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The Dragonfly Society Of The Americas

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Journals Published By The Society

ARGIA, the quarterly news journal of the DSA, is devoted to non-technical papers and news items relating to nearly every aspect of the study of Odonata and the people who are interested in them. The editor especially welcomes reports of studies in progress, news of forthcoming meetings, commentaries on species, habitat conservation, noteworthy occurrences, personal news items, accounts of meetings and collecting trips, and reviews of technical and non-technical publications. Articles for publication in ARGIA are best transmitted as attachments to e-mails, but can be submitted on floppy disks. The editor prefers MS DOS based files, preferably written in Word, Word for Windows, WordPerfect, or WordStar. **All files should be submitted unformatted and without paragraph indents.** Line drawings are acceptable as illustrations.

T. Donnelly (address above) and Jim Johnson are the editors of ARGIA.

Bulletin Of American Odonatology is devoted to studies of Odonata of the New World. This journal considers a wide range of topics for publication, including faunal synopses, behavioral studies, ecological studies, etc. The BAO publishes taxonomic studies but will not consider the publication of new names at any taxonomic level. Enquiries and submission of manuscripts should be made to BAO editor, T. Donnelly, 2091 Partridge Lane, Binghamton, NY 13903. Final submissions (after review) should be made as e-mail attachments or on floppy disk, with illustrations in final form and preferably adjusted to final size.

Membership In The Dragonfly Society Of The Americas

Membership in the **DSA** is open to any person in any country. Dues for individuals in the US, Canada, or Latin America are \$20 US for regular membership and \$25 US for institutions or contributing membership, payable annually on or before 1 March of membership year. Dues for members in the Old World are \$30 US.

Dues should be mailed to Jerrell Daigle, 2067 Little River Lane, Tallahassee, FL 32311

The **Bulletin Of American Odonatology** is available by a separate subscription at \$20 US for North Americans and \$25 US for non-North Americans and institutions.

Front cover: Glenn Corbiere caught this Hine's Emerald (*Somatoclora bineana*) in flight!

In This Issue

We received the very sad news that Nancy Adams succumbed to cancer late this summer. Several of us remember her at the Sparta (North Carolina) meeting. Nancy was well known to every dragonflyer who had any occasion to visit the National Museum. Nancy always went that extra step for us—and always with a smile and good humor.

The high point of the summer for most of us was the annual DSA meeting at Arnprior, Ontario. We have now had two meetings with a day devoted to presentations, and this session was every bit as successful as the previous year. The field trips were held under sunny skies and we continued our tradition of taking at least one very good record for the home area—this time a *Cordulegaster obliqua* (Arrowhead Spiketail) nabbed by Oliver Flint. Probably the high point for most participants was the evening flight of *Neurocordulia michaeli* (Broad-tailed Shadowdragon) on the Petawawa River. Several eager netters waded up to their waists in the fading light trying to nab a few of these insanely fast, erratic insects flying just above the water surface.

I had several “finest moments” on this trip. One was that huge beaver walking determinedly down the middle of the road and forcing me to stand aside as it strode past. Another was a memorable view of a sturgeon that swam slowly by my legs in the beautiful Petawawa River. It was a lovely trip.

Next year is getting off to a rousing start. The Kentucky meeting will be hosted by Carl Cook and Ellis Laudermilk at Mammoth Cave National Park. I wonder if there are underground odes?

The Southeast meeting next year will be in central Arkansas. A few of us went here a few years ago; in spite of unseasonably cold weather we had a marvelous time and found all sorts of neat things. Next year should be superb. The Northeast meeting will be in northern New Hampshire, home already to several outstanding finds, such as one of the few US records for *Coenagrion interrogatum*.

The reports of the Northeast and Southeast meetings this year show that both were very successful. My finest moment at the Northeast meeting was the close examination of a large timber rattler found by Dave Small. Most of our northern specimens are quite dark, but this was a

gorgeous yellow and brown phase. Oh, and the bugs were great also. Our group photo is on the back cover. Note the setting!

Paul McKenzie reports on the first Missouri “field foray”. It is gratifying to see that local groups are becoming more and more organized. Interest in dragonflies grows more effectively this way, and the payoff is additional remarkable records for the state.

Hine’s Emerald is in the news again. Glenn Corbiere’s glorious photo of one flying in northern Michigan graces our cover. Paul McKenzie and Tim Vogt review the status of the species in Missouri and Mark O’Brien reports on the very successful workshop in northern Michigan.

The New York list just increased a little. The state with the second largest Odonata fauna just added *Celithemis verna* (Double-ringed Pennant)—thanks to Ginger Brown.

One of the most interesting new records is by Dennis Paulson—of *Anax concolor* in southern Texas. This species has a huge range—in the Bahamas and West Indies south to Argentina. Within this range it is highly variable in abdomen color—from dark with pale spots (see back cover) to solid dark red to bright orange with pale spots. People in south Texas should be alerted to other color forms of this species—especially the orange abdomen with pale spots. Perhaps some of these recent Valley records of the Comet Darner (*longipes*) are really concolor!

Tim Vogt and Paul McKenzie have also added both species of *Telebasis* (Duckweed and Desert Firetails) to the Missouri list. This is truly the east-meets-west state; *Rhionaeschna mutata* and *multicolor* (Spatterdock and Blue-eyed Darners) also occur here—and not too many miles apart.

R. Butler *et al.* show that *Enallagma laterale* (New England Bluet) is now firmly located in eastern Maine. Paul Bedell and Allen Bryan report on *Orthemis ferruginea* (Roseate Skimmer) in Virginia. Wade Worthen reports on Odonata of two South Carolina state parks, and Mary Steele and Jerrell Daigle report on interesting odes from western Tennessee.

Mark O’Brien found a *Hagenius* (Dragonhunter) larva with Zebra Mussels firmly attached. And Fred Sibley

showed me an exuvia of *Epithecus princeps* (Prince Baskettail) with these mussels. Have we a new menace lurking in our streams and lakes?

John Matthews reviews the migration of *Anax junius* (Green Darner)—which many of you are probably witnessing right now. This remains one of the most interesting behaviors of North American dragonflies and the complete picture is still unfolding for us.

The most startling Odonata story for decades was the recent revelation by Adolfo Cordero that the Azores populations of the *Ischnura bastata* (Citrine Forktail) are parthenogenetic. This raises questions about the reproductive strategies of other species on oceanic islands, which I comment on here.

Fred SaintOurs describes a sad ecologic disaster in a stream/pond habitat on Massachusetts. When will our “leaders” realize that you can’t battle ecological problems by simply dumping chemicals on them?

Andy Rehn and David Furth provide answers (but not all of them) to a fascinating human tragedy that several of us have known about for years—the mystery of Perry Turner and a substantial assemblage of “borrowed” type specimens of dragonflies from national museums of several countries. Most of the specimens have been recovered and returned,

but the complete story is still not known—at least to us.

There are two new English names for Odonates—both recent discoveries in South Texas. This is the place that has given us many new species for North America in the past few years, and it will be *the* odonate hot spot for some years to come.

Jessica Ware recently gave birth to a charming daughter—which many of us met at Arnprior. She is named “Aeshna”, which will confound the authorities for years to come but bring a smile to those “in the know”.

Ken Tennessen contributes a poem on the fate of a population of *Enallagma aspersum* (Azure Bluet). Can’t people stop introducing fish into every pond?

We review three books here. I have seen two and I thoroughly recommend them. The Evolution book (Grimaldi and Engel) is one of the very finest insect books I have seen in decades. My thrill in seeing it for the first time was even greater than when I opened the newly published “Insects of Australia” in 1972. Run, do not walk . . .

Robert Larsen gives us another word for Dragonfly, this time in Navajo. Can you say “Tani-l’ai”. I didn’t think so.



Nancy Adams (1958–2005)

Oliver Flint, Curator Emeritus, National Museum of Natural History (with an interpolated paragraph by Nancy Adams)

On Sat, August 20, Nancy Adams succumbed to cancer (lymphoma). She had been undergoing chemotherapy since early in the year, and we were all optimistic that she would recover. Sadly, this was not to be; it turned out that her cancer did not respond to treatment. The end came quickly and suddenly.

Nancy was born in Pensacola, Florida on 21 April 1958. She attended Covenant College, Lookout Mountain College, Georgia, graduating with a BA degree in biology in 1981. She was a teacher/naturalist at the Chatanooga Nature Center and the first teacher/naturalist at Landmark Park in Dothan, Alabama. Nancy enjoyed serving her God on short-term




mission trips to other cultures and as an active member of Reston Presbyterian Church. Other joys included canoeing, collecting insects, especially dragonflies, birding and playing cards. In 1983, Nancy started her career in the Entomology Department at the Smithsonian Institution, National Museum of Natural History. During her years there, she enjoyed collecting trips to Canada, Peru, Trinidad, and Tobago.

Nancy had worked with me since October of 1984 and by her hard work had risen to become a “Supervisory Museum Specialist”. Whenever a request for material or a gift of specimens came in, she was responsible for the getting out or putting away the lot.

Everything here is accompanied with lots of paperwork for which she was most adept. She loved to get out in the field, and thereby met many of our members. The work that gave her most pleasure was handling specimens: getting them all properly labeled, sending them out for identification, getting them back with names (especially when some were new to the collection), arranging everything neatly, and then capturing the data. She wanted to see everything in perfect condition where chaos had reigned before. In addition to the Odonata, she was responsible for the Plecoptera, Ephemeroptera, Trichoptera, Neuroptera, Mecoptera, and scarab beetles. Her work on the flea and

louse collections led to two, large, coauthored publications detailing the primary types housed here. She was so handy with the computer that I have never learned how to do anything with them!

Typical of Nancy's lifestyle, she wrote her own obituary, leaving blanks for the appropriate dates. She leaves a tremendous vacancy in the department and is deeply missed by all. 


In Grateful Appreciation

Carl Cook

My Dear Friends,

My long association with DSA has in many ways been addictive, perhaps more accurately intoxicating! If my memory is accurate three or four of the present Executive Council were present at the SIO meeting seventeen years ago when someone suggested we should organize a "national dragonfly collectors society" and before the evening was over DSA had been born, and for some strange reason I had been selected as the person to get that brand new organization off the ground and running. It was a great experience that I will always remember fondly, but

I never dreamed in those early days that DSA had such a magnanimous future and would so quickly become one of the world's eminent scientific societies.

It was an honor to have some small part in the early organization of our Society, and I am humbly grateful for the Society's remembrance. 

Welcome to Kentucky in June 2006

Carl Cook and Ellis Laudermilk

We are delighted the Cave City–Mammoth Cave National Park area of Kentucky has been selected as the site for DSA's 2006 Annual Meeting, 9–11 June. For those who attended DSA's Southeast Regional Meeting in 2004, the location and facilities are already well known. For strangers the brief overview presented here should be helpful, and a more detailed venue will appear in an early 2006 issue of ARGIA.

Cave City is a small leisurely, rural town in central Kentucky, the closest metropolitan area from Mammoth Cave National Park, and business activity there is largely related to catering for persons visiting that attraction. Consequently motels are plentiful, including most major names, but even so advance registration is a good precaution during the summer. Get information on Cave City's attractions, lodging and dining from the internet: <<http://cavecity.com>> and then clicking the desired category. We


expect to negotiate a special lodging discount with one of the local motels, at last years Southeast Meeting the participating motel was Quality Courts, who provided entirely satisfactory service.

By auto Cave City is approximately 90 miles from either Louisville, Kentucky or Nashville, Tennessee, via Interstate 65, also these two cities are the best air terminals for anyone flying.

The preliminary meetings schedule is: suggested arrival afternoon or evening of 8 June; Business session: morning of 9 June; presentation of papers: afternoon of 9 June. We are considering where to hold these sessions: (1) Kentucky Cave Association's Hamilton Valley Research Center, (2) Mammoth Cave Nat. Park's Maple Springs Research Station (no cost, but concerns about seating capacity of either), (3) Cave City Convention Center (best option

if we can subsidize cost). 10–11 June will be devoted to field activities: guided visits to Little Barren River, Green River, Big Brush and Lynn Camp Creeks, Hundred Acre and Sloans Crossing Ponds, among others. Also “The Bug Works” (Carl’s residence at Center, Kentucky) will be open to visitors.

A post-meeting collecting foray will follow 12–15 June for anyone desiring to participate. Details are not firm

at this point and we are open to suggestions. A possible scenario is two separate trips: (1) guided by Ellis to some of his favorite eastern Kentucky collecting locations. (2) Guided by Carl to some of Tennessee Highland Rim’s superb streams—Daddy’s Creek, Clear Fork, Fall Creek, Little Swan Creek (take notice Nick Donnelly!) [The editor has noticed and is drooling at the thought.] 

2006 Southeastern DSA Meeting


George L. Harp

Several of you have requested that the 2006 Southeastern DSA meeting be held in the Arkansas Ouachitas. Since I couldn’t think of any way to avoid this request graciously, Phoebe and I shall organize the meet. It is scheduled for 19–21 May. Headquarters will be at the Riverwood Inn (1-800-829-4666; 363 Highway 70 E, Glenwood, AR 71943). They have a meeting room that, I believe, we can utilize during the evenings. Current rates for two people are \$66.90/night (\$64.11 for AARP). I have reserved eight rooms, non-smoking, each with double queen beds, for the nights of 18–20 May. These are all 2nd floor rooms, as the ground floor rooms are already reserved. I strongly recommend making your reservations early, as there is a family reunion scheduled annually at this motel and at this time of year. A second,

decent, motel is Ouachita Mountain Inn, 189 Highway 70 E, Glenwood, ph. 1-870-356-3737.

I shall inform the Ouachita National Forest that we will be collecting then. I shall try to get some more maps of this forest, but if you already have one, please bring it. Also, if you have a reprint of the “Dragonflies of the Ouachita National Forest” paper published by Phoebe and myself in 2003, bring it along as well, as it lists detailed collecting sites for all the species we reported.

Several good things will be flying that weekend, including the endemic species *Gomphus oklabomensis* (here’s another chance, Roy!), *Gomphus ozarkensis*, *Ophiogomphus westfalli*, and *Cordulegaster talaria*. There are also at least four known sites in Montgomery County for *Anax longipes*, *Celithemis verna*, and *Libellula flavida*. *Neurocordulia xanthosoma* and *N. virginensis* will be flying by then, and there is some chance of seeing *N. yamaskanensis*, since John Abbott has collected this species in Stone County (north-central Arkansas).

If you are interested in attending this meeting, please make your reservations early, and also, for planning purposes, please contact me (e-mail: <glharp@astate.edu>). 


Northeast DSA Meeting, 2006

We do not yet have a firm invitation for the Northeast meeting next year. We have received strong indications that the meeting will be held in northern New Hampshire in late June. This is a spectacular area, and I am looking forward to it. Keep your eye on this space for further developments!

Springtime in Tallahassee, Florida, 2006

Jerrell J. Daigle <jdaigle@nettally.com>

A mini-springtime meeting will be held in Tallahassee, Florida from 27 March–1 April. Our base of operations will be the Sleep Inn (1-800-753-3746), but there are other inexpensive motels nearby on Capital Circle NW. We are planning on several local collecting trips to locate new populations of *Cordulegaster sayi*, *Gomphaeschna antilope*, *Epithea spinosa*, *Didymops floridensis*, and

Enallagma coecum cardenium. In addition, we hope to find *Ophiogomphus* sp. along the Apalachicola bluffs plus any other species of odonates, orchids, birds, pitcher plants, etc., attendees would like to see. For more information, please contact me by e-mail or by phone, 850-878-8787, and let me know if you are interested in attending. 

Yahoo Yazoo!

Steve & Mary Jane Krotzer


Twenty-six enthusiastic participants gathered in Yazoo City, Mississippi over Memorial Day weekend for the now traditional southeastern DSA meeting. The nine-county area adjacent to Yazoo City is the most undercollected part of Mississippi, and the primary focus of the meeting was to try to add as many new county records as possible in this area. The group that eagerly accepted this challenge was represented not only by “locals” from Mississippi and its neighbors—Alabama, Tennessee, Louisiana and Arkansas—but also by folks from as far away as Georgia, Florida, West Virginia, Iowa, Texas, Connecticut, and Washington.

After some initial scouting and collecting on Thursday afternoon, and a nice catfish dinner that evening, the early arrivals began adding new county records in earnest on Friday. After a long, hot day of chasing *Arigomphus* and *Nasiaeschna*, among other species, everyone was more than ready for the big group dinner at El Palenque (another cerveza, por favor!!) All those who had arrived by Friday evening were also treated to a couple of presentations at the hotel: a summary of the Mississippi project by Steve and Mary Jane Krotzer, and a fascinating overview of the world fauna by Dennis Paulson, which he had given about a week earlier at the Dragonfly Days festival in Texas. Thanks, Dennis, for giving it again for us! George and Phoebe Harp graciously volunteered to host next year’s southeastern meeting in Arkansas—we’re looking forward to it already.

Saturday was sunny and hot, allowing for another full day of field activity which concluded with, for Omar Bocanegra and Jake Lewis, an unusual dusk flight of *Anax junius* and *Epiaeschna heros* over one of the Mississippi Delta’s rivers. Many more county records were added, and it was noted that *Telebasis byersi*, previously known

from only one locality in Mississippi, was actually quite “weedy” in this part of the state! In addition, a small group headed east to look for some of the gomphids that occur in that part of Mississippi, such as *G. modestus*, *G. dilatatus*, and *G. vastus* (without success, unfortunately). The hotel lobby was a popular gathering spot Saturday evening, as accounts of the day’s activities were discussed.

By Sunday morning the weather had changed, and rain and thunderstorms were in the forecast all day. The group largely broke up then, but a small, dedicated (or crazy?) handful headed out for one last attempt to tack on a few more records. We did succeed to a surprising extent, and we found out that *Anax junius* and *Pantala hymenaea* will fly in pretty darn heavy rain!! A special thanks to Steve and Marcia Hummel, Scott Peyton, and Sam Riffel for being willing to get totally soaked with us just to get an *Ischnura posita* or *Pachydiplax longipennis* for the county record!!

All in all, the meeting was a resounding success. We collected 48 species and documented a total of 138 new county records. Some of the more unusual or uncommon species encountered included *Lestes inaequalis*, *L. rectangularis*, *Telebasis byersi*, *Coryphaeschna ingens*, *Arigomphus maxwelli*, and *Cordulegaster obliqua*. Of the nine counties mentioned earlier, the group was able to meet the target of documenting at least ten species for eight of them, and we got many more than ten species in most of those. Again, a heartfelt “thank you” to all who participated; because of your help, we were able to accomplish in one weekend what would have taken Mary Jane and I pretty much an entire season, at least. 

Bigger is Better at Northeast DSA Meeting

Bryan Pfeiffer <Bryan@WingsEnvironmental.com>

On the trail to a quarry pond in central Pennsylvania, a small group of odonatists bumped into Tom Young, who was running away from the pond toward his vehicle.

“We’ve got *longipes* at the pond,” said Young, a New Hampshire odonatist, not breaking stride.

“So where are you going?” someone yelled.

“To get rid of this white T-shirt!” said Young as he vanished down the trail.

