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In This Issue..... 1

DSA is on Facebook..... 1

Calendar of Events..... 1

2011 Annual Meeting of DSA held in Fort Collins, Colorado, by Dave Leatherman..... 2

Northeast Regional DSA Meeting, by Joshua Rose..... 8

2011 Annual Oregon *Aeshna* Blitz Sets New Records, by Steve Gordon..... 10

2012 Annual DSA Meeting: Baldcypress Swamps, Sandy Ponds, Blackwater Rivers, and Clubtails, by Chris Hill..... 12

Northeast Meetings Update, by Bryan Pfeiffer..... 12

New North American Dragonfly Named..... 13

***Argia plana* (Springwater Dancer), a New Species Record for Alabama**, by Steve Krotzer..... 13

The Mystery of *Sympetrum danae* (Black Meadowhawk) at Page Arizona, by Rich Bailowitz, Pierre Deviche, and Doug Danforth..... 13

First Lincoln County, Nevada Record for *Lestes congener* (Spotted Spreadwing), by Bruce Lund..... 14

Request for Data from New Hampshire, by Pam Hunt..... 15

An Inventory of the Odonates of the Dunning Creek Wetlands, Bedford County, Pennsylvania, by Dennis McNair and Lane Loya..... 15

Manitoba Dragonflies—Lots of Them, by Dennis Paulson..... 20

***Gomphaeschna antilope* (Taper-tipped Darner) New for Michigan: a Mystery Ode and an Ode Mystery**, by Chris Hill..... 21

Request for *Orthemis* Specimens, by Jerrell J. Daigle..... 22

Back to Panama, by Nick Donnelly..... 23

Aruba Adventures, by Jerrell J. Daigle..... 24

Aim High Academy: Summer Earth Ecology Program, by Elizabeth F. Ballare..... 25

Use of Lakes by *Cordulegaster maculata* (Twin-spotted Spiketail), by Barbara Hager and William Shields..... 29

Spin-Dry Dragonflies, by James S. Walker..... 29

A Call for Papers for BAO..... 31

Photos Needed..... 31

In This Issue

There are several reports in this issue of ARGIA about successful meetings held this summer around the country. Dave Leatherman recounts the wonderful time had by all at the DSA annual meeting in Ft. Collins, Colorado. Joshua Rose provides a description of the Northeast Regional meeting of the DSA that was held in Dover, Delaware. While many odonates were found, it wasn't without difficulty as several attendees apparently had to be extracted from mud in the cypress swamps. Steve Gordon reports on the 2011 Annual Oregon Aeshna Blitz, which was a tremendous success this year.

Turning our attentions to next year there are already several meetings scheduled for 2012. Chris Hill whets our appetites for what we can expect at the annual meeting to be held in Florence, South Carolina. Bryan Pfeiffer and Colin Jones provide details on the Northeastern DSA meeting to be held in St. Marie, Ontario, Canada and NymphFest 2012 to be held in Montpelier, Vermont.

There are a number of new records to report in this issue. Steve Krotzer documents Springwater Dancer (*Argia plana*) for the first time in Alabama. Rich Bailowitz, Pierre Deviche and Doug Danforth discuss their find of a Black Meadowhawk (*Sympetrum danae*) in Page, Arizona. Bruce Lund reports the first Lincoln County, Nevada record for Spotted Spreadwing (*Lestes congener*).

Dennis McNair and Lane Loya present an inventory of the odonates of Dunning Creek Wetlands in Bedford County, Pennsylvania.


Dennis Paulson reports on an amazing trip he and Netta made to Manitoba where they saw more than a few baskettails.

Chris Hill recounts his surprising discovery of the Taper-tailed Darner (*Gomphaeschna antilope*) in Michigan.


Jerrell Daigle continues his travels in the Caribbean, this time with a trip to Aruba. Please also note Jerrell's request for *Orthemis* specimens. Nick and Ailsa Donnelly have been busy with travels again and he tells us of another trip to Panama full of adventure and discovery.

Liz Ballare worked with a group of high school students this summer at Rutgers University. This sounds like a great program where underprivileged students get an opportunity to participate in real science and of course, get exposure to a great group of insects.

Barbara Hager and William Shields discuss Twin-spotted Spiketail (*Cordulegaster maculata*) breeding in lakes of upstate New York

James Walker discusses some very interesting behaviors he observed and video taped this summer. You may have seen some of this "spin-dry behavior" discussed on the various listserves. 

DSA is on Facebook

 For those of you who stay connected using the social networking web site Facebook, The Dragonfly Society of the Americas now has a Facebook page. Information, announcements, and links relating to the Society as well as photos and discussion contributed by those who "like" the page will be found here. The page is located at <<http://www.facebook.com/DragonflySocietyAmericas>> or just search for "dragonfly society" within Facebook and the page will appear in the results list.

Calendar of Events

For additional information, see <<http://www.odonatacentral.org/index.php/PageAction.get/name/DSAOtherMeetings>>.

Event	Date	Location	Contact
NymphFest 2012	18–19 February 2012	Montpelier, Vermont	B. Pfeiffer <bryan@dailywing.net>
DSA Annual Meeting	4–6 May 2012	Florence, South Carolina	C. Hill <Chill@coastal.edu>
DSA Northeast Meeting	6–8 July 2012	Sault St. Marie, Ontario	B. Pfeiffer <bryan@dailywing.net>

2011 Annual Meeting of DSA held in Fort Collins, Colorado

Dave Leatherman, 612 Stover Street #7, Fort Collins, CO 80524 <daleatherman@msn.com>

The 2011 Annual Meeting of DSA, held in Fort Collins, Colorado 5-10 July 2011, was hosted by Dr. Boris Konratieff, Inez and Bill Prather, and Dave Leatherman at Colorado State University. A total of 62 persons registered and attended part or all of the meeting, making it a successful DSA gathering.

Despite that Colorado is not particularly diverse by Odonata standards elsewhere, and the spring/early summer weather in 2011 not particularly conducive to odonate development, the results of the field trips and quality of the paper session combined to make this an outstanding meeting (see the species total compiled by Bill Prather).

This year's event began with pre-meeting field trips in the little-explored extreme southeastern corner of Colorado. A small group of migratory odonate enthusiasts from Texas and Arkansas met field trip coordinators Bill and Inez Prather and Dave Leatherman at Lamar in 100+ degree heat on the evening of 5 July. Finding decent accommodations in this sparsely populated region was good training for discovering the less than abundant numbers and

diversity of dragons, damsels, restaurants, and rest stops over the next few days.

The trip on 6 July first took us 75 miles southwest of Lamar to the Comanche National Grassland's Carrizo Creek Picnic Area (roughly 30 miles southwest of Springfield in Baca County: a little over 21 miles west of US 287 on Grassland Road M). All water sources are precious on the vast high plains steppe of eastern Colorado, particularly lotic ones. As such, Carrizo Creek coursing through cholla and yucca-studded shortgrass, punctuated by deceptively rugged juniper-clad outcroppings, has long been known to biologists as "special". While not finding a lot of unusual or unexpected species this day, the group did acquire specimens and/or photographs of *Argia lugens* (Sooty Dancer), *Gomphus militaris* (Sulphur-tipped Clubtail), and *Plathemis subornata* (Desert Whitetail). We also found a singing male Indigo Bunting, heard Yellow-billed Cuckoo, Eastern Phoebe, a Greater Roadrunner, and some beautiful Collared Lizards. Suffice it to say, a naturalist needs both "eastern" and "western" guides for this part of Colorado.



Photo by Bryan Pfeiffer.

Our second locale this day was on the Baca/Las Animas County line about 4 miles west of the Carrizo Picnic Area on private property along Cottonwood Creek in Cottonwood Canyon. Here in similar rugged, arid terrain endowed with a flowing stream we sought and found a few individuals of our primary target: *Libellula nodisticta* (Hoary Skimmer), a species discovered here by the Prathers only a few years ago. This is one of two known Colorado locations for this southwestern species. The one individual, which finally responded to calming commands from Greg Lasley, posed for photos and is now headed to the University of Texas collection. Other nice species noted here were *Argia alberta* (Paiute Dancer), *A. fumipennis* (Variable Dancer), *A. nahuana* (Aztec Dancer), *A. plana* (Springwater Dancer), *Amphiagrion abbreviatum* (Western Red Damsel), *Ischnura denticollis* (Black-fronted Forktail), *Erythemis simplicicollis* (Eastern Pondhawk), *E. collocata* (Western Pondhawk), and *Libellula saturata* (Flame Skimmer).

Driving the Cottonwood Canyon “loop” south, east, then north back up to GR M, we stopped at a different Carrizo Creek crossing, one of the few historical locations in CO for *Dythemis velox* (Swift Setwing), but only found a beautiful Spiny Softshell Turtle.

July 7 was devoted to traveling to the meeting site in Fort Collins, some 250 miles to the northwest, with a mid-day exploratory stop at the Brett Gray Ranch in remote southwestern Lincoln County (as portrayed in the Colorado DeLorme Atlas, about 9 miles due west of the intersection of SR 71 and T Road centered around two small reservoirs and a landing strip). This working ranch, recently purchased by The Nature Conservancy, boasts fairly pristine wetlands that comprise part of the greater Horse Creek drainage. There are no towns to speak of within 30 miles. Highlights here included several Lesser Earless Lizards, a Short-horned Lizard, various robber flies, and, of course, a nice array of odonates: (see Bill Prather’s complete summary, which breaks out species found at Brett Gray). Several of these were new for the Lincoln County list. We thank Chris Pague and Mary Ewing of TNC for allowing our visit and showing us around this interesting property.

After the Brett Gray Ranch, we bee-lined for Limon and food at the South Side. The only rating available on-line gives this establishment a “food and service” rating of 8 (maybe a tad high but as hungry as we were, we won’t quibble), “value” a 10 (yes), and “atmosphere” a 3. Not sure why the reviewer had an issue with walls half decorated with someone’s mirror collection, the other with portraits of John Wayne. Our genuine problems with this place



were their complete lack of dessert and inability to divert the heavy rainstorm that pelted us all the way to Denver on I-70 and north on I-25 to Fort Collins.

The first formal day of the meeting, 8 July, found our group of mostly old friends gathered on an eastern CSU campus parking lot loaded with anticipation and field gear. Boris gave us an introductory pep and “realistic expectations” talk. Driving north on College Avenue, one eager participant driving the car ahead (Marla Garrison of Naperville, Illinois) appeared to be giving intermittent hand signals for an impending left turn. Upon passing, recklessly on her left, we determined in reality she was warming up her net-swinging arm with a small hand-held weight. Now that’s what I call a hard core, positive oditude. We headed north to the Red Feather Lakes area, where we split into two groups to survey both Parvin Lake and the Lost Lake area.

At Parvin Lake State Wildlife Area (north from Fort Collins on US 287 approximately 18 miles to Livermore, then west on Larimer County 72 E Road for another 19 miles), one of several recreation lakes clustered at an elevation of 8,100 feet, we started very slowly due to cold temperatures and intermittent sunshine. The shortage of anisopteran action actually allowed for particular attention to damselflies of four species (*Coenagrion resolutum* [Taiga Bluet], *Enallagma annexum* [Northern Bluet], *Enallagma boreale* [Boreal Bluet], and *Ischnura damula* [Plains Forktail]. What a luxury to have patient two-legged books with names like Paulson, Abbott, DuBois, and Biggs over one’s shoulder! I, for one, appreciated their apparent endless patience with mortals handing them specimens to ID. Eventually, things warmed up a bit and a few dragons were found, but unfortunately they were mostly *Libellula quadrimaculata* (Four-spotted Skimmer).

At unnamed lakes and bogs a few tenths of a mile northeast of Lost Lake, about 20 driving miles north of Parvin Lake, we had better luck due to improved conditions. The primary species of interest was *Leucorrhinia proxima* (Belted Whiteface), but we also encountered *Aeshna interrupta* (Variable Darner), *Aeshna palmata* (Paddle-tailed Darner), and *Sympetrum madidum* (Red-veined Meadowhawk).



Dot-tailed Whiteface (*Leucorrhinia intacta*) looking down at the Fort Collins DSA proceedings from Horsetooth Mountain. Photo by Dave Leatherman.

July 9 was devoted to the DSA Business Meeting and Paper Session in the Plant Science Building at Colorado State University.

Inez Prather kicked off an outstanding Paper Session with a delightful slide show set to music, featuring Rocky Mountain scenery, flora, and fauna, interspersed with DSA attendees in action during field trips over the last three days. U2 crooning their 1987 hit “Still Haven’t Found What I’m Looking

For” seemed particularly appropriate and popular with the audience.

Dave Leatherman then gave an overview of Colorado Odonata, which included never-before-heard interplay between first-time sexual partners unraveling mysteries of the wheel position.

We enjoyed an excellent lunch generously provided at the CSU Student Center by Boris. Afterwards, we took advantage of time spent locked out of the meeting room by taking the team photo (nice going Bryan Pfeiffer and Annette DeGiovine Oliveira).

The afternoon of our indoor day featured a number of outstanding papers and posters:

Dennis Paulson, of the Slater Museum of Natural History at the University of Puget Sound, Seattle, Washington, narrated an excellent and visually dazzling travelogue entitled “Dragonfly Nature Touring in Costa Rica”. The term “master naturalist” is freely bantered these days, but hearing the voice of a true master go up half an octave when recounting Canopy Lizards, White Bats, and tiny snakes that live in termite colonies was nothing short of contagious. Oh yes, his group found 135 odonate species in 22 days, in the middle of the rainy season! Where do we sign up for the next one?

Chris Hill, of Coastal Carolina University at Conway, and host for next year’s meeting in South Carolina, gave a very interesting, albeit somewhat alarming, talk entitled, “Where Have All the Damselflies Gone? Have Increases in a Human-subsidized Dragonfly Depressed Damselfly Abundance and Richness?” While cause and effect can be a slippery slope, it appears human developments, with



Hoary Skimmer (*Libellula nodisticta*) at Cottonwood Canyon, southeastern Colorado. Photo by J.C. Abbott.



