



Newsletter of the Ohio Odonata Society

Ohio Dragon Flyer

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Ohio Odonata Society Board

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Cover Photo

Flag-tailed Spinyleg (*Dromogomphus spoliatus*)
Dave Tibbets, August 23 2023, Hamilton Co.

Sony A7, ISO1250, 1/1600, f/8, 400mm

On a hot sunny day at Miami Meadows Park in Cincinnati this Flag-tailed Spinyleg was standing-tall in obelisk mode.

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2024 DSA Meeting Update

Ohio Odonata Society President, Dave McShaffrey, chairs the 2024 Dragonfly Society of the Americas annual meeting right here in Ohio. More information is coming in the April newsletter, but Dave offers a quick summary:

Date and Location: The 2024 DSA meeting will be held in Marietta, Ohio June 28-30th 2024. Marietta is located at the confluence of the Ohio and Muskingum Rivers in the glaciated part of the state.

Travel and Lodging: Marietta is centrally isolated with road access via I77 from the north and south. Columbus and Pittsburgh airports are about 2 hours away, Cleveland 3 hours, and Cincinnati and Detroit a bit further out. Smaller airports including Akron/Canton, Charleston WV, and Toledo are within driving distance. The local Parkersburg WV airport has service to and from Charlotte NC. Lodging will be available in the dorms at Marietta College as well as the numerous hotels ranging from historic to modern in the town; meals may be taken at a host of local restaurants.

Dragon-hunting: Pre and-post trip meetings will be held in other parts of Ohio near some of the airports and offering access to exceptional Odonata sites like Cedar Bog (actually a fen). We will be looking for local hosts for these trips, details to come. Local trips will focus on wadable stretches of the Little Muskingum River in the Wayne National Forest and on other Ohio tributaries as well visits to the Ohio River Islands National Wildlife Refuge and extensive post-mining lotic sites at either The Wilds or Jesse Owens State Park. Late June is near the end of the season for most of the gomphids and the beginning for many of the libellulids and Macromiidae. Cruisers are “easily” caught in the Little Muskingum River and Dragonhunters should still be out.

Other Area Activities: The oldest organized settlement in Ohio, Marietta has a number of historical sites as well as extensive trail systems for hiking and mountain biking; there are numerous activities to entertain family members during the meeting. Historical sites include 2 museums and several restored homes and the nearby Blennerhassett Island Historical State Park with a restored mansion famous for its role in the Burr rebellion.

A link to Dave’s video announcement: <https://youtu.be/tLiKlmK8toY>



Beaver Pond Impact on Odonate Populations Jay Heiser jay@heiserhollow.net

Our Coshocton County property's wetland of 4+ acres always had greater biodiversity than our 50 wooded acres. In the spring of 2019, I was thrilled to encounter a pair of amorous beavers, dancing and hooting in the creek that borders the wetland area. I had no concept of the change that these two rodents would make on the flora and fauna of our property, resulting in a significant increase in the number of species and biomass. Virtually every category of life was impacted, not the least of which were the Odonates. The last four and a half years have demonstrated a very significant relationship between the extent of the pond and the density and diversity of Odonate life.

In the early part of the 20th century, the inhabitants of a tiny log cabin used this space as a 'truck farm', growing vegetables for market, finally giving up in the late 1950s. When my family purchased the property in the early 1970s, the wetland area had a stand of dead trees, suggesting that it had flooded several decades after it had been allowed to go fallow. By the 2000s, the center of the triangular shaped area consisted of a wool grass marsh, punctuated with clumps of alder. A year-round spring kept this area permanently hydrated, with crystal clear water but little obvious aquatic life. Several surrounding vernal pools supported typical obligate species, including fairy shrimp, swamp darter larvae, spotted salamanders, and wood frogs.

In April 2019, the beavers constructed a dam in a 4-foot-deep ravine, just over 10 feet away from the creek bed. As water eventually began flowing around the sides of the dam, the beavers built a pair of dikes on either side, slowly but surely increasing the surface area of the beaver pond, and exponentially increasing its volume. By 2022, the dike on the south flank was about 30 feet. On the

north flank, paralleling the creek bed, the dike extended almost 150 feet. In the fall of 2019, the beavers excavated a 70-foot-long canal, permanently hydrating the 'classic' vernal pool that had hosted fairy shrimp and swamp darners.

This unexpected bit of civil engineering soon became somewhat moot, as the rising beaver pond encompassed, and extended beyond what had previously been a temporary pool. As the permanently hydrated areas grew in size and depth, the amount of standing vegetation, both woody and herbaceous, was reduced, resulting in much better flying conditions. By the summer of 2021, the beaver pond consisted of several acres of relatively open water—attracting Odonate, species, birds and fish that I hadn't previously observed.



Beaver Pond at Peak – April 2022. Two adults and two kits were active in the pool, which is at its full extent in this photo.

The beavers disappeared early May, possibly because they had used up their convenient sources of food. That August, as the beaver dam lost integrity, the water level began dropping. The vernal pool area soon dried out, and by October most of the beaver pond was dry. As their pond drained, it became apparent that the beavers had straightened and deepened the original gully that led from spring to creek, and had created other channels into the vernal pool. By shoving soil onto their dike, the beavers had lowered the adjacent ground level. These forms of excavation now facilitate the drainage of areas that had retained more surface water before the beavers' arrival. However, the original dam still limits the maximum outflow, and

several heavy 2023 rains almost completely refilled the beaver pond, requiring over a week to drain. Consequently, the wetland is experiencing relatively rapid and extreme shifts in water level, and the current water surface area is likely lower than it was before the beavers arrived. It's impossible to fully account for the impact of the beavers' work on the mix and population of odonatan, and other categories, but the population and activity of multiple species consistently increase and decrease with changes in water level.



Beaver Pond October 2023. Fall rains have re-filled an area that has completely dried out several times during the previous 12 months.



Skimming Bluet. This previously undocumented species colonized the beaver pond for a single season

Several species that I had not previously observed on our property were attracted to the changed habitat, and then disappeared after it drained. The most dramatic example was the Skimming Bluet which first arrived in mid-May 2022, and was consistently observed across most sections of the beaver pond for 15 weeks. Although I did have 3 sightings in 2023 at our artificial fish pond, 220

meters away, I didn't have a single Skimming Bluet observation in the dried-out beaver pond

My first Black Saddlebag sightings were in early summer 2021. In 2022, I observed multiple pairs in tandem. In the Fall, I photographed two teneral saddlebags, strongly suggesting successful breeding in the beaver pond. In 2023, I had a single, brief observation. Although I had previously seen a few Painted Skimmers, Spring of 2021 was the first time I'd seen mating behavior. In the Spring of 2022, a small group of males were defending territory. I only had a single sighting in 2023 in an area that soon went dry.