This wouldn’t be the first time a dragonfly dictated an odonatist’s fashion statement. And it paid off for Young, who returned less brightly clad and promptly landed a male *Anax longipes* (Comet Darner) without even wetting his feet. Minutes later, Young’s friend Cliff Bernzweig,

employing different technique, crouching chest-deep in the pond, got one too.

And so it went at the 2005 Northeast Regional gathering of the Dragonfly Society of the Americas, held in and around State College, Pennsylvania, from 9–12 June. Large dragonflies were among the many highlights, including *Tachopteryx thoreyi* (Gray Petaltail), *Aeshna mutata* (Spatterdock Darner), *Epiaeschna heros* (Swamp Darner), *Cordulegaster obliqua* (Arrow Spiketail), *Libellula vibrans* (Great Blue Skimmer) as well as some equally impressive yet smaller species, such as *Gomphus rogersi* (Sable Clubtail) and *Enallagma cyathigerum* (Northern Bluet).

State College is the home town of Clark Shiffer and the old stomping grounds of Hal White, who organized the meeting (<http://www.udel.edu/chem/white/TAP.html>). It was also the home base for George and Alice Beatty, whose Odonata legacy remains in the collection at Penn State University's Frost Entomological Museum. (Contact Jill Crompt at jmc544@psu.edu for details and access.)

It was the Beattys, during a stop at a local frozen custard stand 40 years ago, who “discovered” a lanky, 15-year-old Hal White chasing moths at the lights and steered him away from Lepidoptera toward a more enlightened entomological path. Needless to say, the region is rich in odonatological history and diversity.

The meeting drew participants from 12 states and one province—as far as Iowa, North Carolina, Tennessee and Toronto, about 45 people in total. They reflected the new diversity and demographics of the DSA: luminaries such as White, Shiffer, Nick Donnelly, and Michael May; the usual hodgepodge of birders-turned-dragonflyers; and even Richard Aaron, from Toronto, who admitted during introductions that he was a mycologist who somehow turned to dragonflies (which drew a round of applause from the group).

Some carried nets, others only cameras. Yet all managed to get along during field exploits, although a cordial and healthy (and expected) discussion on collecting versus photographing ensued on-line after the meeting adjourned. The abundance of cameras generated some rich images of the event and its fauna—on display at the gathering's web site.

Heat, haze, and humidity greeted odonatists each morning, with temperatures reaching 90 degrees Fahrenheit in short order every day. Some dodged a few powerful thunderstorms. But none of it would keep this group from its appointed rounds. Not even the “Dragonfly Therapeutic Massage & Day Spa”—an establishment directly across

the street from the hotel (I am not making this up—see our group photo at the gathering's web site or on the cover of ARGIA).

One highlight was Ten Acre Pond in Scotia—a semi-permanent pond about four miles west of State College. With no natural inlets or outlets, the pond's water level rises and falls in response to weather cycles. Once or twice during its history, it has dried completely. And during periods of high water, local folks have even stocked the pond with fish. These varying events have conspired to produce a varied Odonata list from the pond—85 species over the decades of its well-documented study.

The general sense from the local experts was that the ode fauna was a bit behind schedule for early June. Nevertheless, the blue-eyed beauty, *Aeshna mutata*, was abundant at the pond during the meeting and a big hit with our group. *Lestes* species were only just beginning to fly. Southern DSA members were treated to the likes of *Gomphus borealis* (Beaverpond Clubtail), *Leucorrhinia frigida* (Frosted Whiteface), *L. hudsonica* (Hudsonian Whiteface) and *L. intacta* (Dot-tailed Whiteface) and an abundance of *Enallagma cyathigerum*. Meanwhile, satisfying the northerners, were *Libellula vibrans* and *Tramea carolina* (Carolina Saddlebags), among others.

Beyond Ten Acre Pond were other choice sites, from peatlands to powerline cuts. A delightful fen at a place called Beaver Dam produced the likes of *Amphiagrion saucium* (Eastern Red Damsel) and *Nehalennia gracilis* (Sphagnum Sprite), yet also some pleasant surprises such as *Libellula auripennis* (Golden-winged Skimmer). It was also a *Cordulegaster* factory—with impressive numbers of *C. maculata* (Twin-spotted Spiketail) and *C. diastatops* (Delta-spotted Spiketail) flying along the fen channel. Not far away, at McAlevys Fort Shale Mound, other odonatists were enjoying *C. obliqua* (Arrow Spiketail) to complete the trio, not to mention several cooperative *Tachopteryx thoreyi*. Elsewhere, at Black Moshannon State Park, for example, the impressive list of 46 species included six *Enallagma* species, eight Gomphid species, the three *Cordulegaster* species, three *Leucorrhinia* species, and two *Tramea* species.


A complete list from various sites, as an Adobe Acrobat Reader file (PDF), is available at <http://www.udel.edu/chem/white/NE-DSA-List.pdf>.

The Northeast odonatists did spend a few hours indoors. Hal White offered an entertaining evening slide presentations about the Beattys and their super-collecting exploits in Mexico and elsewhere. Not incidentally, Hal organizes one heck of a regional DSA meeting; his hard work, before

and after the gathering, made this a memorable event.

Our group discussed revising and reinvigorating the “migration project”—with Mike May expressing interest in reestablishing the web site, but also recognizing that someone else will have to step forward to oversee data collection and management. Our evening concluded with a private screening of Randy Emmitt’s ode and lep screen saver program, which, of course, turned into a group quiz. Clark Shiffer blew us all away. So quick on the call was Clark that if the game show Jeopardy ever had an

“Odonata special” Clark would emerge as our Ken Jennings, the all-time champ.

One other highlight after a long, hot field day was a picnic barbecue—hot dogs, burgers, potato salad, cake, abundant conversation, some specimen identification and swapping, and one serious cloudburst. But after the rain stopped, and Larry Roche showed up during dessert with a male *Enallagma divagans* (Turquoise Bluet), an intrepid few pick up their nets, donned their wet boots and went out for a post-picnic trip to the pond. 

North to Arnprior—The DSA 2005 Annual Meeting

Roy Beckemeyer

When I went through customs in Ottawa on Friday the 8th of July, the lady at the desk asked why I was visiting Canada. I was surprised to hear, when I told her “I’m here for a dragonfly meeting”, that I was the second person of the morning who had told her that; I suspect she heard the same excuse many more times that day. Furthermore, she commented that there had been an item on a morning TV show about dragonflies. These all sounded to me like harbingers of a successful DSA meeting!

I waited for half an hour for Jerrell Daigle’s airplane to arrive. Then we drove north to Arnprior. Airlines don’t feed their passengers these days, so Jerrell and I asked at the Quality Inn in Arnprior about restaurants for lunch. When we walked into the diner that had been recommended, who should be sitting there but Mike May! There’s no better way to enjoy a meal than chatting with old friends about dragonflies, and the afternoon went by quickly. Back at the motel, more and more folks showed up, and the dragonfly discussions became more and more varied.

The lawn between the motel and the Madawaska River soon filled up with groups of people talking dragonfly talk and catching up on the year’s events. By that evening, our Ontario hosts, Paul Catling, Brenda Kostiuk, and Colin Jones, were able to welcome folks from all over the USA and Canada, of all levels of odonate experience, from beginners to the people who “wrote the books”.

The very close proximity of the Madawaska River allowed a number of participants to take advantage of the huge lights that attracted thousands of mayflies, some caddisflies, and an occasional *Neurocordulia yamaskanensis* (Stygian Shadowdragon) between 9 and 10 PM. Some of the local fishermen were amazed that we were looking for dragonflies at night, but several of the kids who were fishing had noticed dragonflies around after dark.

Saturday was devoted to our annual business meeting and to talks on dragonflies. This worked out great, as the weather for most of the day was a bit cloudy. We heard welcomes to Canada from Paul and to Arnprior from City Councilor Ken DeLuca, who also told us of the community’s commitment to preserve its natural history treasures in the form of numerous local parks and nature trails.

After a brief business meeting and the passing out of the buttons by Jerrell (this year’s featured odonate was the local specialty *Stylurus notatus*, Elusive Clubtail), the day’s presentations began. Paul Catling (coauthor Raymond Hutchinson) covered “Dragonflies of Canada and the Canadian National Collection”. Along with many other facts, Paul mentioned that young whooping cranes, common loons (one was found with a gullet filled with *Somatochlora cingulata*, Lake Emerald, larvae), and sturgeon were all predators on dragonflies, and he reminded us that odonates eat not only midges and mosquitoes, but also insects that are pests of rice.

Colin Jones reviewed “Conservation of Ontario’s Rare Dragonflies”. Marilyn Anions told us about “The Nature-serve Canada Network of Conservation Data Centres”, setting the stage for our visit to Ontario. Now that our appetites were keen, Paul and Colin next told us about the plans for field trips for Sunday and Monday.

In the afternoon, we heard a nice variety of papers on all sorts of aspects of odonatology. Jason Bried talked about his graduate research, “An Overview of Community and Conservation Ecology Studies of Odonata in Mississippi Wetlands”. Jessica Ware, one of Mike May’s students, passed on what she had accomplished to date on understanding dragonfly wing vein patterns: “Wing Venation Patterns: Due to Flight Behaviour or Familial Relationships?” Chris Beatty (coauthor T.N. Sherratt)

presented some food for thought: “Conspicuous Coloration in Males of the Damselfly *Nehalennia irene* [Sedge Sprite] (Zygoptera: Coenagrionidae): Do Males Signal Their Unprofitability to Other Males?” A. Rashad (coauthors C.D. Beatty, M.R. Forbes, and T.N. Sherratt) looked into how dragonflies respond to prey species that mimic Hymenoptera in “Mimicry Through Dragonfly Eyes.” And in the last paper, John Abbott dazzled us with pictures of “Dragonflies and Damselflies of Trinidad” and let us see what the, till now unknown, male of *Phyllogomphoides cornutifrons* looks like.

David Bree talked about records of *Ischnura hastata* and *Progomphus obscurus* (Common Sanddragon) in Ontario in two short talks, “Ebb and Flow of the Citrine Forktail”, and “Isolated Sanddragons.” Bev Wigney shared her simply fabulous photos of dragonflies and damselflies and explained her non-traditional but very successful digital photographic techniques. What depth of field! What wonderful colors! What great subjects!

Finally, Michael Blust requested that attendees pass on to him any odonate records they might have for Vermont in his review of the “Dragonfly Survey in Vermont.” Then Colin Jones gave a demonstration of the Ontario Odonata Atlas web site and John Abbott talked briefly about the OdonataCentral web site, both of them reminding us that we are living in the information age.

The Toronto Entomologists’ Association, the wonderful society that has made Edmund Walker’s valuable books on the dragonflies and damselflies of Canada and Alaska and his monographs on the genera *Aeshna* and *Somatochlora* available in lovely reprint editions, had publications available for sale at a table manned by Alan Hanks, treasurer of the TEA.

After dinner Saturday evening, we were treated to a talk on the “Natural History of the Algonquin Region” by naturalist Michael Runtz, a dynamic and informative naturalist who knows his dragonflies (and birds, bugs, mammals, flowers, trees, and everything else in nature, it would seem). After the talk, Michael joined the rest of the assemblage at the banks of the Madawaska to watch for *Neurocordulia*.

The meeting and field trips were attended not only by DSA members and Odonata specialists, but by many members of the Toronto Entomologists’ Association and other naturalists from the area, which greatly enhanced the total field experience, allowing us to give names to many plants and animals we might not otherwise have come to know. Hopefully the visitors learned something about dragonflies from us as well.


The Donnelly Effect has apparently become inoperative for DSA meetings, and Sunday and Monday were bright, sunny, and warm — perfect dragonfly party weather. And the dragonflies were partying, indeed. Steve Hummel and I carpooled with the group under Paul Catling’s leadership on Sunday, staying in the general vicinity of Arnprior for the day. We began at a sand pit, where 25 or more species were eventually found, including four *Lestes* species, and visitors, like *Dromogomphus spinosus* (Black-shouldered Spinyleg), from the nearby Ottawa River. From there we wended our way to the Ottawa River, where we were allowed to collect and photograph on private property bounding the river near a ferry crossing. Here a number of clubtails led us on merry chases, and many *Macromia illinoensis* (Illinois River Cruiser), looking much darker than their southern cousins from Kansas, were patrolling. Lunchtime found a group of us wolfing down cheeseburgers in the little town of Pakenham, along the Mississippi River. Here a few folks were lucky enough to catch *Gomphus quadricolor* (Rapids Clubtail) and other goodies. On our way to the White Lake Fen, we stopped at a small stream and were treated to *Cordulegaster obliqua* (Arrowhead Spiketail), a relative rarity in these parts, and the more common *C. diastatops* (Delta-spotted Spiketail). The fen was a delight, worth every drop of sweat it took to traverse the boggy, muddy trail in, and we were treated to nice views of a mature larva of an unnamed species of moth (a *Hemileuca*) that is apparently endemic to fens in the area. Evening found us with specimens to process and tales to tell about dragonflies caught and dragonflies missed.

On Sunday, Ontario continued to swelter with record temperatures, and the DSA folks continued to revel in perfect odonate weather. The day started with a group photo, then a quick trip north out of Arnprior to Beachburg ponds, where dozens of *Celithemis elisa* (Calico Pennant) were ovipositing in tandem. Here also were *Dorocordulia libera* (Racket-tailed Emerald) flying about at shoulder height and occasionally perching for portraits. We traveled on to the Petawawa River, a simply beautiful stream purported to be the home of *Ophiogomphus anomalus* (Extra-striped Snaketail) and *Neurocordulia michaeli* (Broad-tailed Shadowdragon). Through the day we caught and/or photographed many dragonflies here, including both *Ophiogomphus anomalus* and *O. rupinsulensis* (Rusty Snaketail), *Gomphus adelphus* (Moustached Clubtail), *Boyeria grafiana* (Ocellated Darner), *Epithea princeps* (Prince Baskettail), *Hagenius brevistylus* (Dragonhunter), and *Dromogomphus spinosus* (Black-shouldered Spinyleg).

We drove into Algonquin National Park for a brief look at the Barron River, where *Hagenius brevistylus*

(Dragonhunter) and *Libellula incesta* (Slaty Skimmer) shared the river with lots of canoes full of kids. But we returned to the Petawawa River to make sure we were there for the evening *Neurocordulia* (Shadowdragon) flight. There was a phenomenal flight of *Ophiogomphus rupinsulensis* as the evening progressed. When we waded out into the river (about 8:00 PM), these guys (they were almost exclusively males) would come along and perch on our nets, hands, shirts and heads. Others would fly up and the perched ones would chase them away. There seemed to be Rusty Snaketails flying everywhere, usually a foot or so above the water. Occasionally, a Black-shouldered Spinyleg male would be seen—they flew around with their abdomens in the air and hovered a lot. We also saw a *Hagenius brevistylus* speed by once in a while. At about 9:00 PM, as the sun set, the *Neurocordulia michaeli* began to fly. At first there were only a few, and since the Snaketails were still flying, they provided a distraction. Eventually the Shadowdragons were nearly the only odonates flying. We were lucky to be in a location where we were looking into a background of well lit smooth water, where the dragonflies showed up quite well, but not until they were quite close. It took a while, and I was getting frustrated hearing John Abbott and other “youngsters” say that they were catching Shadowdragons regularly, but finally I got the hang of it, and started catching my share. After taking a half dozen

or so females, I finally got a male, then started catching and releasing to try for more males. Most of the flying *Neurocordulias* seemed to be female *N. michaeli*. Near the end of the half hour or so of the flight, I saw a male sweep in and grab a female right in front of me. I took a swing and caught the pair—they were *N. yamaskanensis*! With so many *N. michaeli* flying around, one wonders how the male *N. yamaskanensis* found the right female!

Catching two species of *Neurocordulia* while standing thigh deep in a beautiful wild river along with friends who also appreciate these incredible and little-known insects was a perfect way to finish off the collecting portion of a very special DSA meeting. Another long night of specimen preparation and field note completion was followed the next morning by saying goodbye to dragonfly friends, some going on to the post-trip meetings, others heading home by various routes. Another DSA meeting—my 10th—another chance to meet interesting people and to see more species of those greatest of insects—the Odonata! See you next year! 

Observations on Local Field Trips Collecting in the Arnprior Area; Annual Meeting of the Dragonfly Society of the Americas, 2005

P.M. Catling, B. Kostiuk, C. Lewis and B. Bracken <catlingp@agr.gc.ca>; <hagenius@primus.ca>

Local field trips took place on 10 and 11 July with different groups visiting the same locations on the two consecutive days. Seven locations were visited with ½ to 1-½ hours at each site. The furthest site was 22 km from Arnprior. The weather on both days was hot and sunny with temperatures reaching 35°C. A participant from Austin, Texas, commented that he did not “think that it got that hot up here . . . and another 10 degrees and it would be just like Texas.” Nevertheless the groups remained generally energetic and good natured and the river and stream locations provided welcomed relief for those who were able to get their feet (or more than their feet) wet. Landowners Liza Badham (site 2), Neil Stewart (site 5), Dale Dean (site 1) and John Trudeau (site 7) kindly provided permission and assistance. On the first day there were 17 cars and 35 people and on the second day there were 10 cars and 25 people. The groups were diverse and included DSA members, local photographers, federal and provincial government biologists, and members of the Ottawa Field-Naturalists Club and the McNamara Field Naturalists from Arnprior. It

was a major educational experience for many. Much information was shared and people were very pleased to have an opportunity to meet some of the well known scientific experts including Nick Donnelly (editor of the DSA newsletter), Sid Dunkle (author of “Dragonflies Through Binoculars”), and Michael May (coauthor of the two basic textbooks on North American dragonflies).

The outing began in a recently excavated sand quarry with fishless ponds (6 km ESE of Arnprior, Ottawa–Carleton, 45.4154°N, 76.2810°W). The substrate was sandy with limited aquatic vegetation and the site provided a special breeding habitat for hundreds of recently emerged Saffron-winged Meadowhawks (*Sympetrum costiferum*). Also characteristic of this habitat in the region was the uncommon and local Amber-winged Spreadwing (*Lestes eurinus*). Several people obtained good photos of this species. Equally local and characteristic, the Azure Bluet (*Enallagma aspersum*) was seen and a few were captured. Many pairs of the very attractive Calico Pennant

(*Celithemis elisa*) were ovipositing in shallow areas of the pool. Another local damsel, largely confined to recent pit ponds in the region, the Northern Bluet (*Enallagma cyathigerum*) was present. Nick Donnelly was particularly interested in collecting specimens for further study of this species and he enthusiastically solicited donations from others. A few Wandering Gliders (*Pantala flavescens*) were seen here but nowhere else. These migrants use the sandy pit ponds to produce a generation that moves south in the fall. This site was rich and productive with 25 species recorded over the two visits.

