

## APPENDIX III

### **Odonata Opportunities in New York Regions, Habitats, and Species in Need of Attention Nick Donnelly and Paul Novak May 2005, revised April 2006**

The New York Dragonfly and Damselfly Survey gives us a marvelous opportunity to document our Odonata fauna properly. We list here some opportunities in terms of habitats and regions of the state that seem especially inviting. This is followed by a rundown of species not yet recorded in the state, species known only from historical records, and other species designated as Species of Greatest Conservation Need in the New York State Comprehensive Wildlife Plan.

By way of background, New York's first list was by Needham (1928) who listed 150 species and 711 species/county records. Donnelly (1992) listed 177 species and 2041 species/county records. Donnelly (1999) listed 189 species, and the current tabulation of species/county records stands at 3556. Until now the number of contributors of new information stood at about three or four persons at any given time.

Only one state-Texas-has more species than New York, and several dozen of these are Mexican species that are accidental in Texas.

The coverage of the state is not equal, and common sense says that our attention should be paid largely to areas heretofore neglected. These are discussed in two parts: types of habitat, and geographic regions.

#### **Large Rivers**

Beginners to the world of odonates commonly concentrate on ponds and lakes, because they seem relatively easy compared to streams and rivers, and because high species totals are easier to obtain in still water. For these reasons, running water is almost invariably under-surveyed for odonates. This is especially true in New York.

Large rivers are, or at least appear to be, difficult to study. They also tend to be neglected because of a prevailing idea that any large river has been degraded by sediment and sewage. A recent Nature Conservancy panel on aquatic habitats in the High Appalachian Plateau of New York dismissed the Susquehanna as degraded to the point that there were no conservation objectives along its main river course. Yet it has a rich odonate fauna, and we drink its water with minimal treatment.

Probably the most efficient way to survey for gomphids will be by rearing larvae. This is a relatively simple exercise and is very rewarding. Surveying riverbanks for exuviae is a quick way to establish basic data and has the advantage of quickly getting an estimate of relative abundances of species. A few species are difficult to determine, but nearly all NY species can be identified with some patience.

Rivers most in need of survey are as follows:

#### Allegheny

Western New York is very poorly known, and the Allegheny River apparently has no NY records. Because it is the closest river to NE Ohio, and because NE Ohio has a number of species unknown in New York, this river should be given very high priority.

Examples of species that might be here are *Macromia allegheniensis* (**Allegheny river cruiser**), *M. taeniolata* (**Royal river cruiser**), and *Gomphus lineatifrons* (**Splendid clubtail**), all unknown in New York but found in NE Ohio. Nearby French Creek has been a disappointment on two brief visits. In much of its reach, the “bedrock” in which the stream is incised is glacial lake clay, which is almost impossible for a gomphid to burrow in.

#### Grass, Oswegatchie, St. Regis, St. Lawrence

The Grass, Oswegatchie, and St. Regis drain the Adirondacks into the St. Lawrence, and have been minimally surveyed in their lower parts. The St. Lawrence itself has also not been well surveyed. Species possibilities for these rivers include *Stylurus notatus* (**Elusive clubtail**), known from New York by two old records, and *Arigomphus cornutus* (**Horned clubtail**), in vegetated backwaters, which occurs in adjacent Ontario.

#### Ausable

This river drains into Lake Champlain rather than directly into the St. Lawrence, and, although it has had some survey work, more careful surveying is needed. It apparently has the only *Ophiogomphus colubrinus* (**Boreal snaketail**) population in the state, and it might have *Progomphus obscurus* (**Common sanddragon**) or *Stylurus* (Hanging clubtail) species.

#### Susquehanna, Chenango, Cohocton, Chemung, Tioga

The main rivers feeding the Susquehanna in the Southern Tier include the Chenango, the Cohocton, the Chemung, and the Tioga. There should be several gomphids in these rivers. The western rivers (especially the Tioga) would be good places to find *Ophiogomphus mainensis fastigiatus* (**Maine snaketail**), a subspecies not found in the state but known from several northern Pennsylvania counties. The Susquehanna itself also deserves additional work.

#### Delaware

The Delaware River was heavily surveyed in the early 1990s. Because of its upstream impoundments, the bottom is “armored,” that is, covered with cobbles, which make it very difficult to burrow into. Nevertheless, there are many species of interest for which additional information is desirable, such as *Gomphus viridifrons* (**Green-faced clubtail**), which apparently makes up a highly disjunct population of this southern and midwestern species.