I had multiple observations of Unicorn Clubtail on and around the beaver pond dam in 2020 and 2022 with single sightings in 2021 and 2023. Other species that were not observed before or after the beavers' arrival included Comet Darner, Familiar Bluet, and Sweetflag Spreadwing. The beaver pond also attracted visitors that were regulars at our fish pond, but had only infrequently, if ever, appeared in the wetland. Slaty Skimmers, Eastern Amberwings, and Common Baskettails were defending territory and breeding in the beaver pond in 2022

The Common Whitetails exhibited the most obvious change in behavior. Before the beaver pond, a relatively small number of males staked out territories in several consistent locations. Competition was relatively light, and the males could spend much of their time perching. As the open water surface area increased year over year, it increased the area suitable for breeding. However, the population of males increased at an even faster rate driving a significant increase in territorial conflict. Compelled to defend their territories from multiple simultaneous intruders, male Whitetails now had minimal opportunity for daylight perching, as hours-long dogfights, often with six or more Whitetails, played out over the several acres of relatively open water. In late summer of 2021 and especially 2022, male Whitetails spent significantly less time perching than they did before the beaver pond.

Although their numbers were significantly smaller, the Twelve-Spotted Skimmers also exhibited higher levels of male competition than was typical before and after the beavers.

Virtually all of our most common species experienced longer flight seasons and population increases in 2020-2022, and then suffered reversals in the diminished hydration of 2023, ultimately ending up with smaller presences than they'd had before the beavers. Eastern Pondhawks, Blue Dashers, Fragile and Eastern Forktails had their record latest flight dates in 2020, 3, 4, 5 and 8 weeks later than in 2023. Slaty Skimmers, Twelve-Spotted Skimmers, Widow Skimmers and Common Whitetails set new late season records in 2022, but then disappeared 3-5 weeks earlier in 2023. 2023 provided only a few isolated observations of male Slaty Skimmers, along with a single Common Baskettail. Eastern Amberwings disappeared entirely. Blue Dashers, which normally persist into September, had disappeared by mid-July 2023. As of November, the remnants of the beaver dam continue to permanently maintain water within the brook that originally drained this area, supporting an easily-observed population of bullheads, minnows, newts and tadpoles. Although far fewer Autumn Meadowhawks were observed in 2023 than in the previous several years, this long skinny pool continues to attract a few breeding pairs, and a Shadow Darner set a new late season record.



Beaver Pond September 2023. Nodding Beggartick have colonized what had previously been permanently hydrated

One final habitat-modifying event provided a few more clues about the relationship between hydration and Odonate activity. A late August rain refilled the empty beaver pond, including a 10-meter pool around the periphery. Only five weeks after their early disappearance, at least ten Blue Dasher males suddenly appeared, fighting over preferred buttonbush branches. Over several days, I also saw a Fragile Forktail, 2 Eastern Pondhawks and 3 Common Green Darners, including a pair in tandem. Depositing eggs in a short-lived pool, 40 meters away from the narrow ribbon of permanent water behind the leaky dam, was clearly not going to be successful, but the fickle nature of a leaky pond misled a lot of water-oriented species. The initial draining at the end of the previous summer was a slow process that took several months, yet it still left countless fish and minnows high and dry (much to the delight of an egret and some herons). Multiple waxes and wanes of water level in 2023, which were significantly more rapid than the previous summer, repeated the process of concentrating and then killing off aquatic vertebrates as shrinking pools became dried out puddles. Although I was not able to see them, it must be the case that every drainage event likewise stranded aquatic invertebrates, including dragonfly and damselfly larvae. Even when the beaver pond was still intact, temporary increases in the pond surface area sometimes attracted females laying eggs in places where standing water never lasted longer than a week. This willingness to take a chance on relatively small bodies of standing water provides an insight into the reproduction strategies of wetland species. Wetlands not only experience a lot of rapid change, but the form of change is often non-cyclical change; successful wetland species roll with the change. As soon as an area appears to be suitable for egg-laying, they fly, crawl, or get deposited in it. If, and while, the conditions are right, they thrive.

Ode Lang Syne 2023

A request for our favorite Ode images submissions of the 2023 season had an overwhelming response. Thanks to *all* who shared your images and memories of a warmer season.

Martin J. Calabrese



Spot-winged Glider (*Pantala hymenaea*) Cuyahoga Co.

I was especially thrilled by this case of mistaken identity! It happened when my son was out in a freshly mowed field next to a soccer field where my daughter was practicing. Initially, he thought it was a wandering glider, but upon closer examination, we realized it was a spot-winged glider. It marked our first encounter with this species, and it was truly deserving of capturing some macro photos for a more enjoyable, up-close look.



Damselflies *Zygoptera* (various)

A bonus collage of macro damselfly eyes from Acacia Reservation Cleveland Metroparks in Lyndhurst, OH. I love the wacky colors and mugs.

Jim Lemon



Jade Clubtail (*Arigomphus submedianus*), Shelby Co.



Emerald Spreadwing (*Lestes dryas*), Shelby Co.



Lilypad Clubtail (*Arigomphus furcifer*), Williams Co



Chalk-fronted Corporal (*Ladona julia*), Williams Co.



Swift Setwing (*Dythemis velox*), Champaign Co.



Paiute Dancer (*Argia alberta*) Champaign Co.

Jessica Lowery



Rusty Snaketail (*Ophiogomphus rupinsulensis*) Franklin Co.



Rapids Clubtail (*Gomphus quadricolor*) Franklin Co.



Dragonhunter (*Hagenius brevistylus*) Franklin Co.



Elegant Spreadwing (*Lestes inaequalis*) Fairfield Co.



Ashy Clubtail (*Gomphus lividus*) Franklin Co.



Aurora Damsel (*Chromagrion conditum*) Richland Co.

Dave Tibbetts



Elusive Clubtail (*Stylurus notatus*) Hamilton Co.



Eastern Ringtail (*Erpetogomphus designates*) Hamilton Co.

I was excited to get a shot of Elusive Clubtails in a mating wheel after years of trying. It was a sunny day in the mid-50s and, for weeks, we had been seeing males and females along a 100-yard stretch of the river at Otto Armleder Park in Cincinnati. On this day, we had made our last pass and were going to call it quits when I spotted them just before the trail out. The Eastern Ringtail shot was a gift; I was walking at Valley View in Cincinnati when this ringtail flew right past me and landed on the flower; sometimes you just get lucky.

On a hot sunny day, at Miami Meadows Park, in Cincinnati, this Flag-tailed Spinyleg was standing-tall, in obelisk mode.

Editor's note – Whimsical posturing in portrait orientation, Dave's Spinyleg image was a perfect fit for the newsletter cover.