Large rivers are another special habitat for certain species of dragonflies and the Ottawa river near the Quyon ferry (Ottawa–Carleton, 45.5109°N, 76.2212°W) provides a good example. This is one of the few stretches of water in the province where the Cobra Clubtail (*Gomphus vastus*) and Elusive Clubtail (*Stylurus notatus*) occur. Hundreds of shed skins of *S. notatus* were found along the shore and two emergences were observed. Many Cobra Clubtails were seen and photographed. A few Midland Clubtails (*Gomphus fraternus*) were present and the riverine Powdered Dancers (*Argia moesta*) were common. Twenty-three species were recorded. Of additional interest at the river was the Eastern Tailed Blue Butterfly (*Cupido (Everes) comyntas*) a tiny and rare species that may have only recently become established as a permanent resident in the district (see Trail & Landscape 37(3): 101, 2003.) It was netted by Chris Michener. Other butterfly species of interest to participants included our Pearl Crescent (*Phycioides tharos*), Northern Broken Dash (*Wallengrenia egeremet*), and Delaware Skipper (*Atrytone logan* seen at site 4).

Both groups had lunch on the Mississippi River at Pak-eham (Lanark, 45.3445°N, 75.0115°W). The highlight here was the rare Rapids Clubtail (*Gomphus quadricolor*) which came in to land on rocks along the shore beside the rapids with the well known five-span stone bridge in the background. Twenty-three species were recorded here, among them the very attractive Rainbow Bluet (*Enallagma antennatum*). An impressively large Snapping Turtle (*Chelydra serpentina*) was also captured and released at this site.

A small stream, little more than an inch deep and two feet wide (3.5 km E of Waba, Lanark, 45.3481°N, 76.4144°W) produced larvae of Twin-spotted Spiketail (*Cordulegaster maculata*) and it was hoped that an adult of this denizen of shady woodland streams would appear. The group positioned itself tightly along the road facing the forest and Oliver Flint from the Smithsonian waited by the trickling stream. Suddenly a spiketail dashed out of the shadows. Oliver netted it and the group had a close up look at a

rare Arrowhead Spiketail (*Cordulegaster obliqua*). Next a Delta-spotted Spiketail (*Cordulegaster diastatops*) landed on a fence beside the stream and many photographs were taken. It was a surprise to see three different species of these large, green-eyed and boldly yellow-marked dragonflies at the same place and the Arrowhead was a new county record. A damselfly associated with small seepages and springs, the Aurora Damsel (*Chromagrion conditum*) was also found here and abundant Ebony Jewelwings (*Calopteryx maculata*) with black wings and metallic emerald bodies made the place seem tropical. A total of ten species were recorded at this brief stop. The second group had a little more time and stopped at another similar stream nearby. Jewelwings were abundant here as well and very photogenic. A few Dragonhunters (*Hagenius brevistylus*) were also seen and their large size and build, suiting them well to a diet of other dragonflies, captured the interest of the group.

The stony, fast-flowing Waba River (Waba River at Waba, Renfrew, 45.3484°N, 76.4591°W) was cool and semi-shaded and a nice place to be on two very hot afternoons. Two gomphids of fast-moving rocky streams were the highlight and both perched on rocks with abdomens held vertically providing numerous opportunities for photographs. The Least Clubtail (*Stylogomphus albigaster*), about the same size as the numerous Powdered Dancers (*Argia moesta*), and also with a white-tipped abdomen, could be distinguished by its more rapid and agile flight. Rusty Snaketails (*Ophiogomphus rupinulensis*) appeared from the trees every so often and then were gone again, as is characteristic of their behaviour. However, on 10 July one posed on a mid-stream rock long enough to allow many close-up photographs.

An old sand pit with some shallow drying pools (S side of Three Mile Bay, White Lake, Lanark, 45.2525°N, 76.4807°W) was the next stop. Here White-faced Meadowhawks (*Sympetrum obtrusum*) had recently emerged from pools with six inches of water and the shallow pools were also apparently home to four species of spreadwings. However, this clearing in extensive Canadian Shield mixed forest was actually mostly of interest due to the high diversity of species that had emerged elsewhere and wandered in. In particular there were several Halloween Pennants (*Celithemis eponina*) perching on twigs here at the northern limit of their range. Late-flying American Emeralds (*Cordulia shurtleffii*), Hudsonian Whitefaces (*Leucorrhinia hudsonica*), and Chalk-fronted Corporals (*Ladona julia*) were present. Jerrell Daigle discovered two Emeralds, Williamson's (*Somatoclora williamsoni*) and Brush-tipped (*S. walshii*) flying in the shadows along the woods road. This site proved to be the most diverse with 28 species on the first day, 28 on the second and a total of

30 for the first two days. Also of local interest here was the Sweetflag Spreadwing (*Lestes forcipatus*).


The final stop was White Lake Fen (Renfrew, 45.3371°N, 76.4983°W), where the group photographed the large black larvae of the very rare Bog-Bean Buckmoth (*Hemileuca* sp.), one of the late-flying giant silk moths that feeds exclusively on bog bean (*Menyanthes trifoliata*). Rose Pogonia Orchids (*Pogonia ophiglossoides*) were also photographed. Among the dragonflies at this site were a late Common Baskettail (*Epithea cynosura*) and more Halloween Pennants and Williamson's Emeralds. The fen produced nine species of dragonflies.

On the second day some of the group led by Peter Burke and Carl Rothfels went to the nearby (5 km S) but more extensive Hayes Bay Fen (Lanark, 45.3371°N, 76.4983°W) where they added Elfin Skimmer (*Nannothemis bella*) to the regional field trip list. Finally most of the group participated in viewing and catching the dusk-flying Stygian Shadowdragons (*Neurocordulia yamaskanensis*) on the Madawaska River right outside the Quality Inn in Arnprior. Ten species were recorded by another group on a visit to "Gillies Grove," an old growth pine stand beside the Ottawa River in the town of Arnprior, but none of these were additional.

The consecutive visits on two days of similar weather allowed a comparison of numbers following collecting and disturbance. The most popular species at the quarry for collecting was *Lestes eurinus* and eight of 13 seen

were collected, but 30 were seen on the second day. The most popular species to collect on the Ottawa River was *Gomphus vastus* which was much more common on the second day when 20 were encountered. On the Wabigoon River *Stylogomphus albistylus* was just as common on the second day as on the first despite the fact that several were collected. There is thus evidence that dragonfly populations are not as disturbed as we might imagine by monitoring and collecting activities. There are obviously many more dragonflies present than were seen and many were not caught despite a large crowd with nets.

Each day the groups met in the evening to tally the records and discuss significant observations. The final master list for the local field trips included 68 species and most people saw at least 55 of them. The number of species that could be easily seen in this area at this time of year is probably 80, but considering that the observations were casual with much time devoted to photography and discussion, and that the weather was hot, the total observed is impressive. The ten species of Gomphids was particularly notable and this group included many of the major highlights as noted above.

It was obvious that the participants enjoyed the local field trips and many visitors from the US to our small corner of northeastern North America were impressed with the Ottawa valley landscape and fauna. 

Post-Conference Field Trip—DSA 2005

P.M. Catling and B. Kostiuk <catlingp@agr.gc.ca>

It was about 9:00 AM on 12 July that about 20 people headed for the far north with the expectation of seeing northern dragonflies and some that we had not seen already on either the local or upper valley field trips. Among those anticipated were Boreal Snaketail (*Ophiogomphus colubrinus*) and Zigzag Darner (*Aeshna sitchensis*). We first covered a lot of ground, passing familiar stops of the upper valley trips, Beachburg, Westmeath, and the Petawawa. It was very hot and sunny (again). The first stop was Aumond Creek (Nipissing, 46.2770°N, 78.4817°W), one of only two nearby locations in Ontario where Maine Snaketail (*Ophiogomphus mainensis*) is known. At both places it is known only from larvae. Of course we hoped to find an adult but were not successful. We did find many larvae. Darting in and out of the shoreline shadows and over the riffles, Ocellated Darners (*Boyeria grafiana*) were common here.

After a rest in Mattawa for lunch, we continued west toward North Bay stopping at the Amable du Fond river Amable du Fond River (Nipissing, 46.2868°N, 78.9052°W). Here 19 species of Odonata were recorded while wading and swimming. Rusty Snaketails (*Ophiogomphus rupinsulensis*) were flying low over the river and landing on mid-stream rocks. After this stop the group broke up, to meet again in Kirkland Lake. Some found Frosted Whiteface (*Leucorrhinia frigida*) abundant in a bog on Highway 11 while others travelled to Esker Lakes Park (map at <http://crownlanduseatlas.mnr.gov.on.ca/htmls/P1621e.html>) and recorded Ski-tailed Emerald (*Somatochlora elongata*) and Lake Emerald (*Somatochlora cingulata*). In the evening, Canada Darner (*Aeshna canadensis*) and Variable Darner (*Aeshna interrupta*) were abundant around the Comfort Inn in Kirkland Lake.

The next day was also hot and sunny. The first stop was for the boreal Boreal Snaketails (*Ophiogomphus colubrinus*) on the Englehart River (Timiskaming, 47.9954°N, 80.3517°W). They were common, but equally interesting were the Zebra Clubtails (*Stylurus scudderi*) and Ashy Clubtails (*Gomphus lividus*). Next we tried to find access to a good bog with hope of some boreal Emeralds (*Somatochlora* spp.) and Canada Whiteface (*Leucorrhinia patricia*). This did not work well. After one aborted attempt, which led to excavated ponds rather than bog, the group accepted the idea of a hike through the bush (the dense bush) to a bog. This hike turned out to be a challenge (or as some said a “death march”). Half the group turned back at an early stage. The boreal forest was thick and rugged. Although the bog (Timiskaming, 47.9204°N, 80.2946°W) was eventually reached, the pools were not found. Much fatigued, the group returned slowly to the road. It was a first hand experience with the boreal forest and a lasting memory (not exactly to be cherished) for all who participated but spirits remained high (remarkably) as Ken Tennessen joked about shredding his legs (he wore shorts) and Nick Donnelly (apparently accustomed to death marches) never sat down. The death march consumed much time.


Meanwhile back at the road Ocellated Emerald (*Somatochlora minor*) and several darners appeared. Next a roadside stop at a pond near to the Englehart River Bridge produced 13 species, among them Black-tipped Darner (*Aeshna tuberculifera*). A beaver marched down the road to meet the group—a nice Canadian experience.

The next day (also hot and sunny), we decided to go further north, still expecting to find some extensive bogs and fens. Although we did not, it was a better day (without hardship) with more northern species. A stop at a marshy lakeshore north of Iroquois Falls (Cochrane, 48.9112°N, 80.6307°W) produced the first Crimson-ringed Whiteface (*Leucorrhinia glacialis*) that the group had seen and the last Chalk-fronted Corporals (*Ladona julia*) were still flying. Proceeding north on Highway 652 we found at a small roadside wetland (Cochrane, 49.2600°N, 80.6277°W) three distinctly boreal species, Subarctic Bluet (*Coenagrion interrogatum*), the hoped for Zigzag Darner (*Aeshna sitchensis*), and Lake Emerald (*Somatochlora cingulata*). The Little Abitibi River (Cochrane, 49.3420°N, 80.4836°W) and the Floodwood River (Cochrane, 49.4915°N, 80.3122°W) produced records of Dusky Clubtail (*Gomphus spicatus*), Ashy Clubtail (*Gomphus lividus*), Moustached Clubtail (*Gomphus adelphus*), and Williamson’s Emerald (*Somatochlora williamsoni*) on the northern edge of their range. Boreal Snaketails (*Ophiogomphus colubrinus*) were abundant on the Floodwood River and a teneral of the Black Meadowhawk

(*Sympetrum danae*), yet another rather boreal species, was found here as well.

The next day it was time to head home. During a meeting over continental breakfast, the group discussed the events and observations of the past few days. Over the three day period 58 species of Odonata had been seen and a number of interesting habitats had been visited. After an exciting conference lasting six days we had become pals and departing was unhappy—but we all agreed that the experience would be long remembered.

One small group returned directly to Ottawa and the others returned home individually or more slowly. The Ottawa-bound group recorded Aurora Damsel (*Chromagrion conditum*) near Temiskaming and nearby on the Little Jocko River they found Harpoon Clubtail (*Gomphus descriptus*) and a new location for Extra-striped Snaketail (*Ophiogomphus anomalus*) thanks to Jerrell Daigle who found the distinctive exuviae under a bridge. Ken Tennessen saw a Wandering Glider (*Pantala flavescens*) at Iroquois Falls. Oliver Flint stopped at Petawawa on the way home and found both Broad-tailed Shadowdragon (*Neurocordulia michaeli*) and Stygian Shadowdragon (*Neurocordulia yamaskanensis*) still flying at dusk on 16 July. Oliver also reported Calico Pennant (*Celithemis elisa*), Dot-tailed Whiteface (*Leucorrhinia intacta*), and Prince Baskettail (*Epithecina princeps*) from Earl’s Lake (46.3028 N, 78.7540 W) at west end of Mattawa on 15 July. Other species recorded by smaller groups included Spiny Baskettail (*Epithecina spinigera*, near Pautois Creek) and Saffron-winged Meadowhawk (*Sympetrum costiferum*, 17 km N of New Liskeard). Considering these additions mostly on the return journey, the post-conference trip recorded 65 species of Odonates. Many records provided by participants are not indicated here because they were not additions to what was seen by the main group, but they will become part of the Ontario Odonata Database maintained by the Natural Heritage Information Centre.

List of post-conference participants: John Abbott, Daniel Bogar, Paul Catling, Duncan Cuyler, Jerrell Daigle, Cathy Darevic, Ailsa Donnelly, Nick Donnelly, Carol Flint, Oliver Flint, George Harp, Phoebe Harp, Raymond Hutchinson, Brenda Kostiuik, Cheryl Lasely, Greg Lasely, Yvette Liautaud, Ken Tennessen. 

2004–2005 DSA Financial Report

Jerrell Daigle, 2067 Little River Lane, Tallahassee, FL 32311

At the request of Nick Donnelly, I have prepared a short summary of the ARGIA and BAO financial account from July 2004 to date. Dues for both journals were combined together in one savings account at the SunTrust Bank in Tallahassee, Florida.

We began the 2005 year with a balance forward of \$6,072.78. Our current account is \$11,322.23. Our projected year-end balance is about \$3,000. Our major expenses of \$9,044.82 were for ARGIA 16(4), 17(1–2), plus BAO 8(4), 9(1–2).

Other costs were for business meeting expenses in Iowa (\$100.00), Ottawa buttons (\$137.06), and our 2005 Corporation fee of \$61.25. In addition, membership dues were raised to the current levels. Also, all future membership dues should be mailed directly to me at the above address. This report was presented at the July DSA meeting in Arnprior, Ontario, Canada and a few copies were distributed to the media. A final annual report will be presented in ARGIA later.



DSA Business Meeting Minutes, 2005

Sid Dunkle, Secretary

The annual meeting of the DSA for 2005 was held at the Quality Inn in Arnprior, Ontario, on 9 July 2005, ably organized and hosted by Paul Catling, Colin Jones, and Brenda Kostiuk. The meeting began at 8:45 AM with introductions by Paul Catling and by Ken DeLuca, Councillor of Arnprior. Mr. DeLuca mentioned that Arnprior has been able to support ecotourism by preserving an old growth grove of forest and establishing three hiking trails. Jerrell Daigle briefly introduced President Roy Beckemeyer, who welcomed all on behalf of the DSA. Jerrell also handed out his now traditional meeting button, this time depicting the Elusive Clubtail (*Stylurus notatus*), while each of the more than 60 attendees introduced themselves by stating their name and their home town. John Abbott described the numerous features of the DSA web site, OdonataCentral.com. Steve Valley requests photos of people and activities taken at previous DSA meetings for archiving on his web site. Treasurer Jerrell Daigle presented the financial report (separate article below). He stated that the society is in good financial health, with a current bank balance of \$US 11,322.23. Dues should be mailed to him at 2067 Little River Lane, Tallahassee, FL 32311.


The 2006 annual meeting is to be held in Cave City, Kentucky, during the second weekend in June, hosted by Carl Cook and Ellis Lauder milk. The 2007 annual meeting is projected for Springerville, Arizona, hosted by Jerrell Daigle. A new slate of society officers was voted in by the members present. Steve Krotzer replaced outgoing President Roy Beckemeyer, while John Abbott is President-Elect. Steve Valley replaced retiring Secretary Sid Dunkle, while Jim Johnson replaced Steve Valley as Regular Member. Jim is also Associate Editor of DSA publications. Paul Catling became an Regular Member for a two year term.

Nick Donnelly gave a report on the northeast sectional meeting, and is looking for a site for next year's northeast meeting. Jerrell Daigle reported on the southeast sectional meeting, and stated that the 2006 meeting will be hosted by George Harp in Arkansas in May. Representatives of the Toronto Entomologists' Association offered several useful publications for sale, and Alan Hanks presented a short history of the association. Ken Tennessen announced the publication of a new book, Damselflies of the North Woods, by Bob Dubois, available by calling 1-800-678-7006. We were sorrowed to hear that Nancy Adams of the Smithsonian Institution is battling leukemia.

Late morning and afternoon presentations included the following, presented by the authors indicated: 1) Dragonflies of Canada and the Canadian National Collection by Paul Catling, 2) Conservation of Ontario's rare dragonflies by Colin Jones, 3) The NatureServe Canada network of conservation data centres by Marilyn Anions, 4) An overview of community and conservation ecology studies of Odonata in Mississippi wetlands by Jason Bried, with additional poster, 5) Wing venation patterns: Due to flight behaviour or familial relationship? by Jessica Ware, 6) Conspicuous colouration in males of the Sedge Sprite *Nehalennia irene*: Do males signal their unprofitability to other males? by Chris Beatty, 7) Mimicry through dragonfly eyes by Arash Rashed, and 7) Dragonflies and damselflies of Trinidad by John Abbott.

Other discussions included 1) The Vermont Dragonfly Survey by Michael Blust, with poster, 2) Close-range Digital Photography by Bev Wigney (many of Bev's amazing photos decorated the walls of the meeting room), 3) The Citrine Forktail (*Ischnura hastata*) in Prince Edward

County, and The Common Sanddragon (*Progomphus obscurus*) in Ontario by David Bree, 4) Dragonfly photography and larval collecting techniques by Benoit Menard, and 5) A demonstration of the Ontario Dragonfly Atlas by Colin Jones. The meeting and presentations concluded

at 5:15 PM. After dinner, we enjoyed a presentation on the Natural history of the Algonquin region by naturalist and TV host Michael Runtz. 

Report of First Field Foray of the Newly Formed Dragonfly Society of Missouri, 10–12 June 2005

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Members of the newly formed Dragonfly Society of Missouri met 10–12 June 2005 to collect at selected sites in northern Missouri. Despite heavy rain at the beginning of the weekend and scattered showers on Sunday (reminiscent of the DSA meeting last year in Decorah, Iowa!), the group was able to log in some significant collecting time. In addition to the author, others in attendance were Tim Vogt, Jane Walker, Joe Smentowski, and host George Shinn. Although the turnout was smaller than expected due to scheduling conflicts, some exciting records were recorded during the weekend foray. Highlights included the discovery of a new population of *Nehalennia irene* at Chloe-Lowry Marsh in Mercer County, multiple individuals of *Lestes unguiculatus* at a private marsh in Adair County, an amazing range extension in Missouri for *Libellula semifasciata* in Putnam County, the collection of a tandem pair of *Gomphus externus* in Putnam County, and collections of four *Macromia illinoensis* from Rebel's Cove Conservation Area, also in Putnam County. According to Donnelly (2004a), the collection of *Libellula semifasciata* would constitute the northwestern most record of this species in North America.


