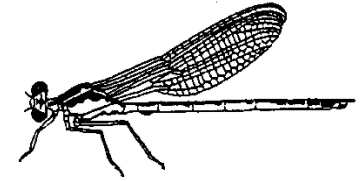


# Ode News



*An Occasional Newsletter about Dragonflies and Damselflies in Southern New England*

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May 1999

**W**elcome to the 12<sup>th</sup> issue of *Ode News*, now in its sixth year of publication!

The last field season of the millennium is upon us and it's shaping up to be the most active yet. The local water table has fallen considerably since last summer and, barring the monsoons we experienced last spring, most sites should be much more accessible this year.

Dragonfly enthusiasts in New England will find more activities than ever this summer. Jackie Sones is conducting her popular workshops at several locations, and a number of walks in association with various organizations have been scheduled. In addition, the Humboldt Field Research Institute in Steuben, Maine is offering two courses on odonata this year, taught again by Paul Brunelle. The Rhode Island Atlas project has entered its second year and it looks like another busy season in that state. Finally, the Dragonfly Society of the Americas is holding their annual meeting in the Adirondacks in July, followed by the International Congress of Odonatology at Colgate University in Hamilton, New York. It looks like an exciting summer ahead! Read on for details on all of these events.

Also in this issue Jim MacDougall describes last year's odonate course at the Humboldt Field Research Institute in Maine, Michael Veit offers some additional observations on hilltopping by dragonflies on Mt. Watatic, and Jackie Sones provides a note on identifying green darners.

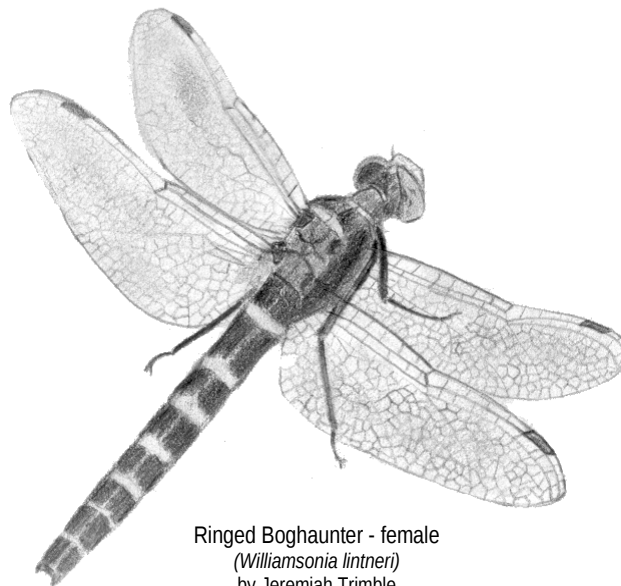
## LATE 1998 SIGHTINGS

Unusually warm weather during the first week of December resulted in some extremely late dragonfly sightings. On several days temperatures throughout southern New England exceeded 60°F and on the 7<sup>th</sup> reached the mid-70s, setting records in many areas.

On that date in Rhode Island, Charles Brown found a Common Green Darner (*Anax junius*) and an unidentified Meadowhawk (*Sympetrum* sp.). At the Connecticut College Arboretum in New London, Jeremiah Trimble recorded 40 Yellow-legged Meadowhawks (*Sympetrum vicinum*) on 3 December and found a dozen still flying on 9 December. He also saw two Common Green Darners on the 7<sup>th</sup>.

In a recent issue of *Argia*, Fred Sibley described his

observations of late dragonflies in western Connecticut ("A beginner's random observations on winter dragonflies", *Argia* 11(1): 13-15.). Fred recorded numbers and occurrence of Yellow-legged Meadowhawks at two ponds, one about 20 miles inland in Naugatuck and the other on the coast in Fairfield. The last meadowhawk at the inland site was on 29 November. However, at the coastal pond, meadowhawks were still numerous on 2 December and a single Common Green Darner was seen nearby. Following several days of exceptional warmth, Fred returned to the pond on 9 December. Although the temperature had fallen into the 40s, Fred caught and marked an amazing 70 Yellow-legged Meadowhawks! Several days of cloudy, normally cold weather ensued. When Fred returned



Ringed Boghaunter - female  
(*Williamsonia lintneri*)  
by Jeremiah Trimble

to the pond on 16 December, the temperature was again in the 40s and there was a skim ice on the pond. Nonetheless, Fred found a single meadowhawk, one that he had marked on his previous visit! This is probably the latest date an odonate has ever been recorded in New England.