Flag-tailed Spinyleg (*Dromogomphus spoliatus*) Hamilton Co.

David Goldstein



Spreadwing Species Greene Co.



Eastern Pondhawk (*Erythemis simplicicollis*) prey to fishing spider Greene Co.



Widow Skimmer (*Libellula luctuosa*) Bill Yeck Park Montgomery Co.



Sympetrum species Spring Lakes Park Greene Co



Flag-tailed Spinyleg (*Dromogomphus spoliatus*) Greene Co.



Grey Petaltail (*Tachopteryx thoreyi*) Montgomery Co.

Ron Boudouris



Violet Dancer (*Argia fumipennis*) Lucas Co.



Vesper Bluet- (*Enallagma vesperum*) Fulton Co.



Painted Skimmer (*Libellula semifasciata*) Lucas Co.



Blue-ringed Dancer (*Argia sedula*) Lucas Co.

Andrew Boose



Yellow-legged Meadowhawk *Sympetrum* Franklin Co.



Shadow Darner (*Aeshna umbrosa*) . Michigan

Cathy and Jim Lundberg



Slaty Skimmer (*Libellula incesta*) (Cathy)



Eastern Ringtail (*Erpetogomphus designates*) Hamilton Co. (Jim)



Royal River Cruiser (*Macromia taeniolata*) Hamilton Co. (Jim)

My favorite Odes-2023 memory is the Little Miami River Eastern Ringtail which hovered, stationary 15 feet away, while Cathy held the kayak perfectly in position.

Jon Cefus



Green-striped Darner (*Aeshna verticalis*) Stark Co.



Spangled Skimmer (*Libellula cyanea*) Stark Co



Midland Clubtail (*Gomphus fraternus*) Stark Co

We had a really great flight of Green-striped Darners along with Black-tipped at the end of September and into October with as many as a dozen Green-striped flying at one time over one little marsh area in southern Stark Co.

Gary A. Korzan



Royal River Cruiser (*Macromia taeniolata*) Lorain Co.



Gray Petaltail (*Tanypteryx hageni*) Lorain County



Four-spotted Skimmer (*Libellula quadrimaculata*) Lorain Co.



Shadow Darner (*Aeshna umbrosa*) Lorain Co



Comet Darner (*Anax longipes*) Lorain Co.

Jay Heiser



American Rubyspot (*Hetaerina americana*)



Smoky Rubyspot (*Hetaerina titia*)



Midland Clubtail (*Gomphurus fraternus*)



Spatterdock Darner (*Rhionaeschna mutata*)



Slender Spreadwing (*Lestes rectangularis*)



Laura's Clubtail (*Stylurus laurae*)

Jim Heflich



Spotted Spreadwing (*Lestes congener*) Geauga Co.



Spaghnum Sprite (*Nehalennia gracilis*) Lake Co.



Delta-spotted Spiketail (*Cordulegaster diastatops*)
Ashtabula Co.



Rusty Snaketail (*Ophiogomphus rupinsulensis*) Lake Co.



Harlequin Darner (*Gomphaeschna furcillata*) Geauga
Co.



Spangled Skimmer (*Libellula cyanea*) Ashtabula Co.

Sarah White



Springtime Darner (*Basiaeschna Janata*) Mont. Co.



Clamp-tipped Emerald (*Somatochlora tenebrosa*)
Champaign Co.



Eastern Ringtail (*Erpetogomphus designatus*)
Warren Co.



Arrowhead Spiketail (*Cordulegaster obliqua*)
Warren Co.



Comet Darner (*Anax longipes*) Montgomery Co.

Mike Abel



Slender Spreadwing (*Lestes rectangularis*) Greene Co.



Autumn Meadowhawk (*Sympetrum vicinum*)
Montgomery Co.



Spot-winged (*Pantala hymenaea*) Glider Greene Co.



Seepage dancer (*Argia bipunctulata*) Champaign Co.



Blue Corporal (*Ladona deplanata*) Greene Co.



Ebony Jewelwing (*Calopteryx maculata*) Greene Co.

Dennis Meyers



Swift River Cruiser (*Macromia illinoiensis*) Clermont Co.



Elusive Clubtail (*Stylurus notatus*) Hamilton Co.



Comet Darner (*Anax longipes*) Clermont Co.



Dragonhunter (*Hagenius brevistylus*)
Eastern Amberwing (*Perithemis tenera*) Hamilton Co.



Cyrano Darner (*Nasiaeschna pentacantha*) Butler Co.

Gregory Caspers



Spangled Skimmer (*Libellula cyanea*) Jefferson Co.



Slender Spreadwing (*Lestes rectangularis*) Jefferson Co.



Calico Pennant (*Celithemis elisa*) Jefferson Co.



Common Green Darner (*Anax junius*) Jefferson Co.

Managing Dynamic Range Jim Lundberg

Armlerder Park, situated along the west bank of the Little Miami River, catches first light where dragonflies can be found warming before flight. When they do begin to fly over the river, the bugs are backlit by morning sun. Sparkling wings and edges halo black bodies. Subject focus lock is aided by this high contrast. The downside of high contrast is that the camera's dynamic range cannot capture all light values, and detail is lost.

You can manage dynamic range with three settings: 1. Lower ISO. 2. Expose to the right. 3. Shoot RAW. Don't use automatic exposure for flight photos; background lighting constantly changes while panning. In order to expose for the bug, not the fluctuating background lighting, use Manual (M) mode for flight photos. Evaluate an image from your first series of flight photos of the session. Adjust your settings based on an image of a bug in full sun. In theory, these settings should be good for the flight session as long as lighting doesn't change. In practice, enable highlight alerts and check the images throughout the session... and tweak settings as needed.

1. Lower ISO: Dynamic range and color sensitivity fall off at higher ISO settings. Unfortunately, the faster shutter speeds required of flight photos force ISO settings higher, but use the lowest ISO setting possible. In other words, use the necessary shutter speed to stop motion blur (1/2000th or faster depending on camera and conditions). Use the lens's widest aperture. Finally, set ISO to 'expose to the right'.
2. Expose to the Right (ETTR): The term refers to histogram graphs where light values are represented with pure black on the left graduating to pure white on the right. Expose to the right is a controlled increase in exposure, pushing *all* light values to the right side of the histogram, bringing out more detail and color in the shadowed areas. However, don't rely on the histogram to adjust exposure settings for dragonfly flight photos; histogram graphed light values represent the big background not the small dragonfly. Enlarge the image and study dragonfly highlights as the basis for exposure adjustments. The key is to increase exposure until the brightest part of the dragonfly is as bright as possible without becoming pure white.
3. Shoot RAW: RAW files require more storage space than JPEG, but they contain *all* the data captured by the camera's sensor offering a finer gradation of tones and colors than JPEG. Most importantly, for backlit bugs, RAW files have a greater dynamic range than JPEG files, retaining more detail in the highlights and shadows and offering the greatest flexibility in post-processing.



