# Odonata of Beaver Dam, Huntingdon County, Pennsylvania: A Record of Faunal Succession in a Changing Habitat

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**Abstract**

Beaver Dam pond, created in the 1930s by damming Shaver Creek, was destroyed by floods in the mid-1960s and early 1970s, leaving a large wet meadow surrounded by forest and fed by Shaver Creek and numerous springs and seep tributaries. The Odonata fauna of this habitat in central Pennsylvania was first sampled in 1954 and has been revisited over 600 times since, mostly in the past three decades. The habitat succession has resulted in faunal changes. Aside from supporting populations of several Odonata species of conservation interest, it is remarkable in that the River Bluet (*Enallagma anna*), a damselfly with western affinities, colonized the site in 2006, the only known location for the species in Pennsylvania and south and east of southeastern Michigan and southern Ontario. We report the yearly and seasonal distribution of the 99 species documented at Beaver Dam and associated stream and wetlands through early 2011.

For the past 65 years at least one Odonata specialist has called central Pennsylvania home and has regularly sampled the Odonata local fauna at a number of interesting habitats. As a consequence, the local diversity, population stability, and changes over time are fairly well documented (Beatty and Beatty, 1971; Beatty, Beatty, and Shiffer, 1969; Beatty, Beatty, and White, 1969; Shiffer and White, 1995, 2014; Shiffer, Leppo, and White, 2014; White, 1963, 2006). Here we add to this record and describe the Odonata fauna at Beaver Dam (also known as Beaver Pond or Pine Swamp) in Huntingdon County, Pennsylvania.

## Description of Beaver Dam

Beaver Dam meadow (Fig. 1A–D). is located about six miles south of State College in northern Huntingdon County, Pennsylvania (N 40°42.7, W 77°52.8) at an elevation of 380 m (1290 ft). Numerous springs and seeps on the south side of Tussey Ridge form the headwaters of Shaver Creek, which winds its way southwest about 12 miles before emptying into the Juniata River at Petersburg. In the 1930s the Civilian Conservation Corps constructed a dam on Shaver Creek near its headwaters, forming a small lake (Beaver Dam) of about 2.7 hectares (6.7 acres) with shallow margins and abundant emergent vegetation. In the mid-1960s a flood washed out the dam, leaving a wet meadow fed by numerous springs. A subsequent major flood in June 1972, caused by the remnants of Hurricane Agnes, further eroded the breach in the dam.

Although the Pennsylvania Game Commission planned to repair the dam to encourage duck hunting, those plans were abandoned when it became known that a robust population of the Sable Clubtail (*Gomphus rogersi*) existed in the stream that flowed through the meadow there. The dam was never repaired and successional forest growth has taken over in dryer parts of the meadow. At various times, visitors have moved rocks to create a low dam and stepping stones that have raised water levels, maintaining a small pool just before Shaver Creek exits the meadow. Beaver Dam meadow is now part of the Rothrock State Forest. A series of aerial photographs from 1938 to 2012 (Fig. 2) show this transition from a pond to an herbaceous marsh.

## Early Records and Survey Methods

The variety of microhabitats combined with succession has supported a diverse and changing Odonata fauna that was sampled intermittently between 1954 and 1981, more regularly between 1982 and 1998, and then intensively from 1999 through 2010 by C.N. Shiffer. In 1986 and 2005 the Dragonfly Society of the Americas held regional meetings during which Beaver Dam was visited by numerous dragonfly specialists. Other than a passing mention of Beaver Dam meadow in reports of those meetings (Dunkle, 1986; Pfeiffer, 2005) and a short note on C.N. Shiffer's discovery of the River Bluet (*Enallagma anna*) at Beaver Dam (White, 2006), very few publications, if any, specifically cite this location of particular Odonata diversity where as many as 70 species have been recorded in a single year (Table 1).

The first Odonata records from Beaver Dam come from a few specimens collected in 1954 by Stuart Frost, for whom the Pennsylvania State University Entomological Museum is named. Many of the species recorded before the dam washed out, like Frost's, are based on specimens collected and not on field notes that would list species seen in addition to those collected. Consequently, our knowledge of the earlier fauna is limited and fragmentary, but nevertheless provides a snapshot of the Odonata present at that time.

Because of varying weather conditions, time of year, and

personal circumstances, there was not a standard survey method other than to attempt to record every species seen and make qualitative estimates of abundance during a visit. The site is small enough to be covered easily in an hour or two during a single visit. Since 1954, Odonata were recorded on 609 dates at Beaver Dam, ranging from late April through mid-November. The site was visited in 12 different years before 1980. When parsed into five-year intervals starting in 1955, there was no interval before 1980 when the site was visited more than seven times. All but two intervals since 1980 have more than fifty visits with a maximum of 239 between 2005 and 2009 (Table 1). While fewer surveys were conducted near the beginning and end of the flying season, over the years the site was visited at least 10 times in every monthly quarter from the fourth quarter of May through the fourth quarter of October, with more than 30 visits every quarter in July and August (Table 2).

Over 90% of all surveys at Beaver Dam were by C.N. Shiffer. Being familiar with the site, its microhabitats, and the Odonata fauna enabled him to conduct thorough surveys during the flight season and recognize unexpected species when they appeared. Thus, we have a fairly complete knowledge of the resident species and their relative abundances. Although H.B. White visited the site once in 2013 and again in 2014, regular monitoring of Beaver Dam meadow and associated wetlands concluded on 30 June 2011.

All records used to construct Tables 1 and 2 come from a Pennsylvania Odonata log book maintained by C.N. Shiffer that was scanned and is available on-line through the Frost Museum Website (Shiffer, White, and Deans, 2014). Voucher specimens exist for virtually every species reported and are currently part of the Florida State Collection of Arthropods in Gainesville, Florida, where CNS's collection now resides.

**Seasonal and Yearly Distribution of Odonata at Beaver Dam**

Table 1 shows the years in which each of the Odonata species was observed at Beaver Dam since 1982. Table 2 shows the seasonal distributions of species observed at Beaver Dam since 1954. Figure 3 graphs the species accumulation curve by plotting the cumulative number of Odonata species documented as a function of years of observation. The graph starts in 1982, the first year CNS began conducting

Figure 1. Beaver Dam meadow and Shaver Creek. Shaver Creek, a stream about two meters wide (1A, upper left), winds through the meadow with several significant spring runs and seepages (1B, upper right) contributing to its flow. The eastern end is a damp marshy fen with tall grass; other areas have bog-like character with sphagnum and cranberries. Immediately upstream of the dam is a small pool representing the lingering remnant of the former pond (1C, lower left). Above and below the meadow, Shaver Creek is a typical cold water Appalachian stream tumbling over rocks and enclosed by forest. Shaver Creek immediately below Beaver Dam is shown in 1D (lower right). A, B, and D by James White, 18 July 2014. C by Betsy Leppo, 9 October 2006.

routine surveys at the site. CNS documented 41 species at the site by the end the first year. The cumulative number of species increased steadily for the first five years; the site list gained 27 species by 1986 for a total of 68 species. In the next 25 years, species were slowly but steadily added; eventually 30 more species were added to the site list for a site total of 98 species. Orange Bluet (*Enallama signatum*) was detected at the site in 1961 but was not seen again. Including the Orange Bluet, the site total reaches 99 species.

