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## In This Issue

I recently heard from Naoya Ishizawa that Dr. Syoziro Asahina passed away on November 28th at the age of 97. Dr. Asahina was the first president of SIO and organized the Japanese Society of Odonatology. I hope to be able to include a more thorough obituary in a future issue of ARGIA.

The end of the year was not boring for odonatology in North America with the discovery of a number of new state and one US record. Rich Bailowitz reports on two new species from Arizona, Neotropical Bluet (*Enallagma novaehispaniae*) and Southern Spreadwing (*Lestes australis*). Jim Johnson reports on his discovery of Desert Forktail (*Ischnura barberi*) in Oregon. Steve Spitzer found Striped Saddlebags (*Tramea calverti*), a species that really seemed to be on the move this year, for the first time in Illinois. Not to be outdone by any of these discoveries, Nathan Kohler reports on the addition of no less than five species to the Montana list. This is a state that has certainly not gotten a lot of attention in the past and Nathan is making some neat discoveries. Perhaps Montana should be on our radar for a future DSA meeting.

Texas also had a couple of additions this year with the discovery of Claw-tipped Bluet (*Enallagma semicircularae*) by Mike Rickard and the notable find of multiple populations of Marsh Firetail (*Telebasis digitcollis*) in the Lower Rio Grande Valley. The latter (see the front cover) is new for the US. Mick McHugh also reports on the northward expansion of several species in Kansas.

Jason Bried and Celeste Mazzacano review wildlife action plans for Odonata conservation across the United States. If you haven't already seen it, I encourage you to read their full assessment published in Insect Conservation and Diversity this year.

Pierre Deviche reports on another mis-pairing of species, this time between Desert Forktail (*Ischnura barberi*) and Rambur's Forktail (*Ischnura ramburii*).

## Calendar of Events

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


Event	Date	Location	Contact
2011 DSA Annual Meeting	8–11 July 2011	Fort Collins, Colorado	<a href="http://tinyurl.com/5s7s6t/">http://tinyurl.com/5s7s6t/</a>
2011 Int. Congress of Odonat.	31 Jul–5 Aug 2011	Odawara, Japan	< <a href="http://www.odonata.jp/wda2011/">http://www.odonata.jp/wda2011/</a> >

Jim Johnson found a nymph of a *Libellula* species, likely *L. quadrimaculata* (Four-spotted Skimmer), crawling out of water for potentially a couple of hours. This is an interesting observation that we know little about and we should all keep our eyes out for such behavior. Jim has also found what appears to be a very useful character for separating California Dancers (*Argia agrioides*) and Aztec Dancers (*Argia nabuana*) in photos and in the field where they overlap and can be so troublesome.

Sue and John Gregoire present a nice summary of their six-year effort to monitor the emergence of Calico Pennants (*Celithemis elisa*) from a pond in up state New York.

I have included the update on OdonataCentral that I promised in Orono at the annual DSA meeting. I hope readers will find the patterns of usage as interesting as I did. I'll take the opportunity to encourage everyone to submit their records to OdonataCentral so that we can build the most useful and powerful database of Odonata distributions in the New World. There are still two US states with no user-submitted records in OdonataCentral.

We have two book reviews in this issue. One on Bob Dubois' newest contribution, a wonderfully done guide to the Rocky Mountains and the other on the second edition of John Hudson and Robert Armstrong's *Dragonflies of Alaska*.

Finally, please remember it is that time of the year to renew your DSA membership. You will find the renewal form enclosed. 

# Minutes of the 2010 Annual Meeting of the Dragonfly Society of the Americas

**Steve Valley**, Secretary

The annual meeting of the Dragonfly Society of the Americas was held on Saturday, 26 June 2010, at the Church of Universal Fellowship, 82 Main Street, Orono, Maine with President Bill Mauffray presiding.

Opening remarks were given by Bryan Pfeiffer.

Bill Mauffray gave a history of DSA.

The meeting buttons were handed out by Jerrell Daigle.

Attending members introduced themselves.

There were 81 participants at the 2010 DSA meeting (including pre- and post-meeting trips):

Steve & Mary Jane Krotzer from Alabama  
George & Phoebe Harp from Arkansas  
Kitt Heckscher and Hal White from Delaware  
Jerrell Daigle and Bill Mauffray from Florida  
Steve & Marcia Hummel from Iowa  
Ken Thompson, Yvette Liautaud, Kathy Kozacky, and Marla Garrison from Illinois  
David Allan Fitch, David & Shelly Small, Michael Veit, Fred Morrison, Joshua Stuart Rose, Jason Forbes, and Glenn Corbiere from Massachusetts  
Phillip deMaynadier, Ron Butler, Bob Grobe & Donna Maritato, Bronco Quick, Sarah J. Nelson, Ed Lindsey, Mark Ward, and Paul Miliotis from Maine  
Pam Hunt, Nancy Rideout, Larry Potter, and Martha Reinhardt from New Hampshire  
Cliff Bernzweig, Mike & Leslie May, and John Michalski from New Jersey  
Ailsa & Nick Donnelly, Ed Lam, Annette Oliveira, Sue & John Gregoire, Linda N. LaPan Sheila & Lew Rosenberg, Ted Mack, Alison Van Keuren, Kazunori Ito, Erin White, Paul & Rachel Novak, Jeff Corser, Steve & Vici Diehl, and Ann DeGroff from New York  
Cary Kerst and Steve Valley from Oregon  
Daniel Bogar and Ken Lebo from Pennsylvania  
Bill & Barbara Kilcup from Rhode Island  
Chris Hill from South Carolina  
Greg Lasley, W. T. Pendleton, John Abbott & Kendra Bauer, and Steve Collins from Texas  
Cindy & Peter Allen from the United Kingdom  
Dennis & Marilyn Washburn from Virginia  
Mike Blust, Bryan Pfeiffer, and Wally Jenkins from Vermont  
Jim Johnson from Washington  
Ken Tennesen from Wisconsin

Reading of the 2009 Annual Meeting minutes was waived

and the minutes were approved as published in ARGIA Vol. 21, No. 4.

Steve Hummel (President Elect) announced that 2011 is an election year for a new President Elect and a new Regular Member, replacing Jim Johnson, on the Executive Council.

Jerrell Daigle gave a presentation proposing the 2011 DSA Annual Meeting be held in Colorado. The proposal was voted on and approved.

John Abbott reported on the Donnelly Fellowship. No funds were awarded in 2010 because of bureaucratic red tape in the Latin American countries where the applicants lived.

Hal White announced tentative plans for a 2011 Northeastern regional meeting in Delaware.


Jerrell Daigle announced tentative plans for the 2011 Southeastern meeting near Pensacola, Florida and the 2010 meeting in Panama City in early July.

Bryan Pfeiffer announced tentative plans for the 2011 Northeastern meeting in New England.

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

Mike May gave a report on the Checklist Committee.


John Abbott gave a report on OdonataCentral.

There was a discussion about photo databases and ways to archive images so they will be available into the future (this included Odonate images and Odonatist images). 

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## 2010 Treasurer's Report

**Jerrell J. Daigle**, DSA treasurer <jdaigle@nettally.com>

We began the 2010 year with a balance forward of \$19,084.53. Our current balance is \$21,528.58. Our projected year-end balance with two months to go should be about \$22,000. Currently, we have a DSA membership of about 315. It is anticipated that income and expenses will be lower in 2010 due to the new cost structure of available cheaper electronic versions of ARGIA. Our expenses of about \$5,000 were for printing issues of 2010 ARGIA, BAO, the annual DSA meeting in Maine, but none for the 2010 Donnelly fellowships. 

## *Enallagma novaehispaniae* Calvert (Neotropical Bluet), Another New Species for Arizona


Rich Bailowitz <raberg2@q.com>

Several of the resident odonatists in Arizona have learned not to give up on November. Lingering warm spells have irregularly startled us with surprises such as *Tramea insularis* (Antillean Saddlebags) and *Micrathyria aequalis* (Spot-tailed Dasher). One possibility is that July and August monsoon rains, widespread in the Southwest, bring in gravid females, some of which have been lucky enough to find suitable habitats for oviposition and subsequent larval development. The three-month lag time between the severe storms of the summer and the dry but productive month of November might just allow enough time for a complete, tropical life-cycle. Whether or not this is true, the phenomenon is exemplified once again this year by the finding of *Enallagma novaehispaniae* (Neotropical Bluet) in Arizona.



This species is common nearly throughout Sonora, just to Arizona's south. Its closest approach to the border is along the Río Altar near Oquitoa, less than 100 miles south of Arizona. We have regularly searched the streams of the Atascosa Mountains west of Nogales, seemingly the closest and most likely locations for temporary or permanent colonies of this species in the state. While *Enallagma semicirculare* (Claw-tipped Bluet), another tropically-based bluet, is fairly common in those mountains, we have had no luck finding *E. novaehispaniae*.

On 16 November 2010, I made a trip to western Maricopa County. The purpose of the trip was to see the extent of the relative outbreak of *Tramea calverti* (Striped Saddlebags) in Phoenix proper this fall. Several ponds in the Gila Bend area, some 100 km west-southwest of Phoenix, were possibilities for *T. calverti* and the day promised to be quite warm. One pond near Painted Rock Rd, approximately 25 km west of Gila Bend is particularly appealing. It, like the other nearby agricultural run-off ponds, keeps water year round. It houses large populations of both *Ischnura ramburii* (Rambur's Forktail) and *Ischnura barberi* (Desert Forktail) and even larger populations of *Sympetrum corruptum* (Variegated Meadowhawk), especially in cooler weather. But what is special about this particular pond is that it is slightly raised and there is a small cement dike at its northeastern corner over which water often runs.