The observations of two rare species of damselflies in Missouri during the foray were so significant that they warrant separate attention. On 12 June, Tim Vogt and I visited Goose Pond, a large freshwater marsh in Clark County. Despite nearly keeling over from heat stroke due to the heat and high humidity, we observed a large population of *Nehalennia irene* (originally discovered by Linden Trail) with at least a few hundred individuals seen (both male and female) in marsh vegetation where there was input from the springs/hillside seeps. We also observed what is possibly one of the largest population of *Amphiagrion saucium* in the interior U.S. (also originally discovered by Linden) with probably 75+ individuals (a few females also observed) concentrated mostly in one area of the marsh. This is undoubtedly the largest breeding population of these two species of damselflies in Missouri. The report of *Amphiagrion* is particularly significant because

it involves the intermediate forms between *A. saucium* and *A. abbreviatum* (Donnelly 2004b; in litt. T.W. Donnelly 13 June 2005). Goose Pond is also the only known site in Missouri for *Argia alberta* but we were unsuccessful in finding any additional individuals because we were probably too early.

Tim and I decided to end the weekend by making a mad dash to Finger Lakes State Park in northern Boone County in hopes of finding me my first *Dythemis velox* that I still have not observed in the field. Although we did not find any *Dythemis* as the sun was setting, we found numerous *Gomphus militaris*, a few *Gomphus graslinellus*, and Tim finally caught a female (in tandem with a male) *Epicordulia princeps* that he needed for his dragonfly book project. Numbers of other common species such as *Celithemis elisa*, *Erythemis simplicicollis*, and *Libellula luctuosa* at this park were staggering!

In conclusion, the first DSM foray was an overwhelming success—everyone enjoyed the camaraderie and the hospitality of the Shinn family was fantastic.

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The Fourth Hine's Emerald Dragonfly Workshop, St. Ignace, Michigan, or Show Me Your Hiney!

Mark O'Brien

Hine's Emerald dragonfly (HED in governmental parlance), *Somatochlora hineana* Williamson, is the only North American dragonfly currently on the Federal Endangered Species List. Over the past six years, efforts by the U.S. Fish and Wildlife (USFWS) to develop recovery plans and survey methods for this species have really helped to discover many new populations of this interesting emerald. Although Wayne Steffins found several populations in Michigan in 1999, it has taken some time for federal and state agencies to give the Michigan populations the attention they deserve. I attended the 2000 HED workshop in Door County, Wisconsin, and that event certainly opened my eyes to what has been found on the biology of this interesting, and perhaps not so rare species as first supposed. In the years since, HED work has produced a number of new populations in Missouri, extending the range of this species far outside the influence of the Great lakes region.

This year's workshop, held 13–14 July, marked a first for Michigan, and especially the Upper Peninsula. Never have so many people looking for dragonflies been in the Upper Peninsula! The workshop, held at the U.S. Forest Service office west of St. Ignace, was a resounding success. Finally, people came to Michigan, where many of us believe we have the most extensive populations of *Somatochlora hineana*. The workshop intended to achieve several aims: first of all, to acquaint field personnel in the state and federal agencies with dragonflies and how to identify possible HEDs. Second, to look at HED habitat so that people will discover potential new HED habitats. Third, to observe HED in its habitat and acquaint people with its interesting biology. Fourth, to look at HED larvae and possibly see them pumped from crayfish burrows. Lastly, we hoped that we would also discover some new locations of Hine's.

Four Michigan Odonata Survey members attended the workshop—Margi Chriscinske, Carl Freeman, Stephen Ross, and of course, myself. I was there to present overviews of the Odonata in Michigan and an overview of larval taxonomy. The four of us stayed at the Andrea Andreas cabin, which Margi reserved for us from the Little Traverse Conservancy. This rustic cabin, located about five miles east of Indian River, sits right next to the Pigeon River. Our evenings there were pleasant, with the water's sounds putting us to sleep at night. We commuted each day up to St. Ignace—crossing the Mackinac Bridge

twice a day starts to add up at \$2.50 per crossing. I hope the locals that use the tokens get some kind of break.

Day one began hot and sunny—and perhaps it was not so bad that we spent a good part of it in the air-conditioned USFS building. Paul McKenzie started out by introducing the purpose of the workshop, and I spent about an hour or so on the general biology of the Odonata and an overview of the Michigan fauna. It was obvious that there were many neophytes to Odonata in the audience, but certainly not to surveys. I had some pretty good questions to answer, and I think many of the attendees were amazed at the variety of Michigan's fauna.

Tim Vogt then presented an overview of identifying emeralds, and the natural history of Hine's emerald. Tim Cashatt's excellent chart showing the key identifying features of the various species is really valuable.

After lunch, Dan Soluk presented a fascinating account of the larval biology and behavior, especially with the HED/crayfish burrow research. This is a fascinating association that is still being worked out by Dan and his students.

Paul McKenzie's account of *hineana* in Missouri was very interesting—their populations are found in small seepage fens in the Ozarks, and are much smaller in scope than our Michigan populations. Missouri effort is using various mapping overlays for vegetation, wetlands inventories, and aerial photographic maps to assess potential HED sites. Paul showed how the National Wetland Inventory can be used as a tool for identifying potential habitats in Missouri. It was not expressed at the meeting, but it makes sense to me that the Ozarks could have been the Pleistocene refugium of *hineana*.

I followed with my short presentation on the taxonomy and biology of Odonata larvae. This was largely based on the web pages done by Ethan Bright, and Bob Glotzhober acknowledged that they are perhaps the best available larval key on the web and in print. I had revised the web pages dealing with *Somatochlora* just prior to the workshop, so having updated information was very much appreciated.

Tim Vogt followed with a demonstration on *Somatochlora hineana* larval characters. Tim's infectious enthusiasm for his subject was welcomed by us all. There were numerous microscopes set up so that the attendees could try

and identify HED adults and larvae, as well as compare them with other species of *Somatochlora*. This was pretty useful, because even though someone can talk and show slides, having the hands-on experience is where the learning begins.

After we broke up for the afternoon, we agreed to all meet in St. Ignace for dinner at the Mackinac Grille. In between, the four intrepid MOS people went over to the lakeshore and did some collecting before dinner. There are small temporary ponds near the lake, and we managed to catch some interesting odes in a just a few minutes. The hot and dry conditions didn't dampen our enthusiasm for a little net waving, and served to make that beer taste even better during dinner.

After dinner, we still had some daylight left, so the four of us drove over to the Pointe aux Chenes area and did some collecting in the very dry sedge marsh. It was beautiful, and I think we only caught a *Somatochlora walshii* and *S. williamsoni* for our efforts.

Day 2 was our field day, where we hoped to see some hineys in their habitat. That's always a worry with events like this—what if the weather doesn't cooperate, or we can't find them? We need not have worried. We split into two groups—each going to different sites. My group arrived at the Summersby Swamp site about 8:30 AM. We had not traveled 75 yards from the cars when we spotted a perched female HED. As we poked around the edges of what looks like a cedar swamp, a male HED came by and perched. Amazingly, he stayed for many minutes and several of us were able to shoot a bunch of film and digital images of him at rest. Most of the group then traveled further into the cedar swamp while Carl and I photographed the perched male. Then Carl followed the group, and then I attempted to do likewise a bit later. Ever try to follow a group through a cedar swamp? I could no longer hear the voices, and I was getting a little testy with the skeeters, so I just went back the way I came in (almost). Carl evidently had the same idea, and we both emerged a few yards from each other! We were standing there talking, and a mated pair of Hine's simply flew past us and perched in a cedar about eight feet off the ground! By this time, Carl was out of film, so I took some shots with my Nikon. The slides actually look pretty decent. We also watched a male doing his little territorial flights, and I managed to get a few decent shots of him in flight. Finally, the group returned, and we split up once again—one group went to the Auckland Road fen and my group went to the site on Castle Rock Road. That site, seemingly quite different from Summersby Swamp, had lots of HED flying around. Sedges were waist-high and hummocky, and if you flattened down an area, a male would fly in and check it out


as a potential oviposition site. This looked like quite a productive site—rather dry from the drought, but the emeralds were feeding and certainly very abundant there.

Hine's emeralds generally taper off in activity towards noon when it is hot, so we headed out for lunch. In our case, the four of us headed out towards Pointe aux Chenes again, to eat lunch and sample along the aux Chenes River. Margi went in with waders and net, while the three dry-landers went along the sedge marsh near the river and along the banks of the aux Chenes River, which was quite slow moving. We caught a few odes and then met back at the Forest Service HQ, where we then assembled and drove back to Summersby Swamp so that we could observe Dan Soluk's crew attempt to extract larvae by pumping out a crayfish burrow. Once we located the first crayfish burrow, we realized that the place was nearly honeycombed with them! While we were looking around, Margi found some exuviae of *S. hineana*! That really impressed me, as well as the HED honchos. Also at the site were lots of *Amphiagrion saucium* and *Nannothemis bella*—which turn out to be a new county record. Meanwhile, Dan's crew set up the pump, and did find several larvae in the first burrow they pumped out, along with some very upset crayfish, *Cambarus diogenes*. The burrow pumping demo, a success, we all parted ways and that concluded the actual HED Workshop.

I think that this workshop showcased the partnerships involved in working on this species. The U.S. Fish and Wildlife Service, U.S. Forest Service, Michigan DNR, various universities and state museums all contributed to this workshop. Participants from federal and state agencies as well as nature conservancies attended. The nearly 40 participants ranged from seasoned Odonata veterans to absolute beginners. I think everyone came away with a better understanding of the Hine's Emerald in Michigan and the potential for further survey efforts. It was also gratifying meeting many of the people whose names I see regularly in e-mails. Paul McKenzie, Tim Vogt, and Dan Soluk deserve many thanks for the long trips they had to take to get to the UP. David Cuthrell, Carrie Tansey, Steve Sjogren, Christe DeLora, Tim Cashatt, and others deserve thanks for getting the workshop organized and hosted in St. Ignace. The Forest Service personnel were very helpful and the building was perfect for our group. Paul McKenzie's enthusiasm and experience was a welcome change from what I have experienced from many USFWS people over the years.

The story doesn't end here—after the workshop, the MOS van headed westward, and we did more collecting in some other areas of Mackinac Co., and the following day Steve, Carl, and I visited Hine's habitat in Presque Isle

and Alpena Counties. We found more HEDs in Presque Isle Co., at Thompson's Harbor State Park. This is a large coastal fen, with the potential for harboring some decent populations of this species. The situation in Alpena Co. is somewhat distressing, since a lot of the potential habitat there is on private property, some of it adjacent to the Huron Portland Cement Quarry in Alpena. We did not

see any Hine's in our search, but it was very hot and mid-afternoon, and the emeralds were all hanging in the shade somewhere. I think this is one area that needs some state and federal involvement with land owners to do proper surveys and use the HED as a rallying point for environmental concerns, much like was done in Door Co., Wisconsin. 

Observations of Hine's Emerald Dragonfly (*Somatochlora hineana*) in Missouri Between 1999 and 2004

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Introduction—Hine's emerald dragonfly (*Somatochlora hineana*) was federally listed as an endangered species by the U.S. Fish and Wildlife Service (USFWS) in 1995 under the Endangered Species Act (ESA) of 1973 (USFWS 1995). This species was given protection under the ESA because of its narrow ecological requirements (especially of the larvae) and vulnerability to habitat degradation and destruction (USFWS 1995, 2001). It is included in lists of Odonata determined to be a risk in North America (Bick 1983, Bick 2003, Dunkle 2004). The species is listed as critically imperiled in Missouri (Trial 2002, Missouri Natural Heritage Program 2005). Extant populations of *S. hineana* are known from Illinois, Michigan, Missouri, and Wisconsin (Cashatt & Vogt 2001, USFWS 2001, Landwer & Vogt 2002, Vogt 2005).

Most of the known *S. hineana* reproductive sites have some notable unifying features. These include shallow, organic soils (typically muck) overlying dolomitic bedrock; calcareous water from intermittent seeps; and shallow, small channels and/or sheetflow. These seepage wetlands often dry out for a few weeks in the summer, but otherwise have thermal regimes that are relatively moderate (cooler in summer and warmer in winter) in contrast to nearby sites without groundwater influence (Vogt & Cashatt 1994; Cashatt & Vogt 2001).

Historically, this species has been reported from Alabama, Indiana, and Ohio (Vogt & Cashatt 1994, Cashatt & Vogt 2001, USFWS 2001). Systematic surveys in Ohio have failed to rediscover this species there (Moody 1994, Glotzhober *et al.* 2000). To date, there have been no systematic surveys conducted in Indiana or Alabama. Thus, extant populations may no longer exist in these three states.

The initial discovery of this species in Missouri was made by Linden Trial in 1999 at Grasshopper Hollow Natural

Area, Reynolds County (USFWS 2001). Extensive searches for this species were conducted between 2001 and 2004 in Missouri and consisted of a combination of adult and larval surveys (Vogt 2001, 2003a, 2004, 2005; Belshe 2002; Landwer 2003; Landwer & Vogt 2002, Walker & Smentowski 2002, 2003a, 2003b, 2004). Identification workshops were held in 2002 and 2003 in Sullivan and Rolla, Missouri, respectively, to facilitate survey efforts across the state. In addition to searches for new localities, monitoring of existing sites was conducted in 2002, 2003, and 2004 (Landwer 2003; Vogt 2003a, 2004, 2005; Walker & Smentowski 2002, 2003a, 2003b, 2004). The purpose of this report is to summarize information obtained while conducting surveys for *S. hineana* in Missouri between 2001 and June 2004. It is hoped that these observations will be helpful to odonatologists in other states and Canada who may conduct surveys for this species.

Methods—Initially, potential *S. hineana* sites were identified by searching the Missouri Department of Conservation's Natural Heritage Database (Database) for suitable fens. Potential survey sites were chosen based primarily upon whether or not they were dominated by herbaceous vegetation (vs. woody), ecological and hydrological integrity, and size. The GENDESC (General Description) and EODATA (Element Occurrence Data) data fields generally were the most instructive. Additional sites were suggested by knowledgeable individuals, frequently field biologists in government agencies. Surveys consisted of searches for adults, larvae, and to a limited extent, exuviae.

Plant and Odonata associates, habitat quality, size, and nature of disturbances or threats were recorded for each site. At sites where *S. hineana* was documented, information on the species' numbers, behavior (e.g., on patrol, foraging, ovipositing) and encounters with other species of dragonflies were recorded.

Larval sampling was limited to sites with crayfish burrows. This sampling was conducted by using a burrow pumping technique developed by Dr. Dan Soluk (University of South Dakota) that employs the use of a manual bilge pump (Soluk *et al.* 2000). Sampled burrows usually were submerged or had surface water in the immediate vicinity. The intake hose was placed in a burrow entrance and pumping was initiated to locate additional entrances. Rinse water, previously strained through a 1 mm mesh sieve, was poured into the alternate burrow opening during pumping. This process was repeated two to three times per burrow. The resultant samples were then rinsed and sorted for *Somatochlora* larvae and other Odonata larvae. All remaining material was returned to the burrow or the surface water near the vicinity. All *Somatochlora* larvae were subsequently reared to facilitate identification. Exuvial molts and specimens which died during rearing were placed in 80% ethanol.

Somatochlora hineana voucher specimens were sent to the Illinois State Museum in Springfield, Illinois, where they were measured. In most instances, a single metathoracic leg was removed and placed in 95% ethanol for future genetics studies. The ultimate depository for these specimens is the Enns Entomology Museum, University of Missouri, Columbia.

Results and Discussion—Due to the low number of *S. hineana* at most Missouri sites, searches for exuviae proved to be unproductive and ineffective. This was despite the fact that the only site discovered in Phelps County at Kaintuck Hollow Fen was based on an exuviae found 7 June 2002 by Tim Vogt *et al.* (Vogt 2003a). Annual monitoring was conducted at selected sites as time and personnel allowed. Additionally, attempts to confirm breeding were made at some sites using burrow pumping where adults had been documented during a previous visit.

Between 2001 and 2004 approximately 93 sites were examined in 23 counties throughout the state. The vast majority of sites searched were within the Ozark Highlands Ecoregion (Nigh & Schroeder 2002), which has the largest concentration of fens in the state. Six additional sites in two additional counties were examined (Belshe 2002) to assess potential habitat for *S. hineana*. These surveys were outside the known flight period for this species in Missouri.

Between 2001 and 2004, 19 new *S. hineana* sites were documented in Missouri: 10 based on adults, 8 based on larvae, and 1 based on exuviae. Many sites were searched multiple years and some localities where *S. hineana* was documented required several visits before the species' presence could be confirmed. Confirmation of breeding

was documented at 16 of the 20 known Missouri sites.

All documented occurrences of *S. hineana* in Missouri were in Ozark Fen natural communities (Nelson 2005) within the Ozark Highlands Ecoregion (Nigh and Schroeder 2002). The north/south and east west distances are 86 and 48 miles, respectively. The total area encompassing all sites is approximately 2400 square miles. The largest number of sites occurs in Reynolds County with nine, followed by Ripley County with five. The greatest distance between one site and its nearest neighbor is ca. 28 miles and the shortest distance between adjacent sites is ca. 0.6 mi. Five sites in Reynolds County and four sites in Ripley County occur within a distance of less than 5 miles. All sites but one (Centerville Slough) are fens (0.1–10 acres). Fens are seepage wetlands with minerotrophic vegetation. Centerville Slough is a shallow, spring fed marsh in an abandoned oxbow. Most sites shared the following characteristics: shallow (< 1 m) organic soils (muck) overlying dolomite; surface water depth < 10 cm (sheet flow, rivulets, and/or seepage pools); primarily graminoid ground cover; and an abundance of crawfish burrows.

The most common shrubs on fen margins included *Alnus serrulata*, *Salix* spp., and *Cornus obliqua*. Graminoids (grasses and sedges) frequently recorded included *Carex hystericina*, *C. interior*, *C. leptalea*, *C. lurida*, *C. stricta*, *C. suberecta*, *C. tetanica*, *C. vulpinoidea*, *Fuirena simplex*, *Glyceria striata*, *Juncus dudleyi*, *J. subcaudatus*, and *Scirpus atrovirens*. Common forbs (dicots and other monocots) typically included *Aster puniceus*, *Cicuta maculata*, *Eupatorium perfoliatum*, *Lysimachia quadriflora*, *Lythrum alatum*, *Oxypolis rigidior*, *Packera aurea*, *Pedicularis lanceolata*, *Pycnanthemum virginianum*, and *Rudbeckia fulgida*. Vogt (2002, 2003b) listed some of these plants as potential indicator species for Illinois, New York, West Virginia, and Wisconsin. These included: *Carex hystericina*, *C. stricta*, *A. puniceus*, and *Lysimachia quadriflora*. These four species, in addition to *Rumex orbiculatus*, also may be useful for Indiana, Ohio, and southern Michigan.