## Hudson

The Hudson is really two different rivers. In its headwaters it is a rushy, rocky river with several good finds of *Ophiogomphus howei* (**Pygmy clubtail**) and *O. anomalus* (**Extra-striped snaketail**) exuviae. The tidal portion below Albany has been much neglected but deserves careful scrutiny. Historical records of *Stylurus amnicola* (**Riverine clubtail**) and *Gomphus vastus* (**Cobra clubtail**) from Bethlehem may have originated from the Hudson.

## **Large Streams**

New York has an abundance of large creeks and streams, many of which support some of the finest fishing opportunities in the US. Surprisingly, few have been surveyed for odonates. Some of these creeks and streams have been impacted by pollution or have been suspected to be impacted, but all are well worth some attention. Some large streams have been disappointing, but their rich fish and mollusk faunas suggest that we have been unlucky, or perhaps there is some reason that odonates really are not common. French Creek, in Chautauqua Co, may be an example of such a stream. Cattaraugus Creek, in several counties of western New York, seems to be another. But some Catskill streams, such as the Esopus, Rondout and Beaverkill, seem prime targets.

## **Bogs and Fens**

The distinctions between these two community types do not seem important to odonates. There are many species of odonates in New York that are essentially confined to bogs and fens, including nearly all of the *Somatochlora* (Emerald) species. The Adirondacks are especially rich in highly vegetated still waters, and the odonate fauna varies considerably from one bog/fen to another. The difficulty of collecting (even getting into!), and the lack of access to many of them have made them under-surveyed. Several species on our “wish list” are bog/fen dwellers in New England and southern Canada.

Another region especially rich in bog/fen habitats is the lowlands of Oswego County as well as other lake plains lowlands, extending west to Buffalo beneath the Niagara escarpment. Bergen Swamp is fairly well surveyed, but it stands alone.

## **Coastal Plain Ponds**

The groundwater-fed coastal plain ponds of Long Island are home to a number of uncommon odonates, including our three state Threatened *Enallagma* (Bluet) species. Although a number of coastal plain ponds are on state or county-owned lands, other sites are not on protected properties. Even those populations on protected lands are at risk from groundwater withdrawal, introduction of predatory fish, all-terrain-vehicle use of pond edges during times of low water, and perhaps control of mosquitoes relative to West Nile virus.

**Species that might be added to the state list (\*), Historical Species, other Uncommon or Infrequently Recorded Species, and Species with Taxonomic difficulties**

Calopterygidae

*Calopteryx angustipennis* (**Appalachian jewelwing**). There is one valid but old record of this species from the Ramapo River in SE New York. Another record from Allegany SP may not be valid due to possible confusion with *Calopteryx amata* (**Superb jewelwing**). The nearest permanent population of this southeastern montane species is in Centre County, PA.

\**Hetaerina titia* (**Smoky rubyspot**). This southern species occurs in Ohio, Pennsylvania, Michigan, and Ontario. It could occur in western New York, where it should be sought in the late summer or fall. *Hetaerina americana* (**American rubyspot**) appears to be fairly widespread, having been recorded in a number of streams in western New York, a number of streams in the Hudson River drainage, and a few Southern Tier streams, as well as a couple of Lake Champlain drainage rivers. Is it found in the counties of central New York or the St. Lawrence drainage? It flies late in the season, usually not appearing until mid-August.

Lestidae

*Archilestes grandis* (**Great spreadwing**) is a huge damselfly that took its sweet time reaching eastern NY. Originating in Mexico and Texas (and adjacent states), it spread northward, reaching Pittsburgh in the 30s and Philadelphia in 1950. It finally made it to SE New York (Long Island) in 1992. It is widespread in Ohio and should be sought in western New York, as well as elsewhere in SE New York, late in the season.

*Lestes australis* (**Southern spreadwing**) was ignored for years as a subspecies of *Lestes disjunctus* (**Common spreadwing**). It occurs in southern NY, and in the Southern Tier. It should be sought throughout the state.

Coenagrionidae

*Argia bipunctulata* (**Seepage dancer**) is known only from an old record by Calvert for "New York." The record is undoubtedly valid, but the exact locality is unknown, and the species has not been seen in NY since. It is a coastal plain species found in tiny seeps and should be sought on Long Island and perhaps in Orange County.