The fact that new species continued to be added over the next 25 years likely reflects in part the gradual change of the Beaver Dam site from an impoundment to an emergent marsh to an herbacous shrub marsh. As the wetland vegetation matured and the percent cover of shrubs and trees increased, the site became more or less suitable for different species of Odonata. In the 1950s and 1960s, the collection of typical pond species during a few sporadic visits contrasts with the absence or near absence of those same species in recent decades when the site has been closely monitored. For example, American and Racket-tailed Emeralds (*Cordulia shurtleffii* and *Dorocordulia libera*), Chalk-fronted Corporal (*Ladona julia*), and Frosted and Dot-tailed Whiteface (*Leucorrhinia frigida* and *L. intacta*) were common or even abundant, but since 1982 their presence has been rare and sporadic. The Beaverpond Clubtail (*Gomphus borealis*), which occurred regularly at Beaver Dam in earlier years, has not been seen there since 1999 despite intensive surveys. Similarly, spreadwings (*Lestes* spp.) have become much less common.

Not all of the Odonata faunal changes are due to the successional changes in the habitat. With changing climatic conditions, we also expect to see species with more southerly ranges moving north into Pennsylvania and colonizing sites such as Beaver Dam. Several species that have shown up in recent years appear to be expanding their ranges northward and have appeared at other sites in Central Pennsylvania (Shiffer and White, 2014; Shiffer, Leppo, and White, 2014). These include Yellow-sided, Spangled, and Slaty Skimmers (*Libellula flavida*, *L. cyanea*, and *L. incesta*), Great Spreadwing (*Archilestes grandis*), Turquoise Bluet (*Enallagma divagans*), and Double-striped Bluet (*E. basidens*). Another species that appears to have expanded its range from the north is the White-faced Meadowhawk (*Sympetrum obtrusum*).

By far the most notable colonization observed was the River Bluet (*Enallagma anna*), a species that had never before been recorded from Pennsylvania (White, 2006). It was first seen by C.N. Shiffer on 29 June 2006, when at least 10 individuals were present. Frequent surveys encountered multiple individuals through the end of July. The following two years, a small population persisted with multiple obser-

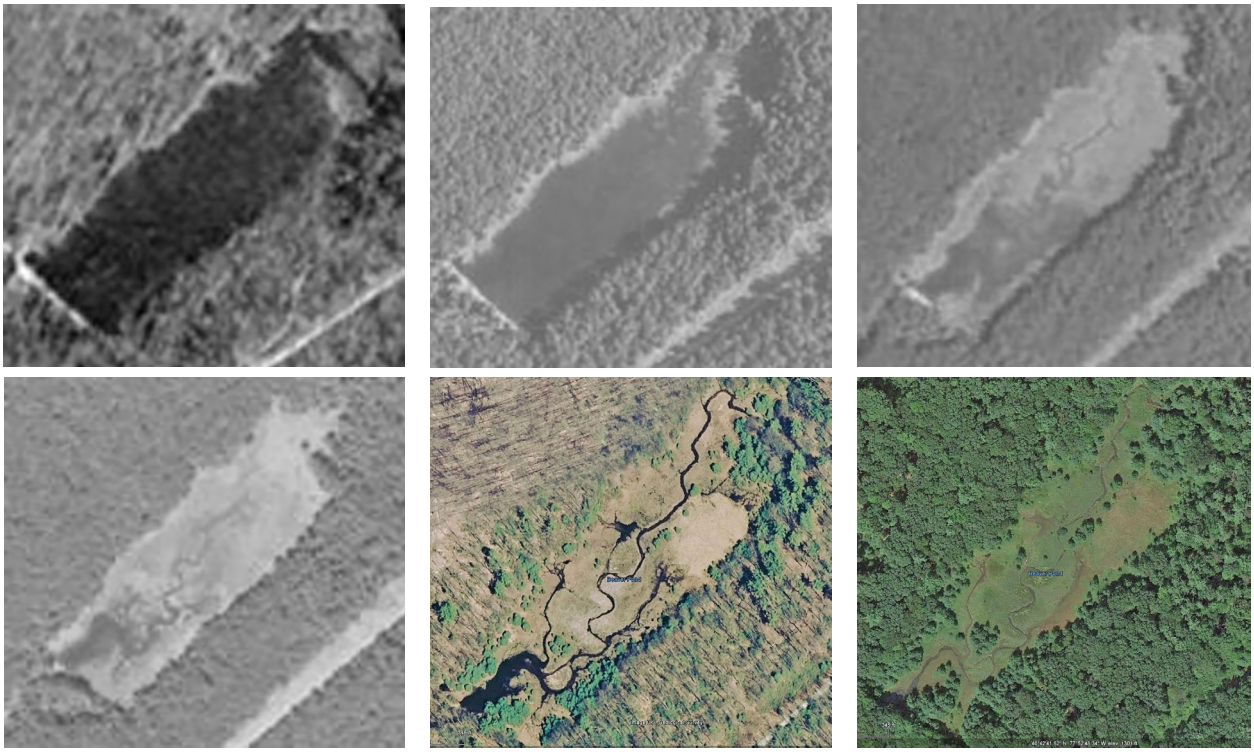

Figure 2. A succession of aerial photographs from 1938 to 2012 showing the transition of Beaver Dam from a pond to a large wet meadow with numerous seeps feeding Shaver Creek. Top left: 10 November 1938; top middle: 2 July 1957; top right: 12 August 1967; bottom left: 3 July 1971; bottom middle: 30 March 2007; bottom right: 30 August 2012. Images from USDA and Google Earth.

vations between 12 June and 17 July 2007 and between 7 June and 12 July 2008. While the species was found in 2009, 2010, and 2011, the frequency of observation and numbers observed were low. *E. anna* was not seen by H.B. White on his visits to the site on 4 July 2013 and 18 July 2014. The current status of the population is unknown and it may no longer be present.