Other Odonate species often occurring with *S. hineana* at many sites include *Argia bipunctulata*, *A. plana*, *Chromagrion conditum*, *Hagenius brevistylus*, *Libellula cyanea*, *L. flavida*, *Somatochlora tenebrosa*, and *Tachopteryx thoreyi*.

To date, the known peak activity of adults is approximately 10 June through 10 July with the earliest observation on 4 June and the latest of 26 July (Landwer 2003). In Missouri, *S. hineana* is generally on the wing by 9:00–9:15 AM and is most active until around 12:00–1:00 PM (Vogt 2001, 2003a, 2004, 2005; Landwer & Vogt 2002, Walker & Smentowski 2002, 2003, 2004). Thus far, observation

times range from 7:24 AM to 3:45 PM (Landwer 2003). These observations are consistent with those for north-eastern Illinois (Mierzwa *et al.* 1995; Cashatt & Vogt 1996; Soluk *et al.* 1996; Vogt & Cashatt 1996, 1999).

Somatoclora hineana abundance at Missouri sites is generally much less than for those of Illinois, Michigan, and Wisconsin. On good days during the peak of the adult flight season, 2–5 individuals may be observed, with occasionally 8–10 at the best sites. To date at some sites, only one adult has been observed. Adults were not observed at six sites where larvae were documented and at the sole site where one exuvia was the basis for confirmation. This was despite the fact that surveys were conducted at these sites during the peak flight season, peak flight times, and during seemingly perfect weather conditions.

The failure to observe adult *S. hineana* at some sites may be a reflection of the presence of *Hagenius brevistylus* and *T. thoreyi* which may be predators on *S. hineana*. On 4 July 2005, McKenzie and Vogt observed a *H. brevistylus* eating a *Somatoclora* sp. at a site where both *S. hineana* and *S. tenebrosa* reproductive behavior have been documented (Vogt 2005). Additionally, we observed a *T. thoreyi* chase a male *S. hineana* that attempted to patrol or feed over the same fen. Because both *T. thoreyi* and *H. brevistylus* are present at many Missouri *S. hineana* sites, potential predation could influence the species' behavior. Patrolling male *S. hineana* may make only temporary visits to small sites that are relatively close together. Similarly, ovipositing females may only visit some fen habitat long enough to search for appropriate habitat to lay eggs. Adult male and female *S. hineana* may make only short visits to these sights due to fear from larger Anisopterans such as *Hagenius* or *Tachopteryx*. Although we currently do not have solid data to support these suppositions, it would provide an explanation of why adult *S. hineana* are not observed at smaller sites where *S. hineana* larvae have been documented. An alternative explanation for the lack of observations of adults at smaller sites is that *S. hineana* is so rare at some localities that they are missed by random chance. Further research in this area is needed.

The lack of observations of adults at some sites and the need to repeat surveys at seemingly suitable sites for multiple years before the species is confirmed highlights the importance of not giving up if *S. hineana* is not found during the first year of survey efforts. It is our opinion that larval sampling may actually be a more effective and productive technique to document the presence of *S. hineana* at targeted sites. One major advantage of conducting larval surveys is that there may be 9 months available (but see shortcomings below) vs. the 1–2 month maximum in some areas during the flight period for adults.

Larval sampling is not without its shortcomings for the following reasons: 1) fen habitat may be too dry for burrow pumping, especially if conducted during the summer months, 2) success requires 2–3 people to carry equipment, sort samples, etc., 3) processing water is necessary to locate larvae submerged in the collected substrate; such water may be lacking at many potential sites or require transportation for a considerable distance to the processing sites, 4) experience is necessary to pick burrows that have a higher likelihood of success, 5) it may be impossible to separate some instars, especially involving females, of closely related species, 6) Missouri *S. hineana* larvae are not as hairy as those in Illinois, Michigan, or Wisconsin, and 7) femora of Missouri *S. hineana* larvae can be striped unlike those in Illinois, Michigan, and Wisconsin.

The collection of early instars could be particularly problematic where it is sympatric with *S. tenebrosa* and/or *S. minor*. Early instars that were collected, but not able to be positively identified to species were reared in captivity in hopes that they could be subsequently identified as larvae or emerged adults. Several problems were associated with the rearing of larvae in captivity: 1) seven larvae reared to final instars without positive identification failed to emerge, 2) temperature and photoperiod may be crucial in breaking diapause, 3) it can be difficult to find a reliable source of food for larvae, 4) food for larvae can be expensive, especially if larvae must be fed for an extended duration, 5) many *S. hineana* researchers are not equipped to set up controlled environments in a laboratory setting for larval rearing, and 6) currently only a handful of experts are trained to consistently separate *S. hineana* larvae from its closely related congeners.

At some Missouri sites, adult feeding, male patrolling, and female oviposition by *S. tenebrosa* has been observed at the same sites where *S. hineana* has been documented. Additionally, larvae of *S. tenebrosa* have been pumped from crawfish burrows. Although we have yet to document larvae of both species from the same burrow, we believe that it is only a matter of time before such co-habitation is documented. Some larval instars of *S. hineana* can be extremely difficult to separate from similar instars of *S. tenebrosa* and the occurrence of the species in the same habitats only exasperates the problem. The same problem is possible in Michigan and Wisconsin involving *S. hineana* and *S. minor*. Consequently, a combination of characters should be used to distinguish *S. hineana* larvae from *S. tenebrosa* in Missouri and from *S. minor* in Michigan and Wisconsin.


Miscellaneous Observations and Needs for Additional Studies—*Somatoclora hineana* sites in Missouri are threatened by illegal all terrain vehicles (ATVs), feral

hogs, beaver dams, road construction, and possibly habitat fragmentation. The use of Fish and Wildlife Service National Wetland Inventory (NWI) maps has enabled Missouri Odonatologists to identify potential new fen habitat that was previously unknown. Although it will be necessary to ground truth sites identified on NWIs, many *S. hineana* enthusiasts in Missouri are convinced that additional sites are yet to be identified in Missouri utilizing this technique. Extant sites should continue to be monitored and there are many aspects of the life history requirements, movements, and interaction with other associated Odonates, particularly potential predators that should be examined. The impacts of wild hogs, beaver dams, and illegal ATV use on delicate fen habitat, need to be assessed. Genetic studies on extant populations would be helpful in understanding the species' movements and be useful in establishing management recommendations, or protocols associated with potential augmentations with future propagation efforts. We recommend that ongoing survey efforts in the state be continued.

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***Celithemis verna* in New York**

Ginger Brown


In June 2005, while conducting surveys of coastal plain damselflies on Long Island for the New York Natural Heritage Program's Dragonfly and Damselfly Survey

(funded by the NY Department of Environmental Conservation through USFWS State Wildlife Grant funds), I collected a teneral male *Celithemis verna* (Double-

ringed Pennant) in the town of Brookhaven. Tim Green and Saneddy Quezada, from Brookhaven National Lab, assisted with this discovery. It is, to my knowledge, the first record of this southern species for New York, and the first record north of New Jersey. In mid-July, I returned to Long Island and, with the assistance of Skip Blanchard and Charlie Brown, again encountered *C. verna*. At that time, the species was collected at two additional ponds (Riverhead and Southampton) and observed at a third (Southampton).

It appears to be well established on Long Island, and with further survey, will likely be found at additional ponds in the area. In all cases, *C. verna* was found at classic coastal plain ponds with sand bottom and varying amounts of muck. Both vegetation and odonate fauna are typical of coastal plain ponds in the northeast. These ponds have abundant emergent graminoid vegetation either along the shore or throughout the pond, and three of the four ponds have floating vegetation (primarily Fragrant Water Lily and/or Spatterdock) interspersed with emergent rushes and sedges.

Celithemis verna was flying with other related species, in some cases a full count of Pennants: *C. elisa*, *C. eponina*, *C. fasciata*, and *C. martha*. *C. verna* is most similar to *C. martha*, and is difficult to differentiate from this species in flight. However, the much reduced hind wing markings of *C. verna* are distinctive. Other coastal plain odonate species found at Long Island's *C. verna* ponds include *Enallagma pictum*, *Enallagma recurvatum*, *Anax longipes*, and *Libellula auripennis*.

The discovery of *Celithemis verna* on Long Island raises the question of whether it occurs further north and east at coastal plain ponds in glaciated areas of southern New England. The most likely location is coastal southeastern Massachusetts, including Barnstable and Plymouth Counties where habitat is abundant. Folks working in these areas should look carefully at any small black pennants resembling *Celithemis martha*. In Rhode Island, coastal plain ponds are limited in occurrence, but we will be on the lookout for *C. verna* at appropriate sites. 

New Zygoptera State Records for Missouri: *Telebasis byersi* and *Telebasis salva*

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Telebasis byersi Westfall 1957, ranges from Delaware (Donnelly 2004, Lam 2004), south to Florida and west to Illinois and Texas (Westfall & May 1996, Donnelly 2004). On 1 September 2004, the first author observed this species in a baldcypress (*Taxodium distichum*) swamp at Big Oak Tree State Park, Mississippi County, Missouri. Three males were perching on duckweed (Lemnaceae) floating on water in the swamp. No females were observed at the time. Two male specimens were collected and subsequently deposited at the University of Missouri Enns Entomology Museum, Columbia. Although previously unreported from Missouri, its presence in Lake County, Tennessee (Harp 2000), and Union County, Illinois (Vogt & McPherson 1985, 1986), suggested its possible presence. The Tennessee and Illinois localities are ca. 20 miles and 50 miles from this site, respectively.

Telebasis salva (Hagen 1861) ranges from California east to Kansas (Bick & Bick 1995, Westfall & May 1996, Donnelly 2004), south to Colombia (Bick & Bick 1995) and Venezuela (Bick & Bick 1995, Westfall & May 1996). While examining uncurated Odonata specimens at the Enns Entomology Museum, on 25 February 2005, we discovered a pinned adult male. This specimen was collected by W.R.


Crow in Jasper County on 11 August 1963. No further data were available. Based upon Bick (1991) and Beckemeyer & Huggins (1998), the nearest known sites from Oklahoma (Muskogee County) and Kansas (Sumner County) are ca. 100 miles and 180 miles away, respectively. It is possible that its presence in Missouri is adventitious.

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Northeast Range Extension and Observations of Atypical “Sash” of *Enallagma laterale* (New England Bluet) in Maine

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Geographic Range—*Enallagma laterale* (New England Bluet) is a globally rare damselfly species (G3 or vulnerable—Natureserve 2005a) that has been documented in eastern Pennsylvania, northern New Jersey, southeastern New York, Connecticut, Rhode Island, Massachusetts, southeastern New Hampshire, and 24 sites in southwestern and coastal Maine, the northern extreme of its range (Westfall & May 1996, Donnelly 2004, Abbot 2005, Maine Damselfly and Dragonfly Survey 2005). Previously the northern-most known location for this species was Tilton Pond in Fayette, Maine (Kennebec City: N 44.4563°, W 70.0722°), and the eastern-most site was Pitcher Pond in Lincolnville, Maine (Waldo City: N 44.3361°, W 69.0498°) (Maine Damselfly and Dragonfly Survey 2005).

While surveying odonate assemblages in fish inhabited and fishless ponds in Downeast, Maine on 16 June 2004, a new breeding location for *E. laterale* was discovered at Otter Pond in T24 MD BPP, ME (Washington City: N 44.8244°, W 67.9324°). During 90 min. of adult sampling by two investigators in three separate 5 × 20 m emergent zone transects, 56 males and seven females were encountered, including six pairs in tandem (voucher specimens were verified and subsequently archived with the MDDS collection in Augusta, Maine). The same site was revisited on 20 June 2005, and again *E. laterale* adults were confirmed. This species was not found during similar surveys

of adult Zygoptera conducted during the same time period in 2004 at 14 additional ponds (Hancock and Washington Counties) within 10–45 km of Otter Pond. Located in the Eastern Interior bioregion of Maine (McMahon 1990) approximately 105 km from the nearest known site to the southwest, this population currently represents the extreme northeastern known limit to the distribution of *E. laterale* in North America (Fig 1).

Habitat Description—*E. laterale* habitat preferences have been reported to include acidic, sandy ponds, ponds or sheltered, lake coves with bog-like margins or rich, emergent vegetation zones, and sphagnum bogs (Westfall & May 1996, Nikula *et al.* 2003, Lam 2004). *E. laterale* is frequently associated with several species of floating aquatic plants including *Brasenia schreberi* (Watershield), *Nuphar variegatum* (Yellow Pond Lily), and *Nymphaea odorata* (Fragrant Water Lily) (deMaynadier & Hodgman 1998, Gibbons *et al.* 2002, and Butler & deMaynadier in prep).

Otter Pond is a small pond (4.8 ha) located in the Maine Coastal watershed (01050002; Natureserve 2005b) at an altitude of 90 m. Littoral zone substrate consisted of gravel, sand, silt, and muck, mean pond depth was 1.5 m (July 2004), and pH was 5.7 (July 2004). Aquatic vegetation included a combination of typical emergent, floating, and bog species: *Andromeda glaucophylla* (Bog Rose-



Figure 1. Distribution of *E. laterale* in Maine, including most northeastern site at Otter Pond (Washington Co.) Inset depicts previously known global distribution of this species by county in the northeastern United States.

mary) *Brasenia schreberi*, *Carex interior* (Inland Sedge) *Carex lasiocarpa* (Wire Sedge), *Chamaedaphne calyculata* (Leatherleaf), *Drosera rotundifolia* (Round-leaved Sundew), *Dulichium arundinaceum* (Three-way Sedge), *Kalmia angustifolia* (Sheep Laurel), *Myrica gale* (Sweet Gale), *Nuphar variegatum*, *Nymphaea odorata*, *Scirpus* spp. (sedges), and *Sphagnum* spp. (peat mosses). Fish species known to inhabit the pond include: *Ameiurus nebulosus* (Brown Bullhead), *Semotilus corporalis* (Fallfish), *Notemigonus crysoleucas* (Golden Shiner), *Lepomis gibbosus* (Pumpkinseed Sunfish), and *Catostomus commersoni* (White Sucker) (R. Jordan, Maine Dept. of Inland Fisheries and Wildlife, personal communication).

Located in Maine's Downeast blueberry barrens, the non-agricultural, vegetated margin of this pond was generally limited to within 15–50 m of the water's edge around approximately 80% of the shoreline and consisted of annuals, woody perennials, and small coniferous and deciduous trees. The remainder of the shoreline was bordered by a more extensive (100–300 m), but similar plant assemblage. While there was no development or obvious signs of recreational use, the pond was periodically used as an irrigation source for surrounding commercial blueberry fields within 50–300 m of the site.

Co-occurring Zygoptera Species—Adult Zygoptera species that co-occurred with *E. laterale* at Otter Pond on 16 June 2004 included: *Chromagrion conditum* (Aurora Bluet), *E. boreale* (Boreal Bluet), *E. hageni* (Hagen's Bluet), *E. signatum* (Orange Bluet), *E. vesperum* (Vesper Bluet), *Ischnura verticalis* (Eastern Forktail) and *Lestes vigilax* (Swamp Spreadwing). Species encountered in a follow-up survey on 18 July 2004 included: *Argia fumipennis violacea* (Variable Dancer), *E. ebrium* (Marsh Bluet), *E. hageni*, *E. vesperum*, *I. posita* (Fragile Forktail), *I. verticalis*, *L. d. disjunctus* (Common Spreadwing), *L. vigilax*, *Nehalennia irene* (Sedge Sprite) and *N. gracilis* (Sphagnum Sprite). *E. laterale* was not observed during the July survey.

Morphology and Unusual "Sash"—Both male and female specimens of *E. laterale* at Otter Pond were typical in terms of body length, male terminalia, and color patterns as described by Westfall & May (1996) and depicted in figures by Lam (2004), with one significant exception. Male of this species generally exhibit a "pair of irregular dorsolateral stripes 1/2 to 3/4 length of segment 8" on that segment (Westfall & May 1996). Popularly referred to as a lateral "sash" or "dash" (and the basis for the species scientific name, "*laterale*"), this black stripe is often used in the field as an aid in identification of the species at a distance because of its prominence on an otherwise blue abdominal segment. The sash is generally an irregular, spindle shape that is narrow anteriorly and flairs slightly posteriorly (Fig 2a). However, a surprising number (~75%) of *E. laterale* examined at Otter Pond in 2004 displayed atypical sashes that were: 1) reduced to a thin line in one animal (2%), 2) wedge-shaped and enlarged posteriorly to 1.5–2 times the mid-sash width resulting in a distinct posterior narrowing of the dorsal blue "stripe" on abdominal segment 8 (51%; Fig 2b & 2c), or 3) enlarged posteriorly to the extent that the sashes actually merged dorsally on segment 8 (23%; Fig 2d & 2e).

In a follow-up survey on 20 June 2005, 20 adult *E. laterale* males were located at this site, and 30% displayed atypical sashes. Comparative surveys at two southern Maine breeding sites for this species were also conducted on 20 June 2005 in Cumberland City at Perley Pond (N 43.9005°, W 70.6678°) and a different Otter Pond (N 44.0160°, W 70.6774°). Of the 24 adult *E. laterale* males examined at these sites, only 8% had mildly atypical sashes (similar to Fig 2b). Possible explanations for large number of males displaying atypical sashes at the Washington City site may include the relative genetic isolation of this northeastern population from others in the species range and/or developmental or genetic effects related to the potential impacts of herbicide and/or pesticide runoff from commercial blueberry fields.

Considered a species of Special Concern in Maine, continued survey work is underway to locate additional populations of this northeastern, North American endemic.

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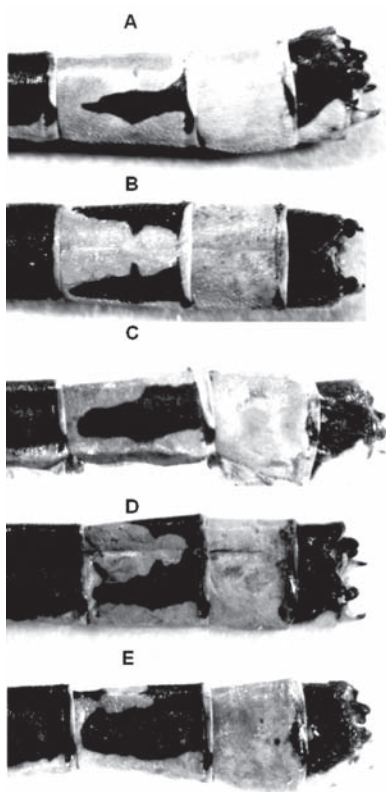


Figure 2. (A-E). Range of variation in *E. laterale* sash expression from typical form (A) to forms that merged dorsally on abdominal segment 8 (D & E). Images recorded from voucher specimens collected at Otter Pond (Washington Cty) on 16 June 2004.

