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Front cover: A pair of Variegated Meadowhawks (*Sympetrum corruptum*) flying in tandem through the Holcim Wetlands in Fremont Co., Colorado. Photographed by Tony Leukering.

In This Issue

Be sure to check out the Calendar of Events below, as there are a lot of great meetings planned for this year. Details of many of these meetings can be found in this issue, so start making your plans.

Nick Donnelly reports on the death of one of the giants in the study of Oriental Odonata in the last century. Syoziro Asahina left a long, rich legacy of dragonfly research behind. I'm sure there will be a commemoration at the International Congress of Odonatology held in Japan this August.

For a touch of the creative side, we are often treated to one of Ken Tennessen's poems, but in this issue, Jerry Hatfield has written an eloquent narrative about chasing dragonflies in the Texas panhandle. Ângelo Pinto and Alcimar Carvalho clarify a mistake in the distribution of *Neocordulia batesi* in Brazil that has been repeated in the literature over the years.

Bruce Lund and Alan Myrup provide a synopsis of 70 years of study on the Muddy River Watershed in Clark County, Nevada. Long-term study sites like this are invaluable, but rare. I can think of a number of others, but there aren't near enough.

Paul Catling, Brenda Kostiuk, and Douglas Tate confirm the existence of River Jewelwing (*Calopteryx aequabilis*) in the Northwest Territories of Canada extending this species' range to above 60°N. John Klymko also reports Extra-striped Snaketail (*Ophiogomphus anomalus*) for Nova Scotia for the first time.

Burton and Chelsey Cebulski report on the dragonflies of The Nature Conservancy preserve, Ives Road Fen, in southeast Michigan. Fred Sibley has been working on the odonate fauna of Nebraska and provides an updated account of that state's numbers and new records.

Cary Kerst discusses how wetland mitigation sites can be beneficial and productive habitats for odonates. Scott King relays the fun had by all in western Minnesota at last year's MOSP gathering.

Finally, there are two new books to announce. Hal White has written a book on the Natural History of Delmarva Dragonflies and Damselflies and I have a new book on the Damselflies of Texas. Details on both are given at the end of this issue.

Calendar of Events

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

Event	Date	Location	Contact
DSA Southeast Meeting	27–30 May 2011	Clayton, Georgia	Marion Dobbs, <ecurlew@mac.com>
GLOM/Minnesota Gathering	9–12 June 2011	Southeast Minnesota	Kurt Mead, <mixedboreal@gmail.com>
DSA Annual Meeting	8–11 July 2011	Fort Collins, Colorado	<http://tinyurl.com/DSA-Colorado>
DSA Northeast Meeting	14–17 July 2011	Delmarva Peninsula	<http://tinyurl.com/4s4vlsw>
Int. Congress of Odonat.	31 Jul–5 Aug 2011	Odawara, Japan	<http://www.odonata.jp/wda2011/>
Aeshna Blitz	26–28 Aug 2011	Diamond Lake, Oregon	Jim Johnson, <jt_johnson@comcast.net>
CalOdes/CA DSA Blitz	26–29 Aug 2011	Colorado River, Cal./Nev.	Kathy Biggs, <bigsnest@sonic.net>

2011 DSA Southeast Regional Meeting in Clayton, Georgia

Giff Beaton <giffbeaton@mindspring.com> and **Marion Dobbs** <ecurlew@mac.com>

This year's southeastern meeting will be held in the small town of Clayton in the mountains of northeastern Georgia from 27–30 May 2011. Rabun County is bordered by the Chattooga River, of "Deliverance" fame, and we will visit it and some of its tributaries. The Chattooga is a designated "Wild and Scenic" river and its rocks and rapids make it popular with canoeists, rafters, and kayakers. We will access it at a put-in point where there are wadeable stretches of water.

There is a comparatively narrow spectrum of habitat types in the area, and our target species are limited accordingly. However, we have some very special ones. Among them are *Calopteryx angustipennis* (Appalachian Jewelwing), *Ophiogomphus edmundo* (Edmund's Snaketail), *Ophiogomphus incurvatus incurvatus* (Appalachian Snaketail), *Gomphus* (*Hylogomphus*) *parvidens* (Piedmont Clubtail; northern form), *Gomphus* (*Hylogomphus*) *viridifrons* (Green-faced Clubtail), and *Macromia margarita* (Mountain River Cruiser). We may be too early for *Macromia alleghaniensis* (Allegheny River Cruiser) and *Neurocordulia virginiensis* (Cinnamon Shadowdragon).

No trip is planned for nearby Black Rock Mountain State Park with its small 17 acre lake, but it is lovely location worth a visit. It's Georgia's highest state park at 3640 feet and sits atop the Eastern Continental Divide with spectacular views of the southern Appalachian Mountains. There are tent and RV camping facilities here as well as rental cabins.

A small block of rooms has been reserved at the Quality Inn in downtown Clayton at a special rate of $89.99 for a non-smoking double, and reservations can be made by calling (877) 424-6423 and asking for Johnna or mentioning dragonflies! Other motels in the area are Days Inn (706) 782-4258 and America's Best Value Inn (706) 782-4702.

It's a beautiful area, and we have some nice odonates to look for. Be aware, however, that this is Memorial Day weekend, the kickoff for the high summer season in the mountains. There *will* be crowds, at the water and at the lodgings. Reservations should be made early.

Clayton is a 2–2.5 hour drive from Hartsfield–Jackson Atlanta International Airport.

It's Election Time

A Nominating Committee composed of Greg Lasley (chairman), Jerrell Daigle, and Michael Blust offer the following candidates: Jim Johnson for President Elect and Bryan Pfeiffer for Regular Member. DSA members who receive hard copies of this issue of ARGIA should find a ballot insert; members who only receive ARGIA electronically can find the PDF version of the ballot at <http://tinyurl.com/4o7525t>. Spaces are provided for write-in candidates. Please complete and return your ballot no later than 1 May 2011.

CalOdes/DSA California Dragonfly Blitz 2011

Kathy Biggs <bigsnest@sonic.net>

This year the CalOdes/DSA California Dragonfly Blitz will be held in southeastern California/southwestern Nevada (Needles–Colorado River area in San Bernardino County, California and Clark County, Nevada) from 26–29 August. We'll be focusing on the area along both sides of the Colorado River and also the northern part of Lake Havasu. We'll especially be looking for Striped Saddlebags (*Tramea calverti*) in California, and any other species we can find to add to these two under-censused counties: San Bernardino County in California and Clark County in Nevada (just the other side of the river). Four-wheel drive may be required in some areas, so car-pooling may be necessary.

There are at least 33 species that would be county and/or **state** records *if* found in one or both of the counties/states:

Pacific Spiketail, *Cordulegaster dorsalis* (desert race *C. d. deserticola* possible?)
Western River Cruiser, *Macromia magnifica*
Brimstone Clubtail, *Stylurus intricatus*
Russet-tipped Clubtail, *S. plagiatus*
Olive Clubtail, *S. olivaceus*
California Darner, *Rhionaeschna californica*
Paddle-tailed Darner, *Aeshna californica*
Walker's Darner, *A. walkeri*
Red-tailed Pennant, *Brachymesia furcata*
Plateau Dragonlet, *Erythrodiplax basifusca*
Neon Skimmer, *Libellula croceipennis*
Eight-spotted Skimmer, *L. forensis*
Twelve-spotted Skimmer, *L. pulchella*
Four-spotted Skimmer, *L. quadrimaculata*
Marl Pennant, *Macrodiplax balteata*
Roseate Skimmer, *Orthemis ferruginea*
Common Whitetail, *Plathemis lydia*
Saffron-winged Meadowhawk, *Sympetrum costiferum*
Cardinal Meadowhawk, *S. illotum*
Band-winged Meadowhawk, *S. semicinctum*
Striped Meadowhawk, *S. pallipes*
Striped Saddlebags, *Tramea calverti*
Canyon Rubyspot, *Hetaerina vulnerata*
Emerald Spreadwing, *Lestes dryas*
Emma's Dancer, *Argia emma*
Lavender Dancer, *A. hinei*
Kiowa Dancer, *A. immunda*
Sooty Dancer, *A. lugens*
Northern Bluet, *Enallagma annexum*

Boreal Bluet, *E. boreale*
Western Forktail, *Ischnura perparva*
Mexican Forktail, *I. demorsa*
Western Red Damsel, *Amphiagrion abbreviatum*

Other less likely possibilities, currently not known in either San Bernardino and Clark Counties (**bold** = possible state record):

Great Pondhawk, *Erythemis vesiculosa*
Filigree Skimmer, *Pseudoleon superbus*
Hudsonian Whiteface, *Leucorrhinia hudsonica*
Springwater Dancer, *Argia plana*
Amethyst Dancer, *A. pallens*
Apache Dancer, *A. munda*
Dusky Dancer, *A. translata*
Fiery-eyed Dancer, *A. oenea*
River Bluet, *Enallagma anna*
Alkali Bluet, *E. clausum*
Plains Forktail, *Ischnura damula*
Painted Damsel, *Hesperagrion heterodoxum*
Flame Skimmer, *L. saturata*
Red Rock Skimmer, *Paltothemis lineatipes*
Mexican Amberwing, *Perithemis intensa*
Desert Whitetail, *Plathemis subornata*
California Dancer, *Argia agrioides*
Aztec Dancer, *A. nahuana*
Vivid Dancer, *A. vivida*
Arroyo Bluet, *Enallagma praevarum*
Desert Forktail, *Ischnura barberi*
Pacific Forktail, *I. cervula*
Black-fronted Forktail, *I. denticollis*
Desert Firetail, *Telebasis salva*

A complete list of species with links to current distribution maps can be found on the CalOdes Yahoo Groups web site in the file section as 2011 Blitz: <http://pets.groups.yahoo.com/group/CalOdes/>.

We'd love to have your help! Please contact Kathy Biggs at <Bigsnest@sonic.net> if you are interested.

For those considering coming from out of state(s), these southwestern species might be present:

White-belted Ringtail, *Erpetogomphus compositus*
Gray Sanddragon, *Progomphus borealis*
Giant Darner, *Anax walsinghami*
Pale-faced Clubskimmer, *Brechmorhoga mendax*
Western Pondhawk, *Erythemis collocata*
Comanche Skimmer, *Libellula comanche*
Bleached Skimmer, *L. composita*
Hoary Skimmer, *L. nodisticta*

Missing 2010 Maine Annual Meeting Attendees

Jerrell Daigle <jdaigle@nettally.com>

We humbly apologize for overlooking the following attendees from the 2010 annual DSA meeting in Maine. They were Tomoko Ito from Japan; Blair Nikula from Massachusetts; Amy, Sam, and Simon Hill from South Carolina; and Betsy and Chris Foster from Virginia. Again, we are sorry about that. This does bring the total attendance to 88, a new DSA annual meeting record. Thanks, everybody for attending the 2010 Maine annual meeting!

2011 Northeast Regional DSA Meeting on Delmarva Peninsula, 14–17 July

Hal White <halwhite@UDel.Edu>

The 2011 Northeast Regional Meeting of the Dragonfly Society of the Americas will be held on the Delmarva Peninsula from Thursday evening, 14 July to Sunday, 17 July. The base of operations will be in Dover, Delaware at Delaware State University. A block of 25 rooms have been reserved at the Hampton Inn nearby at $89/night. The room rate will be held for registrations until 22 June provided the block is not filled. A web site providing registration, housing information, meeting schedule, regional information, and species lists for various habitats is at: <http://www.udel.edu/chem/white/nedsa2011/nedsa2011-HomePg.html>.

