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Front cover: *Triacanthagyna caribbea* (Caribbean Darner), a new species for the U.S. at Santa Ana National Wildlife Refuge, Hidalgo Co., Texas on 13 November 2007. Photo by Steve Collins.

In This Issue

I started the last issue off with a statement about this year being one for the record books in the lower Rio Grande Valley of Texas. Well, things have certainly not slowed down there as those of you that follow Tex-Odes have no doubt read. Several of the species found there that are new for North America now have official common names. These names are *Triacanthagyna caribbea* (Caribbean Darner), *Planiplax sanguiniventris* (Mexican Scarlet-tail), and *Tauriphila argo* (Arch-tipped Glider).

In this issue we have reports on several successful meetings this summer, including the annual DSA meeting in Bend, Oregon, the Northeastern DSA meeting in Malone, New York, and the fourth annual CalOdes/DSA Blitz, which was held at Modoc National Wildlife Refuge.

Nick Donnelly provided two interesting notes for this issue. In the first, Nick discusses several of the known *Enallagma* hybrids and adds evidence of a new one between *carunculatum* (Tule Bluet) and *civile* (Familiar Bluet). In the second, he describes an observation from the recent Bend meeting that must have been truly spectacular. I heard from several attendees about the incredible numbers of *Octogomphus specularis* (Grappletail) that were observed along the outlet stream of Gold Lake.

We have two stories of bird predation on dragonflies in this issue. The first, by Jeffrey Babson, details an account of a Sulphur-bellied Flycatcher feeding on a darner. The second, by John and Sue Gregoire, involves cooperative hunting of *Celithemis elisa* (Calico Pennant) by Cedar Waxwings.

The Gregoires update us with this year's mass emergence of *Celithemis elisa* around the sanctuary pond they have been studying in the Finger Lake region of New York. They also proposed and helped design some new trail head signs at Glen Gorge. One of these signs talks about the *Tachopteryx thoreyi* (Gray Petaltail) and its propensity to land on the casual observer. They've included a photo of this new sign and if you look carefully, you might recognize someone.


Jerry Hatfield has been at it again and documents a number of new county records from the Texas Panhandle and the central Texas area. Robert Larsen discusses the habitat and ecology of the uncommon *Libellula composita* (Bleached Skimmer). This is one of the highlights of Bit-

ter Lake National Wildlife Refuge in southeastern New Mexico, where Robert passionately studies odonates.

There are several interesting articles on exuviae and larval emergence in this issue. Tim Manolis tells us more about spiders living in exuviae and along with Steve Klett, documents an exuvia attached to an adult *Pachydiplax longipennis* (Blue Dasher). I wonder how often something like that happens. Chris and Amy Hill detail the distances that macro-miids will travel to emerge. We should be keeping our eyes out for exuviae well away from the water's edge!

There are a bunch of new records in this issue. Robert Behrstock documents the first *Aphylla protracta* (Narrow-striped Forceptail) for Arizona. Steve Collins reports *Triacanthagyna caribbea* (Caribbean Darner) for the first time in the U.S. from the lower Rio Grande Valley of southern Texas. He photographed this species there last year and it has been seen there repeatedly in September of this year. This is certainly not the only new species to show up in south Texas this year though. Fabrice de Lacour shares his and Ed Lam's discovery of *Tauriphila argo* (Arch-tipped Glider), also new to the U.S., in south Texas.

Jerrell Daigle reports on the latest findings of *Chrysobasis lucifer* (Lucifer Damsel) at the Audubon Corkscrew Swamp Sanctuary in Florida. Ryne Rutherford and Mark O'Brien report a significant range extension of the Hine's Emerald (*Somatochlora hinei*) in Michigan. And Bill Mauffray reports *Dythemis velox* (Swift Setwing) from Indiana for the first time.

This has been such a "hot" summer for odonates that they are even making new discoveries in the far north of Alaska. John Hudson and Lisa Saperstein report *Coenagrion angulatum* (Prairie Bluet) for the first time from that state. 

Mark Your Calendar

The 6th Worldwide Dragonfly Association International Congress of Odonatology will be held in Xalapa, Mexico, 7-12 June 2009. For more information see <<http://www.ecologia.unam.mx/odonatology2009/index.html>>.

The 2008 DSA Annual Meeting

Josh Vlach <josh.vlach@gmail.com>; photos by Jim Johnson

Pre-Meeting Trip

As I prepared to attend my first meeting of the Dragonfly Society of the Americas in Bend, Oregon, it occurred to me that I didn't know all that much about dragonflies. So as I packed my suitcase, grabbed my net, some envelopes, and hesitatingly left my camping gear behind, I wondered what a meeting of dragonfly enthusiasts would be like. Monday evening I met Steve Valley, or as those of us in the Northwest call him—the Godfather of Oregon Odonatology, up in the Cascades near where highways 20 and 22 meet. We looked at a wetland or two, determined it was too cool for dragonflies, then stopped in with his parents to spend a pleasant evening discussing what Bend once was and what it has become (was a mill town, now a touristy retirement and vacation community for Californians).

Early Tuesday morning I tossed my gear into Steve's crumpled truck and we headed off towards John Day for the pre-meeting trip. Although I've lived in Oregon for nearly five years, I had never made it to that part of the state. I think everyone who attended will agree that we saw some beautiful country. There were beautiful rivers cutting through weathered rock areas that looked like the Painted Desert, and excellent (although hot) weather.

That afternoon when we finally arrived at the hotel (after making a few stops along the John Day on the way) we

were greeted by "Welcome Dragonfly Association Society" on their sign. In spite of renaming of DSA, I think everyone was still pretty sure that they were in the right place. After settling into the acceptable yet confused hotel, one of the legendary parking lot meetings began. Through the afternoon and evening it was like watching a family reunion held in a parking lot and a couple of hotel rooms. It was nice for me too, I got to see a number of the Oregon and Washington folks that I don't see too often and I had the opportunity to meet many people that I had only heard of in dragonfly "stories" (which are much like fish stories except with small flying insects). After a fun evening of making new acquaintances and seeing old friends, everyone settled in for the night looking forward to an enjoyable day of collecting.

The next morning, Steve and Jim Johnson (to whom we owe much gratitude for an excellent meeting) presided over a brief parking lot orientation and handed out field maps. Small groups rolled out to survey the surrounding countryside. There were many places to collect along Service Creek, Magone Lake, Canyon Meadow Lake (a beautiful mountain bog where I spent much of the first day), and the forks of the John Day River. Collecting along the John Day permitted people ample opportunity to see notable species such as *Cordulegaster dorsalis* (Pacific Spiketail), *Erpetogomphus compositus* (White-belted Ringtail), *Gomphus lynnae* (Columbia Clubtail),



and *Macromia magnifica* (Western River Cruiser). A new state record for *Leucorrhinia proxima* (Belted Whiteface) was collected at Magone Lake by Steve Gordon and Cary Kerst. It was hot, but that didn't stop the enthusiastic participants from netting and photographing the day away.

2008 DSA Annual Meeting

The next day was more collecting at the same sites as folks continued the pre-meeting trip while making their way to Bend for what was technically the main event—the meeting. On the way we enjoyed the scenery, stopping to collect here and there, and many folks stopped in at the museum at the John Day Fossil Beds (which I heard was nice—no dragonflies though).

That evening Steve and Jim called us all together to get everyone on the same page. A lighthearted meeting in a small room at the Super 8 ensued. Soon everyone had the details of the meeting collecting trip—they included numerous sites on the east side of the Cascades including bogs, lakes, and rivers. Groups could go where they wished thanks to handy labeled color topo maps handed out by the organizers. As far as room arrangements, most everyone stayed at the hotel where it was easy to socialize and arrange to meet. A few people opted to stay at Central Oregon Community College (COCC, which I say as see-oh-see-see!), which meant they were a little more isolated. One advantage to Bend being a tourist town is that there are plenty of restaurants to choose from and there was even some kind of festival and car show in town.

The collecting day (Friday before the meeting) was a great success. Everyone traveling at their own pace and in small groups seemed to work extremely well. In spite of the large number of attendees, I never felt too crowded and never banged nets with anyone or heard anyone complain about



Bill Mauffray, presiding.

their photo being ruined by some fool with a net (or vice versa). There were too many suggested locations to visit them all (in my opinion), but there were some highlights: Todd Lake offered an opportunity to see some beautiful scenery surrounding some excellent *Tanypteryx hageni* (Black Petaltail) habitat (adults were plentiful). I had the opportunity to take part in my first larval collection of this species—it was a great site, streams running down steep hills with wildflowers leading to a picturesque mountain lake. By the way, those burrows are hard to find until you see one; then you wonder how you missed them! Also, *Ophiogomphus morrisoni* (Great Basin Snaketail) was abundant below Crane Prairie Reservoir on the Deschutes River. There were some truly breathtaking sites—beautiful mountain lakes with mountain backdrops, lava flows, etc.



Annual Meeting Speakers



Ken Tennesen



Steve Valley



Tim Manolis



Laura McMullen

Overall there were approximately 54 species identified on the trip! Oh, and in case you haven't already done so, don't forget to send Steve or Jim your list of species collected/observed!

I must say that as a first timer I really enjoyed the actual meeting, which had a great combination of amateur and professional Odonate enthusiasts with diverse backgrounds accompanied by a laid back collegial atmosphere. I've never been to a meeting where there was more of a sense of community. Despite the pleasant Saturday weather outside, there didn't seem to be too much difficulty getting people to attend the meeting. Folks met up at COCC's Boyle Educational Center, and we had a number of very interesting presentations. The knowledgeable Ken Tennesen presented "Geographic Variation in Size of *Hagenius brevistylus*" with interesting preliminary data on variability over different latitudes and accompanying hypotheses as to why, with an extra interesting mystery in Texas (Texas is a mystery). Steve Valley gave, "*Tanypteryx hageni* Not So Rare After All," which combined information on years of recording *T. hageni* habitat (with GPS) and demonstrated how he has used this information with mapping software to illustrate that they probably aren't that rare after all—and by association, neither is Bigfoot.

The next somewhat surprising entry was Tim Manolis' "Residence and Reproduction Within Dragonfly Exuviae by a Jumping Spider, *Sassacus vitis* (Salticidae)". Who would have thought that dragonfly exuviae could double as spider condos? Not me. Ken Tennesen and Jim Johnson gave "Highlights of a 2008 Trip to Ecuador," which, as I imagine you've come to expect, fantastic photos of their trip. OSU student Laura McMullen gave an interesting talk on "*Progomphus borealis*: Desert Trail-Makers and Fastest Burrowers," where she supplied us with some interesting information and observations on their behavior and, based on her title, she has set up an obvious challenge to find a faster burrowing larva. Its always great to see behavioral research—its so rare! This is also the first presentation I've ever seen where an entomologist was wearing a pistol (in her slides, not during the meeting). We next had a talk from Celeste Mazzacano from the Xerces Society on "Conserving Odonate Biodiversity," an issue that is certainly near and dear to all of our hearts.

John Mathews (and several coauthors who weren't present) presented his now complete graduate research on "Continental-Scale Dragonfly Migration Revealed through Genetic Markers and H and Sr Isotopes" in which he gave a broad overview of his efforts at documenting the migration of *Anax junius*. Then the final presentation of the day was Dennis Paulson's "Odonata of a Megadiverse Locality: Explorer's Inn, Peru." This was a combination of excellent photographs of species most of the attendees had never seen (or I may be speaking for myself) and a description of a trip that has to make any dragonfly aficionado green with envy. All of these presentations were capped on either end by the business meeting, which Steve Valley will cover in the minutes.



Celeste Mazzacano



John Mathews



Dennis Paulson



Ailsa and Nick Donnelly receiving an award for their commitment, dedication, and many contributions to the Society and field of Odonatology. A fellowship was created in their honor to financially assist members who would otherwise not be able to attend the annual DSA meeting.


Jim and Steve put together a great meeting: They got the weather right, the company was top notch, the collecting was good, things went as planned, and the scenery was beautiful. I'm glad I was able to attend!

Post-Meeting Trip

Sunday started the post-meeting trip. It started with the last parking lot meeting (these seem to occur spontaneously most mornings and evenings), which was full of anticipation of what was yet to be seen and good-byes for many colleagues who wouldn't see each other for another year (or possibly more). Once again, people were free to choose their own collecting destiny. They could choose to return to pre-meeting sites, meeting sites, or a few new post-meeting sites further to the south of Bend

with the main focus being Gold Lake and the opportunity to collect *Octogomphus specularis* (Grapple-tail). An additional notable collection was *Ophiogomphus morrisoni* on Crescent Creek and at the Gold Lake outflow (I'm afraid I had to part ways before we made it to Gold Lake). From my perspective, other than Steve starting a small fire in his truck while driving down the highway (cigarettes and maps don't mix), it was a great start to the post-meeting trip and a great end to the DSA meeting for me.

As I've often found, people who are drawn to entomology tend to be good folks, and you dragonfly folks are no exception. I was able to meet (and re-meet) many interesting people who just blow me away with their identification skills and knowledge of the Odonata (among many other things—geology, plants, birds, etc.). Everywhere I went, everyone was more than happy to

help me with identifications, answer my questions about biology, or just chat. After talking to a great many of you on the trip, I think we owe Jim and Steve a big round of applause. It sounded to me as if they organized an extremely memorable meeting (with assistance from some natural Oregon beauty). Thank you for welcoming such a super-novice into your company! 