A number of species recorded for Beaver Dam are associated with Shaver Creek and seeps that surround the area. They are probably present every year but are harder to find along the woodland stream or in forest vegetation. These include the Gray Petaltail (*Tachopteryx thoreyi*), Springtime Darner (*Basiaeschna janata*), Tiger and Twin-spotted Spiketails (*Cordulegaster erronea* and *C. maculata*), Southern and Northern Pygmy Clubtails (*Lanthus vernalis* and *L. parvulus*), and Uhler's Sundragon (*Helocordulia uhleri*). Other stream species are found along Shaver Creek in the open meadow. These include Delta-spotted Spiketail (*Cordulegaster diastatops*), Lancet, Ashy, and Sable Clubtails (*Gomphus exilis*, *G. lividus*, and *G. rogersi*), and Ski-tailed Emerald (*Somatochlora elongata*). In the bog and fen portions of the meadow, one can find Four-spotted and Painted Skimmers (*Libellula quadrimaculata* and *L. semifasciata*), Clamp-tipped and Brush-tipped Emeralds (*Somatochlora tenebrosa* and *S. walshii*), Hudsonian Whiteface (*Leucorrhinia hudsonica*), Eastern Red Damsel (*Amphiagrion saucium*), Aurora Damsel (*Chromagrion conditum*), Hagen's Bluet (*Enallagma hageni*), and Sphagnum Sprite (*Nehalennia gracilis*).

**Species of Concern**

Twenty-two species of concern in Pennsylvania are known from the Beaver Dam site (Table 4). Of those, 11 appear to occur regularly and were documented in at least 10 out of 30 survey years. These 11 species were further examined for trends in how frequently they were observed between 1982 and 2011, when regular surveys were taking place. This 30 year period was divided into six 5-year intervals (1982–1986, 1987–1991, 1992–1996, 1997–2001, 2002–2006, and 2007–2011). The number of surveys in which a species was observed during each 5-year period was divided by the total number of surveys in that same 5-year period to account for survey effort. The percentage of positive surveys for a species within each 5-year intervals was plotted. A trend line was added to evaluate the linear trend. Species with a linear regression $R^2$ value equal to or greater than 0.20 were considered to be increasing or decreasing (depending on the direction of the trend) at Beaver Dam; $R^2$ values less than 0.20 were considered stable. The results of this analysis are presented in Table 4.

Species of concern that appear to be increasing at the site include Turqoise Bluet (*Enallagma divagans*) and Ski-tailed Emerald (*Somatochlora elongata*). Species of concern that appear to be declining at the site include American Emerald (*Cordulia shurtleffii*), Beaverpond Clubtail (*Gomphus borealis*), Amber-winged Spreadwing (*Lestes eurinus*), and Brush-tipped Emerald (*Somatochlora walshii*). These trends may be due in part to habitat succession or a changing climate creating more or less favorable conditions for these species. Other factors that could be involved include species relationships (e.g., competition and predation), diseases, and changes in water quality.

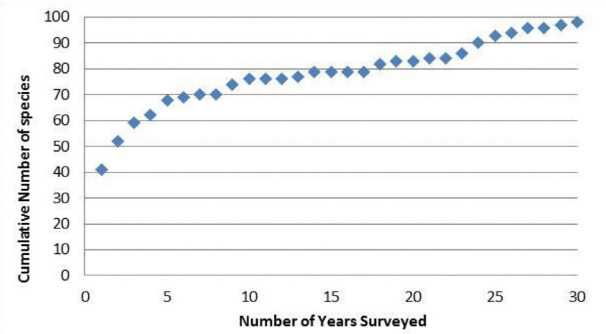

Figure 3. Graph of the cumulative number of Odonata species observed at Beaver Dam over the thirty-year period, 1982–2011.

In summary, Beaver Dam meadow and associated wetlands support a diverse and interesting Odonata fauna. Future monitoring efforts that include measures of habitat and environmental conditions shed more light on how and why the Odonata fauna is changing at Beaver Dam.

**Acknowledgements**

We thank James White for three photographs used in Figure 2. We also thank the numerous people who have shared their observations made over the years at Beaver Dam.

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Table 1. Yearly distribution of Odonata at Beaver Dam, Huntingdon County, Pennsylvania, 1982–2011. Numbers in the final column also include data from 1954–1982.

| Year | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | Tot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Calopteryx maculata* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | 33 |
| *Archilestes grandis* | | | | | | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | | 12 |
| *Lestes australis* | | | | | | | | | | | | | | | | | | | X | X | X | | | | | | | | | | 3 |
| *Lestes congener* | X | | X | | X | | | | | | | | | | | | | X | X | X | X | X | | X | X | X | X | X | | | 13 |
| *Lestes dryas* | | | | | | | | | X | | X | | | | | | | | | | | X | | | | | | X | | | 4 |
| *Lestes eurinus* | X | X | X | X | | X | X | X | | X | X | X | X | | | | | X | | | | | | | | X | X | | | | 14 |
| *Lestes forcipatus* | X | X | | X | X | X | | | X | X | X | | X | | | | | X | | | | X | | X | | X | X | X | X | | 17 |
| *Lestes rectangularis* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | | X | X | X | X | X | X | X | X | X | X | X | X | | 30 |
| *Lestes vigilax* | X | X | X | X | X | | | | | | X | | | | | | | | | | | | | | X | X | | | | | 8 |
| *Amphiagrion saucium* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | 27 |
| *Argia apicalis* | | | | | | | | | | | | | | | | | | | | | X | | | | | | | | | | 1 |
| *Argia fumipennis violacea* | X | X | X | X | X | | X | | X | X | X | X | X | | | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | 26 |
| *Argia moesta* | | X | | | | | | | | | X | | X | | | | | | | | | X | | | X | X | | | X | | 7 |
| *Chromagrion conditum* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | X | X | | X | X | X | X | X | X | X | X | | 30 |
| *Enallagma anna* | | | | | | | | | | | | | | | | | | | | | | | | | X | X | X | X | X | X | 6 |
| *Enallagma annexum* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | 1 |
| *Enallagma antennatum* | | | | | | | | | | | | | | | | | | | | | | | | | | | X | | | | 1 |
| *Enallagma aspersum* | X | X | X | X | X | X | X | X | | X | X | X | X | X | | X | | X | X | X | | X | X | X | X | X | X | X | X | X | 29 |
| *Enallagma basidens* | | | | | | | | | | | | | | | | | | | | | | | | | X | | | X | | | 2 |
| *Enallagma civile* | | | | | | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | | 15 |
| *Enallagma divagans* | | | | | | | | | | | | | | | | | | X | X | X | | | X | | X | X | X | X | X | X | 10 |
| *Enallagma exsulans* | | | X | | X | X | | | | X | | X | X | | | X | | | | X | | X | | X | X | X | X | | X | | 15 |
| *Enallagma hageni* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | 31 |
| *Enallagma signatum*[1] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| *Ischnura hastata* | X | | | | | | | | | | | | | | | | | | X | | | X | X | X | | | X | | X | | 7 |

[1] *Enallagma signatum* was observed in 1961 but not subsequently.