Elusive Clubtail. 1000mm, 1/2000, f/14, ISO 4000, RAW, No flash

The image, right, was processed with noise reduction, sharpening, darkened highlights and brightened shadows.



Odonata Monitoring at Wiregrass Lake Ron Boudouris

The fifth year (2023) of Odonata monitoring at Wiregrass Lake (my second year) proved to be interesting with unexpected numbers and intriguing observations. Rick Barricklow and I, again, shared monitoring responsibilities. Last year, we were accompanied by two student interns for a few of the monitoring walk-arounds, and this year we were accompanied at different times by three student interns, a community volunteer and, on one occasion, Ohio Odonata Society member, Sally Isacco. It was very nice to have had the opportunity to share the “Wiregrass experience” with them.

Wiregrass Lake is an eleven-acre, man-made lake and is encircled by a ½ mile trail. It has a varied shoreline with sandy beaches, shrubs, trees, and a few concrete structures with benches. After a sand mining operation on 16 acres ceased in the late 1980’s, plans for a potential future housing development started to take place. However, Metroparks Toledo was able to acquire the property in 2004, preventing it from being sold off as lakefront lots.

After extensive buckthorn removal and native wet prairie plantings, much of the site has been restored as part of a larger scale project supporting turtle conservation and other wildlife species, state-listed plants, and globally rare plant communities. Some of the best examples of the Oak Openings Region’s wet prairie communities exist here. Wildlife corridors, such as the newer, three-mile Mosely Trail, were created via this Metropark site to connect other natural area habitats within the Oak Openings Region.



Banded Pennant *Celithemis fasciata*
Rick Barricklow

In 2015, Wiregrass Lake Metropark officially opened to the public. In addition to primitive camping at a few sites, recreational activities such as hiking, fishing, kayaking, and canoeing are also offered; however, balancing these popular pursuits with preservation is critical for continued success at this park, and monitoring wildlife populations such as odes is important.

Each year, the monitoring project begins in May and ends in September. Surveys occur approximately every ten days give or take a day or two depending on weather conditions and/or the schedules of the monitors. The lake is divided into four quadrants with count totals tallied for each quadrant as well as overall totals tallied for each monitoring day and for the season. Individuals are noted that are flying over the lake, along the shoreline, on the trail, and in the vegetation on the side of the trail opposite the lake.

During the first few years of the monitoring project, there appeared to have been a decline in the number of species as well as the number of individuals when compared to anecdotal information prior to 2019; but the last two years have seen a significant increase in the overall number of individuals, continued fluctuations in the number of species, a recent significant increase in the number of individuals for many species, and a decline in the number of individuals for a few species. The reasons for the increase/decline/fluctuations in the number of species and individuals are unclear but may have to do with human activity, weather/climate, lake levels, predators, etc.

Species Totals by Year

Species	2023	2022	2021	2020	2019
Eastern Amberwing	577	215	219	189	195
Variable Dancer	268	221	76	230	170
Calico Pennant	151	118	124	167	98
Double Striped Bluet	137	40	47	89	76
Slender Bluet	103	64	11	79	26
Autumn Meadowhawk	92	67	10	30	5
Eastern Forktail	92	42	28	31	38
Familiar Bluet	82	80	20	40	44
Widow Skimmer	74	60	60	112	78
Banded Pennant	67	50	33	46	28
Prince Baskettail	51	33	25	18	14
Stream Bluet	29	4	0	1	7
Slaty Skimmer	27	38	15	29	70
Dusky Clubtail	19	10	4	2	2
Black Saddlebags	16	28	10	28	18
Skimming Bluet	15	3	33	18	12
Common Green Darner	12	3	8	5	14
Blue-fronted Dancer	11	27	21	13	18
Common Whitetail	6	26	9	5	3
Fragile Forktail	6	10	8	2	2
Eastern Pondhawk	4	9	5	35	24
Dusky Dancer	4	3	0	0	0
Pronghorn Clubtail	4	0	7	4	0
Blue Dasher	2	11	6	8	23
Ashy Clubtail	2	0	1	0	2
Powdered Dancer	2	0	0	0	1
Spot-Winged Glider	2	0	0	0	0
Gilded x Royal River Cruiser	2	0	0	0	0
Flag-tailed Spinyleg	1	8	0	0	1
Wandering Glider	1	3	3	0	1
Azure Bluet	1	2	0	0	2
Twelve-spotted Skimmer	1	1	2	3	5
Common Baskettail	1	0	1	0	0
Southern Spreadwing	1	0	0	0	0
Vesper Bluet	1	0	0	0	0
Swamp Darner	0	2	0	0	3
Unicorn Clubtail	0	0	1	0	0
Orange Bluet	0	1	1	1	4
Halloween Pennant	0	0	5	29	22

Individual Observations by Year (including identified to genus only)

2023	2022	2021	2020	2019
1992	1242	981	1450	1416

Species by Year

2023	2022	2021	2020	2019
35	30	35	30	39

Comments/Observations

The level of the lake at the beginning of the 2023 monitoring season was slightly above average, but there was a slow and steady decline of the lake level during the next five months. At the end of the monitoring season, the level of the lake was lower than I had ever observed before, and there was increased shoreline access for much of the lake. I wonder if the lower lake level, as well as visitors being able to walk in areas that had previously been covered by water, might have an impact on Odonata numbers next year.

The 2023 monitoring season saw a year-over-year slight to significant increase of the number of individuals for 24 species, a decrease of the number of individuals for 10 species, no change in the number of individuals for one species, and two species that were seen last year but not this year. And remarkably, there were over 500 more individuals seen this year than the previously high year of 2020; and leading the way were Eastern Amberwings that more than doubled year over year to 577 individuals.

There were significant increases this year in the numbers of Ashy/Dusky Clubtails, Variable Dancers, Calico Pennants, Double-Striped Bluets, Slender Bluets, Autumn Meadowhawks, and Eastern Forktails.

There were four firsts this year of new species. The four species were Southern Spreadwings, Vesper Bluets, Spot-Winged Gliders, and Gilded x Royal River Cruisers.

I am struck by the decline and, then, disappearance of Halloween Pennants during the five years of the monitoring project. For the last two years, none have been seen.

The total number of Ashy/Dusky Clubtails was 77 for 2023 compared to 39 for 2022. Rick and I were able to photograph the terminal abdominal appendages to determine that at least 19 of the 77 were Dusky Clubtails compared to 10 of the 39 for last year. There were two individuals that were identified as Ashy Clubtails. The Ashy/Duskys were seen in all four quadrants. This was definitely a prolific year for them and, at times, it seemed that no matter where we looked, we were seeing them, and no matter where we stepped along the trail, we were flushing them out.