[see photos of odonates photographed during the annual meeting in the color photo supplement included with the PDF version of this issue of ARGIA. Ed.]

Minutes of the 2008 Annual Meeting of the Dragonfly Society of the Americas

Steve Valley, Secretary <svalley2@comcast.net>

The annual meeting of the Dragonfly Society of the Americas was held on Saturday, 2 August 2008, at Central Oregon Community College, Boyle Education Center, Room 0155, in Bend, Oregon, with President-elect Bill Mauffray presiding (President John Abbott was unable to attend).

Introductions and welcoming statements were given by Steve Valley and Jim Johnson.

Attending Members introduced themselves.

There were 53 participants at the 2008 DSA meeting:

Colin Jones from Ontario, Canada
Steve and Mary Jane Krotzer from Alabama
George and Phoebe Harp from Arkansas
Dave and Kathy Biggs, Tim and Annette Manolis,
and Douglas Vaughan and Doris Kretschmer from

California

Jerrell Daigle and Bill and Esther Mauffray from Florida

Nicholas Block and Kathy Kozacky from Illinois

David Allan Fitch, Dave Small, and Michael Veit from Massachusetts

Pam Hunt from New Hampshire

Ailsa and Nick Donnelly, and Ed Lam from New York

Rie Miyazaki from Oklahoma

Steve Berliner, Tessa Biboux, Eric Coombs, Steve Gordon, Bob Hamilton, Cary Kerst, Marshall Knoderbane, John Matthews, Celeste Mazzacano, Laura McMullen, Toshio Miyazaki, Larry and Alla Powers, Steve Valley, and Josh Vlach from Oregon

Greg Lasley and Cheryl Johnson from Texas

Alan Myrup from Utah

Paul Bedell and Anne Wright from Virginia

Mike Blust and Bryan Pfeiffer from Vermont

Jim Johnson, Michael Kasprzak, Dennis Paulson and Netta Smith, and Jim and Betsy Walker from Washington

Ken Tennesen from Wisconsin

Reading of the 2007 Annual Meeting Minutes was waived and the minutes were approved as published in ARGIA Vol. 19, No.3.

Jerrell Daigle handed out the meeting buttons.

Jim Johnson read a letter from Adrian Trapero Quintana thanking DSA for accepting his poster paper, "Reproductive Behavior of the Damselfly *Telebasis dominicanum* (Selys, 1857) in Santiago de Cuba".

Treasurer's Report by Jerrell J. Daigle: We began the 2008 year with a balance forward of \$15,625.05. Our current balance is \$17,350.40. Our projected year-end balance should be about \$12,000. Currently, we have a DSA membership of 340. We filed a 990 Tax Exempt Form online and it was approved. Our 8734 Non-Profit Organization status report has been approved by IRS. It is anticipated that income and expenses will be lower in 2008 due to the new cost structure of available cheaper electronic versions of ARGIA and BAO. Our status as a non-profit organization means we follow the society bylaws. We can make grants to fund research and/or travel expenses to people who want to give presentations at the annual meeting. DSA membership dues are tax deductible.

Jerrell Daigle gave a presentation proposing the 2009 DSA Annual Meeting be held in Missouri. The proposal was voted on and approved.

Jerrell Daigle announced tentative plans for the 2009 Southeastern meeting in Virginia and North Carolina.

Bryan Pfeiffer announced tentative plans for the 2009 Northeastern meeting in New England.

Bill Mauffray gave a report about the International Odonata Research Institute.

Jim Johnson gave an editor's report for John Abbott (Editor-in-chief) about ARGIA. Subscriptions can now be electronic in PDF format.

Ken Tennesen (Editor) reported on Bulletin of American Odonatology (BAO). BAO now accepts short notes and reports and is available in electronic PDF format.

Jim Johnson read a brief report from John Abbott about the OdonataCentral.org web site which has more than 900 registered users.

Dennis Paulson reported on the Checklist Committee and moderated a discussion about "Vouchering Dragonfly Records."

Nick and Ailsa Donnelly were presented with a plaque honoring their long service to DSA and the establishment of The Nick and Ailsa Donnelly Fellowship was announced. The fellowship will be funded from the savings in printing and mailing costs that result from electronic subscriptions to ARGIA and BAO. The funds will be used to help members who cannot afford to attend the annual meeting and give presentations.

Jim Johnson took the group photo during the break. 

BAO Reminder

Since we have completed Volume 10 of the Bulletin of American Odonatology, subscribers are encouraged to renew their subscription (those who have not already subscribed through Volume 11 or beyond). Use the form at <http://www.odonata-central.org/views/pdfs/DSA_Membership_Form.pdf> to renew or start a subscription to BAO—as well as renew your DSA membership for future years, if you wish.

Report on the Northeastern DSA Meeting

William J. Nichols Jr., Masters Candidate, Northern Illinois University, Dept of Biological Sciences Dekalb, IL 60115 <wnichols@niu.edu>, **Jenna R. McAdoo**, Masters Candidate, Northern Illinois University, Dept of Biological Sciences Dekalb, IL 60115 <jmcadoo@midtel.net>, **Erin White**, New York Natural Heritage Program, 625 Broadway, 5th Floor, Albany, NY 12233-4757 <elwhite@gw.dec.state.ny.us>, and **Jan Trybula**, Biology Department-SUNY Potsdam, 44 Pierrepont Avenue, Potsdam, NY 13676 <trybulj@potsdam.edu>

The Northeastern meeting of the Dragonfly Society of the Americas was held in Malone, New York on 26–29 June 2008. Malone is near both the Adirondack Mountains and the Saint Lawrence River Valley, which provided many different habitats in which to find odes! The weekend yielded fairly decent weather for the odonate enthusiasts, some who traveled quite a distance to the meeting. There were 43 people in attendance for at least one day of the four-day meeting.

We kicked off our meeting with a picnic Thursday night at the Malone Memorial Recreation Park where folks could meet new faces and reconnect with friends. On subsequent nights, we gathered in the evenings at the Malone campus of North Country Community College to go over the day's findings with each group. Our two main field days were Friday and Saturday, in which a group went north with Jan Trybula to survey Robert Moses State Park on the Saint Lawrence River, the Raquette River, and anywhere else one could bring a net. Another group went south with Erin White to the Visitors Interpretive Center at Paul Smiths, and other bog and brook habitats within the Adirondack Park.

The first day was filled with talk of finding *Gomphus ventricosus* (Skillet Clubtail), which had been seen on the Raquette River

in weeks prior to the event. This is big for New York, as prior to findings on the Raquette the past two years by Jan and his students, Skillets have not been confirmed in the state since 1928. Unfortunately, the Raquette did not provide this elusive fly that weekend. However, the St. Lawrence River at Robert Moses State Park did yield many fun finds as several exceptionally eager volunteers waded into the river up to their waists to catch *Didymops transversa* (Stream Cruiser). Robert Moses State Park was new territory for odonate enthusiasts since the site had no official records before this event. The workers at the Nature Center at the park are eager for a species list and this meeting has helped start one.

One particularly exciting site comes to mind when talking about the southern field trips. Dubbed the “unknown bog” or “big bog” by some of the group, *Somatochlora franklini* (Franklin's Emerald) was found by Sue and John Gregoire on Friday and George Nixon on Saturday. Many also observed a field of *Hagenius brevistylus* (Dragonhunter) feeding on baskettails at this site on Saturday. The most exciting site though was not even supposed to be a part of Saturday's events. On the way to the unknown bog, the caravan of cars traveling along a one-lane dirt road in the Adirondacks stopped and all of the occupants jumped out at the site of fluttering wings on Quebec Brook. During this adventure several exciting species were found and were new discoveries for many



Photo by Bryan Pfeiffer.

of the odonate lovers present. Many people waded into the water for a chance to catch a *Ophiogomphus aspersus* (Brooks Snaketail), *Cordulegaster maculata* (Twin-Spotted Spiketail), or *D. transversa*, among 23 total species.

Overall 66 species were found over the four day event. For a preliminary species listing for all of the survey sites combined please see Table 1. Further information is still available at the meeting web site, <<http://www2.potsdam.edu/trybulj/NEDSA/>>. These records will also contribute to the efforts of the New York Dragonfly and Damselfly Survey (<<http://www.dec.ny.gov/animals/31061.html>>) and the Adirondack All Taxa Biodiversity Inventory (<<http://www.adirondackbiodiversity.org>>). It is our hope that all of the odonate lovers at this meeting made new friends and contacts, as well as found many “lifers”. Special thanks to all who participated!

Table 1: Odonate species observed at all survey sites combined from 27–29 June for the NEDSA Malone Meeting. Some identifications are still pending review.

Zygoptera

CALOPTERYGIDAE

- Calopteryx aequabilis* (River Jewelwing)
- Calopteryx amata* (Superb Jewelwing)
- Calopteryx maculata* (Ebony Jewelwing)

LESTIDAE

- Lestes dryas* (Emerald Spreadwing)
- Lestes eurinus* (Amber-winged Spreadwing)
- Lestes inaequalis* (Elegant Spreadwing)

COENAGRIONIDAE

- Amphiagrion saucium* (Eastern Red Damsel)
- Argia fumipennis violacea* (Variable Dancer)
- Argia moesta* (Powdered Dancer)
- Chromagrion conditum* (Aurora Damsel)
- Enallagma antennatum* (Rainbow Bluet)
- Enallagma carunculatum* (Tule Bluet)
- Enallagma civile* (Familiar Bluet)
- Enallagma cyathigerum* (Northern Bluet)
- Enallagma ebrium* (Marsh Bluet)
- Enallagma exsulans* (Stream Bluet)
- Enallagma geminatum* (Skimming Bluet)
- Enallagma hageni* (Hagen's Bluet)
- Ischnura posita* (Fragile Forktail)
- Ischnura verticalis* (Eastern Forktail)
- Nehalennia gracilis* (Sphagnum Sprite)
- Nehalennia irene* (Sedge Sprite)

Anisoptera

AESHNIDAE

- Aeshna* sp. (Darner)
- Anax junius* (Common Green Darner)

- Basiaeschna janata* (Springtime Darner)—exuviae
- Boyeria grafiana* (Ocellated Darner)—emerging larvae
- Boyeria vinosa* (Fawn Darner)—exuviae

GOMPHIDAE

- Arigomphus* sp. (Clubtail)
- Dromogomphus spinosus* (Black-shouldered Spinyleg)
- Gomphus adelphus* (Mustached Clubtail)
- Gomphus borealis* (Beaverpond Clubtail)
- Gomphus descriptus* (Harpoon Clubtail)
- Gomphus exilis* (Lancet Clubtail)
- Gomphus lividus* (Ashy Clubtail)
- Gomphus spicatus* (Dusky Clubtail)
- Hagenius brevistylus* (Dragonhunter)
- Ophiogomphus anomalus* (Extra-striped Snaketail)
- Ophiogomphus aspersus* (Brook Snaketail)
- Ophiogomphus mainensis* (Maine Snaketail)
- Stylogomphus albistylus* (Least Clubtail)

CORDULEGASTRIDAE

- Cordulegaster maculata* (Twin-spotted Spiketail)

MACROMIIDAE

- Didymops transversa* (Stream Cruiser)
- Macromia illinoensis* (Swift River Cruiser)

CORDULIIDAE

- Cordulia shurtleffii* (American Emerald)
- Dorocordulia libera* (Racket-tailed Emerald)
- Epithea canis* (Beaverpond Baskettail)
- Epithea cynosura* (Common Baskettail)
- Epithea princeps* (Prince Baskettail)
- Neurocordulia yamaskanensis* (Stygian Shadowdragon)—exuviae
- Somatochlora elongata* (Ski-tailed Emerald)
- Somatochlora franklini* (Delicate Emerald)
- Somatochlora minor* (Ocellated Emerald)

LIBELLULIDAE

- Celithemis* sp. (Pennant)
- Erythemis simplicicollis* (Eastern Pondhawk)
- Ladona julia* (Chalk-fronted Corporal)
- Leucorrhinia frigida* (Frosted Whiteface)
- Leucorrhinia glacialis* (Crimson-ringed Whiteface)
- Leucorrhinia hudsonica* (Hudsonian Whiteface)
- Leucorrhinia intacta* (Dot-tailed Whiteface)
- Libellula luctuosa* (Widow Skimmer)
- Libellula pulchella* (Twelve-spotted Skimmer)
- Libellula quadrimaculata* (Four-spotted Skimmer)
- Nannothemis bella* (Elfin Skimmer)
- Plathemis lydia* (Common Whitetail)
- Sympetrum internum* (Cherry-faced Meadowhawk)
- Sympetrum obtrusum* (White-faced Meadowhawk)



The Modoc Experience: CalOdes/DSA Blitz IV

Douglas Aguillard, San Diego, California <doug@basiclink.com>

August 8, 2008 marked the start of the CalOdes/DSA Blitz IV. Our past Blitzes, in order, visited Modoc County, in extreme north-eastern California, followed by trips to Imperial County, and then to Inyo/Mono Counties. The purposes of these events are:

1. To survey areas of California that haven't had extensive dragonfly field work done.
2. To look for new state and/or county distribution records.
3. To bring new folks into this field and get acquainted with them.
4. To give the CalOdes membership a chance to get together at least once a year, spend time in the field together, to campout and talk all night, and to enjoy being together at days end.