Table 1, continued. Yearly distribution of Odonata at Beaver Dam, Huntingdon County, Pennsylvania

| Year | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | Tot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Ischnura posita* | | X | | X | X | | X | | X | X | X | X | X | X | | | | X | X | X | | X | X | X | X | X | X | X | X | | 23 |
| *Ischnura verticalis* | X | X | X | X | X | X | X | | X | X | X | X | X | X | | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | 35 |
| *Nehalennia gracilis* | | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | 27 |
| *Nehalennia irene* | X | X | X | X | X | X | | | X | X | | | X | X | | X | | X | X | X | X | X | X | X | X | X | X | X | X | | 24 |
| *Tachopteryx thoreyi* | | | X | X | | | | | | | | | | X | X | | | X | X | X | | X | X | X | X | X | X | X | X | X | 16 |
| *Aeshna canadensis* | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | | X | X | X | X | X | X | X | X | X | X | X | | X | | 26 |
| *Aeshna constricta* | | | | | | | | | | | | | | | | | | | | | | | | | | | X | | | | 1 |
| *Aeshna tuberculifera* | X | X | | X | X | X | | X | | X | | X | X | X | | | X | X | X | X | X | X | X | X | X | X | | | X | | 22 |
| *Aeshna umbrosa* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | X | X | X | X | X | X | X | X | X | X | X | X | X | | 29 |
| *Aeshna verticalis* | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | | 30 |
| *Anax junius* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | 35 |
| *Anax longipes* | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| *Basiaeschna janata* | X | | | | | | | | | | | | | X | | | | X | | X | | | | | | X | | X | | X | 7 |
| *Boyeria grafiana* | X | X | X | X | | | | | X | X | X | X | X | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | | 22 |
| *Boyeria vinosa* | X | X | X | X | | X | X | X | X | X | X | X | X | X | | X | | X | X | X | | X | X | X | X | X | X | X | X | | 25 |
| *Epiaeschna heros* | | | | | | | X | X | X | | X | | | | | | | X | | X | | | X | X | X | X | X | X | | | 13 |
| *Gomphaeschna furcellata* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | | 1 |
| *Rhionaeschna mutata* | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | 2 |
| *Arigomphus villosipes* | X | X | | | X | X | | | | X | X | X | X | | | | | X | X | | | | | | | | X | | X | | 15 |
| *Dromogomphus spinosus* | | | | | X | | | | | | | | | | | | | | | | | | | | | | X | | | | 2 |
| *Gomphus borealis* | | X | X | X | X | X | X | X | X | X | X | X | | X | | | | X | | | | | | | | | | | | | 15 |
| *Gomphus exilis* | X | X | X | X | X | X | X | | X | X | X | X | X | X | | X | | X | X | X | | X | X | X | X | X | X | X | X | X | 26 |
| *Gomphus lividus* | X | X | X | X | X | X | X | | | X | X | X | X | X | | | | X | X | X | X | X | X | X | X | | X | X | X | | 24 |
| *Gomphus rogersi* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | X | X | X | | X | X | X | X | X | X | X | X | | 26 |
| *Hagenius brevistylus* | | | | | X | X | | | X | X | | | X | X | | | | X | | X | | X | | X | X | | | X | X | | 13 |
| *Lanthus parvulus* | | | | | X | X | X | X | | | | | X | | | | | | | | | | | | | | | | | | 5 |
| *Lanthus vernalis* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | X | X | X | | X | | X | X | X | X | X | X | | 24 |
| *Ophiogomphus mainensis* | | | | X | | | X | X | | | | | | | | | | | | | | | | | | | | | | | 3 |
| *Ophiogomphus rupinsulensis* | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| *Stylogomphus albistylus* | X | | | | X | X | X | X | X | X | X | X | X | X | | | | X | X | X | | X | X | X | X | X | X | X | X | X | 23 |
| *Cordulegaster diastatops* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | X | X | X | | X | X | X | X | X | X | X | X | X | 26 |
| *Cordulegaster erronea* | X | | | | | X | X | X | | X | X | X | X | | | | | X | X | X | | X | X | X | | X | X | | | | 16 |
| *Cordulegaster maculata* | | | X | X | X | | X | X | | | X | X | | X | | | | X | X | | | X | | X | X | | | X | X | | 15 |
| *Didymops transversa* | | | X | | | | | X | | | | X | | | | | | | | | | | | | | | | X | | | 4 |
| *Macromia i. illinoiensis* | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| *Cordulia shurtleffii* | | | | X | | X | X | | X | X | | X | | | | | | | X | X | | | | | | X | X | | | | 12 |
| *Dorocordulia libera* | | X | | | X | | | | | | | | | | | | | | | X | | | | | | | X | | | | 7 |
| *Epitheca canis* | | | | X | | | | X | | X | | | | | | | | | X | | | | | | | | | | | | 5 |
| *Epitheca cynosura* | X | X | X | X | X | X | X | | X | X | | X | X | | | | | | X | | | | X | X | | X | X | X | X | | 23 |
| *Epitheca princeps* | X | X | X | X | X | X | X | X | X | X | | X | X | X | X | | | X | | | | X | X | | X | X | | | | X | 20 |
| *Helocordulia uhleri* | | | X | X | | X | X | X | X | X | X | | | | | | | X | X | X | | X | | X | X | X | X | X | X | X | 19 |
| *Somatochlora elongata* | | | | | X | X | | | | X | | | X | | | | | X | X | | | | | X | X | X | X | X | X | | 12 |
| *Somatochlora linearis* | | | | | | | | | | | | | | | | | | | | | | | X | | X | | | X | | | 3 |
| *Somatochlora tenebrosa* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | 29 |
| *Somatochlora walshii* | | X | | | | | | | | | | | | | | X | | X | X | X | X | | X | X | X | X | X | | | X | 13 |

