Ode News - An Occasional Newsletter about Dragonflies and Damselflies on Cape Cod

Volume V, Number 1 - ISSN 1084-9750 - May, 1998

Greetings! This issue marks the beginning of the fifth year of publishing this modest chronicle of odonates and odonatists in southern New England. Looking back at the first issue of *Ode News*, published in April of 1994, we are struck both by how much we have learned since then, and by how little we yet know. It was an audacious decision, given our inexperience and ignorance, to publish that first issue, but we were so excited by our initial discoveries (modest though they seem in retrospect) that we threw caution to the wind and plunged ahead. Our intent was simply to share our interest and observations with a few like-minded acquaintances. Little did we know that *Ode News* and its companion Web site would soon lead to wonderfully enriching contacts throughout the country and even the world. Clearly, interest in dragonflies and damselflies is poised for a major emergence, the magnitude of which will be revealed once more field guides become available (soon, we hope!). Production of this newsletter and the Web site is a lot of work, but we are pleased and gratified to be a part of the budding awareness of these intriguing insects.

Featured in this tenth issue of *Ode News* is a summary of an extensive odonate survey conducted on Upper Cape Cod in 1996, the conclusion of an article on Massachusetts clubtails, another in our series "For Those Just Emerging," a brief article on binoculars for bugwatchers, a 1998 walk and program schedule, and assorted news and notes of interest.

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FIRST ODES OF 1998

After an incredibly warm winter and early spring, we were hopeful the 1998 ode season would get off to an early start. However, while such expectations were met not too far to our south, New England odonates apparently resisted any temptations to emerge prematurely. During an incredible warm spell in late March, Bob Barber reported three species of odonates in southern New Jersey: Common Green Darner (*Anax junius*); Eastern Forktail (*Ischnura verticalis*); and Fragile Forktail (*Ischnura posita*), the latter two apparently early records. Steve Walter reported sightings of a couple of Common Green Darners in the New York city area that same weekend. Despite these appearances at our doorstep, to our knowledge the first odes in New England were not found until the third week of April.

In Rhode Island, Ginger Carpenter reported that she and Nina Briggs saw their first Ringed Boghaunters (*Williamsonia lintneri*) on 21 April, the same date as last year, though they thought this year's bugs had been out for a couple of days when first seen. Around that time they also noted Common Green Darners, Harlequin Darners (*Gomphaeschna furcillata*), and a possible Springtime Darner (*Basiaeschna janata*). In addition, some small libellulid exuviae, most likely a species of whiteface (*Leucorrhinia* sp.), were found.

In Massachusetts, Bob Speare found a female Ringed Boghaunter at the Ipswich River Wildlife Sanctuary in Topsfield on 24 April, near where Fred Goodwin photographed a male of this rare species last year. The reappearance of the species suggests a local breeding population and Fred and Bob are searching for suitable sphagnum habitat. Mark Mello also found a Ringed Boghaunter at Ponkapoag Bog in late April. In Concord, Dick Walton found a Beaverpond Baskettail (*Epitheca canis*) on 29 April and a Springtime Darner on 30 April.

1998 ODE WALKS AND WORKSHOPS

We have been very pleased with the success and popularity of the dragonfly walks over the past few years, and look forward to these 1998 walks. All walks are highly weather dependent, so be sure to check with the leaders beforehand if conditions look questionable.

Saturday, 13 June: Plymouth. Sponsored by the Wildlands Trust of Southeastern Massachusetts. Leader: Jackie Sones. This walk will include a search for two state-listed damselflies that are specialties of coastal plain ponds: the Pine Barrens Bluet (*Enallagma recurvatum*) and the Lateral Bluet (*Enallagma laterale*). For meeting time and location, contact Brian Reid at 781-934-9018.

Saturday, 11 July: Norwell. Sponsored by the North & South River Watershed Association. Leader: Jackie Sones. Preregistration required ($3 donation suggested). Meet at 9:00 a.m. at the NSRWA's office on South Street in Norwell. To register, call the NSRWA office at 781-659-8168.

Saturday, 18 July: Petersham & vicinity. In conjunction with the Athol Bird & Nature Club. Leaders: Jackie Sones and Jeremiah Trimble. The diverse habitats in and around Petersham support a rich variety of pond, bog, and riverine species. Despite less than favorable weather, last year's walk in this area yielded at least 37 species of odonates. Meet at 9:00 a.m. at the Petersham Common on Route 32. For more details, contact Dave Small (phone: 508-249-2094; e-mail: dhsmall@tiac.net).

