

ARGIA

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CalOdes San Bernardino Dragonfly Blitz, 29 June–2 July, 2017

Doug Karalun <dkaralun@roadrunner.com> and Kathy Biggs <bigsnest@sonic.net>

We plan to see the many gorgeous desert species that occur in this remote, seldom-visited area of California. Because I-15 is a major interstate that sees a lot of traffic heading towards Las Vegas on weekends, Doug has planned our trips so that we will not be on I-15 on a Friday when heavy traffic is expected. Deep Creek (see the list below) is the only location selected that sees a large number of people. We should get there early enough to secure parking and look for odes before the crowds arrive. The remaining locations should have fewer people.

Accommodations: The main meeting motel will be the Comfort Suites in Victorville, where rooms are \$86/night. A list of other hotels in the area along with their rates can be found at <<http://tinyurl.com/yanzd4gb>>. As an alternative to a hotel, camping is available at in the Angeles National Forest around Wrightwood, which is a higher-elevation area with temperatures reaching a maximum of around 80–85°F at that time of year.

29 June, Desert Route

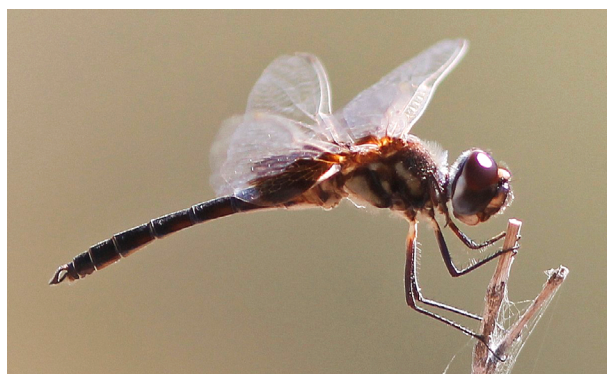
We will meet at the Comfort Suites at 8:00 AM, and proceed to the following sites:

Afton Canyon: The Mojave River rises to the surface here, with reeds, grasses, and trees. We will be driving up a dirt road with some sandy parts. There is a BLM campsite present. Potential species include Paiute Dancer (*Argia alberta*), Black-fronted Forktail (*Ischnura denticollis*), Desert Forktail (*I. barberi*), Desert Firetail (*Telebasis salva*), Comanche Skimmer (*Libellula comanche*), Widow Skimmer (*L. luctuosa*), Roseate Skimmer (*Orthemis ferruginea*), and Marl Pennant (*Macrodiplex balteata*).

Fort Cady: Man-made ponds along the Mojave River; reached by driving up a dirt road. Potential species here include Black Saddlebags (*Tramea lacerata*), Red Saddlebags (*T. onusta*), and



Lavender Dancer (*Argia hinei*), Plunge Creek, San Bernardino County, California, 10 October 2015. Photo by Doug Karalun.



Marl Pennant (*Macrodiplex balteata*), Big Morongo Canyon, San Bernardino County, California, 5 September 2015. Photo by Doug Karalun.

Common Green Darner (*Anax junius*).

Daggett Airport Pond: A man-made pond reached via paved roads. Possible species include Widow Skimmer and White-belted Ringtail (*Erpetogomphus compositus*).

Harper Dry Lake: a small man-made desert wetland reached
continued next page...

Calendar of Events

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

Event	Date	Location	Contact
Ohio Odo-Con	23–25 June 2017	Ashtabula Co., Ohio	Jim Lemon <jlem@woh.rr.com>
CalOdes Blitz	29 June–2 July 2017	San Bernardino, California	Doug Karalun <dkaralun@roadrunner.com>
Eagle Hill Odonate Seminar	2–8 July 2017	Steuben, Maine	see < http://tinyurl.com/gvwhupg >
NE DSA Meeting	13–16 July 2017	New Hampshire; Vermont	B. Pfeiffer < http://bryanpfeiffer.com/nedsa/ >

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by driving up a dirt road. Possible species include Bleached Skimmer (*Libellula composita*), Desert Forktail, Blue Dasher (*Pachydiplax longipennis*), and Western Pondhawk (*Erythemis collocata*).

30 June, Mountain Route

We will meet at the Comfort Suites at 8:00 AM, and proceed to the following sites:

Deep Creek: A mountain trout stream with a rocky bottom, reached by driving along a bumpy dirt road. We will need to hike down the river channel to see Western River Cruiser (*Macromia magnifica*), but just a short walk should allow us to see Bison Snaketail (*Ophiogomphus bison*), Grappletail (*Octogomphus specularis*), Serpent Ringtail (*Erpetogomphus lampropeltis*), Gray Sanddragon (*Progomphus borealis*), Pacific Spiketail (*Cordulegaster dorsalis*), Walker's Darner (*Aeshna walkeri*), American Rubyspot (*Hetaerina americana*), Sooty Dancer (*Argia lugens*), Lavender Dancer (*A. hinei*), and Northern Bluet (*Enallagma annexum*).

Green Valley Lake: A man-made mountain pond reached via paved roads. Possible species here include Western Forktail (*Ischnura perparva*), Pacific Forktail (*I. cervula*), and Cardinal Meadowhawk (*Sympetrum illotum*).

Bluff Lake: A higher-elevation lake and wetland reached by a dirt road. Possible species include Emerald Spreadwing (*Lestes dryas*), Northern Bluet, and Boreal Bluet (*Enallagma boreale*).

1 July, Lowland/Foothills Route

We will meet at the Comfort Suites at 9:00 AM and proceed to the following sites:

San Timoteo Creek: A lowland riparian area reached via paved

roads. Potential species include Filigree Skimmer (*Pseudoleon superbus*) and Neon Skimmer (*Libellula croceipennis*).

East Highland Reservoir: A man-made lowland pond reached via a paved road. The site can only be accessed by HOA members, of which I am one. Potential species include Red-tailed Pennant (*Brachymesia furcata*), Flame Skimmer (*Libellula saturata*), Mexican Amberwing (*Perithemis intensa*), Blue Dasher, Western Pondhawk, Tule Bluet (*Enallagma carunculatum*), and Blue-ringed Dancer (*Argia sedula*).

Deep Creek/Mojave River Confluence: This is on the lower section of Deep Creek, with some desert influence, and is sandy-bottomed rather than rocky. We will hike one mile into the site. Potential species include California Dancer (*Argia agrioides*) and Aztec Dancer (*A. nahuana*) (and since they occur together here it's a good chance to learn how to tell them apart!) as well as Lavender Dancer (*A. hinei*), Arroyo Bluet (*Enallagma praeviarum*), Desert Firetail, Serpent Ringtail, Giant Darner (*Anax walsinghami*), and Walker's Darner (*Aeshna walkeri*).

Cajon Creek and Lost Lake: A foothill riparian area and fault seep pond reached via a dirt road. Possible species include Giant Darner, Pacific Spiketail, Lavender Dancer, Pale-faced Clubskimmer (*Brechmorhoga mendax*), and Cardinal Meadowhawk. Spotted Spreadwing (*Lestes congener*) may also be possible at Lost Lake.

Badger Basin: A man-made settling pond near the mountains, reached via a dirt road. Giant Darner is a possibility here.

2 July, sites not yet determined

Sites are to be determined, according to the dictates of the weather and the desires of the group. Potential locations can be found at <http://tinyurl.com/ydd3ngm5>, and you can access a



Giant Darner (*Anax walsinghami*), San Bernardino County, California. Photo by Ron Oriti.



Roseate Skimmer (*Orthemis ferruginea*), San Bernardino County, California. Photo by Ron Oriti.

Google Sheets document showing odonate species seen at San Bernardino County sites at <<http://tinyurl.com/ya8tr6ye>>.

For those who wish to camp, people who don't mind the heat might want to stay at Afton the first night; this site is "first come, first served", but it always seems to have vacancies. The San Bernardino Mountains have many campsites but they might be crowded for the holiday weekend. Please contact Kathy Biggs for information.

If you are interested in participating in the Blitz, please contact Doug or Kathy and we will put you on an e-mail list to receive further details and updates.



Mexican Amberwing (*Perithemis intensa*), San Bernardino County, California. Photo by Ron Oriti.

Species Report from SEDSA 2017 Meeting in Conyers, Georgia

F.M. Stiteler <fmmonk@gmail.com>

The Southeast DSA regional meeting (SEDSA) took place from 12–14 May 2017. A great time was reported by one and all, from beginners to experts. Everyone seemed to find something to be pleased with, even if only the best shot of something they were familiar with. There were really no rare species, at least of odes, but we did see a wide variety including some interesting looks at nymphs. I myself am grateful to have been able to host the meeting with lots of help from local and not-so-local friends.