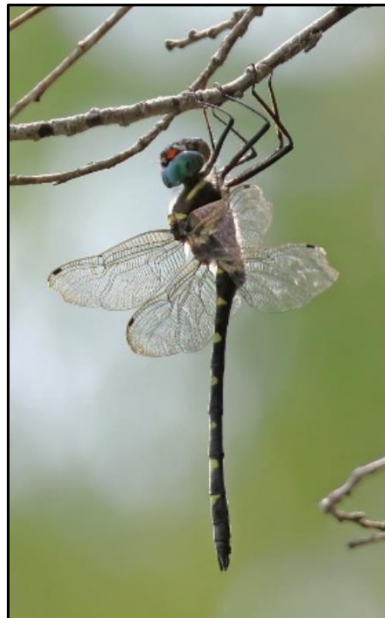


Pronghorn Clubtail *P. graslinellus* (m)
 Ashy Clubtail *P. lividus* (f)
 Ron Boudouris

There were a couple of interesting observations of Ashy/Duskys in tandem that I am thinking might have had to do with the “density” of individuals around Wiregrass Lake. The first observation was of a male Pronghorn Clubtail resting on the ground in tandem with an Ashy male. Rick and I were able to take photos of them on the ground and then of them taking flight where they quickly separated (see Fig. 1). The second observation was of a male Pronghorn flying in tandem with what might have been an Ashy female. They dipped down toward the water a couple of times and then landed close to me on the shore where I was able to take some photos.



Pronghorn Clubtail *P. graslinellus* (m)
 Ashy Clubtail *P. lividus* (m)
 Rick Barricklow



Gilded x Royal River Cruiser
M. pacifica x taeniolata
 Ron Boudouris

In the last two years, Rick and I had seen a few River Cruisers around Wiregrass Lake but were never able to get a specific ID. However, we got lucky two times this year on 7/31 and 9/10 when River Cruisers landed nearby and we were able to take photos. On both occasions, the River Cruisers were identified as Gilded x Royal River Cruisers. This was a first for me, and I have to admit, very exciting.

Unique individual species may have been missed because the monitoring occurs about every 10 days. Recently, Rick started an Odonata of Wiregrass Lake Metropark project on iNaturalist. Observations around Wiregrass Lake will auto-populate to the project, so next year we may have a better idea of possible species missed by the monitoring project.

Thanks to Karen Menard, Monitoring and Research Supervisor with Metroparks Toledo for her continued help and support during the 2023 monitoring season, and to Karen and Rick for their input regarding this report.

Your comments and questions are welcome. I can be contacted at bison90@centurylink.net. We are looking forward to the 2024 monitoring season. What will it bring?

Odonata Survey at Hawthorne Crossing Jim Lundberg



*One of two large flood plain meadows on property.
Exceptional Spring habitat for foraging Clubtails*

The Hawthorne Crossing Conservation Area, managed by the Campbell County Conservation District, Kentucky, encompasses 135 acres along the lower Licking River. The Conservation District granted permission for a 2023 survey of the dragonflies and damselflies (Odonates) within the conservation area.

So, why post an article on a Kentucky preserve in the Ohio Odonata Society newsletter? One reason is that the Licking River flows from Central Kentucky, joining the Ohio River between Ohio's Little Miami River and Great Miami River, so it is a natural route for southern riverine species expanding range north into Ohio. Although preserve access is currently by appointment only, the development plan for Hawthorne Crossing includes the establishment of a public trail system. Kentucky's Hawthorne Crossing Conservation Area is a 20-minute drive south of Cincinnati – border crossing documents not required.

Survey visits were conducted at least twice a month through the flight season. Photo observations were posted on iNaturalist. Twentynine Odonate species were documented including five first-recorded species records for Campbell County, Kentucky. Four habitat areas within Hawthorne Crossing were selected for the survey:

1. Riffle Creek. 2. Pond. 3. Wetland. 4. Licking River.

1. Riffle Creek: Hawthorne Crossing protects approximately 2000 linear feet of Riffle Creek including the mouth of the creek as it flows into the Licking River. Riffle Creek maintained shallow pools with continuous light flow through the summer months. Twelve Odonate species were observed. It is possible that stream restoration on property, which included the creation of some deeper pools, will attract more species over the next few years.
2. Pond: The survey included the largest of the three property ponds. Twelve species were observed including a Spatterdock Darner *Rhionaeschna mutata* which is listed Critically Endangered (NatureServe) in Kentucky. This is the 6th documented *R. mutata* observation recorded in Kentucky.
3. Wetland: The small wetland area includes a few depressions in semi-permeable soil. They remained damp, but without standing water, in late summer. Two species were observed in the wetland site that were not observed elsewhere on the property: Slender Spreadwing *Lestes rectangularis* and Blue-faced Meadowhawk *Sympetrum ambiguum*.
4. Licking River: The Licking River flows 303 miles through farmland and forest, 289 miles before it reaches Hawthorne Crossing. A large sand and gravel island immediately downstream of the mouth of Riffle Creek is the site of the original low water crossing for which the conservation area is named, and it is the

last shallows on the Licking River. Beyond Hawthorne Crossing, the remaining 14 miles of the Licking River is affected by the Ohio River's Markland Dam, and it becomes deeper, slower and more silted. Two floodplain meadows on property, each approximately 150 yards long and 50 yards wide, were productive for foraging Clubtail (*Gomphidae*) dragonflies. Six Gomphidae species were observed in the meadows: Black-shouldered Spinyleg *Dromogomphus spinosus*, Flag-tailed Spinyleg *Dromogomphus spoliatus*, Russett-tipped Clubtail *Stylurus plagiatus*, Cobra Clubtail *Gomphurus vastus*, Midland Clubtail *Gomphurus fraternus* and Green-faced Clubtail *Hylogomphus viridifrons*. Outside of 2023 Licking River observations, there are few documented Kentucky observations of the last four species, especially *H. viridifrons*.



Looking towards the preserve from a Water Willow covered, mid-summer island in the Licking River, the mouth of Riffle Creek is just right of center.



Green-faced Clubtail *Hylogomphus viridifrons*. Mature male individuals develop green eyes, a pale green face and base thoracic color turns from the bright yellow of this fresh individual to greyish or pale grey-green. Abdominal segment 8 is longer than segment 9, making the club appear rounded from above. A thank you to Sarah White for the identification.



Spatterdock Darner *Rhionaeschna mutata*. A single sighting over the pond doesn't indicate breeding status.

