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Front cover: *Anax longipes* (Comet Darner) in flight, photographed in Austin, Texas on 6 June 2008. Photo by Eric Isley.

In This Issue

This year is certainly on track to be one for the record books. The Lower Rio Grande Valley of Texas has been the site of exciting discoveries for North America. No fewer than five species have already been documented for the first time in Texas, and all but one of these is new for the United States! The new species are *Coryphaeschna* probably *apeora*, *Brechmorhoga praecox*, *Idiataphe cubensis* (Metallic Pennant), *Planiplax sanguiniventris*, and *Tauriphila argo*. Rick Nirschl and David Dauphin discuss the discovery of two of these.

The annual meeting in Bend, Oregon is quickly approaching and we have a nice lineup of talks to be presented. You will find abstracts of these talks in this issue. If you have not already signed up for the meeting, it is not too late.

Jerrell Daigle reports on the tremendous success of the Southeastern Regional Meeting that was held at Cheraw State Park in South Carolina. This was a well-attended meeting that resulted in a number of nice finds; see Dennis Paulson's photograph of *Gomphus septima* (Septima's Clubtail) on the back cover.

Paul Catling and Brenda Kostiuk describe an incredible migration of *Aeshna interrupta lineata* (Variable Darner) in southern Manitoba. They estimate an impressive 10 million dragonflies crossed through a 4 km flyway in just a few days!

Juerg De Marmels and colleagues also describe a migration event. They found thousands of *Pantala hymenaea* (Spot-winged Glider) crossing the Venezuelan Andes.

Dennis Paulson provides some interesting observations of *Epitheca stella* (Florida Baskettail) and perhaps the first account of water mites actually preventing copulation. We have all seen heavy loads on various species at times, but this is real evidence of the potential negative consequence.


Tim Manolis and Kathy Biggs provide some insightful natural history on the little known *Zoniagrion exclamationis* (Exclamation Damselfly) of California.

Ken Tennessen and Jim Johnson made another expedition to Ecuador and did well. They found over 80 species and managed to photograph at least 50 of them. Be sure to check out some of their beautiful images in the color spread available with the online version.

Kent Fothergill details the use of Christmas bird count procedures on odonates in Idaho. I've heard this discussed many times and I suspect it will become more and more of a common practice as the number of dragonfly enthusiasts increases.

George Harp followed up the Southeastern Regional Meeting with a trip to the Francis Marion National Forest in South Carolina where he documented a number of new records. A little further north, Walter Chadwick provides an initial assessment of the odes in the Bronx, New York.

François Meurgey and colleagues document a trip to Martinique as part of their ongoing study, and eventual book, on the Odonata of the French West Indies. They anticipate it will hit the shelves in 2009.

Finally, I mention a number of miscellaneous items that I thought would interest the readers of ARGIA. 

Calendar of Upcoming Events

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

Event	Date	Location	Contact
DSA NE Regional Meeting	26–29 Jun	Adirondacks, New York	Jan Trybula <trybulj@potsdam.edu>
DSA Annual Meeting	1–3 Aug	Bend, Oregon	Jim Johnson <jt_johnson@comcast.net>
CalOdes Blitz	9–10 Aug	Trinity Co., California	Kathy Biggs <biggsnest@sonic.net>

2008 DSA Annual Meeting Presentation Abstracts

Below are abstracts of presentations scheduled to be given at the upcoming Annual Meeting in Bend, Oregon, 2 August 2008.

Highlights of a 2008 Trip to Ecuador, by Ken Tennessen and Jim Johnson

Pictorial highlights of an odonatological expedition to southern Ecuador, 27 March to 13 April 2008, will be presented. Areas primarily in Azuay, El Oro, Loja, and Zamora-Chinchipe Provinces, including locations in coastal areas, the Andes, and the Amazon drainage, were visited. Approximately 80 species were found.

Residence and Reproduction within Dragonfly Exuviae by a Jumping Spider, *Sassacus vitis* (Salticidae), by Tim Manolis

Sassacus vitis is a widespread and common species of jumping spider throughout much of North America in dense herbaceous vegetation, including sedges, grasses, etc., bordering ponds and streams. Systematic sampling of dragonfly exuviae bordering the American River in Sacramento, California, has revealed a pattern of frequent use of these for roosts and nests by *Sassacus vitis*. Various aspects of this behavior will be discussed.

Continental-Scale Dragonfly Migration Revealed through Genetic Markers and H and Sr Isotopes, by John H. Matthews, Thomas E. Juenger, Leonard I. Wassenaar, Larry Mack, and Jay Banner

Research into the evolutionary ecology of long-distance insect migration has been limited by the technical difficulty of effectively tracking large-scale movement, with few species from only a handful of orders studied to date. Here we inferred the scale and direction of individual movement as well as gene flow patterns of adult North American dragonflies (*Anax junius*) by combining stable isotopic analysis with multilocus genotyping. Using isotopic approaches, we found evidence that individuals flying along major coastal migration corridors are primarily from inland wetlands rather than coastal regions. We found that adult dragonflies migrated an average 8° latitude south, with a net displacement of up to 25° south latitude before capture. Based on genetic data, we inferred that eastern North American represents a single population, and we suggest that southward migration is driven by access to seasonally available fish-free wetlands. Our study is the first to provide empirical evidence of large-scale migration in the order Odonata and describes both intra- and inter-

generational movement for the same group of individual insects. By extension, our study also reveals a synergistic new model for studying insect movement.

Conserving Odonate Biodiversity, by Celeste Mazzacano

Hundreds of invertebrate species have become extinct worldwide in the past few hundred years, a large proportion of which are insects. The International Union for Conservation of Nature (IUCN) lists 72 insect species as extinct worldwide, while the Natural Heritage Program lists 160 insect species in the United States as presumed extinct or as missing and possibly extinct. Aquatic invertebrates comprise the top three most at-risk groups of animals in the United States, and 18% of dragonfly and damselfly species are considered threatened. Aquatic invertebrates are jeopardized by habitat destruction, introduced species, pollution, and altered hydrologic regimes. Unfortunately, they are often overlooked and under-protected, and only a single dragonfly species is listed under the Endangered Species Act. Conservation of imperiled aquatic invertebrate species such as dragonflies and damselflies will require a concerted effort in which scientists, conservationists, informed amateurs, and land managers must be actively involved. Towards this end, The Xerces Society is soliciting input in creating a Red List of at-risk aquatic invertebrate species. The Aquatic Red List draws on published and unpublished data and collection records to identify threatened, endangered, and vulnerable species, their habitats, their historical and current distributions, critical threats to their survival, and conservation needs. The Red List will help heighten awareness of the plight of aquatic invertebrates and gain protection for the most vulnerable species before they decline to a level where recovery is impossible.

***Progomphus borealis*: Desert Trail-makers and Fastest Burrowers**, by Laura McMullen

Dragonfly larvae have been an important contributor to the field of ichnology (the study of traces of organismal behavior). Sanddragons, of the family Gomphidae, create intricate patterns in river sandbars due to their crawling movements. They are adapted to life in swift, sandy rivers. I have shown *Progomphus borealis* (Odonata: Gomphidae), the Northern Gray Sanddragon, to have the fastest burrowing speed on record, at .72 seconds (time from initial movement on sand surface to coverage with sand) (McMullen in prep.). I observed and quantified sanddragon burrowing behavior on the Big Sandy River in Arizona in Spring 2007. The average burrowing speed was


2.38 seconds, and differed by instar, with smaller instars burrowing more quickly. The average sandbar trail length was 180.97 cm. 37% of sandbar trails crossed themselves at least once. Ichnological studies can be important for species records over time, behavioral studies related to feeding or survival, or studies of habitat distribution.

Geographic Variation in Size of *Hagenius brevistylus*, by Ken Tennessen

Body size of *Hagenius brevistylus* decreases abruptly from south to north. South of 40° N latitude, hind wing length (hwl) of males averaged from 52.9 to 51.1 mm compared to 48.5 to 46.7 mm north of 40°. Clines in all six characters measured fit converse Bergmann's rule. However, specimens from south-central Texas were significantly smaller

than specimens from more eastern locations at similar latitude (mean hwl 49.7 mm), and they had more yellow on abdominal segment 8. Possible factors contributing to the differences will be discussed.

Tanypteryx hageni, Not So Rare After All, by Steve Valley

A few years ago *Tanypteryx hageni* was considered to be a rare and possibly endangered species. The use of consumer-grade Global Positioning System (GPS), computer mapping programs and the Internet has allowed us to pinpoint the locality of larval/breeding sites. The number of known sites has increased from a few dozen to more than 100 through the use of these technologies. 

Carolina Cherubs!

Jerrell J. Daigle, Tallahassee, Florida <jdaigle@nettally.com>

Another enthusiastic bunch of birders and dragonfly folks gathered at the Cheraw State Park in Cheraw, South Carolina to conduct an intensive survey of the Odonata found at the park. As part of this 2008 southeast regional meeting, seventeen attendees from all over the United States showed up for the task. They were Ed Lam, Fabrice de Lacour, Ollie and Carol Flint, George and Phoebe Harp, Gayle and Jeanell Strickland, Jim Johnson, Dennis Paulson, Giff Beaton, Marion Dobbs, Jeff Biller, Steve Krotzer, Lynn Smith, Chris Hill from South Carolina, and myself.