Each year, the Blitz attracts more people. In 2005, seven people attended the first Blitz in Modoc County; 2006 brought ten folks to Imperial County, and then in 2007, 12 people came to Inyo and Mono Counties. For 2008, a total of 15 made it to Modoc. The only original members who have attended all four Blitz were Kathy and David Biggs (Sonoma County), Ray Bruun (Shasta County), and Doug Aguillard (San Diego County). Attending their third Blitz were Steven Bruun (Shasta County), Paul Johnson (San Benito County) and Pat Sherman (San Diego County). Second time Blitzers were Dave and Linda Blue (Inyo County), and we welcomed first time Blitzers, Gary Suttle (San Diego County), George Sappington (Shasta County), Karen DeMello (San Mateo County), Jan Hintermaster (Santa Clara County), Rob Santry (Shasta County) and Chris Heavilin (Contra Costa County).

With California being one of the largest states in the US, some may wonder "Why the return to Modoc after such a short time?" Our goal has always been to explore new areas throughout the state and alternate between the northern, central and southern sections of the State. Kathy Biggs and I originally planned for us to visit the Trinity Alps in Trinity County for our fourth Blitz since it is an area where little fieldwork had been done. But unfortunately, forest fires had been burning there for over a month, and they were not expected to be contained until the middle of August. Smoke and air quality was a concern for us. The decision to go back to Modoc was an easy one. It's a large area, and the urge to find the Pale Snaketail (*Ophiogomphus*

severus) was a strong lure as it would be a lifer for most of us. In California, this Snaketail is only found in the very most northeastern area of Modoc County.

Many of the Blitzers met in Adin, California, and started blitzing their way from Lassen County to Modoc. Patricia Sherman and I personally left a few days earlier and headed for Willow Lake (an ode hotspot) in Plumas County, and then we headed towards Alturas to join the group being led by the Biggs and Ray Bruun from Adin. David and Linda Blue were already in the Alturas area searching for odes, by the time we all came together. The majority of the group camped out together in Cedar Pass in the Warner Mountains, and was greeted by Striped Meadowhawks (*Sympetrum pallipes*) at our campsite. After setting up camp we went to Strough Pond located further up the Pass. We found many of the expected species, but nothing unusual. It was then back down to the North Fork of the Pitt River, where we searched for and found the River Jewelwing (*Calopteryx aequabilis*). It was then into Alturas for dinner, where Paul Johnson finally found us after searching for several hours. A good evening of catching up with folks back at the campsite was followed by a good night of sleeping.

The next morning, we headed for the eastern portion of Surprise Valley, on the eastern side of the Warner Mountains. Ray Bruun had selected a spot where he was told that a portion of Sand Creek had permanent water. He thought it would make a good area to search and he was right. After a long drive on the rutted and dusty trail and after passing a small herd of wild horses, we found Sand Creek to be in a beautiful little canyon that had cold fresh water running, surrounded by juniper trees and sagebrush.

We immediately found our ode: the Pale Snaketail. There were several among other dragons and damsels. We spent a lot of time in the area, and it was hard to leave as it was such a beautiful place. We made our way back to Surprise Valley, and started searching the area's hot springs (Leonard's and Seyferth's) and their associated hot creeks with water temps ranging from 140 degrees up to 180. The ode activity was amazing with many species found among the sagebrush and hot water. It was here that a decision to head to Fee Reservoir, a large body of water, was made and it became the only problem of our trip. We ended up getting lost out in the sagebrush and spent a lot of time searching for a route to get us there. We finally made it, but then we didn't find a lot of odes, so half the party

started heading back to camp, while the other half stayed and searched further. The group that left early stopped at a few spots along the road near old farm houses, where there were creeks or ditches filled with water, and very happily found more odes in large numbers.

Day two arrived with another beautiful morning; we headed south of Alturas to the Modoc National Wildlife Refuge, one of the known locations in the state of the Cherry-faced Meadowhawk (*Sympetrum internum*), another target species for many of us. This is another spot where we not only found our target species, but many other species were available for our pleasure. We spent a lot of time there, and then headed further south along Hwy 395 to the small town of Likely, California.

At Likely, we turned east towards Clear Lake. We were following the South fork of the Pitt River. Our convoy suddenly pulled off the side of the road, where a bridge crossed the river, and we immediately had a clubtail fly over our vehicles. By the time that it landed, up to eight people were standing over it. Its image was taken, and then it flew. It was determined at that point to be possibly a Great Basin Snaketail (*Ophiogomphus morrisoni*), not previously known from Modoc County. After a short period of searching, another clubtail landed nearby, where it was photographed, and then netted. It indeed turned out to be a Great Basin Snaketail, making it the first voucher record for Modoc County. This was our main county record of the event, which has continued our streak of finding new bugs on each outing.

A Hybrid Complex in *Enallagma*

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There have been several mentions of hybrid *Enallagma* in recent years. Catling (2001) described a hybrid *ebrium* (Marsh Bluet) and *hageni* (Hagen's Bluet). I have seen a putative hybrid *hageni* and *laterale* (New England Bluet) from Vermont, taken by Mike Blust.

Miller and Ivie's (1996) new species *Enallagma optimolocus*, from Montana, is currently regarded by most workers as a hybrid between *Enallagma anna* (River Bluet) and *E. carunculatum* (Tule Bluet). Shortly after its description Ken Tennessen found an additional male during a DSA trip to Crook County, Oregon. Jim Johnson (in press) further describes this hybrid and gives additional Oregon and California occurrences.

I described a hybrid between *anna* and *civile* (Familiar Bluet) from Ontario and Iowa (Donnelly, 2000). The rea-

We continued to stop at various locations along the Pitt River and enjoyed ourselves. Many folks searched for odes while enjoying soaking their feet in the cold waters flowing among the many rocks during the warmest part of the day. Common Green Darners (*Anax junius*) were abundant, seemingly in migration heading downstream.

The group continued up to Clear Lake, where they found an American Emerald (*Cordulia shurtleffi*), among others. Most folks had to leave then, or shortly thereafter. A few tried for Gray Sanddragon (*Progomphus borealis*) and Pacific Spiketail (*Cordulegaster dorsalis*) along Mill Creek below Clear Lake. There were sandbars, but no sanddragons; a spiketail was seen, but, yet again, it evaded the net and remains a sight only record. Paul Johnson and Dave and Kathy Biggs stayed on for a fourth day and returned to Goose Lake and to the high mountain lakes visited during our first blitz. Karen DeMello and Pat Hintermaster visited the lakes the prior day. At the high elevation lakes a Mountain Emerald (*Somatochlora semicircularis*) was netted and became the voucher specimen for Modoc County, in addition Four-spotted Skimmers (*Libellula quadrimaculata*) were found, bringing our total number of species seen during the blitz to 49.

Overall it was another wonderful Blitz, with sunshine, slight winds, and temps in the 80s. No snow this time in Modoc! We had a total of 47 species the first three days, if you count my trip to Willow Lake, which added White-faced Meadowhawk (*Sympetrum obtrusum*) to the list. 🦋

son for this brief note is to complete the hybrid complex triangle with illustrations of hybrids between *carunculatum* and *civile*, from Michigan (specimens loaned by Ken Tennessen) and New York. The latter specimen was nearly the only odonate collected during a dismal local field trip instructing the local naturalists' club about dragonflies. It was perched forlornly on a dead tree branch just beyond the edge of the Susquehanna River in Broome County, New York. I netted it simply to have a specimen to show the group and found to my surprise that it was a hybrid.

I also report here a probable additional *carunculatum* × *anna*, taken in eastern North Dakota. The specimen slipped from my grasp while being observed through a hand lens and flew off to an almost certainly barren future.

The illustrations show two views of the male terminalia.

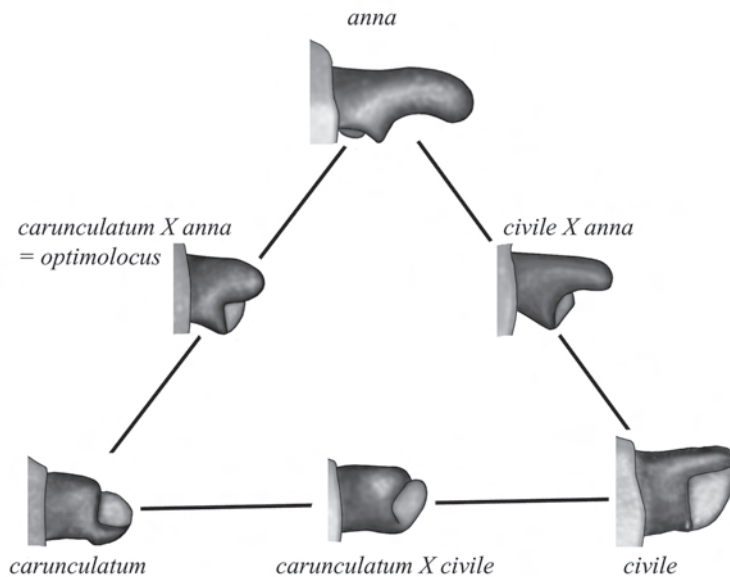


Fig. 1 Male terminalia (lateral view) of species and hybrids for *Enallagma anna* (River Bluet), *civile* (Familiar Bluet), and *carunculatum* (Tule Bluet).

The lateral view is conventional, but I find an inclined (lateral-dorsal) view more informative throughout the genus.

Hybridism has been somewhat neglected in the Odonata. It is likely to be even more neglected in the future as the interest in photographic identification of odonates grows,

donated a paratype of *E. optimolocus* and the aberrant *anna*.

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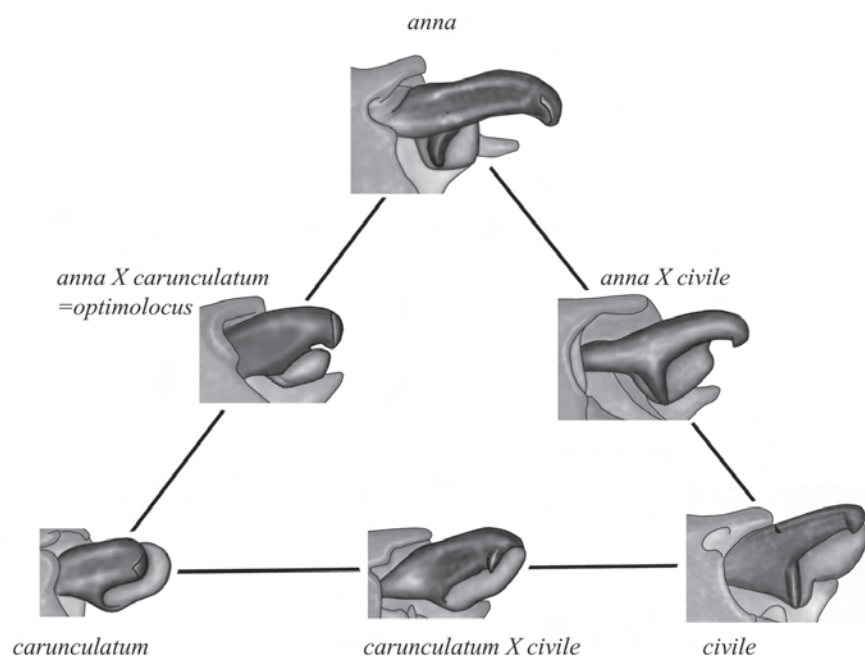


Fig. 2 Male terminalia (inclined view) of species and hybrids for *Enallagma anna* (River), *civile* (Familiar Bluet), and *carunculatum* (Tule Bluet).

and netting of specimens decreases. I would encourage the netting and close examination of *Enallagma*, as hybrids are likely to be found to be more common than presently suspected.

Over the years I have amassed a few specimens in this complex with aberrant, relatively short, male cerci. A putative *E. carunculatum* from Berkshire Co., Massachusetts was taken by Ginger Brown. I have three similar examples of *E. anna*: Cuming Co., Nebraska (Fred Sibley), Flathead County, Montana (Kelly Miller), Elmore Co., Idaho (T. Donnelly). I now wonder if these specimens might represent a result of hybridism. At any rate, we have a lot more to learn about these insects.

Acknowledgements

Specimens were loaned by Rosser Garrison, Ken Tennessen, and Colin Jones. Kelly Miller

An Interesting Record of Bird Predation on a Darner

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Over the years, the pages of ARGIA have documented several reports of birds preying upon odonates (Heldk, 1998; Moulton, 1998; Donnelly, 2002; Dunkle, 2002; Gallucci & Freeman, 2007). This note documents another such record.

On 8 August 2007, I was searching for butterflies and odonates in Garden Canyon in the Huachuca Mountains of Cochise County, Arizona. I was looking in the vicinity of a small stream which passes through oak woodland. The stream is about 1–1.5 meters across and several centimeters in depth with a gravel bottom with some riffles and occasional deeper pools.

I soon observed a teneral darner (Aeshnidae) in slow, fluttering flight moving slowly downstream. It appeared to be searching for a place to land, as it would land briefly on overhanging branches, perch for a moment, before it would take off again to fly a bit further downstream. As the darner moved slowly downstream, a Sulphur-bellied Flycatcher (*Myiodynastes luteiventris*), which had been calling in the area for about 10 minutes prior to my detection of the darner, swooped in and snagged the darner in its bill before flying off into the adjacent woodland.

I could not identify the species of darner involved, although I did observe *Oplonaeschna armata* (Riffle Darner) flying in the area. Also, this observation coincided with the flight period of *Rhionaeschna dugesi* (Arroyo Darner), and *Aeshna persephone* (Persephone's Darner) in Garden Canyon, so these species are possibilities for the darner in question.