## FIRST 1999 ODES

The first odes of the year in southern New England appeared in mid-April. Ringed Boghaunters (*Williamsonia lintneri*) emerged in Rhode Island, where 33 exuviae were found on 15 April (*fide* Ginger Carpenter). Three days later, Harlequin Darners (*Gomphaeschna furcillata*) and Common Green Darners (*Anax junius*) were also noted in

## 1999 WALKS AND PROGRAMS

There is a full schedule of activities planned throughout Massachusetts this season, from half-day walks to three-day courses. Some of these events are free, while others are scheduled by organizations, such as Massachusetts Audubon, and require registration and a fee. Many of these programs are weather dependent, so if in doubt call ahead.

**Saturday, 8 May: Concord & vicinity.** Meet at 9:30 a.m. at the Nine Acre Corner convenience store at the intersection of Route 117 & Sudbury Road in Concord. We'll be looking for the endangered Ringed Boghaunter (*Williamsonia lintneri*) and other early fliers. Leaders: Dick Walton (978-369-3729) and Blair Nikula (508-432-6348).

**Monday, 14 June: "Dragonflies and Birds: Life History Similarities and Differences."** 7:30 p.m. Evening program by Jackie Sones for the Hampshire Bird Club at the Immanuel Lutheran Church, 867 N. Pleasant Street, Amherst, MA.

**Friday, 2 July: In Search of Dragons and Damsels, I.** 9:00 a.m.–12:00 p.m. Walk at Ashumet Wildlife Sanctuary in Falmouth. Leader: Jackie Sones. To register call: 508-349-2615. (Fee)

**Friday, 23 July: In Search of Dragons and Damsels, II.** 9:00 a.m.–12:00 p.m. Walk at Nickerson State Park in Brewster. Leader: Jackie Sones. To register call: 508-349-2615. (Fee)

**Saturday, 24 July: Ipswich River Wildlife Sanctuary,** Topsfield. 9:00 a.m.–12:00 p.m. Workshop conducted by Jackie Sones. Slides and discussion, followed by a walk. To register call: 978-887-9264. (Fee)

**Sunday, 25 July: Petersham & vicinity.** 9:00 a.m.

With the Athol Bird & Nature Club. Meet at the Petersham Commons on Route 32. Leaders: Dave Small (508-249-2094) and Blair Nikula (508-432-6348).

**Sunday – Tuesday, 1 – 3 August: Dragonflies and Damselflies of Cape Cod.** Workshop at the Wellfleet Bay Wildlife Sanctuary in Wellfleet. Instructor: Jackie Sones, with Ginger Carpenter and Blair Nikula. For more information call: 508-349-2615. (Fee)

**Wednesdays, 4, 11, & 25 August; Thursday, 19 August: Dragonflies & Damselflies in Depth.** 7:00–9:00 p.m. Broad Meadow Brook Wildlife Sanctuary, Worcester. A four-week course with guest presenters and weekend field trips. For details call: 508-753-6087. (Fee)

**Saturday, 7 August: Discovering Dragonflies and Damselflies in Dartmouth.** Walk in conjunction with Massachusetts Audubon Society's Naturewatch. For more information or to register call: 1-800-AUDUBON, ext. 7251. (Fee)

**Saturday, 21 August: Berkshires Sanctuaries.** 1:00 – 4:00 p.m. Workshop conducted by Jackie Sones. Slides and discussion, followed by a walk. To register call: 413-637-0320. (Fee)

Rhode Island (*fide* G. Carpenter). In Massachusetts, Carol and Peter Trull saw a Common Green Darner in Brewster on 18 April, and the same day Jeremiah Trimble found a teneral male Eastern Forktail (*Ischnura verticalis*) in Eastham. This may be the earliest the latter species has ever been recorded in the state.

### 1999 DSA MEETING

The 1999 Annual Meeting of the Dragonfly Society of the Americas will be held in the Adirondacks in upstate New York from Thursday, 8 July through Sunday, 11 July. The meeting will be based at Paul Smiths College in Paul Smiths, just north of the Saranac Lake region. Field trips will be run to a variety of sites, including the Bloomingdale Bog and Ausable River, and a good variety of northern odonate species should be present. There will also be evening programs (for those able to remain awake!).