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Anax concolor, a New Species for the United States

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On 5 June 2005 I spent the time from 0900 to 1515 walking around Santa Ana National Wildlife Refuge, Hidalgo County, Texas. The first wetland I visited was Willow Pond 1, a shallow weedy pond surrounded by tall forest that is not far from the entrance. Almost immediately I spotted two male Comet Darner (*Anax longipes*), exciting as I hadn't known that species to occur in the Lower Rio Grande Valley. While watching them, I saw another darner also flying back and forth over the pond, this one slightly smaller and with a dark, pale-spotted abdomen. At first I thought it might be an Amazon Darner (*Anax amazili*), a rare visitor to the region, but in my experience, Amazon Darners do not fly back and forth over ponds during the day in the way most other species of *Anax* do. This individual acted much like the Comet Darners, was shaped exactly like them, and was constantly chased by them, and I then wondered if it might be *Anax concolor*, not known to occur north of the Mexican border. The smaller darner alternated flying through beds of tall *Scirpus* and flying over the open water, and it usually flew at knee height or lower, while the Comets stayed over the open water and flew at waist height. When I returned to the pond at about noon, neither species was present. I was left unsure of the identity of the spotted darner.

Toward the end of my stay at the refuge, I was walking around a small pond between the refuge entrance and the main road, and an aeshnid suddenly hung up in a tree right in front of me and a bit more than two meters above the water. I managed to get a few photos [see back cover—ed.] and then disturbed it trying to get closer. This individual was definitely a male *Anax concolor*, the first documented for the United States, and I decided that it was very likely this species that I had seen earlier. It is possible that they were the same individual. Subsequent visits by John Abbott and Martin Reid failed to turn up any more individuals of *concolor*, and it may be only a vagrant from farther south, stimulated to disperse by the beginning of the rainy season in eastern Mexico. The farthest north previous record of which I am aware is from the San Andres Tuxtla region, Veracruz (González Soriano 1997).

Anax concolor has been considered both a subspecies of *Anax longipes* (Paulson 1966, Needham, Westfall & May 2000) and a distinct species (Geijskes 1968, Peters 1988). I now follow the latter authors in considering it a good species. Earlier literature had confused the situation, reporting *longipes* from all over the range of *concolor* because they were considered conspecific, and, unfortunately, this confusion continues to the present (Meurgey

2004). The two species are very similar structurally, but Geijskes (1968) showed numerous minor differences. One that can be seen readily on specimens concerns the tips of the male cerci, those of *longipes* being more square-ended with the backward-pointing apical spine more distinctly projecting from the squared-off tip, while those of *concolor* are more tapered to the broader-based apical spine. Also, the epiproct is relatively slightly shorter in *concolor*, and the patch of denticles on the dorsal surface of S2 is less extensive in *concolor*. Geijskes listed additional differences in the shape of the penis, the size and shape of the female cerci, the shape of the lateral carinae on the female abdomen, and details of head morphology in the larvae.

The only dramatic difference between the two species is in the male abdominal color, *longipes* entirely red-orange and *concolor* dark reddish-brown with conspicuous blue spots. Females are much more similar, both having obvious pale spots on the abdomen but *longipes* overall much richer red-orange and *concolor* reddish-brown with the pale spots more contrasting. In addition, *concolor* is smaller than *longipes*, with no overlap in size, and *concolor* has an extensive yellowish wash across the middle of the hindwings lacking in *longipes*.

The presence of both species together at Santa Ana also seems to argue against their being conspecific, and it will be interesting to document further the occurrence of both species in far southern Texas.

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Orthemis ferruginea Observed in Virginia

Paul Bedell and Allen Bryan

Orthemis ferruginea (Roseate Skimmer) is common in the deep southeastern United States, but north of Georgia is sporadic in occurrence. Abbott (2005) indicates records for only two counties in South Carolina and eight counties in North Carolina. There is a second-hand sight record for Washington D.C. (Czaplak 1998) and a sight record with photographs from Maryland (Solem & Solem 1999). Both of these records are from mid-July.

Allen Bryan observed and photographed a mature *Orthemis ferruginea* on 19 June 2005 in Henrico County, Virginia. The location was at a small recently constructed storm-water retention pool in a suburban Richmond setting. Water quality appeared very poor; muddy and with an algal bloom. The shore lacked any vegetation and was muddy for about two feet until the sloping sides allowed for a thin layer of mowed introduced grasses. This artificial setting was underscored by the presence of a brood of hybrid mallards of uncertain genealogy. The only other odonates observed were 6–8 *Perithemis tenera* (all males) and a few *Plathemis lydia* (again, only males). But into this bleak environment appeared, improbably, this beautiful large pinkish-red dragonfly!

I observed the *Orthemis* on 25 June. I didn't photograph or net the insect, as I was returning from performing at a wedding and was still wearing my tuxedo! I did have a pair of 8 × 30 close-focus binoculars which I always keep in my car. It appeared to be a mature male, with a purplish-red thorax and pinkish abdomen. I returned again on 29 June, more appropriately dressed and equipped, but it was not present. Others looked for it but the Roseate Skimmer was not seen again. This is the first record for Virginia.

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Odonata Survey of Paris Mountain State Park and Jones Gap State Park, Greenville County, South Carolina

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I surveyed odonates at two state parks in Greenville County, South Carolina, in the summers of 2003 and 2004, with a focus on anisopterans. During 2003, I surveyed Paris Mountain State Park from 3 April until 13 September. This 516 ha park sits on the north face of Paris Mountain (616 m elevation), a monadnock 10 km N of the city of Greenville, South Carolina, and about 25 km south of the Blue Ridge escarpment. Timber was cut throughout the area until the 1930s, but now there are maturing stands of pines, oaks, and hickories. The headwaters of the Reedy River originate on the northwest face of Paris Mountain. This river runs through the center of Greenville and was used (and abused) by Greenville's textile industry. Moun-

tain Creek drains the northeastern face, and runs through the state park east to the Enoree River. Mountain Creek is dammed twice in the park; first to form Mountain Lake (once used as a reservoir for Greenville), and then to form Lake Placid. Both lakes are used for fishing, and Lake Placid (6 ha) is also used for swimming. So there are a variety of lentic and lotic habitats, from lakes to the riffles, runs, and pools of Mountain Creek.

During 2004, I surveyed Jones Gap State Park, Greenville Co., South Carolina, from 8 May until 10 October. Jones Gap State Park lies along the border of South Carolina and North Carolina. Its 1354 ha is part of the 4000 ha

Mountain Bridge Wilderness Area that also includes Caesar's Head State Park. The highest point in the park is Standingstone Mountain at 984 m. The Middle Saluda River, the state's first scenic river, runs through the park. In addition to the pools and riffles of the river, odonates are also attracted by the trout hatchery pond and the fields that surround the Ranger Station.

Most specimens are cataloged and preserved in the Furman University Zoological Collection. (Collections were permitted under S.C. State Parks permit number N-12-02 and N-01-04.) The exceptions are the three specimens of *Epiaeschna heros*, *Hagenius brevistylus*, and *Tachopteryx thoreyi* captured at Paris Mountain State Park. These impressive specimens were placed in a diorama and given to the park for their education center. In addition to adult specimens, there were two species collected as larvae by Ranger Tim Lee at Jones Gap State Park. These were identified and returned to Mr. Lee's collection at the park.

Paris Mountain State Park


Total of 22 species (* = new county record, Abbott 2005). *Argia apicalis*, *A. fumipennis*, *A. moesta**, *A. tibialis*, *Calopteryx maculata*, *Celithemis fasciata*, *Dromogomphus*

spinosus, *Enallagma divagans*, *Epiaeschna heros*, *Epithecica* (*Tetragoneuria*) *cynosura**, *Erythemis simplicicollis*, *Gomphus exilis*, *G. lividus*, *Hagenius brevistylus*, *Ladona deplanata**, *Lestes vigilax*, *Libellula incesta*, *L. luctuosa*, *L. vibrans*, *Perithemis tenera*, *Plathemis lydia*, *Tachopteryx thoreyi*.

Jones Gap State Park

Total of 17 species (+ = larva, * = new county record, Abbott 2005). *Argia fumipennis*, *Boyeria vinosa*+, *Calopteryx maculata*, *Celithemis elisa*, *Cordulegaster maculata*, *Cordulegaster erronea*, *Epithecica* (*Tetragoneuria*) *cynosura**, *Gomphus exilis*, *Hagenius brevistylus*, *Lanthus vernalis**, *Libellula vibrans*, *Pachydiplax longipennis*, *Plathemis lydia*, *Somatochlora tenebrosa*, *Sympetrum vicinum**, *Stylogomphus albistylus*+, *Tachopteryx thoreyi*.

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New Stewart County, Tennessee Records

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We have added some new Stewart County, Tennessee records over the past two years. Jerrell J. Daigle, Jerry Daigle, and I collected all of the following species at the pond and creek on the "Triple J Ranch". The following species were recorded from Stewart County, which now totals 34, almost all of them new county records. They are as follows: *Anax junius*, *Argia apicalis*, *A. fumipennis violacea*, *Arigomphus villosipes*, *Calopteryx maculata*, *Celithemis elisa*, *C. fasciata*, *Dythemis velox*, *Enallagma aspersum*, *E. geminatum*, *E. signatum*, *E. traviatum*, *Epithecica costalis*, *E. cynosura*, *E. princeps*, *Erythemis simplicicollis*, *Gomphus exilis*, *Hagenius brevistylus*, *Ischnura posita*,

I. verticalis, *Ladona deplanata*, *Lestes inaequalis*, *L. incesta*, *L. luctuosa*, *L. pulchella*, *Macromia illinoiensis*, *Pachydiplax longipennis*, *Perithemis tenera*, *Plathemis lydia*, *Somatochlora tenebrosa*, *Stylogomphus sigmastylus*, *Sympetrum vicinum*, *Tramea carolina*, and *T. lacerata*.

The presence of *Dythemis velox*, a species common in dry Texas country, is interesting in that it may be expanding its range towards the Northeast. Perhaps, this is a sign of global warming? Also, one should look for it in nearby Kentucky, which would be a new state record. Keep your eyes open! 

Northern Bluet Separated from its Eurasian Relative and Assigned a New Species Name

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A rather small and select list of Odonata species occur in both North America and Eurasia, and that list has now been reduced by one.

In a lengthy paper on the evolutionary radiation of *Enallagma*, Turgeon *et al.* (2005) show by analyzing both mitochondrial and nuclear DNA that there are three dis-


tinct northern groups (clades) of *Enallagma*. Two of these radiated in the Nearctic region and another in the Palearctic region. New World populations that have been called *Enallagma cyathigerum* are actually more closely related to all the typical Nearctic bluets such as *E. boreale*, *clausum*, *davisi*, *ebrium*, *hageni*, *laterale*, *minusculum*, *recurvatum*, and *vernale* than they are to the small Palearctic clade that includes *E. cyathigerum*, *deserti*, and *risi*. The third clade of northern species includes *E. anna*, *aspersum*, *carunculatum*, *civile*, *doubledayi*, *geminatum*, and *praevarum*. The remaining species of North American *Enallagma* are in yet another group called the Southern clade.

Thus New World populations previously considered as *Enallagma cyathigerum* must be recognized as a separate

species, which receives the name *Enallagma annexum* (Hagen 1861). The common name remains Northern Bluet.

This study was made possible by the cooperation of many DSA members who sent specimens to the authors.

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Long-Distance Migration and Emergence Patterns in *Anax junius*: A Review of Work to Date

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Mike May and Philip Corbet wrote recently about some of the outstanding issues regarding the seasonal behavior of *Anax junius* (2003), particularly its long-alleged ability to migrate hundreds of kilometers. According to them, there are two basic problems: untangling the relationship between migrants and non-migrants (with the latter sometimes referred to as residents), and determining how far and where the migrants might be traveling. Perhaps most important, May & Corbet also used their article to call for assistance. My own request for aid is a separate article in the previous issue. Here, however, I'd like to follow up on both research issues addressed by May & Corbet.

Emergence Trends. Several individuals have been monitoring *A. junius* emergence at single sites around North America. May has data from Maryland, and I've been watching ponds in Austin, Texas, and Caledon, Ontario, near (but not identical to) the original research site of Robert Trottier. The latter was a graduate student of Philip Corbet at the University of Toronto who first documented the widely different life histories of migrant and non-migrant individuals, notably revealing bimodal emergence within a single pond. He found that non-migrants emerge in late spring or summer, and migrants emerge (and presumably migrate) in late summer or early fall. Non-migrants overwinter at their natal pond as larvae. This pattern continues to hold reasonably true in Caledon (reported in part in Matthews [2004]), and other researchers—Paulson and Jenner (1971) for North Carolina and Wissinger (1988) for Indiana—have noted broadly similar regional patterns. These results are summarized in Corbet (1999). At my site in Austin, Texas, a huge

emergence peak extends between March and June, with a possible second peak in September–October (unpublished data).

May & Corbet described the site studied by Wissinger (1988, and reproduced in Corbet [1999]) as being one in which a trimodal pattern was observed: a distinct early spring peak, a late spring peak, and a summer peak; long periods without emergence occurred between these peaks. This pattern is still not clearly resolved or easily reconciled with Trottier's data (1971). Other anomalies exist. In Austin, I've recorded some *A. junius* emergence in every month even though I haven't seen adults every month. Paul Catling has written a thoughtful article discussing the presence of non-migrant larvae (which overwinter in Ontario) near Ottawa, which is farther north than this behavior was observed by either Walker (1958) or Trottier (1971). Given the harshness of Ontario winters, this observation is far from trivial and may follow from climatic warming trends in this region since the mid 1970s (Environment Canada data).

Migration: Range Size and the Extent of Movement. Catling points out that Walker spent many decades collecting odonate adults and larvae in Canada and only rarely found overwintering non-migrant larvae (2004). May and Corbet (2003) note that Trottier had great difficulty finding overwintering larvae in southern Ontario, an observation I can support from my own efforts in 2003 and 2004, even with the assistance of Walker's (1958) and Trottier's (1971) published accounts. The northern range limit of *A.*

junius may be somewhat variable, perhaps influenced by decadal climate trends. We clearly need more records of larval occurrence and emergence at both northern and southern range limits. The limits to adult flight are presumably much less restricted than the winter temperatures that non-migrant larvae are exposed to.

The implications for long-distance migration are relevant in this context. Russell *et al.* (1998) surveyed accounts of mass fall migration events during the twentieth century and found evidence that synoptic weather systems might concentrate hundreds or thousands of individual *A. junius* in coastal areas. Soltesz *et al.* (1995) described the much spottier spring (northern) migration records. Russell (2005) further found evidence for regular fall movement south across the Gulf of Mexico and a much smaller spring north across the Gulf. Clearly, the evidence for large numbers of *A. junius* engaging in true migration is strong albeit anecdotal and largely unsystematic.

Ideally a study would reveal the extent to which migrant *A. junius* are traveling. The first such serious attempt was made by Freeland *et al.* (2003), analyzing the extent of mitochondrial gene flow from a wide range of sites in North America. Their study suggested that migrants and non-migrants form a single population or (at a minimum) much gene flow was occurring between migrant and non-migrant “populations.” A follow-up study is now in progress (Matthews, Freeland, and Cognato, in preparation). Approaches using alternative proxies for movement could produce useful contrasts with mitochondrial evidence.

A Request for Assistance. My dissertation work focuses on developing additional proxies for *A. junius* movement. I’ve recently received National Science Foundation funding with Dr. Camille Parmesan, my advisor, to clarify intergenerational movement of *A. junius* migrant adults using nuclear DNA markers. Dr. John Abbott has also been invaluable in shaping my thoughts and in providing material assistance. The same grant also provides support to explore the intragenerational movement of adults. In lieu of the development of radio-transmitters, tracking the movement of individual adults requires the use of some intrinsic tracer. Very sensitive molecular markers can sometimes provide this resolution. But there is also much promise in the use of isotopic ratios that vary predictably over large scales. Geologists Jay Banner (University of Texas) and Len Wassenaar (University of Saskatchewan and Environment Canada) are working actively with me in these areas. Such techniques have been employed effectively with a wide range of species, including Monarch butterflies (e.g., Wassenaar & Hobson 1998) and a number of birds. Thus, I plan to collect migrating adults along a “transect” ranging between Toronto, Ontario, and the U.S. Gulf coast, prob-

ably following the Atlantic coast, starting this September. I hope to follow this trip up with a northbound journey the following spring, possibly visiting the Yucatan, Tamaulipas, southern Florida, and the Caribbean.

There are now many people involved in addressing issues relevant to *A. junius* migration and emergence, but I agree wholeheartedly with May & Corbet (2003) that we need to involve still more people. I hope some of the readers of ARGIA will be participating.

Acknowledgments. John Abbott, Philip Corbet, and Mike May provided valuable comments for this article, and I am grateful for their feedback.


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Oceanic Islands in the News—or—Parthenogenesis Means Never Having to Remember Valentine's Day

Nick Donnelly

One of the all-time most interesting and important discoveries in odonate biology was that *Ischnura hastata* (the Citrine Forktail, and North America's smallest odonate) has a population on the Azores that is parthenogenetic. Belle (1990) made the original discovery, but several (most?) workers did not immediately accept his conclusion. I had at about the same time (Donnelly 1990) published on the *Nesobasis* fauna of Viti Levu, the main island of the Fijian group, and noted that, for several species, I had found far more females than males. I considered that the Azores situation might be similar, and thought, "The entomologists only have to search more thoroughly for males". But the Azores situation turned out to be far more interesting than I (or many others) had imagined. Adolfo Cordero, of the University of Vigo, brought larvae to his laboratory and began to rear them. He managed, at the time of his publication earlier this year (Cordero *et al.* 2005) to rear and "breed" nine generations, producing about 1900 adults—all female! As he noted, "This is the first known population of Odonates that reproduce entirely without fertilization by males." The phenomenon, known as parthenogenesis, is a form of cloning. It is widespread and well known in the plant world, but is recognized far more rarely in the animal world. The process represents a trade-off: reproduction is simpler and may work if males are absent for some reason. The negative consequence is that there is no mixing of genetic material from two parents and no possibility of ameliorating the population by genetic means. It is extreme genetic bottlenecking. But it does work.

I have always been hooked on oceanic islands. I did my

PhD dissertation work on some West Indian islands, and I later worked on the Fijian islands, which are far more remote. This experience sharpened my outlook on problems of oceanic islands, which I have always regarded as magnificent places to test biological theories. Let's consider the larger problems of insects (or nearly everything else) on oceanic islands. First of all, they are distant from populations that might replace them if a catastrophe were to occur. This doesn't seem like a big deal until you have actually seen an insular disaster. My third trip to Fiji was a month or so after Cyclone "Wally" hit Viti Levu in 1980. This cyclone (in the southwest Pacific hurricanes are called "cyclones") dumped a meter of rain on central Viti Levu in less than 24 hours. The devastation was immense. Tiny, shaded, streams trickling down from the forested volcanic escarpments totally were laid open to the sun, flowing in deeply scoured, partially weathered volcanic bedrock—the normal substrate as well as all the vegetation having been completely stripped away. Needless to say, there were no damselflies. Happily, the island is the size of Puerto Rico, and there was enough of a *Nesobasis* (and other animal) fauna elsewhere on the island that within a few years there appeared to be an almost complete restoration of the original odonate fauna. But what would happen to a much smaller island? Very likely there would be total extirpation. If the island were remote enough, it would not be repopulated for a long time.