It was a little windy when we headed down to the big lake there, but we soon found lots of action at the pitcher plant

bog, along the boardwalk over part of the lake, and at the dam outfall below the lake. We got such notable species as *Gomphus diminutus* (Diminutive Clubtail), *Nannothemis bella* (Elfyn Skimmer), *Epitheca semiaquea* (Mantled Baskettail), and *Enallagma davisii* (Sandhill Bluet). We even got a new state record! Ed Lam got the first specimen of *Gomphus septima* (Septima's Clubtail) near the dam outfall, and soon we started seeing more and more of them, either perching on the boardwalk, the dam hiking trail, or in open sunny areas. This rare species was a first for many folks and several specimens were photographed. Another species, *G. parvidens carolinus* (Piedmont Clubtail), was found by George and Phoebe Harp below the dam. This




species began to appear in numbers in late afternoon there. Even later, around 8:00 PM, a handful of *Neurocordulia* showed up over the riffles, both large and small, leading me to suspect two species with the small one being *N. alabamensis* (Alabama Shadowdragon). Despite swinging wildly for eight minutes, we did not get any into our envelopes. Oh, well! There is always next time! All in all, we got about 50 species, many of which were new records for Cheraw State Park. For South Carolina, as of 2006, there are 156 species of dragonflies and damselflies known. This will change with the new state records from this trip.

The next day, we looked at some sites for *G. apomyius* (Banner Clubtail), but we did not find any. We did stop at one site north of Cheraw, White's Creek, which was dammed to form, get this, Dragonfly Lake! We even took a group photo in front of the big sign there. A few new things were here such as *Celithemis verna* and *Gomphus australis*, but that was about it. Later that day, we went to Campbell's Lake south of Cheraw and started finding lots of things there. The highlights were *Enallagma weewa* (Blackwater Bluet) in the outlet stream below the lake. Some hardy folks waded out into the lake to catch patrolling *Epiptera costalis* (Slender Baskettail) males. After dinner, some of

us went looking for *Neurocordulia* there. It was too dark to see anything, but Ollie and Carol Flint set up light traps and collecting sheets. We were able to see the experts in action as they collected lots of caddisflies, including some big *Banksiola* and some stoneflies.

All in all, it was a fun trip and everyone enjoyed seeing each other again! Some folks had good luck collecting after the meeting. Marion Dobbs photographed *Ophiogomphus incurvatus* (Appalachian Snaketail) and *O. edmundo* (Edmund's Snaketail) at the South Carolina–Georgia border along the Chattooga River. A nice ending, I would say.

I would like to thank Chris Hill for getting the permits to do our thing, the staff at Cheraw State Park, and Lynn Smith for compiling the South Carolina species list for us plus ground-truthing some sites for us. We are still musing over proposals to hold next year's meeting in either North Carolina in the mountains, South Carolina in the mountains, or in northwest Florida. More details on the eventual meeting site will be revealed in a later issue of ARGIA. Hope to see you there! 

Massive Road Kill and Migration of Variable Darners, *Aeshna interrupta lineata*, in Southern Manitoba

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The following observations are of interest with regard to both the significance of road kill and the size and movement of dragonfly populations.

The extent and importance of road kill to dragonflies is often mentioned but there is little detailed information available (see footnote). Some species are more susceptible than others as a result of wandering, migration, or relatively long distance dispersal from places of emergence. The Variable Darner, *Aeshna interrupta lineata*, has been observed in large numbers (Catling & Brownell, 2002).

East of Brandon approximately between Hughes and Carberry, the Trans Canada highway passes through a region of sand hills. Much of the area is included within Spruce Woods Provincial Forest. The landscape includes a mosaic of woodlands, prairie and ponds. At 6:45 PM on a mild evening of 22 July 2007, we noticed numerous Variable Darners crossing the road for a stretch of about 5 km. Approximately 200 were seen to cross while we traveled at 100 km/hour along a 2 km stretch of highway. Stopping at 49.9019° N 099.5641° W, we observed the flight for one

hour. In a 50 m length of highway, one dragonfly crossed every second. All of the dragonflies were flying south 2 to 6 feet above ground and all that we caught (approx. 30) and all that we found dead on the gravel road shoulder (150) were *Aeshna interrupta lineata*. Considering that the movement appeared to be occurring evenly over a 2 km stretch of highway, it appears that approximately 144,000 dragonflies crossed that section of highway in one hour (40 lengths × 60 per minute × 60 minutes) and it could be a much larger number if the movement had occurred over a longer time period.

The next day we returned to the section of highway at noon and made observations for 2 hours. The flight was continuing but at 6 observation points the average number of individuals crossing over a 50 m section was 5 per minute and again 99% were flying south. All that we observed appeared to be *A. interrupta lineata*. There were thousands of dead dragonflies along a 4 km stretch of highway and of hundreds closely examined all were *A. interrupta lineata*. They were all mature (not teneral) and both males and females were present but females represented 65% of the road kills.

At the six observation points equally spaced along the highway and including the gravel edges of both east and west lanes we found an average of 10 dead dragonflies every meter of highway on the gravel shoulder. This means that a minimum of over 40,000 individuals had been killed. Many that were hit were likely taken by predators or blown further off the road (and were not seen in the grass) so that the number killed may be more than double that observed, possibly in the neighborhood of 100,000.

This mortality would seem likely to have an impact, but possibly not to the extent anticipated. Since the dragonflies were crossing the road, rather than using the road area as a habitat, the mortality was less than it might have been. We estimated, based on direct observations, that only one in a hundred dragonflies crossing the road was actually hit. If this is the case then the actual number of dragonflies passing through this 4 km wide flyway (based on road kills), presumably over a few days, was $100,000 \times 100 = 10,000,000$. This remarkable number alone suggests the importance of dragonflies in the ecosystem and compares with the magnitude of major migrations in eastern North America (Russell et al., 1988), although the individuals were not in close contact (swarming).

Florida Baskettail (*Epitheca stella*) a Marsh-dweller

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On the afternoon of 9 April 2008, I visited St. Marks National Wildlife Refuge, Wakulla County, Florida, to look for dragonflies and birds. I had spent all afternoon at the same place in June 2004 and had been impressed by the abundance of certain species, and I needed photos of some of them, so I thought I would try another visit while in the area.

I soon found that odonates were virtually absent. At my first stop at Stony Bayou Pool, the first large water body encountered as you come from the north on highway 59, I saw nothing at all in flight, even though it was warm and sunny, with a moderate breeze from the east-southeast. I walked down the levee to the east of the road and finally saw a small brown dragonfly, realizing it was a baskettail (*Epitheca*). As I walked farther, I encountered one after another of these dragonflies, each flying in the lee of a large shrub or small tree from just above the ground up to a height of about three meters. When I stopped, I found that these individuals would fly back and forth downwind from me, approaching me and then turning to go back over a flight path not much more than five meters in length. Presumably small flying insects gather anywhere out of the wind and provide good foraging opportunities. Not having a net at the

Catling, P.M. and V.R. Brownell. 2002. Large numbers of *Aeshna interrupta* in southeastern Saskatchewan. ARGIA 13(4): 7.

Russell, R.W., M.L. May, K.L. Soltesz, and J.W. Fitzpatrick. 1998. Massive swarm migrations of dragonflies (Odonata) in eastern North America. American Midland Naturalist 140: 325–342.

Footnote: There is little published information on impact of roadkill on dragonflies. One of the few articles being: Rao, R.S.P. and M.K.S. Girish. 2007. Road kills: assessing insect casualties using a flagship taxon. Current Science 92(6): 830–837.

Stickers are available (on the Web) to stick on a vehicle to memorialize the demise of God's creatures (kind of like notches on a gun). The 1" tall stickers are printed on clear vinyl to withstand years of weathering. They include moose, elk, bear, deer, raccoons, skunks, prairie dogs, snakes, possums, turtles, dogs, squirrels, cats, birds, armadillos, and the only insect is a dragonfly! This further indicates that road kill is an issue for dragonflies. What's more, it indicates that it is an issue for people! 

moment, I tried photographing several of them in flight and got photos that would be recognizable only to genus.

Because of the relatively long, slender appearance of the abdomen, I was convinced they were *E. stella*, Florida Baskettails. I was also confident of the species identification because of the habitat. I had earlier found *E. stella* to be the common baskettail in the Everglades and other extensive marshes in southern Florida (Paulson, 1999, 2001), and I don't think of any other species of this genus as being common in this sort of habitat.

Farther down the road, I found numerous individuals flying short beats in the lee of a grove of trees adjacent to another large marshy area and easily caught three males, which proved to be *E. stella*. The only other odonates seen in the refuge were a single Rambur's Forktail (*Ischnura ramburii*) and a single Eastern Pondhawk (*Erythemis simplicicollis*).


Apparently early April is still too early for the suite of odonates that are common in that area. On 18 June 2004, Four-spotted Pennants (*Brachymesia gravida*), Halloween Pennants (*Celithemis eponina*), Eastern Pondhawks, and

Needham's Skimmers (*Libellula needhami*) were common at Stony Bayou Pool, while Rambur's Forktails, Four-spotted Pennants, Seaside Dragonlets (*Erythrodiplax berenice*), and Marl Pennants (*Macrodiplox balteata*) were common at brackish water bodies at the coast. A few Carolina Saddlebags (*Tramea carolina*) were seen everywhere away from water.

Epithea stella may be largely limited to marshy lentic environments. Records are sparse outside peninsular Florida and southern Georgia, with distantly outlying records in northwest Georgia (Dade County) and northern Louisiana (Ouachita Parish) (Donnelly, 2004). Jerrell Daigle (pers. comm.), with years of field work, has never found *stella* in the Tallahassee area just to the north of St. Marks. That area is hilly, with abundant streams and small lakes, but it lacks the extensive marshes of the flat coastal low-

lands. The present observation extends the known range of the species west onto the base of the Florida Panhandle, and it should be sought in early spring in marshes farther west along the Gulf Coast.