The Delmarva Peninsula includes the state of Delaware, the Eastern Shore (of the Chesapeake Bay) of Maryland, and two counties of Virginia. Except for the northernmost parts of Delaware and Maryland, this is on the Coastal Plain with elevations less than 100 feet above sea level. While the Delmarva Peninsula is largely agricultural, there are numerous state parks and other natural areas that support interesting Odonata populations and distinctive habitats. For example, the ponds produced by an abandoned sand mining area in Maryland near the border of Delaware has been surveyed extensively in recent years has turned up the following: *Somatochlora georgiana* (Coppery Emerald), *Celithemis fasciata* (Banded Pennant), *Celithemis verna* (Double-ringed Pennant), *Erythrodiplax minuscula* (Little Dragonlet), *Nannothemis bella* (Elfin Skimmer), *Libellula flavida* (Yellow-sided Skimmer), *Enallagma dubium* (Burgundy Bluet), *Enallagma pallidum* (Pale Bluet), *Enallagma*

weewa (Blackwater Bluet), *Nehalennia integricollis* (Southern Sprite), and *Telebasis byersi* (Duckweed Firetail) that are not often encountered in the northeastern US and should still be flying at meeting time. The Pocomoke River watershed is another area that supports interesting species often near their northern limit of distribution on the east coast. Then there are salt marshes and tidal fresh water areas where other species like *Libellula needhami* (Needham's Skimmer), *Brachymesia gravida* (Four-spotted Pennant), and *Erythrodiplax berenice* (Seaside Dragonlet) can be found. Nearly 130 species are known from Delmarva and hopefully new ones will be found during the meetings. These species are discussed in "Natural History of Delmarva Dragonflies and Damselflies", to be published in April.

Organizers: Hal White, Kitt Heckscher, Jim White, and Jim McCann

Syoziro Asahina: 1913–2010

T.W. Donnelly <tdonelly@binghamton.edu>

The death of Syoziro Asahina at the age of 97 on 21 November 2010 truly ended an era. Not only was Asahina the most important figure in Japanese odonatology, but also one of the two major contributors to the study of Oriental Odonata during the twentieth century (the other being the late Maurits Lieftinck, who died in 1985).

Born in Tokyo in 1913, Syozoiro enjoyed boyhood natural history outings from a very young age, accompanying a highly supportive father on botanical outings. By the young age of fifteen he was hooked on dragonflies, having journeyed on an outing with the Tokyo Entomological Society. He reported that he was especially impressed on this outing by catching the large *Tanypteryx pryeri*. (Does this ring any bells?). His youthful interests were not limited to dragonflies, and another pursuit was for Japanese grylloblattoids, which in a curious way connects him to the eminent Canadian odonatist E.M. Walker, who made the original discovery of this remarkable insect group. During his long life Asahina was also interested in the Blattaria, and published extensively on this group.

Asahina was 15 when he began publishing notes on dragonflies, and he was still 17 when he went on a trip to Okinawa, during which he collected his first new species (a *Hemicordulia*), which he published in his twenties. By the time he began his college studies he was already an accomplished entomologist. Almost at the very beginning of his interest, he plunged into a study of *Epiophlebia superstes*—the iconic "Mukashi-tombo" ("ancient dragonfly"), arguably the most famous odonate in the world and Asahina's main object of odonate study. His book "Morphology of *Epiophlebia superstes*", published in 1954, exhaustively compares the morphology of this remarkable odonate with Zygoptera (mainly *Mnais strigata*) and Anisoptera (mainly *Davidius nanus*). It has always been one of the most useful books in my library.

The onset of Japan's entrance into World War II was anticipated prior to Pearl Harbor, and Asahina's entomological studies were redirected to medical entomology. Interestingly, several American entomologists were similarly diverted (among odonatists, Donald Borror and George Bick both were military entomologists in the South Pacific). Asahina was posted to Manchuria for the duration of the war. Ultimately he became the chief of Medical Entomology for the National Institute of Health in Tokyo, and he continued to study mosquitoes throughout the remainder of his career.

However, after the war his main interest returned to the Odonata. Among his first foreign trips was one to Dar-

jeeling, where he found larvae of the Himlayan species *Epiophlebia laidlawi*, known only at that time in the larval form and confirmed that it was distinct from the Japanese superstes. (The first adult *laidlawi* was found later.) Meanwhile he continued intensive studies of the Japanese odonate fauna, ultimately describing 16 percent of the species-level names of the Japanese fauna.

I began a correspondence and exchange of specimens in the 1960s. Among the material he sent me were several specimens taken by Prince Masahito, the younger brother of Emperor Akihito. He never explained how these specimens came into his possession but I have been reminded several times that all members of the royal family have been encouraged to pursue serious studies, many of which involved biological topics.

One of his most interesting Japanese new species discoveries was the small coenagrionid *Mortonagrion hirosei*, a small brackish water damselfly that has become seriously imperiled by development along the coast line. He continued a strong interest in the conservation of this species for the remainder of his life.

An invitation in the late 1970s to participate in some mosquito control studies in Thailand began a long interest in the odonate fauna of this marvelous country. When I first visited Thailand in 1980 his systematic series had not yet appeared, and I relied mainly on Fraser's "British India" series for identifications. I sent specimens to Asahina and was pleased to find many of them woven into the series, which, spanning the period 1982 to 1989, is one of the finest taxonomic accomplishments for any tropical odonate fauna of the world. Later I enjoyed a similar experience when I first visited Vietnam in 1996. Asahina published six papers (1995 to 1997) based mainly on the fauna of the northern part of the country, including an emphasis on the very place that I had visited, and I was pleased that he included several species otherwise unidentifiable to me that I had taken.

One of the most interesting (to me) studies he participated in during the postwar period involved the collecting and study of stray insect specimens, which were collected aboard weather ships then so important to meteorological forecasting. Before the use of airborne sound devices, and long before the advent of the use of satellite observations, meteorological predictions in all the first-world countries involved the use of weather ships, more or less permanently stationed in small areas of the ocean far enough offshore to extend meteorological mapping significantly, and, in the case of Japan especially, to give warning of typhoons. The duties for technicians on these ships during their two–three week long "legs" were excruciatingly boring and the entire ship's crew found the occasional arrival of insect swarms a welcome break in the monotony. Crewmembers began to assemble collections, and Asahina was one of the shore-based entomologists enlisted to identify and interpret the material. Odonata were exceptionally represented, but many other orders were found. In several short papers Asahina convincingly showed that these swarms were entrained in the cores of typhoons and thus capable of being transported great distances. I think too long odonatists have ignored these studies.

Asahina often ventured from the narrow, traditional path of describing new species and synonymizing old ones. He was one of the first odonatists to write on hybridism, which in Japan is observed mainly in *Sympetrum* and *Anax*. He certainly gave me a great deal to think about.

Asahina played a leadership role not only in Japanese odonatology, but also on a broader stage. He was deeply involved in conservation projects, including the formation of a large dragonfly biotope near Nakamura on the island of Shikoku. In 1957 he began, with Dr. S. Eda, the journal Tombo, which I was pleased to receive until 1992. Even with my inability to read Japanese I was able to profit from this journal (also many of his papers)—largely because of their useful English summaries and figure captions. Many of the papers of this journal treated odonates in other parts of the world and many were by non-Japanese authors. For several years it was really the only international journal in the field.

My last correspondence and sending of specimens was in the late 90s. He always sent out Christmas "cards" to his correspondents every year. These were always postcards with a carefully drafted figure of a Japanese odonate species, showing only the wings on one side, along with a brief written holiday greeting. A few years ago I noted that these were no longer being sent and realized that at his advanced age he was quietly passing from our scene. The news of his death was hardly surprising, but was very sad with the realization that one of our great students of Odonata was gone. He was a kind and generous person who left a large legacy and gave all of us much to think about.

The most useful summary of his career is an autobiographical sketch, which appeared in Odonatologica (1984, 13(2): 215–232).

The Seasonal Pursuits of a West Texas Dragonfly Enthusiast

Jerry K. Hatfield, Lubbock, Texas <dragonflywatcher1029@yahoo.com>

I hold in the palm of my hand the small rectangular-shaped medallion of a bookmark replete with olive-green tassel looped through a small pre-cut hole in its upper right-hand corner. The medallion contains an image on its surface that harks back to the "Victorian era" with its artistic flair and attention to detail. The background contains "Queen Anne's Lace" flora overlaid with an Old World dragonfly specimen of some sort of "Darner" species. On the bottom right third of the medallion is spelt out in bright yellow-gold lettering the word Hope.

To me it seems a most apt virtue to assign this bookmark whose scene seems to depict most concurrently a sense of longing or expectancy especially as I anticipate the return of the warm season ahead. Mid-winter's cold temperatures always has a way of working its effects on the dragonfly enthusiast; arousing daydreams of the coming spring and summer, and all the explorations to be done and possible discoveries that each new season generates. "Hope" is the main idea behind words like anticipation, even expectation that describes my impatience with winter's seeming relentless embrace. As spring's advance comes ever closer, I look forward to the emergent arrival of the familiar and perhaps new wonders to behold! Perhaps a quote from the late great Russian poet and butterfly enthusiast Vladimir Nabokov may serve to underscore this idea of longing even further: "Few things indeed have I known in the way of emotion or appetite, ambition or achievement, that could surpass in richness and strength the excitement of entomological exploration."

As the years come and go, it seems the eye has become more adept at the observation and discovery of species that in previous years might just as easily have gone unnoticed. Amazing aerial acrobats, the winged marvels of the insect world come in all colors of the artist's palette which makes many of them not easily overlooked. How does one miss the rich turquoise filigreed body of the Blue-eyed Darner set off by those large impressive orbs that appear as deep and wise and as an ancient well? How's one's head not turned at the stunning orange-red body and saturated wings of the Flame Skimmer as he zips past in search of prey or a suitable mate? Has anyone seen the "Victorian-gothic" looking Filigree Skimmer whose flight pattern resembles the dancing butterfly? Consider the club-tailed species called Flag-tailed Spinyleg whose club-shaped tail is so swollen that it gives the appearance of the long florescent bicycle flag (of my early teen years) streaming in the wind. Not to be outdone is the Checkered Setwing whose blushing red face (resembling a beacon like Rudolph's red nose) makes this small wonder a real standout! The wings, too, of a number of species add to their overall beauty. Consider the dark-brown and orange wing coloration and splotching of the Halloween Pennant or the alternating pattern of black and white wing patches of the Twelve-spotted Skimmer. Why does one not look more closely at the glowing florescent-green eyes and wing patches of the enigmatic Prince Baskettail? If you are still unimpressed even now, how about the pink body and candy-apple red face of the Carmine Skimmer or its close cousin the Roseate Skimmer to set one's senses ablaze?

These few and many more are the reason for mid-winter daydreams of coming spring. It is to this end that this dragonfly enthusiast places his greatest hopes and longings. And whether you become a witness to these marvelous goings "to and fro" 'til season's end, they will not cease to put on one's of nature's most spectacular shows either dashing about on the wing or at rest atop a conspicuous perch.

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

Unending Mistake on the Distribution of the South American Emerald *Neocordulia* (*Mesocordulia*) *batesi batesi* (Selys, 1871)

Ângelo Parise Pinto, Programa de Pós-graduação em Ciências Biológicas (Zoologia) IB – USP, Museu de Zoologia, Universidade de São Paulo, SP, Brazil <odonata_angelo@hotmail.com> and **Alcimar L. Carvalho**, Laboratório de Biologia e Sistemática de Odonata, Departamento de Entomologia, Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, <alagoc@acd.ufrj.br>

Recently Pinto & Lamas (2010: 614) presented a table summarizing the records of Brazilian Corduliidae species based exclusively in the odonatological works published from the 20th Century. In that table *Neocordulia* (*Mesocordulia*) *batesi batesi* (Selys, 1871) was cited from São Paulo State in Brazil. Despite the authors' intention to be faithful to the published records, a distracted odonatologist can be led to an erroneous conclusion about the occurrence of this species in that state, and hence in the Brazilian biomes Atlantic Forest or Cerrado. Therefore an emendation is required to avoid misunderstanding.