Seventy species were reported during the meeting (32 damselflies; 38 dragonflies, including two identified only to genus [*Epithecina*, *Cordulegaster*]). A species list with various field locations can be found below. Letters following each species name correspond to the following field locations (all in Georgia):

M—Monastery of the Holy Spirit in Rockdale County, with 2,300 acres of mostly greenspace including over 1,000 acres in permanent easements. It includes a 4.5 miles frontage on South River which flows out of Atlanta, three named streams, and over a dozen smaller streams. There are five medium-sized ponds and several areas of swamp and marsh.

HF—High Falls State Park, Monroe County, on the Towaliga River.

P—Piedmont National Wildlife Refuge in Jasper County, Pond 6A (a man-made impoundment) and a swamp created by beaver dams on Little Falling Creek.

C—Big Haynes Creek Nature Center (Georgia International Horse Park) in Rockdale County.

A small group visited the Melvin L. Newman Wetlands Center in Clayton County, where we were able to view nymphs that had been collected in staked leaf litter net bags, and some folks visited

a site in Newton County on the Yellow River to collect nymphs.

Blessings to one and all, F.M. Stiteler.

Species list for SEDSA Meeting, 12–14 May 2017

Zygoptera (Damselflies)

Ebony Jewelwing (*Calopteryx maculata*), M, P, C
 Sparkling Jewelwing (*C. dimidiata*), M, C
 American Rubyspot (*Hetaerina americana*), M, HF
 Southern Spreadwing (*Lestes australis*), M
 Elegant Spreadwing (*L. inaequalis*), M, C
 Sweetflag Spreadwing (*L. forcipatus*), M
 Slender Spreadwing (*L. rectangularis*), M, P, C
 Swamp Spreadwing (*L. vigilax*), M, P, C
 Blue-fronted Dancer (*Argia apicalis*), M, HF
 Variable Dancer (*A. fumipennis*), M, HF, P, C
 Powdered Dancer (*A. moesta*), M, HF
 Blue-ringed Dancer (*A. sedula*), M, HF
 Blue-tipped Dancer (*A. tibialis*), M, HF, P
 Dusky Dancer (*A. translata*), HF
 Azure Bluet (*Enallagma aspersum*), M
 Double-striped Bluet (*E. basidens*), M
 Familiar Bluet (*E. civile*), M
 Attenuated Bluet (*E. daeckii*), M, C
 Turquoise Bluet (*E. divigans*), M, HF
 Atlantic Bluet (*E. doubledayi*), M, P
 Burgundy Bluet (*E. dubium*), P
 Stream Bluet (*E. exsulans*), HF
 Skimming Bluet (*E. geminatum*), M
 Orange Bluet (*E. signatum*), M, P
 Slender Bluet (*E. traviatum*), M, P
 Vesper Bluet (*E. vesperum*), C
 Citrine Forktail (*Ischnura hastata*), M, P

Lilypad Forktail (*I. kellicottii*), C
 Fragile Forktail (*I. posita*), M, P
 Rambur's Forktail (*I. ramburii*), P
 Eastern Forktail (*I. verticalis*), C
 Southern Sprite (*Nehalennia integricollis*), M

Anisoptera (Dragonflies)

Gray Petaltail (*Tachopteryx thoreyi*), M
 Common Green Darner (*Anax junius*), M, HF, C
 Comet Darner (*A. longipes*), P
 Regal Darner (*Coryphaeschna ingens*), M
 Swamp Darner (*Epiaeschna heros*), M, C
 Cyrano Darner (*Nasiaeschna pentacantha*), M
 Black-shouldered Spinyleg (*Dromogomphus spinosus*), HF
 Blackwater Clubtail (*Gomphurus dilatatus*), HF
 Cocoa Clubtail (*G. hybridus*), M
 Cobra Clubtail (*G. vastus*), M, HF
 Dragonhunter (*Hagenius brevistylus*), HF
 Piedmont Clubtail (*Hylogomphus parvidens*), M
 Lancet Clubtail (*Phanogomphus exilis*), M, P
 Common Sanddragon (*Progomphus obscurus*), HF
 Spiketail sp. (*Cordulegaster*), C

Prince Baskettail (*Epitheca princeps*), M, HF, P
 small baskettail sp. (*Epitheca*), M, P
 Calico Pennant (*Celithemis elisa*), M, P, C
 Banded Pennant (*C. fasciata*), M, P
 Double-ringed Pennant (*C. verna*), P
 Swift Setwing (*Dytthemis velox*), HF
 Eastern Pondhawk (*Erythemis simplicicollis*), M, HF, P, C
 Little Blue Dragonlet (*Erythrodiplax minuscula*), P
 Blue Corporal (*Ladona deplanata*), M, C
 Golden-winged Skimmer (*Libellula auripennis*), P
 Bar-winged Skimmer (*L. axilena*), HF
 Yellow-sided Skimmer (*L. flavida*), M
 Spangled Skimmer (*L. cyanea*), M, HF, P, C
 Slaty Skimmer (*L. incesta*), M, HF, P, C
 Widow Skimmer (*L. luctuosa*), M, P
 Great Blue Skimmer (*L. vibrans*), M, HF, P
 Blue Dasher (*Pachydiplax longipennis*), M, HF, P, C
 Eastern Amberwing (*Perithemis tenera*), M, HF, P, C
 Common Whitetail (*Plathemis lydia*), M, HF, P, C
 Blue-faced Meadowhawk (*Sympetrum ambiguum*), M, P
 Autumn Meadowhawk (*S. vicinum*), P
 Black Saddlebags (*Tamea lacerata*), M, P
 Carolina Saddlebags (*T. carolina*), M, P



Participants in the 2017 SEDSA meeting.

Photo Submissions for ARGIA

Would you like to contribute a photo as a possible front or back cover “glamour shot” for ARGIA? We use high-quality images in TIFF or JPEG format with a resolution of at least 300 ppi at 6.5 inches in width. **Please check your image resolution before sending!** Photos of an interesting behavior or specimen may be suitable for Parting Shots if they have a resolution of 300 ppi at column width (3.2 inches).

Please send your photos as e-mail attachments to <editor@dragonflysocietyamericas.org> (up to 15 Mb), via a file transfer service, or in GoogleDrive, **NOT in the body of an e-mail or document!** Photos may be used in later issues, but will never be used for purposes other than ARGIA, and the copyright is retained by the photographer. Please include date, location (state and county at minimum), and photographer's name for each photograph.

Gomphus Subgenera Have Become Genera!

Dennis Paulson, Seattle, Washington <dennispaulson@comcast.net>

A recent publication (Ware et al., 2016) proposes that what we have been recognizing in the literature as subgenera of the genus *Gomphus* be raised to the level of genus. This is based on both morphological and molecular evidence and is not surprising to many of us. These four groups have always seemed distinctive enough to rate as subgenera, and there are characters that define them both as adults and as larvae/nymphs. The genus *Gomphus* is now restricted to Old World species.

The DSA Checklist Committee (John Abbott, Tim Cashatt, Jerrell Daigle, Rosser Garrison, Mike May, Dennis Paulson, Ken Tennessen, Steve Valley) has acted upon this change and, after discussion and vote, came up with a common name for each genus, which we present here. These are the species in their respective genera:

Gomphurus—Majestic Clubtails

Gomphurus crassus, Handsome Clubtail
G. dilatatus, Blackwater Clubtail
G. externus, Plains Clubtail
G. fraternus, Midland Clubtail
G. gonzalezi, Tamaulipan Clubtail
G. hybridus, Cocoa Clubtail
G. lineatifrons, Splendid Clubtail
G. lynnae, Columbia Clubtail
G. modestus, Gulf Coast Clubtail
G. ozarkensis, Ozark Clubtail
G. septima, Septima's Clubtail
G. vastus, Cobra Clubtail
G. ventricosus, Skillet Clubtail

Hylogomphus—Bantam Clubtails

Hylogomphus abbreviatus, Spine-crowned Clubtail
H. adelphus, Mustached Clubtail
H. apomyius, Banner Clubtail
H. geminatus, Twin-striped Clubtail
H. parvidens, Piedmont Clubtail
H. viridifrons, Green-faced Clubtail

Phanogomphus—American Clubtails

Phanogomphus australis, Clearlake Clubtail
P. borealis, Beaverpond Clubtail
P. cavillaris, Sandhill Clubtail
P. descriptus, Harpoon Clubtail
P. diminutus, Diminutive Clubtail
P. exilis, Lancet Clubtail
P. graslinellus, Pronghorn Clubtail
P. hodgei, Hodges' Clubtail
P. kurilis, Pacific Clubtail
P. lividus, Ashy Clubtail
P. militaris, Sulphur-tipped Clubtail
P. minutus, Cypress Clubtail
P. oklahomensis, Oklahoma Clubtail
P. quadricolor, Rapids Clubtail
P. sandrius, Tennessee Clubtail
P. spicatus, Dusky Clubtail
P. westfalli, Westfall's Clubtail

Stenogomphurus—Appalachian Clubtails

Stenogomphurus consanguis, Cherokee Clubtail
S. rogersi, Sable Clubtail

References

Ware, J.L., E. Pilgrim, M.L. May, T.W. Donnelly, and K. Tennessen. 2016. Phylogenetic relationships of North American Gomphidae and their close relatives. *Systematic Entomology* 42(2): 347–358.