Lodging and meals will be available at the college for a cost of \$135.50, which includes three nights lodging (linen and towels *not* included), three evening dinners, and three breakfasts. To make reservations, send your check (payable to: Dragonfly Society of the Americas) to T. W. Donnelly, 2091 Partridge Lane, Binghamton, NY, 13903 (e-mail: [tdonnel@binghamton.edu](mailto:tdonnel@binghamton.edu)). Alternatively, there are numerous motels and campgrounds in the Saranac Lake area 15-20 miles from the college.

This meeting immediately precedes the International Congress of Odonatology, also in New York (see above), and will likely attract a large crowd, so make your reservations now!

## 1999 International Congress of Odonatology and 1st Symposium of the Worldwide Dragonfly Association (WDA)

**Colgate University, Hamilton, New York, USA**  
**July 11-16, 1999**

*Co-organizers:*

Dr. Janet Rith

River's Edge Geographics, P.O. Box 453, Bemidj, MN 56601.

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e-mail: [vmcmillan@mail.colgate.edu](mailto:vmcmillan@mail.colgate.edu)

Colgate University cordially invites all those with an interest in dragonflies to a stimulating week of scientific sessions, informal presentations, films, field trips, and other special events at Colgate University in upstate New York. Afterwards, participants are encouraged to attend one or both of two post-Congress tours, to the Adirondack Mountains and further afield to the lakes, forests, and rivers of Minnesota. A meeting of the IUCN Odonata Specialist Group is also scheduled on July 11, 1999.

Scientific papers or posters on the behavior, ecology, taxonomy, physiology, conservation, or other aspects of the Odonata are invited. Informal presentations (films, slide shows, etc.) are also welcome. The deadline for registration and submission of Abstracts (250 words) was March 1, 1999, but late registrations and abstracts will still be accepted to the extent that space permits. Please contact either Co-organizer if you are interested in attending, or see the Congress Web

### RHODE ISLAND ATLAS

Following an extremely successful first year (including six species new to the state), the Rhode Island Atlas Project, under the energetic leadership of Ginger Carpenter, is gearing up for an active second season. An organizational meeting in late March attracted about 30 enthusiastic volunteers, suggesting that the state will receive great coverage in 1999. If you are interested in participating in the atlas, at any level, contact Ginger at the Nature Conservancy in Providence; phone: 401-331-7110; e-mail: [gcarpenter@tnc.org](mailto:gcarpenter@tnc.org).

## BOG HAUNTING AT EAGLE HILL

*Jim MacDougall*

Last June I spent a week at the Humboldt Field Research Institute (formerly known as Eagle Hill) studying odonates. It was my first such seminar at this well-known forum. I have friends who have taught and/or taken courses there, and they have all come back recharged and raving about the food. In the weeks leading up to our rendezvous *waaay* Down East, I was definitely getting excited about the opportunity to focus more than an hour a week learning about odes. Nothing I conjured up in my imagination could have prepared me for the eventual outcome.

Eagle Hill is in Steuben, Maine which is east of Acadia and west of Machias. It sits on a spruce-covered granite peninsula surrounded by dark blue water, speckled with lobster buoys. It is classic Maine. The primary industries of this area are lobster fishing and blueberry picking. It is a world apart from the traffic and rush of eastern Massachusetts and I'm sure the residents there like that just fine. It is a fabulous landscape in which to anchor oneself for a seminar.

The Humboldt Field Research Institute is a small cluster of shingled buildings scattered throughout the stunted spruces. You can't see it all from any one vantage. There's a meeting hall/mess area, office, two classroom buildings, and an assortment of small cottages. I opted to tent which is cheaper, but on the Maine coast you can depend on it being damp, particularly if the seminar is at all aquatic and your clothes are always wet. Cabins are available with varying degrees of privacy to suit your sensitivities.

The instructor for our week of dragonfly and damselfly study was Paul-Michael Brunelle of Nova Scotia. Paul is noted for his many years of studying odonates in the maritime provinces of Canada, and for his discovery of a new species of shadowdragon (*Neurocordulia*) from New Brunswick.