Selys (1871: 312–313) described *Gomphomacromia batesi* in his Synopsis based in one male specimen. The only information on the topotype locality was "Patrie: Le haut Amazone a St.-Paulo, par M. [Henry Walter] Bates. (Coll. Selys.)". Following Selys' quotation there is no doubt that the collecting region of this specimen is in Brazilian Amazonia in a place called "São Paulo". Martin (1907: 54) in the Catalogue of Selys excluded the expression "St.-Paulo", referring just to "Haut-Amazone" and made a new record to Ecuador.

Calvert (1909) described the first Central American corduliid, i.e. *Neocordulia longipollex*, from Costa Rica, and did not mention *N. batesi*. However in a post-scriptum of that paper, Williamson (1909: 412) highlighted the similarity of Calvert's species with *N. batesi*. May (1991) revised the genus, recognizing *N. longipollex* as a subspecies of *N. batesi*. In addition, he recorded *N. batesi batesi* from Brazil (with doubt), Colombia, Ecuador and Peru, and *N. batesi longipollex* from Costa Rica, Mexico, Nicaragua and Panama. In the same paper, May (1991) erected a new subgenus (*Mesocordulia*) to include these two subspecies, *N. griphus* May, 1991 and *N. campana* May & Knopf, 1988. *N. caudacuta* De Marmels, 2008 from Venezuela (De Marmels, 2008) also should be included in this subgenus, which thus includes four species. These four species are distributed from northwestern South America to Mexico.

Apart from these aspects Costa et al. (2000: 8, 14) recorded *N. batesi* (probably referring to *Neocordulia batesi batesi*) from São Paulo State in the Southeastern Brazil, citing the Martin (1914) record in the Genera Insectorum. That record was followed by Heckman (2006) and in the table presented by Pinto & Lamas (2010). Martin (1914: 13) cited *N. batesi* to Goyaz [Goiás State?] and São Paulo in Brazil. However, as stated by Selys (1871), São Paulo is an Amazonian locality, and correctly presumed by May (1991), should be the municipality of São Paulo de Olivença located in the west region of Amazonas State in Brazil, a locality visited by Bates on 10 September of 1856. He resided there for the subsequent five months (Papavero, 1973: 260). Apparently May (cf. May, 1991; May & Knopf, 1988) did not consult the Genera Insectorum and neither examined the specimen of *N. batesi* from Goiás (if it still exists), making it impossible at the moment to confirm the authenticity of the Martin record.

Therefore the record from São Paulo State in Costa et al. (2000), repeated by Heckman (2006) and Pinto & Lamas (2010), is misleading, due the confusion between the municipality of São Paulo de Olivença, in the Brazilian Amazonia, and São Paulo State, which encompasses part of the Atlantic Forest and Cerrado biomes. The correct number of corduliids recorded from that state must be six species: *Cordulisantosia machadoi* (Costa & Santos, 2000); *Lauromacromia picinguaba* Carvalho, Salgado &Werneck-de-Carvalho, 2004; *Navicordulia errans* (Calvert, 1909); *Neocordulia androgynis* (Selys, 1871); *N. carlochagasi* Santos, 1967, and *N. setifera* (Hagen in Selys, 1871).

Furthermore, the newly described species *Neocordulia pedroi* Costa, Carriço & Santos, 2010, based on just one reared male specimen from Atlantic Forest (Espírito Santo State, southeast Brazil), considered by the authors as a *Mesocordulia* representative (due the absence of a biconical sternal process in S8, as well as the acute small ventrobasal tooth in the cerci), must have its status reconsidered. This newly emerged specimen, apparently crumpled, does not present any of the characteristic conditions of *Mesocordulia* in its F-0 exuvia. So, based on larval characters it is improbable that this species pertains to this subgenus (Pinto et al. in prep.).

We hope to have solved the problem of the erroneous record of *Neocordulia batesi batesi* from São Paulo state in Brazil, avoiding the repetition of that mistake in upcoming studies. The occurrence of that species in Goiás State needs additional investigation, but probably is a case of misidentification.

Acknowledgements

We wish to express our sincere thanks to Dr. Jessica L. Ware (at least for her attempt) and M. Sc. Danielle Anjos dos Santos for helped with the René Martin reference. Mike May kindly reviewed this note.

Literature Cited

Calvert, P.P. 1909. The first Central American corduline. Entomological News 20: 409–412. [post-scriptum by E.B. Williamson on p. 412].

Costa, J.M., A.B.M. Machado, F.A.A. Lencioni, and T.C. Santos. 2000. Diversidade e Distribuição dos Odonata (Insecta) no Estado de São Paulo, Brasil: Parte I-Lista das Espécies e registros bibliográficos. Publicações Avulsas do Museu Nacional 80: 1–27.

Costa, J.M., C. Carriço, and T.C. Santos. 2010. *Neocordulia pedroi* sp. nov. (Odonata: Corduliidae) from southeastern Brazil. Zootaxa 2685: 51–56.

De Marmels, J. 2008. *Neocordulia caudacuta* sp. nov. from the Coastal Cordillera, Venezuela (Odonata: Corduliidae). International Journal of Odonatology 11(1): 15–20.

Heckman, C.W. 2006. Encyclopedia of South American aquatic insects: Odonata—Anisoptera. Illustrated keys to known families, genera, and species in South America. Dordrecht: Springer. viii + 725.

May, M. 1991. A review of the genus *Neocordulia*, with a description of *Mesocordulia* subgen. nov. and of *Neocordulia griphus* spec. nov. from Central America, and a note on *Lauromacromia* (Odonata: Corduliidae). Folia Entomológica Mexicana 82: 17–67.

May, M. and K.W. Knopf. 1988. *Neocordulia campana* spec. nov., a new species of dragonfly from Panama (Anisoptera: Corduliidae). Odonatologica 17(1): 33–44.

Martin, R. 1906 [1907]. Cordulines. In: Catalogue Systématique et Descriptif des Collections Zoologiques Du Baron Edmond de Selys Longchamps. Fasc. 17. Bruxelles. Hayez, Impr. Des Académies. 94 p., pls. I–III.

Martin, R. 1914. Odonata, Fam. Libellulidae, Subfam. Cordulinae. Genera Insectorum 155: 1–32, pls. I–III.

Papavero, N. 1973. Essays on the history of Neotropical dipterology, with special reference to collectors (1750-1905). Vol. II. São Paulo: Museu de Zoologia Universidade de São Paulo, 446 pp.

Pinto, A.P. and C.J.E. Lamas. 2010. *Navicordulia aemulatrix* sp. nov. (Odonata: Corduliidae) from northeastern Santa Catarina State, Brazil. Revista Brasileira de Entomologia 54(4): 608–617.

Selys-Longchamps, E. de. 1871. Synopsis des Cordulines. Bulletins de L'Académie Royale Des Sciences, des Letres et des Beaux-Arts de Belgique (2) 31: 238–316; 519–565.

1937-2010: Odonata Associated with the Muddy River Watershed in Clark County, Nevada

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Long term surveys combined with short term intensive surveys where daily observations are repeated over a few seasons at the same sites, reveal species diversity and trends that cannot be observed any other way. Indeed, as one expert commented, ". . . after decades of study in Broome County, NY . . . I can probably find no more than 80% of the total species in a single given year" (Donnelly, 2004). In the Muddy River watershed, Dr. Richard Baumann of BYU–Provo and students have conducted surveys on a few days each month from March through October from 1984 to 2009 and Bruce Lund has been doing daily surveys in all months, but mainly from May through November from 2008 to 2010. As a result, the Muddy River watershed has the most surveyed and best documented Odonata fauna in Clark County, Nevada and this paper provides an up-to-date report. Of the forty-eight species listed in the OdonataCentral Clark County list, thirty-nine have been documented in the Muddy River watershed with two new species added.

The Muddy River Ecosystem and Odonata Survey Sites

The Muddy River ecosystem is unique for a number of reasons: 1) it originates from and is sustained by more than 20 warm (32°C) headwater and riverside springs, 2) the groundwater springs sustain a consistent 36,000 acre-feet year-round flow as the river meanders for 32 river miles from its headwaters starting at 550 m elevation to its mouth at Lake Mead at 385 m, 3) while flowing through Mojave Desert that is the hottest and driest of the North American deserts with a 10 cm average annual precipitation, this river ecosystem includes warm spring, stream, river, marsh, pond, adjacent field and woodland habitats that support a relatively high concentration and diversity

of Odonata species, and 4) the warm headwater springs and streams create warm microhabitats that support year-round flight periods for a number of Odonata species.

History of Odonata Surveys

The North American Odonata Dot Map Project documented species occurrences in Nevada back to the first published literature in 1915, providing early records for state and Clark County species (Donnelly, 2004a,b,c). The Clark County checklist on the OdonataCentral web site incorporates the North American Odonata Dot Map records to 2004 plus new records and photographs (referred to as "OC#" in this paper) to 2010 (Abbott, 2010). The first surveys conducted in Clark County were by Ira LaRivers in 1937–1938 where he documented eleven species that were confirmed by Dr. James Needham (LaRivers, 1938, 1940). However, LaRivers seems to have done a minimum of surveying in the Muddy River area because while his publication map shows Overton, Nevada as a survey site, he only lists a *Sympetrum corruptum* (Variegated Meadowhawk) collection. Even so, this is the first odonate record for the Muddy River area.

The next Muddy River surveys began nearly fifty years later led by Dr. Richard Baumann and BYU students from September 1984 to September 2009. A brief article in Argia listed 25 species from five families collected from 1996–1997 that were vetted by Dr. Sidney Dunkle and that "four species represent new state records for Nevada" (Baumann & Huillet, 2000). However, this claim was modest because an analysis of the specimens in the BYU–Provo collections shows that Baumann and students have accumulated the first Clark County records for 17 species, four being state records.