Since the flycatcher flew off with the darner, I do not know the ultimate result of this incident.

What I find most interesting about this observation is the size of the bird relative to its prey. The flycatcher is approximately eight inches long. The darner is approximately half that size. In contrast to some other reports of bird predation upon odonates that describe larger birds such as falcons, grebes, and herons preying on odonates, this observation illustrates that much smaller birds are also capable of taking dragonflies and damselflies.

I offer this as a contribution to the growing list of records of bird predation on odonates.

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Cedar Waxwing (*Bombicilla cedrorum*) Cooperative Hunting of *Celithemis elisa* (Calico Pennant) Teneral

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In previous ARGIA notes on *Celithemis* emergence we have mentioned cooperative hunting of *elisa* and other tenerals by Cedar Waxwings. While flycatcher and other avian predation of odonates are often mentioned, we were struck by the innate intelligence and adaptive behavior we observed during our *Anax* and *Celithemis* surveys this summer.

From the cooperative hunting lens, we have noted very little single bird ode predation by waxwings although that


is quite normal for Common Grackles and Red-winged Blackbirds in their solo hunts for gomphid larvae and tenerals.

The waxwings always used one of a variety of cooperative techniques to flush and capture tenerals; they seldom bothered adults. Additionally, they discerned a decent sized meal (*Celithemis*) from lesser prey, such as the hordes of emerging *Enallagma* and *Ischnura*.

Typically, one or two waxwings would fly low over the pond's surrounding vegetation thereby forcing the teneral to flush and fly. At that point, one to six waxwings would make attack passes on the larger teneral. As opposed to other avian species that delicately remove odonate wings before ingesting head, thorax and abdomen, the waxwings swallowed their prey whole. Once sated, hunters and beaters would swap duties.

These actions in themselves are remarkable, but the story goes on. These birds quickly noted our daily circumambulations of the pond as we counted emerging *elisas* and collected *Anax junius* exuviae. Within a day or two, waxwing scouts announced our approach and the flock separated into two or three hunting echelons. Obviously, we had relieved them of beater duties as we were much more efficient at the flush!

How efficient a feeding strategy is this? On two of our slower rounds, we counted both the numbers of *Celithemis elisa* emerging and those taken by waxwings. Both days showed a 75% success ratio! That's better than one has catching a restaurant waiter's attention these days.

One cannot closely observe such behavior without pondering the depths of innate intelligence in vertebrates, but we'll leave that for more lofty discussions. From the ornithologists cum odonatologist view, we enjoyed a little tit for tat by mist-netting and banding quite a few distracted Cedar Waxwings. 

Celithemis elisa (Calico Pennant) Does It Again

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The 2008 emergence period for *Celithemis elisa* (Calico Pennant) has come and gone and, once again, they did not disappoint.

A brief overview: For the past four years this species had emerged in very large numbers from a pond on our sanctuary. The property is located in the Finger Lakes Highlands of New York and is 60 acres of field, forest and stream with 10 ponds of various sizes and depths. The pond at the center of all our studies is only 35 × 40 meters across, 18 feet deep and eight years old. The bottom is covered with *Chara*, a plant-like alga that provides optimum habitat for aquatic animals of all descriptions, and the only fish are Fathead Minnows. During the years 2005 to the present, we have conducted daily counts of emerging *C. elisa* from the start of their season to the last day and beyond (ARGIA 19[1]: 10–11; 20[1]: 14–15).

The sheer numbers are rather impressive, almost to the point of being unbelievable, and their emergence strategy is very interesting. Although the emergence period is quite long, over about two months, in all four years the species has chosen a period of just several days during the first couple of weeks in June as the time for major emergence.


By major emergence I mean thousands within five days.

I can safely say they emerged in droves “come hell or high water”. In 2006 we had heavy rain and flooding during the peak period, but some came anyway. In 2007 we had a horrible drought that created an extensive beach, but that didn't stop them either. This year, 2008, was as perfect as perfect can be and we had the highest peak period count yet.

During our counts we noticed behavior by not only these dragonflies but by other animals as well. Once the Cedar Waxwings make the discovery that there is a meal handy, they work in unison to flush and snap up weak teneral as they flutter off on their maiden flight. This has become an annual event.

This year ants appeared to enjoy overcoming vulnerable emergers by boring a hole and cleaning them out from within. While watching that, I timed a nearby *C. elisa* larva on another stem go from larva to maiden flight in an hour and a half!

As the pond ages we expect the phenomenon to subside, assuming *C. elisa* is undergoing a colonizing stage that

will eventually level off. We intend to keep tabs on this species and continue to monitor their behavior. Personally, I hope they entertain and dazzle us for many years to come. 

Here are some numbers gained during our single daily counts around the pond

| Year | Top 5 Days | Total During Top 5 Days | Overall Total | Emergence Period |
|------|------------|-------------------------|---------------|------------------|
| 2005 | 7–11 June | 2,028 | 2,455 | N/A (late start) |
| 2006 | 5–9 June | 5,169 | 10,945 | 63 days |
| 2007 | 2–6 June | 4,892 | 6,497 | 61 days |
| 2008 | 8–12 June | 6,244 | 8,237 | 64 days |

Educating New York's Finger Lakes Visitors to *Tachopteryx*

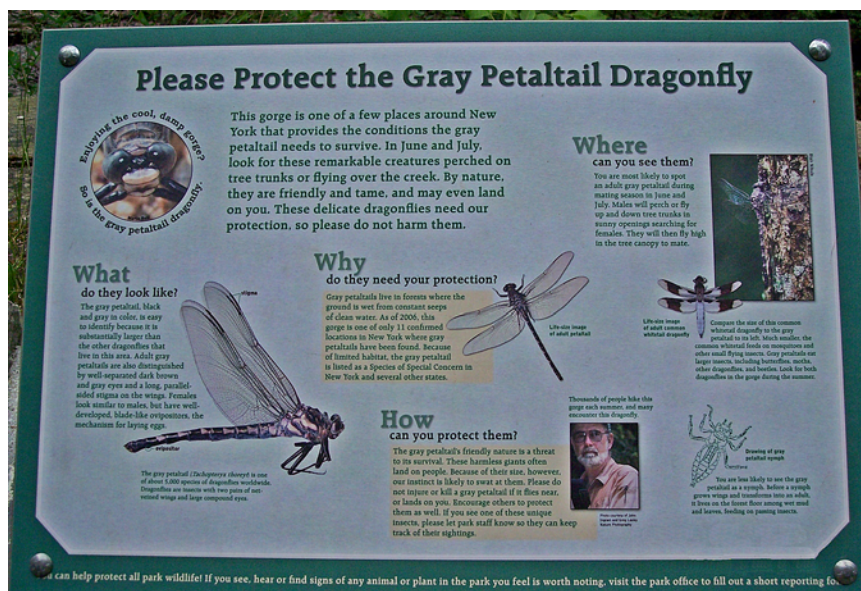
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The Watkins Glen, New York gorge and other such attractions are visited by hundreds of thousands of tourists each year. Eleven venues in the Finger Lakes Parks system are home to adult *Tachopteryx thoreyi*, the Gray Petaltail.


During our many visits to the Glen gorge, we've seen and heard tales of big dragonflies in a plethora of languages. Most, if not all, were in the form of dire warnings of what those "darning" or "sewing" needles would do to ones lips, nose, ears and other assorted body parts, not to mention all the "stinger" anecdotes.

Unfortunately, *Tachopteryx* is a gregarious soul and truly enjoys perching in easy reach on safety walls, gorge shale and people! Who knows how many have been swatted and dispatched over the years—certainly more than are collected as collecting in New York's state parks require a specific permit.

A few years ago we proposed and then helped design educational placards with the area staff of the Office of Parks, Recreation and Historic Preservation (OPRHP). This spring, and just in time for the petaltail flight sea-



son, these colorful signs (see photo) have been installed at several locations within each of the parks known to host *Tachopteryx*.

We may thus save a few and keep our gorge species going long enough to discover its breeding habitat preferences while also educating thousands of people internationally. All our science has to date is a single anecdotal report of a female laying eggs in a seep feeding a gorge—despite seasonal searches by a number of paid and volunteer researchers. 

Dragonflies and Damselflies for the 2008 Season: New Records from the Texas Panhandle, Hill Country, and San Antonio

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With 13 new photographic records submitted for Lubbock County, Texas, in 2006 and 15 in 2007, perhaps it would be wishful thinking that 2008 would turn up even more record totals than the previous two seasons. And indeed such is wishful thinking, for this season has turned up only four new Lubbock County records to date. But with at least three more months remaining of the season, who knows what may yet be discovered? The 2008 season has had its surprises, though, with new records for *Libellula composita* (Bleached Skimmer), *Libellula vibrans*

(Great Blue Skimmer), *Progomphus obscurus* (Common Sanddragon), and *Enallagma basidens* (Double-striped Bluet).

Whereas the latter two were quite expected, the first two were pleasant surprises. I observed and photographed the male *Libellula composita* (OC 282355) on 4 June at Lubbock Lake Landmark (located on the northwest side of the city of Lubbock) and thought its presence might be the result of being blown off course by the westerly winds

that hit Lubbock hard in late May to early June this year. However, upon closer inspection, it became obvious that this species was not yet mature and likely not possible it would have survived such a journey from eastern New Mexico or extreme southwestern Texas.

I obtained photos of a male *Libellula vibrans* (OC 283485) on 12 August at Llano Estacado Audubon Trail (located four miles south southeast of Lubbock at Buffalo Springs Lake). This species was patrolling a small, shaded streambed that feeds a swampy area on the north side of the creek (North Fork of the Double Mountain Fork). *L. vibrans* was in company with several other species which included *Anax junius* (Common Green Darner), *L. comanche* (Comanche Skimmer), *L. pulchella* (Twelve-spotted Skimmer), *L. saturata* (Flame Skimmer), and *Rhionaeschna multicolor* (Blue-eyed Darner).

I observed and obtained photos of a male *Progomphus obscurus* (OC 282320) on 27 May at Ransom Canyon, Texas (located about two miles east of Buffalo Springs Lake) perched on a small man-made spillway that empties from the lake into the other end of the North Fork. He was not too wary and afforded me several decent photos. The last new species record was of a male and female *Enallagma basidens* (OC 282189) on 13 May at Llano Estacado Audubon Trail. Several females were also observed and photographed ovipositing unguarded by males and almost completely submerged.

However, the majority of the new records I have posted on OdonataCentral (<www.odonatacentral.org>) are from outside of Lubbock County. While I photographed many more than those listed below, the list was generated from those that were not previously documented in a given county or records that, heretofore, were represented by the dot-map project and not specific records on OdonataCentral. They are listed below under the counties from which they were obtained and are arranged alphabetically. All were photographic submissions only.

Bexar County

Enallagma novaehispaniae (Neotropical Bluet)
Erythemis vesiculosa (Great Pondhawk)

Briscoe County

Argia sedula (Blue-ringed Dancer)
Dythemis fugax (Checkered Setwing)
Dythemis velox (Swift Setwing)
Dromogomphus spoliatus (Flag-tailed Spinyleg)
Gomphus militaris (Sulphur-tipped Clubtail)
Pantala hymenaea (Spot-winged Glider)
Sympetrum corruptum (Variegated Meadowhawk)

Garza County

Argia moesta (Powdered Dancer)
Argia sedula (Blue-ringed Dancer)
Hetaerina americana (American Rubyspot)

Gillespie County

Argia immunda (Kiowa Dancer)
Libellula saturata (Flame Skimmer)

Kendall County

Argia moesta (Powdered Dancer)
Argia sedula (Blue-ringed Dancer)
Argia translata (Dusky Dancer)
Brachymesia gravida (Four-spotted Pennant)
Brechmorhoga mendax (Pale-faced Clubskimmer)
Dythemis velox (Swift Setwing)
Erpetogomphus designatus (Eastern Ringtail)
Erythemis simplicicollis (Common Pondhawk)
Gomphus militaris (Sulphur-tipped Clubtail)
Hetaerina americana (American Rubyspot)
Libellula luctuosa (Widow Skimmer)
Micrathyria hagenii (Thornbush Dasher)
Orthemis ferruginea (Roseate Skimmer)
Pachydiplax longipennis (Blue Dasher)
Pantala flavescens (Wandering Glider)
Perithemis tenera (Eastern Amberwing)
Phyllogomphoides stigmatus (Four-striped Leaf-tail)

McCulloch County


Dythemis fugax (Checkered Setwing)
Dythemis velox (Swift Setwing)
Erpetogomphus designatus (Eastern Ringtail)
Dromogomphus spoliatus (Flag-tailed Spinyleg)

Tom Green County

Brachymesia gravida (Four-spotted Pennant)
Erythemis simplicicollis (Common Pondhawk)
Perithemis tenera (Eastern Amberwing)

A special thank you is in order for Dr. John C. Abbott for all his help in helping me to identify species and for his undying enthusiasm and encouragement. Also, thanks to Dennis Paulson and Sidney Dunkle who have been most gracious in their comments and responses to e-mails.