When I arrived, there was a black Jeep Wrangler parked outside Classroom 2. The jeep had a funky looking screen draped over a frame extending out from the front bumper, not unlike the arrangement of legs on a pondhawk, and it had all sorts of long-handled nets stuck to the roof. This was a serious odonate-mobile. There was a serious odonatologist

dressed in earth tones brewing a cup of tea on the terminal appendages of this four-wheeled bog hunter. It was our instructor, Paul Brunelle. He rolled a cigarette and with a smile said hello. We learned as the days passed that this was a long honored ritual of Paul's and the Jeep was his own maritime province.

Paul is a graphic designer by profession, with an almost singular avocational passion for the study, inventory, and understanding of odonates. For the past couple of decades he has made the search for odonates and their documentation his focus. He maintains an extensive database of all of his records, and has developed his own printed field collection envelopes for recording baseline data on habitat, locality, time, and date. He has an extensive collection of all the species found in Canada and northern New England. These specimens were all laid out for us in the classroom.

Paul had organized two weeks worth of work for our one-week class. One in the event it rained all the time and the second for sunny days to include extensive field collecting and preserving of specimens. We had good weather and a combination of class and fieldwork. Each morning was spent learning the key characters of all the species we were likely to find in northern Maine. He had great support materials to pass out, largely developed on his own utilizing his graphic design talents. We received color field keys of spreadwings, bluets, emeralds, and snaketails; black-and-white field keys for darners, meadowhawks, and whitefaces. The introduction to each family, genera, and species was so thorough that some of the participants were overwhelmed by the sheer weight of this new knowledge. My very limited understanding of odonates was very helpful in allowing me to keep up with the pace. In short, the class was considerably more than I could have ever hoped for and the tuition was a mere token of the value of this course.

Beyond the magnificence of the lecturer and course, the one thing I hadn't even considered was my classmates. I simply hadn't thought about it before arriving.

Each of my classmates was an expert in one field or another in their own right. The class consisted of Mark McCollough, Director of Maine's Nongame Division; Phil DeMaynadier, from the Nature



The undescribed Shadowdragon (*Neurocordulia* sp.) discovered by Paul Brunelle. Since its discovery several years ago, it has been found at a number of riverine sites in New Brunswick and Maine.

Conservancy and assisting Paul with Maine's Odonate Atlas; Don Miller, professor from Lyndon State College in Vermont who studies moths and beetles in Vermont's Northeast Kingdom; Linda Berard, a lichen expert from eastern Massachusetts; Joan Milam, spotted turtle expert and invertebrate biologist for Massachusetts Audubon; Betsy Newcomer, freelance rare plant botanist for the State of Maine; Juan Sanchez, director of a nature center in Connecticut; Dave Sterling, professor from New York; Larry Weber, arachnologist from Minnesota; Ned Hatfield, teacher and aquatic invertebrate monitor from New Hampshire; and Karen Frolich, larval odonate expert for the New York State Biological Survey.

Needless to say, this accidental assemblage of talent and enthusiasm was simply too exciting for words. We ate breakfast at 7:00 a.m., hit the classroom by 8:15, worked on key characters until lunch, loaded up the vans, headed out to the field, and studied odonates, spiders, lichens, trees, shrubs, aquatic plants, birds, beetles, and moths. We would bring our collection back to the lab, eat dinner, and spend the evening in the lab identifying the day's catch and honing our collective natural history skills. No one would leave the lab before 10:30 p.m. We had six days of this, and no one wanted it to stop. What did I learn? Other than lots about dragonflies and damselflies, I learned:

- the importance of taking proper field notes for inclusion with specimens.

- to value collected specimens and to properly prepare them for perpetual storage and utility.
- wear nylon clothing to dry out as rapidly as possible.
- when collecting along rivers, position yourself at the foot of a riffle and the head of a pool, on a rock where a tree overhangs the river.
- use a wide, very shallow net for collecting larvae.
- respect the explosive nature of acetone.
- my trusty tent of 18 years leaks.
- if there is a very difficult dragonfly to catch, call Mark McCollough to net it.
- if you have a very difficult (any) nymph to identify, call Karen Frolich.
- there are spiders big enough to eat fish.
- leeches of Down East will cause infection, so wear long pants.
- the food is great at Humboldt Field Research Institute.
- the people you meet there are people you hope will be life-long friends.