Species	Flight Dates	Sites	
CALOPTERYGIDAE			
Smoky Rubyspot <i>Hetaerina titia</i>	Aug 22	3	
Ebony Jewelwing <i>Calopterix maculata</i>	May 22-Jun 14	1	
COENAGRIONIDAE			
Dusky Dancer <i>Argia translata</i>	Jul 24	4	
Blue-fronted Dancer <i>Argia apicalis</i>	Jun 14-Sep 18	1, 2, 4	
Blue-tipped Dancer <i>Argia tibialis</i>	May 31-Jun 29	1, 4	R
Powdered Dancer <i>Argia moesta</i>	May 31-Aug 22	1, 2, 3, 4	
Variable Dancer <i>Argia fumipennis</i>	May 31	1	
AESHNIDAE			
Spatterdock Darner <i>Rhionaeschna mutata</i>	June 14	2	R
Common Green Darner <i>Anax junius</i>	Jun 14--Sep 18	2, 3	
COENAGRIONIDAE			
Fragile Forktail <i>Ischnura posita</i>	May 5-Aug 22	2, 3, 4	
Eastern Forktail <i>Ischnura verticalis</i>	May 5-Jun 29	2, 3	
Stream Bluet <i>Anallagma exulans</i>	May 22-Aug 11	4	
GOMPHIDAE			
Black-shouldered Spinyleg <i>Dromogomphus spinosus</i>	Jun 14-Aug 22	1, 4	R
Flag-tailed Spinyleg <i>Dromogomphus spoliatus</i>	Jul 11-Aug 11	4	R
Russett-tipped Clubtail <i>Stylurus plagiatus</i>	Aug 22	4	
Cobra Clubtail <i>Gomphurus vastus</i>	May 17-Jul 11	4	
Midland Clubtail <i>Gomphurus fraternus</i>	May 8-Jun 14	4	
Green-faced Clubtail <i>Hylogomphus viridifrons</i>	May 8-May 17	4	R
Unicorn Clubtail <i>Arigomphus villosipes</i>	May 17-May 31	2	
LIBELLULIDAE			
Slaty Skimmer <i>Libellula incesta</i>	Jun 14-Aug 22	2	
Spangled Skimmer <i>Libellula cyanea</i>	May 31-Jun 14	2	
Widow Skimmer <i>Libellula luctuosa</i>	Jun 14-Jul 11	2	
Black Saddlebags <i>Tamea lacerate</i>	Jun 14-Jul 11	2	
Common Whitetail <i>Plathemis lydia</i>	May 17-Jun 29	2, 3	
Eastern Pondhawk <i>Erythemis simplicicollis</i>	May 17-Aug 22	1, 2, 4	
Blue-faced Meadowhawk <i>Sympetrum ambiguum</i>	Aug 22-Sep 18	3	
Blue Dasher <i>Pachydiplax longipennis</i>	May 31-Aug 22	2, 3	
LESTIDAE			
Slender Spreadwing <i>Lestus rectangularis</i>	May 22	3	
MACROMIDAE			
Swift River Cruiser <i>Macromia illinoensis</i>	May 17	4	

Sites: 1. Riffle Creek. 2. Pond. 3. Wetland. 4. Licking River.

R (Record): Campbell County species, first recorded observation based on a review of Odonata Central and iNaturalist posted observations.

2023 Ohio Odonata Survey (as of 12/13/2023) Jim Lemon jlem@woh.rr.com

We are at the end of the 2023 Dragonfly season. There may be some additional observations arrive, but the bulk of the data is now in place. Our latest flying adult Ode in the data (so far) is a Nov 27 Autumn Meadowhawk. 2023 will be the top year in the Ohio Odonata Society database with over 38,000 observations from more than 1,000 contributors. All 88 Ohio Counties are represented in the data, some more than others. While we did not have March observations, all of our other months (Apr-Nov) were ahead of the 5-year average and five months (Apr, Jul, Sep, Oct, Nov) posted new all-time high numbers.

135 species were recorded, short of our 5-year average (138), but 55 species had new all-time annual high observations. It was an especially good year for many Clubtail species. Eight species were documented in all 88 counties (Widow Skimmer, Fragile Forktail, Eastern Pondhawk, Eastern Forktail, Eastern Amberwing, Common Whitetail, Blue Dasher).

The exciting story for the year is our Four-spotted Skimmer irruption in late June, with 247 observations. We had over 100 new County Records (Four-spotted Skimmer accounts for more new County Records than any other species). Van Wert Co had the most new County Records. There will be 20+ new flight expansions (either new early date or new late date).

2023 Ohio Odonata Survey – County Data

88 Counties	# Observations	# Sp	# Days	# Users	# Co Records
Adams	145	39	26	19	
Allen	102	32 #	23 #	8 #	2
Ashland	147 #	26	27 #	18	
Ashtabula	[3578] #+	68 #	161 #+	38 #+	2
Athens	215 #+	35	25	26 #	3
Auglaize	147 #	26 #	8	3	2
Belmont	145 #	28 #+	8 #+	4	1
Brown	355 #+	29 #	13 #	9 #+	3
Butler	563 #	44 #	101 #	41	1
Carroll	687 #+	28 #	87 #+	10 #+	1
Champaign	1398 #+	64 #	85 #	40 #	1
Clark	718 #	52	61 #	27 #	1
Clermont	509 #+	59 #+	129 #	44 #	4
Clinton	130 #	27	21 #	16 #+	2
Columbiana	125 #	31 #	13	10 #	3
Coshocton	1153 #	55 #	95 #	11 #	2
Crawford	313 #+	39 #	18	21 #+	2
Cuyahoga	786 #	56 #+	135 #	119 #+	1
Darke	135	43	17	4	1
Defiance	105 #	31 #	9	6	1