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Didymops and *Macromia* Go Walkabout: Long Distance Crawls by Odonate Larvae to Emergence Sites

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On 14 June 2008, we discovered a fresh-appearing exuvia of *Didymops transversa* (Stream Cruiser; Fig. 1) under the eaves of a summer house by Long Lake, Traverse City, Michigan (44.742° N, 85.753° W). The emergence site was 50.3 m (165 ft) from the lake edge and 2.7 m above the ground. Although macromiids are known among odonates for traveling away from the immediate water's edge to emerge (D. Paulson, pers. comm.; note under *D. transversa* in Needham et al., 2000), the distances we document here seem exceptional when compared with published records. For example, Corbet (2004, pp. 237–240 and Appendix A7.4) discusses distances larvae travel to emergence sites and lists published lengths and heights of the longest recorded trips by 33 species of odonate larvae. Those records range to a maximum of 46 m, with only seven of the 33 species exceeding 20 m. Distances in that range appear to be routine for both *D. transversa* and *Macromia illinoensis* (Illinois River Cruiser) at Long Lake. (*M. illinoensis* emerges later in the season but travels distances similar to *D. transversa* and emerges on many of the same sites. We could detect no differences in emergence site use by the two species.)

In June and July 2008 we found over 100 exuviae and

emerging adults of those two species. Larvae presumably emerge more often on natural vegetation than on man-made structures, but we found only three *M. illinoensis* (and no *Didymops*) emergence sites on trees: one 18.3 m from the lake and 4.0 m up, another 34.4 m in and 0.8 m up, a third 36.6 m in and 5.1 m up. Exuviae were so much more conspicuous on structures that most of the exuviae we found were on sheds and houses. We found exuviae commonly at bath/boathouses 2–8 m from the lake edge and 2–3 m above the ground. Farther back, on a house that ranged from 17.8 m from the lake (at the closest corner) to 29 m (at the far corners), emerging adults could be seen on most days, and on 29 June we counted 39 accumulated exuviae on that house, between 1 and 4 m above the ground (and between 4.4 and 7.4 m above the lake, since that house is up a steep bank from the water). We found a few exuviae on another house about 10 m from the lake, but up a steeply sloping 8 m bank, so 10 m above the water. The longest distance traveled by a *D. transversa* is listed at the top of this note. For *M. illinoensis*, the “record” was 46.3 m from the lake and 2.8 m up. Those two trips were the only two exuviae we observed on that particular structure—larvae seem to travel that far only occasionally. All the figures above except the three tree

sites were influenced, of course, by the availability and location of the structures.



Figure 1. Exuvia of *Didymops transversa*. Long Lake, Traverse City, Michigan.

Although sites away from the immediate shore probably provide some escape from predators that exploit emerging dragonflies, the benefits of such long trips as we document here are a bit mysterious. All the structures where we found exuviae were in wooded areas, and some larvae would have to have crawled past dozens of apparently suitable trees for emerging. Presumably the long crawls themselves pose some risk from terrestrial predators such as rodents and toads.

In Corbet's (2004) table, *Macromia illinoensis* is listed, with a longest horizontal distance traveled of 6 m and a greatest height of 4.6 m.

Perhaps there is something distinctive about the site we visited that leads to longer emergence crawls, but we have no hypothesis as to what, except that the site is a lake, and both species (while regular at lakes with wave action) are commonly associated with streams and rivers. We present some habitat details here, in case they are of use for comparison to other sites. Long Lake is a large (1160 ha), mesotrophic lake. The woods between the houses and the lake are in low places and contain fairly mature Eastern Hemlock (*Tsuga canadensis*), Sugar Maple (*Acer saccharum*) and Northern Red Oak (*Quercus borealis*). The forest floor is covered with a mixture of hemlock needles and deciduous leaves. We estimated at least 80% of the forest floor is leaf litter bare of any vegetation. The patches with vegetation have moderate herbaceous cover and include Sarsaparilla (*Aralia nudicaulis*), Bracken Fern (*Pteridium aquilinum*), Interrupted Fern (*Osmunda claytonia*), and various wildflowers including Canada Mayflower (*Maianthemum canadense*) and Bluebead Lily (*Clintonia borealis*). Shrubs (largely Huckleberry, *Vaccinium* sp.) and grass are present in a band extending 1–5 m back from the beach. In higher areas Red Pine (*Pinus resinosa*) dominates the canopy and understory vegetation is even sparser.


Why exactly do the larvae pass by so many seemingly suitable trees? Do crawling larvae make test climbs up trees (like sea turtle “false crawls”) and then abandon them if they decide they’re not good enough? Or is it one long ground-level march until the final ascent? Did we find so many exuviae on buildings strictly due to their being obvious there, or do the larvae actually prefer the buildings—

does the silhouette of a house against the sky exert a draw on the larvae that causes them to ignore trees and keep crawling? We also have not determined whether larvae are more likely to make the longest trips on rainier (or drier) nights. We are curious about the progress of these long emergence marches, but haven’t yet figured out a way to observe them. Any suggestions?

Acknowledgement

Thanks to Dennis Paulson for suggesting we write a note about our observations.

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Very Unusual Gomphid Oviposition Behavior—a Consequence of Extreme Crowding?

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Of all the marvelous moments of the Oregon DSA meeting this summer (and there were many, thanks to Steve and Jim), the behavior of *Octogomphus specularis* (Grapple-Tail) was the most fascinating for me. I had encountered this species only once previously and had seen nothing remarkable about its behavior. It was your typical stream gomphid: males waited patiently along a stream, either for females bent on mating or other males muscling into their territories. Nothing prepared me for the abundance of *Octogomphus* along the outlet stream of Gold Lake (Lane County, Oregon), which we visited on the final day of the meeting

There were *Octogomphus* on every rock. Several times I counted seven per rock. Besides these crowded rocks, the

alder trees along the stream had many more, partially hidden in the leaves where they perched. I estimated that a 20-meter stretch of stream had conservatively a minimum of a hundred eager males.


I found several instances of groups of four males arranged in what a crystallographer (I cannot escape my mineralogical career) knows as a close-packed arrangement. This is the familiar honey-comb pattern, which is hexagonal close-packed in two dimensions, with the unit cell a rhombic quadrilateral. The unit spacing (measured at their center of gravity at the rear of the thorax) was almost exactly, and remarkably uniformly, four inches. This represents the “personal space” required by each competing male. I have never seen anything like this in the world of dragonflies.

During the Valentine, Nebraska, meeting in the summer of 1998, when the temperatures soared to records of well over 100 degrees each day, many of us saw an analogous one-dimensional close packing (spacing about two inches) of perched *Rhionaeschna multicolor* (Blue-eyed Darner) hanging beneath branches. But this was a resting (and heat avoidance) behavior and had nothing to do with mating activity.

I had never encountered females of *Octogomphus*, and I was anxious to observe their mating behavior. Females were scarce (wouldn't you be scarce?). A few females appeared quickly to oviposit "normally", tapping their abdomen tips on the water surface during a brief horizontal flight over the water surface. Their oviposition flights were very rapid, with the female tapping the water only once or twice and then fleeing for the trees with a male or two in hot pursuit. It was not easy to distinguish these from males hitting the water surface, which I attribute to drinking.

I saw one female laying eggs beneath a fallen, horizontal tree trunk, which lodged about six inches above the water surface, and which afforded sufficient privacy that the female could lay her eggs without attracting the notice of the nearby males. The female was about six back from the open stream and was effectively hidden (except that this odonatist is even more persistent than a sex-crazed male *Octogomphus*).


The most interesting female *Octogomphus* attracted my attention by perching on the rocks amidst the males, who paid it no attention at all. Apparently a perching female who behaves like a male excites no interest at all among the males, who are, however, very quick to chase and intercept flying females. Anyway, this particular female, when I approached, flew several meters to a horizontal floating log, again landing amidst close-packed males. When I approached a second time it flew less than a foot and landed just above the water on the vertical surface of the log. It quickly rotated its abdomen vertically and climbed downward until the last centimeter of the body was in the water. It remained briefly (full disclosure: I netted it) in this position, where it extruded a large mass of bright salmon-orange eggs. I have only seen oviposition like this among damselflies and some aeshnids, but in these cases the eggs are inserted into plant material. This is the only time I have seen eggs extruded slowly into open water by a perched dragonfly.

I think this apparently aberrant oviposition was the result of extreme crowding. I had never appreciated how daunting it is for a female to function when in an extremely crowded circumstance. 

***Pachydiplax longipennis* (Blue Dasher) Flying with Exuvia Attached**

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While on a dragonfly-watching walk around Kelly Pond on Sonoma State University's Fairfield Osborn Preserve in Sonoma County, California, on 14 June 2008, we spotted a *Pachydiplax longipennis* (Blue Dasher) which appeared to

have an exuvia attached to the top of the thorax. The dragonfly was perched on emergent vegetation on the edge of the pond (see photo). It appeared to be a male, not fully mature (i.e., without bluish pruinescence or bright green eyes) but not teneral, either. When we netted the dragonfly, the exuvia became detached, and at this time we noticed that the point of attachment was the anterior right wing, which had apparently not fully emerged from the larval wing sheath. Upon detachment, the dragonfly was left with three good wings and a small stub for the fourth. It was still able to fly off when released, although its flight was not as rapid or as strong as it might have been if it had four good wings. As the dragonfly did not appear to be teneral (i.e., had probably not just emerged that morning) it would appear that it had been able to fly and survive for at least one day with the exuvia attached. 



Spiders Residing in Odonate Exuviae—An Update and Request for Information

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In early August, at the DSA annual meeting in Bend, Oregon, I gave a presentation on the use of dragonfly exuviae for roosting and nesting by a jumping spider, *Sassacus vitis*. I have observed this behavior to be fairly common at a site along the American River near my home in Sacramento, California, but would like to get a better idea of just how widespread this practice might be (the spider in question is common and wide-ranging in western North America, from British Columbia to Panama). As luck would have it, the day after my presentation, Steve Krotzer told me he had found a small jumping spider in an exuvia of *Macromia magnifica* (Western River Cruiser) he had collected along the John Day River a few days prior.

Steve graciously provided me with the spider, and lo and behold—it was a male *Sassacus vitis*!

I know a lot of ARGIA readers collect exuviae, at least occasionally, and would love to hear from any of you about any spiders, especially—but not limited to, jumping spiders, you may find in them. You may even send me specimens (alive or dead) if you like.



Notes on the Fragile Habitat, Distribution, and Ecology of the Bleached Skimmer (*Libellula composita*)

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General Distribution

Libellula composita (Bleached Skimmer) described by Herman Hagen in 1873 is considered rare across its range in western North America. It is most commonly associated with brackish outflow from sink holes, and is most always associated with relict Pupfish populations throughout its range in the desert Southwest. In its northern range in the Great Basin the Bleached Skimmer is associated with relict habitats from the ancient Lake Bonneville also showing relict fish populations like the Jane Chub (Utah Lake), Bonneville Cisco (Bear Lake), and Least Chub (Fish Springs NWR). The Bleached Skimmer is so closely associated with relict Pupfish populations in the desert southwest that it could be used as an indicator of relict or extinct Pupfish populations.

The Bleached Skimmer is found in the same habitat as the Devil's Hole Pupfish and Ash Meadows area of Nevada; the Death Valley Pupfish, Salt Creek Pupfish, Owens Valley Pupfish, and the extinct Tecopa Pupfish of California; Desert Pupfish south into the Imperial Valley; Desert Pupfish of southern Arizona; Comanche Springs Pupfish; Leon Springs Pupfish of west Texas; and Red River Pupfish of the Oklahoma and Texas Panhandle. Here in New Mexico the Bleached Skimmer is found in the habitat of the Pecos Pupfish and White Sands Pupfish. All are relict habitats of ancient shallow seas that once covered these areas like the Permian and Paradox Seas and the ancient

Lake Bonneville of the Great Basin. The largest documented populations of the Bleached Skimmer are found on the Bitter Lake National Wildlife Refuge, Bottomless Lakes State Park, and the Overflow Wetlands Wildlife Habitat Area in southeastern New Mexico.

Description

The Bleached Skimmer is recognized by its bleached, almost ghost-like appearance showing a white face and pearl gray eyes. The thorax and abdomen are a light tan edged in black along the sutures becoming pruinose white or blue, giving them the bleached appearance. The leading edge of the wings, the costa, is white to bright yellow. There is a saffron to amber colored wing patch at the base of each wing and an small amber spot at the nodus. Total length is up to 50 mm (2 inches) with a wing span of about 80 mm (3 inches). Its white to yellow costa is unique among the skimmers.

Habitat and Ecology

Although the Bleached Skimmer is found on man-made impoundments on the Bitter Lake National Wildlife Refuge, it is primarily found on the brackish outflow (sheet flow) from the gypsum sinks and saline spring fed pools. Examples are the Overflow Wetlands from Bottomless Lakes State Park; the outflow from Sago Springs on the refuge; the spring fed saline pools on the east side of

Chain Lakes in Chaves County; and the outflow from Perch Lake and Twin Lake (sinks) in Guadalupe County, New Mexico.

They are found most abundantly in shallow sheet flow through Salt Grass flats containing Iodine Bush, Sea Lavender, and Pickleweed and about sinks and pools containing Stonewort and emergent Salt Grass. The salinity in the skimmer's aquatic habitat ranges from 1.4% to 3.5% on the Bitter Lake Refuge. This same habitat type is common in the Owens, Imperial and Death Valleys of California; Fish Springs in Utah, and the Ash Meadows of Nevada. In all these habitats the Bleached Skimmer is most often associated with the somewhat rare *Argia alberta* (Paiute Dancer), *Erythemis collocata* (Western Pondhawk), and *Ischnura barberi* (Desert Forktail). In southern New Mexico the primary food source for the Bleached Skimmer is butterflies, especially the Western Pygmy Blue which are abundant in the saline aquatic habitats. The Pygmy Blue is especially attracted to the Four-winged Salt Bush and the Inland Sea Lavender. Oviposition is generally in tandem on open waters of sinks and spring fed pools. But, females oviposit independently, unguarded by the male, in shallow sheet flow of the Salt Grass flats by tapping her eggs into small pockets of water between the Salt Grass where there is less predation on eggs by Pupfish.