Female Boreal Whiteface (*Leucorrhinia borealis*) at Twin Lakes, Larimer Co., Colorado. Photo by Jim Johnson.



Greg Lasley, the “Hoary Skimmer Whisperer” at Cottonwood Canyon, southeastern Colorado. Photo by Dave Leatherman.

their attendant water impoundments, are increasing populations of damselfly-eating dragonflies like pondhawks, which appear to be depressing prey populations below historical levels.

Steven D. Collins, of Texas Tech University in Lubbock, enlightened the group with “Mapping Suitable River Reaches for Sensitive Odonates: Preliminary Results Using the Maine Dragonfly and Damselfly Survey”. The sophisticated modeling approach utilized in Steven’s research would appear to have many applications for the survey and conservation of odonates wherever the required input data is available.

Celeste A. Mazzacano (in collaboration with Scott Hoffman Black [formerly of CSU]) presented on “The Migratory Dragonfly Partnership: A New Collaborative Effort to Better Understand and Protect Dragonfly Migration in North America”. This international effort involving Canada, the US, and Mexico, backed by The Xerces Society and many agencies/partners, is in its formative stages. If successful, it has great potential to positively affect the migratory (as many as 18 species) and non-migratory odonates alike, along with their habitats.

Steven Roble of the Virginia Dept of Conservation and Recreation, Division of Natural Heritage (in collaboration with Allen Bryan), both of Richmond, spoke on “Odonata Fauna of the James River, Virginia”. This 430-mile river traverses the entire length of the state and is a prime example of how natural systems can rebound from point-source pollution. Since 2006 Steve and Allen have surveyed this waterway and found an impressive diversity of approximately 40 species of odonates (8 of them state or globally-rare), including 17 gomphids (one in good numbers that is undescribed!). As a result of this work, the James now rivals the better-known New River in its odonate richness.

Susan Olcott of the West Virginia DNR based out of Farmington provided an update of “The West Virginia Dragonfly and Damselfly Atlas”. This ambitious effort relies heavily on citizen volunteers. As such, it involves all the joys and challenges inherent in a work force long on enthusiasm and short on formal training. However, results have been impressive, including five state records and 655 new county records. Combined with additional collection records from individuals and museums, a much clearer picture of West Virginia’s fauna and their habitat requirements is taking shape.

The cherry on this day’s cake was provided by John Abbott (University of Texas at Austin) describing “A New Species of *Cordulegaster*”. This taxon, given the name *C. sar-*

racenia (description published in Zootaxa), is now known from southeast Texas and western Louisiana. Its story, beginning with suspicion it was “something new” hiding in our midst based on photos sent to OdonataCentral, to its receiving formal description and stand-alone due, reads like a well-spun mystery. The associated cast, each important, includes both amateur and professional odonatologists. Equally fascinating is the set of habitat parameters this early season spiketail seems to require, involving a specific range of slope, trickle of water, and associated pitcher plants (*Sarracenia*).

The last official day of this year’s DSA meeting, 10 July, involved the majority of the group biting the bullet and getting an early start with Bill and Inez Prather and Dave Leatherman to the unpredictable High County near Cameron Pass. Other more reasonable sorts explored various sites in Fort Collins and Longmont with Boris Kondratieff.

The high elevation trips traveled up SR 14 through beautiful Poudre Canyon. Due to the exceptional snowpack in the upper mountains to the west, the Cache La Poudre River was roiling, to the thrill of rafters. The ongoing mountain pine beetle (*Dendroctonus ponderosae*) epidemic provided some early “fall color” in the form of thousands of dead ponderosa and lodgepole pine trees in the lower and middle stretches. About 65 miles west of Fort Collins, we turned onto Larimer 103 Road (“Laramie River Road”) and drove a few miles past Chambers Lake to the parking lot for the Lost Lake–Twin Lakes Trail (not to be confused with the Lost Lake we approached on 8 July north of Red Feather).

The visit to this area, originally scheduled for the 8th, held marginal potential for the various target species due to the snow and resulting lateness of the season. The day of our visit, cooler temperatures and considerable clouds hampered odonate activity early on, but we eventually found most of what we wanted. The two-mile hike at over 9000 feet elevation to Lost Lake, Laramie Lake, and a big peat bog just south of Twin Lakes scattered the group into smaller groups according to odonate activity, physical discomfort, and general ambition. Regardless, the scenery was spectacular. Most attendees found *Somatochlora semicircularis* (Mountain Emerald), and *Leucorrhinia borealis* (Boreal Whiteface) in decent numbers. Some on the trip discovered other target species including *Somatochlora hudsonica* (Hudsonian Emerald) and *Leucorrhinia hudsonica* (Hudsonian Whiteface). We essentially struck-out on desired darners like *Aeshna eremita* (Lake Darner) and *A. juncea* (Sedge Darner), although a few attendees found these on visits apart from the group trips. Of note, there’s a rumor John Abbott got

so hungry near the peat bog he was seen lowering a large leech into his open mouth.

The threat, and then reality, of monsoon rains ended our visit in early afternoon. Tired but happy we loaded up for the downhill return to Fort Collins.

The lowland trip with Boris Kondratieff to the Northern Colorado Environmental Learning Center (ELC) at the east terminus of Drake Avenue in eastern Fort Collins, Frank State Wildlife Area southeast of Fort Collins on the east side of I-25 and the Golden Ponds area in Longmont off Hover Road was quite successful in finding plains taxa.

Species at the ELC included common local taxa such as *Anax junius* (Common Green Darner), *Rhionaeschna multicolor* (Blue-eyed Darner), *Libellula luctuosa* (Widow Skimmer), *Enallagma antennatum* (Rainbow Bluet) and other damsels.

Most finds at Frank SWA were common but Steve Hummel found *Argia emma* (Emma’s Dancer), the only occurrence of this species reported during the entire set of meeting trips.

Nice finds at Golden Ponds were *Argia vivida* (Vivid Dancer), both Colorado pennants, *Celithemis elisa* (Calico) and *C. eponina* (Halloween), *Epithecina petechialis* (Dot-winged Baskettail), *Gomphus militaris* (Sulphur-tipped Clubtail), large numbers of both pondhawk types *Erythemis simplicicollis* (Eastern) and *E. collocata* (Western), *Libellula pulchella* (Twelve-spotted Skimmer), *Perithemis tenera* (Eastern Amberwing), *Plathemis lydia* (Common Whitetail), *Pachydiplax longipennis* (Blue Dasher), and *Enallagma signatum* (Orange Bluet). The latter (prior to this meeting) had only been known from a few locations in the state. Individual parties added at least two other locations in the Loveland and Fort Collins areas!

Lastly, of note, Steve Hummel discovered *Gomphus grasilinellus* (Pronghorn Clubtail), as well as *G. militaris* (Sulphur-tipped Clubtail), at Arapahoe Bend Natural Area on the east side of Fort Collins. There are but a very few records of the former species for Larimer County.

All in all, an enjoyable and productive set of field trips. No adverse rattlesnake or landowner encounters, no serious injuries, nobody fell off a cliff, nobody got stuck in peat. The Prathers deserve our thanks for all their efforts at scouting and planning, working out logistics, and giving us options. The total list of 70 species for all DSA meeting field effort combined is just under 2/3 of the known state total of 108! Not bad for a late-developing year and coverage of about a third of the state.

We all enjoy being in the field, of course, but other activities round out the true benefit of such gatherings as this DSA Annual Meeting. Networking, renewal of friendships, visits to the impressive collection housed in the Gillette Museum at CSU, mentoring, information exchange, just being in a new place—all collectively make for a productive, agreeable event. Boris Kondratieff was at the center during this week. He deserves the final accolade for his roles, both quietly behind the scenes and in full “action” mode, that make him “The Man” around here.

Lastly, as a bit of an outsider, I have to say I’ve been around a lot of nature people in my time. Most have been birders, but my experience with other special interest groups is also extensive. This assemblage of DSA folks was perhaps the most impressive and enjoyable for me, ever. It was an honor and a privilege to be with you. Thank you for coming to Colorado and letting us benefit from your knowledge and good will. South Carolina is lucky to be up next. My only request is that you try to get Jerrell to smile and show a little enthusiasm. We already miss his southern drawl!

List of taxa for all field trips, 5–10 July 2011 DSA Annual Meeting in Colorado, compiled by Bill Prather, <rossgull@aol.com>

indicates species seen during, but not necessarily limited to, a pre-convention trip to Brett Gray Ranch (see meeting summary narrative for date and description of the area)

Hetaerina americana (American Rubyspot) #
Lestes congener (Spotted Spreadwing) #
L. dryas (Emerald Spreadwing) #
L. unguiculatus (Lyre-tipped Spreadwing) #
Amphiagrion abbreviatum (Western Red Damsel) #
Argia alberta (Paiute Dancer) #
A. apicalis (Blue-fronted Dancer)
A. emma (Emma’s Dancer)
A. fumipennis (Variable Dancer)
A. lugens (Sooty Dancer)
A. moesta (Powdered Dancer)
A. nabuana (Aztec Dancer)
A. plana (Springwater Dancer) #
A. vivida (Vivid Dancer)
Coenagrion resolutum (Taiga Bluet)
Enallagma anna (River Bluet)
E. annexum (Northern Bluet) #
E. antennatum (Rainbow Bluet)
E. basidens (Double-striped Bluet)
E. boreale (Boreal Bluet)
E. carunculatum (Tule Bluet) #
E. civile (Familiar Bluet) #

E. praevarum (Arroyo Bluet) #
E. signatum (Orange Bluet)
Ischnura damula (Plains Forktail) #
I. demorsa (Mexican Forktail)
I. denticollis (Black-fronted Forktail) #
I. perparva (Western Forktail) #
I. verticalis (Eastern Forktail)
Aeshna eremita (Lake Darner)
A. interrupta (Variable Darner)
A. palmata (Paddle-tailed Darner)
Anax junius (Common Green darner) #
Rhionaeschna multicolor (Blue-eyed Darner) #
Gomphus graslinellus (Pronghorn Clubtail)
G. militaris (Sulphur-tipped Clubtail) #
Cordulia shurtleffi (American Emerald)
Epithea petechialis (Dot-winged Baskettail)
Somatochlora hudsonica (Hudsonian Emerald)
S. semicircularis (Mountain Emerald)
Celithemis elisa (Calico Pennant)
C. eponina (Halloween Pennant)
Erythemis collocata (Western Pondhawk)
E. simplicicollis (Eastern Pondhawk)
Leucorrhinia borealis (Boreal Whiteface)
L. hudsonica (Hudsonian Whiteface)
L. intacta (Dot-tailed Whiteface)
L. proxima (Belted Whiteface)
Libellula forensis (Eight-spotted Skimmer)
L. luctuosa (Widow Skimmer) #
L. nodisticta (Hoary Skimmer)
L. pulchella (Twelve-spotted Skimmer) #
L. quadrimaculata (Four-spotted Skimmer)
L. saturata (Flame Skimmer)
Pachydiplax longipennis (Blue Dasher) #
Pantala flavescens (Wandering Glider)
P. hymenaea (Spot-winged Glider)
Perithemis tenera (Eastern Amberwing)
Platthemis lydia (Common Whitetail) #
P. subornata (Desert Whitetail) #
Sympetrum corruptum (Variegated Meadowhawk) #
S. costiferum (Saffron-winged Meadowhawk)
S. danae (Black Meadowhawk)
S. internum (Cherry-faced Meadowhawk)
S. madidum (Red-veined Meadowhawk)
S. obtrusum (White-faced Meadowhawk)
S. pallipes (Striped Meadowhawk)
S. semicinctum (Band-winged Meadowhawk) #
Tramea lacerata (Black Saddlebags) #
T. onusta (Red Saddlebags) #



Northeast Regional DSA Meeting

Joshua Rose <opihi@mindspring.com>

The northeast regional meeting of the Dragonfly Society of the Americas convened in Dover, Delaware on Thursday 14 July 2011, marked by the sound of numerous little wooden hammers bashing apart Blue Crab exoskeletons at the Boondocks. By the end of the weekend, the 52 participants netted, photographed, observed, or found exuviae of 69 odonate species!

The real action started on Friday morning as everyone converged on Idylwild Wildlife Management Area in Maryland. This site of varied wetland habitats delivered as advertised with over 40 species. Pam Hunt ducked under a bridge near the parking area and came out with exuviae of a Common Baskettail (*Epitheca cynosura*), a Georgia River Cruiser (*Macromia illinoiensis georgina*), and an Umber Shadowdragon (*Neurocordulia obsoleta*). Melissa Callahan, a graduate student of Mark McPeck at Dartmouth, was on hand to collect genetic samples for her research on *Enallagma*; the group helped her locate and capture several species of bluets, including Burgundy (*E. dubium*), Blackwater (*E. weewa*), Orange (*E. signatum*), Slender (*E. traviatum*), and Attenuated (*E. daeckii*).

Several observers watched in awe as one of the meeting coordinators Hal White netted a Georgia River Cruiser practically from behind his ear. Other species caught for in-hand photography and then released included Swamp Darner (*Epiaschna heros*) and Mocha Emerald

(*Somatochlora linearis*). Rick Cheicante and Jim McCann saw a Coppery Emerald (*S. georgiana*) that most of us missed. Other members of the group spotted, and in most cases photographed, Cyrano Darner (*Nasiaeschna pentacantha*), Prince Baskettail (*Epitheca princeps*), Banded (*Celithemis fasciata*) and Double-ringed Pennant (*C. verna*), Yellow-sided (*Libellula flavida*) and Spangled Skimmer (*L. cyanea*), Elfin Skimmer (*Nannothemis bella*), Sparkling Jewelwing (*Calopteryx dimidiata*), Elegant Spreadwing (*Lestes inaequalis*), Citrine Forktail (*Ischnura hastata*), a horde of Lilypad Forktails (*I. kellicotti*), a first Idylwild record Eastern Forktail (*I. verticalis*), and Southern (*Nehalennia integricollis*) and Sphagnum Sprites (*N. gracilis*), among others. Jen Frye of the Maryland Department of Natural Resources provided hospitality with drinks, candy bars, and access to parking nearer our quarry.