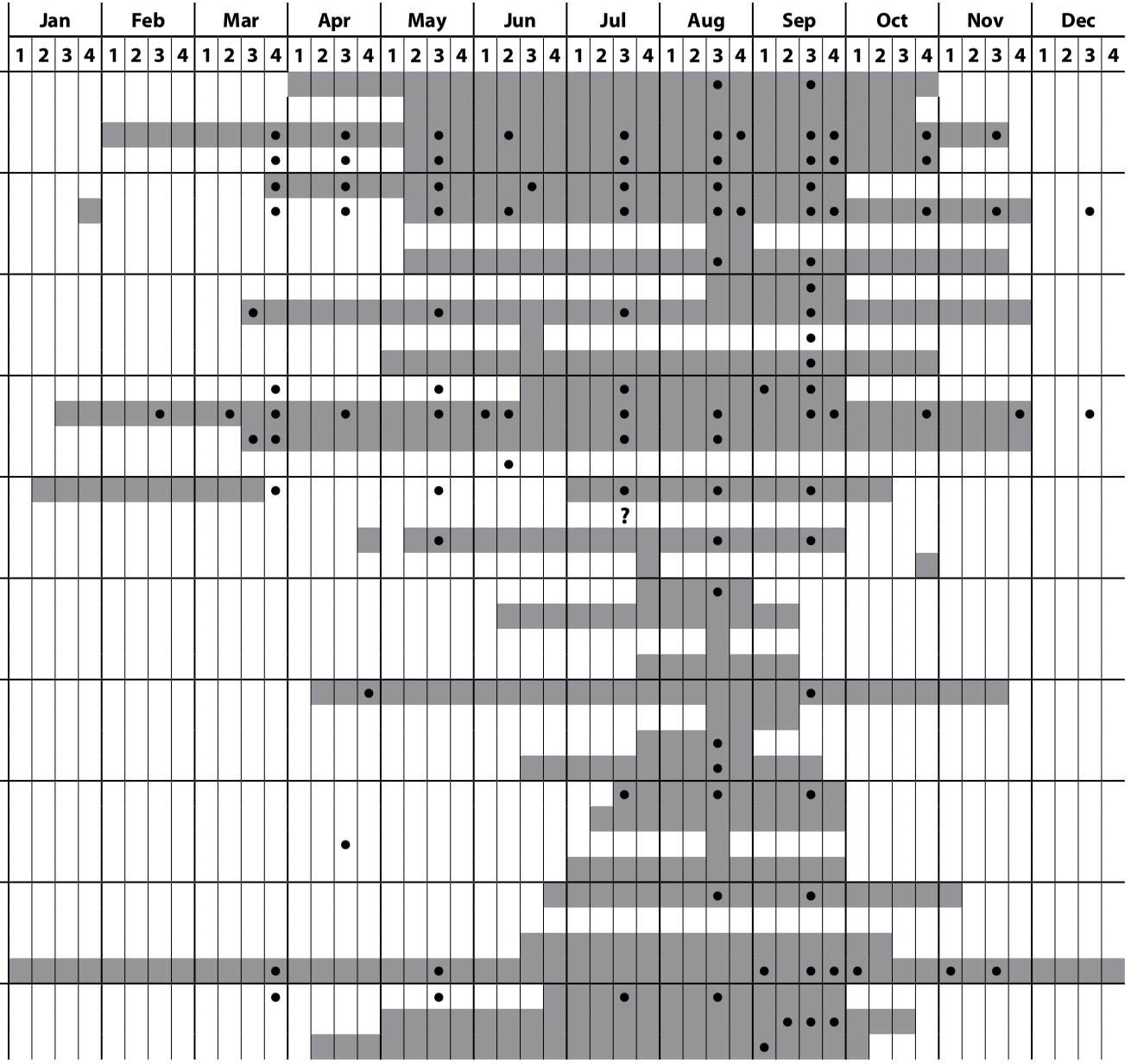
In 2000, Potter photographed and Paulson confirmed *Libellula luctuosa* (Widow Skimmer) as the first Clark County record from Bowman Reservoir (Paulson & Potter, 2000). Subsequent sightings have shown this to be a common species over large ponds at the Hidden Valley (OC# 313359) and the Overton Wildlife Management Area (OC# 314396) sites.

Table 1. Species occurrences throughout Muddy River sites. **MRH** = Muddy River Headwaters, **MVWC** = Meadow Valley Wash: Clark Co., **MVWL** = Meadow Valley Wash: Lincoln Co., **HVR** = Hidden Valley Rd. Pond and Marsh, **OWMA** = Overton Wildlife Management Area, **BR** = Bowman Reservoir.

Species	MRH	MVWC	MVWL	HVR	OWMA	BR	Males	Females	Paired	Egg-laying
Anax junius (Common Green Darner)	●	●	●	●	●		●	●	●	●
Argia agrioides (California Dancer)	●			●			●			
Argia immunda (Kiowa Dancer)	●						●	●	●	●
Argia moesta (Powdered Dancer)	●	●	●	●	●		●	●	●	●
Argia nahuana (Aztec Dancer)	●						●			
Argia sedula (Blue-ringed Dancer)	●	●	●	●	●		●	●	●	●
Brachymesia furcata (Red-tailed Pennant)	●						●			
Brechmorhoga mendax (Pale-faced Clubskimmer)	●		●	●	●		●			
Enallagma carunculatum (Tule Bluet)	●				●		●			
Enallagma civile (Familiar Bluet)	●	●	●	●	●		●	●	●	
Enallagma praevarum (Arroyo Bluet)				●	●		●	●		
Erpetogomphus compositus (White-belted Ringtail)	●	●	●	●	●		●	●		
Erythemis collocata (Western Pondhawk)	●	●	●	●	●		●	●	●	●
Hetaerina americana (American Rubyspot)	●	●	●	●	●		●	●		
Ischnura barberi (Desert Forktail)	●	●		●	●		●	●	●	
Ischnura cervula (Pacific Forktail	●									
Ischnura denticollis (Black-fronted Forktail)	●	●	●	●	●		●	●	●	
Ischnura hastata (Citrine Forktail)	●									
Libellula comanche (Comanche Skimmer)	●	●	●	●	●		●	●	●	●
Libellula composita (Bleached Skimmer)	●						●			
Libellula forensis (Eight-spotted Skimmer)	●	●	●	●	●		●			
Libellula luctuosa (Widow Skimmer)	●	●		●	●	●	●	●	●	
Libellula nodisticta (Hoary Skimmer)	●						●			
Libellula pulchella (Twelve-spotted Skimmer)	●	●			●		●	●		
Libellula saturata (Flame Skimmer)	●	●	●	●	●		●	●	●	●
Macrodiplax balteata (Marl Pennant)	●			●			●	●	●	
Orthemis ferruginea (Roseate Skimmer)	●	●	●		●		●	●		
Pachydiplax longipennis (Blue Dasher)	●	●	●	●	●		●	●	●	●
Pantala hymenaea (Spot-winged Glider)	●	●	●		●		●			
Perithemis intensa (Mexican Amberwing)			●	●	●		●	●		
Plathemis subornata (Desert Whitetail)	●	●					●			
Progomphus borealis (Gray Sanddragon)	●	●	●				●			
Rhionaeschna multicolor (Blue-eyed Darner)	●	●	●	●	●		●	●	●	●
Stylurus intricatus (Brimstone Clubtail)				●						
Stylurus plagiatus (Russet-tipped Clubtail)	●	●	●		●		●	●		
Sympetrum corruptum (Variegated Meadowhawk)	●	●	●		●		●	●	●	●
Telebasis salva (Desert Firetail)	●	●		●	●		●	●	●	●
Tramea lacerata (Black Saddlebags)	●		●	●	●		●	●	●	●
Tramea onusta (Red Saddlebags)	●	●	●	●	●		●			

Lund conducted 226 surveys at five Muddy River sites (Muddy River Headwaters 151 visits, Meadow Valley Wash Clark County 12 visits, Meadow Valley Wash Lincoln County 14 visits, Hidden Valley pond and marsh 18 visits, and Overton Wildlife Management Area 31 visits)

Table 2. Annual flight occurrence for all species to date. Shaded cells = Lund records, ● = Baumann and student BYU records; numbers below months represent quarters.



from August 2008 to November 2010. Site visits were made in all months with most in May through November when Odonata numbers and variety of species were at their peaks. These surveys added five new County records and one Nevada state record.

There were six main survey sites along the Muddy River in northeast Clark County, Nevada (Muddy River Headwaters, Meadow Valley Wash Lincoln County, Meadow Valley Wash Clark County, Hidden Valley Pond and Marshes, Overton Wildlife Management Area, Bowman Reservoir). GPS locations, elevations, and habitat descriptions for each site (except for Bowman Reservoir) can be found as part of individual species records on the OdonataCentral web site.

Species Observations and Comments

Table 1 shows species occurrences throughout the study area. Twenty-three of 39 species have been found at either four or five of the five survey sites. These 23 species are considered "common" and should be expected to be found on any survey in suitable habitat in the Muddy River area during their seasonal flight periods and Table 2 illustrates the annual flight occurrence periods observed for all species to date.

Special comments are noted below for first Clark County and Nevada state records in the Muddy River area, and a few other noteworthy observations.

Argia agrioides (California Dancer) is confirmed in the Muddy River from OdonataCentral vetted photograph (OC# 314758) from Lund; however, no specimens were collected by Baumann and students. *A. nahuana* (Aztec Dancer) is confirmed by 31 specimens collected by Baumann and students in the BYU–Provo collections and from OdonataCentral photographs (OC# 313320, 313321, 322483) from Lund. Since the ranges of these two species overlap in Clark County and there is high quality habitat in the Muddy River ecosystem, a more equal occurrence record between the two species would seem to be expected. However, it is noteworthy that similar uneven occurrence counts are seen in two other sources. An Odonata survey at the Ash Meadows National Wildlife Refuge documented only a single *Argia agrioides* occurrence in 19 survey sites as compared to 17 *Argia nahuana* occurrences spread over 9 of the 19 sites (Stevens & Bailowitz, 2008). Ash Meadows NWR is in Nye County, Nevada, less than 20 miles west of Clark County, is also well within the range of both species, and has high quality wetland habitats similar to those in the Muddy River. The North American Odonata Dot Maps show a single occurrence in Nevada for *A. agrioides* and three for *A. nahuana* (Donnelly, 2004c). These two species are similar and notoriously difficult to identify and a focus on these species should be made to understand their status in the Muddy River area.

Argia immunda (Kiowa Dancer) was collected by Baumann and Huillet as the first Clark County record in the Muddy River Headwaters site. They recognized this as an outlying population hundreds of miles to the north and west of its contiguous range by noting that this "large *Argia immunda* population was somewhat surprising" (Baumann & Huillet, 2000). Indeed, Lund's surveys have found this population to be well established and one of the most abundant species to be found in the Moapa Valley NWR within the Muddy River Headwaters site. Here they occur in association with the warm springs and streams in virtually all months of the year. The North American Odonata Dot Map shows two occurrences in Nevada with one being the Baumann and Huillet occurrence (Donnelly, 2004b).

Brachymesia furcata (Red-tailed Pennant) was photographed as the first Nevada state record by Lund in the Muddy River Headwaters site in 2009 with at least four males interacting in an abandoned spring-fed swimming pool (OC# 314669, 314706). At least two males were observed again in the same site in 2010 and suggest this may be a resident species at this site. The North American Odonata Dot Map shows no occurrences in Nevada (Donnelly, 2004c).

Brechmorhoga mendax (Pale-faced Clubskimmer) was collected by Baumann and Huillet as the first Nevada state record in 1997 in the Muddy River Headwaters site. Subsequent collections and photographs made by Lund in the same site (OC# 314666) and other Clark County sites (OC# 7088) suggest this is a resident species. The North American Odonata Dot Map shows one occurrence that is the Baumann and Huillet point (Donnelly, 2004b).

Enallagma carunculatum (Tule Bluet) was collected as the first Clark County Record from two BYU specimens collected on September 2009 at the Muddy River Headwaters site. Lund photographed a subsequent sighting at the Hidden Valley Marsh site (OC# 313354). The North American Odonata Dot Map shows 15 occurrences in northern Nevada (Donnelly, 2004c).

Ischnura barberi (Desert Forktail) was collected as the first Nevada state record by Baumann and Huillet in the Muddy River Headwaters site in 1997. Lund subsequently collected specimens and photographs at three other Muddy River sites that suggest this is a resident species (OC# 314618, 314496, 314322, 313387). The North American Odonata Dot Map shows three occurrences in northern Nevada (Donnelly, 2004c)

Ischnura hastata (Citrine Forktail) was collected as the first Nevada state record by Baumann and Huillet in the Muddy River Headwaters in 1997 and is the only state occurrence to date. The North American Odonata Dot Map shows no occurrences in Nevada (Donnelly, 2004c).

Libellula composita (Bleached Skimmer) was photographed as the first Clark County record by Lund in the Muddy River Headwaters site in 2009 (OC# 314388). A sighting in 2010 at the same site suggests this may be a resident species at this site. Lund also collected a specimen in the Virgin River in Clark County in 2010. The North American Odonata Dot Map shows seven occurrences in the northern half of Nevada (Donnelly, 2004a).