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Mass Migration of the Spot-winged Glider (*Pantala hymenaea*) in Venezuela


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On 10 August 2007, while driving on the road from Barinitas to Mérida, in the Venezuelan Andes, a large dragonfly, presumably a darner, hit the windshield of the first author's car, just a few kilometers above the small town of Santo Domingo. It was 10:00 in the morning, but this came as a surprise, as the sky was overcast, there was dense fog and light drizzle, the temperature was an estimated 20° C, or less. At this spot the road passes through a narrow canyon, not more than 40 m wide.

A few kilometers further up on the same road, near Los Frailes (2800 m elevation), the valley opens. Dense fog still persisted, and temperature averaged 15° C. Here, thousands of male and female Spot-winged Gliders (*Pantala hymenaea*) were observed flying from west to east along the road, with moderate tail wind, between two and twenty meters above the ground, together with some interspersed Amazon Darners (*Anax amazili*). For seconds, the fog let through a few sun rays, which augmented the mass of passing Spot-winged Gliders. These observations were made at an important migration route for birds. During the boreal autumn, between August and November every year, large numbers of individual birds cross the Andes from west to east by this route. The birds belong to diverse families from vultures (Cathartidae) to shorebirds (Scolopacidae) and swifts (Apodidae) to swallows (Hiruninidae) and warblers (Parulidae), the latter three families being especially numerous. We believe, that the dragonflies (all specimens of both species collected

were mature adults with their gut variably filled), ascended through the Río Chama valley from the Lake Maracaibo lowlands to cross the Andes and reach the Orinoco plains, but we don't know the place of emergence of these dragonflies, nor what may have been their future route and ultimate destination.

On 15 August 1981, wandering *P. hymenaea* had also been caught also at another well known migration route, this time in the Coastal Cordillera, viz. Portachuelo Pass (1100 m elevation), at Rancho Grande Biological Station, Aragua State (the famous working place of William Beebe). Here they moved from north (Caribbean coast) to south (Orinoco plains). Otherwise, *P. hymenaea* is rather uncommon in Venezuela, and only about 25 specimens are stored in the collection of the MIZA. These were collected in Zulia, Barinas, Falcón, Lara, Miranda and Delta Amacuro States, as well as in Bolívar, the last one located south of the Orinoco River. The data are from February, April, May, but mostly from August, September and October.

Anax amazili has also been captured migrating through Portachuelo Pass, this time together with Striped Saddlebags (*Tramea calverti*): 21 October 1998 (1 female was collected). Other specimens were caught there in May and June, but no information about possible wandering activity is included with these specimens (two males from 1977 and 1983, respectively). 

Mites Prevent Sex


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While photographing odonates at Bamber Lake, Ocean County, New Jersey, on 7 June 2008, I noticed a pair of Skimming Bluets, *Enallagma geminatum*, in tandem. The male was attempting to transfer sperm from his eighth to his second abdominal segment but was unable to do so because of a heavy load of water mites (presumably *Arrenurus*) beneath his abdomen. He had about 12 mites attached to the undersides of segments 6–10, effectively keeping the two abdominal segments from contact. He also had two or three mites at the base of his legs. The female also had two mites under segment 6 (numbers and location determined from photos).

Corbet (1999), in his extensive discussion of parasitism of odonates by water mites, gives no mention of this negative consequence of parasitism, but with the mite loads that some odonates carry, it may not be uncommon. This male would have been unable to reproduce, at least until he shed the mite load. Mites generally leave their host when the sexually mature odonate returns to the water to breed, but this is quite variable, and many mature odonates carry mite loads, so

some individuals may be permanently unable to breed although otherwise in good condition.

Literature Cited

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Additional Information on the Behavior and Morphology of the Exclamation Damsel (*Zoniagrion exclamationis*)

Tim Manolis <Ylightfoot@aol.com> and Kathy Biggs <bigsnest@sonic.net>

Little has been published on the behavior, morphology or natural history of the Exclamation Damsel (*Zoniagrion exclamationis*) since the rediscovery and description of the species (previously known from a single, old specimen) by Kennedy (1917). Since this species is in a monotypic genus whose relationships to other coenagrionid genera is uncertain, we feel that the additional information presented here will be of some value.

Kennedy (1917) found this species frequenting the quiet pools and backwaters of streams and rivers in the San Fran-

cisco Bay area and the Sacramento Valley and surrounding foothills of northern California. Its known range has been found to be a bit more extensive in recent years, extending from Humboldt and Shasta counties in the north (Manolis, 2003) to as far south as northern Santa Barbara County (Lethaby, 2007). It is still unknown outside of California (distribution map by county at <<http://southwestdragonflies.net/damsels/cadamselphotos/zoniexcl.gif>>).

Kennedy's primary description of habitat associations was that "... many pairs were caught about a pool shaded by

large alders and in the open glades in the underbrush males were abundant.” Our observations have been similar, e. g., “. . . particularly associated with sun-dappled, sylvan glades of blackberries (*Rubus*) and herbaceous vegetation such as poison-hemlock (*Conium maculatum*), mugwort (*Artemisia douglasiana*) and Queen Anne’s lace (*Daucus carotus*)” (Manolis, 2003). Biggs reports often finding them in the dappled shade behind her pond, rather than out in the direct sunlight. We would add here that we rarely see *Z. exclamationis* wander out a meter or two into open grassy areas, even when these immediately border the dense herbaceous riparian zone frequented by the species. Indeed, we never find them more than 100 m from breeding sites along streams or at ponds, even within extensive riparian habitat. This is in marked contrast with other co-occurring coenagrionids (*Argia*, *Enallagma* and some *Ischnura* species) which are often seen foraging in grasslands and along open trails at considerable distances from water.

Not only does *Z. exclamationis* seem to avoid open, sunny areas, it has an early flight season, typically from late March to the middle of June, before the onset of hot summer weather in the Mediterranean climate of most of its known range. Individuals are rarely reported into July, and we are aware of only two reports in August and one in September, all from coastal counties where high summer temperatures are ameliorated somewhat by onshore air flows and fog.

In addition, our general sense is that *Z. exclamationis* is somewhat more active in cooler weather than are at least some other co-occurring odonates. In one recent instance, Manolis led a dragonfly-watching field trip along the American River Parkway in Sacramento, Sacramento County, on 24 May 2008. Weather at the beginning of the walk (10 AM) was overcast with a light drizzle and a temperature of about 56° F. Initially, no odonate activity was observed, but as the party walked through dense grasses and sedges bordering a backwater lagoon of the river, they found small clusters of dragonflies, mostly Widow Skimmers (*Libellula luctuosa*) with some Twelve-spotted Skimmers (*L. pulchella*), Common Whitetails (*Plathemis lydia*), and damselflies, including bluets (*Enallagma civile*, *E. carunculatum*, and *E. praeviarum*), Pacific Forktails (*Ischnura cervula*) and *Z. exclamationis*. Most of these odonates, particularly the anisopterans and the bluets, were perched within a few inches of the ground in fairly dense vegetation, and were so cold as to allow them to be easily picked up by hand. In contrast, the Exclamation Damsels were more active, difficult or impossible to catch by hand, and would on occasion fly upward into nearby brush or trees.

Another interesting difference we observed between *Z.*

exclamationis and the various *Enallagma* species involved coloration. The bluets were invariably dark with the typically bright blue areas having turned slate-blue or dark purple in an apparently temperature-dependent response. The male and blue female (see more on female color morphs below) Exclamation Damsels, however, were as bright blue as they typically appear on warm sunny days. On the afternoon of the previous day (23 May) Cary Kerst and Manolis had observed dozens of Exclamation Damsels at the same location, under mostly sunny skies at a temperature of about 83° F. Several pairs were seen in tandem and ovipositing in floating vegetation around the edge of the lagoon. The variations in female coloration seen on that warm afternoon were the same as seen on the following cold morning.

The variation in color morphs of female *Z. exclamationis* is somewhat greater than previously reported in the literature, even by us. Kennedy (1917) described the thorax color of females “as in the male, but the antehumeral pale stripe continuous, . . . pale colors . . . less bright in the female, the antehumeral stripe being olive brown, with a narrow stripe of the same, posterior to the black humeral stripe, this shading into a pale bluish gray on the metepisternum.” He described the abdomen as “colored as in the male, except the dorsum of segment 9 is entirely black.” Westfall and May (1996) more or less echoed this description, except to note that the antehumeral stripes were “usually wider than in male, more narrowly divided or only strongly constricted, often olive or purplish.” Biggs (2000) indicated that the pale areas on the female were blue like on males and that the antehumeral stripe was usually interrupted as on males. She included a photo of a blue female. The dust-jacket for Common Dragonflies of the Southwest (Biggs, 2005) includes a photograph of a blue female with an interrupted antehumeral stripe. Manolis (2003) also indicated that most females were colored like males, but added that “the older female may be darker, the pale blue areas becoming slate-colored or purplish.”

Recently we have observed the entire range of morphs described above involved in tandem matings and ovipositing, suggesting that they all represent mature color morphs. Basically these morphs include: (1) blue females, with the pale areas of the thorax and abdomen as blue as on males; (2) olive females, as described above by Kennedy (1917) but with either an olive or blue dorsal patch atop abdominal segments 7–8; (3) sooty, olive-brown or purplish females, with the pale areas almost entirely obscured. Perhaps olive females become dark females as they age, but Manolis and Kerst observed both types on 23 May under warm, sunny skies, and again the following day in cloudy, cool conditions. The pale areas of both male and female teneral *Z. exclamationis* are a pale tan or olive, as on

many other coenagrionids. Variation in the shape of the antehumeral stripe, i.e., whether it is interrupted, forming an exclamation mark, or continuous with a narrow constriction, appears to be independent of color morph.