On this particular day, water was flowing over the "dam" and into a nice-flowing stream, mostly hidden beneath tamarisks, seep willows, and cattails, but the first 10 meters or so were open. About 11 AM, when the area was first checked, several *Argia sedula* (Blue-ringed Dancer) were basking on the dirt edges to the stream. Also, two males of what proved to be *Enallagma novaehispaniae* were perched on the dead branches and emergent vegetation at the stream's edge. One specimen was collected as a voucher. I called Doug Danforth, hoping he could photograph the other individual but he was unavailable. The following day, Pierre DeViche of Phoenix drove over to photograph the second male. This record represents a first for Maricopa County, for the state of Arizona, and a range extension of approximately 225 km to the northwest of its known Mexican range. The presence of two specimens rather than one leaves the door open as to the origins of the species here. And it gives me another reason to continue my November field trips in Arizona. 

### 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).

## ***Lestes australis* (Southern Spreadwing), New for Arizona**

**Rich Bailowitz** <raberg2@q.com>


Four species of *Lestes* have long been known to occur in Arizona. These include the common and widespread *Lestes alacer* (Plateau Spreadwing), *L. congener* (Spotted Spreadwing), *L. disjunctus* (Northern Spreadwing), and *L. dryas* (Emerald Spreadwing). Over the past 10 years, occasional specimens have been collected that don't neatly fit into any of these taxa. Six specimens—five males and a female, were collected in eastern Arizona over this span of years and remained unidentified in my collection.

In an effort to obtain closure on this matter, during the summer of 2010, the six specimens were mailed to Nick Donnelly, resident expert on the genus, in upstate New York. One of the six specimens, a male, was identified as *Lestes disjunctus*; the other five, however, were identified as *Lestes australis* (Southern Spreadwing).

These two *Lestes* species, *disjunctus* and *australis*, are extremely similar. In Arizona, *L. disjunctus* is small, occurs in late summer and frequents shallow, snowmelt, occasionally ephemeral ponds at high altitudes in three megapopulations. These populations are on the Kaibab Plateau of northcentral Arizona, in the higher Chuska Mountains in the extreme northeast corner of the state, and in the White Mountains of east-central Arizona, always above

8,000 ft. The questionable specimens, however, were larger, taken in mid-summer, and were found as low as 4,600 ft elevation. Some were taken at ponds with little emergent vegetation and others were taken at richly vegetated impoundments.

Three locations are confirmed for *L. australis* in Arizona. They are Apache County, Concho Golf Course Lake, 13 August 2008 (RAB) 1 male; Cochise County, cattle tank, 7 miles ENE Portal, 28 July 2001 (RAB) 1 male, 1 female; and Graham County, BS Tank, San Carlos Indian Reservation, 18 July 2007 1 male, 11 August 2010 1 male.

In light of the recent splitting of the Common Spreadwing into Northern and Southern Spreadwings, distributions in the complex remain incompletely known. It is hoped that these data will help to delineate the ranges for the future. 

## ***Ischnura barberi* (Desert Forktail) Found in Oregon**

**Jim Johnson**, Vancouver, Washington, <jt\_johnson@comcast.net>

The 2010 “Aeshna Blitz”—an annual gathering of odonatists in Oregon, was held in the Alvord Basin in the southeastern corner of the state on 16–18 September. Because of unforeseen scheduling conflicts among a number of usual participants, only Steve Berliner and Josh Vlach were able to attend in addition to myself.

Besides new late flight dates for several species, the Blitz was largely uneventful, but we had a good time which is always the primary objective. Sites visited were Mann Lake, Mickey Hot Spring, Alvord Hot Spring, Borax Lake, and Cottonwood Creek.

On the final day of the weekend, 18 September, we decided to check out Borax



Fig. 1. Oregon's first and so far only *Ischnura barberi* (Desert Forktail), a female, at Borax Lake, Harney County, Oregon, 18 September 2010. Photo by Jim Johnson.

Lake one more time before adjourning and going our separate ways. In greasewood shrubs near the edge of the lake, I came upon a strange looking female damsel which I did not recognize. It was particularly odd in that the thorax was almost entirely unmarked olive green. It had an interesting pattern of black on the abdomen too, but because of the plain thorax I wondered if it was an odd-ball individual with a pigment problem. I took a number of photos before collecting her.

I finally got around to taking a close look at the specimen the next day and it became clear that it was a female *Ischnura barberi* (Desert Forktail) based on structural characteristics of the pronotum and mesostigmal plates. This was a new species for Oregon, and a surprising one at that since it wasn't considered a likely candidate for occurrence in the state. This is OdonataCentral.org record #323402, <<http://tinyurl.com/OC-323402>>.

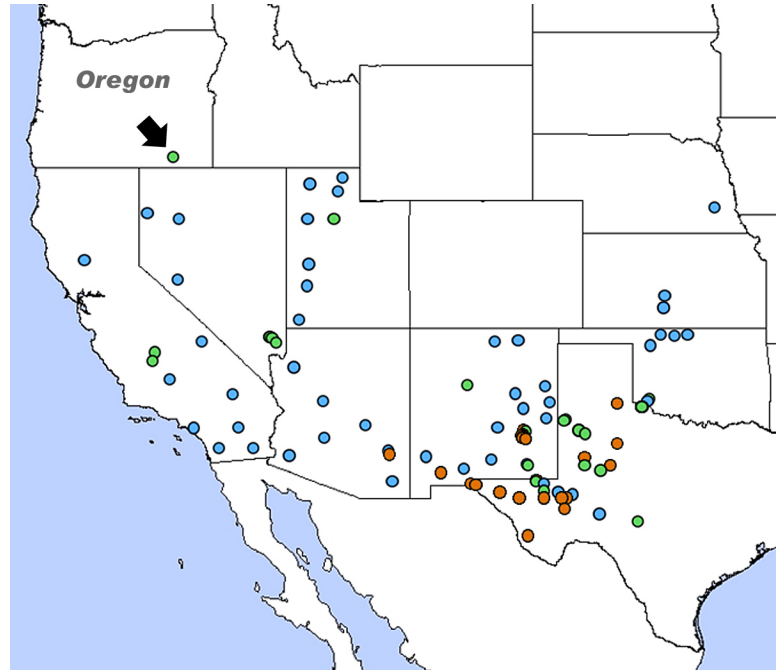


Fig. 2. Map of *Ischnura barberi* (Desert Forktail) records at OdonataCentral.org. Arrow indicates the new Oregon record. Adapted from <<http://tinyurl.com/OC-Ischnura-barberi-Map>>.

No other individuals were found. If I had seen any males or androchromatic females I would have recognized them immediately. Borax Lake has been visited a number of times in the past by me and others, so I have to wonder if it's a very recent arrival. Maybe they're primarily in a little pocket of microhabitat that tends to be overlooked. *Ischnura barberi* occurs at a variety of alkaline and saline wetlands (Abbott, 2005; Paulson, 2009) and Borax Lake—as well as a number of other wetlands in the Alvord Basin (often associated with hot springs), certainly fit that description.

The nearest records of *Ischnura barberi* to Oregon are from Washoe and Pershing Counties, Nevada (Abbott, 2010), however those are Dot Map Project records and the exact locations are not provided. The Borax Lake site is currently the northernmost location where this primarily

southwestern species has been found. I'll definitely return next year to see if I can find more.

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## Recent Discoveries in Montana

Nathan S. Kohler <[nskohler@bresnan.net](mailto:nskohler@bresnan.net)>

The 2010 season in Montana was a productive one. Five species were added to the state list, significant range extensions made on some, new locations found for uncommon others, and one species collected that had not been documented within the state in over 100 years! In addition, over 150 new county records were submitted to OdonataCentral

in 2010. Such is the case from the rarely sampled waters of this expansive state. Most of the discoveries that I made in the western part of the state were somewhat expected, but the eastern portion proved quite the opposite. All five of the new state records came from the east, some the furthest north those species have ever been documented. These addi-

tions bring the total number of odonate species known to occur in Montana to 86 (53 Anisoptera and 33 Zygoptera).

### New Montana Species: ZYGOPTERA

*Ischnura damula* (Plains Forktail): My initial discovery of this species was on 11 July 2010 at Pemberton Pond, along Pilgrim Creek in Powder River Co. (OC# 321209). I collected two males and one female at this location. Following this find, on 13 July 2010, I collected two males from a pond located below Grasshopper Springs in the Long Pine Mountains, Carter Co. (OC# 321210). Both of these locations were similar lentic habitats with sedge and rush, but differed in their settings; one out in a plains stream basin, and the other in low mountains surrounded by Ponderosa pine.

Based on the known range of *I. damula* (Donnelly, 2004c), I was not too surprised to find them in southeast Montana, and it is likely that they occur in other eastern counties as well.

The very similar *I. cervula* (Pacific Forktail) is known from two of the three southeast counties that I visited during 10–15 July 2010. I did not spend a great deal of time at the two locations listed above, so it may be an oversight on my part, but I did not encounter any *I. cervula* during this trip. It will be interesting to see if both these species are found to coexist at any specific locations in this region.

*Argia apicalis* (Blue-fronted Dancer): I first encountered this species on 12 July 2010 along the Little Missouri River, 2 miles south of Alzada in Carter Co. (OC# 321197). I collected two males and one female from this location. On 13 July 2010, also in Carter Co., one male was collected from Boxelder Creek near Belltower. The next day, 14 July 2010, one pair was collected from the Little Powder River a few miles southeast of Broadus in Powder River Co. (OC# 321216). And the following day, 15 July 2010, another pair was collected from Pumpkin Creek, 15 miles southeast of Miles City in Custer Co. (OC# 321222). All of these locations were typical, slow moving prairie streams with occasional riffles. The specimens I found were all located near the stream in areas with rock, exposed ground, or gravel bars.