Delaware	222	42 #	64	33	
Erie	186 #	30	47	24 #	
Fairfield	260 #	37	31	26	1
Fayette	398 #+	25	5	5	
Franklin	3184 #+	69 #+	145	[123] #	1
Fulton	202 #+	29	21 #	8 #+	2
Gallia	224 #	31 #	7	3	4
Geauga	618	63	88	43 #	
Greene	1098 #+	66 #	140 #+	67 #+	2
Guernsey	124 #	26	16 #	9 #+	2
Hamilton	1166 #+	61 #+	160 #+	78 #	
Hancock	255	53	53	12	1
Hardin	222 #+	30 #	22 #+	7 #	2
Harrison	171 #	31	23 #	10 #+	2
Henry	182 #	39 #+	12 #	5	5
Highland	112	28	14 #	9	
Hocking	158 #	43	42 #	36 #+	
Holmes	217 #+	24	29 #	9	1
Huron	143 #	23 #	13	6	3
Jackson	139	30	20 #	11 #	1
Jefferson	165 #	37 #+	34 #+	4	2
Knox	351 #+	31 #	13	14 #	1
Lake	845 #	69 #	83	57 #	
Lawrence	282 #+	31 #	12 #	7 #	
Licking	508 #	39 #	55	27	1
Logan	348 #	40	39 #	10	1
Lorain	901 #	57 #	120 #	44 #	1
Lucas	2212 #	70	[166] #	76 #+	
Madison	346 #	34	33 #	7	1
Mahoning	156 #	38 #	56 #	21 #+	1
Marion	221 #	27 #	5	6	2
Medina	465 #	47 #	83	41 #+	2
Meigs	112	26 #	11 #+	6 #	2
Mercer	160 #	26 #	8	3	3
Miami	182	39	22	15	2
Monroe	102 #	25 #	5	2	
Montgomery	964	[76] #	139 #+	51 #	2
Morgan	132 #	31 #	16	7	2
Morrow	470 #	37 #+	36 #+	17 #+	3
Muskingum	292 #+	43 #	30 #+	18 #+	2
Noble	123 #	26 #	8 #	5 #	
Ottawa	160 #	24	65 #+	32	2
Paulding	76	24	3	1	1

Perry	302 #+	49 #+	23	10 #+	5
Pickaway	296 #	37 #	25	14	2
Pike	119	36 #	11	12 #+	1
Portage	399 #	57	86 #	52 #	
Preble	198 #	33 #	19 #	15 #	
Putnam	355 #+	28 #	4	4 #	
Richland	178 #+	27	29 #	20 #	2
Ross	111	31	24 #	24 #+	1
Sandusky	184 #	28	20	11	1
Scioto	231 #	28 #	11	13	1
Seneca	247 #	28 #	14 #	9 #	1
Shelby	181 #	40 #	15	4	3
Stark	1141 #	72 #	107 #	40 #	
Summit	1207	73 #	147 #+	121 #	1
Trumbull	199	45 #	40 #	16 #+	3
Tuscarawas	161 #	28 #	17 #	8	1
Union	440 #+	43 #+	34 #+	12	5
Van Wert	173 #	36 #+	16 #	3	[6]
Vinton	432 #+	34 #	12 #	10 #	
Warren	286 #	46 #	61 #	42 #	3
Washington	160	35 #	16	6 #	1
Wayne	281 #+	44 #+	65 #	31 #	3
Williams	167 #	45 #	8	6	
Wood	98	26	37	19	1
Wyandot	242 #	25	8	8	1

where 2023 is above 5 year ave
+ where 2023 is new high value
[top value]

2023 Ohio Odonata Survey – Species Data

Species	# Observations	# Counties	# Days	# Users	# Co Records
Gray Petaltail	37	16 #	27 #	24	1
Common Sanddragon	0	0	0	0	
Dragonhunter	60 #	15	27	30 #	1
Rusty Snaketail	122 #+	4 #	19 #+	12 #	
Riffle Snaketail	0	0	0	0	
Eastern Ringtail	47 #+	6 #+	19 #	12 #+	2

Spine-crowned Clubtail	0	0	0	0	
Green-faced Clubtail	5	1	4 #	3 #	
Midland Clubtail	127 #+	20 #	24	31 #	2
Plains Clubtail	10	3 #+	7	6	1
Handsome Clubtail	62 #+	3	18 #+	10 #+	
Riverine Clubtail	0	0	0	0	
Cobra Clubtail	32	6	14	14	1
Skillet Clubtail	0	0	0	0	
Splendid Clubtail	13 #	1	4 #	4 #	
Elusive Clubtail	60 #+	1	27 #+	14 #+	
Russet-tipped Clubtail	90 #+	4 #+	37 #+	17 #+	
Arrow Clubtail	18	9 #+	14 #	12 #+	2
Ashy Clubtail	209 #+	35 #+	36 #+	41 #+	
Pronghorn Clubtail	81 #+	10 #+	19 #	17 #+	2
Lancet Clubtail	354 #+	44 #+	53 #+	40	2
Dusky Clubtail	31 #+	5 #	9 #	6	
Rapids Clubtail	109 #+	11 #+	24 #+	17 #+	
Jade Clubtail	20 #	5 #+	4	3	1
Lilypad Clubtail	30 #+	5 #+	7 #	8 #	1
Unicorn Clubtail	362 #+	53 #	50 #+	74 #+	2
Laura's Clubtail	1	1	1	1	
Flag-tailed Spinyleg	142 #+	22	50 #	33 #	
Black-shouldered Spinyleg	52	20	28	23	1
Eastern Least Clubtail	50 #+	7 #	18 #	12 #	1
Northern Pygmy Clubtail	0	0	0	0	
Southern Pygmy Clubtail	41 #+	2 #	8 #+	9 #	
Taper-tailed Darner	0	0	0	0	
Harlequin Darner	14 #	3 #	10 #+	8 #	
Springtime Darner	62 #+	22 #+	27 #+	28 #+	1
Fawn Darner	44 #	20 #	29 #	29 #+	
Ocellated Darner	2	2 #	2	2	
Comet Darner	68	25	36	36 #	
Common Green Darner	877 #+	75 #	168 #+	159 #+	
Cyrano Darner	52 #+	25 #+	30 #+	26 #+	5
Swamp Darner	46	18	29	36	3
Spatterdock Darner	55 #+	13 #	24 #+	23 #	1
Shadow Darner	134 #	35 #+	60 #	71 #+	2
Lance-tipped Darner	0	0	0	0	
Variable Darner	0	0	0	0	
Mottled Darner	0	0	0	0	
Black-tipped Darner	32 #+	6 #+	14 #+	10 #+	
Canada Darner	0	0	0	0	
Green-striped Darner	29 #	8 #	17 #	16 #+	