Much remains to be learned about correlation of color changes with age, mating status, etc., but at the very least, we have seen no evidence of striking temperature-mediated color change. There does appear to be some geographic variation in these morphs, however. In the coastal ranges, for example at Sebastopol, Sonoma County, Biggs sees mostly blue females and dark females are very rare. In contrast, in the Sacramento Valley Manolis frequently sees the entire range of female color morphs.

Lastly, we would like to clarify the manner of oviposition by this species. Kennedy (1917) described and illustrated oviposition by the female as “unassisted by the male,” and this has been repeated as “fact” by most authors since (Smith & Pritchard, 1956; Westfall & May, 1996; Manolis 2003). We have observed such behavior, but have also observed tandem oviposition on a number of occasions. Indeed, Biggs has observed tandem oviposition more frequently than oviposition by lone females. The posture and behavior of tandem pairs of Exclamation Damsels during oviposition has been very similar to that we have observed exhibited by the Familiar Bluet (*Enallagma civile*)—the tandem male usually in a perched position, but sometimes in a sentinel guarding position, with his body raised at about a 45 degree angle.

Photos showing color variation and ovipositing postures may be viewed on Biggs’ California Dragonflies Web site: <http://www.sonic.net/~biggsnest/Pond/Lists/pond_damsels.html#ZOEX> and in the Photo File

Folder Exclamation Damsels Ovipositing on the CalOdes Group: <<http://pets.ph.groups.yahoo.com/group/CalOdes/photos/browse/e8e0>>.

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Chasing Dragonflies in Southern Ecuador

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Recent reports of unusually heavy rainfall, flooding, and even roads and bridges washed away throughout much of Ecuador in the past year weren’t enough to deter us from completing our plans to continue researching the odonate fauna of this intriguing country. Besides, the winter months in both Wisconsin and Washington had been long, and we were ready for some action, with the attitude that warm rain, no matter how much, was better than cold rain and sleet. On 27 March 2008, we met in Atlanta and flew to Guayaquil to begin a 16-day jaunt through some of the southern provinces. Our first area of interest was the southwestern part of the country, including the western Andean slopes, to accumulate as many records as possible

for this poorly collected region. Our second objective was to return to the Zamora region, on the eastern side of the Andes, to augment our two previous brief visits to this area. Although we planned to photograph everything we saw, that is to the extent that the dragonflies would allow, we were unsure how we would react encountering species we had not seen before—photograph the first one we see or net it first?!

East of Guayaquil we passed a number of wetlands and ditches filled with aquatic vegetation that undoubtedly harbor a diverse community of libellulids and coenagrionids. However, the sky was cloudy our first morning, so we

decided to drive until we found some sunshine, as we figured we could investigate that area on our return. Our first stop was in Guayas Province, at a small stream-ditch complex in, of all places, a banana plantation! Along the way, a crop duster smeared our windshield with an oily film. Although we expected to see unending banana monoculture along the roads east and south of Guayaquil, we really hadn't planned on stopping to check out the odonates. When we began to see some sunshine, curiosity and anxiousness got the best of us, and it is a good thing it did. We found nearly 20 species along the little stream and associated side pools, including *Phyllocycla hespera*, *Orthemis sulphurata* (distinct with its color combination of dark purple thorax, pruinose red abdomen to segment 7 but not pruinose on more terminal segments), *Tauriphila argo*, *Argia thespis* (maybe) and the beautiful orange *Heteragrion cooki*, which one would not expect in this lowland, barely shaded stream. We took nearly 200 photos that first day, the whole time thankful for the digital revolution which spared us from carrying dozens of rolls of film.

We spent our second day in the lowlands of El Oro Province, near Arenillas, at a small stream and associated wetlands. This area is quite heavily farmed, although there were still native trees and shade in spots. Species of interest included *Neoneura bilinearis*, *Telebasis brevis* and an undescribed species of *Leptobasis*. At the time we mistook the *Telebasis* for a second *Leptobasis*; the combination of mostly orange abdomen and pale green thoracic stripes of *T. brevis* resembles the color pattern of *Leptobasis*. On top of that, stumbling around in the heat of the bright sun and the unrelenting humidity after six months of acclimating to a cold North American winter undoubtedly affected our mental capacities. The most intriguing find here was a photograph we took of a small coenagrionid that we could not place to genus; it had a narrow, faint blue humeral stripe and a black abdomen with some red markings on the anterior segments. It disappeared from view after a single photo; we couldn't even be sure if it was a male or a female from the oblique view in the photo. We considered returning to this locality at the end of our trip, time permitting, to try to secure a specimen or two.

Worn out by the humidity and common libellulids of the lowlands, we turned our sights on higher ground, expecting to see a number of different odonates on the western slopes of the Andes than on the eastern side. However, clearing of the mountainsides has been intense east of Arenillas. On the road to Piñas, we only found one clear, undisturbed stream. The old Catch 22 reared up once again: Areas accessible by road have been heavily altered while pristine areas are often very difficult to access. The road to Zaruma led to more agriculture and deforested hills. However, continuing east and south, we saw more

trees in the steep valleys, but by the time we encountered streams and small waterfalls that had riparian vegetation and were not muddy, rain had set in. We decided that if we came back this way, this area warranted investigation. We spent our third night in Catamayo. Our guidebook stated that this is a totally unremarkable town. It was correct.

Traveling through the highlands to Loja, at around 2300 m elevation, we became reacquainted with *Rhionaeschna marchali*, *Erythrodiplax ines*, *Ischnura fluviatilis*, and *Oxyallagma dissidens* with its banded brown eyes, olive drab green thorax, red pterostigmas and red-black-blue abdomen. In the morning, when they're cold, the blue at the tip of abdomen is gray, and we had fun watching them warm up and change color. By afternoon we arrived in Vilcambamba, still in time to visit a seep along the Río Chamba where we found *Anisagrion inornatum*, *Acanthagrion trilobatum*, an *Argia* species (possibly *oculata*), *Hetaerina aurora* and *Remartinia luteipennis*, to name a few. We spent two nights at Madre Tierra, where the food was delicious and the air comfortable. We were also befriended by a little Siamese-kinda cat we nick-named "Queso." A real lap kitty. (Why "Queso"? It's a long story.) On our fifth day, with some remorse, we said "chao" to Queso and Madre Tierra. We stopped at some mountain streams as we continued east toward Zamora, finding only a few spectacular species such as *Cora inca* with bright blue thorax, the large *Polythore procera* with black and white wing bands, a female *Ormenophlebia imperatrix*—a big cousin of *Hetaerina*, and one female of a mid-sized *Progomphus* we've yet to identify.

In the mountains south of Zamora we photographed *Teinopodagrion depressum*, *Polythore terminata*, and several species of *Argia* (including *nigrior* and *variegata*). We also discovered a new shade-loving species that appears to belong in Kennedy's seldom seen, little known genus *Archaeopodagrion*. This was definitely a photograph or catch dilemma; we ended up with several males and a female that we will use to describe it. North of Zamora, near the tilapia farm and spa, Hosteria El Arenal, where we stayed for four days, we got good photographs of a number of common species, including the little amberwing, *Perithemis mooma*, the setwings *Dythemis sterilis* and *D. multipunctata*, and the blue and black damselflies *Acanthagrion floridense* (syn. *peruvianum* Leonard) and *A. yungarum*. Exuviae of *Aphylla boliviana* were common on certain boulders bordering the ponds, but we saw only one adult, a female. During a hike up a little stream into the forested slope above the Hosteria, we saw two or three *Teinopodagrion*, but they were completely uncooperative. Other species found in this region included a fourth species of *Acanthagrion* (*A. bartei*), plus *Argia huanacina*, *Erythrodiplax castanea*, *Uracis imbuta*, and a small, elusive,

shade-loving, don't-want-my-picture-taken *Micrathyria*. We were disappointed in not seeing *Philogenia* or *Palaemnema*, and are at a loss to explain why.

About mid-way through our journey, we decided to go north to the Macas area, in Morona Santiago Province, but late on the afternoon of 4 April, about 100 km north of Zamora, our right rear tire blew out. This is when we discovered that our spare was—you guessed it, also flat (it was inflated when we picked up the vehicle at the airport); the rim was defective. This created a situation that was not easily solved, and to make a long story short, we ended up back at El Arenal that night. We had to wait another whole day to get a new tire and rim (cloudy all that day anyway), and decided that given the time we had left and the uncertain conditions of the bridges and roads in the mountains west of Macas, that it was best if we headed back the way we had come. A major factor in our decision-making was the realization that we could explore some of the habitats we saw between Catamayo and Zaruma, plus the wetlands near Arenillas.

With a new rim and tire now supporting our rear, we turned back west. We found a pond south of Loja that was overrun by *Oxyallagma dissidens* and *Lestes forficula*, but we also picked up a male of *Rhionaeschna joannisi* floating in the water. On the western side of Loja, a polite policeman informed us that a 40-foot section of the main highway had washed away the night before, and with lots of arm movement indicated that we would have to detour in order to get to Catamayo. Finding this designated route took us several hours, and driving it through the mountains was a tortuous test—imagine a narrow road above very high, steep slopes, no guard rails, and all the other traffic which would normally take the highway including demented bus drivers who feel that they own the entire road. And you haven't seen potholes until you've been on this one. We spent another night in the totally unremarkable town, hoping the next few days would make it worthwhile.