This is only one of the tragedies that might befall an insular population. Volcanic eruptions can (and have) completely extirpated an island's flora and fauna. If the island is remote, the regeneration of the flora and fauna depends

on rare and capricious events—plant seeds wafted on the wind or attached to birds, insects somehow flying (more likely entrained in a low-pressure cell) to the island, etc. And serial invasions of the new plants and animals are never in the same sequence, so the vagrant arrivals each have to contend with an environment unlike any that occurred previously anywhere.


Now, let's ask, "why *Ischnura*?" This is a genus of very small, seemingly fragile damselflies. But the genus contains several species that are very able colonizers. Almost every island in the South Pacific has a population of *Ischnura aurora*, which is little larger than *bastata* but seemingly no more robust. Why does it live on essentially every South Pacific island? Answer: it is a very efficient colonizer. To be a good colonizer of a tropical or subtropical island, an insect need only the ability to remain aloft and to be able to lay eggs in a wide range of tiny fresh water habitats. The flight part is actually fairly easy. Rather than actually flying, the insect has to remain aloft for a few days at a time entrained in the center of a low-pressure cell. These are called "hurricanes" if they are very low pressure, but they exist in some abundance as unnamed less powerful cells. The other Pacific odonate "super colonizers" are *Tramea transmarina*, *Pantala flavescens*, and *Anax guttatus*—all super fliers or drifters, and none of them fussy about where they breed. *Ischnura heterosticta* (about the size, and very similar to our *Ischnura verticalis*) is also widespread on these Pacific islands. The tiny species *I. bastata* has also made it to the Santa Cruz in the Galapagos archipelago. *Ischnura* seems to have the "right stuff" for remote colonization.

Once the damselfly has reached the island, then it faces additional problems. What does it eat? This is a no-brainer for odonates—they eat whatever is flying around. Another problem is, "What sort of predators are present?" Happily, at least in Fiji and I suspect generally, the predators present a less serious problem than on the mainland. On Fiji there are relatively few damselfly-catching birds and the lizards are very small and not very common. I suspect this is why so many remote-island damselflies (think *Nesobasis* or *Megalagrion*) evolve to relatively large sizes (even the *Ischnura bastata* on the Galapagos are distinctly larger than on the mainland of South America, and they can't have been there all that long).

But the real problem for insular species may have to do with reproduction. Because they started off few in number and could be locally reduced in population by some sort of insular environmental disaster, there might be periods in which males are scarce or even absent. Instead of allowing themselves to be extirpated, they may resort to unconventional types of reproduction, one of which is parthenogenesis. The Galapagos population of *bastata* is not, so far as we suspect, parthenogenetic. Males are about as common as females on Santa Cruz.

Picking up on Cordero's discovery, Tom Sherrat wrote an interesting essay in a recent issue of NATURE (Sherrat 2005). The article mentioned also the Fijian *Nesobasis* fauna and speculated that the female dominance and apparent sex-role reversal of some species of this genus might be a related phenomenon. Two of Sherrat's associates, Chris Beaty (who was at the Arnprior meeting) and Hans van Gossum, of Carleton University secured funding and are even now on Fiji studying *Nesobasis rufostigma*, and other female-dominant species. Chris and Hans are far more perceptive than me on the entire subject of damselfly behavior, and I am on tenterhooks wondering what they will learn. Every day I receive tantalizing e-mails from them. I wanna go back! As I say, oceanic islands are where it is at.

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Hagenius brevistylus Larva with Attached Zebra Mussels, Photo by P. Myer

Mark O'Brien (taken from a blog)

Remember how the Lilliputians tied down Gulliver? They were small, but many. Zebra Mussels, are small, but they have tied down many a structure in the Great Lakes due

to their enormous numbers of individuals that accumulate. This latest blog entry was inspired by Phil Myers from the UM Museum of Zoology, currently teaching a



with photographing insects with his Nikon digital SLR. At this point, he has far surpassed me in the number of insect photographs he has taken.


Phil was shooting odes around Douglas Lake, and saw that there were many *Hagenius brevistylus* (dragonhunter) trying to emerge and dying at the water's edge, when they could not break free from the coating of Zebra Mussels (*Dreissena polymorpha*) from the final larval instar. For a mobile hunter like the dragonhunter, the added weight of these mussels has to be a detriment. Of course, if they are covering the exoskeleton where the integument splits along the top of the thorax, the emerging adult will be trapped and die. We do not know how much of a detri-

summer course at the UM Biology Station at Douglas Lake. Phil has been the main force behind the Animal Diversity Web Project here at UM, and has been going wild

mental factor the Zebra Mussels are to a population of lake-based dragonflies, and this could be a very interesting research project for a student at the Bio Station. This has to have a short-term negative impact on larger species that take longer to reach maturity (1–3 years for *Hagenius*). In 2001, Margi Chrisincke wrote about *Didymops transversa* and *Dromogomphus spinosus* in Otter Lake that were encrusted by zebra mussels. About that time, I saw a *Dromogomphus spinosus* exuvia with a Zebra Mussel on the shore of Burt lake, just a few miles away from Douglas lake.

I encourage anyone else to share their observations on this phenomenon.

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Editor's Addendum—an example from Keuka Lake, New York

I am encouraged to share an observation. Fred Sibley came by recently with a remarkable exuvia which he had found on the shore of Keuka Lake, New York. The attached photo shows a skin of *Epitheca princeps* with zebra mussels attached. Presumably these mussels dried out and died when their substrate hauled itself out of the water to emerge. I wonder if the bug noticed all the extra weight?

Fred also observed that *princeps* seems to be more scarce this year. Are the mussels imperiling these bugs? Food for thought . . .]



Monponsett Disaster

Fred SaintOurs

Monponsett Pond in southeastern Massachusetts, a popular recreational pond for fishermen, motor boaters, and jet skiers, is home to at least three state-listed invertebrates. Recently the town of Halifax voted to add Sonar, an herbicide that works by preventing aquatic plants from taking up nutrients, to the pond to address problematic weeds that have become a nuisance throughout much of the

northeast. Although this chemical has been extensively tested on aquatic invertebrates and is not known to cause them harm at normal concentrations, there is more to the story as we float downstream.

There are two ponds, East Monponsett and West Monponsett, separated by a causeway but connected by a culvert.

Actually they were one large natural pond many moons ago (most ponds here are artificial), which was known by the local Native Americans as a great fishing hole. When I was a child these ponds were clear (though slightly tannic) with a clean sand and gravel bottom, and full of fish. East flows into West, then out via Stump Brook, which passes through a wildlife sanctuary. The nuisance weed problem is apparently only being addressed in the East pond; the West pond now has such low visibility (about 12" by Secchi disk) from all the motorboat activity and algae blooms that underwater plants, which need sunlight, cannot survive.

In July 2005 I manipulated (notice I didn't say "paddled") a canoe down the outlet stream of the west pond. I haven't seen or smelled anything this bad in my 25+ years of canoeing experience. At the first dam/spillway there was a viscous layer of duckweed so thick that turtles were floating on it, and it smelled like raw sewage. Below this, the sedimentation/eutrophication was so bad that cutgrass has moved into the channel and was literally choking the waterway. Instead of seeing the usual *Calopteryx*, *Didymops*, and *Cordulegaster* patrolling the stream, pretty much all I saw was *Pachydiplax longipennis* along its banks. The complete domination of one of our most common lentic species in a lotic system was rather disheartening, considering the poor condition of many of this state's rivers and streams as well as the relative rarity of lotic Odonata.

In many cases throughout the northeast, problems with nuisance aquatic weeds are likely caused by an excess of dissolved nutrients. Addressing these problems by adding a chemical that inhibits the uptake of nutrients by the plants counters all logic. An intelligent solution would be to try using the ability of such successful nutrient-utilizing plants to our advantage. Harvesting and composting the plants every few years would not only reduce the populations and clear the way for boaters and fishermen, it would provide a clean and renewable source of garden-quality topsoil. Given the popular attitude that emphasizes low cost and expediency, however, chances are remote that mechanical harvesting will be employed. Chemicals are cheap and fast-acting, though we all know what happens when we attempt to continuously solve problems using "quick-fix" methods.

In my opinion the use of Sonar in suburban water bodies with unnaturally high nutrient loads is a disgusting display of ecological negligence. Who cares? All the bad stuff is happening downstream in a wildlife sanctuary that nobody visits. As long as those motor boaters and jet skiers are happy . . .

P.S.—In August I went back to check the culvert connecting the ponds and found the plastic barrier that was put in place to prevent Sonar from getting into the west pond partially submerged, rendering it more or less ineffective.



Rediscovery of a Lost Dragonfly Collection and the Holotype of *Tanypteryx hageni* (Selys)—or — *Tanypteryx* Meets Sasquatch: The Perry Turner Story

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In August 2003, Tim Manolis of Sacramento, California sent an e-mail to Rosser Garrison, Dennis Paulson and Andrew Rehn and asked, "Have you guys ever heard of Perry Turner?"

In fact, we had, but we shall return to the question of "who is Perry Turner" in a moment. Manolis had inquired because, a few days earlier, his friend Lew Oring (an ornithologist at the University of Nevada, Reno) and his wife had happened through Susanville, California on a bird-watching trip. While in Susanville, they visited Pat's Antiques and Used Furniture store. Oring's wife noticed several butterfly and dragonfly specimens on display and learned from the store's owner (Pat Haflich) that the collection had belonged to Dr. Perry E. Turner, Jr. Thinking

that the collection might be of some interest to local dragonfly enthusiasts and/or museums, Oring alerted Manolis, knowing of Manolis' interest in dragonflies and contacts with other dragonfly-knowledgeable colleagues.

A few days later, mainly out of mild curiosity, Manolis and Rehn traveled to Susanville to examine the collection. Manolis was hopeful that the collection might contain county records for California, and Rehn was hopeful that there might be a few old reprints associated with the specimen collection. They had little idea of what they were about to discover.

After arriving at what turned out to be little more than a junk shop, Manolis and Rehn learned that Haflich had

acquired the odonate collection when he purchased the entire contents of a large storage locker that had been rented for years by Turner. The locker apparently contained all of Turner's worldly possessions, but after he disappeared and stopped paying rent (sometime around 2001), Haflich purchased the entire contents for \$125. Haflich's shop was full of Turner's belongings, all for sale, including old toy trains, used camera equipment, hundreds of photographic slides in dozens of carousels, oil paintings, etc. The odonate collection was in a back room against the wall. Much of the collection was pinned and stored in three California Academy style insect cabinets with six drawers each. Fortunately, the drawers were tight-fitting and of good quality, because Rehn noticed immediately that two of the cabinets contained numerous specimens of the family Petaluridae that clearly had been borrowed from museums around the world, and that most were still in good condition. In particular, there were four specimens of *Tanypteryx hageni* (Selys) from the Selys collection at the Institut Royal des Sciences Naturelles de Belgique (IRSN) in Brussels. Rehn highly suspected that one of the males, labeled "Nevada, morr." in Selys' hand, was the holotype. Other specimens were clearly indicated by their labels as belonging to various museums, including the United States National Museum (USNM), the American Museum of Natural History (AMNH), the British Museum of Natural History (BMNH), the University of Michigan Museum of Zoology (UMMZ), the California Academy of Natural Sciences (CAS), Oregon State University (OSU), the Florida State Collection of Arthropods (FSCA), and the Victoria University of Wellington (VUW).

The third cabinet contained Turner's personal collection of dragonflies and other insects. There were also several Schmitt boxes containing approximately 200 pinned Odonata that had been borrowed from the University of California, Davis (UCD), and a small 3 × 5 card file that contained approximately 200 papered Odonata and Lepidoptera collected by Turner in California and Oregon. Much of the material in the Schmitt boxes and card file had been heavily damaged by dermestids. There was also a file cabinet full of many papers pertaining to dragonfly collection research and records, especially for *T. hageni*. Rehn and Manolis were especially amused to discover that in addition to research on petalurid dragonflies, Turner had long been on the path of Sasquatch (Bigfoot)! There was a voluminous manuscript that described Sasquatch as a new family, genus and species of hominid, and a second, equally voluminous manuscript that described Sasquatch insectivory on petalurid larvae: apparently Sasquatch digs the larvae out of their burrows and eats them, and is rare because its food source is rare!

After having a good laugh over the Bigfoot manuscripts, Rehn explained to Haflich the scientific value of the collection and that much of the material had not rightly belonged to Turner. Haflich was unsympathetic to the scientific value and importance of this material, and the encounter became somewhat unfriendly when Haflich said that he would not give the museum specimens back to rightful owners (i.e. museums), having acquired them legally. Haflich indicated that he would only sell the collection in its entirety and that he expected to get several thousand dollars for it. However, Haflich later agreed (to Rehn) that he would give back any material that could be documented, and he gave Rehn one month to produce the documentation. Also during their visit with Haflich, Rehn and Manolis learned from him that in addition to the items on the sales floor, there were approximately 150 additional boxes of stuff in Turner's storage locker that Haflich had not had time to open and sort through. Haflich claimed that those boxes were not on the premises.

Returning to his home in Sacramento, Rehn reported his findings to Paulson and Garrison and began contacting the various museums to acquire the old loan forms necessary to document ownership. He was particularly dismayed when, with the help of Garrison, he learned from Jérôme Constant at the IRSN that the type of *T. hageni* was not present in the Selys collection and that there were records of four specimens being loaned to Turner in 1984. In addition, Rehn learned that Turner had borrowed from the IRSN a large collection of letters sent from R. McLachlan and H.K. Morrison to Selys between 1878 and 1881, but the documents had never been returned. Morrison was a commercial insect collector in the late 19th century who operated first out of Cambridge, Massachusetts, and then later out of Morganton, North Carolina. He collected specimens all over North America and sold Odonata to Selys for 10 cents each, including the holotype of *T. hageni*, which he collected somewhere in the Sierra Nevada above Reno in 1878.

All of the museums provided Rehn with copies of their loan records, and there was much evidence that over the years many curators had repeatedly asked Turner to return the loans, which he never did. Meanwhile, Paulson had related the story on the Natural History Collections Listserve (NHCOLL-L), where it caught the attention of USNM collections manager David Furth, who would soon become very involved in the story. After six weeks, Rehn contacted Haflich and indicated that he had acquired documentation from most of the collections known to have loaned material to Turner. At that time, Haflich claimed that he had sold the collection to a university, but would not divulge where.

Allow us to digress for a moment and introduce Dr. Perry E. Turner, Jr. Turner was a doctoral student of Michael Ghiselin (a famous systematist and evolutionary biologist) at UC Berkeley in the late 1960s. Having completed both his undergraduate and Master's degrees at Berkeley with R.L. Usinger, he earned a doctorate in Zoology from there in 1970. His dissertation research centered on the ecology and population biology of *T. bageni*, which at that time was considered to be much rarer than is known today. Turner became somewhat infamous among other odonatists, entomologists and ecologists because his dissertation ("Allusive Dragons") was rather obtuse and speculative, often drifting into lengthy discussions of general principles of ecology, the genetics of speciation and the philosophy of science. After finishing at Berkeley, he acquired a post-doctoral position at Harvard to study with Ernst Mayr, but he never attended (we discovered a letter that Mayr had written to Turner in 1971, clearly annoyed, explaining that Turner's appearance on the Harvard campus for an hour one afternoon did not constitute enrollment).

More importantly, Turner was known for borrowing material and never returning it. During the 1960s, '70s and '80s, Turner borrowed Odonata specimens, especially of the family Petaluridae, from public and private collections all over the world. In addition to the museums noted above, he acquired material from the personal collections of Tony Watson, Syoziro Asahina, and Dennis Paulson, and possibly others. As we discovered, he corresponded voluminously with Bastiaan Kiauta, Minter Westfall, Allen Davies, and many others. In 2003, Rehn learned from Kiauta that Turner had acquired much antiquarian literature from SIO over the years, and that Turner eventually left at least two large invoices unpaid: one for a full run of the journal *Konowia*, and a second for the lavish *Dragonflies of Japan in Color* by Hamada and Inoue (1986). Turner claimed repeatedly over the course of several years that he was going to privately publish his dissertation as an encyclopedic account of the life history and population biology of *T. bageni*, and that additional volumes on ecology and biogeography were forthcoming. He was self-employed as an ecological consultant, and used his business (Turner Laboratories, Ltd.) as a front for borrowing material under the guise of ongoing research in dragonfly ecology and systematics. However, we never discovered evidence of him ever having any clients, and it was apparent from many of his personal letters that he often received money from his parents. Rehn met Turner by chance in 1995 at Butterfly Valley in California, a well-known *T. bageni* locality. It was clear at that time that he was living out of his car, a 1968 Mercury Cougar, which was eventually purchased by Haflich (entirely dismantled) as part of the contents of Turner's storage locker.

Now, back to the caper . . .

In October 2003, after Haflich claimed that he had sold the Turner collection to an anonymous source (which was obviously untrue), Dave Furth (USNM) and Rehn began discussing the possibility of taking legal action to recover the borrowed material. First, Furth embarked on a covert spying operation in December 2003 to confirm that the material was still at Haflich's junk shop in Susanville. Accompanied by a personal friend (Doug Unger from Reno, Nevada), he anonymously visited the shop as an "ignorant" tourist. The only employee at the store that day was Haflich's ex-wife. Furth found the Turner materials exactly as described by Rehn, in the back room against a wall. The cabinets were stacked on top with many Kodak carousels of slides as well as various glass top display boxes with butterflies (e.g., a case with giant silk moths marked for \$79, a case of a male and female birdwing butterflies marked at \$100, an unmarked larger case of exotic butterflies that Haflich's ex-wife thought may be selling for \$300, etc.) After the appearance of Furth's casual interest in butterflies, Haflich's ex-wife freely divulged that there was a lot more of the Turner material at Haflich's home and that she thought that he had only paid about \$25 for the abandoned storage locker. She also told stories she had heard about Turner's weird existence. She showed off many large oil paintings of dragonflies, butterflies, trout, and other natural history scenes painted by Turner hanging around the store (priced from about \$100–\$300). Also there were many used cameras and especially a significant collection of 50-cent coins—all for sale in the store.

Armed with the knowledge that the Turner collection was, in fact, still in Susanville, Furth returned to Washington, D.C. and approached Elaine Johnston of the Smithsonian Institution's Office of General Counsel (OGC) about using legal recourse against Haflich should he refuse to cooperate in returning any borrowed material to the appropriate institutions. Beginning in December 2003, Furth acquired Authorization and Release Forms from appropriate persons at several institutions that had loaned material to Turner; these forms gave the Smithsonian permission to act on their behalf in recovery of the specimens. It took many months for Ms. Johnston to affect any action, but Furth refused to allow the issue to be forgotten and tenaciously pressed Johnston to present Haflich with a formal request from the Smithsonian's OGC to return the borrowed material. The first author thinks that the entire odonatological community owes an enormous debt to Dave Furth, because his unwavering persistence finally achieved results. In August 2004, the Smithsonian Institution, with the support of the U.S. Department of Justice (Sacramento), formally drafted a request that Haflich return all the dragonfly specimens and related archival

material to the USNM and other collections. It was made clear in the request that the U.S. Dept. of Justice was prepared to use all legal recourse against Haflich, including civil or criminal prosecution, should he destroy, sell or dispose of in any way any part of the dragonfly collection.