After splitting up for dinner, the group reconvened to hear talks that evening. Melissa filled us in on *Enallagma* phylogeography and her reconstructions of where the bluets were hiding and evolving during the ice ages. She also discussed other work in the McPeck lab on the “burst of energy” that larvae of the fish-intolerant bluets use to escape from larval anisopteran predators, and the evolution of secondary reproductive parts in the genus. Liz Ballare, a graduate student with Jessica Ware at Rutgers University, gave a quick talk on her project studying *Macromia illinoiensis* and *M. georgina*, hybridization between the two,



Group photo of Northeast Regional DSA meeting attendees. Photo by Meena Haribal.

and its implications for the status of the two taxa. Mike May described the work of his student Dave Moskowicz radio-tracking and color-marking *Cordulegaster erronea*, and showed Dave's brilliant video of male *C. erronea* attempting to mate (or not) with models of females using different shapes and colors; it apparently won first place in the inaugural Entomological Society of America video contest! Lastly, Hal White, author of the just-published "Natural History of Delmarva Dragonflies and Damselflies" (available for purchase from Rowman & Littlefield), introduced us to several of the most extreme, amusing, and interesting bits of Delmarva odonatology, including the parallels between Shadowdragon exuviae and US Army troop graffiti from WWII, and photos of the first Delaware or Eastern Shore of Maryland records of *Tramea calverti*, *Stylurus laurae*, and *Rhionaeschna mutata*.

The meeting split among three field trips on Saturday. The smallest group went in search of species of south-eastern coastal tidal wetlands, recording Four-spotted Pennant (*Brachymesia gravida*), Needham's Skimmer (*Libellula needhami*), Carolina Saddlebags (*Tramea carolina*), and of course Seaside Dragonlet (*Erythrodiplax berenice*). A larger outing explored a beautiful section of the Choptank River, and had the best set of clubtails of the meeting with Dragonhunter (*Hagenius brevistylus*), Common Sanddragon (*Progomphus obscurus*), and Black-shouldered Spinyleg (*Dromogomphus spinosus*), but came up short looking for Laura's Clubtail (*Stylurus laurae*). Also found were a Fawn Darner (*Boyeria vinosa*) exuvia and more Blackwater Bluets and Sparkling Jewelwings. The largest number of participants headed to the Nasawango River vicinity, where a little bog yielded the only Painted (*Libellula semifasciata*) and Bar-winged Skimmers (*L. axilena*) of the weekend, along with an impressive array of pitcher plants. Richard Orr noted the weekend's only Skimming Bluet (*Enallagma geminatum*) on the river itself. It was also on this trip that a series of long slogs through cypress swamps, during which we played "can you top this" by seeing which one of us could accidentally sink the deepest into the mud (Dan Irizarry won by a landslide, almost literally), finally arrived at a section of river with a couple of dozen Duckweed Firetails (*Telebasis byersi*).

The whole gang gathered back together that evening at the Abbott's Mill Nature Center to eat, drink, and compare notes and photos. The site boasted an impressive abundance of Stinkpot turtles, one of which got into a contest with Stick LePan over who could make the most menacing face. After dinner, Richard Orr's attempts to net an emerald over the nearby lawn inspired several others to join his effort; Rick Cheicante finally succeeded in capturing the critter, which turned out to be Fine-lined (*Somatochlora filosa*)!



Joshua Rose and Stick LePan doing their best to imitate a Stinkpot Turtle. Photo by Pam Hunt.



Dan Irizarry being extracted from a bog by fellow odonatologists! Photo by Pam Hunt.

The meeting officially ended Saturday night, but predictably, many of the participants were in the field Sunday morning looking to add more species to the weekend's tally. Loose ends tied up included Wandering Glider (*Pantala flavescens*) and Rambur's Forktail (*Ischnura ramburii*) at Bombay Hook National Wildlife Refuge; Comet Darner (*Anax longipes*), Calico Pennant (*Celithemis elisa*), Twelve-spotted Skimmer (*Libellula pulchella*), and Familiar Bluet (*Enallagma civile*) at Cool Springs Park in Wilmington; and Tiger Spiketail (*Cordulegaster erronea*), Powdered Dancer (*Argia moesta*), and Stream Bluet (*Enallagma exsulans*) at White Clay Creek State Park. Hal visited a few of his favorite spots and added Common Green Darner (*Anax junius*), Royal River Cruiser (*Macromia taeniolata*), Sweetflag Spreadwing (*Lestes forcipatus*), and Azure Bluet (*Enallagma aspersum*).

In addition to Hal White, Jim White (no relation) of the Delaware Nature Center, Christopher "Kitt" Heckscher of Delaware State University, and Jim McCann of

the Maryland Department of Natural Resources helped organize the meeting and lead field trips. Considering the unbearably hot humid weather that followed a week later when the heat index reached 123(!) one day, the organizers did a wonderful job of arranging blue sunny skies, low humidity, and pleasant temperatures in the 80s. Several meeting participants have posted their photos on various web sites. Enjoy!

Annette DeGiovine Oliveira:

<<http://dragonflydazed.blogspot.com/search/label/Delaware>>

Dan Irizarry:

<<http://www.flickr.com/photos/danirizarry/collections/72157627096281705/>>

Meena Haribal:

<<http://www.flickr.com/photos/91426175@N00/sets/72157627197957621/show/>>

Ken Larsen:

<http://kenlarsen.smugmug.com/Friday-Surveys/2011-DSA-NE-Meeting-July-2011/18107969_H3MK7Q#1389405321_ZX9LwRd>

Beverly Dant:

<<http://bcdant.shutterfly.com/6886>>

Some video clips by Meena:

<<http://www.youtube.com/watch?v=jXIE3dDUYSA>>

<http://www.youtube.com/watch?v=PQhds7SgX_E&feature=related>



2011 Annual Oregon *Aeshna* Blitz Sets New Records

Steve Gordon, 1140 W. 24th Ave., Eugene, OR 97405 <scfgordon24@comcast.net>

Held in the High Cascade zone near Diamond Lake in Douglas County at about one mile in elevation, the 12th annual Oregon Aeshna Blitz conducted on Saturday, 27 August established four new Oregon late date records. But the real records were thirteen attendees (a record number), four female humans (the first women ever for the Oregon Blitz), and the youngest attendee (Xabrina Vlach at three and one-half months). This year's attendees included: The Steves—Berliner, Gordon, and Valley; Sherry Daubert,

Jim Johnson, Cary Kerst, Ron Lyons, Dale and Elva Paulson, Max Speedrow, and Josh, Michelle, and Xabrina Vlach.

We came from Vancouver, Milwaukie, Albany, Eugene, Roseburg, and Bandon to reach Broken Arrow campground in the Umpqua National Forest. Our designated site for the Blitz was nearby Horse Lake. The setting was beautiful with larger Diamond Lake (elevation 5,187 ft.)



Attendees at the 2011 Oregon Aeshna Blitz. Photograph by Steve Valley.

to our north nestled between Mount Bailey (8,375 ft high) and the sharply-spined Mt. Thielson (9,184 ft. high). The campground lies over ancient Mt. Mazama ashes now dominated by lodgepole pine forests.

Stops to and from the Blitz at Salt Creek at the outlet of Gold Lake in Lane County yielded a healthy number of *Octogomphus specularis* (Grappletail), including photographed mating pairs, *Somatochlora albicincta* (Ringed Emerald), *Ophiogomphus morrisoni* (Great Basin Snaketail), *Argia vivida* (Vivid Dancer), and *Ischnura erratica* (Swift Forktail) (8/26 new Oregon late date). A *Macromia magnifica* (Western River Cruiser) along the North Umpqua River was a new Oregon late date record on 26 August.

From the east side of Crescent Lake in Klamath County *Aeshna canadensis* (Canada Darner) and *Anax junius* (Common Green Darner) were found. On Friday the 26th, a team covered the area north of Diamond Lake and observed *Ophiogomphus morrisoni* (Great Basin Snaketail), *Cordulegaster dorsalis* (Pacific Spiketail), *Cordulia shurtleffii* (American Emerald), *Epitbea spinigera* (Spiny Baskettail) (8/26 new Oregon late date), and *Argia emma* (Emma's Dancer).

On Saturday at Horse Lake, all thirteen Blitz participants convened and recorded twenty species. *Aeshna interrupta* (Variable Darner) dominated the *Aeshna* scene with a few *A. palmata* (Paddle-tailed) found, as well. *Cordulegaster dorsalis* (Pacific Spiketail), *Cordulia shurtleffii* and *Somatochlora semicircularis* (American, one female, and Mountain Emeralds) were observed, and *Leucorrhinia hudsonica* and *L. glacialis* (Hudsonian and Crimson-ringed Whitefaces) were common. *Sympetrum costiferum*, *S. obtrusum*, and *S. pallipes* (Saffron-winged, White-faced and Striped Meadowhawks); *Lestes congener*, *L. disjunctus*,



Ophiogomphus morrisoni (Great Basin Snaketail) at Salt Creek boat ramp at the outlet of Gold Lake, Lane County, Oregon. Photograph by Jim Johnson.



Mating *Octogomphus specularis* (Grappletails) with an orientation problem at Salt Creek boat ramp at the outlet of Gold Lake, Lane County, Oregon. Photograph by Steve Berliner.


L. dryas, and *L. unguiculatus* (Spotted, Northern, Emerald, and Lyre-tipped Spreadwings), and *Nehalennia irene* (Sedge Spite) (8/27 new Oregon late date) were among other highlights.

In the camp Northern Goshawk visited, as did Clark's Nutcracker, Gray and Steller's Jays, Common Nighthawks, and Red Crossbills. Through Jim's telescope we observed the Andromeda Galaxy. Cary's night light attracted hundreds of caddisflies and an adult ant lion, and Steve Valley found a *Monochamus scutellatus oregonensis*, a long horned beetle with "horns" longer than the beetle. Young Xabrina was mesmerized by the campfire, and Max, Steve Valley's grandson, was content to roast a bag of marshmallows; he used his unconsumed marshmallows to mark a nighttime trail from the campfire to his tent. Elva Paulson showed us her latest field journal with watercolor and pen and ink sketches of bison, ravens, and robins drawn during a cold April trip to Yellowstone National Park. We were amazed to hear her tell of her parents, Frederick and Frances Hamerstrom, who received a PhD and Master of Science degree respectively from Aldo Leopold at the University of Wisconsin. Her mother was the only female to receive an advanced degree from him, and she was the first professional female biologist in the world. You don't learn those kinds of things around ordinary campfires.

On the way home from the Blitz, some members stopped at Gold Lake. Cary Kerst and Steve Gordon stopped at a constructed wetland pond at a lower elevation (approximately 3,130 feet) called Thorn Prairie in Douglas County where they recorded thirteen species, including *Aeshna umbrosa* (Shadow Darner), *Cordulegaster dorsalis* (Pacific Spiketail) (a dead female found floating in the

pond), *Erythemis collocata* (Western Pondhawk), *Libellula luctuosa*, *L. pulchella* (Widow and Twelve-spotted Skimmers), *Plathemis lydia* (Common Whitetail), *Sympetrum corruptum* (Variegated Meadowhawk), and *Archilestes californica* and *Lestes congener* (California and Spotted Spreadwings). At an even lower elevation pond in Stewart Park in Roseburg they found *Libellula saturata* (Flame

Skimmer), *Pachydiplax longipennis* (Blue Dasher), and *Enallagma carunculatum* (Tule Bluet) as well as an amazing density of *Libellula luctuosa* (Widow Skimmers) and *Tramea lacerata* (Black Saddlebags).

The scenery, weather, Odonates, and company combined to make the 12th Oregon Aeshna Blitz a success. 

2012 Annual DSA Meeting: Baldcypress Swamps, Sandy Ponds, Blackwater Rivers, and Clubtails

Chris Hill <Chill@coastal.edu>


The 2012 DSA annual meeting will be centered in Florence, South Carolina. Florence is in the Pee Dee region of South Carolina, with access to blackwater and brown-water rivers, and to sandhills ponds with their distinctive odonate fauna.

The meeting is planned for 4–6 May, with field trips on 4 and 6 May and business meeting on the 5th. We have a block of rooms reserved at the Marriott Springhill Suites in Florence, 843-317-9050 (mention dragonflies) or book at the personalized web site <<http://cwp.marriott.com/flosh/dragonfly/>>.

A pre-meeting trip on the South Carolina coastal plain 2–3 May and a post-meeting trip to the Chattooga River

on the South Carolina–Georgia border 7–8 May are also planned.

South Carolina is an undersurveyed state, and we expect the meeting will produce dozens of new distributional records, but we also plan to visit well-surveyed sites. The timing of the meeting should produce warm weather, sandhill pond and other regional specialties and an abundance of southeastern clubtails.

A web page with site details and lists of expected (and hoped-for) species will be forthcoming but is not active yet. Contact Chris Hill at <chill@coastal.edu> for updates. 

Northeast Meetings Update

Bryan Pfeiffer <bryan@dailywing.net> and **Colin Jones** <colin.jones@ontario.ca>

Save the dates for two regional meetings in 2012 sponsored in part by the Northeast chapter of the DSA.


First, spend quality time with dragonflies in February without heading toward the Equator. NymphFest 2012 is set for 18–19 February 2012 in Montpelier, Vermont. Experts and novices alike will gather to share and swap wisdom (and exuviae). Expect lectures on finding and identifying dragonfly larvae and skins, as well as workshops on identification of particular groups. We'll also establish and staff an "Identification Station" where experts-in-residence can help participants who bring their own exuviae.

The Northeast chapter of the DSA hosts NymphFest every four years (in election years). So while the politicians are in New Hampshire this winter, you should be able to find your way to Vermont in February. We're still finalizing details for the event. If you'd like e-mail updates on

our progress contact Bryan Pfeiffer at <bryan@dailywing.net>. Final details will appear in the next issue of ARGIA. For an account of the 2008 NymphFest check out <<http://www.odes.millersriver.net/nymphfest2008.htm>>.