The next morning the sun was shining, so we branched off Hwy. 50 and took the road to Zaruma again; this time we found dragonflies. At a small stream/roadside pool complex we found *Rhionaeschna planaltica*, *Sympetrum gilvum* and a species of *Argia* near *medullaris*, of course with *E. ines* and *O. dissidens* accompanying them in numbers. At another small seep further up the road there were *Anisagrion inornatum* and the *Argia* nr. *oculata*. At the third small stream, we couldn't believe our eyes. In the shade was a small polythorid that when it flew off small electric blue flashes from its wings. It was *Cora munda*. The iridescent area is only in the hind wings, a small oval about mid-length and posterior to the M_3 vein. We took photos of adults, collected a few, and also got a few nymphs; a female

emerged several days later. This species was established by McLachlan in 1878 based on three females, and since then only one male had been collected, in 1941 near Piñas. We also saw a couple *Heteragrion cooki* at this stream.

The last few days of our trip treated us with more surprises. At the wetlands near Arenillas (the locality where we had photographed the small black and red coenagrionid early in our trip), we found a totally pruinose small coenagrionid. We figured this had to be the mature stage of what we had photographed the week before. We spent that night in Machala, and when we e-mailed Rosser Garrison describing this find, he informed us that he had a new species of *Telebasis* from Ecuador, related to *T. inalata*, that was totally pruinose. Our first reaction? No way could this be a *Telebasis*! Upon returning home, we became convinced it is; what a diverse group. (Where is Jerrell when you need exclamation marks?).

Other species of interest we encountered on the last leg of our journey in the western slopes of the Andes were *Teinopodagrion croizati*, a *Polythore* we are unable to identify, *Gynacantha mexicana* flying at dusk and hanging in the shade in numbers the next morning, *Anatya guttata*, and *Libellula herculea* (quite small individuals however, with slightly different accessory genitalia). We also saw a single, unusual-looking drab damselfly with wings held out (megapodagrionid?) in the forest that we couldn't catch. But the last two days in the humid lowlands made us ready to head for home. It seemed the throngs of *Erythemis vesiculosa* sucked up what little energy we had left. In total, we saw over 80 species of Odonata, and got decent to good photographs of at least 50 of them. We have the feeling there are more surprises to be found in the western slopes of the Ecuadorian Andes, but getting to the undisturbed places, especially before they are torn up, is going to be extremely challenging.

[Note on specimen preservation: because we were unable to purchase acetone in Ecuador, we stored our specimens in zip-lock plastic bags with packets of drying agent, then acetoned them when we got home.]

[Be sure to check out the photo supplement included with the PDF version of this issue of ARGIA, available to DSA members at <odonatacentral.org>. This supplement includes a dozen photos taken by Ken and Jim on their trip in Ecuador. Ed.] 

Idaho Odonata Counts Using Christmas Bird Count Procedures

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Introduction

The idea of conducting odonate counts utilizing Christmas Bird Count (CBC) protocols was discussed on the general Odonata list (moderated by Dennis Paulson <<https://mail.ups.edu/mailman/listinfo/odonata-l>>) in 2003. We undertook such counts in Idaho following procedures already in use by the National Audubon Society (2005) for the annual CBC and by the North American Butterfly Association (2008) for the annual Fourth of July Butterfly Count (4JBC). Counts must take place annually during a 24-hr period within prescribed dates. Each count has an established origin, which is the center of a circle with a 7.5 mi radius. All observations must be made in this circle. Besides species and number of individuals, weather data, some habitat data and measures of effort are recorded.

Both the CBC and 4JBC are conservation success stories because they accomplish two very important goals: data collection and widespread public involvement. The CBC began in 1899 (Robbins, 1966) and the 4JBC began in 1974 (Pyle, 1984). Both count programs have broad popular support, widespread geographic coverage in North America, and a long temporal data string, enabling the detection of trends in species occurrence and abundance. This is especially true of the CBC, through which significant changes in species range and abundance have been detected (LeBaron, 2004).

Study Sites

Camas National Wildlife Refuge (NWR) is in eastern Idaho north of Idaho Falls. It is on the edge of the Snake River Plain. Elevations between 1600 and 1840 m above sea level are contained within the count circle. It is a mix of sagebrush steppe and palustrine wetlands. It is not a CBC site, but is a 4JBC site started in 2005. The count center is at 43° 58' N, 112° 16' W.

Minidoka NWR is in southern Idaho and includes Lake Walcott, an irrigation reservoir on the Snake River. The aquatic habitat is lacustrine and the uplands are primarily sagebrush steppe with a narrow riparian zone around the reservoir. Elevation sampled is about

4,240 ft depending on reservoir levels. Minidoka NWR is not a CBC site, but is a 4JBC site started in 2001. The count center is at 42° 39' N, 113° 22' W.

Magic Mountain is in southern Idaho, east of Twin Falls in an area known as the South Hills and managed by the Sawtooth National Forest. The habitat is a diverse mosaic of lodgepole pine, aspen, and sub-alpine fir forest stands with intervening sagebrush steppe and mountain shrub communities. Aquatic communities include seeps, springs, beaver ghettos, and trout streams. Elevations between 5900 and 8050 feet above sea level are contained within the count circle. This is a 4JBC site, first sampled in 2002. The count center is at 42° 11.5' N, 114° 17' W.

Methods

We selected three sites that were part of the 4JBC program. Recorded establishment of counts was a coarse description of habitat. Recorded on the sampling dates were species and number of individuals, weather and participants. Also recorded was time in field, and distance covered on foot, or vehicle, etc. as a measure of effort and changes to habitat. See the North American Butterfly Association Web site (2008) for more complete details. The Christmas Bird Count procedure is similar (National Audubon Society, 2005) to, and was the model for, the 4JBC (Pyle, 1984). Camas NWR was sampled in 2005–2006. Minidoka NWR was sampled in 2004–2006. Magic Mountain was sampled in 2003–2005. A late-summer/early-fall time frame was chosen to avoid conflicts with the 4JBC.

Table 1. Odonate species and number of individuals observed during the Camas National Wildlife Refuge Odonate Counts in 2005–2006.

Species	20 Aug 2005	9 Sep 2006
<i>Lestes congener</i> , Spotted Spreadwing	370	309
<i>Enallagma boreale</i> , Boreal Bluet	2	-
<i>Enallagma carunculatum</i> , Tule Bluet	43	38
<i>Ischnura cervula</i> , Pacific Forktail	-	3
<i>Ischnura denticollis</i> , Black-fronted Forktail	-	2
<i>Aeshna palmata</i> , Paddle-tailed Darner	4	4
<i>Aeshna interrupta</i> , Variable Darner	1	-
<i>Aeshna umbrosa</i> , Shadow Darner	-	-
<i>Sympetrum semicinctum</i> , Band-winged Meadowhawk	43	15
<i>Sympetrum danae</i> , Black Meadowhawk	1	17
<i>Sympetrum internum</i> , Cherry-faced Meadowhawk	19	31
<i>Sympetrum corruptum</i> , Variegated Meadowhawk	5	2
<i>Sympetrum pallipes</i> , Striped Meadowhawk	-	8
Total individuals	488	429
No. species	9	10

Table 2. Odonate species and number of individuals observed during the Minidoka National Wildlife Refuge Odonate Counts in 2004–2006.

Species	28 Aug 2004	21 Aug 2005	10 Sep 2006
<i>Lestes disjunctus</i> , Common Spreadwing	42	8	-
<i>Lestes congener</i> , Spotted Spreadwing	-	6	36
<i>Lestes dryas</i> , Emerald Spreadwing	-	2	-
<i>Enallagma clausum</i> , Alkali Bluet	1	12	8
<i>Enallagma carunculatum</i> , Tule Bluet	97	49	16
<i>Ischnura cervula</i> , Pacific Forktail	1	8	10
<i>Ischnura perparva</i> , Western Forktail	-	1	2
<i>Amphiagrion abbreviatum</i> , Western Red Damsel	1	-	-
<i>Anax junius</i> , Common Green Darner	5	1	1
<i>Rhionaeschna multicolor</i> , Blue-eyed Darner	2	-	-
<i>Aeshna interrupta</i> , Variable Darner	-	-	4
<i>Aeshna umbrosa</i> , Shadow Darner	-	-	1
<i>Sympetrum semicinctum</i> , Band-winged Meadowhawk	36	40	12
<i>Sympetrum internum</i> , Cherry-faced Meadowhawk	-	12	10
<i>Sympetrum corruptum</i> , Variegated Meadowhawk	2	4	-
<i>Sympetrum pallipes</i> , Striped Meadowhawk	-	-	6
Total individuals	187	143	106
No. species	9	11	11

Table 3. Odonate species and number of individuals observed during the Magic Mountain Odonate Counts in 2004–2005.

Species	22 Jul 2003	8 Aug 2004	30 Jul 2005
<i>Lestes disjunctus</i> , Common Spreadwing	20	29	194
<i>Lestes dryas</i> , Emerald Spreadwing	1	3	-
<i>Argia vivida</i> , Vivid Dancer	-	8	50
<i>Enallagma cyathigerum</i> , Northern Bluet	32	-	-
<i>Enallagma boreale</i> , Boreal Bluet	-	4	142
<i>Enallagma anna</i> , River Bluet	-	9	-
<i>Ischnura perparva</i> , Western Forktail	-	24	36
<i>Ischnura denticollis</i> , Black-fronted Forktail	2	-	-
<i>Amphiagrion abbreviatum</i> , Western Red Damsel	-	1	28
<i>Anax junius</i> , Common Green Darner	-	1	-
<i>Aeshna interrupta</i> , Variable Darner	-	-	1
<i>Aeshna palmata</i> , Paddle-tailed Darner	10	64	31
<i>Ophiogomphus severus</i> , Pale Snaketail	-	1	4
<i>Cordulegaster dorsalis</i> , Pacific Spiketail	2	3	8
<i>Libellula forensis</i> , Eight-spotted Skimmer	5	13	1
<i>Libellula quadrimaculata</i> , Four-spotted Skimmer	6	-	2
<i>Libellula saturata</i> , Flame Skimmer	1	-	-
<i>Plathemis lydia</i> , Common Whitetail	5	7	1
<i>Sympetrum semicinctum</i> , Band-winged Meadowhawk	-	1	-
<i>Sympetrum internum</i> , Cherry-faced Meadowhawk	-	2	4
<i>Sympetrum pallipes</i> , Cherry-faced Meadowhawk	4	30	15
<i>Tramea lacerata</i> , Black Saddlebags	-	2	-
Total individuals	88	202	517
No. species	11	17	14

It was also hoped that this time frame would encounter large migratory events.