Threats to the Habitat

The main threat to the habitat of the Bleached Skimmer is the depletion of ground water by well pumping and the elimination of outflow from the gypsum sink holes out onto the alkali flats, and the human modification of critical sinks. The outflow from the Bitter Lake north tract Ink Pot and many of the sinks on the middle tract of the refuge stopped in the 1950s. The Tecopa sinks were modified in the late 1940s and early 1950s which caused the extinction of the Tecopa Pupfish in California. The outflow from Leon Springs and Comanche Springs in Texas ended in the mid 1950s due to the depletion of groundwater by pumping. Those original sink habitats at Fort Stockton and Leon Springs in Texas are now gone. The Owens Valley habitat, now in restoration, was depleted by the demand for water in the Los Angeles Basin, and the Devil's Hole and Ash Meadows habitats of Nevada are threatened by the demand for water by metropolitan Las Vegas.

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First Arizona Record of Narrow-striped Forceptail (*Aphylla protracta*)

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On 16 July 2008 at 0900 hrs, a male Narrow-striped Forceptail (*Aphylla protracta*) was discovered at Twin Ponds, San Bernardino NWR, Cochise Co., Arizona. It was perched about 0.3 m above the water on a bent cattail (*Typha*) stalk. At 0956 hrs, a copulating pair of this species was observed hanging vertically on a shaded *Typha* leaf c. 2 m above the water. Recognizable photos of the male were obtained and copies were sent for review to Richard Bailowitz, Doug Danforth, Dennis Paulson, and Sandy Upson. On 22 July, presumably this same male was briefly observed, and once again on 31 July when better photos were obtained. There were no additional observations of the female. The location is 31° 20.39' N 109° 15.88' W at an elevation of 1138 m. It is c. 23 km east of Douglas, Arizona and 0.65 km north of the Mexican border. This is the first confirmed record of any member of the genus *Aphylla* in Arizona.

Aphylla protracta is a resident of south Texas and both slopes of Mexico, ranging southward through Central America to Costa Rica (Garrison, 1986). In Sonora, Mexico, it has been taken from sea level to 1400 m and as close as the Río Bavispe bridge in Huasabas—a distance of c. 159 km south of Twin Pond (Upson et al., 2007). The single record for Chihuahua, Mexico was an individual noted at the Río La Palotada, only 99 km southeast of Twin Ponds (Behrstock et al., 2007).

Created in 1982 to protect aquatic resources and several species of endangered fishes, San Bernardino NWR hosts a rich assortment of Odonata. Approximately 70 species have been recorded at a dozen artesian-fed ponds, and two rain-fed streams. The refuge lies at the headwaters of the Río Yaqui, which receives water from southeastern Arizona, northeastern Sonora, and northwestern Chihuahua and then flows southwestward through the state of Sonora, before emptying into the Gulf of California. Other species found on the refuge that are more characteristic of northwest Mexico and may have used the Río Yaqui as a corridor for dispersal include the first U.S. records of Yaqui Dancer (*Argia carlcooki*) and White-tipped Sylph


(*Macrothemis pseudimitans*) (Behrstock et al., 2004; Danforth & Bailowitz, 2007).

Note that during the 1995 DSA annual meeting field trip, Jerrell Daigle and Ailsa Donnelly observed what appeared to be an *Aphylla* at the Slaughter Ranch Pond, located only 1.4 km southwest of Twin Ponds.

Acknowledgements

Thanks to the abovementioned odonatologists and to Sid Dunkle for reviewing my photos, and to Bill Radke, Manager of San Bernardino National Wildlife Refuge, for encouraging ongoing studies of Odonata on the Refuge.

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Triacanthagyna caribbea (Caribbean Darner) in Texas: Another U.S. Record

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On 13 November 2007 at 11:04 AM, I found a male *Triacanthagyna caribbea* (Caribbean Darner) at Santa Ana National Wildlife Refuge in the Lower Rio Grande

valley of Texas. The darner was observed flying through shadowed woodlands on a trail west of the visitor center. After following the dragonfly to where it landed, I

immediately set up my Swarovski scope in an attempt to digiscope it before moving in for a closer photo attempt. I moved in slowly, with my point-and-shoot held far in front of me. I've found that insects do not always notice large, slow-moving objects, and this trick frequently works. The darner obliged, at one point transferring sperm to its accessory genitalia, and I was able to get satisfactory dorsal and lateral photos before it flushed.

Unfortunately, I did not come to realize the identification or significance of this sighting until recently. Though I was happy with my photos, I dismissed this darner as *Gynacantha mexicana* (Bar-sided Darner). The pinched S3, *Gynacantha*-like flight, and apparent lack of other choices convinced me it was *G. mexicana*. Furthermore, I had encountered *G. mexicana* at Hugh Ramsey Nature Park a couple days earlier. Recently, while sorting through photos from a March 2008 trip to La Selva Biological Station in Costa Rica, I realized that the *G. mexicana* I found trapped in their cafeteria looked nothing like my Texas darner, but actually appeared to be a *Triacanthagyna*.


I used the key found in Needham, Westfall and May (2000) to confirm the genus identity, while comparing photos of *T. trifida* I had taken in Florida. According to OdonataCentral (<<http://www.odonatacentral.org>>), the closest known *T. trifida* record is over 900 miles east in Florida (or Cuba). I suspected a tropical member of the genus was more likely, and was elated when an internet search produced an online PDF of E.B. Williamson's 1923

key. The thoracic markings, pinched S3, cerci shape, and pale green first and second femora suggested *T. caribbea*. E-mails to Dennis Paulson and John Abbott returned with their "good record keeping seal of approval," both of whom added that yellow in the last couple abdominal segments was also consistent with *T. caribbea*.

It remains to be seen if this record represents a stray individual, though a variety of interesting habitats are preserved within Santa Ana NWR and an overlooked breeding population is possible.

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[See the photo of this beautiful insect on the front cover of this issue. It has recently been seen in the lower Rio Grande Valley on multiple occasions. Ed.]

Prairie Bluet (*Coenagrion angulatum*): A New Record for Alaska with Notes on its Habitat and Other Odonate Species Found Near Kanuti Lake, Kanuti National Wildlife Refuge

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Alaska is over 1.7 million square kilometers in size—2 ½ times bigger than Texas—with most of the state consisting of remote, rugged, and largely roadless land. It should therefore come as no surprise that the Odonata of Alaska are poorly known. The state is so under-surveyed that even a modest collecting effort can yield new state records, and certainly range extensions. Yet only a handful of people are actively collecting these insects in the Last Frontier. Thus, in the fall of 2005, JH was excited to receive a batch

of unidentified adult odonates collected near the Arctic Circle, within Alaska's Kanuti National Wildlife Refuge (NWR). The specimens were part of a baseline inventory of insects conducted by refuge biologist LS and her crew in the summer of 2004. Sixteen months later they found their way to JH who, on a dark and rainy evening, sat at his kitchen table armed with a hand lens and reading lamp, anxiously identifying the specimens.



Lisa Saperstein surveys the plant community at Kanuti Lake, Kanuti NWR, Alaska.

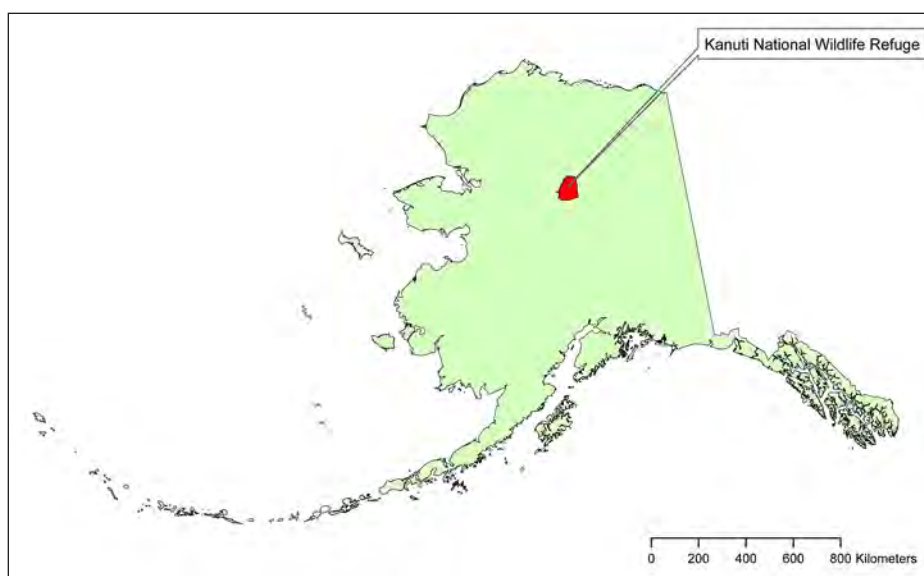
bia until 1997 when several populations were discovered in the northeastern portion of the province (Ramsey & Cannings, 2000). The distribution of *C. angulatum* extends from northwestern Iowa through the Dakotas and across the southern half of Manitoba, Saskatchewan, and Alberta, with isolated records of the species in northeastern British Columbia, the Northwest Territories, southwestern Ontario, and now Alaska (Paulson, in press). The species has not been found in the Yukon Territory (Cameron Eckert, pers. comm.) The Kanuti Lake record extends the range more than 700 kilometers west from the nearest record in Canada's Northwest Territories (Catling, 2003).

Since very few odonate records from arctic Alaska exist, the Kanuti collection would certainly yield a range extension or two. As it turned out, the material did produce range extensions, but one specimen was especially interesting—a single male *Coenagrion* with terminal appendages that were obviously different from those of *C. resolutum* (Taiga Bluet), a Eurasian bluet found in the Kanuti collection and widely distributed throughout interior Alaska. Careful not to get too excited too soon, JH calmly paged through his guides for a match. The white angled claspers were unmistakably those of *C. angulatum*, the Prairie Bluet damselfly, a fact later confirmed by Dennis Paulson. LS and her crew had added one more species to the small but growing Alaska odonate list for a total of thirty-three!

E.M. Walker described *C. angulatum* as the most common damselfly of the Canadian prairies where he observed it near semi-permanent stagnant prairie sloughs, slow streams, and ponds (Walker, 1953). In Alberta *C. angulatum* is also found in aspen parklands and the southern boreal forest (Acorn, 2004). *C. angulatum* was considered “at risk” in British Colum-

Not satisfied with a single specimen and wanting to know more about the species in Alaska, we returned to Kanuti Lake in June of 2007 with the support of a challenge grant from the U.S. Fish and Wildlife Service (USFWS). Our goals: 1) to confirm the continued presence of *C. angulatum*, 2) to describe its habitat generally, and 3) to document the early summer odonate community near Kanuti Lake.

When it comes to accessibility, Alaska's NWRs are “out there” and Kanuti is no exception. Straddling the Arctic Circle, Kanuti is about 207 km northwest of Fairbanks. Encompassing 6,625 km², the refuge is slightly larger than



The location of Kanuti National Wildlife Refuge.

Delaware and lies in a basin formed by the Koyukuk and Kanuti rivers. There are no roads or villages within the refuge boundaries, and the nearest road, the Dalton Highway, is about 13 km from the refuge's eastern boundary at its closest point. Low and high temperatures on the refuge can range between -56°C and 34°C . The refuge is underlain by discontinuous permafrost with a landscape of rolling hills, river floodplains, numerous wetlands, and streams. Vegetation is characteristic of the boreal forest, with large expanses of black spruce muskeg, rolling hills with mixed forest of black and white spruce and paper birch, and wetland and riparian areas bordered by willows, grasses, and emergent vegetation.

For JH the expedition began in Juneau on board a Boeing 737 bound for Anchorage and then Fairbanks, the home turf of LS. From there we flew 1.5 hours north in a 14-seat commercial flight to Bettles, a tiny village on the refuge's northern border. Aircraft size dropped again in Bettles as we crawled into a chartered de Havilland Beaver for the 30-minute flight to Kanuti Lake, the site of a comfortable solar-powered cabin maintained by the USFWS and our base of operations for the next five days (10–14 June).

The combination of long warm summer days and abundant and varied wetlands make Kanuti a virtual dragonfly factory, and the area around Kanuti Lake is no exception. At 40 hectares in size, the shallow lake is bordered by wide bands of emergent plants like *Equisetum fluviatile* (Water Horsetail), *Carex* spp. (sedges), and *Calamagrostis canadensis* (Blue-joint Grass). At the cabin dock we were greeted by swarms of tame *Leucorrhinia borealis* (Boreal Whiteface) and *L. hudsonica* (Hudsonian Whiteface) plus *C. resolutum*, *Cordulia shurtleffi* (American Emerald), *Enallagma boreale* (Boreal Bluet), *E. annexum* (Northern Bluet) and *Libellula quadrimaculata* (Four-spotted Skimmer), the official state insect of Alaska.

With the arctic sun falling—albeit slowly and never really with the intention of setting—we quickly loaded our supplies into the cabin, hopped into our mini-canoes, and headed out across the lake in pursuit of Prairie Bluets. We collected at three sites on the lake that afternoon and found *C. angulatum* at each. Fears that the 2004 discovery was some kind of fluke were laid to rest and we returned to the cabin for a late dinner. Outside *L. quadrimaculata*, *C. shurtleffi*, and *L. boreale* were still flying at 11:30 PM.