The Spread of *Libellula saturata* (Flame Skimmer) Through Oregon and its Appearance in Washington

Jim Johnson <gomphusjim@gmail.com>

Libellula saturata (Flame Skimmer) has been spreading northward through Oregon for some decades at least. While the record of its spread through Oregon is certainly incomplete—particularly from before the 1990s—a pattern of northward expansion is clear, and now the species is present in Washington.

Paulson and Garrison (1977) reported that the first Oregon record of *L. saturata* was in Josephine Co. in 1974—with the previous northernmost record in Tehama Co., California. However, specimen records from the southern tier of Oregon counties go back to the 1920s (pers. comm., Chris Marshall, Oregon State Arthropod Collection). These early specimens were collected in Jackson and Harney counties by H.A. Scullen in 1927 and 1930, and in Jackson and Lake counties by J. Schuh in 1934. Schuh (1936) also reported his finds in his Masters Thesis at Oregon State University (which was the Oregon State Agricultural College at the time).

Records from the Umpqua and the southern Willamette valleys from before the mid-1980s are lacking, so the timing of the species' advance through those areas is unknown. Steve Valley (pers. comm.) first found *L. saturata* in the central Willamette Valley in 1983—a lone individual at Freeway Lakes just south of Albany, Linn Co. Starting in 1986 or 1987, the species was seen regularly in Albany on Burkhart Creek at Knox Butte Road, and for many years this northern outpost was the only site in the area where the species was found. In 1989, Steve Valley (pers. comm.) found the species at Blue Mountain Hot Spring, Grant Co., about nine miles east of the town of John Day. This represented a northward advance beyond the southern tier of counties east of the Cascades, although how long the species was present at this location before its discovery is unknowable. Even today, much of Oregon east of the Cascades receives only intermittent visits by those most familiar with odonates, and the sparse records of *L. saturata* reflect this.

By the time “The Odonata of Oregon” was published (Johnson and Valley, 2005), *L. saturata* was known to occupy (though not necessarily continuously) a large swath of southeastern Oregon east of the Cascades and the western interior valleys (Rogue, Umpqua, and Willamette) north to Albany, with an outlier record of a single male at Tualatin National Wildlife Refuge in Washington County, collected by Maurita Smyth. At this time the species was unknown from coastal areas.

By the time of “Update of The Odonata of Oregon” (Johnson and Valley, 2012), *L. saturata* had been recorded on the southern Oregon coast in Curry and Coos counties (the first of these in

2005, OC 6976; Lyons, 2013), the species had reached southwest Portland in Multnomah Co. (OC 321973), and a male had been photographed at Wickiup Reservoir, Deschutes Co., for an unexpected Cascade Range record at over 4,300 feet elevation (OC 315774). These latter two records both occurred in 2009. In 2014, Mike Hamilton photographed a male at Breitenbush Hot Springs, Marion Co., for another surprising find from the Cascades at 2,320 feet elevation (iNaturalist submission 790546).

In 2015, *L. saturata* was observed at wetlands in the middle of Portland such as Tanner Springs Park (OC 434573) and Westmoreland Park (OC 435648). By 2016, the species was conspicuous at Salish Ponds (report by Bonnie Comegys on the Western Odonata Facebook group)—within a dragonfly's easy flight of the Columbia River. On 10 September 2016, I observed a male and photographed an ovipositing female at Soapstone Lake, Clatsop Co. (OC 455310). This became the northernmost record in Oregon, and, because of the meandering route of the lower Columbia River, this was further north than most of Clark County, Washington. This really seemed like the year to finally find the species at my local ponds in the Vancouver area.

I've been checking Kline Pond just north of Vancouver, Clark Co., Washington, on a somewhat regular basis throughout the odonate season—always thinking about the probability of eventually finding *L. saturata*. That finally happened on 14 September 2016. I found a lone male alternately flying back and forth as it chased other odonates and perching in the sun along the pond's northern shore. I obtained several photos during a few brief moments that it perched (OC 455577). I returned on 16 and 21 September, and on each of those days I found a lone male *L. saturata* appearing intermittently along the same stretch of shoreline on the north side of the pond. More photos were obtained both days (OC 455705, 456155, 456159).

Since only a lone male was observed at any given moment at Kline Pond on each of the three days, it would have been easy to assume that only one male was present in the area. However, analysis of wing wear and variations in wing coloration visible in my photos revealed that the male on the 16th was not the same male first found on the 14th. Additionally, the “lone” male photographed twice on the 21st was actually two males, both different from the first two males. This really demonstrates how much dragonflies come and go at any particular location. I didn't see any *L. saturata* anywhere else around the large pond nor at the nearby smaller pond. I'm not sure what was so attractive about the stretch of shore on the north side of the big pond.

The late-season appearance of *L. saturata* at Klineline Pond certainly suggests that these were dispersers rather than local emergers, and this fits a general pattern of appearances at “new” locations in Oregon as well (Johnson, 2012; Lyons, 2013). No doubt, the species will become established in Clark County and continue its march north up the Puget Trough and into the Columbia River basin of Washington, much as *L. luctuosa* (Widow Skimmer) began 10 years earlier (Paulson, 1997).

References

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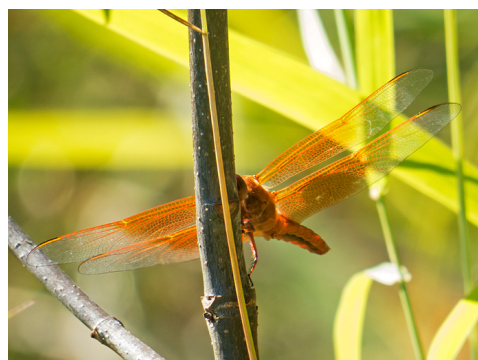
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Figures 1–4. Male *Libellula saturata* (Flame Skimmer) photographed in 2016 at Klineline Pond, Clark County, Washington, on 14 Sep. (Fig. 1; upper left), 16 Sep (Fig. 2; lower left), and 21 Sep (Figs. 3 [upper right] and 4 [lower right]). Although only one male was observed at any given time, minute variations in wing wear and wing coloration apparent in the photographs demonstrate that each of these was a different individual.

Call for Papers for Bulletin of American Odonatology (BAO)

The Bulletin of American Odonatology needs your submissions for the timely reporting of research on Odonata of the New World. Submitted articles may include faunal synopses, behavioral analyses, and ecological studies. See the last page of this issue of ARGIA for BAO publishing guidelines or contact Steve Hummel, BAO Editor, at <editor@dragonflysocietyamericas.org>.

Rediscovery of *Stylurus townesi* (Townes's Clubtail) in South Carolina

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

As I recounted in ARGIA last year (Hill, 2016), the Congaree River in central South Carolina produced the first documented sighting of *Stylurus amnicola* (Riverine Clubtail) for the state in 2016, with a female photographed on 15 May and a single exuvia collected on 11 June. On the 11 June trip I collected not only one exuvia from *S. amnicola* and eight from *S. plagiatus* (Russet-tipped Clubtail), but also a different small *Stylurus* exuvia with conspicuous hairs on the venter. The hairiness and the lengths of the terminal appendages indicated (Needham et al., 2014) that the exuvia came from *Stylurus townesi* (Townes's Clubtail). A trip on 30 June turned up three more of these putative *S. townesi* exuviae, but none for *S. amnicola* and no adults of either species.

I was able to visit the site one more time on 4 August 2016 and got on the river on a typical South Carolina summer afternoon, hot but partly cloudy with the threat of thunderstorms. The late afternoon sun lit the trees on the right (Calhoun County) bank, and I found Russet-tipped Clubtails common and very approachable. Over the next hour and a half I found about a dozen adult (and one teneral) Russet-tips perched, saw more flying, and one landed on my boat. *Argia moesta* (Powdered Dancers) skimmed the water's surface near the banks and *Macromia taeniolata* (Royal River Cruisers) patrolled along the banks. Then on the sunlit side, I saw a much smaller dragonfly, more the size of the Powdered Dancers than the Russet-tipped Clubtails, perched vertically on willows that trailed into the water. It disappeared around the corner into the shade, but it or another one flew by and perched on a similar perch, and I was able to swing a net from the boat and capture it—a male *S. townesi* (Figure 1)! A second male nearby behaved the same way, with short sorties skimming just above the water's surface, then returning to perch a foot or less above the water on willows. I submitted my photos to Odonata Central (#452150; Abbott, 2006–2017).



Figure 1. Male *Stylurus townesi* (Townes's Clubtail) captured on the Congaree River in Calhoun County, South Carolina on 4 August 2016.