Sunday, 19 July: Ipswich River Wildlife Sanctuary, Topsfield. Workshop conducted by Jackie Sones. Slides and discussion, followed by a walk. To register call: 978-887-9264. (Fee)

Friday, 24 July: Wellfleet Bay Wildlife Sanctuary, South Wellfleet**.** Workshop conducted by Jackie Sones. Slides and discussion, followed by a walk. To register call: 508-349-2615. (Fee)

Saturday, 8 August: Myles Standish State Forest, Plymouth. Leaders: David Ludlow (phone: 781-585-3794; e-mail: dludlow@adelphia.net) and Blair Nikula (phone: 508-432-6348; e-mail: odenews@capecod.net). Within the borders of this 14,651-acre state forest are an exceptional number and variety of wetlands, including many coastal plain ponds. We hope to see a good selection of coastal plain specialties. Meet at 9:00 a.m at the main (north) entrance to the forest on Alden Road off Long Pond Road.

DRAGONFLY COURSE IN MAINE

Paul-Michael Brunelle from Nova Scotia, founder of the Atlantic Dragonfly Inventory Project, is teaching a week-long course entitled "Dragonflies and Damselflies of the Northeast" as part of the Eagle Hill Field Seminars. The course runs from June 28 – July 4 and will be based at the Humboldt Field Research Institute in Steuben, Maine. The course will cover life stages, morphology, behavior, temporal and geographical distribution, sampling techniques, field studies of adults, and collection of larvae for taxonomic study and rearing. Tuition for the course is $370, with room and board available for an additional fee. Paul Brunelle is one of the most experienced and knowledgeable odonatologists in the Northeast, and we have no doubt that this course will be exceptional and well worthwhile. For more information write to: Humboldt Field Research Institute, P.O. Box 9, Steuben, ME 04680-0009;ph: 207-546-2821; e-mail: humboldt@nemaine.com; Web site: http://maine.maine.edu/~eaglhill.

DSA NORTHEAST REGIONAL MEETING

The 1998 Northeast Regional Meeting of the Dragonfly Society of the Americas will be held over the weekend of 19–21 June in Fryeburg, Maine. The focus of the weekend will be the Saco River, which has been the source of many interesting and exciting odonate records, including such rarities as Boreal Snaketail (*Ophiogomphus colubrinus*), Pygmy Snaketail (*O. howei*), and Elusive Clubtail (*Stylurus notatus*). A variety of habitats in the area offer the potential for a great weekend. The meeting is being organized by Paul Brunelle. For more information contact Paul at 902-423-1845 (e-mail: as849@chebucto.ns.ca); or give us a call at *Ode News.*

DSA 1998 ANNUAL MEETING

The Dragonfly Society of the Americas is holding their national gathering in Valentine, Nebraska, the weekend of 17–19 July. Valentine is located in the Nebraska Sandhills, a unique geographical area with an interesting faunal mix. Although the area has not been well studied, some of the odonates known from the area include such interesting species as the Plains Emerald (*Somatochlora ensigera*), Pale Snaketail (*Ophiogomphus severus*), and Brimstone Clubtail (*Stylurus intricatus*). The meeting is being organized by Roy Beckemeyer of Kansas and Steve Hummel of Iowa. Roy has set up a Web site with details on the meeting at: www2.southwind.net/~royb/dsa98.html. For additional information contact Roy (ph. 316-264-0049; e-mail: royb@southwind.net) or Steve (ph. 712-657-2180; e-mail: mshummel@netins.net).

COPPERY EMERALD UPDATE

In the last issue of *Ode News* (Vol. IV, No. 2) we reported the exciting rediscovery of the Coppery Emerald (*Somatochlora georgiana*) in Massachusetts. During one of our visits to the site, Jeremiah Trimble found a couple of exuviae that he suspected might be from that species. He sent one of them to Jerrell Daigle, who first described the nymphs in 1994. Jerrell confirmed that the exuvia was indeed from a Coppery Emerald, thus providing the first evidence of breeding by the species in the state, or anywhere in the Northeast!

UPPER CAPE ODONATE SURVEY

Jeremiah Trimble

During the summer of 1996, my father (Peter Trimble) and I, with help from Dick Forster, Blair Nikula and Jackie Sones, intensively surveyed several sites on Upper Cape Cod for odonates. The surveys were part of the Installation Restoration Project associated with the Massachusetts Military Reservation. The study sites were mostly ponds, including Ashumet Pond, John's Pond, Mashpee/Wakeby Pond, Weeks Pond, Snake Pond, and Triangle Pond. In addition, various other habitats were surveyed, such as several vernal pools and bogs, although the majority of significant odonate information came from the ponds.

Most of the ponds were fairly big, and unvegetated except for minimal emergent plants close to the shoreline. At each site, meander surveys were conducted where diligent observers walked the entire perimeter of the pond, recorded the various species of odonates seen, and attempted to count every individual of each species encountered. This got a little hairy at times when we were overwhelmed by huge numbers of Civil Bluets (*Enallagma civile*) as you will see!