During the next three days we traveled by canoe, foot, and jet boat (on the nearby Kanuti River) to visit ponds, wetlands, and other lakes within a 1.25 mile radius of the cabin. Each day we found *C. angulatum* and expanded our species list for the area. Of the 14 sites that we visited in and around Kanuti Lake, 11 held *C. angulatum*. Although

we did not attempt to quantify the abundance of adult odonates, we judged, based on sightings of and encounter rates with other odonate species, that *C. angulatum* was a common species in the Kanuti Lake area. Based on our sense of relative abundance, we ranked the six damselfly species encountered from least to most abundant: *Nehalennia irene* (Sedge Sprite, rare), *C. interrogatum* (Subarctic Bluet, rare), *C. angulatum* and *Enallagma annexum* (common), *C. resolutum* (abundant), and *E. boreale* (abundant). *L. quadrimaculata* was by far the most abundant odonate and occurred at all fourteen sites. The odonates most often found with *C. angulatum* included *L. hudsonica* (73% of sites), *C. shurtleffi* (82%), *E. boreale* (91%), *L. quadrimaculata* (100%) and *C. resolutum* (100%). Other odonate taxa found during the trip included *Aeshna eremita* (Lake Darner), *A. juncea* (Sedge Darner), and *Leucorrhinia proxima* (Belted Whiteface). *Aeshna* were rare as they were just beginning to emerge during our stay.

We found *C. angulatum* near a wide variety of water bodies. And although each site was unique in its own way, one feature stuck out, literally (or should we say literally?), among those habitats where *C. angulatum* occurred: the presence of emergent vegetation. With the exception of one partially drained beaver-influenced lake, all *C. angulatum* sites were bordered by wide (up to 8 m) bands of emergent vegetation dominated by *Equisetum fluviatile* and *Calamagrostis canadensis*. Certainly this type of habitat provides important cover for larvae and oviposition sites for adults.

At the time of this study, Tetlin NWR held the record for the most odonate species (20) in the state. Our efforts at Kanuti Lake added five species to the list of odonates collected in the refuge in 2004 for a total of 15 species. But that was not the end. Just before returning to Fairbanks, we captured a single *Leucorrhinia patricia* (Canada Whiteface) in a sphagnum bog near Bettles. The following month LS added four additional records to the Kanuti list with *Somatochlora albicincta* (Ringed Emerald), *Sympetrum internum* (Cherry-faced Meadowhawk), *Aeshna interrupta* (Variable Darner), and *Lestes disjunctus* (Northern Spreadwing). The summer of 2008 produced *Aeshna subarctica* (Subarctic Darner), *Sympetrum danae* (Black Meadowhawk) and *Aeshna sitchensis* (Zig-zag Darner) were collected in the refuge in 2004, but not since. With 21 species, Kanuti NWR can now boast the greatest odonate diversity of any place in Alaska.

While Kanuti is the current hotspot for odes in Alaska, it is no longer the only place where *C. angulatum* has been found in the state. In June 2008 LS found a specimen in a Fairbanks-area lake that had formerly been used as a peat mining site. Later that month more specimens were

found at that site and another in Fairbanks, but they were far less common than at Kanuti Lake and the species was absent from other seemingly suitable lakes surveyed in the area. More collecting will be required to fill in the gaps in *C. angulatum* distribution within Alaska and between the state and its closest Canadian populations.

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Corkscrew Crystals!

Jerrell J. Daigle <jdaigle@nettally.com>

An enthusiastic bunch of birders and dragonfly folks met at the Audubon Corkscrew Swamp Sanctuary near Immokalee, Florida to look for the new holy grail damselfly, *Chrysobasis lucifer* Donnelly, a species known previously from Central America. The group consisted of Peggy and Fred Sibley, Annette and Tim Manolis, Cary Kerst, Brad Kolhoff, Mike Knight, staff members Dawn Beyer and Denise Nemeth, and me. We searched virgin cypress swamps on 16–17 February. We only saw two specimens, a mature male (2:00 PM) and a mature female (11:40 AM) which were captured by Cary, Brad, and myself. Amongst other things in the swamp were small numbers of *Ischnura*

prognata (Furtive Forktails), *I. hastata* (Citrine Forktail), and *I. posita* (Fragile Forktail).

In a couple of updates, I heard that Brad saw one in March. In April, Nick Donnelly and Brad looked for them, but did not see any. It appears that this species may be a fall/winter species. We hope to go back later this year and census the populations of this enigmatic species. Also, I would like to thank Mike Knight and his staff for their help and support! 



From left to right: Brad, Cary, Jerrell, Annette, Tim, Peggy, and Fred.

Dythemis velox (Swift Setwing) in Indiana

Bill Mauffray, Intl Odonata Research Institute, Gainesville, FL <iodonata@bellsouth.net>

I received an e-mail with photos of *Dythemis velox* that were taken on 10 August 2008. Carolyn Begley and Jiri Dadok, who describe themselves as amateur dragonfly watchers, reported that “there appears to be a thriving population in Greene-Sullivan State Forest in Central Indiana.”

They reported that “We first saw the dragonfly on Aug-3-08 in the Greene-Sullivan State Forest, but were not able to identify or photograph it. We then returned on Aug-10-08 and took the photos. There were 3 individuals next to the sign for Ellis Lake and another one near the lake. We were short on time, but found at least one individual near every other lake we stopped at in the area on our way home.”

They could not find it listed in Jim Curry’s “Dragonflies of Indiana” but were able to identify it as a Swift Setwing, before sending me the images which I verified as that species. Upon my request they returned on 26 August 2008 to collect a voucher specimen. The locality data: Indiana: Greene County, Greene-Sullivan State Forest, near Jct. CR-200-S and CR-1500-W, Ellis Lake, latitude: 38.9941° N, longitude: 087.2277° W, 12:40 PM. Conditions (according to <intellicast.com>): 79 degrees, winds ENE 10–15mph, relative humidity: 55%, cloud cover 11% (slightly hazy). “The dragonfly was sitting on a small stick near the water over mud catching insects. We saw another individual near the water under similar conditions about 6 feet.”

According to OdonataCentral species list, the nearest records are from Jackson County in southern Illinois



and Davidson County, Tennessee. This Indiana record is the northernmost record for this species and a new state record. The specimen was donated to the FSCA/IORI collection in Gainesville, Florida.

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Tauriphila argo (Arch-tipped Glider)—New Species for the United States

Fabrice de Lacour <thoreyi@warwick.net>

On 7 June 2008, Ed Lam and I arrived in Texas to begin a two week trip to observe, photograph and collect specimens for Ed who is writing a Peterson Field Guide to Dragonflies of North America. We had the pleasure of spending the first few days in the Austin area with Greg Lansley, John Abbott and Giff Beaton and then on 10 June we headed for the Rio Grande Valley.

On 11 June, Ed and I drove to Bentsen State Park where we hoped to collect *Planiplax sanguiniventris* (Mexican Scarlet-tail), a species recently discovered by David and Jan Dauphin which had been previously photographed

but never captured. At La Parida Banco resaca in Bentsen State Park where *P. sanguiniventris* had been seen near the boat launch, I slowly began wading westward. Shortly thereafter I netted a dragonfly unknown to me. Ed initially believed it was *Planiplax*, possibly an immature but I found it to resemble a *Tramea*. I continued to wade further from the boat launch and shortly before 11:00 AM I spotted my first *P. sanguiniventris*. After pursuit and a few misses I was finally successful in netting an adult male. This species was wary and proved difficult to capture. Ed now decided to join me in wading the resaca. We once again discussed the unknown species and we decided it might be

in the Neotropical genus *Tauriphila* which is composed of five species, two of which rarely enter the southern United States. The most likely candidate in southern Texas would be *T. azteca* (Aztec Glider).

Ed and I were anxious to return to our motel to look through Needham's Dragonflies of North America and hopefully identify this ode. While Ed was showering, I looked at the keys and quickly realized that this was a new species for the US. It was *Tauriphila argo*. Ed made scans of the collected individual and sent them to John Abbott, Nick Donnelly, and Dennis Paulson for confirmation. Receiving a fast and positive response made it now official. *Tauriphila argo* is a species normally found in Cuba, Mexico and south to Brazil.

The genus *Tauriphila* resembles *Tramea* but there are several differences in structural characters. *Tramea* caudal appendages are extremely long, the pterostigmas are longer on the forewing than the hindwing and the triangle of the forewing is three-celled with the trigonal interspace composed of four rows of cells. In the genus *Tauriphila*, the caudal appendages are of average length, the pterostigmas are of equal size and the forewing triangle is two-celled with the trigonal interspace composed of three cells. These are some of the structural differences, but of course the bug has to be in hand to see most of these features.


Brachymesia fuscata (Red-tailed Pennant), also a common ode in the resaca may be initially confused with *T. argo*, but in flight *B. fuscata* have short patrols and perch on tips of twigs and vegetation. Also, in *B. fuscata* the abdomen and face is bright red with a stout abdomen being inflated or bulbous at S2–S3. With *T. argo* in flight, one notices a more slender and duller reddish abdomen, dark face and eyes. The patrol is nothing less than exhaustive. I found only two males perched vertically in the shade of the tall shoreline vegetation at midday when temperatures were peak.

When *T. argo* is in hand and seen laterally, very strongly arched cerci are easily noticed. Dorsally the cerci are divergent near their base and then become strongly convergent distally. I netted approximately a dozen individuals and all had very thin black bands on the dorsal/distal section of abdominal S3–S9.

On 14 June I decided to wade the entire perimeter of the resaca to see how many *T. argo* and *P. sanguiniventris* were present. This task was slow and arduous and took more than three hours from start to finish. There were more than 50 adult males and two females. Females, orange in color, appeared to be looking for a desirable location to oviposit but unfortunately I was unable to net either one. All males

were fairly evenly distributed along the entire length of the pond. Seven males and one female *P. sanguiniventris* were also seen, with the female actively ovipositing in a highly vegetative cove, but once again I failed to collect it. The thorax of *P. sanguiniventris* females are lighter gray in color, much like a mature male *Erythemis simplicicollis* (Eastern Pondhawk). Unlike *T. argo*, all *P. sanguiniventris* were found along the western shoreline from the boat launch with one exception. It becomes apparent that we may have two viable populations of two recently added species for the US fauna.

This was a successful collecting trip with many other rare species netted during this venture, including *Rhionaeschna psilus* (Turquoise-tipped Darner), *Phyllocycla breviphylla* (Ringed Forceptail), *Gomphus modestus* (Gulf Coast Clubtail), *Cannaphila insularis* (Gray-waisted Skimmer), *Erythemis attala* (Black Pondhawk) and *Macrothemis inequiunguis* (Jade-striped Sylph).

Special thanks go to Greg Lasley for his gracious hospitality and many thanks to John Abbott, Nick Donnelly and Dennis Paulson for their expertise. Much appreciation also goes to John Abbott for facilitating the acquisition of our collecting permits, for without them this trip would not have been nearly as successful. 

Dragonfly vs. Shrew

Check out this battle between several odonates (as well as many other insects) and a shrew in the glacial marshes of northern Montana: <<http://tinyurl.com/3och5c>>. Photography by Alex Badyaev. It looks like the dragonfly got one bite in anyway.

Want Some Buttons?

Jerrell Daigle has extra DSA annual meeting buttons remaining from previous meetings. He has buttons available from 1993 (Oregon) to 2008 (Oregon) except for 2005 (Ontario). If you would like a particular button or two, let Jerrell know at <jdaille@nettally.com>.

A Significant New Hine's Emerald (*Somatochlora hineana*) Record for Michigan

Ryne Rutherford <rrutherford@nmu.edu> and Mark O'Brien, MOS Coordinator, Insect Division, Museum of Zoology, University of Michigan, Ann Arbor, MI 48109-1079 <mfobrien@umich.edu>

On 4 August 2008, a new population was discovered in Menominee County, Michigan by the senior author (RR). Two male Hine's Emeralds (Fig. 1) were netted, photographed and released at a site just south of Hayward Lake. The site is on Hayward Lake road No. 16. The site is due east (less than a half mile) off the spur road that heads north to the Hayward Lake on the south side of the lake. The site is a low semi-open conifer swamp/fen in an elongated depression containing lots of Northern White Cedar (*Thuja occidentalis*) clumps on raised mossy mounds with openings containing sedges (*Carex* sp.) and Bog Birch (*Betula pumila*) (Fig. 2). The dominant vegetation included *Larix laricina*, *Thuja occidentalis*, *Parnassia glauca*, *Betula pumila*, *Myrica gale*, *Andromeda glaucophylla*, *Sarracenia purpurea*, *Phragmites australis*, *Menyanthes trifoliata*, *Rhamnus alnifolia*, *Campanula rotundifolia*, and *Carex* sp. The *S. hineana* individuals were netted as they flew along the edge of the road. Many individuals of *S. walshii* were also seen at the site.

This site is in a straight line from the Door Peninsula of Wisconsin, and is about 30 air miles from Bailey's Harbor, Wisconsin. On Google maps, it is erroneously called Haywood Lake.



Fig. 1. *Somatochlora hineana* male.


This new site in Menominee County certainly extends the potential range of Hine's Emerald in Michigan all the way from near the Wisconsin border to across the southern part of the Upper Peninsula, and indicates that more surveys need to be undertaken in Delta County and westward in areas where dolomitic limestone is predominant. 