Although *A. apicalis* was found in small numbers at the locations listed above, their presence in three southeast counties indicates that they are well established, and it will be interesting to discover how far their range extends into Montana. The Custer

Co., Montana location is approximately 175 miles northwest of the nearest known record of *A. apicalis* in Custer Co., South Dakota (Abbott, 2010).

*Argia moesta* (Powdered Dancer): The first finding of this species occurred on 12 July 2010 along the Little Missouri River in Carter Co., not more than 50 meters from the first sighting of *A. apicalis*. I collected two male *A. moesta* from this location (OC# 321198). On 13 July 2010, also in Carter Co., one male was observed on Boxelder Creek near Belltower. I was unable to net this individual, but it was viewed sufficiently close to be sure of its identification. The next day, 14 July 2010, I visited the Little Powder River southeast of Broadus in Powder River Co. Within a small area near the highway bridge, I found as many as two dozen *A. moesta*, many in tandem pairs. The larger number of individuals seen in this area, compared to those few found at the other two locations is interesting. I collected two pairs from this location (OC# 321215). All of the males I observed were never more than a few inches above the gravel, or water, and proved surprisingly difficult to net. The tandem pairs were more easily approached, and would perch higher on vegetation at the water's edge.

*A. moesta* was encountered at all but one of the same locations where *A. apicalis* was found, so it too appears to have established populations in southeast Montana. The Powder River Co., Montana location is approximately 250 miles northwest of the nearest known record of *A. moesta* in Cherry Co., Nebraska (Donnelly, 2004c).

*Argia immunda* (Kiowa Dancer): On 30 June 2010, Bob Martinka and I visited “The Plunge,” a large warm spring located a few miles south of Landusky in the Little Rocky Mountains, Phillips Co. This spring entered directly into a small impoundment and exited at the opposite end to form Warm Springs Creek. During our visit, we found *A.*



*Argia immunda* (Kiowa Dancer), male. Landusky Plunge, Phillips Co., Montana. 30 June 2010.



*immunda* to be common around the spring and impoundment, as well as along Warm Springs Creek, a short distance downstream. I collected three males and one female from this area (OC# 323514).

This is one of the more significant finds of the year, as it represents the furthest north that *A. immunda* has been recorded. The nearest known record is approximately 350 miles to the southeast in the Black Hills, South Dakota (Donnelly, 2004c). Equally removed from its primary range, *Erpetogomphus designatus* (Eastern Ringtail) has also been found at this same Phillips Co. location (Miller & Gustafson, 1996), and it is interesting to note that both of these species show a similar pattern in their extensions to the north and west (Donnelly, 2004a).

#### ANISOPTERA

***Macromia pacifica*** (Gilded River Cruiser): One male was collected by me on 14 July 2010 along the Little Missouri River, 2 miles south of Alzada in Carter Co. (OC# 321212.) I observed at least one other adult *Macromia* two days prior at the same location, but was unable to capture it. Those few individuals observed during both visits were seen cruising just above the stream, with occasional lifts, or turns.

This is the furthest northwest that *M. pacifica* has been recorded, and certainly one of the most significant finds during the 2010 season. The nearest known records are approximately 550 miles to the southeast in Morris and Wabaunsee Counties, Kansas (Donnelly, 2004b).

*Macromia* larvae were found in the Little Missouri drainage some years ago. Because *Macromia* larvae are difficult to identify to species, these larvae were assigned to *M. illinoensis* based on morphology, the known distribution of the species, and the fact that they are the most common

in the genus (Miller & Gustafson, 1996). This record was considered provisional, pending collection of adults for positive identification. Thus my main purpose in visiting the Little Missouri River was to hopefully confirm this by capturing the first adult *Macromia* in Montana. The finding of one *Macromia* species does not necessarily preclude the other, and further visits to this region will be needed to determine if *M. illinoensis* occurs in the state as well.

#### Other interesting records: ZYGOPTERA

***Calopteryx aequabilis*** (River Jewelwing): One each, male and female was collected by me on 12 July 2010 along the Little Missouri River, 2 miles south of Alzada in Carter Co. (OC# 321119). One more male was collected from the same area on 14 July 2010.

Prior to 2005, *C. aequabilis* was known in Montana from three counties in the west, and these are the first specimens collected from the eastern part of the state. There are three observational records of this species in eastern Montana, all from Phillips Co., seen during July 2005 and June 2007 (Montana Natural Heritage Program).

***Lestes forcipatus*** (Sweetflag Spreadwing): On 20 July 2010 I collected two males and one female from a large sedge meadow near Glacier Creek in Missoula Co. (OC# 321307). That same day, one more male was collected from a similar habitat near Cold Creek, also in Missoula Co. Following this find, on 15 September, I collected one male from a glacial pothole with floating moss and sedge east of Seeley Lake in Powell Co. One female was collected from this same location on 26 September 2010 (OC# 323209).

These are the first records of this species in western Montana. Known previously from a few eastern counties, these new finds suggest that *L. forcipatus* is probably more widespread throughout the whole of the state than current records indicate.

#### ANISOPTERA

***Aeshna subarctica*** (Subarctic Darner): Two males and one female were collected by me on 28 September 2010 from a glacial pothole with floating moss and sedge, east of Seeley Lake in Powell Co. (OC# 323247). Following this, on 7 October 2010, I collected one male from some shallow ponds in the Indian Creek Meadows Area, Lewis and Clark Co. (OC# 323417).

Previously, this species was known from only two locations in western Montana;



*Macromia pacifica* (Gilded River Cruiser), male. Little Missouri River, Carter Co., Montana. 14 July 2010

Mud Lake in Granite Co. and one dot-map record from an unknown location in Beaverhead Co. (Donnelly, 2004a). *A. subarctica* is one of the least common Aeshnids found in Montana, so these new discoveries are of some significance, especially the Powell county location, where the occurrence of regular breeding seems likely.

***Somatochlora ensigera*** (Plains Emerald): A single male was collected by me on 15 July 2010 along Pumpkin Creek, 15 miles southeast of Miles City in Custer Co. (OC# 321223). A few more *Somatochlora* were observed at both this area, and the Little Missouri River in Carter Co. I captured only the one male during this trip, and can only assume the others were *S. ensigera*. There are two other recent observations of *Somatochlora* species in eastern Montana. Both are listed as *S. ensigera*. On 30 July 2005 one adult was seen along Little Warm Creek in Phillips Co., and on 20 September 2007 another single adult was seen along East Shotgun Creek in Roosevelt Co. (Montana Natural Heritage Program).

Montana is the type locality for this species (Walker, 1925). The first description was by Rene Martin (1906) from a single female collected at an unknown location in eastern Montana. That specimen is now housed in a collection at The Royal Belgian Institute of Natural Sciences, Brussels. From what I've been able to determine, this finding is the first collected Montana record of *S. ensigera* in over 100 years, and is likely the first adult male to be recorded in Montana (Miller & Gustafson, 1996; Beckemeyer, 1998). In looking at the distribution of records from surrounding states and provinces (Donnelly, 2004b), it seems probable that *S. ensigera* should occur in several other eastern Montana counties.

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### Request for *Orthemis* Specimens

Jerrell J. Daigle <[jdaigle@nettally.com](mailto:jdaigle@nettally.com)>

I am looking for specimens of the following species of *Orthemis* for DNA studies. A leg only will be used and the specimen will be returned to you afterwards. The species are as follows: *Orthemis ambirufa*, *O. anthracina*, *O. attenuata*, *O. concolor*, *O. coracina*, *O. cinnamomea*, *O. flavopicta*, *O. harpago*, *O. phillipi*, and *O. regalis*. The more recent, the better. If you have any questions, please let me know. Many thanks, Jerrell!

## The Northward Extension and New County Records of Five Kansas Dragonflies

Earl S. (Mick) McHugh DDS, Kansas City <[Emchugh2@kc.rr.com](mailto:Emchugh2@kc.rr.com)>

The following five species of dragonflies were found further north in Kansas during the season of 2010 than had been previously reported. The counties of Linn and Johnson are adjacent to Missouri, and Jefferson County is two counties into Kansas. The three counties, as listed, are approximately 25 to 75 miles north of Crawford County. Crawford is the furthest north any of the following spe-

cies had been reported previously in Kansas. All of the reported sightings have been vetted, and are recorded in OdonataCentral.

***Ladona deplanata*** (Blue Corporal)

Linn Co. OC#318419, 14 April 2010

Linn Co. OC#318495, 21 April 2010

Linn Co. OC#318595, 28 April 2010

***Tramea carolina*** (Carolina Saddlebags)

Jefferson Co. OC#315528, 25 August 2009

Jefferson Co. OC#319781, 11 June 2010—same area as the 2009 sighting.

Johnson Co. OC#321232, 28 July 2010

Linn Co. OC#321280, 30 July 2010

***Celithemis fasciata*** (Banded Pennant)

Linn Co. OC#319338, 28 May 2010

Linn Co. OC#319439, 31 May 2010

Linn Co. OC#319895, 16 June 2010

Johnson Co. OC#321088, 25 July 2010

***Dythemis fugax*** (Checkered Setwing)

Linn Co. OC# 320431, 2 July 2010

Linn Co. OC# 320648, 10 July 2010—seen in three different locals.