One significant finding was the discovery of the Powdered Dancer (*Argia moesta*), a species we had not found on Cape Cod before and which was known from only a few sites. It was even

more amazing to find that this species was very common at a few of the ponds. On 24 July, we counted 1,382 of these damselflies at Ashumet Pond in Falmouth!

Some of the most interesting information from these surveys was the sheer numbers of odonates encountered. The Civil Bluet is a common and widespread damselfly found most often at large, sandy ponds. Though I knew it was common on Cape Cod, nothing prepared me for the numbers we recorded. At Ashumet Pond, in a single survey on 24 July, we counted 16,495 individuals. That day we recorded a total of 18,275 odonates at Ashumet Pond, giving an idea of the dominance of this species on some of these ponds. Interestingly, the next most common odonate was the Powdered Dancer. Combined, these two species accounted for 98% of all individuals recorded! On 27 July, at John's Pond in Mashpee, we counted 8,398 Civil Bluets. The peak of abundance for this species surely must include the latter half of July!

The abundance of relatively uncommon Cape Cod odonates on these ponds was also interesting. Little Bluet (*Enallagma minusculum*) was found to be abundant at a few of the sites surveyed. Previously, we had regarded this species as fairly local on Cape Cod, and never abundant (proving we had never spent much time in this habitat!). However, at Triangle Pond in Sandwich on 23 July, we tallied 2,345 of these pretty damselflies. Similar numbers were recorded from several other ponds as well. The abundance of Stream Bluets (*Enallagma exsulans*) on these ponds was unexpected for a species normally associated with rivers and streams. A maximum of 1,042 was found at Triangle Pond on 21 July. The discovery of the Big Bluet (*Enallagma durum*) on these inland, freshwater ponds was intriguing, since it is normally found in more brackish waters. However, after finding it on the Connecticut River in western Massachusetts, the discovery of Big Bluet in these freshwater habitats was not completely unexpected. As many as 19 were found on 27 July at John's Pond.

Though damselflies dominated these surveys, dragonfly discoveries were in no short supply. The most unexpected anisopteran find concerned the status of the Black-shouldered Spinyleg (*Dromogomphus spinosus*). It turned out to be fairly common on these ponds. Previously, we had encountered this species at only a few sites on Cape Cod and hardly ever more than a few individuals at a time. During these surveys, at Mashpee/Wakeby Pond in Mashpee on 26 August, we counted 105 of these beautiful dragonflies. They preferred to land on beaches which were often crowded with people. Imagine the looks we got, walking by with net in hand and eyes to the sand! These odes often landed on our canoe as we attempted to survey Mashpee/Wakeby Pond. Sometimes they landed on our cooler, sometimes they landed on us! Perhaps they were trying to escape the crowded beaches?! The Fawn Darner (*Boyeria vinosa*) is known on Cape Cod from only a few sites. As a result, the discovery of an individual on Mashpee/Wakeby Pond on 26 August was significant. On the same date, an exuvia of this species was found floating in the water near the pond shore. The occurrence of this species on a pond is also significant since Fawn Darners are generally associated with rivers and streams. One further anisopteran of note was the Widow Skimmer (*Libellula luctuosa*). We discovered one individual at Ashumet Pond. This was one of few we have recorded on Cape Cod in the last few years.

The results of this study are proof positive of the valuable information that can be acquired with intensive surveys. Perhaps this will encourage more people to look into the odonate fauna of

particular sites in greater depth. There is so much to learn about odes, even in our own backyards! Have fun!

ODE NEWS WEB SITE

In the last issue of *Ode News* we indicated that we had run out of space on our Web site and were unable to add any more photos until additional space could be located. Well, we are delighted to announce that the Bioinformatics Project in the Biology Department at the University of Massachusetts in Amherst has generously agreed to store all of our odonate photos on their server! As a result, we have been able to add over one hundred more photos. A graduate student at UMass, Shaunak Denai, has also set up a searchable database for the photos. Using the database, it is now possible to search for photographs of any species on the Massachusetts list by genus, species, or common name.

We now have over 300 odonate photos posted on the Web site, representing 155 of the 165 species on the state list. Additionally, Jackie Sones has added photos of about 47 species taken outside of the state, in such diverse places as New Brunswick, Maine, Florida, Texas, and Mexico. We are tremendously grateful to Steve Brewer, Jeff Boettner, and the University of Massachusetts for providing this opportunity to make more odonate photos available to enthusiasts worldwide. If you have Web access, check out the new photos, and watch for further improvements to the *Ode News* Web site. The address is:
www.capecod.net/~bnikula/odenews.htm

BINOCULARS FOR ODE WATCHERS

Blair Nikula

With the burgeoning interest in butterfly and dragonfly watching, more and more people are looking for binoculars suitable for such interests. Fortunately, the choices for insect watchers have increased considerably in just the last couple of years. Indeed, the recent proliferation of close-focusing binoculars has made insect watching much more viable for the many people who do not wish to run around with a net in hand, and has undoubtedly contributed to the expanding interest in this pastime. An article in the Spring 1997 issue of *American Butterflies* (Vol. 5, #1) reviews the choices that were available a year ago. A couple of new models have appeared since, however, expanding the options for insect watchers. (If you would like a copy of the *American Butterflies* article, send a S.A.S.E. to us at *Ode News*.)