Delta-spotted Spiketail	45 #+	2	7 #+	7 #	
Brown Spiketail	18 #	4 #	9 #	8	
Tiger Spiketail	14 #	5 #	5 #	7 #+	
Arrowhead Spiketail	16	6	10	12	
Twin-spotted Spiketail	11 #+	6 #+	7 #+	9 #+	1
Swift River Cruiser	63 #	18	37 #	25 #	
Allegheny River Cruiser	0	0	0	0	
Royal River Cruiser	56 #	19	26	21 #	1
Wabash River Cruiser	0	0	0	0	
Macromia Hybrid	23 #+	5	14 #+	8 #+	1
Gilded River Cruiser	3	1	1	1	
Georgia River Cruiser	0	0	0	0	
Stream Cruiser	22 #+	8	11 #+	10 #+	1
Umber Shadowdragon	0	0	0	0	
Stygian Shadowdragon	1	1	1	1	
Smoky Shadowdragon	0	0	0	0	
Prince Baskettail	494 #+	81 #+	100 #	81 #+	
Common Baskettail	93 #+	33 #+	33 #	38 #+	4
Slender Baskettail	1	1	1	1	
Beaverpond Baskettail	1	1	1	1	
Uhler's Sundragon	3	1	1	1	
Mocha Emerald	11	9 #	7	8	
Plains Emerald	0	0	0	0	
Clamp-tipped Emerald	11	5	7	7	1
Hine's Emerald	0	0	0	0	
Incurvate Emerald	0	0	0	0	
Brush-tipped Emerald	0	0	0	0	
Kennedy's Emerald	0	0	0	0	
American Emerald	0	0	0	0	
Racket-tailed Emerald	2	1	1	1	
Elfin Skimmer	48	1	17	17	
Eastern Amberwing	1586 #+	[88] #	120 #	188 #+	
Halloween Pennant	531 #	61	88	110	
Calico Pennant	418 #	46	86	71	
Banded Pennant	133 #	15	39	25	
Double-ringed Pennant	5	1	2	2	
Scarlet Skimmer	0	0	0	0	
Band-winged Dragonlet	0	0	0	0	
Little Blue Dragonlet	0	0	0	0	
Blue Corporal	102 #+	12	23 #	19 #	
Yellow-sided Skimmer	3	1	1	1	
Chalk-fronted Corporal	1	1	1	1	
Widow Skimmer	1723 #	[88] #	130 #	252 #+	

Golden-winged Skimmer	0	0	0	0	
Spangled Skimmer	203 #+	33 #	48 #	43 #	
Painted Skimmer	103	24	46 #	39	
Twelve-spotted Skimmer	361	61	89	98	
Four-spotted Skimmer	247 #+	31 #+	16 #+	57 #+	[23]
Slaty Skimmer	774 #	62 #	108 #	117 #	
Great Blue Skimmer	14	8	9	10	
Common Whitetail	1818 #+	[88] #	142 #	[319] #	
Variegated Meadowhawk	30 #	7 #	17 #	11 #	2
Blue-faced Meadowhawk	101	15	48	29	2
White-faced Meadowhawk	7	3	5	6	
Cherry-faced Meadowhawk	0	0	0	0	
Ruby Meadowhawk	19	10	13	10 #	
Band-winged Meadowhawk	83	18 #	38	26	1
Autumn Meadowhawk	1483 #	64 #	130	146 #	
Saffron-winged Meadowhawk	0	0	0	0	
Dot-tailed Whiteface	238 #+	31 #	44 #	44 #	2
Frosted Whiteface	0	0	0	0	
Belted Whiteface	0	0	0	0	
Blue Dasher	1905 #	[88] #	132	227	
Eastern Pondhawk	2125 #	[88] #	148	225	
Swift Setwing	59 #+	7 #	19	10	1
Spot-winged Glider	115 #+	25 #+	51 #	45 #+	3
Wandering Glider	177 #	35	77	59 #	
Striped Saddlebags	0	0	0	0	
Black Saddlebags	393 #	72 #	114	89	
Red Saddlebags	37 #+	15 #+	22 #+	19 #+	3
Carolina Saddlebags	66	23	44	31	1
Appalachian Jewelwing	0	0	0	0	
River Jewelwing	10 #	1	6 #	6	
Ebony Jewelwing	1277 #+	70	117 #+	295 #	
American Rubyspot	752 #+	50 #	116 #+	83 #+	
Smoky Rubyspot	65 #	4	18	7	
Great Spreadwing	126 #	27 #+	51 #	60 #	4
Elegant Spreadwing	85 #+	23 #+	32 #	28 #+	4
Amber-winged Spreadwing	80 #	17	34 #+	23	2
Spotted Spreadwing	79	15	37	24	2
Lyre-tipped Spreadwing	5	4 #	5	5 #	2
Sweetflag Spreadwing	79 #+	18 #	39 #+	25 #	3
Northern Spreadwing	1 #	1	1	1	1
Southern Spreadwing	15	7	8	12 #	1
Slender Spreadwing	419	59 #	112 #	72	
Emerald Spreadwing	71 #	15	23	21 #	2

Swamp Spreadwing	93 #+	23 #	37 #	25 #	3
Blue-fronted Dancer	888 #	81 #	114 #	133 #+	
Seepage Dancer	187 #	5 #	33	30 #	
Violet Dancer	1255 #+	82 #	121 #+	136 #+	
Paiute Dancer	44	4 #	17	13	
Powdered Dancer	811 #+	62 #	95 #	99 #+	1
Blue-ringed Dancer	411 #	44	75	46 #	
Blue-tipped Dancer	691 #	65 #	83 #	119 #+	
Dusky Dancer	230 #	47 #	68 #	43 #	
Eastern Red Damsel	216 #+	24 #+	52 #	59 #+	2
Duckweed Firetail	0	0	0	0	
Sphagnum Sprite	57	9 #	22 #	16	1
Sedge Sprite	50 #	11 #	23 #	20 #	1
Aurora Damsel	95 #+	18 #	27 #+	27 #+	2
Taiga Bluet	0	0	0	0	
Turquoise Bluet	215 #+	27 #+	43 #+	33 #+	6
Hagen's Bluet	0	0	0	0	
Boreal Bluet	3 #	1	3 #+	3 #+	1
Northern Bluet	8 #	2 #	4 #	3 #	
Skimming Bluet	716 #+	74 #	116 #+	89 #+	
Orange Bluet	671 #+	82 #+	122 #	83 #+	
Vesper Bluet	257 #+	34 #+	55 #+	36 #+	8
Marsh Bluet	0	0	0	0	
Stream Bluet	870 #+	76 #	96 #	93 #+	
Rainbow Bluet	64 #+	16 #	19 #	23 #+	1
Tule Bluet	54	9 #	25	19 #+	1
River Bluet	8 #	2 #+	3 #	2 #	1
Atlantic Bluet	0	0	0	0	
Familiar Bluet	940 #	73 #	152 #+	119 #+	
Double-striped Bluet	744 #+	78 #	135 #+	90 #+	
Azure Bluet	329 #	51 #	90 #+	82 #	
Westfall's Slender Bluet	538 #+	61 #+	71 #+	65 #+	
Furtive Forktail	0	0	0	0	
Fragile Forktail	2239 #+	[88] #	168 #	187 #+	
Lilypad Forktail	203 #+	10 #	52 #+	24 #+	3
Rambur's Forktail	1	1	1	1	1
Eastern Forktail	[2500] #+	[88] #	[169] #	191 #+	
Citrine Forktail	81	13	33	18	1

2023 is above 5 year ave
+ 2023 is new high value
[top value]