*Argia translata* (**Dusky dancer**) is a stream species found from southern Canada to Argentina. There are surprisingly few NY records, which is probably a combination of two factors. NY is at the north end of its range and this species occurs along rivers, which tend to be under-surveyed. It has also been found on a number of the New York City water supply reservoirs.

*Argia apicalis* (**Blue-fronted dancer**) and *A. tibialis* (**Blue-tipped dancer**) appear to be western and southern New York species. They are found on rivers and large streams, often of the deeper and muddier type, and are sometimes found together.

*Coenagrion interrogatum* (**Subarctic bluet**) is known from two records in Franklin County in the Adirondacks (Paul Smiths Visitor Center and Chain Lakes), both on the same day and a few miles apart. This is the most northerly damselfly in North America. It would be good to know whether there are regular populations at these two sites and whether other populations are present in the Adirondacks. It is a pond or tiny, slow-stream species.

*Enallagma pictum* (**Scarlet bluet**), *E. minusculum* (**Little bluet**), *E. recurvatum* (**Pine Barrens bluet**), and *E. laterale* (**New England bluet**) are all Long Island species (*laterale* also occurs in Westchester County and in the Hudson Highlands) which are of special interest because their habitats are imperiled, mainly by ground-water withdrawal, but also by simple development encroachment. The first three species are state listed as Threatened in New York State.

*Enallagma vernale* (**Northern bluet**) may have simply been overlooked in the past because of its close resemblance to the common *E. cyathigerum* (**also called Northern bluet**). It inhabits small rivers by preference, and I have taken mine mainly from a canoe. It is also intergrading with *cyathigerum*, and its identification is not easy.

*Enallagma weewa* (**Blackwater bluet**) was first recorded in New York on Long Island in 1998. There should be additional locations for it on Long Island.

*Ischnura prognata* (**Furtive Forktail**) is a southern wooded-swamp species for which there is a single NY record. It should be sought in the SE part of the state, but, because of its habitat, it will be difficult to find.

*Ischnura ramburii* (**Rambur's Forktail**) is a coastal plain species that barely reaches New York for which there are a few Long Island records. Unlike most odonates, it can tolerate brackish conditions. It should be more widespread on Long Island than existing records indicate and could be in brackish marshes of the lower Hudson River.

*Ischnura kellicotti* (**Lilypad Forktail**) is another southern species, which inhabits small ponds with floating vegetation, especially water lilies, upon which it perches and lays its eggs. In addition to Long Island, there are known populations in Westchester, Orange, and Dutchess counties, but it should occur in other Hudson Valley counties as well.

*Ischnura hastata* (**Citrine Forktail**) is seemingly fairly widespread on Long island but is scarce in upstate New York and is rare in Ontario.

*Nehalennia integricollis* (**Southern sprite**) is a Long Island species which occurs and shares perils with the group of *Enallagma* listed above.

## Aeshnidae

\**Aeshna juncea* (**Sedge darner**) and \**A. sitchensis* (**Zigzag darner**) are both known from northern New England but have never been recorded in New York. Both are northern species found preferentially in large bog habitats. *A. sitchensis* is rather easy to spot at a distance because it lands directly on the bog mat (as well as on the ground and nearby tree trunks), and because its flight is undulatory, like a woodpecker's. *A. juncea* is very like *A. tuberculifera* (Black-tipped darner).

*Aeshna subarctica* (**Subarctic darner**). There is a small, persistent population in Chenango County and an old record from "Blue Mountain" (Hamilton County). There should be Adirondack populations. The species flies late (in Chenango County, it is found around Labor Day) and prefers bogs with floating species of Sphagnum (these are not common).

*Aeshna mutata* (**Spatterdock darner**). This is an early flying (June) species that is found in highly vegetated lakes and ponds. Although it seems to prefer spatterdock (*Nuphar*), it has persisted for decades at a lake near Watkins Glen that has virtually none of these. There are a number of older records from counties in the Southern Tier.

*Aeshna clepsydra* (**Mottled darner**) appears to be widespread in the state, but there are very few records for it. It should be looked for statewide on small lakes and ponds.

*Anax longipes* (**Comet darner**). This is a coastal plain species that nevertheless maintains some inland populations. There is one such population in Albany County and another in Schuyler County. It is a species that appears to be associated with fishless ponds, including smaller, artificial ponds. There are many records of what appear to be wandering specimens unattached to a resident population. Collections of exuviae or spring surveys for larvae are warranted where adults are observed, in order to determine whether they are breeding at the site.