The most critical feature of binoculars used for studying insects is the ability to focus at a very close range. A few years ago, it was hard to find binoculars whose minimum focusing distance was less than 15 feet or so. For birdwatching, this is generally not a significant problem. For watching insects, however, viewing at distances of less than 15 feet is often critical for seeing field marks that may be important for identification or for seeing subtle behavior. Most close-focusing binoculars have a magnification of 7x or 8x which is fine. Although many birdwatchers

prefer 10x binoculars, the extra power offers little advantage at close range, and few 10x binoculars will focus closer than 12 feet or so. The lower power is also easier to hold steady. If you wear eyeglasses, pay particular attention to the specifications for eye relief — the larger the figure, the better. Look for a minimum of 15mm, with 18–20+mm being preferred. The field-of-view is also important. The wider the better for picking up quickly moving subjects. Look for a minimum of 325 feet at 1000 yards.

Close-focusing binoculars range widely in quality and corresponding price. You can spend anywhere from $100 to $1,000 or more (prices quoted here are approximate discount prices). In almost every case, you will get what you pay for. The cream of the crop is the Bausch & Lomb Elite 8x42 which can be purchased for about $750. The minimum focus is six feet or less. The quality is unsurpassed and eyeglass wearers will delight in the ample eye-relief. Their main drawback is that they are rather heavy. There are several other makes of high quality binoculars in this price range, including models from Zeiss, Leica, and Swarovski, but none offer the close focusing abilities of the B&L Elites.

Swift Optics recently introduced a new model, the Eaglet 7x36, which should prove to be very popular with insect watchers. They are moderately priced (about $325±), are supposed to be waterproof, and have decent eye-relief (16mm). They also have among the most remarkable close-focusing abilities of any binocular on the market. The advertised minimum focus is six feet, but Jeremiah Trimble recently acquired a pair that focuses to less than five feet — even if you're short, you can focus on your feet with these amazing glasses! If you're not prepared to shell out big bucks, the Eaglet may be just what you've been waiting for. Other moderately priced glasses, comparable in design to the Eaglets, with excellent close-focusing are the Eagle Optics Ranger 7x36 ($290±) and 8x42 ($350±); the Celestron 8x42 Regal ($400±); and the Cabela 10x42 ($280±).

Most of the close-focusing binoculars available for less than $250 are of the so-called compact design. These have objective lenses of 30mm or less in diameter and some are literally small enough to fit in a shirt pocket. The tradeoff is that, because the objective lenses are small, the image is often a bit dark. On bright sunny days, which of course is when most of us do our insect watching, this is usually not a problem. Most compact models are also of rather flimsy design and eyeglass wearers will find the eye-relief on these models to be quite poor (I've yet to see a pair I was comfortable with). Some of the compact models that butterfliers favor are the Bausch & Lomb 7x26 Custom ($250±), and the Minolta 8x22 and 10x25 Pockets ($100±).

Binocular manufacturers are continuously updating their product lines, and we can expect to see additional close-focusing models appearing frequently. The current trend for ever-closer focusing binoculars is great for insect watchers, though it can be tough to keep up. Buying binoculars these days is a lot like buying computers: Almost before you take them out of the box, something newer and better appears!

IN FOCUS: THE CLUBTAILS (FAMILY GOMPHIDAE) – PART 2

Blair Nikula

In part 1 of this article, Dick Forster introduced the clubtails (Gomphidae) and described 11 of the 27 species known from Massachusetts. In this conclusion, I review the remaining 16 species.

The taxonomy of the Gomphidae has always been a source of much uncertainty and debate among odonatologists. Fourteen genera are now recognized in North America, though that number has ranged as high as 17. Based upon this conservative taxonomic treatment, the Massachusetts species are distributed among nine genera: *Arigomphus* (two species); *Dromogomphus* (one species); *Gomphus* (eleven species); *Hagenius* (one species); *Lanthus* (two species); *Ophiogomphus* (five species); *Progomphus* (one species); *Stylogomphus* (one species); and *Stylurus* (three species). The largest group, *Gomphus*, has been the greatest source of taxonomic uncertainty. Some authors have divided *Gomphus* into several genera or subgenera, including *Gomphurus*, *Hylogomphus,* and *Phanogomphus*. While these taxa may be uncertain, they provide some value to the observer, as the species within these groupings often share characteristics that help to narrow down the identification possibilities.