Meanwhile, the Northeast regional meeting of the DSA is tentatively set for 6–8 July 2012 in Sault St. Marie, Ontario, Canada. Participants will have the option of traveling to and lodging in Sault St. Marie, Michigan, while attending the meeting in its sister city across the border in Canada. Plans for this one are also still in progress, but it will be a joint offering of the Northeast chapter of the DSA and the annual Great Lakes Odonata Meeting (GLOM).

As is often the case for regional meetings at northern latitudes, boreal species will be a priority, including *Somatochlora* such as Ocellated Emerald (*Somatochlora minor*) and Delicate Emerald (*S. franklini*) and Gomphids

including Extra-striped Snaketail (*Ophiogomphus anomalus*) and Boreal Snaketail (*O. colubrinus*). A post-meeting trip farther north will also be scheduled with the hopes of finding early *Aeshna* including Sedge Darner (*Aeshna juncea*), Ringed Emerald (*S. albicincta*), Broad-tailed Shadowdragon (*Neurocordulia michaeli*) and possibly Canada Whiteface (*Leucorrhinia patricia*). Watch for complete details in the next issue of ARGIA. Colin Jones <colin.jones@ontario.ca> is the principal meeting organizer. 

New North American Dragonfly Named

Cordulegaster sarracenia Abbott & Hibbitts has been given the official common name of Sarracenia Spiketail!

Argia plana (Springwater Dancer), a New Species Record for Alabama


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On 9 September 2011, I visited Ruffner Mountain Nature Preserve, located within the metropolitan area of Birmingham, Alabama. While there, I walked through a constructed wetland area, created approximately three years ago by altering the flow of an artesian well through a forest clearing to create a series of three small ponds. While walking along a boardwalk where the spring water from the artesian well flowed through a heavily vegetated grassy area before emptying into the first pond, I noticed a large, brilliant blue *Argia* basking in the sun along the boardwalk at ca. 0830 CDT. It was clearly not any of the *Argia* species known to occur in Alabama, so I netted the specimen for closer examination and determined that it was *A. plana*, Springwater Dancer. During the following 90 minutes I observed 8–10 additional males and 3 females in the same general area. Voucher specimens and photographs were also obtained. By ca. 1030 CDT, temperatures had risen considerably and all individuals had disappeared from the boardwalk, presumably to the thick vegetation surrounding the small spring inflow. The only other species of odonates seen at this area were *Argia fumipennis*, *Ischnura posita*, and *Plathemis lydia*.

Argia plana, though common in parts of the southwestern and central United States, is not known to occur east of Missouri or Arkansas. This record represents a significant



Argia plana (Springwater Dancer), male, Ruffner Mountain Nature Preserve, Jefferson County, Alabama. Photo by Steve Krotzer.

range extension to the east, and is the first known occurrence of the species east of the Mississippi River. While it is possible that this population could have resulted from an accidental introduction, it does not seem likely. A similar disjunct distributional pattern exists for another odonate species, *Somatochlora hineana*; there is one historical record from northeast Alabama, with the nearest known populations occurring in Missouri. 

The Mystery of *Sympetrum danae* (Black Meadowhawk) at Page, Arizona

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One of the odonate species in Arizona with the most restricted range is *Sympetrum danae* (Black Meadowhawk). While it is true that it is quite tiny and might even be overlooked at times, the known colonies in the state are thought to be restricted to a single metapopulation in the higher White Mountains of southern Apache County. With a center of abundance at Carnero Lake (34° 06' 54" N 109° 31' 49" W and an elevation just shy of 9000 ft)

and another at Bog Tank (34° 02' 48" N 109° 40' 58" W at an elevation of nearly 8200 ft), and just a few singletons in the intervening wetlands and stream sides, the extent of the range in Arizona seemed to be pinned down.

It was almost with disbelief, therefore, that we discovered a fresh female at a municipal golf course pond in Page, Arizona, just a few miles from the Utah border but

a mind-boggling 220 air miles from the known Arizona populations.

Upon collecting the specimen, we discussed its possible origins. The Kaibab Plateau, fewer than 40 miles to the WSW, tops out above 9100 ft and is pockmarked with lakes and wetlands. The summit of Navajo Mountain is only 36 miles ENE of the Page Golf Course and has pockets of thick spruce forest at its top. Perhaps one of these locations could support a colony of *Sympetrum danae*.

We had considered, even before the Page find, the notion that additional populations of *S. danae* might be tucked away either on the Kaibab Plateau, on the Arizona Strip of northern Mohave County, or in the higher reaches of the Chuska/Lukachukai/Carrizo Mountains of extreme northern Apache County. However, considerable fieldwork in these areas has failed to produce any records.


We decided to expand our search to neighboring states. A single purported record from San Juan County in northwestern New Mexico came to light and gave further credence to the notion that northeastern Apache County might be a sound bet and, even more to the point, a source for our mysterious find at Page.

This lead ran into trouble when the possible specimen from northwestern New Mexico, thought to be housed in the Colorado State University collection, didn't materialize. Mislabeling was suspected because the only region of New Mexico with confirmed *Sympetrum danae* records housed in the CSU collection is the extreme north-central highlands (Sandoval, Colfax, and San Miguel Counties; B. Kondratieff, pers. com., September 2011).

In Utah, to the immediate north, a single record is shown in OdonataCentral.org. This Kane County record originates from the Grand Staircase Escalante National Monument where a specimen was taken by C.R. Nelson on 29 September 1999 along Skutumpah Rd at Sheep Creek Jct, about 10 miles SW of route 12 at Henrieville. GPS coordinates for the site are 37° 29' 43" N 112° 03' 59" W, at an elevation of 5531 ft. This location is 52 air miles northwest of the Page site. It is also along a tributary to Paria Canyon, a canyon that empties into the Colorado River fewer than 7 miles from the Page site. Could a single individual have worked its way down that contorted river for all those miles and ended up within the Page city limits?

On the evening of the capture, we contacted Dennis Paulson who is familiar with this species in the wetlands of Washington. We informed him of the strange find, a *Sympetrum danae* at a pond in Page surrounded by Great Basin desertland, at an elevation near 4000 ft. He gave us a reply that turned our mystery into a misconception. He wrote,

"I guess all they have to do is jump off a mountain and keep gliding. Actually, in Washington *S. danae* occurs at some desert (sagebrush steppe) ponds, so by no means does it have to be in a boreal setting. I have one record from the lowlands of western Washington that I considered a downslope vagrant, but indeed it is usually in more or less northern habitats."

Downslope vagrant, desert ponds . . . sounds like a reasonable diagnosis to us. 

First Lincoln County, Nevada Record for *Lestes congener* (Spotted Spreadwing)

Bruce Lund <blund@mvdsl.com>

The North American Dot Maps show there are about eight records for *Lestes congener* (Spotted Spreadwing) in northern Nevada and none in the southern most Clark, Lincoln, and Nye Counties (Donnelly, 2004).


Range maps in Paulson (2009) indicate southern Nevada is outside of the species range; however the North American Dot Maps show occurrence records nearby to the west in California and east in Arizona (Donnelly, 2004). The OdonataCentral.org county checklist for southern Nevada counties lists a record in Nye County, credited to the Dot Map Project (OC #211795), but with no specific information to support this record (Abbott, 2011) [editorial note: the record is apparently based on a specimen

in the UMMZ]. The species was not observed during a two-year odonate survey at the Ash Meadows National Wildlife Refuge which is the only published survey for Nye County (Stevens & Bailowitz, 2008).

With records around and adjacent to southern Nevada counties, finding *Lestes congener* here is a reasonable expectation that became reality on 20 June 2011. While conducting odo surveys around the Lower Lake of the Pahranaagat National Wildlife Refuge (Lincoln Co.), I encountered hundreds of the Spotted Spreadwing and took specimens and photos (OC #328827). There were also thousands of *Enallagma civile* (Familiar Bluet) and I saw many Spreadwings being chased and devoured by the

bluets and other odonates as *Libellula forensis* (Eight-spotted Skimmer).

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- Paulson, D. 2009. Dragonflies and Damselflies of the West. Princeton University Press, Princeton, NJ.
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Request for Data from New Hampshire

The New Hampshire Dragonfly Survey (NHDS) is a five-year project to document the distributions of Odonata in the state. From 2007–2011, a small and dedicated army of volunteers has collected over 17,000 records from sea level to 5000' in the White Mountains, documented 157 or the 164 species known to occur in the state (including finding four *NEW* species for New Hampshire), and had a great time doing it. As the NHDS winds to a close, I am seeking any other data that may have been collected by odonatists who happened to be in New Hampshire during the survey period. Anyone with records of *ANY* species from anywhere in New Hampshire from 2007–2011 is encouraged to contact me as indicated below. More info on the NHDS is also available at <<https://sites.google.com/site/nhdragonflysurvey/>>.

To submit data or get more information, contact Pam Hunt at <phunt@nhaudubon.org> or (603) 224-9909 x328.

An Inventory of the Odonates of the Dunning Creek Wetlands, Bedford County, Pennsylvania

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Study Site

The Dunning Creek Wetlands (DCW) is located in south-central Pennsylvania near the town of Alum Bank in Bedford County (centered at 40° 09' 49" N 078° 36' 25" W). The wetlands are approximately 7 km west of the Allegheny Front, and the site ranges in elevation from about 345 to 365 m above sea level. The DCW consists of approximately 40 ha of restored wetlands and 30 ha of adjacent upland fields that were reclaimed from farmlands in the mid-1990s, making it one of the largest privately-owned restored wetlands east of the Mississippi River. The wetlands were developed by the owner, Thomas Dick, in cooperation with the US Fish and Wildlife Service, and the site is now managed by members of the Allegheny Plateau Audubon Society as a wildlife sanctuary and stopover habitat for migratory waterfowl (Allegheny Plateau Audubon Society, 2011).

The restored wetlands area consists of seven larger impoundments ranging in size from

about 0.3 ha to the 3.5 ha Teal Lake, with a number of smaller pools and potholes scattered among them (Figures 1 and 2). The land surrounding these ponds consists primarily of open, early-succession field habitat planted with switchgrass, mil-



Figure 2. Teal Lake at the Dunning Creek Wetlands, Bedford County, Pennsylvania.

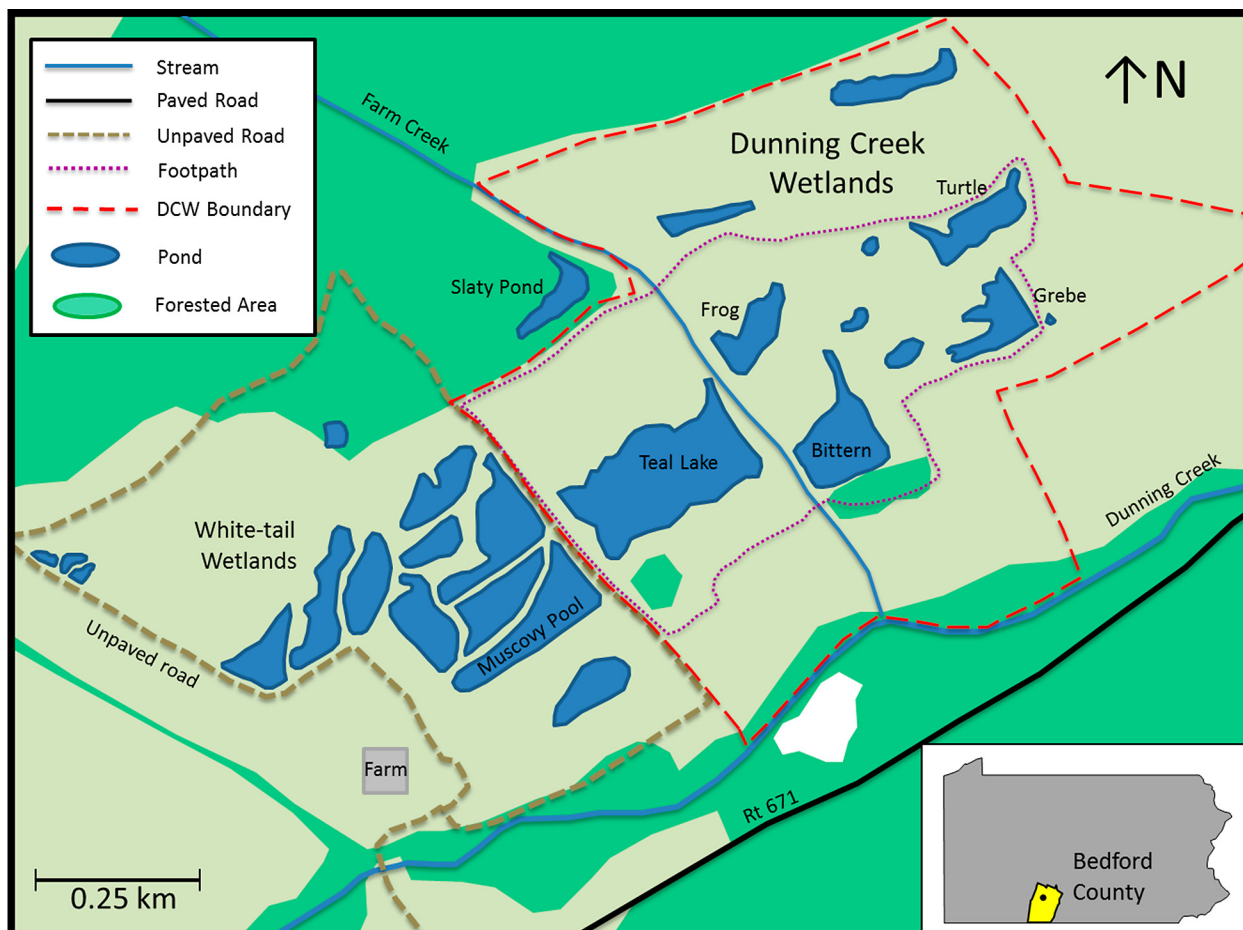


Figure 1. Map of the Dunning Creek Wetlands, Bedford County, Pennsylvania.

let, corn, silky dogwood, buttonbush and other vegetation to encourage wildlife. A small, 2-ha stand of alder has also been established along the southeastern edge of the wetlands (Allegheny Plateau Audubon Society, 2011). The owner of the property directly to the west of the DCW has also constructed about 30 ha of wetlands and uplands habitat from formerly-farmed land. This adjacent area, known as White-tail Wetlands, consists of open fields and early-succession forest interspersed with about 15 ponds ranging in area from approximately 0.1 ha to the 1.5 ha Muscovy Pool.