***Dythemis velox*** (Swift Setwing)

Linn Co. OC#319896, 16 June 2010

Linn Co. OC#320874, 18 July 2010



## Striped Saddlebags (*Tramea calverti*) New for Illinois

Steve Spitzer <steven0703@yahoo.com>

Montrose Dunes is a protected area along Lake Michigan on the north side of Chicago. The area is a bit over ten acres, and has some small willow trees near the shoreline. On 7 September 2010 there was a hard wind from the southwest, and I went dragonfly hunting on the east side of the willows. There were dozens of saddlebag dragonflies visible and most were Black Saddlebags, with some Red Saddlebags mixed in. I photographed several of the red dragonflies, and one of them appeared different. After an online search, the closest match I could find was a Striped Saddlebags (*Tramea calverti*). Several individuals knowledgeable about dragonflies confirmed my tentative ID.



The photographed Striped Saddlebag was a female on the lee side of a small willow that was itself on the lee side of some larger willows. The wind was negligible up to a height of six feet above ground, and the dragonflies stayed

low to avoid the wind. Because they were staying low and perching, I was able to get within a foot or two and photograph several individuals. This dragonfly was reported to OdonataCentral (OC#322956).



### 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

# OdonataCentral: The Past, Present and Future

John C. Abbott, The University of Texas at Austin, Austin, Texas <jcabbott@mail.utexas.edu>

At the 2010 DSA Annual Meeting in Orono, Maine, I gave an update of OdonataCentral, <<http://www.odonatacentral.org>>, and promised a write-up describing the history of OdonataCentral, where things currently stand, and where I hope to take it. While doing this, I took the opportunity to crunch some numbers and see just who is using the site.

## The Past

In November of 2004, I relaunched my South-central US regional web site, OdonataCentral as a web site with national coverage sponsored by my museum, the Texas Natural Science Center at the University of Texas at Austin. At the time, it relied on the novel incorporation of existing World Wide Web, database, and geographic information system (GIS) technologies to produce a truly dynamic, interactive field guide and web site for the dragonflies and damselflies of North America. See Abbott and Broglie (2005) for a full discussion of the initial version of this web site.

At the heart of OdonataCentral lies the North American Dot Map Project. Started in 1994, the project involved the efforts of more than 100 contributors from the Odonata community to accurately document and amalgamate the distributions of all North American odonate species through 2004. A three volume hard copy set of the data was published (Donnelly, 2004a,b,c).

It was the realization of the tremendous value of such a massive wealth of vetted digital data that led to the expansion and relaunching of OdonataCentral in 2004 with several subsequent updates and enhancements (Abbott, 2006, 2007a). In addition to just making the Dot Map data available online, I wanted to continue forward by having a community web site that served as the central repository for all North American records. In 2004, one of the novelties of OdonataCentral was that it allowed and solicited community involvement. Anyone could submit new species locality records to the site. Submitted records have to be vouchered by either photographs or specimens. Outside of museum and private collections, nearly all records submitted are vouchered with photographs. Digital photos can be uploaded to the site and linked to the user's record entry.

New records were vetted by regional experts and incorporated into the site based on the expert's determination. The originator of the record is then recognized in perpetuity for the record and accompanying information. This

turns out to be a driving force for many contributors. The ability to add to the odonate knowledge base is appealing to many as is the ability to view their contributions.

The early version of the web site was developed by an employee and myself. Neither of us were computer programmers, but we had some computer background, a lot of enthusiasm, and very hard heads. The site was a real mish-mash of languages, but it worked. We used ESRI's ArcIMS software to power the Odonata Distribution Viewer. It was a powerful tool that allowed users to visualize the geographic distribution of dragonflies and damselflies across North America. Users could zoom, pan, and query the distribution of any North American species to view species limits geographically, find gaps in county records for selected species, or generate accurate county checklists. Anyone who has used ESRI's software knows that for all of its power and potential, it has to rank as some of the most onerous software to use.

A number of issues immediately came up with the site. First, at this point, the site was still running off of a server housed under the desk in my office and I did not have the IT support and redundancy really required for a site like this. Second, the ArcIMS software we were using literally crumbled under the magnitude of the records we were dealing with. Third, users became frustrated, rightfully so, because the records they submitted were sent to a holding area that was only visible to record vetters and there was no real feedback system in place. These two issues, along with the overall desire to improve the site, led to yet again, a complete overhaul of the site (Abbott, 2007b). This time, my museum director came up with \$30,000 to put towards the development and enhancement of OdonataCentral. With these funds, I hired a local computer programmer to rewrite the site, make it more stable, improve functionality and we added a number of features.

Some of the major changes to the site included expanding it to world-wide coverage, we abandoned ESRI's ArcIMS software and went with a Google API to power the Odonata Distribution Viewer, and user submitted records were now immediately visible as pending. The site also incorporated the Dragonfly Society of the America's web site, including membership information and online journal access. In addition, the site took on a new, much spiffier look, was moved from under my desk to official UT servers, the database was moved to an Oracle server, and many elements of the site were vastly improved (Abbott, 2007b, 2009).

Two big downsides I hadn't predicted however, occurred simultaneously. The first was that I was lead to believe the Oracle server now powering OdonataCentral would be dedicated and fast. It turns out that the server is shared with some major university resources that resulted in dramatic slow downs and erratic behavior at times. I also ended up losing nearly all the control I had over the site with the redesign. Though it had been vastly improved, as money dried up and the programmer found more lucrative opportunities in the gaming world, I essentially lost any control I once had over the site. I am able to only make minor changes to certain pages throughout the site. One of the biggest problems that came up was the inability to incorporate large datasets (including the University of Texas Odonate collection) in the database. Without the programmer, I have had no way to even update the UT's collection and I have large datasets from many other collections and individuals that ultimately need to get incorporated into OdonataCentral.

It became clear that funding was the necessary, but missing, component to move OdonataCentral forward. The financial support from the museum has dried up and I have begun exploring other sources. In 2009, I was the Principle Investigator on a large multi-year collaborative National Science Foundation proposal to database the major North American odonate collections with large Neotropical holdings. All of the subsequent digitized data would be captured and disseminated by OdonataCentral and used to help complete the IUCN (International Union for the Conservation of Nature) Odonata Specialist Group, for which I am a member, Global Dragonfly Assessment (von

Table 1. The number of user-submitted records to OdonataCentral by country.

Continent	Country	# of records
South America	Ecuador	1
South America	French Guiana	1
South America	Peru	1
North America	Netherlands Antilles	1
North America	US Virgin Islands	1
Caribbean	Antigua And Barbuda	2
Caribbean	Trinidad and Tobago	2
South America	Bolivia	3
North America	Aruba	9
Caribbean	Dominican Republic	10
Central America	Costa Rica	12
North America	Puerto Rico	22
Central America	Nicaragua	29
Central America	Panama	33
North America	Canada	40
North America	Mexico	81
North America	United States	15,514

Ellenrieder, 2009). As a result, the proposal included funds to make further improvements to OdonataCentral. It was met with "very good" and "excellent" reviews, but was not funded. In order to strengthen the proposal and ultimately make ourselves more competitive, I felt like we needed to show how OdonataCentral could be used in a creative and novel way and I began looking for someone or some group that could help get my ideas for the web site actually implemented. At this point, I discovered the Texas Advanced Computing Center (TACC, <<http://www.tacc.utexas.edu>>). This is a well-funded ORU (Organizational Research Unit) at the University of Texas who is interested in collaborating with researchers to archive and disseminate data. After several meetings, we have now plotted a course forward for OdonataCentral.

### The Present

I'm working with TACC to migrate OdonataCentral from the Oracle server at UT to TACC's MySQL server. This will ultimately provide me more control and allow TACC to work with me on maintaining the site and ultimately making improvements to it. This migration will happen during December and should result in only limited interruption to the OdonataCentral web site. I will then be working with TACC to see what is possible in the short run and ultimately they will partner up with us on the resubmission of the National Science Foundation proposal in August of 2011.

A subtle, but significant change that occurred in 2010 was to pull the scope of OdonataCentral back from worldwide to only the New World. There are well-established databases already in place that are collecting distributional records for the Old World. A couple hundred records from the Old World had been submitted to OdonataCentral, but this was a small percentage of the overall record submissions and it has been a struggle just to keep up with the vetting of New World Records.

TACC was able to help me extract some data from OdonataCentral that I wanted to share. This is all based on data up through August of 2010. OdonataCentral is quickly approaching 1,500 registered users and over 16,000 user submitted records. Of those, 353 (24%) users have submitted at least one record. Most of the records have been submitted by a relatively small number of users however. One user has submitted over 1,000 records, 39 users have submitted over 100 records, and 92 users have only submitted a single record.

The distribution of record submissions is, not unexpectedly, strongly skewed towards the United States (Table 1). In addition there have been 14 records submitted for three

islands in the Caribbean, six records for four countries in South America, and 74 records across three countries in Central America.

Within the United States, records are also strongly skewed (Table 2). Over 15,000 records have been submitted from 48 of the 50 states; no records have been submitted for Rhode Island and West Virginia. Nearly 22% of the records submitted have been from Texas.

Records have been submitted for 484 different species. Thirty-seven of those have more than 100 submissions and represent 44% of all user submitted records. The top 10 species (Table 3) represent 16.7% of user submitted records. Sixty-eight (14%) species have only had a single record submission and 222 (46%) species have had 10 or fewer submissions.

There has been a continuous increase in the average number of user submissions over time (Fig. 1). To me, this really shows, despite some of its limitations, people are taking advantage of and using OdonataCentral. Vetting has been a bit arduous at times because of the large number of records and relatively few vetters. Currently, there are 11 record vetters. Three of whom have vetted 75% of the user submitted records and one, nearly 50%. Despite these sometimes overwhelming numbers, records are getting vetted at a rate that is more-or-less on par with their submission (Fig. 1). I have outlined some ideas in the Future section as to ways that I think OdonataCentral

can change to better accommodate the need for timely feedback of submissions.