*Boyeria grafiana* (**Ocellated darner**). This is a creek and river species that is under-represented in our present lists. It flies late in the season and commonly during cloudy days when it is difficult to spot along vegetated banks.

*Gomphaeschna antilope* (**Taper-tailed darner**). There is a single (northernmost) record from Ulster Co. within a wooded swamp in the eastern Catskills. It should be sought in the southeastern part of the state. It is a dusk flier and often flies into open windows.

*Nasiaeschna pentacantha* (**Cyrano darner**) is found regularly in the SE corner of the state but should be found throughout the upstate region, though probably not in the Adirondacks.

## Petaluridae

*Tachopteryx thoreyi* (**Gray petaltail**) occurs in several gorges in the Southern Tier, and in Harriman State Park. There are sight records from near Whetstone Gulf and old specimen records from the Ramapos. It should be sought in the SW corner of the state and across the Southern Tier but could also occur elsewhere. Although generally associated with wooded swamps in other parts of its range, most New York records are from gorges fed by seepage areas. These seepage areas are almost certainly the breeding/larval habitat, but confirming this through the collection of exuviae or larvae would be a worthwhile endeavor.

## Gomphidae

\**Arigomphus cornutus* (**Horned clubtail**) occurs in eastern Ontario and should be sought in northern New York in vegetated ponds or backwaters of rivers.

*Gomphus fraternus* (**Midland clubtail**) is represented by scattered records in the upstate area. There is no demonstration yet of a persistent population, but the Wallkill River might have one.

*Gomphus vastus* (**Cobra clubtail**) is represented by only a few records. Two of these records are very old, including one from Elmira (Chemung County) and one from Bethlehem (Albany County). This species presents a challenge: adults commonly perch in trees and are not as easily found as *G. fraternus*, which perches on or near the ground. Dave Wagner reported that in the Connecticut River *G. fraternus* was found abundantly as adults but rarely as exuviae. However, the reverse was true for *G. vastus*; exuviae were abundant, but adults were very scarce.

*Gomphus ventricosus* (**Skillet clubtail**) has been taken near the upper Wallkill in Orange County and near Old Forge in Herkimer County. Both are old, historical records and both areas are in need of searching. Yet the species is found today on the Wallkill in Sussex County, NJ.

\**Gomphus lineatifrons* (**Splendid clubtail**) is known from NE Ohio but has never been found in SW New York. It is a very large species and quite easy to spot when present. It should be sought on the Allegheny and in the mouths of streams that enter Lake Erie.

*Gomphus quadricolor* (**Rapids clubtail**) is an elusive river and large-stream species. This should be sought as larvae and exuviae, as well as adults.

*Gomphus abbreviatus* (**Spine-crowned clubtail**) is another uncommon, big river clubtail. It is known from the Delaware, the Susquehanna, and Tioga rivers but should be on some others as well.

*Gomphus rogersi* (**Sable clubtail**) is a southern species of small forest streams. Two Orange County locations are the northernmost locations for this species. Other locations in Orange County probably await discovery.

*Lanthus parvulus* (**Northern pygmy clubtail**) and *L. vernalis* (**Southern pygmy clubtail**) are each represented by multiple records. These are poorly understood species; the belief that *parvulus* (the northern species) is a stream species and *vernalis* (the southern species) a seepage species is apparently unfounded. Larvae of the two species have been found coexisting, and adults of the two species are found together also. These should be sought in wooded streams and seepages in the Southern Tier. Larvae are indistinguishable and should be reared.

*Ophiogomphus anomalus* (**Extra-striped snaketail**) and *O. howei* (**Pygmy snaketail**) are among the most elusive of North American odonates. Both breed in rocky, clean rivers, and the Hudson River near Warrensburg is the only river in the state known to have both species. *Howei* has also been found in the Schroon River and is known historically from the Susquehanna near Binghamton. *Anomalus* is also known from the Delaware, Moose, St. Regis, and Raquette rivers. Adults of both species evidently live in the trees and come to the water infrequently for breeding. Both have distinctive exuviae, and doubtless additional records for both will be found through the collection of exuviae. Both should also be sought as adults.

*Ophiogomphus colubrinus* (**Boreal snaketail**) is apparently confined to the Ausable River, where adults have been found on one branch and exuviae on both branches. It should be sought on additional Adirondack rivers, and the full extent of its occurrence on the Ausable should be better defined.