Libellula forensis (Eight-spotted Skimmer) was photographed as the first Clark County record by Lund in the Overton Wildlife Management Area in 2009 (OC# 314394). Additional 2010 occurrences have documented this species at each of the five Muddy River survey sites which suggests this is a resident species. However, it is interesting to note that there has only been one individual seen at each of the five sites to date. The North American Odonata Dot Map shows fourteen occurrences in the northern half of Nevada (Donnelly, 2004a).

Libellula nodisticta (Hoary Skimmer) was photographed as the first Clark County record by Lund in the Muddy River Headwaters site in 2010 (OC# 322340). This is the only occurrence to date. The North American Odonata Dot Map shows eight occurrences in the northern half of Nevada (Donnelly, 2004a).

Macrodiplax balteata (Marl Pennant) was photographed and collected as the first Clark County record by Lund in the Hidden Pond and Marshes site in 2009 (OC# 314733, 314780). Multiple males and females were observed and photographed in 2009 and 2010 flying in pairs and ovipositing indicating this is a resident species at this site. A 2010 observation in the Muddy River Headwaters site suggests species may occur more widely or be spreading out from the Hidden Pond site. The first and only other Nevada record to date was made in 2005 at Ash Meadows National Wildlife Refuge (Stevens & Bailowitz, 2008). The North American Odonata Dot Map shows no occurrences in Nevada (Donnelly, 2004a),

Plathemis subornata (Desert Whitetail) was collected as the first Clark County record by Huillet in the Muddy River Headwaters in 1997. A second sighting was photographed in the Meadow Valley Wash Clark County site by Lund (OC# 313394). This seems an unusually low occurrence rate for the species since the Muddy River is in the middle of its natural range and has quality habitat. The North American Odonata Dot Map shows eleven occurrences in the northern half of Nevada (Donnelly, 2004a).

Progomphus borealis (Gray Sanddragon) was photographed as the first Clark County record by Lund in the Muddy River Headwaters in July 2009 (OC# 314162). Subsequent sightings at the Muddy River Headwaters and Meadow Valley Wash sites in 2009 and 2010 (OC# 314329, 314478) suggest this is a resident species. The North American Odonata Dot Map shows one occurrence in northern Nevada (Donnelly, 2004a).

Stylurus intricatus (Brimstone Clubtail) was collected as the first Clark County record from the Muddy River area by J. Cross & J. Proscu in (no date) and vetted by D.B. Thomas in the BYU collection. Its location was generally described but would place it in or near the Hidden Valley Pond and Marshes site. North American Odonata Dot Map shows three occurrences in northern Nevada (Donnelly, 2004a).

Stylurus plagiatus (Russet-tipped Clubtail) was collected as the first Nevada state record by Baumann and Huillet in the Muddy River Headwaters in 1997. Subsequent photographs by Lund in 2003 (OC# 325936) and in 2009 (OC# 313115) and numerous field observations in the Muddy River Headwaters suggest this is a resident species at this site. The North American Odonata Dot Map shows no occurrences in Nevada (Donnelly, 2004a).

Argia sedula (Blue-ringed Dancer), *Argia immunda* (Kiowa Dancer), *Ischnura denticollis* (Black-fronted Forktail), and *Hetaerina americana* (American Rubyspot) have been observed flying as occasional individuals throughout the winter months of December, January, and February by Lund. These were in association with warm springs and streams where warm water and air microhabitats may allow them and their insect prey to be active during colder temperatures.

Acknowledgments

We express our sincere thanks to Sidney Dunkle who verified many of the collections for Richard Baumann and his BYU students, John C. Abbott and his expert vetters at OdonataCentral who identified many species as evidenced by the photographs referenced in this paper, and to Dennis Paulson who has been unfailingly helpful in identifying photographs and specimens in general and for reviewing and correcting identifications of *Argia agrioides* photographs in particular. We also offer our gratitude and appreciation to Dr. Richard Baumann for his mentoring role over the years and providing access to the BYU–Provo invertebrate collections.

Literature Cited

Abbott, J.C. 2010. OdonataCentral: An online resource for the distribution and identification of Odonata. Texas Natural Science Center, The University of Texas at Austin. Available at <http://www.odonatacentral.org>.

Baumann, R., and A. Huillet. 2000. Odonata of Moapa Warm Springs, Clark County, Nevada. ARGIA 12: 2–3.

Donnelly, T.W. 2004a. Distribution of North American Odonata. Part I. Aeshnidae, Petaluridae, Gomphidae, Cordulegastridae. Bulletin of American Odonatology 7: 61–90.

Donnelly, T.W. 2004b. Distribution of North American Odonata. Part II. Macromidae, Corduliidae, Libellulidae. Bulletin of American Odonatology 8: 1–32.

Donnelly, T.W. 2004c. Distribution of North American Odonata. Part III. Calopterygidae, Lestidae, Coenagrionidae, Protoneuridae, Platystictidae. Bulletin of American Odonatology 8: 33–99.

LaRivers, I. 1938. An Annotated List of the Libelluloidea (Odonata) of Southern Nevada. Pomona College Journal of Entomology and Zoology.

LaRivers, I. 1940. A Preliminary Synopsis of the Dragonflies of Nevada. The Pan-Pacific Entomologist, p 111–123.

Paulson, D. and S. Potter. 2000. Three Dragonflies New to Nevada. ARGIA 12: 3.

Paulson, D. 2009. Dragonflies and Damselflies of the West. Princeton University Press, Princeton, NJ.

Stevens, L. and R. Bailowitz. 2008. Odonata of Ash Meadows National Wildlife Refuge, Southern Nevada, USA. Journal of the Arizona–Nevada Academy of Science 40: 128–135.

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).

River Jewelwing, *Calopteryx aequabilis* Say, New to Northwest Territories

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The River Jewelwing, *Calopteryx aequabilis* Say, has a widespread boreal distribution in North America (Westfall & May, 2006). It occurs in central Alberta and central Saskatchewan (Donnelly, 2004) and in northern British Columbia east of Fort Nelson at approximately 59°N (R. Cannings, pers. comm.). In British Columbia it was previously known only from Christina Creek in the southern interior (Cannings, 2002, 2003). Although it is shown as occurring in Northwest Territories by Acorn (2004) there is no literature report and no supporting specimen at CNC (AAFC Ottawa) or UASM (E.H. Strickland Entomological Museum) and this part of the range cannot be substantiated (J.H. Acorn, pers. comm. 2009). The species has not been included in listings of Northwest Territories Odonata (Catling et al., 2005). However, Nahanni National Park Reserve biologist Doug Tate saw an individual in the town site of Jean Marie River (61.5234° N, 120.6314° W), southeast of Fort Simpson, on 24 and 25 June 2009. It was not possible to secure a specimen or a good photograph. This sight record is, however, not to be disputed because no other NWT odonate has brown wings and an iridescent green body and Doug was familiar with this species in Ontario. The specimen was a female; it had uniformly brown wings with white pterostigmas. This observation alerted people to the presence of this species in NWT and it made the possibility of encountering it elsewhere more likely.

On 10 July 2010 we (Catling and Kostiuk) stopped at the Mackenzie Highway bridge over the Kakisa River (60.9887° N, 117.2441° W) near the southwest end of Great Slave Lake. Walking north along the west bank, we observed approximately ten males of *Calopteryx aequabilis*. They were all confined to the shoreline and flew close to, and beneath, overhanging sedges (*Carex atherodes*), which grew to 1.5 m high. They rarely flew more than 2 dm above the water and rarely more than 1 m from the shore. The river at this point was fast moving over a variable bottom of stone, sand and silt. The jewelwings were remarkably inconspicuous and could easily have been overlooked without the directed search mandated by Tate's observation at Jean Marie River. Nowhere in the more southerly portions of the range to the east have we found this species so inconspicuous. Possibly the large numbers of *Aeshna* (mostly *A. juncea*) present made *C. aequabilis* more secretive than usual. We saw at least 100 individuals of *Aeshna* in five minutes.

These observations raise a number of questions. The fact that only males were seen on the Kakisa River in July suggests that the flight season was just beginning. As males usually emerge before females, this makes the observation of a female at Jean Marie River in late June surprising. There might also be differences in behavior between eastern North American and northwestern populations, the latter being more secretive and less conspicuous.

This most recent recorded species in Northwest Territories brings the territorial list of Odonata species (Catling et al. 2004, 2005) to 42 and extends the range of *Calopteryx aequabilis* to north of 60°N. The species was surprisingly inconspicuous at the Kakisa River, and we believe that entomologists previously stopping at the bridge, rather than being a new arrival in the area, overlooked it.

Literature Cited

Acorn, J. 2004. Damselflies of Alberta. University of Alberta Press. 156 pp.

Cannings, R.A. 2002. Introducing the dragonflies of British Columbia and the Yukon. Royal British Columbia Museum. 96 pp.

Cannings, S.G. 2003. Status of River Jewelwing (*Calopteryx aequabilis* Say) in British Columbia. Unpublished report, Conservation Data Centre, B.C. Ministry of Sustainable Resource Management, Victoria, BC. 17 pp.

Catling, P.M., S. Carriere, D. Johnson and M. Fournier. 2004. Dragonflies of the Northwest Territories, Canada: New records, ecological observations and a checklist. Argia 16: 9–13.

Catling, P.M., R.A. Cannings, and P.M. Brunelle. 2005. An annotated checklist of the Odonata of Canada. Bulletin of American Odonatology 9: 1–20.

Donnelly, T.W. 2004. Distribution of North American Odonata, part III: Calopterigidae, Lestidae, Coenagrionidae, Protoneuridae, Platystictidae. Bulletin of American Odonatology 8: 33–99.

Westfall, M.J. and M.L. May. 2006. Damselflies of North America, revised edition. Scientific Publishers, Gainesville. 502 pp.

Dragonflies of Ives Road Fen Preserve

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Ives Road Fen is the property of The Nature Conservancy (TNC). It is located in southeast Michigan, Lenawee County. The fen was nearly lost to agriculture and invasive species until 1979 when the botanist, Bob Smith, discovered this dying habitat. He sent reports of his find to TNC, Michigan Nature Association (MNA) and The Department of Natural Resources (DNR). In 1987, TNC started purchasing what is now known as Ives Road Fen Preserve. In 1990, restoration efforts started with permanent staff and volunteers. To date, the preserve contains approximately one hundred acres of fen prairie, three hundred acres of floodplain forest, and almost three hundred acres of upland fields. To get a better understanding of this area, early in the spring we spent two weekends working in the volunteer program, which is the heart of the fen restoration. We were so impressed with the program that we plan on spending a few weekends in 2011 helping out. Chuck Person, the preserve volunteer crew chief, was very helpful in his extensive knowledge of the area. TNC is very fortunate to have such a dedicated and knowledgeable worker.

We spent a great deal of time at the fen. We were granted permission by TNC to do a small research project involving *Somatochlora tenebrosa* (Clamp-tipped Emerald). Although this project was not successful, we may post the results in Argia at a later date. During the time spent at the fen, we decided to make a collection of dragonflies of Ives Road Fen.

Near the end of the season my daughter, Chelsey, suggested that we include dragonflies listed in the Michigan Odonate Survey along with the years that they were collected. She gathered and organized all of the collecting data. We started collecting 26 May 2010 and ended 30 September of the same year. On two occasions, we collected with Derek Kaczor, a senior student at Siena Heights University. He was collecting dragonflies for his senior project. Being that he was also a member of the baseball team, we found that he was very good with a net! His specimens are included with mine listed as collected in 2010. TNC was interested in a species list. The actual dates collected are not included, only the years indicating if the species was present. The list that follows is the one sent to TNC.