Table 1, continued. Yearly distribution of Odonata at Beaver Dam, Huntingdon County, Pennsylvania

| Year | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | Tot |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Celithemis elisa* | X | X | X | X | X | X | X | | X | | X | X | X | X | | | | X | X | X | | X | X | X | X | X | X | X | X | | 24 |
| *Celithemis eponina* | | | | | | | | | X | | X | | | | | | | | X | X | | | | | X | X | X | | | | 7 |
| *Erythemis simplicicollis* | | X | X | | X | X | | | | X | | | | | | | | | X | | | X | X | X | X | X | X | X | | 15 |
| *Ladona julia* | X | X | X | X | X | X | X | | | X | | | X | | | | | | X | | | | | X | | | X | X | X | | 20 |
| *Leucorrhinia frigida* | | | | | | | | | | | | | | | | | | | | | | | | X | | | | | | | 3 |
| *Leucorrhinia hudsonica* | X | X | X | X | X | X | X | | | X | X | X | X | X | | X | | X | X | X | | X | | X | X | X | X | X | | X | 23 |
| *Leucorrhinia intacta* | | X | | | | X | | | | | | | | | | | | | | | | | | | | | X | X | X | | 7 |
| *Leucorrhinia proxima* | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | | | 1 |
| *Libellula auripennis* | | | | | | | | | X | | | | | | | | | | | | | | | X | | | X | | | | 3 |
| *Libellula axilena* | | | | | | | | | | | | | | | | | | | | | | | X | | | | X | | X | | 3 |
| *Libellula cyanea* | | | | | | | | | X | X | X | X | X | | | | | X | X | X | | X | X | X | X | X | X | X | X | | 16 |
| *Libellula flavida* | | | | | | | | | | | | | | | | | | | | | | | | | X | X | X | X | X | X | 6 |
| *Libellula incesta* | | | | | | | | | | | | | | | | | | | | | | | | X | | | X | X | | | 3 |
| *Libellula luctuosa* | X | X | X | X | X | X | X | | X | X | X | X | X | X | | | | X | X | X | | X | X | X | X | X | X | X | X | | 25 |
| *Libellula pulchella* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | 30 |
| *Libellula quadrimaculata* | | X | X | X | X | | X | | | X | X | | | | | | | | | | | X | | X | X | | X | X | X | | 13 |
| *Libellula semifasciata* | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | X | X | | X | X | X | X | X | X | X | X | X | 28 |
| *Libellula vibrans* | | | | | | | | | | | | | | | | | | | | | | | X | X | | | | | | | 2 |
| *Pachydiplax longipennis* | | | | | | | | | | X | | X | | | | X | | X | X | | X | X | X | X | X | X | X | X | X | | 14 |
| *Pantala flavescens* | X | | | | X | | | | | X | X | | | X | | | | X | X | X | | X | X | X | | X | X | X | X | | 15 |
| *Pantala hymenaea* | | | X | | X | X | X | | | | X | X | X | | | | | | | | | | | X | X | | | | | | 9 |
| *Perithemis tenera* | | | | | | | | | | | | | | | | | | | | | | | | | | X | X | | | | 2 |
| *Plathemis lydia* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | | X | X | X | | X | X | X | X | X | X | X | X | X | 31 |
| *Sympetrum internum/janeae*[2] | | | | | | | | | | | | | X | X | | X | | X | X | X | | X | X | X | X | X | X | X | X | | 14 |
| *Sympetrum obtrusum* | | | | | | | | | | | | | | X | | | | X | X | X | | X | X | X | X | X | X | X | X | | 12 |
| *Sympetrum rubicundulum*[1] | | | | | | | | | | | | | | X | | | | X | X | X | X | X | X | X | X | X | X | X | X | | 13 |
| *Sympetrum semicinctum* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | 30 |
| *Sympetrum vicinum* | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | X | X | X | X | X | X | X | X | X | X | X | X | X | | 29 |
| *Tramea lacerata* | | | X | X | X | X | X | X | | | | X | X | X | | | | X | X | X | X | X | X | X | X | X | X | X | X | | 23 |
| **Total Species** | 41 | 46 | 46 | 47 | 53 | 49 | 45 | 35 | 41 | 52 | 47 | 46 | 49 | 41 | 11 | 22 | 8 | 58 | 59 | 55 | 28 | 56 | 52 | 63 | 62 | 64 | 70 | 64 | 62 | 26 | |
| **Total Collecting Dates** | 9 | 7 | 12 | 15 | 24 | 11 | 14 | 7 | 5 | 9 | 9 | 15 | 13 | 6 | 1 | 1 | 1 | 29 | 33 | 22 | 4 | 16 | 33 | 34 | 44 | 58 | 60 | 43 | 48 | 3 | 609 |

[2] There is taxonomic disagreement over whether *Sympetrum janae* and *S. internum* are separate species, a single variable species, or a hybrid complex (Donnelly, 2013). Furthermore, both are close to *S. rubicundulum*. Consequently, it is likely that two species occurred at Beaver Dam before 1995, but the distinctions were not appreciated. Thus, the absence of data points before 1995 is not necessarily an indication the species was absent.

Table 2. Seasonal distribution of Odonata at Beaver Dam, Huntingdon County, Pennsylvania. Monthly quarters defined as: I = 1st–8th, II = 9th–15th, III = 16th–23rd, and IV = 24th–end of the month.