Also of note at the DCW are two lotic ecosystems. Dunning Creek itself runs along the southern edge of the site and eventually empties into the Raystown Branch of the Juniata River in Bedford, Pennsylvania, while a much smaller stream, Farm Creek, runs southeasterly through the wetlands, emptying into Dunning Creek.

The average yearly temperature in the area is 10.8° C, with an average summer (June–August) temperature of 21.3° C and average summer highs and lows of 29° C and 14° C, respectively. The average winter temperature (December–February) is -0.3° C, with average highs and lows of 5.0° C

and -5.7° C, respectively. The average annual precipitation is 98.2 cm. July is typically both the warmest (22.0° C) and wettest (11.2 cm precipitation) month of the year (The Weather Channel, 2011).

Study Purpose and Methodology

The purpose of our investigation was to document the species richness and flight seasons for adult odonates inhabiting the DCW and neighboring ponds in 2010. Although studies of avian establishment in wetlands reclaimed from agriculture are relatively widespread (e.g., O’Neal et al., 2008), less is known about the establishment of invertebrates, including odonate communities, in these habitats. Considering that odonates are ecologically-valuable components of both aquatic and terrestrial food webs, their presence in a restored wetland can serve as a valuable indicator of ecosystem health (Corbet 1999). As such, good conservation planning for sites like the DCW requires up to date inventories of odonate species inhabiting those areas.

A few recent studies have begun to shed light on the ecology of odonates in reclaimed wetlands. For example,

Table 1. Species of Zygoptera Observed at the Dunning Creek Wetlands in 2010.

Species (Common Name)	Dates of Observation in 2010	Relative Abundance ¹	Observed in 2010, not 2003	2010 Bedford County Record ²	PA State Conservation Rank ³
<i>Calopteryx maculata</i> (Ebony Jewelwing)	4 June – 7 July	3/10 (30%)			
<i>Lestes australis</i> (Southern Spreadwing)	2 July – 18 Aug	3/19 (16%)			
<i>Lestes congener</i> (Spotted Spreadwing)	28 Aug – 10 Nov	13/22 (59%)			
<i>Lestes disjunctus</i> (Northern Spreadwing)	25 May	n/a	•	•	
<i>Lestes forcipatus</i> (Sweetflag Spreadwing)	07 Jul	n/a	•	•	S3/S4
<i>Lestes rectangularis</i> (Slender Spreadwing)	2 July – 29 Sept	14/34 (41%)			
<i>Lestes vigilax</i> (Swamp Spreadwing)	11 June – 15 July	3/10 (30%)	•		
<i>Argia fumipennis violacea</i> (Variable Dancer)	2 June – 29 Aug	11/25 (44%)			
<i>Enallagma aspersum</i> (Azure Bluet)	2 June – 30 Aug	4/26 (15%)			S3/S4
<i>Enallagma civile</i> (Familiar Bluet)	2 June – 8 Oct	12/36 (33%)			
<i>Enallagma divagans</i> (Turquoise Bluet)	10 Aug	n/a	•	•	S3
<i>Enallagma exsulans</i> (Stream Bluet)	18 June – 30 Aug	2/22 (9%)	•	•	
<i>Enallagma geminatum</i> (Skimming Bluet)	25 May – 30 Aug	10/28 (36%)			
<i>Enallagma signatum</i> (Orange Bluet)	20 May – 28 Aug	10/27 (37%)			
<i>Enallagma traviatum</i> (Slender Bluet)	4 June – 2 Sep	8/26 (31%)	•		
<i>Enallagma vespersum</i> (Vesper Bluet)	11 Jun	n/a	•	•	
<i>Ischnura hastata</i> (Citrine Forktail)	7 July – 11 Oct	6/27 (22%)			
<i>Ischnura posita</i> (Fragile Forktail)	5 May – 23 Sep	26/37 (70%)	•		
<i>Ischnura verticalis</i> (Eastern Forktail)	5 May – 26 Oct	42/45 (93%)			

¹ Percentage of Dates Observed = Number of observations of that species within its flight season ÷ total sample dates within its flight season.

² Specimen properly documented, submitted and accepted at www.odonatacentral.org.

³ Only species of conservation interest are noted. Others are considered secure (S5) in Pennsylvania. S1 = Critically Imperiled, S2 = Imperiled, S3 = Vulnerable, S4 = Apparently Secure (uncommon but not rare), S5 = Secure.

Mabry and Dettman (2010), as well as Roush and Anon (2003), demonstrated that odonate diversity was highest in restored wetlands with high structural vegetative diversity at the water's edge, as opposed to those sites with more monotypic vegetation. Our study of the DCW, an area comprised of many sub-habitats varying highly in vegetative complexity, also contributes to this database of information regarding the establishment of odonates following wetland restoration.

Our surveying efforts at the DCW in 2010 began in early May and concluded in late November. We collected data on a total of 50 days throughout this time span; generally 2–3 site visits were made per week. To assess the site thoroughly, we varied our sampling efforts to ensure that different ponds were sampled at different times of the day. We also rotated our visits to particular ponds daily to ensure that the entire wetlands were sampled about once per week at minimum. Identifications were mostly made

on-site with binoculars or by netting, primarily using the field guides of Lam (2004) and Nikula et al. (2007) as references. In 2003, a similar survey was conducted at these wetlands by Dennis McNair, and although quantitative comparisons should be made with caution due to differences in sampling effort, the data provide us with an overall qualitative comparison of species diversity and flight seasons.

Study Results

We observed a total of 50 species of odonate adults (20 species in three families of Zygoptera and 30 species in four families of Anisoptera) at the Dunning Creek Wetlands in 2010 (Tables 1 and 2). Included in that list are 11 species that are properly documented new records for Bedford County, Pennsylvania (Tables 1 and 2), according to the list maintained at the OdonataCentral web site (Abbott, 2011). We should also note that 11 odonate spe-

Table 2. Species of Anisoptera Observed at the Dunning Creek Wetlands in 2010.

Species (Common Name)	Dates of Observation in 2010	Relative Abundance ¹	Observed in 2010, not 2003	2010 Bedford County Record ²	PA State Conservation Rank ³
<i>Aeshna canadensis</i> (Canada Darner)	28 Aug – 14 Sep	2/8 (25%)	•	•	
<i>Aeshna constricta</i> (Lance-tipped Darner)	03 Sep	n/a			S3/S4
<i>Aeshna tuberculifera</i> (Black-tipped Darner)	25 Aug	n/a	•	•	S2/S3
<i>Aeshna umbrosa</i> (Shadow Darner)	23 Sep – 10 Nov	8/13 (62%)			
<i>Aeshna verticalis</i> (Green-striped Darner)	30 Aug – 11 Oct	3/12 (25%)	•	•	S3/S4
<i>Anax junius</i> (Common Green Darner)	5 May – 11 Oct	35/41 (85%)			
<i>Arigomphus villosipes</i> (Unicorn Clubtail)	27 May – 4 June	3/3 (100%)			
<i>Gomphus exilis</i> (Lancet Clubtail)	20 May – 4 June	3/5 (60%)			
<i>Epitheca cynosura</i> (Common Baskettail)	20 May – 21 June	9/9 (100%)			
<i>Epitheca princeps</i> (Prince Baskettail)	2 June – 30 Aug	19/26 (73%)			
<i>Somatochlora linearis</i> (Mocha Emerald)	02 Sep	n/a			S1
<i>Celithemis elisa</i> (Calico Pennant)	27 May – 28 Aug	11/25 (44%)			
<i>Celithemis eponina</i> (Halloween Pennant)	2 June – 7 Sep	24/29 (83%)			S2/S3
<i>Erythemis simplicicollis</i> (Eastern Pondhawk)	25 May – 23 Sep	31/35 (89%)			
<i>Ladona julia</i> (Chalk-fronted Corporal)	5 May – 25 June	11/12 (92%)			
<i>Leucorrhinia intacta</i> (Dot-tailed Whiteface)	20 May – 29 June	9/12 (75%)			
<i>Libellula cyanea</i> (Spangled Skimmer)	25 May – 30 Aug	14/28 (50%)			
<i>Libellula incest</i> (Slaty Skimmer)	15 July – 10 Aug	2/6 (33%)	•	•	S3/S4
<i>Libellula luctuosa</i> (Widow Skimmer)	25 May – 23 Sep	27/35 (77%)			
<i>Libellula pulchella</i> (Twelve-spotted Skimmer)	25 May – 7 Sep	21/31 (68%)			
<i>Libellula semifasciata</i> (Painted Skimmer)	20 May – 2 Sep	7/30 (23%)	•	•	
<i>Pachydiplax longipennis</i> (Blue Dasher)	20 May – 3 Sep	28/31 (90%)			
<i>Perithemis tenera</i> (Eastern Amberwing)	2 June – 14 Sep	26/31 (84%)			
<i>Plathemis lydia</i> (Common Whitetail)	20 May – 23 Sep	25/36 (69%)			
<i>Sympetrum obtrusum</i> (White-faced Meadowhawk)	30 Aug – 7 Sep	2/4 (50%)			S3/S4
<i>Sympetrum rubicundulum</i> (Ruby Meadowhawk)	21 June – 8 Oct	24/31 (77%)			
<i>Sympetrum semicinctum</i> (Band-winged Meadowhawk)	31 July – 13 Oct	9/16 (56%)			S3/S4
<i>Sympetrum vicinum</i> (Autumn Meadowhawk)	28 Aug – 21 Nov	20/23 (87%)			
<i>Tramea carolina</i> (Carolina Saddlebags)	27 May – 4 June	2/3 (67%)	•	•	
<i>Tramea lacerata</i> (Black Saddlebags)	20 May – 14 Sep	27/34 (79%)			

¹ Percentage of Dates Observed = Number of observations of that species within its flight season ÷ total sample dates within its flight season.

² Specimen properly documented, submitted and accepted at www.odonatacentral.org. We were unable to photo-graph or capture the Mocha Emerald observed on 2 Sept 2010

³ Only species of conservation interest are noted. Others are considered secure (S5) in Pennsylvania. S1 = Critically Imperiled, S2 = Imperiled, S3 = Vulnerable, S4 = Apparently Secure (uncommon but not rare), S5 = Secure.

cies observed at the wetlands are of conservation concern in Pennsylvania (Tables 1 and 2), including the critically imperiled *Somatochlora linearis* (Mocha Emerald) (Pennsylvania Natural Heritage Program, 2011). Flight seasons for the species observed in 2010 ranged from early May to mid-November. The earliest observed species were *Ischnura posita* (Fragile Forktail), *I. verticalis* (Eastern Forktail), *Anax junius* (Common Green Darner), and *Ladona julia* (Chalk-fronted Corporal), while three species, *Lestes congener* (Spotted Spreadwing), *Aeshna umbrosa* (Shadow Darner), and *Sympetrum vicinum* (Autumn Meadowhawk), maintained activity well into November.

Sixteen of the species documented in 2010 were not observed during the previous survey of 2003 (Tables 1 and 2), while four species, *Amphiagrion saucium* (Eastern Red Damselfly), *Gomphus lividus* (Ashy Clubtail), *Somatochlora tenebrosa* (Clamp-tipped Emerald), and *Pantala flavescens* (Wandering Glider), were observed in the 2003 survey but not in 2010. Combined with the observation that total odonate species richness increased from 39 species in 2003 to 50 species in 2010, our data indicate that odonate diversity at the site has increased as the wetlands and surrounding field habitats have matured. It is also indicative that the management practices undertaken at these wetlands (e.g., efforts to plant native species, to increase structural vegetative diversity, and to remove invasives) have indeed been successful for attracting and increasing odonate diversity.


Overall observed odonate richness at the DCW totals 60 species, in consideration of the data from both the 2003 and 2010 surveys, as well as from other intermittent observations made by Dennis McNair and other members of the Allegheny Plateau Audubon Society. In addition to species observed in the 2010 and 2003 surveys, the list includes *Lestes dryas* (Emerald Spreadwing), *L. eurinus* (Amber-winged Spreadwing), *Enallagma antennatum* (Rainbow Bluet), *E. eribium* (Marsh Bluet), *Anax longipes* (Comet Darner) and *Cordulia shurtleffii* (American Emerald). This number of species, which represents 34% of the 178 species listed at OdonataCentral.org for Pennsylvania (Abbott, 2011) likely makes it one of the more species-rich localities for odonates in the state. For comparison, the DCW is slightly less species-rich than the well-known Ten-Acre Pond in nearby Centre County, which had 74 documented odonate species (42% of the state's total) as of the mid 1990s (Shiffer & White, 1995). Of course, comparisons must be made cautiously as that site has been studied in greater depth over a number of decades.

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Manitoba Dragonflies—Lots of Them

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Netta Smith and I spent 16–18 June 2011 in southwestern Manitoba after a wonderful four days in subarctic Churchill. The trip was primarily for bird photography, but we enjoyed mammals, frogs, wild flowers and a relatively small number of insects, including fewer biting flies than expected, thank goodness.

I was surprised to see as many odonates as we did. Of course, we were coming from Churchill, where the ice had just broken up on the Churchill River—no odonates there (there were bumblebees, some flies, and even a few butterflies). But the southwest, with some nice warm, sunny days, featured an abundance of our favorite insects.

Four-spotted Skimmers (*Libellula quadrimaculata*) were the most common and ubiquitous species, not surprising for a species that is characteristic of the northland and emerges early in the season. But the sheer numbers amazed me. In mile after mile of the main road in Duck

Mountain Provincial Park, there was never a time when there weren't fourspots over the road and lifting off from the vegetation. Road-killed ones were constant sights, more roadkill odonates than I had ever seen before. And that's with very sparse traffic on this gravel road.