\**Ophiogomphus mainensis fastigiatus* (**Maine snaketail**) is the Allegheny Plateau subspecies (*mainensis mainensis* is the northeastern subspecies and is found in the Adirondacks and Catskills). *Fastigiatus* is found in northern Pennsylvania and should be sought on upland rivers in the western part of the Southern Tier.

*Progomphus obscurus* (**Common sanddragon**) is currently known from two Adirondack rivers, the Schroon and the Hudson. It requires clean, sandy rivers and should be sought on Long Island, where it may also occur at sandy ponds.

*Stylurus amnicola* (**Riverine clubtail**) is a midwestern species that is rare in New England (mainly Connecticut River system) and eastern Ontario. There is an historical record from Bethlehem near Albany. It should be sought in New York rivers.

*Stylurus notatus* (**Elusive clubtail**) is notoriously difficult to net, because it patrols over wide rivers. There is a very old record from Monroe County and a more recent, but still old (1939) record from near Crown Point on Lake Champlain. It would be expected on large rivers (such as the St. Lawrence) and possibly Lake Champlain.

*Stylurus plagiatus* (**Russet-tipped clubtail**) is a big river species that in New York, is only known to occur in the Hudson River south of Albany County, but we don't have a good feel for how abundant it is in the Hudson. It may also occur in tributaries where they meet the Hudson. There is a curious old record from Long Island as well.

#### Cordulegastridae

*Cordulegaster erronea* (**Tiger spiketail**) is at the northern end of its range in New York. There are recent records from Westchester, Schuyler, and Erie counties, and it should be sought on small woodland streams fed by springs and seepage areas. *Cordulegaster obliqua* (**Arrowhead spiketail**) is another southern species. It has been found in a number of Southern Tier, Finger Lakes, and Hudson Valley counties. It is also associated with seepage areas and spring-fed brooks.

#### Macromiidae

\**Macromia taeniolata* (**Royal river cruiser**) is a large river or lake species. It is a strong flier and difficult to net. There is a population in northern Ohio, and it should be sought in western New York.

\**Macromia allegheniensis* (**Allegheny river cruiser**) is a small creek or stream species. It is widespread in Ohio and Pennsylvania but unknown in New York. It should be sought in the western part of the state.

#### Corduliidae

*Epithea* (or *Tetragoneuria*) species. *E. cynosura* (**Common baskettail**), *E. canis* (**Beaverpond baskettail**), *E. spinigera* (**Spiny baskettail**), and *E. princeps* (**Prince baskettail**) are all are widespread. *E. semiaquea* (**Mantled baskettail**) is known from Long Island, but it should be sought on Staten Island. Specimens of this species have unmarked wings in eastern Massachusetts and reduced markings in northern New Jersey, making it identifiable only by the distinctive tapering shape of the abdomen. *E. costalis* (**Stripe-winged baskettail**) is very similar to *cynosura* and occurs widely in NE Ohio and the pine barrens of NJ. It should be sought in SW New York, and it may occur on Staten Island or Long Island. Experience has shown the value of taking specimens of these confusing species.

*Neurocordulia obsolete* (**Umber shadowdragon**) is a lake species of eastern New York. It flies at dusk and is very difficult to net. It should be sought on small lakes in eastern New York. The exuviae are not easy to distinguish from *N. yamaskanensis*, in spite of published keys.

\**Neurocordulia michaeli* (**Broadtailed shadowdragon**) is a newly described species from New Brunswick, Maine, and Ontario. It should be sought in northern New York.

*Somatochlora albicincta* (**Ringed emerald**) is a boreal bog-margined pond species. There are old records from Mount Marcy and Lake Tear in the high peaks region of the Adirondacks.

*Somatochlora cingulata* (**Lake emerald**) is represented only in a few records. It is a northern lake species that has also been found on a river in the Adirondacks. One of the records is an old record from Slide Mountain in the Catskills.

*Somatochlora franklini* (**Delicate emerald**) is a northern and western species. There is a single New York record, and it should be sought in large Adirondack bogs.

*Somatochlora incurvata* (**Incurvate emerald**) is known from a few Adirondack bogs. It seems to prefer bogs with abundant tiny bodies of water.

*Somatochlora kennedyi* (**Kennedy's emerald**) is known from a few Adirondack bogs. It flies in July, earlier than its congeners (mainly August species), and is undoubtedly more widespread than records suggest.