| | Apr | May | | | | June | | | | July | | | | August | | | | September | | | | October | | | | Nov | | Earliest and Latest Dates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Species Name** | IV | – | = | ≡ | ≥ | – | = | ≡ | ≥ | – | = | ≡ | ≥ | – | = | ≡ | ≥ | – | = | ≡ | ≥ | – | = | ≡ | ≥ | – | = | |
| *Calopteryx maculata* | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | 5/27 -9/30 |
| *Archilestes grandis* | | | | | | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | 9/3-11/7 |
| *Lestes australis* | | | | | | | | | | | | | | X | X | X | | | X | | | | | | | | | 8/8-9/9 |
| *Lestes congener* | | | | | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | 8/26-11/8 |
| *Lestes dryas* | | | | | | | | | | X | | X | X | X | | X | | | | | | | | | | | | 7/6-8/9 |
| *Lestes eurinus* | | | | | | | | X | X | X | X | X | X | | | | | | | | | | | | | | | 6/17-7/27 |
| *Lestes forcipatus* | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | | | | | | | | 7/16-9/21 |
| *Lestes rectangularis* | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | 6/27-11/8 |
| *Lestes vigilax* | | | | | | | | | | X | X | X | X | | | | X | | | | | | | | | | | 7/4-8/28 |
| *Amphiagrion saucium* | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | x | | | | | | | | | | 5/19-9/8 |
| *Argia apicalis* | | | | | | | | | X | | | | | | | | | | | | | | | | | | | 6/28 |
| *Argia fumipennis violacea* | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | 6/15-9/22 |
| *Argia moesta* | | | | | | | | | | | X | X | X | X | X | | | | | | | | | | | | | 7/11-8/13 |
| *Chromagrion conditum* | | | X | X | X | X | X | X | X | X | X | X | X | | X | | | | | | | | | | | | | 5/12-8/9 |
| *Enallagma anna* | | | | | | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | 6/7-7/31 |
| *Enallagma annexum* | | | | | | | X | | | | | | | | | | | | | | | | | | | | | 6/15 |
| *Enallagma antennatum* | | | | | | | X | X | | | | | | | | | | | | | | | | | | | | 6/15-6/18 |
| *Enallagma aspersum* | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | X | | | | | 6/2-10/11 |
| *Enallagma basidens* | | | | | | | | | X | | | | X | | | | | X | | | | | | | | | | 6/29-9/8 |
| *Enallagma civile* | | | | | | | X | | | X | X | | | | X | X | | X | X | X | X | X | X | X | X | X | | 6/10-11/8 |
| *Enallagma divagans* | | | | | | | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | 6/12-8/13 |
| *Enallagma exsulans* | | | | | | | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | 6/13-8/15 |
| *Enallagma hageni* | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | 6/2-9/9 |
| *Enallagma signatum* | | | | | | | X | | | | | | | | | | | | | | | | | | | | | 7/12 |
| *Ischnura hastata* | | | X | | | | | X | | | | X | | | | X | X | X | X | X | | X | | X | X | | | 5/12-10/30 |
| *Ischnura posita* | | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | | X | X | X | | X | | | | | | 5/7-10/9 |
| *Ischnura verticalis* | X | X | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | 4/28-10/14 |
| *Nehalennia gracilis* | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | 6/4-9/20 |
| *Nehalennia irene* | | | | | | | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | 6/13-8/29 |
| *Tachopteryx thoreyi* | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | 6/2-8/28 |
| *Aeshna canadensis* | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | 7/13-10/6 |
| *Aeshna constricta* | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | 8/3 |
| *Aeshna tuberculifera* | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | 7/20-10/11 |
| *Aeshna umbrosa* | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | 7/6-11/12 |
| *Aeshna verticalis* | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | | X | X | | | | 7/16-10/30 |

Table 2, continued. Seasonal distribution of Odonata at Beaver Dam, Huntingdon County, Pennsylvania.

| | Apr | May | | | | June | | | | July | | | | August | | | | September | | | | October | | | | Nov | | Earliest and Latest Dates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Species Name | IV | – | = | III | IV | – | = | III | IV | – | = | III | IV | – | = | III | IV | – | = | III | IV | – | = | III | IV | – | = | |
| *Anax junius* | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | 5/3-11/9 |
| *Anax longipes* | | | | | X | | | | | | | | X | | | | | | | | | | | | | | | 5/27-7/16 |
| *Basiaeschna janata* | | | | X | X | X | X | X | X | | | X | | | | | | | | | | | | | | | | 5/21-7/16 |
| *Boyeria grafiana* | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | | | | | | | 7/21-9/27 |
| *Boyeria vinosa* | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | | | | | | 7/21-10/3 |
| *Epiaeschna heros* | | | | X | X | X | X | X | X | X | X | | X | X | X | X | | X | | | | | | | | | | 5/21-9/2 |
| *Gomphaeschna furcellata* | | | | | | X | | | | | | | | | | | | | | | | | | | | | | 6/4 |
| *Rhionaeschna mutata* | | | | | | | | X | | | | | | | | | | | | | | | | | | | | 6/17-6/20 |
| *Arigomphus villosipes* | | | | | | X | | X | X | X | X | X | | | | | | | | | | | | | | | | 6/4-7/17 |
| *Dromogomphus spinosus* | | | | | | | | | | X | | | | | | | | | | | | | | | | | | 7/3-7/7 |
| *Gomphus borealis* | | | | | | X | X | X | X | X | X | X | | | | | | | | | | | | | | | | 5/27-7/19 |
| *Gomphus exilis* | | | | | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | 5/27-7/30 |
| *Gomphus lividus* | | | | | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | | 5/24-7/16 |
| *Gomphus rogersi* | | | | | | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | 6/1-8/13 |
| *Hagenius brevistylus* | | | | | | | | X | X | X | X | | | | | | | | | | | | | | | | | 6/17-7/18 |
| *Lanthus parvulus* | | | | | X | X | X | X | X | X | | | | | | | | | | | | | | | | | | 5/28-7/8 |
| *Lanthus vernalis* | | | | | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | 5/24-7/30 |
| *Ophiogomphus mainensis* | | | | | | X | | | | | | | | | | | | | | | | | | | | | | 6/3-6/6 |
| *Ophiogomphus rupinsulensis* | | | | | | X | | X | | | | | | | | | | | | | | | | | | | | 6/4-6/21 |
| *Stylogomphus albistylus* | | | | | | | X | X | | X | X | X | X | X | X | X | X | | | | | | | | | | | 6/10-8/26 |
| *Cordulegaster diastatops* | | | | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | 5/19-7/31 |
| *Cordulegaster erronea* | | | | | | | | | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | 6/30-9/10 |
| *Cordulegaster maculata* | | | | | X | X | X | X | X | X | | | X | | | | | | | | | | | | | | | 5/31-7/30 |
| *Didymops transversa* | | | | X | | X | X | | | | | | | | | | | | | | | | | | | | | 5/22-6/12 |
| *Macromia i. illinoiensis* | | | | | | | | | | X | | | | | | | | | | | | | | | | | | 7/1 |
| *Cordulia shurtleffii* | | | | | X | X | X | X | X | X | | X | | | | | | | | | | | | | | | | 5/24-7/19 |
| *Dorocordulia libera* | | | | | | X | X | X | X | X | X | | | | | | | | | | | | | | | | | 6/1-7/12 1 |
| *Epitheca canis* | | | | | X | X | | | | | | | | | | | | | | | | | | | | | | 5/27-6/2 |
| *Epitheca cynosura* | | | | | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | 5/27-7/24 |
| *Epitheca princeps* | | | | | | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | 6/6-8/8 |
| *Helocordulia uhleri* | | | | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | 5/21-7/29 |
| *Somatochlora elongata* | | | | | | | | | | | X | X | X | X | X | X | X | X | | | | | | | | | | 7/12-9/6 1 |
| *Somatochlora linearis* | | | | | | | | | | | | | | | | X | X | | | X | | | | | | | | 8/23-9/17 |
| *Somatochlora tenebrosa* | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | 6/22-10/8 2 |
| *Somatochlora walshii* | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | 6/17-9/10 |
| *Celithemis elisa* | | | | | | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | 6/8-8/18 |
| *Celithemis eponina* | | | | | | | | | | X | X | X | X | X | X | X | X | X | | | | X | | | | | | 7/3-10/4 |
| *Erythemis simplicicollis* | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | 6/10-9/21 |
| *Ladona julia* | | | | | | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | 6/3-7/24 |
| *Leucorrhinia frigida* | | | | | | X | | X | | | X | | | X | | | | | | | | | | | | | | 6/2-8/3 |
| *Leucorrhinia hudsonica* | | | | | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | 5/27-7/27 |
| *Leucorrhinia intacta* | | | | | | X | X | X | | X | X | X | X | | | | | | | | | | | | | | | 6/3-7/16 |
| *Leucorrhinia proxima* | | | | | | | | X | | | | | | | | | | | | | | | | | | | | 6/22 |

