Dragonflies (*Odonata*)

This profile covers this insect group generally, with an emphasis on rare and vulnerable, habitat-dependent species. Selected species are discussed here as examples, but there are many other Odonates that occur or could occur in the study area. NYNHP (2008) lists 66 species of Odonata as rare in New York State.

### Habitats

Damselflies and dragonflies are dependent upon habitats with standing or flowing water. The early stages (nymphs) are wholly aquatic, and require waters of sufficient depth, quality and duration in which to grow and transform into winged adults. Though often found near water, adult damselflies and dragonflies occur in and utilize nearly every type of terrestrial habitat, even those far from water. Habitat specialization is characteristic of many Odonates, especially rare species. Here we mention several examples. Spatterdock damer (*Rhionaeshna mutata*) (G4 S2) breeds in fishless ponds with floating vegetation such as yellow pond lily. Mottled damer (*Aeshna clepsydra*) (G4 S2S3) oviposits along marshy edges of lakes, and adults hunt in nearby woodland clearings. Arrowhead spiketail (*Corduligaster obliqua*) (G4 S2S3) breeds in muck-bottomed forest spring seeps with rivulets, and perches on weed stems along forest edges. Clubtails, a group containing several state-rare species, are dragonflies of streams. Skillet clubtail (*Gomphus ventricosus*) (G3 SH) inhabits turbid rivers; Septima's clubtail (*Gomphus septima*) (G2 S1) prefers clean, rocky rivers; zebra clubtail (*Stylurus scudderi*) (G4S3) occurs in clear, forest streams with riffles. Among damselflies, blue-tipped dancer has the unusual habit of ovipositing in dead wood in slow streams. Sparkling jewelwing (*Calopteryx dimidiata*) (G5SH) prefers sand-bottomed streams with submerged vegetation, whereas American rubyspot (*Hetaerina americana*) (G5 S3) occurs in the rocky or gravelly streams.

### Study Area Distribution

Damselflies and dragonflies occur throughout the study area. Most state-rare species in the study area are southern species near the north end of their ranges. Westchester County has occurrence records of 9 NYNHP-listed Odonate species, more than any other county in the study area. State-rare arrow clubtail (*Stylurus spiniceps*) is a northern species reported from Rensselaer County. Odonates are not well-documented in New York. Many species may occur over more of the state than current information indicates. The New York Odonata Survey project of the New York Natural Heritage Program has been active since 2005, and should greatly improve our understanding of these insects in the state. Records in the study area include American rubyspot (*Heteraena americana*) (S3) and comet damer (*Anax longipes*) (S2) in Columbia County), Needham's skimmer (*Libellula needhami*) (S2S3) in Putnam County, tiger spiketail (*Corduligaster erronea*) (S1) in Westchester County. Rensselaer County boasts five state-rare Odonates: superb jewelwing (*Calopteryx amata*) (S3), arrowhead spiketail (*Corduligaster obliqua*) (S2S3), brush-tipped emerald (*Somatochlora walshii*) (S3), mottled damer (*Aeshana clepsydra*) (S2S3) and zebra clubtail (*Stylurus scudderi*) (S3) (White 2008).

### Other Relevant Aspects of Ecological Niche and Behavior

Immature stages typically are found in aquatic habitats characteristic of the species. Adult damselflies are relatively weak fliers, seldom moving far from their early-stage habitats. Adult dragonflies of many species fly long distances from their points of origin, or prefer different habitats for feeding from those used for reproduction. Some species, after transforming, leave the vicinity of aquatic habitats and disperse to upland locations such as open ridges or forest paths. Young adult dragonflies (teneral) require time to harden their wings and strengthen their flight muscles. Remaining at ponds or streams may leave them vulnerable to predation by other dragonflies. Some dragonflies gather in feeding swarms to take advantage of large emergences of mosquitoes and other stream insects.

## **Description and Identification**

Damselflies are generally smaller than dragonflies, with narrower abdomens. Dragonflies hold their wings horizontally when perching, while damselflies hold their wings folded together vertically over the abdomen, or in the case of spreadwings (Lestidae), only partly open. Damselflies are weak fliers, and tend to remain close to the water surface or sheltering vegetation. Dragonflies are fast, strong fliers; some may fly at elevations of 4 m or more above ground or water. Though some dragonflies seem perpetually in flight, both damselflies and dragonflies tend more or less frequently to land, resting or perching on vegetation, rocks, wood or other objects. At the edges of ponds, dragonflies often compete for good perches, one driving another off a cattail stalk or the protruding twig of a submerged branch. Perching insects may be recognized easily, especially with the aid of binoculars; insects in flight can be difficult. Certain groups (families or genera) have easily recognized characteristics (e.g. clubtails, bluets), but within each group, species may be difficult to determine without an individual in hand. Capturing dragonflies is difficult, requiring a lightweight, long-handled net, and considerable skill and agility on the part of the capturer. Immature stages and casts can be identified to species by experienced experts.

## **Threats and Conservation**

Loss of habitat is probably the most serious threat to damselflies and dragonflies. Chemical pollution may be detrimental to aquatic stages of some species, mostly by reducing prey. Because mosquitoes and blackflies are important food sources for adult dragonflies, spraying to control these pests may greatly reduce available food in a given location. This is probably true of chemical insect suppression efforts in general. Some insecticides are capable of killing adult damselflies and dragonflies on contact, or immatures in water. Given adequate suitable habitat, high reproduction compensates for losses of individuals killed by moving vehicles. Large dragonflies can often avert collisions with vehicles traveling at low or moderate speeds. Preservation of Odonate habitat, and management for high resource quality for these insects provides benefits beyond the conservation of damselflies and dragonflies themselves. These effective insect predators can reduce numbers of biting insects significantly, obviating the need for chemical controls, the nymphs by eating the aquatic immature stages of mosquitoes and other pests, and the adults devouring the mature, winged mosquitoes in the air.

## **Survey Technique Constraints**

Damselflies and dragonflies, like most insects, are seasonal flyers. Many species appear for a relatively short time (3-10 weeks) and are gone. Habitat-specificity is also characteristic of many species. Before any survey it is important to learn the habitats of the survey area, so as to predict the Odonate species likely to occur there. A review of the flight periods of potentially occurring species will help to decide approximate survey dates and locations. Few identifications can be obtained without the insect in hand for close examination. In some groups (e.g. clubtail dragonflies [*Gomphidae*], bluet damselflies [*Enallagma* spp.]), identification may require examination of specimens by an expert. Any adequate survey of Odonata will require capture and preservation of specimens. Skill with a net is required to capture these agile and wary fliers. Dragonflies and damselflies remain inactive in cool, wet weather, so warm, sunny days should be chosen for surveys of adults.

## **References to Identification Literature**

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American Rubyspot. Photo © Erik Kiviat