### The Future

As mentioned above, funding is the most serious limiting factor at the moment for moving OdonataCentral forward. I am working with TACC and a number of North American collaborators to resubmit a NSF proposal in August of 2011 that would provide some funding to improve and enhance OdonataCentral. In the short run, I'm hoping that the migration of the web site to TACC servers will provide me greater control.

I have many ideas for the enhancement of OdonataCentral. One of the major areas for improvement is the user interface and the self-populating menus that have given some users fits. Another major goal is to provide an interface that will allow users and curators to upload large, previously vetted datasets, to OdonataCentral. The current inability to do this is a big shortcoming of the web site. It presents some major challenges (checking data like state names, county names, species names, user names, etc. for consistency), but there are ways to do this and I feel confident we will get there. My goal has always been to have a single, up-to-date resource to consult for the distribution of New World Odonata. There are lots of sites and individuals that of course keep track of records on smaller park, county, and state scales, but I hope to find an efficient way to “connect” the data of these sites to OdonataCentral.

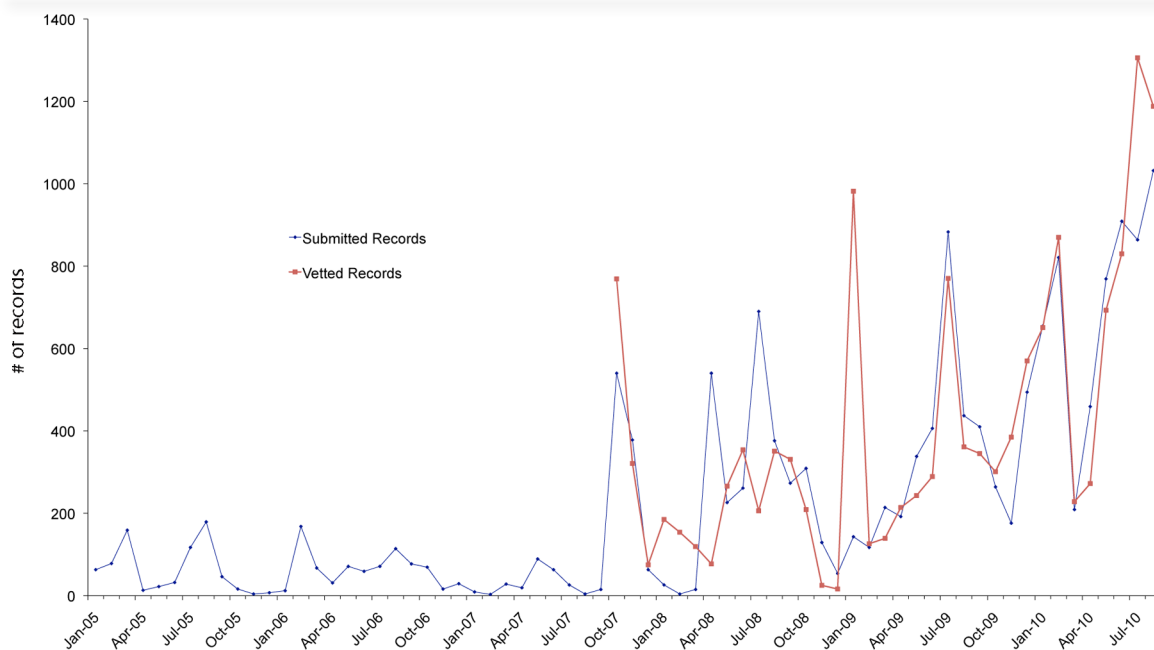


Figure 1. Time series of the number of users submitted and vetted records in OdonataCentral. Data for vetted records was only available beginning October 2007.

The larger vision I have for OdonataCentral is to incorporate a Wiki-type interface in to the site. A Wiki interface allows users to collaboratively create and edit web pages using a web browser. This would allow users to upload photos for which they don't have an id. Other users could then comment on it and ultimately place a name on it. This type of identification tool is used by the popular BugGuide web site, <<http://www.bugguide.net>>, and has proven to be very successful. Once the uploaded georeferenced photo has been assigned to a species, it then can become part of the database of distributional information. Not only would a system like this allow users to submit photos for which they are unsure of the species, but it would also effectively allow all users to participate in the identification, and thus vetting, of the records which would alleviate the pressures put on a few individuals at the moment.

A relatively simple enhancement to the site will be making all submitted photos for records available in the field guide section. A Wiki interface could be used in this part of the site as well. All users could collaboratively contribute to building a field guide to all New World Odonata. For those of you who are unfamiliar with the power of a Wiki interface, Wikipedia (<<http://en.wikipedia.org/>>) is probably the best example. It has been shown that this online encyclopedia, which is written, edited and managed by all of its users, is more accurate than Encyclopedia Britannica that hires specialists to write on particular topics. The idea is that there is always someone out there that knows more than you do and if you provide them the opportunity to contribute, many will.

As more and more users submit records, the goal is to replace county-level Dot Map Records with actual location-level records. With time, as the database grows, users would then be able to plot seasonal abundance histograms for any geographic scale (a favorite local, park, county, state, or country) much like they do in many bird publications. This is just a matter of collecting data. The more data collected, however, the more difficult it becomes to vet and monitor for integrity. This is where I think a change to the Wiki interface is a partial solution. I however, think it would still be valuable to maintaining the scientific integrity of the data, to have Record Administrators, but I envision a series of algorithms that would flag potentially interesting or suspect records. For example, each species could be assigned to some level of rarity, which along with a calculation of the distance to the next nearest record for that species, might result in a flag that the record should be subjected to more careful scrutiny.

I hope to also setup pages that would automatically keep track of seasonality for any particular area. Right now,

Table 2. The number of user-submitted records to OdonataCentral by US state.

State	# of Records	% of US Records
Texas	3350	21.59%
New Jersey	2089	13.47
Oklahoma	2056	13.25
Tennessee	745	4.80
Montana	586	3.78
Georgia	519	3.35
New Mexico	495	3.19
Florida	455	2.93
New York	454	2.93
Iowa	436	2.81
Louisiana	373	2.40
Oregon	347	2.24
California	286	1.84
South Dakota	278	1.79
South Carolina	276	1.78
Michigan	270	1.74
Pennsylvania	260	1.68
Kansas	256	1.65
Minnesota	228	1.47
Vermont	171	1.10
Indiana	170	1.10
Nevada	157	1.01
Arkansas	155	1.00
Colorado	152	0.98
Missouri	139	0.90
Virginia	107	0.69
Washington	75	0.48
Illinois	68	0.44
North Dakota	67	0.43
Ohio	56	0.36
Maryland	54	0.35
Nebraska	49	0.32
Alaska	40	0.26
Mississippi	39	0.25
Connecticut	36	0.23
Alabama	33	0.21
Wyoming	33	0.21
Arizona	30	0.19
Utah	28	0.18
Delaware	17	0.11
Kentucky	17	0.11
North Carolina	13	0.08
Hawaii	10	0.06
Wisconsin	10	0.06
Idaho	9	0.06
Maine	9	0.06
Massachusetts	6	0.04
New Hampshire	5	0.03
Rhode Island	0	0.00
West Virginia	0	0.00

this is a somewhat arduous task for any single individual in any single area, but this should be easily managed by regular and automatic analysis of the submitted records.

When we changed the Odonata Distribution Viewer from being powered by ESRI's ArcIMS software to GoogleMaps, we lost some functionality. One of the most desired functions is to be able to link to a species with some constrained geographic distribution (*Anax junius* in Texas, for example). Several web sites have expressed the desire to be able to link to OdonataCentral's maps in this way. I hope that in the near future, that we can make that functionality along with a number of features available again. I would also like to use the OdonataCentral database to generate an updated version of the North American Dot Maps.

### What Can You Do

One of the most commonly e-mailed questions I get is what records and photos am I wanting users to submit. Ideally, I would love to capture the most data possible. One way to do this would be if OdonataCentral had an easy to use interface, you might ideally choose to manage all of your photographic observations within the site and thus all your records would be captured without any redundancy in the maintenance of data. Some users really enjoy documenting seasonality. That means early on, you may upload 20 photos of a common species for an area, but at 20 different dates. Others are more interested in geographically unique records. In its current form, because all records must be vetted by relatively few Record Administrators, we are requesting that users try and limit their submissions to only new (at the county level) geographic records or new season records at whatever geographic scale you are interested in. This will help ease some of the burden on the Record Administrators.

OdonataCentral continues to evolve, though I recognize it has been slow to do so over the last couple of years and this has frustrated many users and myself. The purpose of writing this note, is to let you know that I am aware of this and I'm continuously looking for ways to improve and enhance the site, but that my hands have been largely tied by lack of funding and expertise recently. I see this as changing though, and I ask for your patience through the process.

OdonataCentral's greatest asset is that it is a community driven web site that has the benefit of many contributors.

Table 3. The number of users submitted records to OdonataCentral by species.