Table 2, continued. Seasonal distribution of Odonata at Beaver Dam, Huntingdon County, Pennsylvania.

| | Apr | May | | | | June | | | | July | | | | August | | | | September | | | | October | | | | Nov | | Earliest and Latest Dates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Species Name** | IV | I | II | III | IV | I | II | III | IV | I | II | III | IV | I | II | III | IV | I | II | III | IV | I | II | III | IV | I | II | |
| *Libellula auripennis* | | | | | | X | X | X | | X | X | | | | | | | | | | | | | | | | | 6/7-7/15 |
| *Libellula axilena* | | | | | | | | X | X | X | X | | | | | | | | | | | | | | | | | 6/18-7/15 |
| *Libellula cyanea* | | | | | | | | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | 6/4-8/17 |
| *Libellula flavida* | | | | | | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | 7/7-8/21 |
| *Libellula incesta* | | | | | | | | | | X | | | | | | | | X | | | | | | | | | | 7/7-9/1 |
| *Libellula luctuosa* | | | | | | | X | X | X | X | X | X | X | X | X | X | | | X | | | | | | | | | 6/10-9/10 |
| *Libellula pulchella* | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | 5/28-10/8 |
| *Libellula quadrimaculata* | | | | | X | X | X | X | X | X | | | X | | | | | | | | | | | | | | | 5/27-7/28 |
| *Libellula semifasciata* | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | 5/13-8/24 |
| *Libellula vibrans* | | | | | | | | | | X | X | | | | | | | | | | | | | | | | | 7/6-7/10 |
| *Pachydiplax longipennis* | | | | | X | | | | X | X | X | X | X | X | X | X | X | X | X | X | | X | X | | X | | | 5/26-10/18 |
| *Pantala flavescens* | | | | | | | | | X | X | X | X | X | | X | X | X | X | X | X | | | | X | | | | 6/25-10/21 |
| *Pantala hymenaea* | | | | | | | | | X | X | X | X | X | X | X | X | X | | | | X | X | | | | | | 6/27-10/8 |
| *Plathemis lydia* | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | 5/27-9/22 |
| *Perithemis tenera* | | | | | | | | | | | | X | | | | | | X | | | | | | | | | | 7/16-9/1 |
| *Sympetrum internum/janeae* | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | 6/15-10/20 |
| *Sympetrum obtrusum* | | | | | | | | | | | X | X | X | | X | X | X | X | X | X | X | X | X | | | | | 7/12-10/12 |
| *Sympetrum rubicundulum* | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | | | 6/29-10/31 |
| *Sympetrum semicinctum* | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | 6/29-10/11 |
| *Sympetrum vicinum* | | | | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | 8/19-11/12 |
| *Tramea lacerata* | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | 6/13-10/23 |
| Total Species by Quarter | 1 | 3 | 4 | 9 | 26 | 43 | 50 | 58 | 58 | 67 | 64 | 66 | 64 | 49 | 49 | 48 | 41 | 41 | 35 | 31 | 21 | 24 | 16 | 12 | 11 | 6 | 6 | 4/28-11/12 |
| Number of visits per quarter 1954-2011 | 1 | 2 | 1 | 2 | 11 | 20 | 14 | 28 | 24 | 38 | 30 | 35 | 44 | 31 | 38 | 35 | 35 | 35 | 27 | 41 | 28 | 37 | 19 | 14 | 10 | 6 | 3 | |

## Photo Submissions for Argia

If you would like to contribute a photo as a possible front or back cover "glamour shot" for Argia, please contact the Editor at <celeste@xerces.org>. We need high-quality images in TIFF or JPEG format with a resolution of 300 ppi at about 6.5 inches in width; please check the resolution before sending. Photos that lack sufficient resolution to be reproduced at the larger cover size but show an interesting behavior or specimen may be suitable for Parting Shots if they have a resolution of 300 ppi at column width (3.2 inches).

Photos can be sent as e-mail attachments (up to 15 Mb), via a file transfer service, or in GoogleDrive. **Please do not send photos embedded in the text of an e-mail!** Submitted photos may be saved for later issues, but they will never be used for other purposes than Argia or sent to other individuals to use. Please include metadata, including date and location (state and county at minimum) for each photogaph.