We used insect nets to capture and identify many specimens. All specimens were subsequently released. Some

species were identified using close focus binoculars. T. Manolis' (2003) field guide to the Dragonflies and Damselflies of California was used to identify specimens as this guide is user-friendly and provides coverage of the South Idaho fauna with minimal alteration.

Results

One state record (Fothergill et al., 2004) and four accepted county records (Abbott, 2007): OC #6394, OC #6414, OC #6415, and OC# 6417 are resultant from these counts. Thirteen species were detected at Camas NWR on 2005–2006 (Table 1). Sixteen species were detected at Minidoka NWR in 2004–2006 (Table 2). Twenty-two species were detected on the Magic Mountain route in 2003–2005 (Table 3).

Participant numbers, while not high on any one count, remained steady and ultimately involved 12 individual participants (Table 4).

Conclusion

The benefits of Odonata data from the specific locations and public involvement were obtained. Odonate

counts were able to be performed in Idaho and attract people unfamiliar with odonates to the joy of standing in beaver ponds swinging nets. Additional conservation benefits to these counts were that land manager awareness of Odonata was increased simply by communicating

Table 4. Participant numbers and party hours for Idaho Odonate Counts performed during 2003–2006.

Count	Participants	Party Hours
Camas NWR 2005	4	5
Camas NWR 2006	4	5
Minidoka NWR 2004	3	5.25
Minidoka NWR 2005	3	5
Minidoka NWR 2006	3	5
Magic Mountain 2003	2	4.5
Magic Mountain 2004	2	6
Magic Mountain 2005	4	6
Total unique participants	12	

the conducting of the count and then later sharing and discussing the data. Odonata are at least as charismatic as birds and butterflies and can be counted utilizing a “citizen science” counting methodology. The CBC and 4JBC programs could be effective models for a continent-wide monitoring system for odonates. Until some entity comes forward to coordinate such an effort and process the data, it will be left to interested individuals to undertake their own monitoring. Lacking other guidance we suggest following the CBC/4JBC procedures so that data would be comparable until such time a coordinating entity is found. The costs of administering such a program can be passed to participants as both the CBC and 4JBC have done. Stacking odonate counts onto CBC and 4JBC count circles may provide data as to how these different animals respond to land use changes. Data such as these will not replace intensive monitoring and atlas projects, but do provide snapshot glances into species occurrence, flight times, and abundance in addition to engaging and educating the public about odonates and their habitats.

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assistance and interest in further documenting Idaho’s odonate fauna.

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2008 Collecting Trip in Martinique (French West Indies)

François Meurgey <francois.meurgey@mairie-nantes.fr>, Gwenaël David, and Bénédicte Thiebaut

Like previous years, a three week collecting trip to the French West Indies was organized by the Natural History Museum of Nantes to complete our knowledge of the distribution of Odonata species and their ecology. This year, our studies were carried out in Martinique from 23 March to 13 April. March is “normally” situated in the middle of the dry season in the West Indies, and we expected sun and relatively high temperatures. However, heavy rainfalls were predominant, almost every day, with temperatures varying between 22 and 25° C (instead of 30–32°

C). I remember our 2007 trip to Guadeloupe, surprisingly warm and sunny, during the “wet season” (*ARGIA* 19[3], 2007). It is now very difficult to anticipate the weather in the Lesser Antilles, and one visiting these islands has to expect anything at any time!

I was accompanied this year by Laurent Charles, a malacologist from the Natural History Museum of Bordeaux who actually works on the West Indian land snails. Jerrell J. Daigle couldn’t join us for this trip, and we missed him.

We met Gwenaël David and Bénédicte Thiebaut, two tireless and very active odonatologists, actually living in Martinique, with whom we spent these three weeks.

We started prospecting early on the 24th. One of our objectives was to find *Erythrodiplax berenice* (Seaside Dragonlet), recently rediscovered in Guadeloupe. We decided to do some prospecting in the mangroves of Sainte-Anne, south of the island, but without any success. We tried several times searching for this species at other places, still without success. We collected many *Orthemis macrostigma* in the south, which will be used by Jerrell for genetic analysis. Other species seen in the mangroves were *Anax junius* (Common Green Darner), relatively rare in Martinique, *Brachymesia herbida* (Tawny Pennant), *Micrathyria aequalis* (Spot-tailed Dasher), and *Erythrodiplax umbrata* (Band-winged Dragonlet). We also saw a beautiful Little Blue Heron (*Egretta caerulea*) trying to mate with a Snowy Egret (*Egretta thula*), first identified as a white form of *E. caerulea*.

March 25 was a *Brechmorhoga* day. In the past year, I received several dried specimens of *Brechmorhoga* from Martinique, which looked strange, but that I identified as *Brechmorhoga archboldi*. To be sure, fresh material was seriously needed. We chose to do some looking in the north of Martinique, near Plateau Boucher (hot spot for bird ringers), at 500m elevation. A forest track crossing several streams and rivers offers a good opportunity to see adults of *Brechmorhoga* hovering above the road. Surprisingly, the first specimen caught, a female, strongly differed from *B. archboldi*. Then, several males were caught, and I realized that none of them could be assigned to *B. archboldi*. After a first quick examination, I concluded that we found *B. grenadensis*. Back in France, I checked closely the specimens and compared them to several *B. praecox* (Slender Clubskimmer) from Venezuela and Trinidad, and also with the holotype of *B. grenadensis* housed at the BNHM (London). Some scans were also sent to Jerrell who compared them with his *B. praecox* from Trinidad. We both concluded that this species was *B. praecox*, calling into doubt the validity of the taxa, *B. grenadensis* or *B. praecox grenadensis*. We now need to visit Grenada, St. Vincent, and St. Lucia to find out what species of *Brechmorhoga* occur there, and to get a better handle on the distribution of the *Brechmorhoga* spp. in the islands. Other species seen here were *Enallagma coecum* (Antillean Bluet), *Protoneura ailsa*, and *Dythemis sterilis*. We found adults of *B. praecox* in five localities, plus larvae and exuviae.

Many days were devoted to the research of new localities to obtain a better distribution picture of the different species with a lot of travelling and few results! Unlike Guadeloupe, Martinique is predominantly occupied by rich

white farmers whose ancestors practised the slave system. As a result, most of the territory is closed, and many interesting aquatic habitats are private. Some of these owners make you pay for the right-of-way on the roads, even public roads, which cross their property. For example, going to the mangroves of Anse Trabaud, in the south of the island, will cost you 2.5 euros.

The “Grand Macabou” (access free), west of the island, is an important protected area where numerous migratory birds can be seen all year round. It is a very good spot for dragonflies with several ponds showing different salinity levels. A small littoral forest pond provided a great number of exuviae of *Anax junius*, *Triacanthagyna caribbea*, *Brachymesia furcata* (Red-tailed Pennant), *Tholymis citrina* (Evening Skimmer), and *Orthemis macrostigma*. Further away from the sea, a great marsh covered with aquatic plants, provided one of the few observations of *Tauriphila australis* (Garnet Glider). This species was first recorded here in 2005, from la Baie du Lamentin, near Fort-de-France on the west coast. Since then, Gwenaël and Bénédicte found a new location for this species in the south of the island. The distribution of this species is now better known, but it remains rare and confined to the southern half of the island. A brief visit to la Baie du Lamentin on the 28th provided two new specimens of *Tauriphila australis*, plus the second record for *Tramea calverti* (Striped Saddlebags) for Martinique.

The 30th was the most frightening day. We decided to reach a small stream in the rain forest in the north part of Martinique. Unfortunately, the forest track was embedded with fallen trees due to Hurricane Dean, and we had to resort to using the machete to blaze a trail! The problem is that Martinique is inhabited by the venomous and aggressive pitviper *Bothrops lanceolatus* or “Fer de Lance”, and by the Antilles Pink-toed Tree Spider, *Avicularia versicolor*. The field excursion was exciting and fun (we didn’t see any snakes), even when a spider fell from a tree just in front of Bénédicte. I’m sure that following her shout, someone is now convinced that Bigfoot exists in Martinique! We finally reached the stream, and found a new locality for *Protoneura ailsa*, plus some *Erythrodiplax umbrata* (Band-winged Dragonlet).

A brief visit to some ponds near Château Gaillard (south-east of Martinique), provided some interesting information about *Tholymis citrina* with a female observed egg-laying at 11:00 AM in a small channel invaded by *Hydrilla verticillata*. Several exuviae were also found at this place. Other species here were *Ischnura ramburii* (Rambur’s Forktail), *Lestes forficula* (Rainpool Spreadwing), *Brachymesia herbida* (Tawny Pennant), *Erythemis vesiculosa* (Great Pondhawk), *Erythrodiplax umbrata*, *Micrathyria aequalis*, *Orthemis*


macrostigma, *Pantala flavescens* (Wandering Glider), and *Tramea abdominalis* (Vermilion Saddlebags).