Fig. 2. Habitat along Hayward Lake Road No. 16

Recent Articles and Books

Dragonflies & Damselflies of the Southwest, by Robert A. Behrstock, Wild West Series, Rio Nuevo Publishers, 2008. ISBN 978-1-933855-14-1. Paperback, 80 pp., \$12.95.


From the back cover: Includes over 70 species of dragonflies and damselflies. At every pond, stream, and water garden, dragonflies captivate us with their flashing colors, speed, and acrobatic flight. Once considered messengers to the spirit world, these aquatic insects are among the world's fastest, oldest, and most beautiful creatures. *Dragonflies & Damselflies of the Southwest* provides naturalists with spectacular color reference photographs, along with detailed information on classification and identification, behavior, and where and when to find them.

Dragonflies and Damselflies of South Africa, by Michael J. Samways, Pensoft Series Faunistica 70. Pensoft Publishers, 2008. ISBN 954-642-330-0. Paperback, 300 pp., €39.

From the Publisher: Dragonflies are a beautiful, important and conspicuous component of freshwater, whether still or flowing. They are also important indicators of freshwater quality and condition, which is significant for current and future conservation initiatives in South Africa. The country's dragonflies are particularly interesting as many are special or endemic to the area, making it a part of the world of great conservation significance. Sadly however, many of these endemic species are highly threatened, especially by invasive alien trees which shade out their habitat. This book is about this exciting dragonfly fauna. Besides aiming at increasing awareness of these lovely and sensitive insects, it enables their identification, using several approaches, from simple flick-through to the use of comprehensive identification keys. Each species is also given a Dragonfly Biotic Index, covering a spectrum from the most common, widespread and tolerant species through to the most threatened, rare and sensitive ones. Michael Samways is Professor and

Chair of the Department of Conservation Ecology and Entomology, Stellenbosch University. He is a Fellow of the Royal Society of South Africa and a Fellow of the University of KwaZulu-Natal. He has published 260 scientific papers and written several books on insect biology and conservation, the most recent of which is *Insect Diversity Conservation*, Cambridge University Press. He has won several awards, and in the last two years, these include the Stellenbosch University Rector's Award for Research Excellence, the John Herschel Medal from the Royal Society of South Africa, and the Senior Captain Scott Medal from the South African Academy for Science and Art. Michael is on several international editorial boards and involved with various international committees devoted to invertebrate conservation. Indeed, his research team is dedicated to the conservation of invertebrates and other biodiversity, which so enrich our planet.

Dragonflies and Damselflies of Northeast Ohio, 2nd edition, by Larry Rosche, Judy Semroc, and Linda Gilbert with illustrations by Jennifer Brumfield. Cleveland Museum of Natural History, 2008. ISBN 978-1-878600-11-0. Spiral Bound, 300 pp., \$24.95.

From the Publisher: The much-anticipated second edition of the *Dragonflies and Damselflies of Northeast Ohio*, by Larry Rosche with Judy Semroc and Linda Gilbert, is available now. Completely redesigned, this comprehensive edition includes charts, graphs and maps of all species occurring in Northeast Ohio. Generously illustrated and containing hundreds of stunning digital photographs by internationally acclaimed nature photographers, this field guide is a must for both the enthusiast and wildlife professional. At over 300 pages, the entire life history, from egg to nymph to adult, is discussed in full detail in a precise, easy-to-navigate format. Available from the Cleveland Museum of Natural History. 

Book Review: Gossamer Wings, Mysterious Dragonflies by Dagmar Hilfert-Rüppell and Georg Rüppell; ISBN: 978-3-00-020389-3. Price: €34,95, \$55 US

Reviewed by **Kathy Biggs** <bigsnest@sonic.net>

This most *splendid* book is written both in German and English and I have read and reread it. I *love it!* It is the most wonderful book with superb pictures and text that

together explain dragonfly lives and behaviors.


Dagmar and Georg are the same dynamic duo who cre-

ated the breathtaking “The Two Worlds of the Dragonflies” television documentary shown on Animal Planet with slow motion footage of the Jewelwings, known in Europe as the Demoiselles. It is this same documentary that shows the diagrams depicting sperm removal, etc. in the genus. Many of the images in the book are taken from the slow motion photography of the Demoiselles.

The book is hardcover, with a preface by Ola M. Fincke, and chapters on appearance, emergence, flight, prey-capture, threatening and fighting behaviors, courtship, mating tactics, danger, mating, oviposition, larvae, roosting, the photographic experience and more. The book has 168 pages and is in landscape layout, each page $8\frac{1}{2} \times 11$ inches.

I feel that this book is not only perfect for the general public but also for those of us with more than a casual interest in dragonflies. Although it should give a lot of general nature-lovers new insight into the lives of dragonflies, I also feel we can *all* learn from it. Not only did I learn *A lot* from it—I even took notes!

Besides being educational, Gossamar Wings would look fantastic on any tabletop and the only detrimental comment I can make is that with the poor showing of the US dollar against the Euro and the high international shipping rates, it is expensive to own—but worth it!

To look at and/or order in English: <www.splendens-verlag.de>; e-mail: info@splendens-verlag.de>. 

erronea

a poem by Sue Gregoire

I'm standing alone on the bank of a stream,
My net poised in my hands.
My grip is firm, my knees are flexed,
My focus is just above that sand.

I've been here for over an hour,
The only movement is in my neck,
As I swing my head from side to side,
Searching for a small winged speck.

Upstream then downstream
I turn again and again.
Back and forth, back and forth,
My attention does not wane.

I know they're here. They *must* be here!
The habitat's just right.
Mixed deciduous forest, small trickling stream,
Just enough shade and light.

Oh, here comes one!
Zigging from left to right!
I hold my breath, here he comes, here he comes,
Zing! Just out of reach of my net!

Well, he has to come back, of course he will.
I only have to wait.
Readjust that grip, flex those knees,
Watch with increased intent.

Ignore those buzzing insects,
You know, the ones that bite.
I want to swat, but I'd better not,
'Cause that's just when he'll come by.

Here he comes, here he comes,
I'm so ready I bite my lip.
Closer, closer, closer,
Around my back he zips!

All right, I'm getting desperate.
My patience is wearing thin.
I've been here almost two hours.
How bad do I want this thing?

Take a deep breath, ready that net,
Resume that Ninja stance.
This is it, one more time,
I'll give it one more chance.

Any minute now, a few more
And surely he'll come around.
Here he comes, here he comes . . . I swing!
Ah, there's that marvelous sound!

That rattling of cellophane wings
I break into a grin.
I knew that I could do it!
I knew that I would win!

I gently remove him from my net,
And pause to admire my booty.
Those big green eyes, that yellow on black,
My, but he's a beauty.

A closer inspection to confirm my suspicion,
But he's not the one I was hoping for.
No yellow stripes, just spots do I see.
I've seen this one before.

Guess I'll mosey on now.
I'm beginning to lose the light.
I give him one more admiring glance,
And release him with a sigh.



ARGIA and BAO Submission Guidelines

Digital submissions of all materials (via e-mail or CD) are vastly preferred to hardcopy. If digital submissions are not possible, contact the Editor before sending anything. Material for ARGIA must be sent directly to the John C. Abbott, Section of Integrative Biology, C0930, University of Texas, Austin TX, USA 78712, <jcabbott@mail.utexas.edu>; material for BAO must be sent to Ken Tennessen, P.O. Box 585, Wautoma, WI, USA 54982, <ktennessen@centurytel.net>.

Articles

All articles and notes are preferably submitted in Word or Rich Text Format, without any figures or tables, or their captions, embedded. Only minimal formatting to facilitate review is needed—single column with paragraph returns and bold/italic type where necessary. Include captions for all figures and tables in a separate document.

Begin the article with title, author name(s), and contact information (especially e-mail) with a line between each. The article or note should follow this information. Paragraphs should be separated by a line and the first line should not be indented. Where possible always refer to the scientific name of a species followed by its official common name in parentheses.

Figures

Submit figures individually as separate files, named so that each can be easily identified and matched with its caption. Requirements vary depending on the type of graphic.

Photographs and other complex (continuous tone) raster graphics should be submitted as TIFF (preferred) or JPEG files with a minimum of 300 ppi at the intended print size. If unsure about the final print size, keep in mind that over-sized graphics can be scaled down without loss of quality, but they cannot be scaled up without loss of quality. The printable area of a page of ARGIA or BAO is 6.5 × 9.0 inches, so no graphics will exceed these dimensions. Do not add any graphic features such as text, arrows, circles, etc. to photographs. If these are necessary, include a note to the Editor with the figure's caption, describing what is needed. The editorial staff will crop, scale, sample, and enhance photographs as deemed necessary and will add graphics requested by the author.

Charts, graphs, diagrams, and other vector graphics (e.g. computer-drawn maps) are best submitted in Illustrator format or EPS. If this is not possible, then submit as raster graphics (PNG or TIFF) with a minimum of 600 ppi at the intended print size. You may be asked to provide the raw data for charts and graphs if submitted graphics are deemed to be unsatisfactory. When charts and graphs are generated in Excel, please submit the Excel document with each chart or graph on a separate sheet and each sheet named appropriately (e.g. "Fig. 1", "Fig. 2", etc.)

Tables

Tables may be submitted as Word documents or Excel spreadsheets. If Excel is used, place each table on a separate sheet and name each sheet appropriately (e.g. "Table 1", "Table 2", etc.)

The Dragonfly Society Of The Americas

Business address: c/o John Abbott, Section of Integrative Biology, C0930, University of Texas, Austin TX, USA 78712

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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. Membership in DSA includes a subscription to 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.

Membership in the Dragonfly Society of the Americas

Membership in the DSA is open to any person in any country and includes a subscription to ARGIA. 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 for all who choose to receive ARGIA in PDF form are \$15. 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. Membership dues and BAO subscription fees should be mailed to Jerrell Daigle, 2067 Little River Lane, Tallahassee, FL, USA 32311. More information on joining DSA and subscribing to BAO may be found at <http://www.odonatacentral.org/index.php/PageAction.get/name/DSA_Membership>.

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Digital submissions of all materials (via e-mail or CD) are much preferred to hardcopy. All articles and notes should be submitted in Word or Rich Text Format, without any figures or tables embedded. Only minimal formatting to facilitate review is needed. Photographs should be submitted as TIFF (preferred) or JPEG files with a minimum of 300 ppi at the intended print size. Charts, graphs, diagrams, and other vector graphics are best submitted in Illustrator format or EPS. If this is not possible, submit as PNG or TIFF at a minimum of 600 ppi at the intended print size. Charts and graphs may also be submitted in Excel documents. Tables may be submitted as Word or Excel documents. For more information see the entire guidelines at the end of this issue or visit <<http://www.odonatacentral.org/index.php/PageAction.get/name/DSASubmissionGuidelines>>. ARGIA submissions should be sent to John Abbott, Section of Integrative Biology, C0930, University of Texas, Austin TX, USA 78712, <jcabbott@mail.utexas.edu>; BAO submissions should be sent to Ken Tennessen, P.O. Box 585, Wautoma, WI, USA 54982, <ktennessen@centurytel.net>.

Back cover: (upper) Three species of Odonata nymphs in Oliver Lee State Park, Dog Canyon, Otero Co., New Mexico. From left to right: *Archilestes grandis* (Great Spreadwing), *Libellula saturata* (Flame Skimmer), and *Paltorthemis lineatipes* (Red Rock Skimmer). Photo by Bob Barber. **(lower)** *Lestes tenuatus* (Blue-striped Spreadwing), a new species for Texas at Willow Lake, Santa Ana National Wildlife Refuge, Hidalgo Co., on 19 September 2008. Photo by Greg Lasley.



Photo Supplement: ARGIA Vol. 20, No. 3

Several photographers submitted the photos below to accompany the article “The 2008 DSA Annual Meeting” by Josh Vlach on pages 2 through 5 in ARGIA 20(3).



Argia emma, male, on the John Day River, Wheeler Co., Oregon. Photo by Steve Krotzer.



Gomphus lynnae, male, on the John Day River, Wheeler Co., Oregon. Photo by Greg Lasley.



Tanypteryx hageni, male, Todd Lake, Deschutes Co., Oregon. Photo by Steve Krotzer.



Gomphus lynnae, female, John Day River, Wheeler Co., Oregon. Photo by Steve Krotzer.



Erpetogomphus compositus, female, John Day River, Wheeler Co., Oregon. Photo by Bryan Pfeiffer.



Lestes unguiculatus, male, Canyon Creek Meadow, Grant Co., Oregon. Photo by Steve Krotzer.



Octogomphus specularis, male, Gold Lake outlet, Lane Co., Oregon. Photo by Greg Lasley.



A "cluster" of male *Octogomphus specularis*, Gold Lake outlet, Lane Co., Oregon. Photo by Dennis Paulson.



Ophiogomphus occidentis, male, on Crescent Creek, Klamath Co., Oregon. Photo by Greg Lasley.



Ophiogomphus severus, male, Canyon Creek, Grant Co., Oregon. Photo by Bryan Pfeiffer.



Ophiogomphus morrisoni, male, Crescent Creek, Klamath Co., Oregon. Photo by Steve Krotzer.



Ophiogomphus morrisoni, copulating pair and interloping male, Deschutes River between Crane Prairie and Wickiup Reservoirs, Deschutes Co., Oregon. Photo by Dennis Paulson.