Numbers following species indicate the years that species has been collected. Information prior to 2010 is from the Michigan Odonata Survey database maintained by Mark O'Brien (mfobrien@umich.edu).

Zygoptera (Damselflies)

Calopterygidae (Broad-winged Damselflies)
- *Calopteryx maculata* (Ebony Jewelwing), 98, 10
- *Hetaerina americana* (American Rubyspot), 10
- *Hetaerina titia* (Smoky Rubyspot), 10

Lestidae (Spreadwings)
- *Lestes eurinus* (Amber-winged Spreadwing), 03
- *Lestes inaequalis* (Elegant Spreadwing), 10
- *Lestes rectangularis* (Slender Spreadwing), 10

Coenagrionidae (Pond Damselflies)
- *Argia moesta* (Powdered Dancer), 10
- *Argia apicalis* (Blue-fronted Dancer), 01, 10
- *Argia tibialis* (Blue-tipped Dancer), 98, 10
- *Amphiagrion saucium* (Eastern Red Damsel), 94, 98, 00, 10
- *Enallagma aspersum* (Azure Bluet), 02, 03
- *Enallagma carunculatum* (Tule Bluet), 00
- *Enallagma basidens* (Double-striped Bluet), 93, 98, 01, 10
- *Ischnura hastata* (Citrine Forktail), 02, 03
- *Ischnura verticalis* (Eastern Forktail), 00, 01
- *Nehalennia gracilis* (Sphagnum Sprite), 98
- *Nehalennia irene* (Sedge Sprite), 98

Anisoptera (Dragonflies)

Aeshnidae (Darners)
- *Anax junius* (Common Green Darner), 00, 10
- *Anax longipes* (Comet Darner), 03
- *Boyeria vinosa* (Fawn Darner), 10
- *Rhionaeschna mutata* (Spatterdock Darner), 10

Gomphidae (Clubtails)
- *Gomphus fraternus* (Midland Clubtail), 10

Cordulegastridae (Spiketails)
- *Cordulegaster bilineata* (Brown Spiketail), 94

Corduliidae (Emeralds)
- *Somatochlora tenebrosa* (Clamp-tipped Emerald), 03, 10

Libellulidae (Skimmers)
- *Celithemis elisa* (Calico Pennant), 10
- *Celithemis eponina* (Halloween Pennant), 98, 00, 10
- *Erythemis simplicicollis* (Eastern Pondhawk), 10
- *Leucorrhinia intacta* (Dot-tailed Whiteface), 10
- *Libellula luctuosa* (Widow Skimmer), 10
- *Nannothemis bella* (Elfin Skimmer), 03
- *Pachydiplax longipennis* (Blue Dasher), 10
- *Plathemis lydia* (Common Whitetail), 10
- *Sympetrum corruptum* (Variegated Meadowhawk), 00
- *Sympetrum obtrusum* (White-faced Meadowhawk). 10
- *Sympetrum rubicundulum* (Ruby Meadowhawk), 98, 00, 01, 10
- *Sympetrum semicinctum* (Banded-winged Meadowhawk, 01, 10
- *Sympetrum vicinum* (Yellow-legged Meadowhawk, 91, 10
- *Tramea lacerata* (Black Saddlebags), 01

Wetland Mitigation Sites Can Provide Excellent Odonate Habitat

Cary Kerst <cary_k@comcast.net>

In 1999, Steve Gordon and I began visiting a series of small ponds (Sandpiper Pond) in the West Eugene Wetlands in Eugene, Oregon. There are three adjacent ponds that were constructed on a 48-acre former sheep pasture as mitigation for Oregon Department of Transportation (ODOT) highway projects. The goals of the mitigation project were restoration of native wet prairie and provision of habitat for western pond turtles. Rising water levels cause the ponds to merge forming a single large pond during winter (Shippey, 2009).

The site is especially interesting because it is surrounded by industrial land and not where one might expect to find excellent wetland habitat, and one of the most diverse odonate habitats in Oregon's Willamette Valley.

During construction, the site was seeded with native plants, and the margins of the ponds were planted with wet tolerant shrubs. Logs were anchored in the ponds to provide basking sites for turtles. The plantings were completed in 1995 just prior to a very wet winter, which flooded the entire site and wiped out nearly all of the plantings (Shippey, 2009). Very shortly after that, a ring of cottonwoods and willows sprang up surrounding the ponds. The site was maintained under an ODOT/City of Eugene/Bureau of Land Management partnership but is now being transferred to the City of Eugene (City).

The water level in the ponds was higher than studies prior to construction suggested, and the logs anchored in the ponds remain submerged except during the driest summers. Western pond turtles have not been found at the site although they do inhabit an old gravel pit (Grimes Pond) adjacent to Sandpiper Pond. Sandpiper Pond has been found to be excellent odonate habitat mainly due to a set of serendipitous circumstances. The ponds are located in the 3000-acre protected West Eugene Wetlands adjacent to an urban stream channel, Bertelsen Slough, Grimes Pond, and a seasonal pond (Stewart Pond). Thus, odonates from nearby habitat were readily available for colonizing the new ponds.

In addition, the site design for pond turtles has proved to provide excellent habitat for dragonflies and damselflies. Soils were carefully managed and wood was placed in the ponds. The pond banks were low gradient and some were wicking-designed such that they would stay wet. These wet banks are now well vegetated and adult *Lestes* (spreadwings) and *Sympetrum* (meadowhawks) especially seem to favor these locations. The meadowhawks are often seen ovipositing in these spots. The low gradient banks support a good stand of emergent vegetation providing good perching and ovipositing sites. Many of the young willows and cottonwoods at the low water line were partially submerged during high water and died providing good perch sites for adult odonates. In addition, the site is surrounded by open areas, which provide good feeding habitat. Thus, if wetland mitigation site design paid attention to such details, these sites could provide excellent habit for odonates as well as other species.

Steve Gordon and I have made numerous visits to Sandpiper Pond and conducted dragonfly walks here for 11 years. We made no effort to standardize the level of effort for the surveys that were done each year. Thus, the data shown in the table below are somewhat anecdotal but represent numerous visits each summer.

During the first year of our visits (1999), we logged 14 species with an additional five species added in 2000. After 2000, the number of new species encountered at the site were few but six new species were added in 2004. Several interesting finds have been made at Sandpiper Pond over the years. A single *Sympetrum obtrusum* (White-faced Meadowhawk) was found here and is the only western Oregon record for this species. However, it was a very ragged individual taken in late fall which had obviously come down from the mountains due to cold weather. The ponds also provided the only Willamette Valley record of *Sympetrum internum* (Cherry-faced Meadowhawk) since the 1930s. Sandpiper Pond is also the only place in Oregon where *Pantala flavescens* (Wandering Glider) has been observed mating and ovipositing. On 13 August 2005, I observed several pairs ovipositing, and pairs continued to be observed into September that year. However, it seems unlikely that this migratory species would complete its life cycle this late in the year in Oregon. The population of *Enallagma boreale* (Boreal Bluet) found here is the only Willamette Valley population.

There are additional species that have only been encountered once (or during one season) at the site including *Epitheca canis* (Beaverpond Baskettail), *Leucorrhinia intacta* (Dot-tailed Whiteface), *Libellula quadrimaculata* (Four-spotted Skimmer), *Gomphus kurilis* (Pacific Clubtail), *Aeshna umbrosa* (Shadow Darner), and *Amphiagrion abbreviatum* (Western Red Damsel). None of these species is reliably found at Sandpiper Pond to date. Through 2009, 38 species have been found at the ponds.

We might expect that the species composition would stabilize after some years of recruitment, and the population now consists of approximately 28 species that could reasonably be expected to be found during a season. Since odonates are adept at moving and colonizing new sites, additional species are likely to be found each year. On any given warm summer day, one can find 20 species flying. Some species may be eliminated over time due to competition. Other factors, which can influence the population, are predation and habitat changes. In 2000, fish were first observed in the ponds. The population of fish seemed to be quite large initially but seems smaller and stable now.

The cottonwoods surrounding the pond had grown vigorously over the years shading much of the ponds and certainly could be expected to negatively impact the odonate population. Dennis Paulson (pers com) described a similar situation at a site he studied in Washington where the odonate population had been negatively impacted by shading from cottonwood trees. An unexpected result of the vegetative growth was a dramatic increase in homeless camping in the area and problems associated with that activity. However, as these things were happening, the City assumed responsibility for maintenance of the area in 2008 and removed 40 cubic yards of camping debris. The City also cut many of the cottonwoods to discour-

Species encountered at Sandpiper Pond by year.

Year	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Number of species	14	13	13	16	20	26	27	24	23	19	25
New species		5	2	2	2	6	4	0	1	0	2

age camping and other illicit activities, to maximize open water characteristics of the site, and to enhance overall plant diversity of the area by providing spaces more suitable for herbaceous species to grow (Paul Gordon, pers. comm.). These activities are likely to mitigate the negative impacts of shading and camping on the odonate habitat of the site. It will be especially interesting to follow odonate diversity at the site in future years.

The list of resident species at Sandpiper Pond include the following:

Aeshna palmata (Paddle-tailed Darner)
Anax junius (Common Green Darner)
Archilestes californica (California Spreadwing)
Enallagma boreale (Boreal Bluet)
Enallagma carunculatum (Tule Bluet)
Epitheca spinigera (Spiny Baskettail)
Erythemis collocata (Western Pondhawk)
Ischnura cervula (Pacific Forktail)
Ischnura perparva (Western Forktail)
Lestes congener (Spotted Spreadwing)
Lestes disjunctus (Northern Spreadwing)
Lestes dryas (Emerald Spreadwing)
Lestes unguiculatus (Lyre-tipped Spreadwing)
Libellula forensis (Eight-spotted Skimmer)
Libellula luctuosa (Widow Skimmer)
Libellula pulchella (Twelve-spotted Skimmer)
Libellula saturata (Flame Skimmer)
Pachydiplax longipennis (Blue Dasher)
Plathemis lydia (Common Whitetail)
Rhionaeschna californica (California Darner)
Rhionaeschna multicolor (Blue-eyed Darner)
Sympetrum corruptum (Variegated Meadowhawk)
Sympetrum costiferum (Saffron-winged Meadowhawk)
Sympetrum illotum (Cardinal Meadowhawk)
Sympetrum semicinctum (Band-winged Meadowhawk)
Sympetrum pallipes (Striped Meadowhawk)
Sympetrum vicinum (Autumn Meadowhawk)
Tramea lacerata (Black Saddlebags)

Literature Cited

Shippey, M. 2009. History and Habitat in the Making, Willamette Resources and Education Newsletter. 5(2).

A Visit to the Prairie Potholes of Western Minnesota: MOSP Gathering 23–25 July 2010

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Northwest of the town of Morris in western Minnesota, a line of cars and US Forest and Wildlife Service (USFWS) vans kicked up dust on an empty township road, slowed, then turned, one after another, into a parking lot overgrown with bromegrass that swept and tickled the bellies of the vehicles as they entered. The doors opened and the hunters clambered out, nearly two dozen, each with a net or camera in hand, each ready to sweep the cattails clean of dragonflies. Overhead popcorn clouds drifted through blue sky.

"Meet back here in one hour," shouts Kurt Mead, as the group evolves and radiates out in multiple directions. After authoring Dragonflies of the Northwoods, Mead launched the Minnesota Odonata Survey Project (MOSP) in 2005 and presides over this gathering, the fifth annual MOSP, with a comfortable and welcome jauntiness. A homesteader in northern Minnesota who has the build and demeanor of a French-Canadian, Kurt has only recently returned from a year in Sweden, a year building log homes, swinging an axe instead of a dragonfly net.