*Somatochlora forcipata* (**Forcipate emerald**), like the previous *Somatochlora*, this species is known from a few large Adirondack bogs. With all of these species we wonder whether they are confined to these large bog complexes or are also found in other smaller bogs.

*Somatochlora linearis* (**Mocha emerald**) and *S. minor* (**Ocellated emerald**) are species of forest streams. *S. linearis* is a southern species with current populations in Orange, Westchester, and Dutchess counties and historical records from Niagara, Tompkins, Oswego, and Cattaraugus counties (the latter from Allegany State Park). *S. minor* is a boreal species with a handful of records mainly from the bog country of the northwest Adirondacks.

*Williamsonia fletcheri* (**Ebony boghaunter**) is known from a few Adirondack bogs and also Chenango Valley State Park in Broome Co. This last record is probably a stray, but this genus is difficult to locate, and the species may be found in other bog habitats.

*Williamsonia lintneri* (**Ringed boghaunter**) is the most sought after New York odonate. The first specimen ever collected of this species was taken in Karner near Albany in 1874, but it has not been seen in the state since. It prefers small bogs with sedges (*Carex*, *Dulichium*) and sphagnum floating in the water column in a sphagnum "soup," but it has also been found in quite different still-water habitats (non-boggy vernal pond in Connecticut; a small hillside ferny bog in northern New Jersey). It flies in April and May only, and it may have been overlooked because of its early season.

## Libellulidae

*Erythrodiplax berenice* (**Seaside dragonlet**). This species is found along the coast from New England to Texas and the tropics. Inland it is known from saline lakes in southern New Mexico. It is considered a salt-water obligate but has been found in perfectly fresh situations. There is an old record from Jefferson County. It should be sought along the Lake Ontario shoreline, and around the saline ponds north of the Niagara Escarpment.

\**Leucorrhinia patricia* (**Canada whiteface**) is a small, northern species of *Leucorrhinia* that has recently been taken in the US for the first time (Maine). It could occur in the Adirondacks, where it will resemble a small *L. hudsonica* (**Hudsonian whiteface**), a common species.

*Libellula auripennis* (**Golden-winged skimmer**) is almost indistinguishable from *L. needhami* (**Needham's skimmer**). Whereas *needhami* inhabits brackish coastal and lower Hudson marshes, *auripennis* occurs only in very fresh ponds. Near the coast it is found in spring-fed clear ponds. It may have been seen in Suffolk County, but there are no specimens to verify its occurrence there. It is widespread on Cape Cod and in coastal New Jersey, and it undoubtedly occurs on Long Island.

*Libellula flavida* (**Yellow-sided skimmer**) is near the northern edge of its range in downstate New York. It has been found on Staten Island and should be on Long Island.

*Pantala flavescens* (**Wandering glider**). A worldwide species with many New York records. There is a question of whether egg laying (as in Lake Champlain) results in viable larvae, or whether all NY specimens originated in the south and drifted north to New York.

*Sympetrum corruptum* (**Variegated meadowhawk**) is a widespread, western species breeding east to Michigan. Specimens in New York are probably all strays and are mainly found near the eastern coast.

*Sympetrum danae* (**Black meadowhawk**) is a northern species with a few Adirondack records and also records from Bergen Swamp in Genesee County. It should be sought in the Adirondacks.

*Sympetrum internum* (**Yellow-legged meadowhawk**), *S. obtrusum* (**White-faced meadowhawk**), and *S. rubicundulum* (**Ruby meadowhawk**) are widespread species in New York. Hybrids between *obtrusum* and *internum* are not uncommon. They are difficult to distinguish in the field (mainly by face color, which is variable), and red *Sympetrum* marked with black on the abdomen should be collected. *Rubicundulum* seems to be mainly found near the Great Lakes, *obtrusum* in the Adirondacks, and *internum* upstate away from the lakes and the Adirondacks. But they overlap considerably and also wander, so that their occurrences in any given year may be different from the previous year.

*Tramea abdominalis* (**Vermilion saddlebags**) and *T. calverti* (**Striped saddlebags**) are tropical species that have been taken in New York as strays. They should be sought along the coast, especially after tropical storms. There are several records of *calverti* all along the Atlantic coast but only a very few of *abdominalis*.

*Tramea carolina* (**Carolina saddlebags**) is a much sought-after species upstate, as it is more readily found in southern NY. It can easily be confused with *T. onusta* (**Red saddlebags**), which occurs within its range at about one tenth the abundance of *carolina* in the upstate and has not yet been recorded in NY.