Species	Common Name	Records	% of Total
<i>Pachydiplax longipennis</i>	Blue Dasher	368	2.3%
<i>Erythemis simplicicollis</i>	Eastern Pondhawk	357	2.2
<i>Plathemis lydia</i>	Common Whitetail	353	2.2
<i>Libellula luctuosa</i>	Widow Skimmer	300	1.9
<i>Ischnura posita</i>	Fragile Forktail	265	1.7
<i>Celithemis eponina</i>	Halloween Pennant	264	1.7
<i>Perithemis tenera</i>	Eastern Amberwing	264	1.7
<i>Anax junius</i>	Common Green Darner	250	1.6
<i>Libellula incesta</i>	Slaty Skimmer	233	1.5
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	228	1.4

I am working hard to expand the ability for all users to contribute their time, expertise, and knowledge on an even grander scale. Together, I think we have the potential to really set the bar for these kinds of web sites. The Odonata community is unique in many wonderful ways, so it is only fitting that it is that community that sets the standard by which others are measured.

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## Review of Wildlife Action Plans for Odonata Conservation

Jason Bried, Albany Pine Bush Preserve Commission, Albany, NY <jbried@albanypinebush.org> and Celeste Mazzacano, The Xerces Society for Invertebrate Conservation, Portland, OR <celeste@xerces.org>

We recently examined representation of odonates as Species of Greatest Conservation Need (SGCN) in the state wildlife action plans (Bried & Mazzacano, 2010). These plans were mandated by the federal government and are designed to identify vulnerable and declining species, to enable conservation measures to be implemented before protection becomes too costly or species recovery is no longer possible (see <<http://www.wildlifeactionplans.org>>). Odonates are among the most charismatic and well-studied “microfauna” and every state contains resident odonatists, many with regional expertise qualifying them to provide input on potential SGCN across multiple states. But because invertebrates are often overlooked or underrepresented in mainstream conservation efforts (Bossart & Carlton, 2002), we were interested in assessing how many states consulted with odonatists in developing wildlife action plans, how well-represented odonates were in state plans, and what these results imply for conservation of less well-studied and less charismatic invertebrates.

developed in 2001–2005, when 441 distinct species were known from the US (based on Daigle, 2000; Donnelly, 2004a,b,c). Although nearly two-thirds (277) of these species were appointed as SGCN overall (191 dragonfly and 86 damselfly species), over half the states neglected to assign dragonfly SGCN, damselfly SGCN, or both (Fig. 1). Most (89%) of the 277 SGCN odonates were recognized as such in five or fewer states; 95 species (34%) were assigned in one state only, with Alaska and Hawaii contributing 30 of these. States in the west and south listed proportionately fewer odonate SGCN than those in the Great Lakes, Mid-Atlantic, and New England regions. We believe this reflects patterns of legal authority, information availability, and involvement by odonatists rather than geographic patterns of true conservation need. Nationally, it appears that few odonatists were involved in wildlife action plans relative to available expertise (potentially only ~5% of DSA members), and that Odonata were underrepresented or omitted as SGCN in many states.

We found that the wildlife action plans (WAPs) have disturbing gaps. The first state wildlife action plans were

In our box plot that is vaguely reminiscent of Space Invaders (Fig. 2), you can see how the SGCN are distributed among

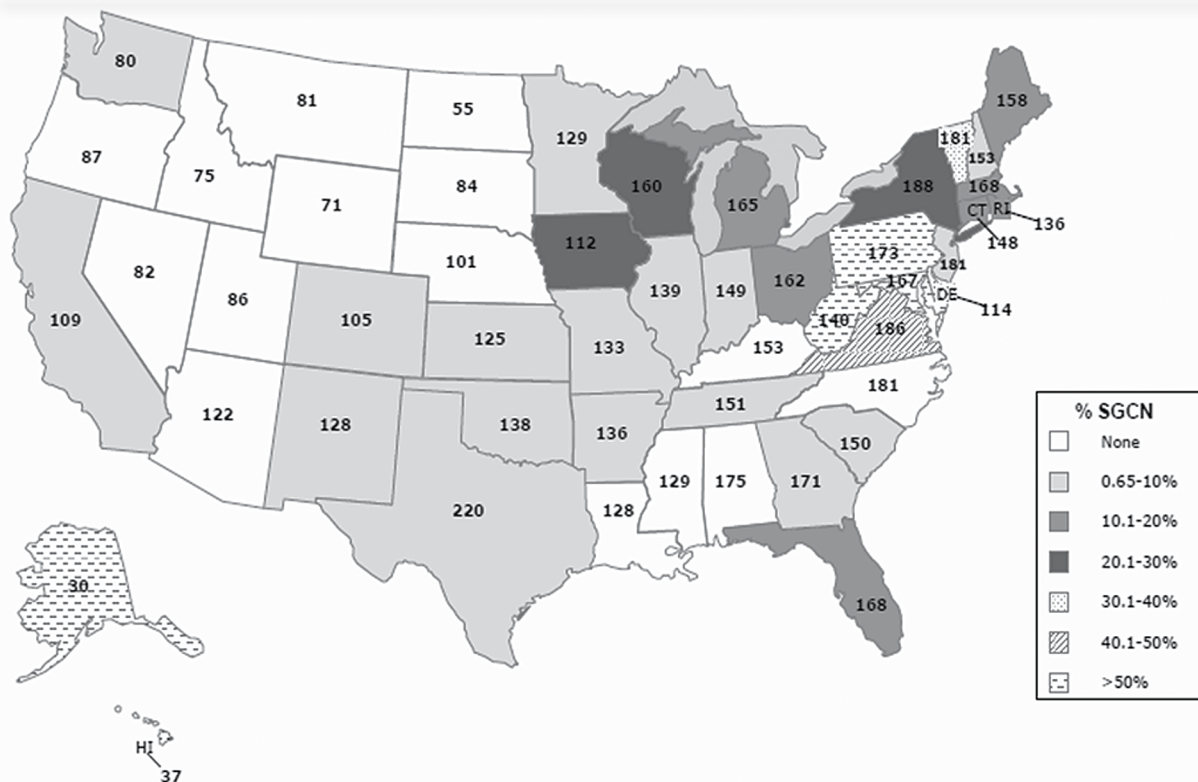


Figure 1. Total number of odonate species per state (Daigle, 2000; Donnelly, 2004a,b,c) and percentage recognized as SGCN.

the primary families and genera. The family Corduliidae (emeralds) was proportionately richest in SGCN (84% of species assigned at least once), with all 25 *Somatochlora* species designated in at least one state. The most species-rich clubtail genera (Gomphidae: *Gomphus*, *Ophiogomphus*, *Stylurus*) contained the next highest percentages (76–82%) for dragonflies. Of the primary damselfly families in the United States, approximately 75% of calopterygids and coenagrionids and 59% of lestids were appointed as SGCN in at least one state.

Many of the plans rightfully embrace the habitat and ecosystems-based approach, and more consideration of multi-species based monitoring and analysis is warranted (DeWan & Zipkin, 2010). But it is also paramount to continually refine and update the SGCN lists, especially for such neglected taxa as insects, as these are used to guide funding decisions and influence subsequent conservation actions. We encourage you to explore your state's wildlife action plan and investigate the odonate SGCN list (if there is one!). The plans are due to be revised in 2015, so the time is ripe to contact the lead WAP official and/or your state Natural Heritage Program with any suggestions for changes (see Bried & Mazzacano [2010] for more detailed recommendations).

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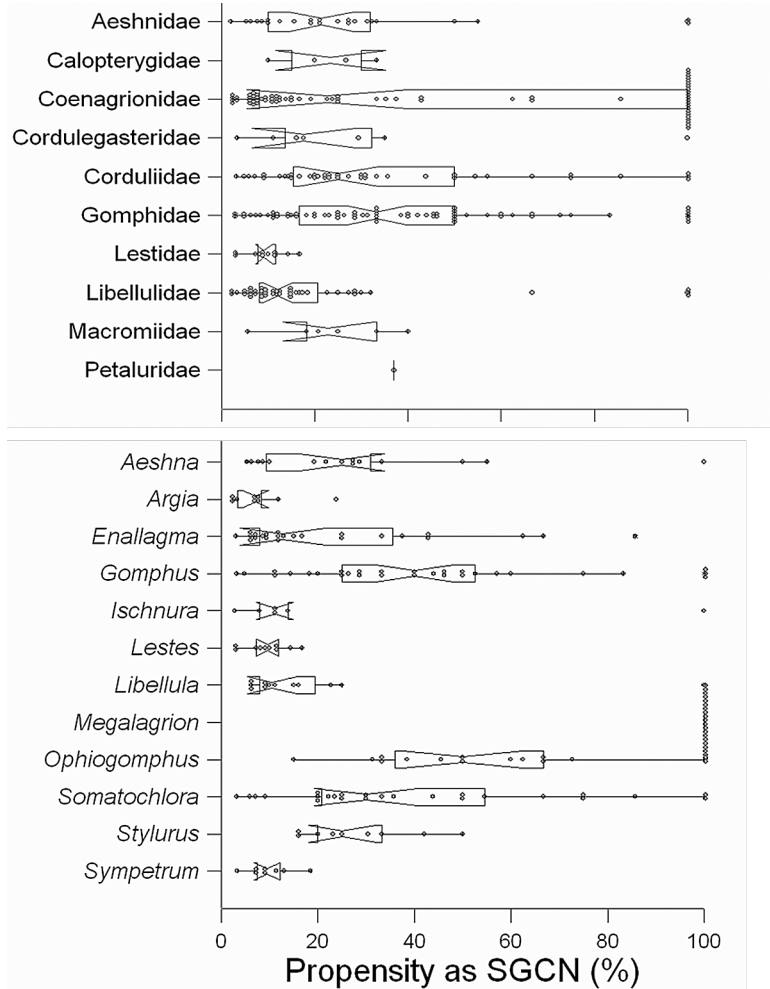


Figure 2. Distribution of Species of Greatest Conservation Need (SGCN) among the primary families (a) and most species-rich genera (b) of United States Odonata. Each dot represents a different species.