One day was devoted to *Gynacantha nervosa* (Twilight Darner). This species was discovered in 2007 from three locations, near Trois-Ilets, south of the island. We were interested in discovering new localities and learning more information about its biology and ecology. We decided to climb the Morne d'Alet, to reach a series of three ponds, where Gwenaël and Bénédicte caught this species for the first time. These forest ponds are heavily embedded with fallen trees, dead leaves and other debris. At sunset we observed several *T. caribbea* hovering and one *G. nervosa* flying straight. These species frequent temporary and very eutrophic, small to medium ponds, and are confined to the top of southern dry hills.

During this stay, I was especially interested in the odonate assemblages in various habitats across the island. We noted that *Protoneura ailsa* was very common everywhere from mountain streams to small rivers in sugar cane plantations, but absent from mangroves and flooded forests. This species is frequently accompanied by *Ischnura capreolus* at low elevations, and *E. coecum* at higher altitudes. *Enallagma coecum* is common and frequents different types of habitat, like rivulets, springs, streams and rivers, while it occupies only slower flowing water and springs in Guadeloupe. *Ischnura capreolus* is sometimes abundant, even in lotic habitats such as streams and rivers, where it is accompanied by *Dythemis sterilis* and *P. ailsa*. We found big populations of *I. capreolus* in small temporary ponds covered by water lettuce in the driest part of the island. These species were never seen in these ponds during one year of regular surveys, showing the high capability of colonization of this species. *Dythemis sterilis* is a high elevation species in Guadeloupe, living above 400 m on mountainous areas of Basse-Terre, where it is confined to fast flowing rivers and

streams. Much more common in Martinique, this species is found from sea level to over 300 m elevation, in both fast flowing and standing waters.

The research of new localities led us to visit several spots near Morne Vert, where after a long climb on 11 April, we found the highest standing water habitat on the island (555 meters elevation). We were surprised to discover *Ischnura bastata* (Citrine Forktail) there flying in the grass near the water. While it is very common in Guadeloupe and Dominica, this is the first record of this species in Martinique. This species was never mentioned from Martinique prior to this date. A hypothesis that Hurricane Dean was responsible for individuals making it over from another island must be considered.

In spite of many difficulties, this trip was fruitful. Lots of new data was collected for the book on Dragonflies of the French West Indies, scheduled to be published in 2009. But, as in 2005, we failed to find *Argia concinna*, *Telebasis corallina*, and *Macrothemis*. *Argia concinna* is known from only one male specimen, caught in the 1980s and housed at the FSCA in Gainesville, Florida. *T. corallina* was never caught, but observed by a local entomologist in 2005. *Macrothemis* is known only from three exuviae collected at Rivière l'Alma, north of Martinique, but we do not know of any adults, and the exuviae could belong to a *Brechmorhoga*. We actively and intensively searched for these species to no avail. This makes me seriously doubt the presence of the species in Martinique. At this time, the number of odonate species in Martinique is 28. 

Odonata of the Francis Marion National Forest

George L. Harp, Jonesboro, Arkansas <glharp@astate.edu>

As it was our first trip to South Carolina, Phoebe and I decided to linger a while after the Southeast Regional meeting in Cheraw. We first spent a few days in Savannah, Georgia, taking the customary carriage ride around the storied squares, churches and other points of note. Several seafood establishments were patronized, to our gastronomical delight. We also visited the Savannah River National Wildlife Refuge, which is actually across the river, in Jasper County, South Carolina. While they would not furnish a permit, they did express an interest in receiving a list of odonates that I might see. Indeed,

we saw six species, of which three would have been new records for that county, but, alas, no vouchers! For those whose curiosity is piqued, the list follows, with the species which would have been new records indicated by asterisk; *Ischnura ramburii** (Rambur's Forktail), *Anax junius* (Common Green Darner), *Brachymesia gravida** (Four-spotted Pennant), *Erythemis simplicicollis* (Eastern Pondhawk), *Pachydiplax longipennis* (Blue Dasher) and *Perithemis tenera** (Eastern Amberwing). Such a short trip, such common species, but, of course, three of them can still not be acknowledged to exist in Jasper County.

Next, we trekked north to Charleston, South Carolina, where we spent a pleasant week. Again, seafood establishments were visited (I think Phoebe finally became satiated, at least for the moment, with oysters), as well as Fort Sumter, a plantation, another carriage ride, and the tall ships, which were visiting Charleston as part of a weekend festival. Swashbuckling outfits were procured for our two young grandsons. A sweetgrass basket became Phoebe's souvenir.

While in Charleston, we traveled north a few miles to the Francis Marion National Forest. This time, a permit was issued. From 19 through 21 May we visited 13 sites. Nearly every species we documented was typical of lentic habitat. Two places were particularly species rich, Little Hellhole Reserve in Berkeley Co. and Twin Ponds at the Twin Ponds Rifle Range in Charleston Co. These had large expanses of littoral zone. On the other hand, streams were either quite small, most with intermittent pools because of recent drought, heavily shaded, or large rivers, too large for me to even think of working (e.g. Santee River). The 33 species documented for this National Forest are listed below.

Unless otherwise noted, voucher specimens are housed in the Adult Odonata Collection of the Arkansas State University Museum of Zoology.

Francis Marion Preliminary Species List


Ebony Jewelwing, *Calopteryx maculata*
 Swamp Spreadwing, *Lestes vigilax**
 Blue-tipped Dancer, *Argia tibialis*#
 Double-striped Bluet, *Enallagma basidens*#
 Familiar Bluet, *Enallagma civile*
 Attenuated Bluet, *Enallagma daeckii*
 Turquoise Bluet, *Enallagma divagans**
 Citrine Forktail, *Ischnura hastata*

Lilypad Forktail, *Ischnura kellicotti*#
 Fragile Forktail, *Ischnura posita*
 Rambur's Forktail, *Ischnura ramburii*
 Green Darner, *Anax junius*
 Comet Darner, *Anax longipes*+
 Swamp Darner, *Epiacantha heros**
 Lancet Clubtail, *Gomphus exilis**
 Four-spotted Pennant, *Brachymesia gravida*
 Calico Pennant, *Celithemis elisa**
 Halloween Pennant, *Celithemis eponina*#
 Banded Pennant, *Celithemis fasciata**
 Faded Pennant, *Celithemis ornata**
 Eastern Pondhawk, *Erythemis simplicicollis*
 Seaside Dragonlet, *Erythrodiplax berenice*
 Little Blue Dragonlet, *Erythrodiplax minuscula*
 Golden-winged Skimmer, *Libellula auripennis*
 Bar-winged Skimmer, *Libellula axilena**
 Slaty Skimmer, *Libellula incesta*
 Painted Skimmer, *Libellula semifasciata**
 Great Blue Skimmer, *Libellula vibrans*
 Blue Dasher, *Pachydiplax longipennis*
 Spot-winged Glider, *Pantala hymenaea*+
 Eastern Amberwing, *Perithemis tenera*
 Common Whitetail, *Plathemis lydia*
 Violet-masked Glider, *Tramea carolina**

* new county record (10) for Berkeley Co.

new county record (4) for Charleston Co.

+ these two species would have been new county records for Charleston Co., but no voucher could be netted.

We thank D.L. Carlson for providing the collecting permit. Both he and Jeanne Riley (Fisheries Program Manager) suggested potential survey sites. Chris Hill determined which species were county records, through OdonataCentral, <www.odonatacentral.org>, and thereby stimulated me, a computer ignoramus, to delve into previously untested waters. Thanks, Chris. 

Brechmorhoga praecox (Slender Clubskimmer)—A New Species for the United States

Rick Nirschl <ricknir@hotmail.com>

Thursday, 28 February 2008, was a warm and sunny day, 82° with a strong wind out of the south, so as I drove along Military Hwy. approaching the North American Butterfly Association butterfly park in Mission, Hidalgo County, Texas, I stopped my van where a line of trees on the south side of the road provided a windbreak. Dragonflies like to hunt along sheltered edges like this and this day was no exception. There were the usual Wandering Gliders (*Pantala flavescens*), Red Saddlebags (*Tramea onusta*), Striped Saddlebags (*Tramea calverti*), and a couple of Great Pondhawks (*Erythemis vesiculosa*) flying about, catching

insects, but I noticed a different looking dragonfly cruising back and forth about 1.3 m off the ground, staying within a small area about 13 m wide. I could see thoracic stripes which made me think it could be some type of darner but the abdomen didn't look right for a darner. After watching for about 10 minutes, I decided that it wasn't going to land for photographs so I got my net, made one feeble attempt to catch it, missed and it was gone. I waited around but it didn't return so I drove the short distance into the NABA butterfly park, parked and walked about 40 m and there it was again, flying, but quickly landing on a vine swaying


in the wind. I took about 20 photographs from 1 m away, not wanting to scare it away when Jeff Glassberg walked up behind me and asked what I was photographing. I told him and asked if he would like to get some photos before I moved in for some close up shots. Jeff took one or two photos and then I took a series of shots from about 10 cm before it flew off.

Later that day I showed my photos to Dr. Josh Rose at Bentsen State Park who said it looked like *Brechmorhoga mendax*, a Pale-faced Clubskimmer and we left it at that. Jeff Glassberg, however, sent his photo to Dave Hanson who forwarded it to Dennis Paulson who said that while it was a clubskimmer, it was not a Pale-faced but one of three other species not found in the United States, *B. vivax*, *B. tepeaca* or *B. praecox*. Unfortunately, Dennis said, it could not be identified to species from this photograph.