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## 1999 HUMBOLDT COURSES

Paul Brunelle's course on odonates at the Humboldt Field Research Institute (formerly known as the Eagle Hill Field Research Station) in Steuben, Maine last year was by all accounts a great success. This year, Paul will be teaching two courses. The first will be held 16 - 22 May and will focus on nymphs, while the second on 15 - 21 August will concentrate on adults. The tuition for each course is \$395. Room and meals are available at an additional cost. For more information contact:

Humboldt Field Research Institute  
P. O. Box 9, Steuben, ME 04680-0009  
phone: 207-546-2821  
e-mail: [humboldt@nemaine.com](mailto:humboldt@nemaine.com)  
Web site: <http://maine.maine.edu/~eaghill>

## OBSERVATIONS ON HILLTOPPING *AESHNAS*

Michael Veit

Mt. Watatic has become one of my regular dragonfly collecting stops ever since I discovered large numbers of dragonflies, especially darners (*Aeshna* spp.) and emeralds (*Somatochlora* spp.), flying about the summit during the summer of 1997. Some observations I made on swarms of darners during two consecutive visits during July 1998 led to my conducting an informal experiment later in the month.

Mt. Watatic (elevation: 1832 ft.) is located in Ashburnham, Worcester County, Massachusetts. Its slopes are largely wooded and the summit is mostly open. There was once a small ski area on the mountain, and there remains remnants of several abandoned ski slopes and trails. These extend from the summit down the north facing side of the mountain to its base. Stands of several species of conifers intermixed with hardwoods separate the old ski slopes and trails from each other. The trails and slopes are partially overgrown with grasses, shrubs, and various weeds. It is above the trails and the open summit where most of the activity occurs.

The two initial visits were made at very different times of the day. On 16 July when I reached the summit at 9:00 a.m., there were many darners swarming. The level of activity remained high until 11:00 a.m., when I stopped collecting. By that time I had netted in excess of 30 *Aeshnas*, the vast majority of which were Interrupted Darners (*Aeshna interrupta*); the remaining few were Shadow Darners (*A. umbrosa*). My next visit was on 20 July from 6:30 – 8:00 p.m. Once again there were many darners swarming, however the species composition was different. I caught about equal numbers of Shadow Darners and Interrupted Darners along with one Green-striped Darner (*A. verticalis*) and one Canada Darner (*A. canadensis*).

After comparing my observations from these two visits, I questioned whether I had caught any of the same individuals each week, and whether the species composition was different on the two visits because I went at different times of the day or because the trips were a week apart and there had been a change in which species were emerging. I decided to try a simple experiment. I would go to the summit in the late afternoon one day and catch and mark as many darners as possible until nightfall, then resume collecting early the following morning.

When I arrived at the summit at 6:30 p.m., on 27 July there was only one small group of three *Aeshnas* flying. However, the activity began to increase shortly thereafter. By 7:00 there were several swarms, each numbering 10–20+ individuals. The activity peaked from 7:30 until 8:00 and I approximated that there were 150 to 200 darners in the air at any one time. By 8:15 the activity had shut down to almost nothing. I saw one *Aeshna* at 8:30 and none thereafter. Sunset on the 27th was at 8:13 p.m.

The earliest swarms were located high in the air, at tree top level and above. They gradually got lower as the evening progressed. By 7:45 many were flying at waist level and below. That evening I captured and marked 17 darners: nine Shadow Darners, five Interrupted Darners, two Canada Darners, and one Black-tipped Darner (*A. tuberculifera*).

I marked each individual with a spot of brightly colored nail polish near the base of the hind wing and used different colors/hind wings for the different species in hope that I might be able to identify them through my binoculars as they swarmed. However, none of those marked were either seen again that evening or recaptured. I was not able to capture and mark as many as I would have liked to, since marking each individual took longer than I originally expected.

I caught my first ode, a Shadow Darner, the following morning at 6:15 a.m., and continued



Variable Darner - male  
(*Aeshna interrupta*)  
© Blair Nikula

collecting until 11:00 a.m. There wasn't a definite peak of activity as there had been the evening before. Instead, there seemed to be a more gradual increase early in the morning then scattered pulses of activity until the air temperature warmed and the activity ceased. During times of greatest activity there were fewer than half the number of individuals flying than during the peak the evening before. Also, most were flying low the entire time, and no tight swarms were apparent.