In early September 2004, Furth returned to Susanville, this time not so anonymously. He presented Haflich with the letter from the Smithsonian's Office of General Council and the supporting letter from the U.S. Dept. of Justice. He also showed Haflich the loan forms from the many institutions and the letters written by various curators over the years as they attempted to get Turner to send their material back. Haflich became very cooperative at that point, and Furth was able to retrieve many of the lost Odonata specimens that day. The specimens were transported (in two trips via Reno) in bulk to the Bohart Museum of Entomology at UC Davis where Rehn sorted through them, associated specimens with loan forms to the extent possible, and finally boxed them up and returned them to their institutions. Furth also found the Morrison/McLachlan correspondence to Selys, and many rare and important books including: Rambur (1842) *Histoire naturelle des insectes—Névroptères*; Ris (1911–1919) *Libellulinen monographisch bearbeitet*; Tillyard (1917) *The Biology of Dragonflies*; a large collection of Selys reprints, and several others which Rehn and Garrison eventually purchased from Haflich. Furth also found a collection of 24 books that bore the bookplate of the late Robert L. Usinger, an aquatic entomologist and professor at Berkeley when Turner was a student there. There were many classic books on ecology and evolution in Usinger's collection, and they have since been returned to Usinger's widow, Martha, who is 92 years old and still lives in the Berkeley area. We speculate that Turner either took or simply failed to return them when Usinger died in 1968.

Some of the material that was documented on the various loan forms was not recovered on Furth's first visit. For example, the CAS had loaned Turner over 200 Odonata specimens between 1964 and 1967, but with the exception of a single Schmitt box containing a few specimens from the Galapagos Islands, most of it was not recovered. About a dozen AMNH specimens were unaccounted for, and at the time we also suspected that additional years of correspondence from McLachlan to Selys were still missing, but this later proved to be a misunderstanding due to a probable typo on the original loan form. Moreover, there were still many boxes that had been in Turner's locker which Haflich had never opened and were not available to Furth on his first visit to recover the material. Thus, he made a second trip to Susanville in December 2004 and went through the remaining boxes, which Haflich had stored in a rental locker off site. Furth was able to recover

the additional material from the AMNH, but unfortunately most of the CAS material, the Konowia volumes and *Dragonflies of Japan in Color* were never recovered. Also, several of the Smithsonian's specimens were not recovered. In the end, however, much of the material that Turner had borrowed was recovered and returned to the appropriate institutions. In cases where specimens had been lost or destroyed by pest damage, we used Turner's own collection to replace them. The type of *T. hageni* and the hand-written letters that Morrison and McLachlan sent to Selys are now safely home in Brussels.

We discovered so many oddities (in addition to the Bigfoot manuscripts) while looking through Turner's belongings for odonate-related material that it would be impossible to recount them all here, but a few choice examples are worth mentioning in closing. At one point we found the top of what appeared to be a mammalian skull in a wooden box. Eventually we found a file of seemingly related correspondence between Turner and several mammalogists to whom he had sent the skull. In his letters, Turner had argued that the skull fragment belonged to a previously unknown species of *Homo* that had inhabited the Pacific cordilleran region, but the mammalogists all assured him that it was from a baby elk. Turner was a member of the International Society of Cryptozoology, and wrote several personal accounts of visual and "non-visual" encounters with Sasquatch. He evidently spent hundreds of hours during the winter typing, re-typing, and annotating his dissertation and its multiple editions, which he never published, and he never threw any of the copies away. In time it became clear to us, through Turner's countless and lengthy letters to Bastiaan Kiauta, that he had borrowed the holotype of *T. hageni* and the letters that Morrison had written to Selys in the late 1870s because he was trying to find the exact bog where Morrison had collected the type specimen. He claimed once in a letter to Kiauta (he always kept multiple copies of every letter he wrote) that after receiving the type from Brussels, he could ascertain the type locality from minute morphological variations in the specimen. His new researches were thus the source of constant delay in the publication of *Allusive Dragons*, which he repeatedly assured Kiauta was going to be a fascinating work, well worth waiting for. It never appeared, but copies of it and several of his more bizarre writings are housed at the Smithsonian Institution. His dragonfly collection is at UC Davis.

The fate of Perry Edward Turner, Jr. remains a mystery.




Aeshna Sierra Ware Huff (26 March 2005)

Mike May

As her odonatological godfather, I'm proud to announce the birth, in Highland Park, New Jersey, on 26 March, of a daughter, Aeshna, to Jessica Ware and Jeremy Huff. Aeshna is doing just fine — in fact she's been coming in to the lab on a pretty regular basis (her baby carrier fits nicely on an opened bottom desk drawer) and I hope to have her swinging a net




Aeshna at 3 1/2 months – note the sunglasses!

by the time she's a year old. Mom and dad are hanging in there and seem pretty happy about the situation when they're not nodding off. As some of you know, Jessica is my graduate student, working on the systematics of Libelluloidea. Jeremy is on the staff at the American Museum of Natural History and works on spiders and other dragonfly food. I hope you'll all join me in celebrating Aeshna's emergence and look forward to recruiting her as the youngest [WDA, DSA] member on record. 

Elegy For The Azure Bluet

Ken Tennessen

The algal mats are here
like I remembered them,
afloat like storm clouds in
a dark-green sky tucked in
this covered corner of Deibert Park.
But blue gills are swarming
in the openings, large and small
they follow me as I sneak
along the wooden walk,
skulking now, for I do not see
the Azure Bluet,
bluest of the bluets.

It must be true what they say,
that the larvae of this damselfly
cannot escape the fish's mouth.
For before the blue gills were here
the Azure Bluet skimmed low
over the water, like
sewing needles they wove
the bright blue of the sky into life.
Wrought of heavenly blue,
they brought heaven here to earth.
Who will do that now? Not
the others, not the Fragile Forktail,
not the Vesper Bluet, all too busy
with each other, and anyway
they are colored of green
and yellow. No,
the bluest bluet is gone from here.
Me too, missing now the sky
and the lure of the blue. 

Common Names for Two Species New to the United States

Dennis Paulson, Chair, Common Names Committee, DSA

Two Neotropical species found for the first time in the United States during the past two summers have lacked English names until now. The DSA CNC spent time discussing alternative suggestions for names for the two species and agreed on the following.

Leptobasis melinogaster González 2002, found by Tom Langschied and Jim Sinclair on the King Ranch (Abbott 2004), will be called Cream-tipped Swampdamsel. Mature males of this long, slender species have a very distinctive cream-colored abdomen tip. *Gaster*, meaning


“belly” or “stomach,” is often used to refer to the abdomen of odonates, and *melino* means “honey.” Imagine creamed honey and you have an idea of the pale color of the abdomen tip, unique among North American species. “Swampdamsel” will be the name for the eight species of the genus *Leptobasis*, distributed south through Amazonian South America. One of them, *L. vacillans*, occurs close enough to the USA that it is another candidate for possible occurrence in Texas or Florida.

The second species is *Anax concolor* Brauer 1865, reported

in this issue of ARGIA. After much discussion, we picked Blue-spotted Comet Darner as the name for this species. It is a very close relative of the Comet Darner, *Anax longipes*, but differs in males having a dark reddish-brown, blue-spotted abdomen instead of the bright red-orange abdomen that characterizes the Comet Darner.

Literature Cited

Abbott, J. 2004. A summer for the record books in Texas. ARGIA 16(3): 16–17.

Paulson, D. 2005. *Anax concolor*, a new species for the United States. ARGIA 17(3): 26–27. 

Book Review: Damselflies of the North Woods, by Bob Dubois; photos by Mike Reese. Kollath-Stensaas Publishing, 394 Lake Ave. South, Duluth MN 55802. \$18.95. E-mail address of publisher: sparkystensaas@hotmail.com. 132 pp, 4 1/2 × 8 1/4 inches (pocket sized), soft cover, lavishly illustrated with color photos.


reviewed by **Nick Donnelly**

This recent handbook is the damselfly companion to Kurt Mead's highly successful *Dragonflies of the North Woods*. Like the companion volume, it is appropriate for a far larger area than the "north woods", which the publishers take to mean the northern half of Iowa east to Michigan and including the southwestern portion of Ontario. You would have to go a long distance south or west before you find a species that is not here, and to the east you would only fail to find some species that are restricted to the immediate Atlantic sea board. Thus, the market area for this book is very large, and it should enjoy a correspondingly large sales.

The book begins with a long, well-illustrated section on morphology, behavior, and life history. Bob stresses the necessity of netting and close examination of damselflies; however, his detailed instructions on netting are somewhat like a high-school essay I once prepared on the sub-

ject, "How to set a mousetrap." Bob's section on damselfly identification is one of the clearest and most useful I have seen in any guide.

The species are individually discussed and illustrated on a two-page spread with magnificent photos, with diagnostic characters or structures shown by arrows. The flight season for each is shown graphically. Range maps are also given for each species.

I have much admiration for this manual. My quibbles are minor: I would have preferred an emphasis slightly more on structures than on color patterns, which I think are puzzlingly variable for several species. But Bob has hit the nail squarely on the head for a guide to beginners: this is an excellent, convenient guide and should be very quickly functional even for a person who has never examined a damselfly previously. I recommend it strongly. 

Book Review: Evolution of the Insects, by D. Grimaldi & M.S. Engel, Cambridge University Press, 2005 (xv + 775 pp)

reviewed by **Roy Beckemeyer**

This is an encyclopedic look at the evolution and diversity of the largest Class of animals: the insects. It is crammed with more than 900 figures, from photographs to electron micrographs to drawings, nearly all of them original to this book and many in full color. The book is in a format that matches in size the breadth and depth of its subject matter; it measures 9 by 12 inches and is nearly 2 inches thick.


David Grimaldi is Curator of Invertebrate Zoology at the American Museum of Natural History as well as an Adjunct Professor at Columbia and Cornell Universities, and is an expert on fossils in amber. Michael Engel is Associate Curator in the Entomology Division and

Associate Professor in the Department of Ecology and Evolutionary Biology at the University of Kansas, and a Fellow of the Linnean Society of London. The authors have spent a number of years traveling around the world to see, study and photograph extant and fossil insects, in the field and in museums. In the process they published a large number of papers ranging from descriptions of new taxa to taxonomic revisions of extant and fossil fauna to phylogenetic studies. They do an excellent job of integrating the extensive fossil record of the insects into discussions of the diversity, biology and relationships of living insects.

Chapter titles are: 1. Diversity and Evolution, 2. Fossil Insects, 3. Arthropods and the Origin of Insects, 4. The

Insects, 5. Earliest Insects, 6. Insects Take to the Skies, 7. Polyneoptera, 8. The Paraneopteran Orders, 9. The Holometabola, 10. Coleoptera and Strepsiptera, 11. Panorpidia: Antliophora and Amphiesmenoptera, 12. Amphiesmenoptera: The Caddisflies and Lepidoptera, 13. Insects Become Modern: The Cretaceous and Tertiary Periods, 14. Epilogue. Our favorite insects are covered in the final portion of Chapter 6 under the headings “Odonatoptera: Dragonflies and Early Relatives: Geroptera; Holodonata: Protodonata and Odonata; Protodonata: The Griffenflies; Order Odonata: The Dragonflies and Damselflies”. It was interesting to see that the authors prefer to call the Protodonata “Griffenflies” rather than “giant dragonflies” to

emphasize the fact that they were a primitive stem group to the Odonata. Their coverage of Odonata takes 9 pages, and they pretty much adopt the phylogeny of Andy Rehn (2003, *Systematic Entomology*, 28: 181–239).

I am probably a bit prejudiced in favor of the authors as I have known Michael Engel for several years and have been waiting for this book for most of them. But in truth, this is a landmark book, one as superb in its execution as was Philip Corbet’s “Dragonflies: Behaviour and Ecology of Odonata” (1999, Harley Books, Colchester). This is a must-have book, and, given its size and quality, a bargain at the price of \$75.00. 

Book Review: *Damselflies of Brazil: An Illustrated Identification Guide. 1—The Non-Coenagrionidae Families*, by Frederico A.A. Lencioni; All-Print Editora, Sao Paulo, Brazil

reviewed by **Fred SaintOurs** and **Anna N. Santos**

With the flurry of dragonfly and damselfly identification guides published in the last few years it is appropriate that one finally be produced for a region that possibly contains the greatest diversity of insects and freshwater fauna in the Western Hemisphere. Brazil, which claims one fifth of the world’s freshwater fish species and an equally sizeable proportion of the world’s freshwater runoff, has a rich variety of Odonata that is being explored at a relatively slow pace due to political barriers to biological exploration, not to mention the difficulty in covering such a large geographic area where access and the terrain itself can be very difficult (don’t forget the spiders, anacondas, and jaguars—oh my!)


Despite the many setbacks to scientific advancement, we now have at our disposal the first volume of “Damselflies of Brazil”. This is the result of a decade of work by Frederico Lencioni, who has been tirelessly reviewing material gathered with the help of a long list of premier Odonatologists including Rosser Garrison, Ken Tennessen, Dennis Paulson, Angelo Machado, and others. The 332-page hardcover manual is written in English, with a Portuguese section covering the full text minus the illustrations. It includes over one thousand diagnostic drawings, almost one third of which are Lencioni’s original handiwork. Damselfly morphology is well described with three pages of large and clearly labeled illustrations, followed by a key to the ten families of Zygoptera found in Brazil including Coenagrionidae, which will be the subject of Volume 2. The family key is based on brief descriptions making it very easy to follow and many of the illustrations are labeled with text, unlike most keys that use only pointers.

The bulk of the book is divided into subsections each with a brief description of a Zygoptera family, followed by a key to genera with notes on habitat, behavior, and appearance. Within each family section, species pages covering a total of 153 described species provide information on the original description, type locality, synonymy, distribution by country and by region within Brazil, and whether the larvae have been described. Not surprisingly the majority have not (according to the author only 13% of Brazilian Odonata larvae have been described), which leads us to conclude that there is a great deal of work ahead for some adventurous grad students talented in dragonfly husbandry. Each species page includes one to several clear and well-labeled diagrams, the majority being enlargements of caudal appendages and very well done. Curiously there seems to be quite a bit of empty space in some diagram boxes, and even a few empty pages, perhaps due to restrictions in the formatting of the book. The upside is that it provides space to include personal notes and drawings. What is lacking are distribution maps, though with so few records for many of the species it is undoubtedly a very difficult task to map their distribution in any meaningful way.

Overall the book is well organized which makes it easy to locate information quickly. One improvement though would have been to include the family name on each species page to avoid backtracking. At the end of the English section is an extensive bibliography listing 120 papers ranging from the 1800s to present day; it is a wealth of valuable references to literature on neotropical Odonata. Finally, the two glossaries, one in English and one in Portuguese, contain 156 entries which we found to be extremely

useful for improving our Portuguese vocabulary related to invertebrate anatomy. One negative aspect of this manual is the lack of pretty pictures. With such vivid color and variety found in Brazil in families like Polythoridae and Protoneuridae, it seems a shame not to include at least a few color plates. However this reassures the shutterbugs out there that there is still plenty of work to be done, and the author himself is working towards building a photo collection in an effort to produce a picture-based guide that is more appropriate for “hands-off” field use. Despite it being largely intended for use with preserved specimens, and the difficulty in getting permission to collect insects, “Damselflies of Brazil” will provide a much-needed boost to the exploration of South American Odonata. Good work, Fred! We’re looking forward to Volume 2.


The book “Damselflies of Brazil: An Illustrated Identification Guide. 1—Non-Coenagrionidae Families”, by Fred Lencioni, is available for the sale in the internet

(www.zygoptera.bio.br). The price is US\$ 60.00 + shipping. This is the first publication which provides the means to identify all described species of Zygoptera found in Brazil, the book is hard cover; (17.5 cm × 24 cm); 332 pages (90 gm couché paper); English text with a section in Portuguese; 6 pages on damselfly morphology; keys for families and genera; 1044 diagnostic drawings of the 153 non-coenagrionidae species (more than 300 are original drawings). Each species is on a single page with: data on original description; data on imago (if male and female are described); synonymy; type locality; where the types are housed; distribution in South America and Brazil; data on larvae (described or not and where); data on revision. There is a glossary with 156 entries in English and Portuguese (in Portuguese with the English word or expression) and Bibliography with 120 papers. 

Southern Boreal Forest Observations for *Somatochlora williamsoni*: is its Range Extending Northward?

Gordon E. Hutchings and **Dave A. Halstead**, (GH) University of Victoria, Victoria, BC <odonatas@uvic.ca>; (DH) Saskatchewan Institute of Applied Science and Technology, Prince Albert, SK <halstead@siast.sk.ca>

The 2005 field season has yielded an interesting development: either *Somatochlora williamsoni* (Williamson’s Emerald) has undergone a significant range extension; or the species has been overlooked by previous surveys in Canada’s western boreal forest. During the early evening of 12 July 2005, *S. williamsoni* adults were encountered in large numbers west of Stanley Mission in the Churchill River region of north central Saskatchewan. Males and females were observed moving back and forth across Highway 915 at a small creek culvert crossing (approximately 55° 20’ N and 104° 45’ W). The feeding swarm was flying 3–5 meters above ground level. Several observations of *S. williamsoni* individuals were noted at other lakes and streams in the same area, and during a second dragonfly survey in the Missinipe region (55° 35’ N) to the northwest on 22 July. Both areas consist of dense boreal forest and numerous lakes and wetland drainages on rugged Precambrian shield.

S. williamsoni was first reported in Saskatchewan in 2003. Modest population numbers were encountered at that time just south of 54° N. Prior to 2003, the known western-most distribution of *S. williamsoni* was at the Manitoba–Ontario border in the vicinity of 49° N latitude. We are wondering what might account for the sudden appearance of this species so far west and north of its previously reported distributional limits. Is it that no dragonfly expert has visited these areas in early to mid-summer, or is this species extending its range northward? We would be interested if anyone in Alberta to the west or Manitoba to the east has encountered this species so we may better understand what is going on. Your assistance is greatly appreciated. 

Navajo Word for Dragonfly

from an e-mail from **Robert Larsen**

Robert Larsen recently circulated a list of Odonata from the Navajo Nation homeland. In this he reveals that on

the Navajo homeland (“Dine’Tah”), odonates are called “Tani-l’ai”. 

Back Issues of ARGIA and Bulletin of American Odonatology

The editor is able to provide back issues of ARGIA. Please contact T. Donnelly, 2091 Partridge Lane, Binghamton, NY 13903. The present price schedule takes into account the different costs of duplication of each number of ARGIA. In the event that an issue becomes exhausted, then photocopies will be sent. **Prices are \$3.00 per issue; this does not include postage; see below.**

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Back cover: (upper) Northeastern DSA group at State College—photo by Bryan Pfeiffer; (lower) *Anax concolor* at Santa Ana NWR—photo by Dennis Paulson.