In part 1, the genera *Arigomphus*, *Dromogomphus,* and *Progomphus*, and the subgenus *Phanogomphus* were described. Here, I cover the Massachusetts species in the genera *Lanthus*, *Ophiogomphus*, *Stylogomphus*, and *Stylurus*, and the subgenera *Hylogomphus* and *Gomphurus*. A number of these species are among the most poorly known odonates in the state; eight are on the state's list of Endangered, Threatened, and Special Concern species.

Two species within the subgenus *Hylogomphus* are known from the Bay State. Among the more frequently encountered clubtails locally, Moustached Clubtails (*Gomphus adelphus*) are fairly common residents of swift flowing streams in western and central portions of the state. They are medium-sized, of rather stocky build, and are darkish in overall appearance. Black cross-stripes on the yellowish face give rise to the common name. The male's terminal appendages are broad and thick, somewhat reminiscent of whale flukes. Moustached Clubtails are on the wing from mid-June through July. A close relative, the Spine-crowned Clubtail (*Gomphus abbreviatus*; Endangered) is one of the most mysterious dragonflies on the state list. The type specimen (*i.e.*, the first one of the species ever described scientifically) was collected in the mid-1800s in, of all places, Provincetown, about as far from suitable habitat as one can get within Massachusetts' borders. There have been very few additional records from anywhere in the state since, though Mike Thomas found a teneral male on the Connecticut River in Sunderland on 15 June 1996. They have been found in recent years in Connecticut, Rhode Island, and southern Maine, so undoubtedly occur in at least small numbers in the Bay State. Spine-crowneds are paler in overall coloration than Moustached Clubtails, and lack the black facial stripes. They have been recorded from a variety of riverine habitats.

The subgenus *Gomphurus* is represented by three species locally. All are primarily Midwestern in distribution, generally of scarce and very local occurrence in New England, and all are state-listed in Massachusetts. They typically inhabit broad, silty rivers and occasionally large lakes. All recent southern New England records are from the Connecticut River valley. *Gomphurus* clubtails are medium sized and characterized by their strikingly expanded "clubs" (*i.e.*, segments

7–9 of the abdomen). Apparently the most common of this group locally is the Cobra Clubtail (*Gomphus vastus*; Special Concern). Cobra Clubtails have blackish markings on their yellow faces, a feature which distinguishes them from our other two species of *Gomphurus*, both of which have unmarked yellowish faces. Although there is an historical record from Middlesex County, all recent sightings of this species have come from the Connecticut River, where it seems to be one of the most common gomphids. Adults are on the wing from late June through late August, and typically perch on the muddy river banks or on the broad leaves of shoreline trees and shrubs. Midland Clubtails (*Gomphus fraternus*; Endangered) have been found only rarely in the state, and mostly on the Connecticut River. Although generally inhabiting large rivers, they have been found on large lakes in parts of their range. Some authors have suggested that Midland Clubtails prefer more turbulent waters than the other *Gomphurus.* Skillet Clubtails (*Gomphus ventricosus*; Special Concern) have the most striking "club" of any gomphid in New England — the "Skillet" moniker referring to this striking feature. Skillet Clubtails are apparently scarce throughout their range and little is known of their habits or behavior. The few recent Massachusetts records have come from the Connecticut River or its tributaries.

The genus *Lanthus* comprises but two species, both of which occur only in eastern North America. Until fairly recently, there was thought to be only one species, *Lanthus parvulus*. However, in 1980 Frank Carle determined that two species were actually involved: a southern form, the Southern Pygmy Clubtail (*Lanthus vernalis*); and a more northerly form, the Northern Pygmy Clubtail (*Lanthus parvulus*). Thus, most publications refer to *Lanthus parvulus* only, and all specimens collected prior to 1980 were labeled *parvulus*. As their common names imply, the pygmy clubtails are among the smallest gomphids in the world, averaging only about an inch and a half in length. The two species differ in several subtle morphological features and, most obviously, in the pattern on the sides of the thorax. On both, the sides of the thorax are yellowish with dark markings, but on Southern Pygmy Clubtails the dark markings are narrower and less extensive, giving them a somewhat paler appearance. Both are on the wing from early June through July, and inhabit small, rocky or gravelly brooks where they perch on streamside vegetation or exposed rocks. However, Southern Pygmy Clubtails seem to prefer more shaded sites than their northern counterparts. They are rather furtive little insects, and the status of the two species in Massachusetts is unclear. The few recent records have all been of *vernalis* and have come from lowland areas in eastern and central parts of the state. Apparently there are some older records of *parvulus* from higher elevations in western Massachusetts. Additional field work and a re-examination of all *Lanthus* specimens from the Commonwealth would shed much light on the relative status of these sibling species.