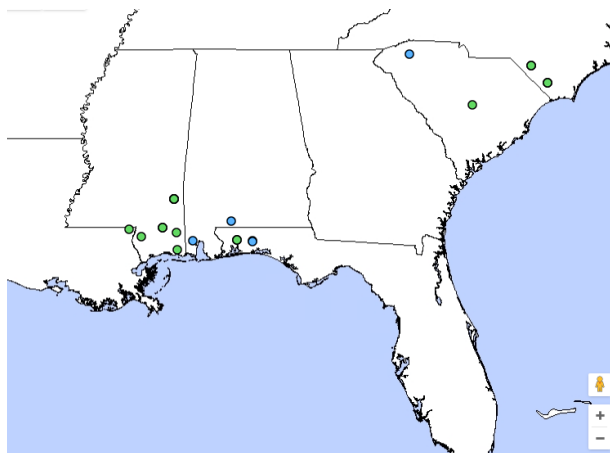


Figure 2. Known distribution of *Stylurus townesi* (Townes's Clubtail) United States as of August 2016. Map generated 8 May 2017 on Odonata Central (Abbott, 2006–2017).

Stylurus townesi was described from a specimen collected on the South Saluda River in upstate South Carolina in August 1931 (Gloyd, 1936). It was also collected on the nearby North Saluda in 1939 (Montgomery, 1940) but hasn't been seen in South Carolina since. Duncan Cuyler documented a population on the Lumber River in Fair Bluff, North Carolina in the 1960s but recent efforts have not been able to detect the species in that state again (LeGrand Jr. et al., 2017). Townes's Clubtail is currently known only from rivers and streams along the Gulf of Mexico from the western Florida panhandle to eastern Louisiana (Figure 2). With an isolated population such as the *S. townesi* I detected in 2016 (230 km SE of the 1930s records in upstate South Carolina, 170 km SE of the North Carolina collections of the 1960s, and nearly 600 km from the nearest populations in the Florida panhandle), one wonders how and when it was established. Was it here all along undetected? South Carolina is not thoroughly surveyed for odonates, and while Richland County on the left bank of the reach where I found these *Stylurus* has 93 species documented, Calhoun County on the right bank had fewer than 20 before our May 2016 visit (Odonata Central, accessed May 2017). Or are these instead more northerly populations of *S. townesi* founded by dispersers from the Gulf Coast strongholds only to wink out after a decade or two?

The Congaree is a very sandy river but with extensive mud along some banks. Mean flows are about 6,500 cfs in summer and 11,000 cfs in winter (USGS National Water Data Information System site 02169500). Species whose exuviae I found in two trips in June included *Erpetogomphus designatus* (Eastern Ringtail, 10 individuals), *Progomphus obscurus* (Common Sanddragon, 2), *Stylurus amnicola* (1), *S. plagiatus* (29), *S. townesi* (4), and *Neurocordulia molesta* (Smoky Shadowdragon,

35). *Gomphurus hybridus* (Cocoa Clubtail) and *G. dilatatus* (Blackwater Clubtail) adults were easily found in May.

Acknowledgements

Thanks to Ken Tennessen, who generously lent me by mail a specimen of the as-yet-undescribed nymph of *S. townesi* for comparison with my exuviae. I'm grateful to Hilda Flamholtz for organizing the survey trip to Calhoun county that led to the discovery of both *S. amnicola* and *S. townesi*, Dave Schuetrum and Dick Watkins for hosting the survey, and Simon Hill for company in the field on two expeditions to the Congaree. I very much appreciate John Abbott and the OdonataCentral vetters who help maintain such a valuable repository of odonate records and distribution.

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Good Things Come in Threes!

Jerrell J. Daigle <jdaigle@nettally.com>

Back to Panama for the third time in a year! Our trip took place from 29 March through 12 April, 2017. This time, our industrious organizer Bill Mauffray and I were joined by Cary Kerst of Eugene, Oregon. As we drove out of Panama City, we remarked how modern Panama cities have become with their skyscrapers, golf courses, new roads, and countless SUVs!

We went back to Santa Fe, where we were successful in finding several good species, including two of the new recently described *Argia* species (Garrison and von Ellenreider, 2017), *Argia elongata* and *A. calverti*. We also found *A. cupraurea*, *A. fulgida*, *A. oculata*, *A. talamanca*, and *A. ulmea* plus a very small *Erpetogomphus constrictor*.

After driving to the Boquete area, we settled in our hotel, Rio Encantado, where we stayed for about a week. We explored



Argia calverti, Willi Maza, 10 April 2017. Photo by Cary Kerst.

the mostly dry scrub forest area and were most successful in places west of Boquete. Here, we found *Anisagrion kennedyi*, *Rhionaeschna jalapensis* (a new Panama record), *R. psilus*, a strange *Lestes*, and *Acanthagrion inexpectum*.



The second half of our trip was on the Caribbean side near Boca de Toros. Here the area was more forested and verdant, and we found a different assemblage of Odonata.

Red-legged Honeycreeper, Rio Encantado, 6 April 2017. Photo by Cary Kerst.

Highlights included a roadside pond with numerous species of *Argia*. At a waterfall and seepages, we found the rare *Argia calverti*, *A. populi*, *Telebasis garleppi*, and the colorful and huge *Libellula herculea*! Near the coast at Rambala, we saw acres of hyacinth ponds with billions of *Telebasis digiticauda* (Marsh Firetail)—literally! One did have to watch out for six foot caimans, though, as Bill found out!

We continued down the road and got to our hotel at Boca de Toros. The owner, Cesar Romero, served us great breakfasts and dinners at his on-site restaurant, and told us of great collecting at the nearby Rio Changuiniola and seepages. He was right! Here we found *Aphylla tenuis*, *Argia insipida* (a new Panama

record), *Leptobasis vacillans* (Red-tipped Swampdamselfly), and *Acanthagrion speculum*. At one small waterfall, we found *Argia adamsi*, the blood red *Heterogastrum erythrogastrum*, and *Psaronneura selvatica* (a new Panama record). The whole area looks very promising.

Before heading back to the Panama City airport, we stopped at my favorite place, Cienaga de las Macanas, where we got a couple of *Orthemis sulphurata*, despite being distracted by swarms of *Tauriphila australis* (Garnet Glider), *Tramea calverti* (Striped Saddlebags), and *Erythemis plebeja* (Pin-tailed Pondhawk). All in all, it was a great trip, and one that also included a 5.3 earthquake near us in Boquete! It was the first earthquake ever for me, even though this was old hat to Cary. By the way, all the nice photos in this article, and many more, were taken by Cary. Hopefully, we will be going back in the future. Hasta la vista!

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Upper: *Idiataphe amazonica*, 30 March 2017. Lower: Team Panama; Jerrell Daigle (left), Bill Mauffray (center), and Cary Kerst (right), 11 April 2017. Both taken at Vista Lago by Cary Kerst.



Upper: Questing for Odonata at a waterfall. Lower: An encounter with future dragonfly experts. Photos by Cary Kerst.

First Recorded Occurrence of the Blue-fronted Dancer (*Argia apicalis*) in Manitoba, Canada

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A male Blue-fronted Dancer (*Argia apicalis*), previously unreported in Manitoba, was observed and photographed at rest on the limestone graveled path of the Churchill River Parkway in the Riverview district of Winnipeg (49.8594°N, 97.1191°W) at 15:36 hours Central Daylight Time (20:36 hours Coordinated Universal Time) on 28 August 2016 (Figure 1). Identity was confirmed by L. de March and D. Paulson (Manitoba and North American odonate experts, respectively) from photographs posted on the same date on the Western Odonata Facebook group. The location is approximately 20 m from the western bank of the Red River and approximately 4 m in elevation above the river surface. Weather at time of observation was sunny, 24°C, with a south to southwest wind at 30–35 kph. No other dancers were observed during the previous 90 minutes of odonate surveying in the park area. Other odonates present in the immediate area as well as the wider park area around this date included *Aeshna* (two species, with one being *Aeshna constricta*, Lance-tipped Darner), *Anax junius* (Common Green Darner), *Sympetrum costiferum* (Saffron-winged Meadowhawk), *S. obtrusum* (White-faced Meadowhawk) and *Enallagma civile* (Familiar Bluet), all of which are typical for the area. Also present was *Pantala flavescens* (Wandering Glider), an unusual occurrence for the area.

Argia apicalis uses a wide range of flowing and standing water habitats but appears to prefer large muddy rivers (Paulson, 2011), habitat that typifies the Red River in southern Manitoba to the international border and farther south into North Dakota and Minnesota. Terrestrial habitat where the individual was found is located between the river-edge vegetation typical of the banks of the Red River in Winnipeg (i.e., treed with American elms, basswood and Manitoba maple, with a shrub understory and mixed herbaceous vegetation along the margins) and an extensive regularly-mowed grass lawn area bordering a residential district. A regenerated herbaceous (grasses, Canada thistle, sow thistle, common milkweed) and shrub area borders the pathway to the immediate northwest of the specific location and the riverbank vegetation borders it to the southeast. Perching on the ground or in low vegetation is typical behavior (Paulson, 2011) and, as noted, the individual was observed on a gravel path in this area. Its response to being approached closer than about 2 m was to fly off and land on the pathway 3–4 m away; accordingly all photographs are from a distance of 2–3 m.