Most of us had arrived Friday afternoon. After checking into our rooms at the summer-vacant dorms on the University of Minnesota Morris campus, we gathered for an evening potluck outside the USFWS-Morris Wetland Management District headquarters a few miles east of town. The landscape was stark and open, a beautifully wide expanse of farmland, prairie, and cattail marshes. As we ate, a wall of thunderstorms appeared in the west, so far away that no sound reached us and the lightning looked like snow upon slopes of distant mountains.

After the last bite of grilled brat and final forkful of salad, we made our way inside, ahead of the threatening weather. I lingered awhile in the visitor's center, looking over the various displays and posters—invasive species, threatened species, the whole unsavory history of the clearances of Native Peoples. Once a vast tall grass prairie interspersed with thousands upon thousands of prairie pothole wetlands, ninety percent of the original wetlands have been drained since settlement in the late 1800s. All but one percent of the original prairie has been turned over and farmed. The Odonata found here this weekend were survivors of a near total erasure of habitat. To the almost clichéd images of pre-settlement abundance—the thundering herds of bison, the sun-blotting flocks of waterfowl—I'm tempted to imagine a haze of dragonflies.

Balanced against this narrative of ecological disaster, the USFWS puts forth their palliative promise, which is to acquire, develop, and manage habitat for waterfowl production. In an average year, the district seeds 300 acres of tilled land back to native grassland species and restores forty drained wetlands. The restoration of wetlands consists of blocking off drainage ditches and removing underground drainage tile, with the re-flooded areas left to naturalize. Unfortunately this approach results, mostly, in cattail-choked potholes, in all likelihood nothing much resembling the original, pre-settlement wetlands. The Ducks Unlimited group funds much of this reclamation. And over the course of the weekend, I heard several people state, always somewhat apologetically I thought, "ducks aren't very picky about their wetlands."

Species List, MOSP Morris Wetland Management District, 24-26 July 2010; 38 County Records in 3 counties

Species	Stevens	Big Stone	Swift
Calopteryx aequabilis (River Jewelwing)			CR
Hetaerina americana (American Rubyspot)			CR
Lestes congener (Spotted Spreadwing)	CR	CR	
L. dryas (Emerald Spreadwing)			CR
L. rectangularis (Slender Spreadwing)		CR	CR
L. unguiculatus (Lyre-tipped Spreadwing)	x	CR	CR
Argia apicalis (Blue-fronted Dancer)		CR	CR
Enallagma anna (River Bluet)			CR
E. antennatum (Rainbow Bluet)			CR
E. carunculatum (Tule Bluet)		CR	
E. civile (Familiar Bluet)	CR	CR	
E. exsulsans (Stream Bluet)			CR
E. hageni (Hagen's Bluet)	x	CR	
Ischnura verticalis (Eastern Forktail)	CR	CR	CR
Nehalennia irene (Sedge Sprite)	CR	CR	
Aeshna constricta (Lance-tipped Darner)		x	
A. interrupta (Variable Darner)	CR	CR	
Anax junius (Common Green Darner)	CR	x	
Stylurus amnicola (Riverine Clubtail)			CR
Libellula pulchella (Twelve-spotted Skimmer)	CR	x	
Plathemis lydia (Common Whitetail)			CR
Sympetrum corruptum (Variegated Meadowhawk)	CR	x	
S. costiferum (Saffron-winged Meadowhawk)	CR	x	
S. internum (Cherry-faced Meadowhawk)	CR	x	CR
S. obtrusum (White-faced Meadowhawk)	CR	x	CR
S. rubicundulum (Ruby Meadowhawk)	CR		CR
Leucorrhinia intacta (Dot-tailed Whiteface)	CR		
27 total species	**13 CRs**	**10 CRs**	**12 CRs**

When I entered the conference room, located downstairs directly beneath the visitor's center, I found a number of people hard at work—hacksaws ratcheting back-and-forth through aluminum racquet frames, wire-cutters snipping at gut-strings, files mumbling across leftover metal teeth—and wondered if I had mistakenly entered a sweatshop rather than a gathering of naturalists. However, the object of this loud and systematic dismantling was soon disclosed. Refitted with stainless steel mesh, riveted, and then caulked, the racquetball racquets became handy odonatological implements, easy to carry into the field, and efficient at straining nymphs out of wetland muck or river silt.

When we had all gathered in the conference room, Kurt welcomed us, went over some logistics, and introduced the evening speaker, Ken Tennessen. After a career as an odonatologist, Ken is now retired, but his research on the Odonata nymphs seems only to have gathered speed and intensified. He gave an overview of the Odonata nymphs, presenting photographs and identifiable traits for each of the families. A Vietnam vet and a poet, with curly black hair and a dairy farmer's roll to his shoulders, Ken's delivery was quiet and disarming, his voice retaining a hint of an accent from years spent working in the South. In an impassioned digression, Ken gave us his reasons for the usage of the term "nymph" instead of "larva." Needless to say this proved difficult for many of us, and as we tried to adapt became a running joke, a few pushing the controversy by adopting names like "dragonfly children" and "water babies." Ken also shared his recipe for preserving Odonata nymphs, a recipe that included the surprising step of parboiling. He told us a story of asking for hot water in an eatery in Ecuador and the subsequent amazement of the locals when he dropped in a handful of dragonfly nymphs.

One of the benefits of these gatherings, at least for me, is hearing the scientific names pronounced, names like *Ophiogomphus rupinsulensis* or *Sympetrum costiferum*. It's a relief to loosen some of the knots and neologisms I somehow manage to insert into those names. One person who speaks the language Odonata well at this year's gathering is Tracey Anderson, associate professor of entomology at the University of Minnesota Morris. Tracey, it turns out, had discovered, while a graduate student, a new species of water mite that parasitized the damselfly *Argia vivida* (Vivid Dancer) in Oregon and had named it after her former teacher, the odonatologist Charles Hamrum, thus *Arrenurus hamrumi*.

The next morning, Ken had a special surprise for us. He passed around a small yogurt container, inside of which,

clinging to a snippet of window screen, was a freshly emerged *Ischnura hastata* (Citrine Forktail). He had collected the nymph (no doubt using a "Tennessen" racquet!) from a wetland in Wisconsin. After this excitement, Kurt talked about the MOSP and gave his Dragonfly 101 powerpoint presentation. He emphasized the near total lack of records for this part of the state (the weekend would yield 38 new county records). Flipping through the pages of Dennis Paulson's Dragonflies and Damselflies of the West, one sees this cloud of unknowing, a white fog drifting across the page from the Dakotas into western Minnesota creating an indentation like a backward "C" in the comfortable blue pillows of the recorded ranges for a number of species. We felt like modern day Humbolts and Wallaces on a collecting expedition in an unexplored land.

I sat down in the bromegrass, as did others, enjoying the shade of wind-break boxelders, and ate my lunch. Doug Stucki pointed out the "M" imprinted on each grass blade, the imbedded hum in the word "brome." Jim Lind, expert birder and odds-defying locator of rare dragonfly species, showed us the small set of laminated cards he had made, filled with select images needed to sort out difficult species in hand in the field, reminding me of Vladimir Nabokov's cut-and-paste custom guides for the Nymphalidae.

Our line of cars and vans rolled south to Artichoke Lake in Big Stone County. This large shallow prairie lake has been impaired, like so many farmland lakes, by high nutrient loading, its water artichoke green, a reinvention of primordial ooze. Elsa Soderstrom, a seasoned veteran of the MOSP gatherings despite being the youngest of the group at ten years of age, spotted and netted a meadowhawk in the parking lot. Knowing we were near to the recorded range of *Sympetrum madidum* (Red-veined Meadowhawk) and knowing that the juveniles of this species resembled, both in size and coloring, *Sympetrum corruptum* (Variegated Meadowhawk), I wanted to take a closer look. Elsa's dragonfly, as it turned out, was *S. corruptum*, a female, each thoracic stripe resembling a comet, bright sulphurous core trailing a white tail (the thoracic stripes of *S. madidum*, and *Sympetrum illotum* (Cardinal Meadowhawk) and *S. pallipes* (Striped Meadowhawk) for that matter, have no yellow and don't angle away from the thoracic suture). While we grouped up and admired this dragonfly, someone shouted "Darner" and then pointed to the sky above the adjacent field.

A single person alone in a field with his net sweeping the heavens has an air of scientific, if not religious, devotion, like a monk trying to get his maker's attention. But a group of people with nets raised, shouting to one another in hot pursuit of flying insects, takes on the likeness of a sports team—the sport resembling lacrosse or the wizard's game of Quidditch as described in the Harry Potter books, the golden snitch a cruising aeshnid. Looking back on the maneuvers, the misses, and the fancy footwork, this game of Darnering is probably a decent spectator sport as well. And then there's the camaraderie. When I missed the one darner that had flown close, I was immediately buoyed by some supportive heckling from Kurt, "It's OK Scott. Everyone misses. You'll be FINE!"

Because of a lame foot, I didn't make it as far a field as the others, but sauntered about the road ditches and netted meadowhawks. A gravid female *Sympetrum obtrusum* (White-faced Meadowhawk) dropped a steady stream of eggs, actually a paired stream. I caught some in my hand, then collected more in a small container I had in my field pack. I showed the eggs to Kurt and Ken and others gathered nearby. Translucent, smaller even than radish seeds, the collected eggs rolled around on the bottom of the container like perfect pearls when the container was passed from hand to hand. Kurt reminded us that this species was well known for its crop-dusting approach to ovipositing.

The final stop on Saturday, before heading back to Morris for dinner at the local Italian restaurant, was a canoe access point on the Pomme de Terre River in Swift County. Here, in the parking lot and floodplain wetlands, we were greeted by superfluous numbers of *Sympetrum internum* (Cherry-faced Meadowhawk). But along the river we found *Hetaerina americana* (American Rubyspot) and on the opposite banks, sunning in the slant rays of sun, *Stylurus amnicola* (Riverine Clubtail).

Participants

Janet Marr, Bob Marr, Lee Scholder, Mary Newstrom, Jeff and Elsa Soderstrom, Pamela Deerwood, John Arthur, Jon Kapinos, Jim Lind, Tracey Anderson, Doug Stucki, Jeff Fischer, Curt Oien, Scott King, Ken Tennessen, and Kurt Mead.

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.

New Species for Nebraska

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After procrastinating for several years on writing a note on new species in Nebraska, I was jarred into action by the last issue of Argia. One article gave the state list as 101 and another listed only 49 records submitted to OdonataCentral from Nebraska. Since Donnelly's dot maps were published nine species have been added to the state list (see accounts below) and over 2000 new county records have been obtained (these records are not reflected in OdonataCentral due to a limitation in uploading large datasets).

Janis Paseka maintains a web site for Nebraska odonates and it is now sponsored by and hosted on the University of Nebraska site, <http://www.museum.unl.edu/research/entomology/Odonata/index.html>. This is currently the only regularly updated source for range maps. The site has more than range maps so it is worth a look. Dennis Paulson, in his western guide, incorporated distribution information and flight period data from the site.

New Species For Nebraska State List

The Dot maps of Nick Donnelly record 100 species for Nebraska and nine species have been added since. Some have been reported in Argia before so this is an update for those species and first report for others. All specimens are either at IORI in Gainesville (most) or in the author's collection. Thanks to the Pasekas, Padelfords, Tim Hajda, and University of Nebraska State Museum for inclusion of their records in this report. Special thanks to Nick Donnelly for encouragement and verification of identifications.