We then sent my photographs to Dennis who was able to identify it as *Brechmorhoga praecox* from the shape of the hamules on the ventral surface of S2 and other features. According to Dennis, "The hamules look exactly right for *praecox*. *B. vivax* and *tepeaca* don't have hamules like that. No other known species in that genus have the relatively narrow hind wings (relatively sparse venation) and rela-

tively long, narrow abdomen of those species. The shape of the spots on S7 is okay for *praecox*, if not typical of it everywhere in Mexico, and a bit wide for *vivax*, although not too dissimilar to that of *tepeaca*. The extent of the markings on the more basal segments is extreme for any of these species, but I'm assuming we still have more to learn about that variation rather than that there is still another species of *Brechmorhoga* down there."

Brechmorhoga praecox had not been recorded in the United States before, so this is an addition to the known species in the U.S. This species is normally found throughout most of lowland Mexico except the Yucatan Peninsula, north to Sonora in the west and Tamaulipas in the east. It also occurs through Central and northern South America to Peru and Brazil. This genus is a stream species and it's not certain that there are suitable habitats for larvae in southern Texas, so this may have been just a vagrant from the south.

Thanks to Dave Hanson, Jeff Glassberg, Dr. Josh Rose and especially to Dennis Paulson for their help in identifying this dragonfly and also to Dennis for providing the known range of this species. 

Odonata Surveys in the Bronx, New York

Walter Chadwick <mrcnaturally@optonline.net>


As a volunteer with the New York Dragonfly and Damselfly Survey I decided to survey sites in the Bronx during 2007. The Bronx is a densely populated Borough of New York City which appeared to be undersurveyed. Two locations were chosen both of which I had previous knowledge of from birding trips: The New York Botanical Garden and the Bartow-Pell Mansion.

At the Botanical Garden two sites were selected, Twin Lakes and the ornamental pools at the Conservatory. The water at Twin Lakes was completely covered with algae on both surveys, which were performed in the late morning. At this site on 10 July and 29 August 2007 the only species observed was *Pachydiplax longipennis* (Blue Dasher). On 10 July the species was frequent and on 29 August only one was observed.

At the Conservatory pools (which contained lotus, water lilies and a type of goldfish during the 10 July survey) the species observed were *Pachydiplax longipennis* (Blue Dasher) common, *Perithemis tenera* (Eastern Amberwing) few, and *Anax junius* (Common Green Darner) few. The 29 August survey produced *Pachydiplax longipennis* (Blue Dasher) fre-

quent, *Anax junius* (Common Green Darner) few, *Ischnura verticalis* (Eastern Forktail) few and an *Enallagma* (bluet) which I could not identify as to species. Surveys at this site were done in the late morning and afternoon, and the water was clear. Additional surveys were planned for September at the pools but they were closed to the public in preparation for an upcoming exhibition.

At the Bartow-Pell Mansion which is located in the northeast corner of the Bronx, two surveys were conducted at an ornamental pool located in the garden. The pool has aquatic vegetation and the water is clear. The 24 July survey was done in the early afternoon and the Odonata present were, *Ischnura verticalis* (Eastern Forktail) few, *Ischnura posita* (Fragile Forktail) few, and *Pachydiplax longipennis* (Blue Dasher) few. On 4 September the observed species were *Libellula pulchella* (Twelve-spotted Skimmer) few, *Anax junius* (Common Green Darner) few, and *Ischnura posita* (Fragile Forktail) frequent. This survey was done in the late morning just before noon. Photos were taken at both locations.

Surveys are planned for 2008 at both locations. 

New U.S. Dragonfly—*Planiplax* sp. (probably *Planiplax sanguiniventris*)

David T. Dauphin, Mission, Texas <dauphins@sbcglobal.net>

On 2 June 2008, my wife Jan and I saw a very brightly marked, small, long-legged dragonfly at Bentsen-Rio Grande Valley State Park, World Birding Center in Mission, Hidalgo Co., Texas. The dragonfly was seen for only about 15 seconds as it flew across in front of us. We returned on 3 June with Tom Pendleton and Jan managed to get 5 quick photos in less than ten seconds when it perched in front of her. After showing a photo to Bentsen-SP park naturalist, Joshua Rose, we thought we had found *Erythemis peruviana* (Flame-tailed Pondhawk). After posting our photos, John Abbott quickly questioned our identification. More photos were sent to John C. Abbott, Sid Dunkle, and Dennis Paulson for identification help, and the dragonfly was determined to be a *Planiplax* species, probably *Planiplax sanguiniventris*, new to the US.


Two weeks prior to and five days after discovering the *Planiplax*, the Lower Rio Grande Valley (Cameron, Hidalgo, Starr, and Willacy Counties) had been having sustained southeast winds at 20–35+ mph. High heat (90°–105°F) is common at this time of year. The exact loca-

tion was the base of a boat ramp on a large resaca at the state park. Our field of view was only about 50 ft. and our views were always rapid fly-bys with the *Planiplax* always about 20 ft., low out over the water, seldom perching and making photographing or netting very difficult.

On three separate days, we were able to see two to four *Planiplax* individuals in our field of view at the same time.

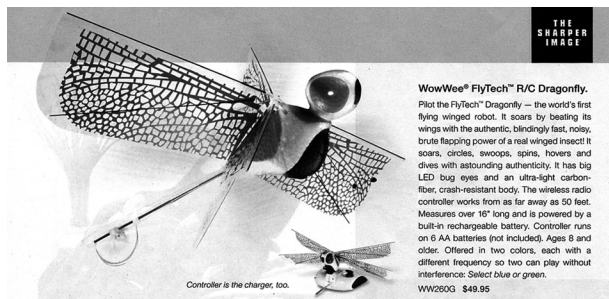
We stood five hour vigils each day after first finding the *Planiplax* and were rewarded on 6 June when Martin Reid struggled through dense cane and located it perched, where we were able to get better photos for confirmation.

We owe a great deal of appreciation to John Abbott, Sid Dunkle, and Dennis Paulson for not only their identification help, but for all their encouragement to keep trying to collect or better photograph the *Planiplax*.

Photos of the *Planiplax* are at <<http://outdoors.webshots.com/album/540330134EjHYsB?start=72>>. 

Odes in the News

I was recently at a neighborhood gathering when one of my neighbors discovered my interest in dragonflies. He mentioned he had just purchased a remote controlled dragonfly for his grandson and quickly brought it back over for me to play with. I had heard about the WowWee Dragonfly Bot, but hadn't had the privilege of attempting to fly one until then. I can't say I was immediately able to control it, but I did manage to keep it in the air for several short, but sustained flights. Not long after this introduction to the dragonfly bot, I saw it prominently displayed on the cover of SkyMall magazine.



Johan van 't Bosch and Eric Gilbert have started up a new Web site, <www.America-dragonfly.net> that is modeled

after the Asia-dragonfly and Africa-dragonfly sites. This is a photo site that will allow everyone to contribute photos or check photos taken by others. The focus is on dragon- and damselflies from the Neotropics: South America, Central America and the West Indies.

I have of course been an admirer of Ed Lam's artwork and beautiful book on the Damselflies of the Northeast, but I only recently discovered the beautiful laminated foldout Guide to the Northeastern Dragonflies and Damselflies that Ed did. This foldout is available from the Massachusetts Audubon Society.

A new dragonfly stamp has been issued by the United States Postal Service. It can be purchased at <<http://tinyurl.com/4t9vay>>.



ARGIA and BAO Submission Guidelines

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

Articles

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

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

Figures

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

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

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

Tables

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

The Dragonfly Society Of The Americas

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

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ARGIA, the quarterly news journal of the DSA, is devoted to non-technical papers and news items relating to nearly every aspect of the study of Odonata and the people who are interested in them. The editor especially welcomes reports of studies in progress, news of forthcoming meetings, commentaries on species, habitat conservation, noteworthy occurrences, personal news items, accounts of meetings and collecting trips, and reviews of technical and non-technical publications. Membership in DSA includes a subscription to ARGIA.

Bulletin Of American Odonatology is devoted to studies of Odonata of the New World. This journal considers a wide range of topics for publication, including faunal synopses, behavioral studies, ecological studies, etc. The BAO publishes taxonomic studies but will not consider the publication of new names at any taxonomic level.

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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 <http://www.odonatacentral.org/index.php/PageAction.get/name/DSA_Membership>.

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

Back cover: (upper) *Gomphus septima* (Septima's Clubtail) taken in Chesterfield Co., South Carolina on Eureka Lake in Cheraw State Park, 9 May 2008. Photo by Dennis Paulson. **(lower)** *Epithea spinosa* (Robust Baskettail) taken in Houston Co., Texas, at Ratcliff Lake, 24 March 2008. Photo by John C. Abbott.



Photo Supplement: ARGIA Vol. 20, No. 2

The photos below accompany the article "Chasing Dragonflies in Southern Ecuador" by Ken Tennessen and Jim Johnson on pages 9 to 11 in ARGIA 20(2).



Anisagrion inornatum, male

Jim Johnson



Anisagrion inornatum, female

Ken Tennessen



Aphylla boliviana, exuvia

Ken Tennessen



Micrathyria ocellata, male

Jim Johnson



Neoneura bilineata, male

Ken Tennessen



Dythemis multipunctata, male

Ken Tennessen



Heteragrion cooki, male

Jim Johnson



Telebasis brevis, male

Ken Tennesen



Oxyallagma dissidens, male

Jim Johnson



Telebasis sp., male

Jim Johnson



Orthemis sulphurata, male

Ken Tennesen



Polythore terminata, male

Jim Johnson