This dancer is distributed primarily in eastern North America from central Illinois and Michigan southwards to northern Florida in the east, and Nebraska to Texas and southeastern Arizona in the west, with records extending northwestwards into

central Montana (Paulson, 2011; Figure 2). In Canada, the species is also present in southwestern Ontario. The northern-most margins of the general distribution in the west are the southern areas of Minnesota and southeast South Dakota; however, outlying populations are sparsely distributed in eastern North Dakota and western Minnesota. The northern-most record for these latter areas is Grand Forks county, North Dakota, at 47.91°N, 97.45°W (<<http://www.odonatacentral.org>>, accessed 3 September 2016), which is closest to the Manitoba occurrence and within the drainage basin of the Red River. The distance between this and the Manitoba location is approximately 218 km.

Four additional odonate surveys were undertaken in the immediate area as well as on packed dirt trails along the greater river edge and park area over subsequent days (29 and 30 August, and 1 and 2 September), with 70 minutes total effort expended in the immediate area and six hours in the wider area. No dancers were observed during these surveys, although other odonates (species mix as noted above) were documented. Weather conditions for the additional surveys were similar to those on 28 August, i.e., temperature 17–24°C, generally sunny, and winds variable in direction (southerly, northwesterly) and speed (10–35 kph).

Weather documented at the Winnipeg International Airport in the days preceding the observation (i.e., 21–27 August 2016) included daytime highs of 22–31°C and winds of 0–34 kph, mostly from southerly or westerly directions (<http://climate.weather.gc.ca/climate_data>, accessed 4 September 2016). Preceding the observation, the periods of August 21–24 and 26–28 were dominated by moderate southerly winds in the region.



Figure 1. Male Blue-fronted Dancer (*Argia apicalis*), 28 August 2016, Winnipeg, Manitoba. Photo by J. Reist.

The presence of only a single male individual and the inability to locate additional individuals despite follow-up effort in the area suggest that this occurrence is a displaced individual. That is, this represents an extralimital vagrant occurrence that perhaps resulted from displacement by southern winds that preceded the date of observation. Alternatively, northwards displacement of a nymph via the north-flowing Red River is also possible. In that context, however, the Red River Valley may present a continuous corridor of suitable habitat from potential source locations in North Dakota and Minnesota. Accordingly, appropriate monitoring in future years is required to document possible future occurrences and/or colonization.

Acknowledgements

I thank L. de March and D. Dodgson for their efforts to locate this individual in the days following the initial observation and for editorial comments on the draft manuscript. I thank L. de March and D. Paulson for confirmation of the species identity from the Facebook post, and L. de March for confirming identifications of other species present in the area.

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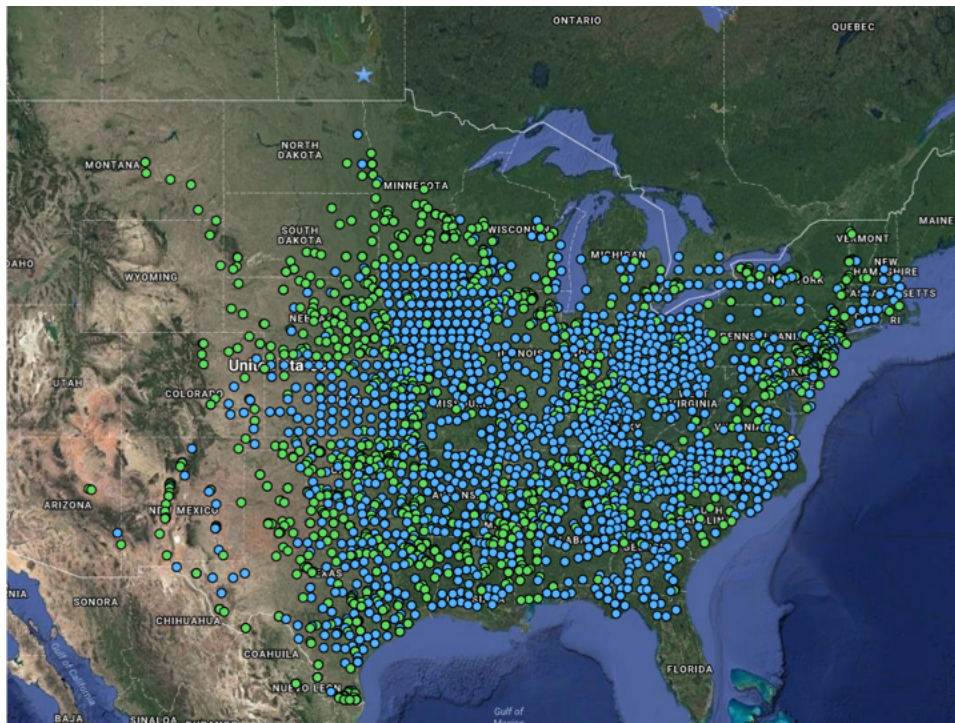


Figure 2. Occurrence locations for Blue-fronted Dancer (*Argia apicalis*) mapped from the OdonataCentral database <<http://www.odonatacentral.org>> (accessed 14 May 2017). The Winnipeg, Canada location (indicated by the star) is 218 km of the northern-most mapped location in North Dakota.

Do Dragonflies Respond to Sound?

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Background

Anisopterans have strong visual acuity for prey detection and other life events (Corbet, 1999; Olberg et al., 2005; Berry et al., 2007; Gonzalez-Belido et al., 2012), but their responses to sound have not been investigated for publication. What anatomical features for auditory sensations might exist? “Does a dragonfly have an auditory neuron?” might be an early question, the

answer to which is unknown to the author at this time. I am unaware of “tympanic ear” or “auditory peg” structures that some insects have being present on dragonflies.

Field observations of *Libellula incesta* (Slaty Skimmer) led to some initial investigations regarding dragonflies’ response to sound. It was observed in the field that *L. incesta* seemed to hover in front of the author after a captured *L. incesta*, placed

in a glassine envelope, was inserted in my front pocket. Did the uncaught dragonfly hear some sound coming from the captured specimen, which was struggling to flap its wings inside the envelope in my pocket? The hovering behavior was often continued for several seconds, as if the uncaught dragonfly was studying me or something it observed. Thus the question of sound perception arose, as well as the possibility that this might be a response to some kind of pheromones emitted from the captured dragonfly.

To test whether a dragonfly under stress might emit sounds, the following study was undertaken.

Methods

To determine if any sound might come from a trapped live dragonfly, three adult *L. inesta* were taken to a professional sound recording studio. When inactive, the recording room was devoid of any detectable sound. Each subject dragonfly, one at a time, was gently held so that wing movement could not occur or be heard. Emitted sound was recorded for 10 minutes per subject. Sound was recorded up to 40,000 Hz. Sound data were analyzed. After the recordings were made, the dragonflies were released from captivity.

Results

Recorded sound was identified at approximately 14,000 Hz (for comparison, humans hear within the range of 20 to 20,000 Hz, and sound in crickets is produced from 2,300 to 3,700 Hz.). The dragonflies produced a clicking noise, believed to be com-

ing from the activity of their leg joints, as slight leg movement was observed during the recording period. No other sound was detected during this test.

Conclusion

Further investigation of sound at higher than 40,000 Hz may reveal whether stressed dragonflies produce higher-frequency sounds. Alternatively, it is possible that sounds produced during stress fall into the range of “infrasound,” which is very low-frequency sound.

Future investigations will pursue the possibility that pheromones produced by a trapped dragonfly may be a potential stimulus for dragonfly awareness of peripheral activity.

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Remembering Clark Nelson Shiffer (15 September 1939–7 April 2017)

Hal White, Newark, Delaware <halwhite@udel.edu>

Clark Shiffer, a short, round-faced man with a straw hat and hip boots, stands in water up to his thighs, staring out over the spatterdock leaves. In his hands is a long-handled net. He crouches slightly like a sentry who has just heard a noise. “That’s Anax longipes,” he says to me. “Oh wonderful! He’s back again this year.”

Thus begins an article by Charles Fergus in *Science*, a national magazine published by American Association for the Advancement of Science (Fergus, 1982). The article goes on to inform readers about dragonflies through the words of Clark Shiffer having a conversation with Fergus while wading in Ten Acre Pond near State College, Pennsylvania. At the time, Clark was the Herpetology and Endangered Species Coordinator for the Pennsylvania Fish Commission and was engaging in his passion—observing and documenting the natural history of Odonata. Between 1967 and 2011, Clark visited Ten Acre Pond over 800 times, contributing to the nearly continuous annual records of dragonfly diversity there begun in the 1950s by

George H. Beatty. This is arguably the longest sustained study of dragonflies at single habitat in North America (Shiffer and White, 1995, 2014) and perhaps the world.