Some of the most striking clubtails are those in the genus *Ophiogomphus*, the Snaketails. They are small to medium-sized dragons characterized by bright green thoracic patterns. Males have moderately flared "clubs." Although the various species are readily recognizable as ophiogomphids, specific identification can be tricky. As with most odonates, the shapes of the male terminal appendages provide the most reliable means of identification, though the patterns on the thorax and abdomen can also be helpful. On females, tiny spines, or "horns," on the top of the head (occiput) and the vulvar laminae are used to confirm identifications. Most species are found in fast-flowing, clear, rocky streams and seem sensitive to habitat degradation. Of the 19 species currently recognized in North America, five are known from Massachusetts. All seem to

be of rather local distribution in Massachusetts and absent from the eastern third of the state. Two are state-listed.

Maine Snaketails (*Ophiogomphus mainensis*) are perhaps the most common of the genus in this area. They have been found on a number of clear, rocky streams in central and western Massachusetts. The yellow markings on the top of the abdomen are long, narrow, and dagger-shaped. Unlike the other snaketails in this area, these yellow dorsal markings are absent from the last four abdominal segments. They are most often seen perching on exposed rocks in mid-stream, where they are skittish and difficult to approach. Brook Snaketails (*Ophiogomphus aspersus*; Special Concern) seem to prefer somewhat less rocky, more sluggish streams than their congeners. They typically are found perching on streamside vegetation. Only a few sites are known in Massachusetts, mostly in east-central parts of the state. Most recent reports have come from the Squannacook River in West Groton and Townsend. Rusty Snaketails (*Ophiogomphus rupinsulensis*) are the largest of the genus locally and, as their name implies, are characterized by extensive rusty coloration on the end of the abdomen. Although Rusty Clubtails reportedly are more tolerant of disturbed conditions than their congeners, the only recent Massachusetts records I'm aware of have come from the Miller's River in Erving. Riffle Snaketails (*Ophiogomphus carolus*; Threatened) have the most northerly distribution of our ophiogomphids. Cold, rocky streams seem to be their preferred habitat. They have been found in recent years on the Green, Westfield, and Farmington rivers. The yellow abdominal markings are thick, bluntly tapered at the distal end, with a sharp constriction near the middle.

Pygmy Snaketails (*Ophiogomphus howei*) are the rarest — or at least the most elusive — of our local snaketails, but one of the most distinctive in appearance. In addition to their diminutive size (1¼"), they have a conspicuous amber band across the base of the hind wings. Pygmy Snaketails have been found from Maine south to Tennessee and west to Wisconsin, though almost never in any numbers. They seem to prefer larger rivers. Although the type specimen came from Amherst in 1922, there have been very few reports in Massachusetts since. Presumably, adults spend most of their time perching high in the treetops. Pygmy Clubtails are not currently state-listed, but certainly should be.

Least Clubtails (*Stylogomphus albistylus*) are appealing little gomphids, similar in size to the Pygmy Clubtails. They differ in having narrow yellowish rings on the abdomen, a more striped lateral thoracic pattern, and white terminal appendages. Least Clubtails inhabit clear, swift, rocky streams where they perch on exposed rocks, logs, and streamside foliage. They seem to prefer somewhat larger streams than the two *Lanthus* species and appear to be more widely distributed in the state. Adults are active from late June through at least mid-August.

Perhaps the least known and most elusive of the gomphids are the Hanging Clubtails in the genus *Stylurus*. These are large clubtails with moderately flared "clubs." Some are rather drab, while others are boldly patterned. Adults apparently spend most of their time hanging from foliage at or near the treetops, and make infrequent forays to the water. Many species seem to be most active late in the day. Some *Stylurus* nymphs have a long, tube-like tenth abdominal segment, making them quite distinctive. In contrast to most gomphids, Hanging Clubtails are on the wing late in the season, generally from early August to mid-September. Of the 11 species in North America, three are known from Massachusetts, and two of those are state-listed.

Zebra Clubtails (*Stylurus scudderi*; Endangered) appear to be the most widely distributed of the three local species, as well as the most strikingly patterned. They are large, dark creatures with green eyes, bold yellow markings on the thorax, and yellow rings on the blackish abdomen. Zebra Clubtails prefer rather shallow, sandy-bottomed streams with occasional riffles. They have been found recently on the Squannacook, Fort, and Mahan rivers, and Fort Pond Brook. August appears to be the best month to find adults. Arrow Clubtails (*Stylurus spiniceps*) are among the more drably colored of the stylurids. They seem to be fairly common on the Connecticut River, but have not been found elsewhere. Males can be seen patrolling low over the river late in the day during August and September. Riverine Clubtails (*Stylurus amnicola*; Endangered) are the least known of their clan in Massachusetts, and are infrequently encountered anywhere in their range. They are smaller than their congeners and have distinct yellowish tibiae. The few state records are all from the Connecticut River.