American Emeralds (*Cordulia shurtleffii*) were likewise abundant in the same area, also far more of them than I have ever seen at one time. Around half of the roadkills were this species, and at their densest, they rose from the vegetation at least one per square meter. All were immature, as were many of the skimmers. Skimmers were also common at the water, but emeralds hadn't made it back there yet.

Even with all that abundance, one spectacle set our hair on end and led to a string of exclamations (and not a few expletives). While driving by Lake Audy, in Riding Mountain National Park, we noticed large numbers of



Spiny Baskettails (*Epitheca spinigera*) from Lake Audy, Riding Mountain National Park, Manitoba, 16 June 2011. Photos by D. Paulson.

odonates rising from the roadside and realized they were baskettails. Pulling the car over, we saw with astonishment that dead twigs and branches along the road were covered with these dragonflies. Thousands of them.

They were Spiny Baskettails (*Epitheca spinigera*), and their density was staggering. They were spread along a few hundred meters of sunny roadside, and I think every bare twig had dragonflies hanging from it. In some clusters of twigs, there were 30–50 of them. Photo ops were endless, and we took them with three cameras, even videos—not that a video of hanging dragonflies is especially exciting.


All the baskettails looked to be immature, probably about the same age, and I assume they represented a massive emergence from the lake, which was a few hundred meters away. We couldn't get down to the lake through the dense forest, so we were unable to look for exuviae or to see if they were still emerging at the time. We stopped a half kilometer up the road and found no trace of them, so they may have been quite local, perhaps from a big marsh adjacent to the lake rather than the open lake itself. I should add that this species is known for highly synchronized emergence.

Boreal Whiteface (*Leucorrhinia borealis*) was another common species, pretty much ubiquitous rising from the road, although in much smaller numbers than the other species. Males and pairs were also at several lakes we checked. Among them were just a few Belted (*L. proxima*), Dot-tailed (*L. intacta*) and Hudsonian (*L. hudsonica*) White-faces, only the last at the water.

No other anisopterans were seen except a few early-emerging *Aeshna*, probably *interrupta* (Variable Darner), which evaded our cameras. We had brought no nets, with our emphasis on the Churchill visit. A few species of zygopterans had made their appearance, the most interesting to me the Prairie Bluet (*Coenagrion angulatum*), which was present in small numbers at the edge of quite a few open lakes.

Along with them but in denser sedgy habitats were similar numbers of Taiga Bluets (*C. resolutum*). Finally, a few *Enallagma* bluets (Northern, *E. annexum*, and Boreal, *E. boreale*) were identified by closeup photos that show their distinctive appendages. Generally this genus was less common than *Coenagrion*, perhaps the norm at this latitude and season.

The last species was a surprise, near the northeastern edge of its range. At Grayling Lake in Riding Mountain National Park, where we went to look for wolves and moose, there was a nice population of Plains Forktails (*Ischnura damula*) in dense grasses and sedges near the lake.

We saw only 13 species, but we came away with a new understanding. For diversity, head south of the border. For abundance, head north. 

***Gomphaeschna antilope* (Taper-tailed Darner) New for Michigan: a Mystery Ode and an Ode Mystery**

Chris Hill, Conway, South Carolina <chill@coastal.edu>

Short version: On 5 July 2005 and on 9 August 2009 I collected two female *Gomphaeschna antilope*, (Taper-tailed Darners; one on each date) at Long Lake, Grand Traverse County, Michigan. The two specimens are now in the collection of the University of Michigan, and constitute the first and second records of the species from the state, extending the species' range about 300 miles, or 500 km, northwest from the nearest previous record in Cuyahoga County, Ohio. OdonataCentral record numbers for the Michigan specimens are #327622 and #314610. This brings the list of Odonata recorded for Michigan to 165 species (Michigan Odonata Survey, 2011).

Longer version: In 2005, when I was just in my second or third year of ode-watching, I was staying a week at a

lake near Traverse City, Michigan where my mother has a house. I spotted a waterlogged dragonfly floating in the shallows, dead. It was bloated and blackish, with no pattern remaining. I saw no way to identify it, but saved it anyway. I acetoned it and put it in an envelope, labeled "mystery ode" and filed it away, figuring maybe at some future date I'd have enough know-how to identify it from wing venation or something like that. And there it stayed for years.

Flash ahead four years—with six years of odonate chasing now under my belt, and experience with both species of *Gomphaeschna* (aka "pygmy darners") in South Carolina, I am up in Michigan for another week long visit, this time in August. I am confident during that visit, that I'm see-

ing pygmy darners flying in the area on several occasions, and hoping to add *G. fuscillata* (Harlequin Darner), the expected species, to the Grand Traverse County list. I try several times to net one, but I fail. I do, however, find a pygmy darner floating in the shallows (again!).

I should explain that quite a few insects, including honeybees in numbers, small butterflies, and live and dead dragonflies are carried by the prevailing winds to the beach by the house, presumably after falling into the 1 km wide arm of the lake that the beach faces. *Gomphus adelphus* (Mustached Clubtails) float up regularly, though I don't know of any suitable streams within a couple miles. This time the insect, a female, was recently expired and in good condition, and I submitted it to OdonataCentral as the first *Gomphaeschna fuscillata* for the county, with fair photographs. I kept the specimen. At about this time I think I compared this individual with the "mystery ode" from 2005 and decided the mystery ode was likely another *G. fuscillata*.

However, back home in South Carolina, looking a little more closely and comparing the Michigan specimens with both *Gomphaeschna antilope* and *G. fuscillata* from South Carolina with handy NWM (Needham et al., 2000) for reference, I realized that wing shape, wing coloration, and wing venation of the two Michigan individuals were consistent with *G. antilope*, previously unknown from Michigan. In fact, it wasn't close—I had three *G. antilope* from South Carolina (one male, two females), seven *G. fuscillata* from South Carolina (three males, four females), and the insects from Michigan didn't come out as *fuscillata*-like or intermediate—in wing shape and wing venation, the two Michigan females came out more *antilope*-like even than the *antilope* from South Carolina. The location of wing coloration—an orange cloud around the nodus instead of further out near the stigma, pointed to *G. antilope*, too. As is often the case, once I "discovered" this field mark (the location of the wing coloration) "myself," I found Sid Dunkle (Dunkle, 2000) had published it long ago. Unless the upper midwest harbored some *G. fuscillata* that mimicked *antilope* in every way, this was a new species for Michigan.

In a way, the distinctiveness of that original blackened "mystery ode" was useful, along with the fact that I photographed the 2009 individual on the weathered picnic table at the lake. Without those pieces of proof linking the specimens to Michigan, there might be the sneaking suspicion that somehow I had taken out a South Carolina *Gomphaeschna antilope* specimen for measurement and put it back in a Michigan envelope.

So, mystery ode finally identified, now the ode mystery. What on earth were these individuals doing on a lake in

northern Michigan? *Gomphaeschna antilope* is a southeastern species. Its occurrence even in Ohio is historical only, with the Cuyahoga County record dating to 1960 (Rosche et al., 2008). And if a *G. antilope* were to slip into Michigan, one would expect it in the southern, flat and warmer part of the state, not the hilly, cool, northern part. But there they were, and not just one insect wafted in on winds, but two in two different years (plus the live *Gomphaeschna* seen flying, although their specific identity is unknown). Is there a population up there, and if so, how did it get established, and how (and where) is it being maintained? I happened to be back at the lake in the third week of July 2011, and unfortunately, I only saw one dragonfly that even might have been a *Gomphaeschna*, flying by well out of net range, so no answers yet.

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Request for *Orthemis* Specimens

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I am looking for specimens of the following *Orthemis* species: *O. ambirufa*, *O. anthracina*, *O. harpago*, *O. coracina*, and *O. regalis*, for DNA work. If you have any specimens to loan, I would really appreciate it. The specimens have to be less than 10 years old and only one leg will be taken. Let me know if you have any questions. Thank you very much!

Back to Panama

Nick Donnelly <tdonnelly@binghamton.edu>

Quick, what do you think of when you hear the word “Panama”? “Canal”? “Tropics?” How about “rain” or “mud”? Ailsa and I returned barely a year since our previous trip, and visited one of the 2010 localities as well as a new one. Although only a week or so later in the year, we found several different things. We took far fewer species than last year (30 vs 42) but four new ones this year versus two last year.

We travel with the “lep people” (John Heppner is the organizer, and the only other collector this time was Ed Fuller, a beetle person), who tend to spend about a week at one place, with the nights dedicated to bright lights and more moths than you dreamed ever existed. Days are given over to odes, while the moth people snooze, or pin the previous night’s catch.

The rains had really started this year. In fact, our contacts in Panama City swore that there was no dry season at all this year. That’s where the mud comes from. And you do spend lots of hours scouring the place where you are staying, looking for something—anything—to read. (In the Dominican Republic one year all I could find in a huge but deserted rural hotel was a Spanish-language Farmer’s Almanac. I read every word. I still know the best season to plant coffee.)

Ailsa and I had a secret weapon this year—our eldest son Andrew, who came with us to look for birds (he thought). I provided him with a net to accompany his aging father and haul me out of the creek bed, if necessary. In fact, he was (and always has been) a sharp eyed collector when handed a net. (He netted, at age eight, a mating pair of *Petalura gigantea*, which were just a bit larger than he was.)

We started this year at Santa Fe, near the continental divide in Veraguas Province. Just like last year, the swallow-tailed kites were numerous and almost always visible. Apparently taking advantage of the winds coming through the mountain pass, there would be as many as two dozen visible at a given time. Our first day out we went back to a good 2010 locality—a nice, nearby stream about 2000 meters in elevation. Scarcely had we gotten our feet wet when Andrew called out to me, asking if I wanted a blue damselfly. Naturally I said, “Yes”, thinking it was one of the blue-bodied *Argia* species—either *cupraurea* or *medullaris*. I was surprised to find that he had taken a *Cora*, and apparently a new species at that. Somewhat smaller than *marina*, and with a nicely patterned body, this is indeed a lovely bug. We hunted for an hour or so and saw no more. When we returned briefly to this place a few days later, we

failed to find any more. That’s how it goes in the tropics!

Andrew continued to amaze his decrepit father by finding three males of *Heteragrion atrolineatum*, which I had originally described from a trip to the Canal Zone in 1971. A few days later he topped this by finding a pair. And I never saw one, having to settle for a lone male of *albifrons*! Later at a nearby spot he swung wildly at nearly invisible dragonflies flying in the gloom at the foot of a waterfall in a deep gorge. Result: two fine specimens of *Neocordulia batesi*! My advice: take along a youthful son or daughter.

Also at Santa Fe, Andrew, while bird watching, found a small lake in the forest. It featured *Aeshna psilus* and *Anax concolor*, neither of which we had found the previous year. *Lestes* were very common and I thought the two species were *tenuatus* and *forficula*, both of which are widespread in Latin America. The *tenuatus* was just that, but the “*forficula*” proved to be a somewhat larger and an apparently undescribed species. As a bonus we found the apparently first Central American record for *Micrathyria venezuelae* as well as a few *Telebasis garleppi*.

After a productive few days (dodging the rain) in Santa Fe we moved on to a new birding lodge (Mount Totumas) a few kilometers from the Costa Rican Border. My bird-watching son was delighted by a nesting pair of quetzals literally right outside the kitchen. They were feeding their sole offspring, who appeared in a nesting hole conveniently placed. Imagine our surprise when this huge chick decided to leave the nest just as we were watching him, and slowly and clumsily flap and scramble into the nearby forest, urged on by his anxious parents. I thought we had had good looks at quetzals previously, but this really topped earlier sightings. The porch of the lodge had several hummingbird feeders, with seven species in constant competition, bossed around by the huge violet saberwings. Now, this is a great birding lodge.

The odes at Mount Totumas were less numerous, but rewarding none the less. The first afternoon—after a brief rain storm—I trudged up the hill and through the mud to inspect some tiny forest streams. It was not good dragonfly weather—the constant gloom meant that sightings of any ode at all were many minutes apart and rather brief. When the sun appeared at all, it lasted no more than about five minutes, and it took at least three minutes of sun before the *Hetaerina* and *Argia* flew down to palm leaves about ten feet above the path. It would take a few more minutes of sun for them to descend to net height, so I took very few. But the

Argia species, like *oculata* but larger, did reward me by being apparently new. The other, fairly common, forest damselfly here was the brilliant blue *Argia medullaris*. As I waited more minutes than I would like to remember for these brief illuminated intervals, I found a *Palaemnema* in the gloom. It was difficult to spot because it had a dark rather than the pale blue tail of most Central American species. It reminded me of *reventazoni* of Costa Rica, to which I guess it is related. Two new species in a few minutes!

While I waited in the gloom I saw a rustle of wings above a tiny watery seep, nearly hidden beneath low shrubbery. I couldn't get a good look at the bug, which I thought was an ovipositing gomphid. When I netted it, I was surprised to find that I had netted my first ever *Cordulegaster godmani*. Later at a lower stream along the road we found a male and two more females. This has been a good year for the *Cordulegaster* family (see the account of the Vietnam trip).

Mount Totumas actually produced fairly few species, but they included choice ones. I took an *Aeshna cornigera*, which

I had not taken in Central America for a few decades. As I looked at it before netting it I thought that there was less blue around the base of the abdomen. This seems to be the only visible difference (in patrolling examples) between *cornigera* and *psilus*. It would be a brave (or foolish) person who would try to distinguish these two in flight!

There is much to discover in Panama, which was largely overlooked by the 19th century naturalists. I have no useful advice to people who would like to explore here, but there are huge swatches of rain forest, especially along the Caribbean coast. There has been so little ode collecting, compared with Costa Rica, that almost any place will reward you with new things. And the country is "muy amable", as they say in Spanish.

[Postscript: I have gone over the *Micrathyria* from Panama again and determined them to be *dictynna*, not *venezuelae*. The two species are close and each is somewhat variable.]