### High Oxygen Levels Spawn Monster Dragonflies

A research paper presented on 1 November at the Geological Society of America's annual meeting in Denver, Colorado has been making a lot of press. You can read about it at <<http://tinyurl.com/26h378q>>.

## Copulating pair of *Ischnura barberi* (Desert Forktail) and *I. ramburii* (Rambur's Forktail)

Pierre J. Deviche <deviche@asu.edu>

Hybrid odonates are rarely reported (e.g., *Libellula forensis* × *luctuosa*: Manolis & Bruun, 2006; *Enallagma* spp.: Donnelly, 2008; review: Corbet, 1999). Factors that potentially contribute to the rare occurrence of hybrids include the fact that heterospecific mating is normally prevented by isolating mechanisms including species differences in color, courtship behavior, and interlocking structures (Paulson, 1974; Corbet, 1999), and that species differ with respect to their phenology and habitat preference. Furthermore, heterospecific mating does not necessarily lead to successful copulation and, even when this is the case, additional mechanisms may prevent fertilization or fertilized eggs may not develop.

Successful copulation in odonates results from a complex sequence of events including formation of a tandem followed by a wheel stage during which copulation takes place. Tandems consisting of individuals belonging either to different but congeneric species or to different genera within the same family have been reported (Corbet, 1999). Progression from the tandem position to the formation of a heterospecific wheel is thought to be less frequent in Zygoptera than in Anisoptera (Corbet, 1999). Successful heterospecific copulation in Zygoptera, in particular those of the genus *Ischnura*, does, however, occur. For example, *I. gemina* (San Francisco Forktail) and *I. denticollis* (Black-fronted Forktail), which are considered to belong to sister groups based on molecular phylogenetic analyses (Chippindale et al., 1999), can hybridize (Leong & Hafernik, 1992). Laboratory studies also demonstrate hybridization between Old World species of *Ischnura* (*I. graellsii* (Iberian Bluetail) and *I. elegans* (Common Bluetail); Sanchez-Guillen et al., 2005).

On 14 September 2010, I observed a copulating pair consisting of a male *I. barberi* (Desert Forktail) and an orange form female *I. ramburii* (Rambur's Forktail; Figure 1). The pair was seen for several minutes flying and also perched in low herbaceous vegetation along the Wild Horse Pass stream (Maricopa, Arizona; 33° 16' 27" N; 111° 59' 34" W), an artificial stream where the two species are commonly found. This apparently provides the first documented



Figure 1. Heterospecific pair in wheel and consisting of a male *Ischnura barberi* and a female *I. ramburii*.

evidence of copulation between these species. The phylogenetic relationship between *I. ramburii* and *I. barberi* remains speculative (Chippindale et al., 1999). The present observation suggests the possibility of hybridization, but whether this ever occurs is unknown because *I. barberi* × *I. ramburii* hybrids have apparently not been found.

I thank Richard Bailowitz and Doug Danforth for valuable discussions and Dennis Paulson for constructive comments on a manuscript draft.


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## 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 group page. Information, announcements, and links relating to the Society as well as photos and discussion contributed by group members will be found here. Many photos taken at the 2010 annual meeting in Maine have been contributed.

Just search for “dragonfly society” within Facebook and we’ll appear in the results list.

## A Nymph Found Out of Water

**Jim Johnson**, Vancouver, Washington, <jt\_johnson@comcast.net>

While visiting Great Meadow near Lake of the Woods, Klamath County, Oregon (just under 5000 feet elevation), on 20 August 2010, I happened to notice a dragonfly nymph with a completely dry dorsal surface walking on the exposed mud surface near the edge of a drying pond. This isn’t something that odonatists see very often, so I snapped a couple of photographs while I had the opportunity (Fig. 1).

Soon after, the nymph crawled onto floating vegetation in the shallow water and paused for a few moments where I could get a few more photographs (Fig. 2). During this time, I could see that the dorsal surfaces were darkening with moisture. Immediately after I took the third photograph of the nymph at the water surface, it submerged out of sight below the vegetation. The time stamps on the photos indicate that about 20 seconds elapsed between the first and third photos.

I had no way of determining where the nymph crawled from or, therefore, how far it crawled to get to this pond. The portion of Great Meadow where this pond is located is almost entirely wet with shallow water after snow melt until the latter part of the summer when water becomes limited to the deeper depressions (such as the one where this pond is located), but other parts can remain damp and muddy for some time in the absence of standing water.

I suspect that this nymph was out of water for no more than a few hours at most considering that there are damp areas well within 100 meters of the pond, it was quite mobile on the exposed mud as it approached the standing water, and it took no more than 30 seconds to disappear beneath the vegetation once it reached the water.

After returning home I sent some of my photographs to Ken Tennesen to see if he could determine the species. Close examination of the abdominal dorsal hooks indicate




Figure 1. A *Libellula* nymph (presumably *quadrimaculata*) found crawling out of water at Great Meadow, Klamath Co., Oregon, 20 August 2010. Photo by Jim Johnson.



Figure 2. The same *Libellula* nymph pictured in Figure 1 after reaching a pond's water surface. The timestamp of each photo is superimposed—approximately 20 seconds elapsed between the first (left) and third (right) photos. Note the darkening dorsal surface as it rehydrated. The nymph submerged immediately after the third photo was taken. Photos by Jim Johnson.

that it is a *Libellula*, but identification to species is uncertain. Based on species abundance at these high elevation meadows, *Libellula quadrimaculata* (Four-spotted Skimmer) is the most likely candidate.

Ken Tennessen emphasized that not much is known about the survival of nymphs that dry out, how far they might crawl to find water, or which species are capable of surviv-

ing dehydration. The next time I see a dry nymph out of water I'll be sure to collect it and conclusively determine the species, but I think photos of nymphs rehydrating in the wild, like the ones that I have obtained, are of interest as well. It would be interesting to experiment with libellulid nymphs to find out how long they are capable of surviving out of water. 

## Using Wing Vein Coloration to Identify *Argia agrioides* (California Dancer) and *A. nabuana* (Aztec Dancer)

Jim Johnson, Vancouver, Washington, <jt\_johnson@comcast.net>

*Argia agrioides* (California Dancer) and *A. nabuana* (Aztec Dancer)—both males and females, are virtually identical in coloration and require in-hand examination (or close, sharp photos) of structural differences to confirm identification. Recently, Dennis Paulson found that some male *A. agrioides* can be identified by the pattern of markings on the second abdominal segment, but other males require a view of structural characteristics (see *Dragonflies and Damselflies of the West*, 2009, by Dennis Paulson). Females have some coloration differences too, but these are not definitive because of variation.

Recently, I discovered what appears to be another helpful character for identifying both males and females of these species in the field or in good quality, well-exposed photos. On *nabuana*, the subcosta, radius anterior, radius posterior first branch, and cubitus are noticeably paler (light

brown or golden) than other major veins. In particular, the pale subcosta and radius anterior contrast with the darker costa, and especially compared with the costa proximal to the nodus (sometimes more obvious, sometimes more subtle—possibly depending on the angle and lighting). On *agrioides* the wing veins are relatively uniform in tone without any contrastingly pale veins, or if there is any difference in tone, the costa is paler than the other veins.

A close look at specimens of *Argia nabuana* reveals that there are some differences between the wings' outer and inner surfaces (on the closed wings). On the outer surface, it is the subcosta (Sc), radius posterior first branch (RP<sub>1</sub>), and cubitus (Cu) which tend to be most pale; on the inner surface, it is the radius anterior (RA) which tends to be most pale, but this can be quite visible through the wings on the opposite side (e.g. when looking at the left side of

the closed wings, you may see the pale RA on the right wings).

I haven't had a chance to field test this difference between *agrioides* and *nahuana*, but I imagine that it is apparent through binoculars and macro lenses (with adequate lighting), and could help those who do not identify these damselfly in-hand to sort out which species are encountered during an outing. It could help to target individuals of *nahuana* where they are not known to occur within the range of *agrioides*, and vice versa, where *agrioides* is not known to occur within the range of *nahuana*. I think it is always a good idea to confirm the identity by examining structural characteristics in-hand, particularly when individuals are found outside of their known range.

I have included one photo each of *Argia agrioides* and *A. nahuana* for comparison. These were both taken on Twentymile Creek, Lake County, Oregon, 26 July 2010, and their identities were confirmed in-hand. In addition, you can check out Ray Bruun's photos of *Argia agrioides* at <http://tinyurl.com/25k9d8q> and *A. nahuana* at <http://tinyurl.com/286q38u>, as well as Greg Lasley's photos of *A. nahuana* at <http://tinyurl.com/2drmqoy> for comparison. No doubt there are other photo collections on the web to check out.



A male *Argia agrioides* (California Dancer) at top, and a male *A. nahuana* (Aztec Dancer), below, both at Twentymile Creek, Lake Co., Oregon, on 26 July 2010. Note the difference in tone (darker on *agrioides*, lighter on *nahuana*) of the major veins. Photos by Jim Johnson.

Note that there are no apparent contrastingly pale veins on the Arizona individuals of *Argia nahuana* on Greg Lasley's site. It is unknown if this is due to variation, angle, lighting, camera exposure/flash settings, image processing, or some combination. Greg was kind enough to send enlargements of the wings and there are no visible traces of pale veins in either. Greg does not recall whether those individuals were collected or confirmed in-hand, so the possibility that they are actually *agrioides* can't be ruled out.