Clubtails are among the most challenging and exciting of all the odonate families. We have spent many exhilarating, exhausting, and all-too-often frustrating hours chasing these delightful critters, and they have provided some of our most memorable times afield. It should be clear from this review how little is known about these insects. I hope you will be inspired to conduct your own searches — and let us know what you find. There is so much to learn, and what better way to spend a hot summer day than searching a cool, clear, rushing stream for the mysterious clubtails!

NEW BRITISH DRAGONFLY GUIDE

The British have yet another guide to the modest dragonfly and damselfly fauna of that archipelago. British Wildlife Publishing has recently published *Field Guide to the Dragonflies and Damselflies of Great Britain and Ireland* by Steve Brooks. This 160-page, softcover book is a model of what a field guide should be. Nearly 50 pages of introductory chapters are followed by extensive keys and thorough species accounts for the 52 species known from the British Isles. The species accounts are broken into sections titled "Description" (including "jizz" — the first time we've seen this distinctly British and somewhat controversial birder's term used for odonates!), "Status and Conservation", and "Ecology and Behavior." The 200+ color illustrations by Richard Lewington are superb, among the best odonates ever done, and are augmented by over 50 color photographs and assorted line drawings. The British have well over a dozen odonate guides, including one for almost every county. We can only hope that some day we, too, will have such an abundance of resources!

DRAGONFLY SWARMS

Blair Nikula

Several groups of dragonflies, particularly the darners (Aeshnidae) and the emeralds (Corduliidae) regularly form swarms in which numbers of dragons, often of several species, gather over open areas apparently to feed on concentrations of prey (*i.e.*, small insects). Though

swarms can form at any time, they are most frequent late in the day and often continue through dusk. Fields, clearings, and open hillsides near water seem the most likely sites to host swarms. Although feeding seems to be the primary purpose, there is little known about this swarming behavior. The mechanism by which these swarms form remains a mystery, and it's difficult, at best, to predict where or when they will form. While these dragonflies may be responding to concentrations of prey, potential prey items often seem no more numerous or concentrated in the vicinity of swarms than in similar nearby habitat. A site that hosts a swarm one day, may have few or no dragonflies on the preceding or following days. Some sites, however, seem to be consistently productive.

These swarms can be a source of great excitement as well as frustration for the odonatist. Many of the swarming species are very elusive normally, so the opportunity for catching, identifying, and examining even small numbers of these insects is equivalent to an odonate gold mine. For example, virtually all Massachusetts records of the rare Coppery Emerald (*Somatochlora georgiana*) have come from evening swarms. However, while these swarming dragons sometimes fly low enough to be catchable, they are often at treetop level, beyond the reach of even the tallest, high-jumping humans — so close, yet so far!

Within the coastal plain, where darners and emeralds are limited in both number and diversity, these swarms are rather rarely encountered (though swarms of gliders [*Pantala* spp.] are quite common). Inland, swarms occur with much greater consistency, particularly during the latter half of the season. One example may illustrate the affection many odonatists have for these events. During a solo excursion to northeastern Franklin County over Labor Day weekend last year, I encountered several low-flying swarms of darners along a dirt road in the town of Warwick. In four hours of virtually non-stop netting, I captured, identified, and released 63 darners, more than I had caught in the entire season up to that point! Seven species were represented in these swarms, including (in decreasing order of abundance): Canada Darner (*Aeshna canadensis*); Shadow Darner (*A. umbrosa*); Black-tipped Darner (*A. tuberculifera*); Green-striped Darner (*A. verticalis*); Mottled Darner (*A. clepsydra*):Variable Darner (*A. interrupta*); and Common Green Darner (*Anax junius*). Only time, and the lack of a third hand, prevented me from capturing many more. I bypassed the largest swarm, containing a hundred or more dragonflies, because of time constraints.

Even for those who are not interested in netting and identifying these impressive creatures, scores of darners gliding and darting over a hillside, wings glistening in the fading sunlight, is a thrilling sight not soon forgotten!

RHODE ISLAND ODONATE ATLAS

Ginger Carpenter has announced the formation of the Rhode Island Odonata Atlas project. This state-wide inventory will continue for a minimum of five years, with the following goals: to maintain an updated species list for Rhode Island Odonata, using volunteers to collect specimens on a town-by-town basis; to collect data on species' occurrences, distributions, and abundances; to make recommendations to the state Natural Heritage Program regarding endangered and

threatened species; and to locate critical habitat for Rhode Island Odonata. With 112 species recorded in the state, participants have an excellent baseline from which to proceed, and can expect to add several species to the state list. Volunteers are needed to assist with collecting, as well as with design and maintenance of the database. Anyone interested in participating should contact Ginger at The Nature Conservancy in Providence (phone: 401-331-7110; e-mail: vcarpenter@tnc.org).