What was perhaps most interesting to me that morning was the behavior some individuals displayed as the morning progressed. I noticed repeated incidences of individuals flying about and inspecting the branches of spruce and pine trees and occasionally hanging up in them for up to several minutes. I did not see any exhibit this behavior the previous evening. Although they appeared to be searching for something, none appeared to be capturing prey. On a couple of occasions, I witnessed what I believe were males search among the trees, locate hanging females, and then pair up and fly off with them. I captured and marked 11 darners that morning: six Shadow Darners and five Interrupted Darners. Once again, I did not see or recapture any marked individuals.

The informal nature of my experiment, i.e., the lack of repeated trials and relatively low number of dragonflies marked, precludes me from making any solid conclusions. However, some generalities may be drawn, and many further questions posed.

There were definitely more dragonflies swarming during the evening than in the morning, and the pattern of activity was different. This was probably at least in part due to the activity pattern of their insect prey.

If my collections accurately reflected the species composition of the *Aeshnas* on Mt. Watatic, then the composition had changed from my initial trips, and the composition also differed between morning and evening.

I estimated the total number I caught and marked during each session (17 in the evening and 9 in the morning) to be about 10% of the maximum number I counted flying at any one time. Why did I not

recapture or even see (through binoculars or with unaided eye) any of the individuals I marked? Was the probability of recapture simply too low? (See Note below.) Did the individuals I marked disperse from the area in an effort to escape? Were the marked individuals more wary, and thus more effective at eluding my swings? Were new individuals constantly entering and leaving the swarms, such that the swarms were remaining at about a constant size, but actually represented only a fraction of the total population present in the area at any one time? Or, is there some other explanation?

Was the searching behavior I witnessed during the later part of the morning typical for that time of the day? What were they actually searching for? I didn't see any searching or hanging up in the hardwoods. Is the presence of the conifers one of the reasons for there being so much *Aeshna* activity atop Mt. Watatic?

There is, however, one conclusion I can draw with certainty. I will be back on top of Mt. Watatic this summer trying to find answers to my growing number of questions.

Note: I conducted a small experiment when I got home to try and test the likelihood of my recapturing an individual having only marked 10% of the population. I counted out 100 kidney beans and put them into a bowl, then randomly "captured" one bean at a time, marked it, and returned to the bowl. I continued capturing, marking, and returning them until I "recaptured" one of the marked beans. In ten trials, I "recaptured" a marked bean eight times before "capturing" ten beans (10% of the population). On this basis, it seems that marking approximately 10% of the population should have resulted in a recapture.

*(Editor's note: Jeremiah Trimble has received a grant through Connecticut College to study hilltopping behavior in dragonflies this summer. He will be focusing his efforts on Mt. Watatic. We look forward to hearing more about this intriguing behavior from both Michael and Jeremiah.)*

## **“GIANT BIRD-EATING DRAGONFLIES CROSS THE ATLANTIC”**

So read one overly sensational headline in a British newspaper last fall. The article, as posted on the Internet (UMI Company), read:

Giant American dragonflies have flown the Atlantic. Their unprecedented arrival in the Isles of Scilly and south-west England is sending waves of excitement through the ranks of British naturalists.

The insects have been identified as Common Green Darners, *Anax junius*, which occur commonly from Alaska in the far north to Panama in Central America but which, until this month, had never been recorded in Europe. It is believed these jumbo jets of the insect world — measuring more than three inches long with a wingspan of more than four inches — have been blown off course to Britain while migrating south for the winter. Their arrival coincides with a spate of sightings of American birds, and follows a weather pattern involving depressions tracking across the Atlantic.

One, a male with a distinctive green thorax, has been present for a week at Penlee Point Nature Reserve, near Rame, south-east Cornwall, and up to six have been reported on the Scillies, west of Land's End, including four together on St. Agnes, the most southerly of the main group of islands. Steve Dudley of the British Dragonfly Society, who is writing a book on dragonflies and has seen one of the green darners, said: “There is no doubt about its identification. Lots of entomologists have now seen it and are equally satisfied.”

Green darners are predatory, their diet including wasps, moths, butterflies, beetles, flies and smaller dragonflies. Attacks on hummingbirds, some varieties of which are smaller than they are, have been recorded.