Clark Shiffer at Ten Acre Pond watching others photograph *Anax longipes* (Comet Darner), 2005. Photo by Bryan Pfeiffer.

Not only did Clark record the species occurring at Ten Acre Pond, he also intensively studied and published on other rich Odonata habitats in Central Pennsylvania (Shiffer et al., 2014a, 2015). Working for the Pennsylvania Fish Commission enabled him to document the distributions of dragonflies throughout the state. In the process, his records and those of others, totaling well over 50,000, were compiled for each species and are now available on line through the Stuart Frost Entomological Museum at Penn State University (Shiffer et al., 2014b). As might be expected on a job with time in the field, Clark was the first to record the occurrence of several species in Pennsylvania (Shiffer 1969, 1970, 1974; White, 2006).

While Clark contributed significantly to our knowledge of Odonata in Pennsylvania and elsewhere, for those who knew him, he will be remembered as an excellent photographer and skilled story teller. All of the thousands of the slides in his collection were taken with a hand-held camera and a macro lens. He took much pride in being able to close in with steady hands for a full-frame photo without spooking his subjects. Perusing the acknowledgements in numerous books on Odonata reveals the many authors who came to Clark to get that good image of a rare or hard-to-photograph dragonfly or damselfly. He always was more than willing to share his pictures, specimens, and experience without any need for special recognition or compensation.

Clark was also proud of his excellent eyesight and attention to detail in field identification (Shiffer, 1968). At the northeast regional Dragonfly Society of the Americas (DSA) meeting in State College, Pennsylvania in 2005, there was an impromptu quiz session in which photos were displayed and audience members were challenged to identify the species shown. Clark was always one of the first to respond and always seemed to be right (Pfeiffer, 2005). He often would follow up with an attention-grabbing description of some experience he had with an illustrated species. At other times he would animatedly describe his meetings with various people and be able to imitate their speech mannerisms.

Clark loved word origins and often described the meaning of the root of scientific names for dragonflies as he discussed them. Clark also described the meaning of his own name. As found on



Clark Shiffer (L), Paul Miliotis (C), and Nick Donnelly (R) at a meeting in New York, 1973.



Carl Cook, first president of DSA (L), with Clark Shiffer (R) at an odonatological meeting in New York, 1982.

Wikipedia: "Clark is an English language surname, ultimately derived from the Latin *clericus* meaning 'scribe', 'secretary' or a scholar within a religious order, referring to someone who was educated." From the Dictionary of American Family Names, Shiffer comes from the German: "occupational name for a mariner or boatman, from an agent derivative of Middle High German *schif* 'ship'." Clark really delighted in how his name incorporated the notion of a scribe, since he was such a dedicated documenter of his natural history observations through notes and photographs. And the historical linkage of his last name of Shiffer to boatmen matches his career with the Fish and Boat Commission.

Collecting and observing the natural world where he grew up near Millerstown, Pennsylvania guided Clark to a major in biology at Elizabethtown College. Subsequently, he taught high school biology for several years in Newport, Pennsylvania. Later, he pursued graduate work in Entomology at Penn State, where his existing interest in dragonflies was further stimulated by association with George and Alice Beatty (Beatty et al., 1970). In 1967, Clark began work for the Pennsylvania Fish Commission at its office in Bellefonte. My association with Clark began about that time, when we met each other at the Beatty's home. As I had been lured before, Clark acquired an attachment to the Odonata of Ten Acre Pond. For many years, he sent me annual summaries of all of his records (characteristically hand-written in capital letters only) that I would enter into spread sheets displaying the seasonal and yearly distribution of the many species found there. After Clark took early retirement from the Pennsylvania Fish and Boat Commission in June 1993, he studied the pond and other locations even more intensively and did contract work for The Nature Conservancy (Shiffer 1993a, 1993b). Clark's field work ended abruptly in 2011 due to severe depression and for the remainder of his life he battled this while living in assisted care facilities. There he made a point of knowing the names of all the staff members and residents whom he greeted by name and regaled with his stories.

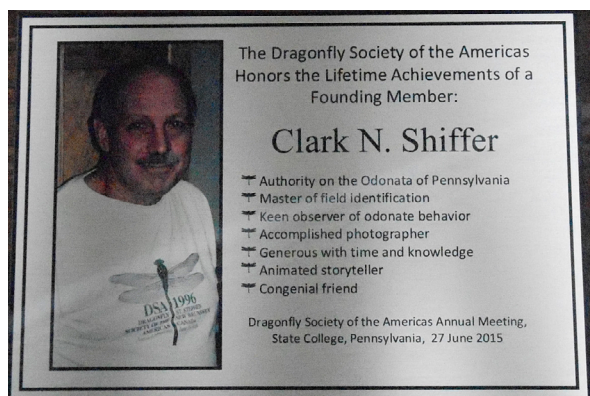
While Clark will be remembered for his work on Odonata,

his work with the Pennsylvania Fish Commission used and enhanced his familiarity with butterflies, fish (Shiffer, 1990), amphibians (Shiffer, 1987), and reptiles. He often monitored the rattlesnake hunts throughout the state, experiences that generated many entertaining evening stories. His discovery of a bottle fly lek site led to a publication (Shiffer, 1983) and an interest in Diptera that was in part sustained by his frequent forays in the field with Frank Fee. And we should not forget his knowledge and slide collection of native wild flowers.

As a founding member of the Dragonfly Society of the Americas in 1989 and frequent attendee of annual DSA meetings, Clark was well known to members of the Society. Clark organized a regional meeting in State College in 1986 and helped organize the northeast regional DSA meeting there in 2005. In 2015 at the national DSA meeting in State College, Clark received a Lifetime Achievement Award from the Society (Valley, 2015). Although in frail health, he received the award in person and then, despite his condition, unexpectedly mustered the energy to stay all day to hear presentations and reminisce with old friends.

My wife and I last visited with Clark in the summer of 2016. We arranged for him to visit Ten Acre Pond where he sat in a lawn chair overlooking the “pond” on a beautiful sunny day. Unfortunately, the pond had been dry for over a month and only a few odonates were to be seen. Nonetheless, he was excited to return to one of his favorite places one last time. Winter snow and spring rain have filled the pond again, and *Anax longipes* (Comet Darner) will have returned to this special place, but without Clark.

With the help of Nick Donnelly, Clark’s Odonata collection was donated to the Florida State Collection of Arthropods in Gainesville. Clark is survived by children Tom, Joan, and Curt; five grandchildren; a brother and a sister; and his former wife, Mary. Those interested in making contributions to DSA in honor of Clark’s memory may mail a check made payable to the Dragonfly Society of the Americas with “Shiffer Memorial Account” written in the subject line to Cynthia McKee,



Lifetime Achievement Award presented to Clark Shiffer at the 2015 DSA Meeting in State College, Pennsylvania.

Treasurer, Dragonfly Society of the Americas, 605 9th Avenue, Ottawa, Illinois 61350-4119.

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Odonata in the News

Odonata in the News is compiled by the Editor. Please feel free to send alerts about any noteworthy odonate-related items such as news stories, popular articles, and scientific publications to me at <editor@dragonflysocietyamericas.org>. A sampling of recent newsworthy Odonata includes:

Harderson S., S. Corezzola, G. Gheza, A. Dell'Otto, and G. La Porta. 2017. Sampling and comparing odonate assemblages by means of exuviae: statistical and methodological aspects. *Journal of Insect Conservation* 21(2): 207–218. Freshwater species are in serious decline all over the world. Thus, monitoring of freshwater ecosystems and species is crucial to guide policy actions and dragonflies are generally considered to be good indicators for these systems. The aquatic life stage of the Odonata is inherently more susceptible to changes in water quality than the imago and therefore exuviae give better insights into site-specific effects. However, utilizing exuviae for monitoring purposes introduces a number of problems. For example, they often do not persist long in the environment. Some of these problems have been addressed. However, there are no published data that distinguish the influence of sampling frequency and total sampling effort on the faunal completeness. Also the number of exuviae necessary to define local assemblages has not been investigated. These questions were addressed by analyzing the data on exuviae collected in seven sites and we found that for any given total amount of time invested, it was always preferable to conduct more short surveys, rather than fewer surveys lasting longer. The study also showed that a sample size of 300 exuviae allowed us to reliably estimate the similarity of two assemblages from different sites. However, when collecting 40 exuviae or less, the reliability was low. Based on our findings we recommend sampling exuviae for a minimum of 5 days, evenly spread out over the entire season during which Odonata emerge, to sample each time for approximately 60 min and aim to collect not less than 300 exuviae in total.