FOR THOSE JUST EMERGING —This Ode Life

Jackie Sones

The following is a compilation of interesting facts about the lives of dragonflies and damselflies. It is by no means comprehensive, but simply an introduction which will hopefully inspire you to learn more!

Oviposition (Egg-laying)

- Most damselflies and darners oviposit endophytically (inside plants), while other dragonflies oviposit exophytically (in the water).
- During oviposition, male-female pairs may go their separate ways, remain in tandem, or the male may engage in non-contact guarding.
- Individual females may lay from hundreds to thousands of eggs.
- Some female damselflies submerge during egg-laying, remaining underwater for over an hour!

Eggs

- Eggs vary in size and shape. Often those found inside plants stems are elongate, while those deposited directly into the water are spherical.
- Eggs that are laid endophytically are often done so at fairly evenly spaced intervals, which may prevent extensive damage to the plant. (The plant provides shelter from predators and drought.)
- Incubation typically lasts from 2 to 5 weeks. It is somewhat temperature dependent, *i.e.*, higher water temperatures may result in faster development rates.
- In some species, such as spread-winged damselflies, egg development is delayed through the winter months and is completed in the spring.

Larvae

- Nymphs may live underwater from one month to five or more years, depending upon the species and the surrounding conditions.
- Nymphs may be found in a variety of habitats and micro-habitats. Some factors which may influence their distributions include water flow (slow or

fast), substrate type (sand, silt, gravel, leaf-litter), vegetation (floating or emergent; dense or sparse), the amount of sun/shade, and oxygen content.
- Dragonfly nymphs are voracious predators, possessing a "killer lip" with which they can reach out and grab unsuspecting prey such as insect larvae, tadpoles, and small fish.
- Damselflies may be seen swinging their bodies from side-to-side, swimming in S-curves through the water. Dragonflies often move via jet propulsion. Water is drawn into the abdomen and then expelled, forcing the nymph forward, sometimes at an astonishing speed!
- Nymphs may undergo from 6 to 15 molts. With each molt, they increase in size. An interesting note: Limbs and caudal lamellae (gill-like structures on damselfly nymphs) may be regenerated during molts!

Metamorphosis

- Odonates undergo a three-stage metamorphosis including egg, larva, and adult. They do not enter a pupal stage, as do butterflies and moths.
- The timing of metamorphosis may depend upon the species, daylength, and water temperature.
- A nymph may crawl far from the water before choosing a firm support (such as a plant stem, tree trunk, or rock) for emergence.
- Although metamorphosis takes place gradually while the nymph is living in the water, the actual emergence from the nymphal skin generally lasts from one to three hours.

The Adult

- Upon emergence, adults are soft and vulnerable, susceptible to attacks by predators (*e.g.*, birds, frogs, and other dragonflies) and to the elements (*e.g.*, wind and rain). It will take some time for their skeletons and wings to harden and for them to become sexually mature.
- On average, adults live from one to three weeks.
- Odonates are "generalized obligate predators." Small insects are caught and eaten on the wing; larger insects are brought to a perch for consumption.

Mating

- Wing and abdominal movements may be important in territorial and courtship displays.
- The "wheel position", in which the male claspers hold the female’s head or neck and the female places the end of her abdomen against the underside of the male’s second abdominal segment, may last from a few seconds to hours.
- A male is capable of removing the sperm from a previous mating before depositing his own.

References consulted:

Brooks, Steve. 1997. *Field Guide to the Dragonflies and Damselflies of Great Britain and Ireland.* British Wildlife Publishing.

Carpenter, Virginia. 1991. *Dragonflies and Damselflies of Cape Cod.* Cape Cod Museum of Natural History.

Corbet, Philip S. 1983. *A Biology of Dragonflies*. E.W. Classey Ltd. (reprint).

MAPPING SOFTWARE

One of the neatest pieces of software to appear in a long time is a program called TopoScout. Produced by MapTech in New Hampshire, TopoScout contains USGS topographic maps that have been scanned onto CD-Roms. With this program, it is possible to view and print topographic maps (at virtually any scale), to measure distances or areas with great precision, and to determine elevations and exact latitude and longitude. There are many other features, too numerous to detail here. The software is sold by state, with 20 states currently available (including all of the northeastern states). The price is about $100/CD, each CD containing about 100 maps. The larger states require multiple CDs. When compared with the price of USGS maps ($4.00/ea.), the CDs are a real bargain. We have used the Massachusetts CD extensively for about a year now, and it has performed flawlessly (knock on wood!). If you use topo maps regularly, you will find TopoScout a real joy. Contact MapTech at 800-627-7236, or visit their Web site at: www.earthvisions.com/topo.

Ode News

Editorial Staff & Production…Blair Nikula and Jackie Sones
Illustrations…Fahy Bygate, Jackie Sones, and Jeremiah Trimble

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