Argia nahuana (Aztec Dancer): A relatively common species in the Republican River drainage and less so further north in Platte River drainage. There are now specimen records from 11 counties: Chase, Clay, Franklin, Frontier, Harlan, Nuckolls, Red Willow, Thayer and Webster Counties in the Republican River drainage. A specimen record from Hamilton, a sight record from Merrick County, a photo from Custer County (Tim Hajda, OC# 320810)), and a University of Nebraska specimen collected 9 July 1964 at North Platte, Lincoln Co. are all from the Platte River drainage. The University of Nebraska specimen was unidentified until recently and is the earliest known record from the state. This species is common in northern Kansas, so a modest northern range extension. It is found in small streams except for one female collected at a small borrow pit.

Enallagma traviatum (Slender Bluet): First recorded by the Padelfords from Cass County and more recently from Sarpy Counties—these counties are on the eastern edge of Nebraska. The first specimen records were from Fremont Lakes, Dodge County 1 July 2006—a site about 30 miles east of Iowa along Platte River. Despite the few county records in Nebraska the species is abundant on the Fremont Lakes. *E. traviatum* flies earlier in the day and during poorer weather conditions than other *Enallagma*. On one overcast day with occasional drizzle there were hundreds of pairs on the Fremont Lakes. This is a slight western extension from southwestern Iowa.

Enallagma vesperum (Vesper Bluet): Recorded by Pasekas and/or Padelfords in Kearney, Cass and Antelope Counties, but specimen records now added from Madison, Dodge and Buffalo Counties as well as Kearney. This is a dusk flying species and in Nebraska the main flights are after sunset. Probably widespread in eastern half of state as it was common at the sites where record. Western extension of range from central Iowa.

Nasiaeschna pentacantha (Cyrano Darner): Several individuals found and a male collected 5 July 2005 at Rockford Lake in Gage County, and a single female netted 7 July 2005 at Rock Creek SHP in Jefferson County. Both were in shallow, muddy heavily shaded streams patrolling slowly as they do. A sight record on 1 July 2006 was at a borrow pit (unusual location) just west of West Point, Cuming County. These represent a slight northern and western extension of range from northern Kansas and western Iowa.

Dromogomphus (Spinyleg): exuviae found in pond at Mahoney State Park, Cass County on eastern border of state. Exuviae at present has been misplaced, but *spoliatus* (Flag-tailed Spinyleg) would be the most likely from habitat and there are records from Missouri just south of this site.

Erpetogomphus designatus (Eastern Ringtail): Male found comatose in gravel parking lot at Bartley Diversion Dam WMA, Red Willow County on 24 Sep 2010 by Don and Janis Paseka, OC# 323329. This is in southwest Nebraska and a modest northern range extension from northwest Kansas.

Stylurus plagiatus (Russet-tipped Clubtail): One teneral female collected on a small, muddy, sluggish creek 7 July 2005, Rose Creek, 1.5 miles W of Reynolds, Jefferson

County. A slight northern range extension from northern Kansas.

Epitheca spinigera (Spiny Baskettail): One male collected over lawn 6 July 2008 at Cub Lake, Keya Paha County (north-central part of state). This was one of about 20 *Epitheca cynosura* (Common Baskettail) types collected that day. This represents a considerable southern extension of range being 350 miles south of the nearest North Dakota record and 250 miles west of the nearest Minnesota record.

Tramea calverti (Striped Saddlebags): A male found 23 June 2010 at Sacramento–Wilcox SWMA, Phelps County and another 4 July 2010 at Ambler Lake, 3.5 miles west of Stapelton, Logan County. This was an exceptionally wet year in Nebraska and all the species of *Tramea* were far more abundant than in a drier year. *Tramea onusta* (Red Saddlebags), usually a rare to uncommon species, was present everywhere with the number of county records (specimens) jumping from 15 to 30 and only limited by the number of counties visited. The first *calverti* was caught in same net swing with two resting *T. onusta*. These were part of a large mixed group of *Tramea* and *Pantala* (Rainpool Glider) hawking insects on lee side of a cedar shelter belt. The second *calverti* was a solitary individual that flew out during a sunny spell on an otherwise overcast day. It perched in a low dead sapling with *T. lacerata* (Black Saddlebags) and was easily netted. This is well north of the more normal south Texas records but many states recorded the species in this irruption year.

Acknowledgements

My wife and I have now made five different trips to Nebraska and been assisted by too many people to mention individually but all of them important. The huge number of landowners who have allowed me to chase odonates on their property, the people in the Nebraska Game and Parks Commission who have been uniformly helpful at parks, state recreation areas, wildlife management areas, answering e-mail queries and issuing permits, staff of the entomology section of the state museum at University of Nebraska allowing me use of the collection and many others Nebraska residents who have assisted our efforts in diverse ways. Roy Beckemeyer and Nick Donnelly, perhaps unknown to them, launched me on this study and have been very supportive. The Pasekas by incorporating the new records in their web site made the atlasing records far more important and accessible than would otherwise have been the case.

Ophiogomphus anomalus, Extra-striped Snaketail, a New Species for Nova Scotia

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I conducted a dragonfly survey with a focus on discovering elusive species through exuviae collection for the Atlantic Canada Conservation Centre on the Medway River in Queens County, Nova Scotia, in 2010 (Klymko, 2010). The Medway River is a moderate-sized, moderately tannic, oligotrophic, fast-flowing river that traverses a sparsely populated terrain dominated by mixed woods. Surveys were conducted on 18 June and 20 July 2010, on a 14 kilometer stretch of river between Bangs Falls (44.2464° N, 64.8329° W) and Riversdale (44.1810° N, 64.6751° W). Survey sites were selected based on habitat suitability, with areas below rapids potentially representing mass-emergence sites being preferred. Habitat at collecting sites varied from rapids to slow water and with a channel width of 40 to 140 meters. Substrate varied from cobble to clay to muck. *Ophiogomphus anomalus* (Extra-striped Snaketail), a species previously unrecorded in Nova Scotia, was found at eight of the 14 sites surveyed, and a total of 68 *O. anomalus* exuviae were collected. The eight sites hosting the species were spread over the entire 14 kilometer stretch of the river surveyed.

Ophiogomphus anomalus, an inhabitant of oligotrophic, fast-running rivers, is restricted to northeastern North America, occurring as far west as Minnesota and as far south as New Jersey (NatureServe, 2011). This Nova Scotia population is nearly 200 kilometers from the nearest known occurrence in the Magaguadavic River, in Charlotte County, New Brunswick, and it is about 60 kilometers east of the most easterly known occurrence on the Cannan River, in Kings County, New Brunswick (ADIP database, Paul Brunelle pers. comm.).

The number of sites where it was detected, and number of exuviae collected, indicates that *O. anomalus* is fairly common on the Medway River, and it is likely the population's range extends upstream and downstream of the area surveyed, as suitable habitat is found in both directions. The Medway River is one of the better surveyed rivers in Nova Scotia, with 300 records of 46 species in the Atlantic Dragonfly Inventory Program (ADIP) database (Paul Brunelle, pers. comm.). However, only nine of the records are of exuvia or larvae. The lack of collecting of immature stages is the likely reason that *O. anomalus* has been over-

looked until now. Given that the immature stages of dragonflies have received little to no attention on most Nova Scotia rivers, there is great potential for further discovery of more elusive species in the province.

Ophiogomphus anomalus is often considered an indicator species for *O. howei* (Pygmy Snaketail), (COSEWIC, 2008), a species listed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). In Canada, *O. howei* is known only from a few locations in New Brunswick and a single location in Ontario, though there are suitable habitats throughout the Maritimes (Ibid.). The discovery of *O. anomalus* further demonstrates the potential for the occurrence of *O. howei* in Nova Scotia.

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Literature Cited

COSEWIC. 2008. COSEWIC assessment and status report on the Pygmy Snaketail *Ophiogomphus howei* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 34 pp. <www.sara-registry.gc.ca/status/status_e.cfm>.

Klymko, J. 2010. Odonate Surveys on the Tusket, Medway, and Lahave Rivers. Unpublished report to the Nova Scotia Species at Risk Conservation Fund, 15 pp.

NatureServe. 2010. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed January 29, 2011).

Announcing Damselflies of Texas: A Field Guide, By John C. Abbott

On any warm summer day, you can easily observe damselflies around a vegetated pond or the rocks along the banks of a stream. Like the more familiar dragonfly, damselflies are among the most remarkably distinctive insects in their appearance and biology, and they have become one of the most popular creatures sought by avocational naturalists. Damselflies of Texas is the first field guide dedicated specifically to the species found in Texas. It covers 77 of the 138 species of damselflies known in North America, making it a very useful guide for the entire United States. Each species account includes:

- illustrations of as many forms (male, female, juvenile, mature, and color morphs) as possible
- common and scientific names, with pronunciation
- distribution map
- key features
- identifying characteristics
- discussion of similar species
- status in Texas
- habitat, seasonality, and general comments

In addition to photographing damselflies in the wild, the author and illustrator have developed a new process for illustrating each species by scanning preserved specimens and digitally painting them. The resulting illustrations show detail that is not visible in photographs. The book also contains chapters on damselfly anatomy, life history, conservation, names, and photography, as well as a list of species that may eventually be discovered in Texas, state and global conservation rankings, seasonality of all species in chronological order, and additional resources and publications on the identification of damselflies.

Can be ordered from The University of Texas Press, <http://www.utexas.edu/utpress/books/abbdap.html>. $24.95, paperback (33% web site discount: $16.72).

Announcing Book on the Odonata of the Delmarva Peninsula, by Hal White

The Natural History of Delmarva Dragonflies and Damselflies will appear later in April 2011. This book by Hal White provides the first comprehensive coverage of the dragonflies and damselflies of the Delmarva Peninsula. It includes photographs of all 129 species known to occur in the region. However, it is more than a field guide for these beautiful insects. Each species serves as a prompt for a short essay. Taken together, the collection offers an eclectic introduction to the world of dragonflies and the people who study them. The author draws on over fifty years of experience in his wide-ranging reflections on a spectrum of topics including the sociology of science, biographical and historical snapshots, biology education, climate change, ethics of collecting, suggestions for sci-

ence projects, behavior, physiology, anatomy, paleontology, evolution, and much more, but with a persistent theme of habitat conservation. The stories are memorable and the explanations clear. There is something here for everyone from the casual reader to the expert.

The book is being published by the University of Delaware Press in collaboration with the Delaware Nature Society. It will appear in late April. Sales will be handled by Rowman & Littlefield: toll free (800) 462-6420, local (717) 794-3800, e-mail: <orders@rowman.com>.

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>.

Articles

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

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

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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

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

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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.

Membership in the Dragonfly Society of the Americas

Membership in the DSA is open to any person in any country and includes a subscription to Argia. Dues for individuals in the US, Canada, or Latin America are $20 US for regular membership and $25 US for institutions or contributing membership, payable annually on or before 1 March of membership year. Dues for members in the Old World are $30 US. Dues for all who choose to receive Argia in PDF form are $15. The Bulletin Of American Odonatology is available by a separate subscription at $20 US for North Americans and $25 US for non-North Americans and institutions. Membership dues and BAO subscription fees should be mailed to Jerrell Daigle, 2067 Little River Lane, Tallahassee, FL, USA 32311. More information on joining DSA and subscribing to BAO may be found at <www.dragonflysocietyamericas.org/join>.

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Back cover: **(upper)** *Aeshna* sp. nymph swimming on top of ice in 1-inch thick layer of rainwater that had formed over a small pond in Lake Placid, New York. Photo by Linda LaPan. **(lower)** Southern Spreadwing (*Lestes australis*) at Buffalo Springs Lake's Llano Estacado Audubon Society Trail, 20 Oct 2010. Photo by Jerry Hatfield.