Dr. Mark Telfer, of the Biological Records Centre of the Institute of Terrestrial Ecology, near Wareham in Dorset, said that there had been reports of unusually large numbers of the insect on the east coast of North America this autumn so there was a chance more would appear with strong westerly winds continuing. “It is quite possible for such long-distance migrants to cross the Atlantic unaided in such conditions,” he added. “If sufficient numbers arrive there has to be a

possibility a breeding population could become established, although this would be complicated by their need to migrate south to a warmer climate for the winter.”

The future arrival of green darners was forecast only in January in a paper by Adrian Parr, published in the entomology journal *Atropos*. In it he wrote: “Sporadic appearances do seem highly likely. As with birds, several of the more mobile species {of dragonflies} appear to use the east American coast as a flyway and many have a flight pattern extending into September or October, so that they are potentially on the wing at the start of the period of autumn transatlantic winds.”

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## **NEW CORBET BOOK**

One of the most eagerly anticipated books in odonatology is scheduled to appear this month (May 1999). Philip Corbet's *Dragonflies: Behavior and Ecology of Odonata*, published by Cornell University Press, is 802 pages with 96 color photographs, 40 black-and-white photos, numerous illustrations and tables, and over 4000 bibliographic citations! The price will be \$95.00. However, some book dealers, such as Patricia Ledlie in Maine, are offering a pre-publication price of \$76.95, good until 90 days after publication.

This volume “emphasizes the diversity found in dragonfly behavior” and “describes the behavioral strategies that influence the fitness of individuals in physical and biotic environments and in all stages of the life cycle. The book also examines behavior associated with processes such as habitat selection, foraging, seasonal regulation, migration, territoriality, mating, and sperm competition, emphasizing the interdependence of all developmental stages, as well as relationships among dragonflies and other animals, including humans.” In 1962, Philip Corbet published *A Biology of Dragonflies* which ever since has been the standard text on dragonfly natural history. This new book is destined to replace it as the definitive reference. Anyone seriously interested in odonata will want it in their library.

## CLASSIC WALKER PUBLICATIONS

The Toronto Entomologists' Association announces that it is now taking pre-paid orders for reproductions of the following out-of-print books:

*The North American Dragonflies of the Genus Somatochlora*, by E.M. Walker (1925). In Canada: \$55 Can. (includes gst and S&H via surface post); In U.S.A.: \$43 U.S. (includes S&H via surface post, add \$3 U.S. for airmail).

*The North American Dragonflies of the Genus Aeshna*, by E.M. Walker (1912) (with color plates). In Canada: \$65 Can. (includes gst and S&H via surface post); In U.S.A.: \$50 U.S. (includes S&H via surface post, add \$3 U.S. for airmail). This publication contains some gorgeous color plates that were originally hand-colored by Walker.

Copies are still available for the 3-volume set *The Odonata of Canada & Alaska*, by Walker & Corbet; cost for 3-vol set: In Canada: \$196 Can. (includes gst and S&H via surface post); In U.S.A.: \$145 U.S. (includes S&H via surface post, add \$5 U.S. for airmail).

A reprint of a classic guide to tiger beetles may also be of interest to some readers: *The Cicindelidae of Canada*, by J.B. Wallis (1961) (with color plates). In Canada: \$28 Can. (includes gst and S&H via surface post); In U.S.A.: \$23 U.S. (includes S&H via surface post, add \$3 U.S. for airmail).

Please inquire for international rates. These are **not** photocopies but are high quality scans by University of Toronto Press — the interior pages are on acid-free paper; the cover is a deluxe-quality hardcover but is not the same as the original. Orders must be pre-paid (personal checks accepted for U.S. or Canadian orders; money or postal orders only for others; sorry we can't take credit card orders but can invoice you). Please send your order to: T.E.A. c/o Alan Hanks, 34 Seaton Drive, Aurora, Ontario Canada L4G 2K1; phone: 905-727-6993 (e-mail inquiries to [nmg.vanderpoorten@sympatico.ca](mailto:nmg.vanderpoorten@sympatico.ca)) Please be sure to specify which book(s) and to give your address!