Aruba Adventures

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In July, I took a trip to the beach resort island of Aruba off the coast of Venezuela. I stayed in Bakval at the Sunflower Villa, <www.arubasunflower.com>, which was run by Reinke Bosch-Wentink, a nice Dutch woman. Her foreman, Willem Kerpens, an Aruban who speaks fluent "papiamento" and English, guided me to the few spots, which had freshwater, and lots of dragonflies. There are not many such places on this barren windswept island covered with acacia, cactus, and blue whiptail lizards. We only found 10 species, but several were in large numbers. The three best spots were the ditches along the Sasaki Highway in Bubali, the rocky canyon stream in front of the Arikok National Park entrance, and the Calbas roadside ditch along the St. Ana church in Noord.

Species list of odonates known from Aruba:

Ischnura ramburii (Rambur's Forktail)

**Anax junius* (Common Green Darner), vagrant

Brachymesia furcata (Red-tailed Pennant)

B. herbida (Tawny Pennant)

Erythemis vesiculosa (Great Pondhawk)

Erythrodiplax berenice (Seaside Dragonlet), not seen by me.

**Miathyria marcella* (Hyacinth Glider), vagrant

Orthemis ferruginea/sulphurata

Pantala flavescens (Wandering Glider)

**Tramea abdominalis* (Vermilion Saddlebags)

T. calverti (Striped Saddlebags), not seen by me.

T. onusta (Red Saddlebags)

*New records. Two questionable species, *Sympetrum* sp? and *Micrathyria didyma*? (Three-striped Dasher) were seen by Theo Muuse in 2007, <<http://gull-research.org/aruba/index.html>>. Photos were taken by him of most of the species listed above.

Of interest is the *Orthemis* which shows characters of both typical *O. ferruginea* (Roseate Skimmer) from Central America and *O. sulphurata* from Ecuador. I managed to catch eight mated pairs with lots of aerial derring-doing! It is similar to the *Orthemis sulphurata* populations found in Grenada and St. Vincent further east. I am presently working on the *Orthemis ferruginea* complex, and I hope to resolve issues in this complex.

All in all, it was a great trip! Aruba has beaches, snorkeling, deep sea fishing, fancy resort hotels, casinos, lots of duty-free shopping with an European flavor, gold mines, borrow pits with dragonflies, wild burros, colorful lizards, and friendly people! For a vacation, I wouldn't hesitate to go back and see my friends, Rienke and Willem. If you have any questions about my trip, please do not hesitate to drop me a line!



Aim High Academy: Summer Earth Ecology Program

Elizabeth F. Ballare <lizballare@verizon.net>

This summer I was a teaching assistant for the very first Aim High Academy: Summer Earth Ecology Program at Rutgers University–Newark, a field ecology course for underprivileged high school students in Newark, New Jersey, and the surrounding area. Funded by the US Department of Education and by a College Access Grant from the New Jersey Commission on Higher Education, the program enabled 16–18 year olds with an interest in and aptitude for science to gain experience in an area of biology they were not exposed to in their classrooms.

Forty students were selected from the pool of applicants and split among five Ecology and Evolution teams. The session ran from 8 July to 29 July. The students participated in existing Rutgers University–Newark graduate fieldwork at research sites in New Jersey. They learned how to identify samples and analyze data in the lab. By the end of the three week program, each group had presented their work to their peers, parents, members of the New Jersey

Education Association and the Dean of Science for Rutgers University–Newark. Included in their presentations were the 1) research question(s) asked, 2) materials and methods, 3) results and 4) environmental significance of the fieldwork they conducted.

The curriculum, which I planned with conjunction with Dr. Jessica Ware, coincided with my current research and introduced the students to urban aquatic insects. My group learned how to use dry and wet nets to properly catch adults and larvae in various ecosystems, and we taught the basic differences between dragonflies and damselflies (size, eye and wing fusion, flight patterns and wing venation). In addition, the students learned how to key out the specimens they caught down to the genus level by using *Damselflies of the Northeast* (Ed Lam), *Dragonflies of the North Woods* (Kurt Mead), and *Field Guide to Dragonflies and Damselflies of New Jersey* (Allen E. Barlow, Jim Bangma and David Golden). Table 1 lists the species

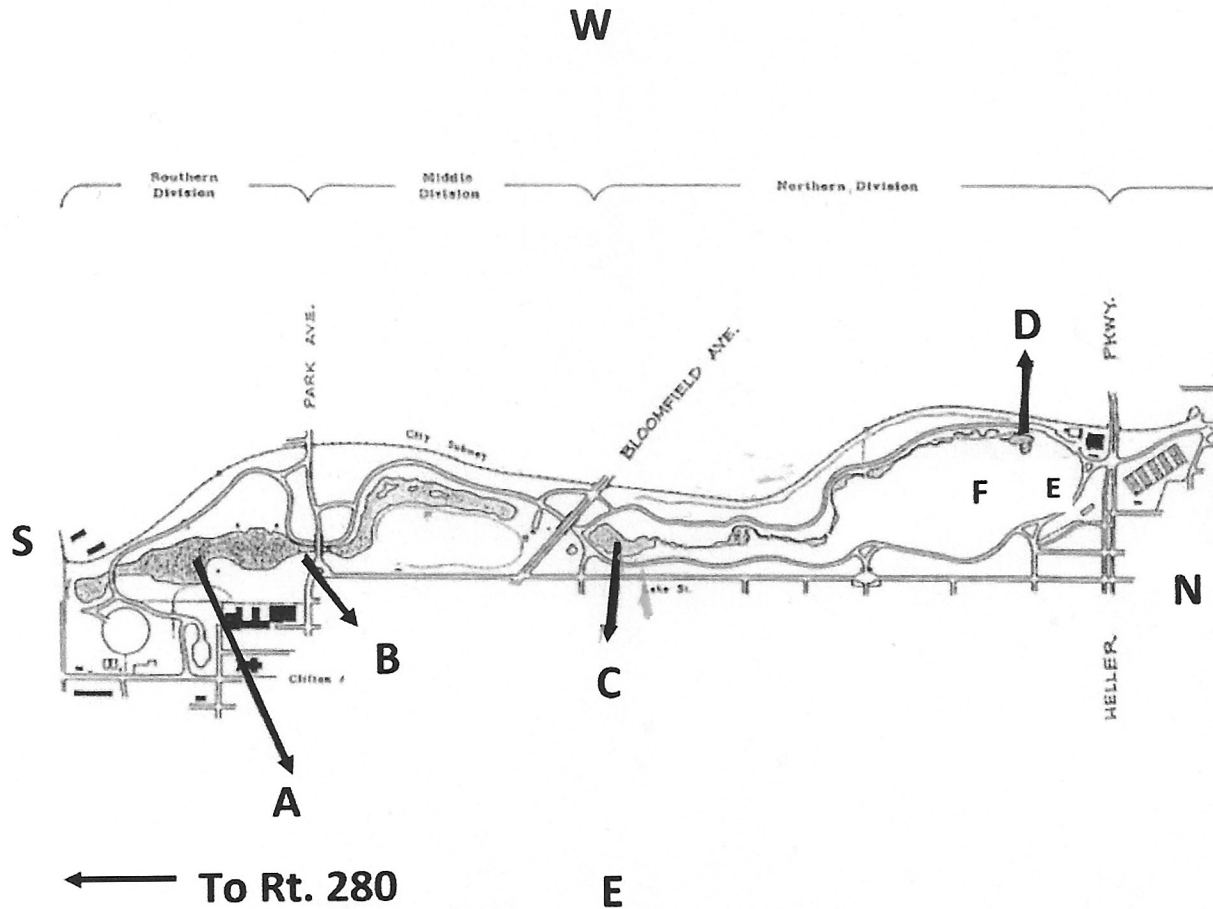


Fig. 1. Map of study sites in Branch Brook Park, New Jersey.

Table 1.

Species	Site			
	Branch Brook Park	Mill Creek Point	Liberty State Park	Ken Lockwood Gorge
	M/F	M/F	M/F	M/F
Damselflies				
<i>Argia apicalis</i> (Blue-Fronted Dancer)	1/0			
<i>Argia moesta</i> (Powered Dancer)				1/2
<i>Calopteryx maculata</i> (Ebony Jewelwing)				2/4
<i>Ischnura posita</i> (Fragile Forktail)	0/2			
<i>Ischnura verticalis</i> (Eastern Forktail)	4/0		3/1	
Dragonflies				
<i>Anax junius</i> (Common Green Darner)		0/2	0/1	
<i>Celithemis elisa</i> (Calico Pennant)			1/0	
<i>Erythemis simplicicollis</i> (Eastern Pondhawk)			5/0	
<i>Erythrodiplax berenice</i> (Seaside Dragonlet)		0/3		
<i>Libellula incesta</i> (Slaty Skimmer)	2/1			
<i>Libellula luctuosa</i> (Widow Skimmer)			1/0	
<i>Libellula needhami</i> (Needham's Skimmer)			7/1	
<i>Libellula pulchella</i> (Twelve-Spotted Skimmer)	0/1		3/1	
<i>Pachydiplax longipennis</i> (Blue Dasher)	14/1		17/4	
<i>Pantala flavescens</i> (Wandering Glider)	1/5	0/2		
<i>Pantala hymenaea</i> (Spot-Winged Glider)		1/1		
<i>Perithemis tenera</i> (Eastern Amberwing)	3/1			
<i>Plathemis lydia</i> (Common Whitetail)			4/1	
<i>Sympetrum internum</i> (Cherry-faced Meadowhawk)		1/0	0/1	
<i>Tramea lacerata</i> (Black Saddlebags)			2/1	

caught at each field site, along with the number of males and females in each.

During the first two days, I took the group to Branch Brook Park. Located in Newark and Belleville, New Jersey, this park consists of 360 acres of open and playing fields and almost 4 miles of streams, rivers and ponds (Fig. 1). I chose the site because a) it was familiar to most of the students and, b) I wanted to make them aware of the biodiversity in their own “backyards.”

Day 1 started out overcast with a slight drizzle, so the students were able to catch only some damselflies on the grasses next to site A, a pond (see Map). But as the sun came out at noon, so did the dragonflies. By lunchtime many students were able to catch an Eastern Forktail (*Ischnura verticalis*) and to note the sun’s important role with energy absorption through the veins in dragonflies’ wings. Still at site A, we also saw dozens of Blue Dashers (*Pachydiplax longipennis*) and male Eastern Amberwings (*Perithemis tenera*) (Fig. 2). Although the latter proved tough adversaries—largely because the pond had a sudden drop off and these insects perched on fallen logs and on garbage that floated far out, I was able to show my students a pair in a mating wheel and even caught the

two as they perched on a tree branch. This was a perfect opportunity to explain how to identify males and females using their genitalia and to demonstrate that the two sexes can be completely different morphologically within the same species.

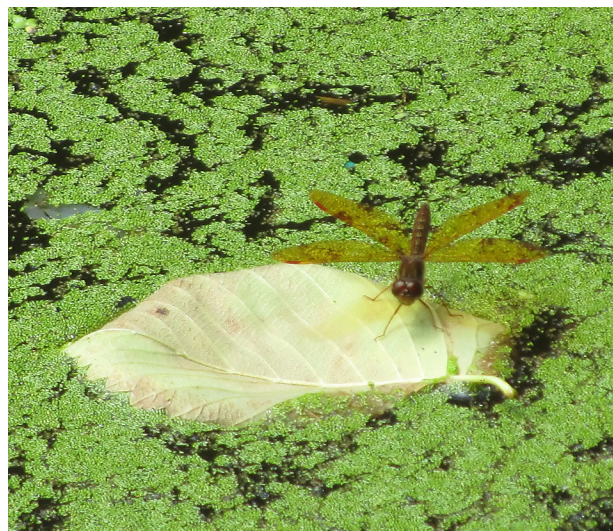


Fig 2. A male Eastern Amberwing (*Perithemis tenera*) perched on emergent vegetation at Branch Brook Park, Newark, NJ, 13 July, 2011.

As the day progressed, we moved through the park stopping to sample at sites B, C (Fig. 3), D and E. Site E, which we visited around 3 PM, was the most exciting for the students. They saw several Wandering Gliders (*Pantala flavescens*) hovering over an open field and chased them down. This was quite a group effort, and I remember thinking, “this should really be considered a team sport.” Swinging their nets and missing time and time again, the kids expressed their frustration at how deceptively close the gliders appeared to be, but when I suggested that we call it a day they protested and would not give up until they caught one (they actually caught three that day). To see how interested and excited they had become after only one day was very rewarding for me.

The beginning of Day 2 was spent at sites D, E, and F. Site D, which was exceptionally muddy, yielded more blue dashers, and we spotted some Common Whitetails (*Plathemis lydia*), as well. Site F, another open field, was teaming with gliders, and we spent the remainder of that morning competing with swallows for our catch.

The second half of Day 2 (1–5 PM) I took the group to Mill Creek Point in Secaucus, New Jersey, a restored wetland off the Hackensack River in the Meadowlands. We attempted to reach several ponds and riparian zones alongside the river, pushing through cat tails (*Typha*) and reed grasses (*Spartina* and *Phragmites*), but we were largely unsuccessful. However, along the road which led into the park, we saw a lot of Spot-Winged Gliders (*Pantala hymenaea*) and Seaside Dragonlets (*Erythrodiplax berenice*), catching two and three respectively. Off a small tributary on the other side of the road, I saw several Common Green Darners (*Anax junius*) subsequently skillfully captured by one of the students, and I caught one Cherry-faced Meadowhawk (*Sympetrum internum*).

The following week (18–22 July) New Jersey experienced a heat wave with indexes climbing to 115° F. On Days 3 and 4 we went collecting at a pond in Liberty State Park in Jersey City, New Jersey, which had the most amazing views of the Statue of Liberty. With full sun and shallow waters, the number of dragons and damsels we saw overwhelmed us. During the two days spent at this site, the group caught eleven different species, a whopping fifty-four specimens and spotted many others that we weren't able to catch: Eastern Amberwing (*Perithemis tenera*), Carolina Saddlebags (*Tramea carolina*), Common Baskettail (*Epitheca cynosura*), and Common Whitetail (*Plathemis lydia*).