Johansson F., P. Halvarsson, D.J. Mikolajewski, and J. Höglund. 2017. Genetic differentiation in the boreal dragonfly *Leucorrhinia dubia* in the Palearctic region. *Biological Journal of the Linnean Society* 121(2): 294–304. The last glacial period had a strong influence on the population genetic structure of boreal species in southern and central Europe. In addition, recent and current human impact on the boreal environment has led to habitat loss, which also has a large influence on population genetic structure of species. Here we present the spatial genetic structure of the boreal dragonfly *Leucorrhinia dubia* using ddRAD sequencing. We sampled individuals from nine locations in Europe, three in Asia (Russia and Japan) and

one location of *L. intermedia* in Japan. Results showed three distinct genetic clusters in Europe. One genetic cluster consisted of individuals sampled from the locations in the Swiss Alps, a second consisted of individuals sampled in the United Kingdom, and a third cluster consisted of individuals from the rest of the seven sampled locations in Europe covering a latitudinal gradient from the French Pyrenees to the north of Finland. There was also a weak support that the French Pyrenees and Austrian Alps samples differentiated from the cluster of the five samples from central and north Europe. We suggest that these clusters reflect historical recolonization patterns since the last glaciation. The *L. dubia* individuals sampled from locations in Asia formed one cluster referring to *L. dubia orientalis* separated from the individuals sampled in European and from the *L. intermedia* locality sampled. Our result suggests that aquatic insects in the fragmented boreal landscape in south central Europe and United Kingdom need conservation consideration.

Le Gall, M., A. Chaput-Bardy, and A. Husté. 2017. Context-dependent local movements of the blue-tailed damselfly, *Ischnura elegans*: effects of pond characteristics and the landscape matrix. *Journal of Insect Conservation* 21(2): 243–256. The loss of ponds and the fragmentation of their surrounding landscape negatively impacts the biodiversity of wetlands, such as damselflies. They are short-distance dispersers and can be influenced by the quality of suitable habitats and the landscape matrix. The aim of this study was to test the effect of the environmental context (i.e. pond characteristics and the surrounding landscape) on movements and survival probability in a damselfly species, *Ischnura elegans*. Three approaches (i.e. capture-mark-recapture, individual tracking and translocation studies) were performed in Northwestern France. The characteristics of ponds did not influence damselfly survival. However, the landscape context affected movements within ponds, and between ponds. Individuals from open-field ponds moved over longer distances than individuals from urban ponds. Moreover, in cases of disturbances, such as a pond drying up, movements from one pond to another were observed only in the open-field context. The ecological quality of the pond did not appear to affect survival of individuals, probably because *I. elegans* has a high tolerance to changes in ecological factors. However, higher local movements depend on the degree of openness of the landscape. Landscape context is hence a key issue in damselfly conservation planning and in maintaining ecological continuities, such as along greenways and blueways, and specifically the degree of landscape openness during pond creation.

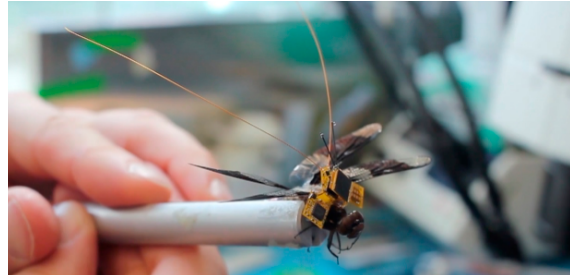
Moeller K.T., A.K. Moeller, F. Moyano, and E.J. Lundgren. 2017. Observation of an American Black Bear eating odonates in Yosemite National Park. *Western North American Naturalist* 77(1):99–101. American black bears (*Ursus americanus*) are opportunistic omnivores with diets that vary seasonally and geographically depending on food availability. Previous scat analyses across several populations suggest that the majority of animal material in the diet of black bears is from insects (mainly ants and wasps). In 2015, a black bear in Yosemite National Park was observed eating dragonflies, a previously unidentified insect food item. Emerging aquatic insects may be an important but overlooked aspect of black bear diet. Documenting the food sources of organisms is critical to understanding their natural history and ecology. In the case of highly digestible food items, visual observation is an important and underrepresented tactic for documenting diet.

Sniegula S., M.A. Prus, M.J. Golab, and D. Outomuro. 2017. Do males with higher mating success invest more in armaments? An across-populations study in damselflies. *Ecological Entomology* DOI 10.1111/een.12397. Males with higher mating success would be expected to invest more in traits that facilitate mating, leading to steeper allometry of those traits with respect to body size. Across-population studies following latitudinal variation in male mating success are an excellent study system to address this question. Males of the damselfly *Lestes sponsa* were used to investigate whether the allometric patterns of the length and width of the anal appendages, used for grasping the female prior to mating, corresponded to male mating success. Across a large latitudinal gradient, it was hypothesised that there is a larger investment in the grasping apparatus, i.e. a steeper allometric slope, following higher mating success. Behavioural observations in field enclosures showed the highest mating success at high latitude, while there were no significant differences in mating success between the central and low latitudes. Positive allometry was found for the length of the anal appendages in high-latitude males, while central- and low-latitude males showed no significant regressions of the traits on body size. These results partially support the hypothesis, as high-latitude, more successful males invested more in the length (but not the width) of the grasping apparatus than did central- and low-latitude males. Therefore, higher mating success might be facilitated by larger investment in armaments. Intraspecific studies on allometric patterns of traits that participate in mating success might offer new insights into the role of those traits in the reproductive behaviour of a species.

Williams E.B., M.M. Chumchal, R.W. Drenner, and J.H. Kennedy. 2017. Seasonality of odonate-mediated methyl mercury flux from permanent and semi-permanent ponds and potential risk to red-winged blackbirds (*Agelaius phoeniceus*). *Environmental Toxicology* DOI: 10.1002/etc.3844. Methyl mercury (MeHg) is an aquatic contaminant that can be transferred to terrestrial predators by emergent aquatic insects such as odonates (dragonflies and damselflies). We assessed the effects of month and pond permanence on odonate-mediated MeHg flux (calculated as emergent odonate biomass x MeHg concentration) in 10 experimental ponds and the potential risk to nestling red-winged blackbirds (*Agelaius phoeniceus*) posed by consuming MeHg-contaminated odonates. Emergent odonates were collected weekly from permanent ponds with bluegill (*Lepomis macrochirus*) (n = 5) and semi-permanent ponds without fish (n = 5) over an 8-month period (January–August, 2015). Methyl mercury flux from damselflies, aeshnid dragonflies and libellulid dragonflies began in March and peaked in April, May and June, respectively, and then declined throughout the rest of the summer. Odonate-mediated MeHg flux from semi-permanent ponds without fish was greater than odonate-mediated MeHg flux from permanent ponds with fish. Nesting of red-winged blackbirds overlapped with peak odonate emergence and odonate-mediated MeHg flux. Because the diet of nestling red-winged blackbirds can be dominated by damselflies and dragonflies, we tested the hypothesis that MeHg-contaminated odonates may pose a health risk to nestling red-winged blackbirds. Methyl mercury concentrations in odonates exceeded wildlife values (the minimum odonate MeHg concentrations causing physiologically significant doses in consumers) for nestlings, suggesting that MeHg-contaminated odonates can pose a health risk to nestling red-winged blackbirds.

Draper's genetically modified cyborg DragonflyEye takes flight. Summarized from an article by Evan Ackerman published on 1 June 2017 in *IEEE Spectrum*, a magazine of the professional society Institute of Electrical and Electronics Engineers. <http://spectrum.ieee.org/automaton/robotics/drones/drapers-genetically-modified-cyborg-dragonfleye-takes-flight#disqus_thread>. The Draper company <www.draper.com> bills itself as a not-for-profit research and development company that provides advanced technological solutions for government, industry, and academic organizations. One of these technology innovations, developed in collaboration with the Howard Hughes Medical Institute, is Draper's DragonflyEye, a hybrid drone that uses live dragonflies to fly. Potential uses for this drone as stated by Draper include guided pollination, payload delivery, and reconnaissance. The dragonfly carries a small backpack containing electronics that interface directly with the insect's

nervous system and control its flight path, using power gleaned from tiny solar panels. Some genetic modifications to the dragonfly are apparently needed in to make it able to accept the electronic commands (the exact modifications needed were not stated in the article, however). You can watch a video of the first DragonflyEye in action at <<https://vimeo.com/219709402>> (the photo to the right is a still image captured from that video), and read an interview with one of the engineers who developed the system at <<http://spectrum.ieee.org/automaton/robotics/industrial-robots/draper-dragonflyeye-project>>. 