## DRAGONFLIES OF NORTH AMERICA

The long-awaited monographic revision of the classic *Manual of the Dragonflies of North America*, by Needham and Westfall (1955) is expected in Winter 1999-2000. Revised by Minter Westfall and Michael May, this work will be the companion volume to the new *Damselflies of North America* published in 1996. A total of about 360 species will be treated, including those from northern Mexico and the West Indies, and numerous additional species described or discovered within the area since 1955. Revised keys to species and revised diagnoses will allow identification of all adults and known larvae of these aquatic insects. Numerous new illustrations are included, plus several pages of color plates. Also included are a revised checklist to species, an extensive bibliography, glossary, and index. (James G. Needham, Minter J. Westfall, Jr., and Michael L. May. 1999. ca. 650+pp. ISBN: 0-945417-94-2. ca. \$75.00).

The International Odonate Research Institute, by special arrangement with the publisher, is now taking advance orders at 10% off the estimated publication price of \$75.00. That is \$67.50 plus S&H of \$5.00 U.S., \$7.50 outside U.S. (Total of \$72.50 in the U.S., \$75.00 outside the U.S.) There is a chance that production costs will drive the price up, but if you order in advance you will be protected from the potential price increase. This offer is valid until 31 July 1999. Make your check to I.O.R.I. and send it along with a note requesting the updated manual to:

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## FIELD PROBLEMS: THE GREEN DARNERS

Jackie Sones

Two species of green damer are found in the Bay State: Common Green Darner (*Anax junius*) and Comet Darner (*Anax longipes*). Over the past few years, I've learned that separating these two species in the field is not always easy for beginners.

Both species are large dragonflies with large eyes, lime-green thoraxes, and long legs. To separate the two, start by checking the color of the abdomen. If you see a blue abdomen, it's a Common Green Darner. Most often it will be an adult male. (However, beware of "look-alike" females that develop some blue.) If you see a brilliant, fire-engine red abdomen, it's an adult male Comet Darner.

If you see a brick-red abdomen, you have a few choices. It could be an adult female or an immature Common Green Darner. It could also be an adult female or an immature Comet Darner.

To separate them, you need to look at a few different field marks. If the beast is perched (lucky find!), try to see the forehead. If it is painted with a "bull's-eye" pattern (black spot encircled by yellow and blue semicircles), it's a Common Green Darner; if it's uniform green, it's a Comet Darner (see illustration). The adult female Comet Darner's eyes will become blue upon maturity, so check for eye color whenever possible.

If the beast is in flight, you might not be able to identify it with 100% certainty. However, consider status, distribution, and flight period.

Common Green Darners are common to abundant. They are found throughout the state in a wide variety of habitats and are seen on-the-wing from mid-April through November. Comet Darners are locally uncommon to rare. They are almost exclusively found at coastal plain ponds (as well as some vernal pools along the coast) and are seen on-the-wing mainly during July and August.

Behavior may also be useful in identification. Common Green Darners are migratory; they may be seen moving or roosting in large numbers along the coast; they join feeding swarms over open fields; and often oviposit (lay eggs) while in tandem.

In comparison, Comet Darners are sedentary; they are often solitary and may actively patrol stretches of shoreline or an entire perimeter of a coastal plain pond; they have not been found in feeding swarms over open fields; and females oviposit alone.

Common Green Darner



Comet Darner



Eyes and forehead patterns of green darners from above.

|                                        | Common Green Darner                                                                                     | Comet Darner                                              |
|----------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| Status                                 | common to abundant                                                                                      | locally uncommon to rare                                  |
| Habitat                                | widespread                                                                                              | coastal plain ponds                                       |
| Flight Period                          | mid-April through November                                                                              | July and August                                           |
| Behavior                               | swarm, migrate, roost in large numbers, active patrolling; pair may remain in tandem during oviposition | solitary, active patrolling; female oviposits while alone |
| Forehead                               | bull's-eye on green                                                                                     | uniform green                                             |
| Abdomen in adult males                 | light blue and brown                                                                                    | fire-engine red                                           |
| Abdomen in adult females and immatures | brick red; some adults with blue                                                                        | brick red                                                 |
| Female eye color                       | light brown with yellow                                                                                 | gray, becoming blue upon maturity                         |
| Range                                  | throughout the U.S. (inc. Alaska and Hawaii)                                                            | along the East Coast (MA-FL), west to Texas and Wisconsin |

this winter. Since being placed on the Web, many



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