Having myself suffered a bit of heat stroke from Tuesday's trip and with the heat on Wednesday (Day 5) holding steady at 110°F, I took advantage of our air-conditioned lab to teach my students how to properly preserve speci-



Fig 3. Site C at Branch Brook Park, Newark, NJ, 13 July 2011.

mens (in this case in acetone), identify the specimens we caught, make labels, and use hand lenses and microscopes.

On Day 6, our final field day, I took the group to Ken Lockwood Gorge, Lebanon, New Jersey to sample at the Raritan River (Fig. 4). We appreciated being away from the city in a forested area with cool, clear water! It felt at least twenty degrees cooler before we even got in the river. All my students have lived their whole lives in urban areas, so it was very satisfying for me to watch them accept the challenge of scrambling over slippery rocks and trying to maintain steady footing through currents while attempting to reach a dragonfly they saw perched on a rock thirty feet away. Although we saw several clubtails (*Gomphus* sp.), we were unable to catch them. This presented an excellent opportunity for the students to see the differences between the more territorial species we had encountered so far and the non-territorial gomphids. Species from previous days were more predictable, returning to perch on the same twig or rock. But here, before we could even think about swinging our nets, the dragons would fly away never to be seen again.

Damselflies were more accessible. We were able to catch the beautiful Ebony Jewelwing (*Calopteryx maculata*) as well as some Blue-fronted (*Argia apicalis*) and Powered Dancers (*Argia moesta*). It was certainly the least exciting



Fig 4. The group at Ken Lockwood Gorge, 21 July 2011. Back (left to right): Di'Andrea Mui, Darrien Bush, Liz Ballare, Shaquille Tucker, Rahhiem Ervin. Front: Tiara Hewitt, Vanessa Mathieu, Jessica Ware, Shakeera Walker, (missing: Talia Griffin). Photo taken by Jeremy Huff.

day for the students, but one of my favorites—so peaceful and calm. And although tree shade and some cloud cover meant fewer flying species, we did spot river cruisers patrolling along a path near the river and found mayfly exuviae. I showed them how to use the triangle nets in the sandy river bottom. The cooler weather was a relief, and they all loved sitting on a rock in the water looking for larvae.

The last week of the course (25–29 July) was spent identifying samples in the lab and putting together a PowerPoint presentation. Each student in my group picked a topic about odonates that most interested him or her and prepared slides as part of a 15 minute group presentation. Topics included mating habits, differences in male and female genitalia, and comparing and contrasting the environments (for example, the pond at Branch Brook Park versus the river at Ken Lockwood Gorge) shared by one genus.

Despite some logistical “hiccups” and the intolerable heat, the Aim High Academy’s program was a huge success. It was evident that our students enjoyed their hands-on experience with science in both the field and lab. One of my students has subsequently e-mailed me that he bought a net at a dollar store and is identifying dragonflies and damselflies on his own. The time was equally profitable for the Rutgers grad students (TAs) who collected useful data. I especially enjoyed teaching my group who were interested, motivated and fun to be with. They even gave


me a present, a planter with gold painted dragonflies on it, after their presentation.

Of particular note during our otherwise productive and enjoyable three week program was the large amount of litter we noticed in and around the waters of Branch Brook Park. All of my students pointed out with disgust the plastic bottles and cans, the old bicycle frame, the random shoe or plastic toy in the ponds where we sampled. This is the same beautiful park that showcases 4,000 cherry blossom trees every spring during the Cherry Blossom Festival. The people we saw jogging and walking their dogs, the children playing frisbee and the lovers having a picnic all deserve to enjoy themselves in a clean environment.

My students’ newly acquired awareness and appreciation of the park’s biodiversity heightened our concern for its sad condition. Therefore, I have begun to put together a flora and fauna sampling project that includes restoration. I hope to form a coalition in conjunction with my fellow ecology and evolutionary biology students, the Rutgers-Newark faculty and the Newark community to clean up the park’s waters and adjacent areas while simultaneously collecting data for the purpose of categorizing plants, birds, bees, spiders, odes and other aquatic insects.

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Map courtesy of Essex County Department of Parks, Recreation, and Cultural Affairs. <<http://www.essex-countynj.org/p/index.php?section=parks/sites/bb>>. 

Use of Lakes by *Cordulegaster maculata* (Twin-spotted Spiketail)

Barbara Hager, Cazenovia College, NY <bhager@cazenovia.edu> and William Shields, SUNY-CESF, NY <wms1@syr.edu>

In a recent issue of ARGIA (Vol 22[1], 2010), Bob DuBois reported finding F-2 and F-3 *Cordulegaster maculata* (Twin-spotted Spiketail) nymphs in Upper St. Croix Lake, Douglas County, Wisconsin. The presence of *Cordulegaster* nymphs in lakes likewise was recorded by M.L.H Thomas (1965); among other macroinvertebrate fauna, he found later stage nymphs during a survey for lamprey in Lake Superior. Dubois (2010) surmised that the nymphs he collected originated from a nearby creek rather than having been deposited there as eggs.

At Cranberry Lake, St. Lawrence County, New York, on 16 June 2009, we found an exuvia of *C. maculata* on one of the docks at the Cranberry Lake Biological Station on Barber Point. Like Bob, we assumed that the larva had originated from a nearby brook (Sucker Brook), the mouth of which was located roughly 240 meters upstream of the exuvia, and probably was swept into the bay during the high water following snowmelt.


However, on the following day, we observed a single *C. maculata* ovipositing within 2 meters of where we had found the exuvia. She spent several minutes laying eggs in the shallow water of the bay in a spot where emergent grasses arose. At one point during oviposition she was chased by a male, but returned to continue laying eggs. For the next couple of days, we saw further *C. maculata* activity at this spot—both oviposition and patrols.

The oviposition substrate was predominantly granitic sand mixed with some fine organic matter. This spot was

sheltered from major wind and wave action by a boulder and spit of land that cut it off from the main lake; however, the current from Sucker Brook and wave action from boats and the mouth of the bay kept the water from becoming stagnant. Emergent grasses and sedges were present but sparse.

Thus, it seems possible that the presence of *Cordulegaster maculata* nymphs in bays and on lakeshore sites near streams and rivers may be due to active oviposition rather than passive and unavoidable washing of the larvae downstream during times of high water flow. Corbet (1999) noted that *C. maculata* has the widest habitat use among the *Cordulegaster* and is often found in the larger streams and rivers as compared to its conspecifics. Further study is needed to see if young nymphs occur where oviposition has been seen in the bay at CLBS.

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Spin-Dry Dragonflies

James S. Walker, Anacortes, Washington <jswphys@aol.com>

A common summertime sight in many areas is a swallow swooping down to dunk itself into the waters of a pond or lake. Dragonflies also dunk into the water. What's even more interesting, however, is what they do after the dunk—they gain altitude and then “spin-dry” to shed the water that clings to them. It's a fascinating behavior that results in a spiral of water droplets shooting out in all directions from the rapidly spinning dragonfly.

I was fortunate enough to first observe the spin-dry behavior in September of 2010, near my home at Cranberry Lake in Anacortes, Washington. I had recently acquired a

Casio Exilim FH25 point-and-shoot camera with slow-motion video capability, and was trying it out on various dragonfly behaviors. The dunking behavior turned out to be even more interesting than I imagined.

The dragonflies that were dunking most frequently at that time were Paddle-tailed Darners (*Aeshna palmata*). A few Shadow Darners (*A. umbrasa*) and Blue-eyed Darners (*Rbionaeschna multicolor*) were present as well, and some may have dunked. Autumn Meadowhawks (*Sympetrum vicinum*) were flying both singly and in tandem, and were observed to dunk and spin dry.

Splash-Dunk Behavior

Let me start by describing the splash-dunk behavior as performed by the darners at Cranberry Lake. You might expect the dragonflies to just bounce lightly off the surface of the lake, like a skipping stone. That's what it looks like in real time. Instead, they plunge into the water with gusto, producing a large central splash from the body and two symmetric side splashes from the wings. They often repeat the splash-dunk a number of times, sometimes hitting the water as many as six times in succession. They then fly upward and away from the water, often to a considerable height.

My first indication that something interesting was happening after the splash-dunking was a video that showed a distant darter pause in its upward flight. The brightness of the darter alternated from light to dark and back again a few times during the pause. The flight then continued as before. I was suspicious that the alternation in brightness might be due to a tumbling motion, so I took more videos. Eventually, I got one with good lighting that showed water droplets shooting outward during the pause in flight. At that point I knew for sure they were spinning.

Fortunately there was a lot of splash-dunk/spin-dry behavior at Cranberry Lake at that time of year. I observed an event every few minutes, which made it possible to obtain several videos of the behavior. On a recent visit to the lake this year, my wife Betsy and I observed 21 splash-dunking events involving darners in two hours. The number of dunks per event varied from 1 to 5, with an average of 2.5 dunks/event.

Spin-Dry Behavior

The spin-dry is a very specific behavior for the purpose of shedding a lot of water quickly. Here's what happens during a typical spin-dry cycle: The dragonfly gains altitude after its last dunk with an upward sloping flight. Eventually it points straight upward briefly, and then pitches forward abruptly, setting itself into a rapid head-over-heels rotation. (The axis of rotation is along the wings.) The abdomen is folded loosely toward the thorax, which speeds up the rotation just like a diver going into the "pike" position. The spinning motion continues for 5–7 complete rotations. A good example is available on YouTube (on the dragonflyguy channel) at the following link: <http://www.youtube.com/watch?v=V3_veyIsPBM>.

A frame-by-frame analysis of the video (shot at 240 fps) shows that the period of rotation is about $T = 0.0583$ s. This gives an angular rotational speed of $\omega = 2\pi/T = 108$ rad/s, which is equivalent to about 1030 rpm. Assuming the dragonfly folds itself into a ball with a diameter about half its usual length ($d = 3.6$ cm), the centripetal acceleration produced by the rotation is $d\omega^2/2 = 210$ m/s², which is about 21 times the acceleration due to gravity. The result is water droplets flying rapidly away from the dragonfly. Counting the droplets, and assuming a typical mass for a drop of water, shows that the total mass of water being shed is comparable to the dragonfly's weight.



Why the Splash-Dunking?

So why are the dragonflies splash-dunking in the first place? Thermoregulation seems unlikely since the splash-dunking was observed with air temperatures in the mid 50s, which left many splash-dunkers stranded in the water. It seems unlikely they are seeking that much water to drink, or that they are hitting the water in an attempt to capture prey. It's possible, however, that they are cleaning themselves of "bug juice", spider webs, or other foreign objects.

Another possibility comes from the fact that, so far, all individuals observed to splash-dunk have been males. Perhaps the water helps with the transfer of sperm, or with lubricating the hamules. (The one case that involved a female was a pair of Autumn Meadowhawks in tandem. They did the complete splash-dunk/spin-dry behavior while still attached!)

Observing the Behavior

Once you've seen the slow-motion videos of splash-dunking and spin-drying, it's possible to observe it in real time. Follow a dragonfly's flight after the last splash-dunk and look for a brief pause. It's often possible to see droplets of water shooting outward at that point. With practice you can even see the dragonfly fold up and spin rapidly.

In general, watch for unexpected falling droplets of water. Once I noticed several small drops falling around me as I stood on the shore of Cranberry Lake. I looked up and, sure enough, there was a darner flying overhead. It had just done its spin-dry.


Clearly, more observations of this behavior would be of interest. It would be helpful to know which species do the splash-dunk. So far Betsy and I have observed splash-dunking in the following species:

Paddle-tailed Darner (*Aeshna palmata*)
Blue-eyed Darner (*Rhionaeschna multicolor*)

Common Green Darner (*Anax junius*)
Four-spotted Skimmer (*Libellula quadrimaculata*)
Flame Skimmer (*Libellula saturata*)
Autumn Meadowhawk (*Sympetrum vicinum*)
Blue Dasher (*Pachydiplax longipennis*)
Black Saddlebags (*Tramea lacerata*)

Do they all spin-dry afterward? So far only the first two darners and the meadowhawk have been seen to spin-dry. Do females ever splash-dunk and spin-dry? Does splash-dunking play a role in reproduction? Additional observations can help to answer these questions, and provide further insights as well.

Acknowledgements

I would like to thank Betsy Walker for her indispensable help with this project. I would also like to thank Dennis Paulson, Pierre Deviche, and John Abbott for their encouragement and helpful comments. 

A Call for Papers for BAO

The Bulletin of American Odonatology is in need of manuscript submissions. It has been more than a year since the last issue of BAO appeared (vol. 11, no. 1), in case you haven't kept track. That issue contained six relatively short contributions. I now have two short manuscripts in the queue and two other possible manuscripts not yet submitted, but that is not enough to put out an issue. If you have a manuscript in preparation, please contact John Abbott (Editor in Chief) or myself and let us know your timetable.

If BAO is to continue to be a vehicle for timely reporting of research results on the Odonata of the New World, you are the ones who can make it happen. We can't publish manuscripts we don't receive.

Ken Tennessen <ktennessen@centurytel.net>, Editor, BAO

Photos Needed

Have any high-quality photos of odonates? We are always looking for great photos to use on the front and back covers of ARGIA. Contact John Abbott at <jcabbott@mail.utexas.edu> if you'd like to make a contribution. Images in TIFF format are best, but JPEGs work too as long as they are high quality and compression artifacts are limited. Resolution needs to be 300 ppi at about the sizes you see printed on this issue (no more than 6.5 inches in width).

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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 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 L7000, University of Texas at Austin, 2907 Lake Austin Blvd., Austin, TX, USA 78703

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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.

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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 <www.dragonflysocietyamericas.org/join>.

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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) Four-spotted Skimmer (*Libellula quadrimaculata*), Gunbarrel, Colorado. Photo by P. Richman. Reflection effect was created in Photoshop. **(lower)** White-faced Meadowhawk (*Sympetrum obtrusum*) transferring sperm to his secondary genitalia, St. Olaf Natural Lands, Northfield, Minnesota. Photo by S. King.