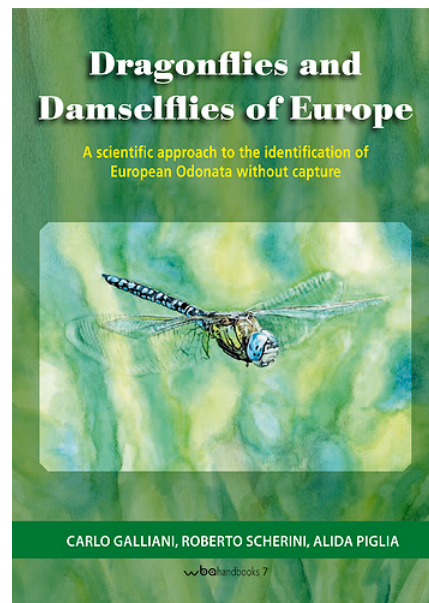


A live dragonfly with a cybernetic backpack and optical implants is now airborne. Image from Draper via Vimeo.

New Book Announcement: Dragonflies and Damselflies of Europe, by Carlo Galliani, Roberto Scherini, and Alida Piglia

Dragonflies and Damselflies of Europe: a scientific approach to the identification of European Odonata without capture. C. Galliani, R. Scherini, and A. Piglia. 2017. WBA Handbooks 7, 352 pp. ISBN: 97888903323-6-4. Order at World Biodiversity Association <<http://biodiversityassociation.org/it/wba-project/shop/publicazioni/dragonflies-and-damselflies-of-europe-wba-handbooks-7/>>. 40 € / \$45 USD.

From the publisher's web site: A simple yet detailed guide suitable both for beginners and more expert readers who wish to improve their knowledge of the order Odonata. Written in English, this book encompasses images and photographs of all the European species having a stable population with chapters about their anatomy, biology, behaviour, distribution range and period of flight, plus basic information about the vagrants with only a few sightings reported. On the whole, 143 reported species, 700 photographs, and 40 drawings are included. 



ID Corner

ID Corner is a new feature in 2017, designed to address the challenges we face as print and electronic identification resources blossom, and more newcomers come into the dragonflying fold. DSA members range from those who are happiest looking at details of adult male hamules or nymph palpal lobes under a microscope, to photographers and hands-off observers who want to know the best field marks to identify an individual to species. Old hands and newcomers can also have questions about the best morphological “tells” for challenging species and how they vary.

Excellent information can be found on many different Facebook page threads and e-mail list serves, but even

the most detailed post can be lost or buried before you have a chance to write all those useful pointers into your field guides. Therefore, we hope this ID-themed section will provide more structure and accountability than those myriad Facebook threads (even though it is not peer-reviewed). We want to make this interactive, with readers asking about specific topics in one issue that can be responded to in the next. Topics and questions can address aspects of identification of adults, nymphs, or exuviae.

We hope that additional DSA members with expertise will contribute notes in the future. If you have any questions, please contact me at <editor@dragonflysocietyamericas.org>. 

Cultural Odonatology

DSA members are as diverse as the insect order we all love; we approach Odonata as scientists, educators, naturalists, artists, poets, photographers, essayists, bloggers, and more, with many wearing several of these hats. Cultural Odonatology focuses on different aspects of the human

relationship with odonates, showcasing dragonflies in art, architecture, literature, and legend, and may contain original works or discussions of odonates in existing works. If you would like to contribute to this feature, contact the Editor at <editor@dragonflysocietyamericas.org>. 

How I Fell Into the Clutches of the Odonata

This feature presents essays from DSA members describing how, when, where, and why they first became interested in Odonata. It also doubles as a fun way for members to find out a little more about each other. If you would like to contribute, write a short essay describing your first forays into the world of Odonata and how it has affected your life since, including your most interesting

ode-hunting tale, and send it to the Editor at <editor@dragonflysocietyamericas.org>. Photographs to illustrate the stirring tale are encouraged. Whether you are discovering odonates this year or have pursued them for decades, I know there are plenty of interesting, entertaining, and inspiring stories out there to be told! 

Parting Shots

Parting Shots pays tribute to the endless diversity and interest of odonate behaviors and to the many skilled photographers among us, with an additional nod to the many unexpected (and sometimes downright silly) ways in which odonates can creep into daily life. If you have photos that showcase an odd, bizarre, unusual, unexpected, or amusing aspect of odonate life (or of life with odonates), please e-mail them to the Editor at <editor@dragonflysocietyamericas.org>, along with a short note describing the photo, location, and event.

Me and My Shadow, by Bryan Pfeiffer <bryan@bryanpfeiffer.com>

Bryan captured this artistic shot of a perched Halloween Pennant (*Celithemis eponina*) and its colorful shadow at Bahia Honda State Park on Bahia Honda Island in the Florida Keys. He describes this lovely dragonfly as “dirt-common in south Florida and a very cooperative bug when you find it.”



Halloween Pennant (*Celithemis eponina*), Bahia Honda State Park, Florida, 14 February 2017, by B. Pfeiffer.

Wheel of Good Fortune, by Ron Oriti <meteoriti@aol.com>

Ron seems to enjoy tormenting people with the fantastic photos he can take without ever having to get out of his vehicle. Ron found these Giant Darners (*Anax walsinghami*) in wheel along a canal in the Owens Valley in eastern California, and again captured the shot from his seat in the car. Ron comments “Well, I’d rather be lucky than good,” but both luck and skill seem evident here...



Anax walsinghami (Giant Darners) mating in wheel position, Owens Valley, California, June 2016, by Ron Oriti.

Congratulations to New Members of the DSA Executive Committee and Thanks to Outgoing Members for Their Service!

Welcome to the new members of the DSA Executive Committee! In a peaceful exchange of power, Robert DuBois is our new President, with Chris Hill moving into Jim Johnson’s place as Immediate Past President, Bryan Pfeiffer becoming the President Elect (after completing a six-year term as a Regular Member), and Nancy McIntyre taking Bryan’s place as a Regular Member. Many thanks to these dedicated DSA members for all they do to advance the Society and its mission!

ARGIA and BAO Submission Guidelines

All materials must be submitted digitally via e-mail or an internet file sharing service (i.e., Dropbox, GoogleDrive, TransferBigFiles, or similar service). If digital submissions are not possible, contact the Editor before sending anything. Material for ARGIA and BAO should be sent to the Editors at <editor@dragonflysocietyamericas.org>. Authors should expect to receive an e-mail confirming receipt of submissions within five business days.

Articles

All articles and notes should be submitted in Word, Pages, or Rich Text Format (RTF), without embedded figures, tables, or captions. All photos and figures must be submitted as separate files (see Figures below). Only minimal formatting of each article 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 Word, Pages, or Rich Text Format document. Articles may be edited if needed for clarity, grammar, and/or space.

Begin the article with title, author name(s), and contact information (including e-mail for primary author) 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. The first time each species is mentioned in the article, always give both the scientific name as well as the official common name (where one has been assigned) in parentheses. Subsequent mention of the same species may be done using scientific or common name only, as the author prefers. Literature should be referenced in the article text using author names, not numbers (i.e., “Carlos and Young, 2009; Quill et al., 2011”).

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 or JPG files with a **minimum of 300 ppi** at the intended print size. If you are unsure about the final print size, keep in mind that oversized 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 Editor 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) can be submitted 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 unsatisfactory. When charts and graphs are generated in Excel or Numbers, please submit the file 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 or Pages documents or as spreadsheets in Excel or Numbers. If Excel or Numbers is used, place each table on a separate worksheet and name each worksheet appropriately (e.g. “Table 1”, “Table 2”, etc.).

The Dragonfly Society Of The Americas

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Executive Council 2017–2019

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Associate Editor (BAO Editor)	S. Hummel	Lake View, Iowa
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Journals Published By The Society

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

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

Membership in the Dragonfly Society of the Americas

Membership in the DSA is open to any person in any country and includes a digital subscription to ARGIA and BAO. Dues for individuals in the US, Canada, or Latin America are \$15 us for regular memberships (including non-North Americans), institutions, or contributing memberships; \$5 us or more can be added for sustaining memberships. Dues are payable annually on or before 1 March of membership year. Membership dues can be paid online via credit card; see <http://odonatacentral.org/index.php/PageAction.getName/DSA_Membership>. Membership forms can also be downloaded and mailed with a check to The Dragonfly Society of the Americas, Inc., Attn: Cynthia McKee, Treasurer, 605 9th Avenue, Ottawa, Illinois 61350-4119. For more information on joining DSA, visit <www.dragonflysocietyamericas.org/join>.

Mission of the Dragonfly Society of the Americas

The Dragonfly Society of the Americas advances the discovery, conservation and knowledge of Odonata through observation, collection, research, publication, and education.

Back cover: (upper) *Lestes vigilax* (Swamp Spreadwing) male, Waukesha County, Big Bend, Wisconsin, 25 August 2016. Photo by Kurt Huebner. **(lower)** Mountain Emerald (*Somatochlora semicircularis*) dorsal close-up, Summit County, Utah, July 2016. Photo by Jim Burns.