A few of my specimens of *nahuana* have veins which are just barely paler than the costa. That may be due to post-mortem changes, but this does appear to be the case in some live individuals too. If these individuals were photographed without the use of flash, it's possible that the veins would appear more uniform in tone. I suggest this take home message: if the subcosta, RA, and RP<sub>1</sub> are visibly paler than the other major veins (the costa proximal of

the nodus, as well as other veins near the posterior margin of the wing), you can assume that you have *nahuana*, but the appearance of uniformly toned veins is not necessarily indicative of *agrioides* and closer scrutiny is recommended to confirm the identity.

I'd be interested in hearing about your experience with the usefulness of this character. There is no doubt some variation in both species, but how much is not apparent at this time. I hope to more accurately assess the usefulness of this character in coming seasons.

Thanks to Ken Tennessen, Tim Manolis, and Rosser Garrison for reviewing these photos as well as specimens available to them.

This article was an adaptation of the web page <http://tinyurl.com/33xksja> where additional photographs can be viewed.



## Monitoring *Celithemis elisa* (Calico Pennant) Emergence, the Sixth Season

Sue and John Gregoire, Kestrel Haven Avian Migration Observatory, Burdett, NY 14818-9626 <khmo@empacc.net>

Since 2005 we have performed daily counts of our emerging *Celithemis elisa* (Calico Pennant) in an attempt to draw a pattern of emergence and to better understand the behavior of this species. We have reported our counts and a bit of surmising in previous issues of ARGIA (2007, 2008, 2009).

*Celithemis elisa* has a very long emergence period here and has always had a very impressive spurt of mass emergence during the first few weeks of the period, typically during the first few weeks of June. In 2010 the first teneral were spotted on 26 May, two days earlier than the previous year, and adults were seen just two days later. As usual, a few days of low numbers passed then the spurt began. The table below summarizes the effort to date.

2005 was the first year they emerged in large numbers from what was then a six-year-old 30 × 40 m pond. We knew they were early colonizers and had seen them around before, but the large number of teneral all at one time really got our attention, and we began the count.

In 2006, 2007, and 2008 they poured out of the pond by the thousands despite some seemingly inhospitable conditions. For reasons unknown to us as of yet there was a big slowdown in 2009.

In 2010 the winter and spring of the eastern portion of the country experienced several periods of abnormally high temperatures, which triggered the very early awakening of most flora and fauna. Normal phenology was pushed ahead by about two weeks, resulting in early bloom of trees and flowering plants, early rising of hibernating animals, and early emergence of a variety of local insects. *C. elisa* began emerging a few days early with the first high count of 138 on 1 June. We expected the next few days to produce many more, but they did not. Instead, emergence declined as numbers dropped into the double digits for a few days then trickled down to single digits for the rest of the season.

During the emergence period the species coped with periods of intense heat and humidity alternating with very cool weather, punctuated by a long dry spell. The final result was a lengthy but slow emergence period.

Since the first year we noticed *C. elisa* emerging en masse from our main study pond, we realized a thorough study would require many years of data. Over the seasons we have witnessed and reported on their reaction to drought, floods, high winds, freezing temperatures, extremely hot temperatures and heavy predation by birds. No matter how adverse conditions were they still emerged in large numbers, with the vast majority coming in the very early days of the emergence period.

Considering the variety of conditions and the fluctuations in numbers and timing between one year and the next, we feel there is still much to learn about this species. It could very well be that this population has completed its attempt at colonization here and is satisfied with the level of success it has reached. It is still by far the most common species at this pond, but that may change as seasons progress. We will continue our study, as it would seem there is always something new to toss in the mix and keep it interesting.

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Summary of *Celithemis elisa* emergence from 2005 through 2010

	2005	2006	2007	2008	2009	2010
<b>Season Total</b>	2,455	10,944	6,497	8,237	1,505	642
<b>Peak Emergence Period</b>	7–11 June	5–9 June	1–6 June	8–12 June	6–10 June	31 May–4 June
<b>Peak Percentage of Total</b>	83% (2,028)	47% (5,169)	75% (4,892)	76% (6,244)	15% (229)	43% (277)
<b>Total Emergence Period</b>	>62 days	63 days	61 days	64 days	68 days	82 days



## Book Review: Dragonflies of Alaska, Second Edition

John Hudson and Robert Armstrong. 2010. Nature Alaska Images, 5870 Thane Rd., Juneau, Alaska 99801. 56 pp. ISBN 9-781578-334810. \$12.95.

Reviewed by **John C. Abbott**, Austin, Texas <jcabbott@mail.utexas.edu>

Most of the large western states support relatively small faunas and Alaska is no exception. Though it is the largest state, it is also the most northern and the arctic latitudes definitely reduce the number of odonates that can survive there. The small fauna actually makes a field guide like this even more useful, because the scope is so narrow.

The first edition of this book was published in 2005 covered 32 species. The second edition adds three species. The introduction is largely a reprinting of the first edition, but with a nice expansion of the section on Watching Alaska's Dragonflies, including a photograph of more people collecting and watching dragonflies along the bank of a stream than I have seen at any single DSA Annual meeting! In 2009, more than 450 people attended the second

annual Dragonfly Day held in Fairbanks. This is a truly remarkable number and the authors are to be commended for helping to promote this group of insects to Alaskans.

A full page is devoted to each species with large photographs, a brief description of the species and its distribution in Alaska broken down into six convenient regions. Within the species accounts, I could find few differences from the first edition. Nearly all of the photographs and illustrations are the same, but in some cases the text was expanded and illustrations were added (in particular, the hamules and vulvar lamina of *Leucorrhinia* spp.).

Anyone traveling to Alaska will definitely want to pick a copy of this book up before leaving. At \$12.95 it is a bargain. ✈

## Book Review: Dragonflies & Damselflies of the Rocky Mountains

Robert DuBois. 2010, American Naturalist Series, Kollath + Stensaas Publishing, 394 Lake Avenue South, Suite 406, Duluth MN 55802. 301 pp. ISBN 978-0-9792006-8-7. \$18.95

Reviewed by **Nick Donnelly**, Binghamton, NY <tdonnelly@binghamton.edu>

I was delighted to see this fine guide, which masterfully covers the mountainous western interior and adjacent lowlands. We all know of Bob's interests in territory further east, and are familiar with his 2005 guide, "Damselflies of the North Woods," by the same publishers. Bob has followed much the same format with this guide. He opens with a complete yet easily digested account of odonate morphology. For this he has devised some illustrative approaches, which I had not seen previously. It is one of the most successful morphological approaches I have seen. Following this is an account of odonate biology, which covers both larval and adult stages. Bob gives a brief, but useful account of the Rockies themselves, emphasizing the elevation-defined life zones which govern the distribution of nearly all living creatures, and which have much less relevance in the remainder of North America.

The species accounts of the approximately 100 species are thorough, and include not only good color photos of the adult insects but also numerous black and white drawings of details. He gives a description for each species, plus valuable clues for their quick identification. I found his "nature notes" interesting and insightful. Their addition

is very useful and delightfully informal. His range maps include the entire western United States, making this a useful guide for a much larger area than the title implies.

Odonatists who have visited the Rockies will be stunned at the number of species he has included. Bob has included all the lower elevation species of the region, and many of the included species will never be found higher than the surrounding plains. The guide is thus useful for people visiting this area who may never climb a hill. So beware the title—even if you have no prospect of even seeing a mountain on your trip, this is a very useful guide for a large area.

I found this guide personally nostalgic. While still in high school and just beginning my interest in dragonflies, I got a summer job pumping gas at what was then was the world's highest gas station at Climax, Colorado. There was no point in taking a net into the field until mid-July, when the snows finally melted, and at the beginning of August the snow started falling again. (Talk about a brief season!) But at a marshy pond at 11,300 feet I was delighted to find *Lestes dryas* (Emerald Spreadwing), *Leucorrhinia hudsonica* (Hudsonian Whiteface), and *Somatochlora semicircularis*



(Mountain Emerald). My list of odonates for that season is one of the shortest on record, but I believe many others will share my excitement with high elevation odes.

I have two minor additions: the first is that high elevation record of *Leucorrhinia hudsonica* (Hudsonian Whiteface), and the second is the more recent finding of a healthy population of *Somatochlora albicincta* (Ringed Emerald) in the Medicine Bow National Forest in extreme southeastern Wyoming.

In ruminating over this guide I was struck by something I had paid very little attention to: Our almost complete lack of knowledge of odonate life higher than 11,000 feet. A brief paper by Bird and Rulon (Ent. News, 1933, 44-45) lists several 12,000' records in eastern Gunnison

County, Colorado, including *Aeshna palmata* (Paddle-tipped Darner), *Somatochlora semicircularis* (Mountain Emerald), *Lestes disjunctus* (Northern Spreadwing), *Lestes dryas* (Emerald Spreadwing), *Coenagrion resolutum* (Taiga Bluet), and *Enallagma boreale* (Boreal Bluet). The problems these bugs face are several: First, the total season (snowless time) is only a very few weeks. And then there are environmental problems, such as the harsh properties of very high altitude air. The wonder is that there are odonates at all in these very high ponds. This is an area of study that is wide open for the eager (and hardy!) odonatist. So get your net and crampons! We have a lot to learn about these magnificent mountains, and their odonate inhabitants. Thanks, Bob, for such a useful guide!



## **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 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>.

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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.

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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.

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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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**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 <[www.dragonflysocietyamericas.org/join](http://www.dragonflysocietyamericas.org/join)>.

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**Back cover: (upper)** Big Bluet (*Enallagma durum*). Photographed in Wakulla, Florida by Marion Dobbs. **(lower)** Shadow Darner (*Aeshna umbrosa*) in flight. Photographed in Letcher County, Kentucky on 20 Sep. 2010 by Ellis Lauder milk.