Table 3. Complete List of Beaver Dam Odonata

*Calopteryx maculata* (Ebony Jewelwing)
*Archilestes grandis* (Great Spreadwing)
*Lestes australis* (Southern Spreadwing)
*L. congener* (Spotted Spreadwing)
*L. dryas* (Emerald Spreadwing)
*L. eurinus* (Amber-winged Spreadwing)
*L. forcipatus* (Sweetflag Spreadwing)
*L. rectangularis* (Slender Spreadwing)
*L. vigilax* (Swamp Spreadwing)
*Amphiagrion saucium* (Eastern Red Damsel)
*Argia apicalis* (Blue-fronted Dancer)
*A. fumipennis violacea* (Variable Dancer)
*A. moesta* (Powdered Dancer)
*Chromagrion conditum* (Aurora Damsel)
*Enallagma anna* (River Bluet)
*E. annexum* (Northern Bluet)
*E. antennatum* (Rainbow Bluet)
*E. aspersum* (Azure Bluet)
*E. basidens* (Double-striped Bluet)
*E. civile* (Familiar Bluet)
*E. divagans* (Turquoise Bluet)
*E. exsulans* (Stream Bluet)
*E. hageni* (Hagen's Bluet)
*E. signatum* (Orange Bluet)
*Ischnura hastata* (Citrine Forktail)
*I. posita* (Fragile Forktail)
*I. verticalis* (Eastern Forktail)
*Nehalennia gracilis* (Sphagnum Sprite)
*N. irene* (Sedge Sprite)
*Tachopteryx thoreyi* (Gray Petaltail)
*Aeshna canadensis* (Canada Darner)
*A. constricta* (Lance-tipped Darner)
*A. tuberculifera* (Black-tipped Darner)
*A. umbrosa* (Shadow Darner)
*A. verticalis* (Green-striped Darner)
*Anax junius* (Common Green Darner)
*A. longipes* (Comet Darner)
*Basiaeschna janata* (Springtime Darner)
*Boyeria grafiana* (Ocellated Darner)
*B. vinosa* (Fawn Darner)
*Epiaeschna heros* (Swamp Darner)
*Gomphaeschna furcellata* (Harlequin Darner)
*Rhionaeschna mutata* (Spatterdock Darner)
*Arigomphus villosipes* (Unicorn Clubtail)
*Dromogomphus spinosus* (Black-shouldered Spinyleg)
*Gomphus borealis* (Beaverpond Clubtail)
*G. exilis* (Lancet Clubtail)
*G. lividus* (Ashy Clubtail)
*G. rogersi* (Sable Clubtail)
*Hagenius brevistylus* (Dragonhunter)
*Lanthus parvulus* (Northern Pygmy Clubtail)
*L. vernalis* (Southern Pygmy Clubtail)
*Ophiogomphus mainensis* (Maine Snaketail)
*O. rupinsulensis* (Rusty Snaketail)
*Stylogomphus albistylus* (Least Clubtail)
*Cordulegaster diastatops* (Delta-spotted Spiketail)
*C. erronea* (Tiger Spiketail)
*C. maculata* (Twin-spotted Spiketail)
*Didymops transversa* (Stream Cruiser)
*Macromia illinoiensis illinoiensis* (Illinois River Cruiser)
*Cordulia shurtleffi* (American Emerald)
*Dorocordulia libera* (Racket-tailed Emerald)
*Epitheca canis* (Beaverpond Baskettail)
*E. cynosura* (Common Baskettail)
*E. princeps* (Prince Baskettail)
*Helocordulia uhleri* (Uhler's Sundragon)
*Somatochlora elongata* (Ski-tailed Emerald)
*S. linearis* (Mocha Emerald)
*S. tenebrosa* (Clamp-tipped Emerald)
*S.walshii* (Brush-tipped Emerald)
*Celithemis elisa* (Calico Pennant)
*C. eponina* (Halloween Pennant)
*Erythemis simplicicollis* (Eastern Pondhawk)
*Ladona julia* (Chalk-fronted Corporal)
*Leucorrhinia frigida* (Frosted Whiteface)
*L. hudsonica* (Hudsonian Whiteface)
*L. intacta* (Dot-tailed Whiteface)
*L. proxima* (Red-waisted Whiteface)
*Libellula auripennis* (Golden-winged Skimmer
*L. axilena* (Bar-winged Skimmer)
*L. cyanea* (Spangled Skimmer)
*L. flavida* (Yellow-sided Skimmer)
*L. incesta* (Slaty Skimmer)
*L. luctuosa* (Widow Skimmer)
*L. pulchella* (Twelve-spotted Skimmer)
*L. quadrimaculata* (Four-spotted Skimmer)
*L. semifasciata* (Painted Skimmer)
*L. vibrans* (Great Blue Skimmer)
*Pachydiplax longipennis* (Blue Dasher)
*Pantala flavescens* (Wandering Glider)
*P. hymenaea* (Spot-winged Glider)
*Perithemis tenera* (Eastern Amberwing)
*Plathemis lydia* (Common Whitetail)
*Sympetrum internum/janae*[1] (Cherry-faced/Jane's Meadowhawk)
*S. obtrusum* (White-faced Meadowhawk)
*S. rubicundulum* (Ruby Meadowhawk)
*S. semicinctum* (Band-winged Meadowhawk)
*S. vicinum* (Autumn Meadowhawk)
*Tramea lacerata* (Black Saddlebags)

[1]There is taxonomic disagreement over whether *Sympetrum janae* and *S. internum* are separate species, a single variable species, or a hybrid complex (Donnelly, 2013). It is likely that two species occurred at Beaver Dam before 1995, but the distinctions were not appreciated. Thus, the absence of data points before 1995 is not necessarily an indication the species was absent.

Table 4. Odonata Species of Greatest Conservation Need (SGCN) in Pennsylvania documented at Beaver Dam. Population trends were analyzed for eleven species that were observed in at least 10 of the 30 years between 1982 and 2011. During this period 587 surveys were conducted. Species of concern and global/state ranks are based on the invertebrate assessment for Pennsylvania's 2015 State Wildlife Action Plan (Leppo et al., 2015). State rankings range from S1, highest conservation concern, to S5, least conservation concern. Global rank definitions are available on the NatureServe web site at <http://explorer.natureserve.org/granks.htm>; state (subnational) rank definitions are available at <http://explorer.natureserve.org/nsranks.htm>.

| Scientific Name | Global / State Rank | Total # years | Total # surveys | Trend | $R^2$ |
|---|---|---|---|---|---|
| *Lestes dryas* | G5 / S3 | 4 | 6 | | |
| *Lestes eurinus* | G4 / S3S4 | 14 | 31 | Decreasing | 0.38 |
| *Enallagma anna* | G5 / S1S2 | 6 | 48 | | |
| *Enallagma divagans* | G5 / S3S4 | 10 | 56 | Increasing | 0.85 |
| *Tachopteryx thoreyi* | G4 / S3 | 16 | 85 | Stable | 0.01 |
| *Aeshna constricta* | G5 / S3S4 | 1 | 1 | | |
| *Anax longipes* | G5 / S2S3 | 1 | 1 | | |
| *Gomphaeschna furcillata* | G5 / S3 | 1 | 1 | | |
| *Rhionaeschna mutata* | G4 / S3 | 1 | 1 | | |
| *Gomphus borealis* | G4 / S3 | 13 | 35 | Decreasing | 0.72 |
| *Gomphus rogersi* | G4 / S3 | 26 | 135 | Stable | 0.14 |
| *Ophiogomphus mainensis* | G4 / S3S4 | 3 | 3 | | |
| *Cordulegaster erronea* | G4 / S3 | 16 | 61 | Stable | 0 |
| *Cordulia shurtleffii* | G5 / S3S4 | 10 | 21 | Decreasing | 0.55 |
| *Helocordulia uhleri* | G5 / S3S4 | 19 | 68 | Stable | 0.07 |
| *Somatochlora elongata* | G5 / S3 | 12 | 41 | Increasing | 0.46 |
| *Somatochlora linearis* | G5 / S2S3 | 3 | 3 | | |
| *Somatochlora walshii* | G5 / S3 | 13 | 110 | Decreasing | 0.93 |
| *Leuchorrhinia proxima* | G5 / S2S3 | 1 | 1 | | |
| *Libellula auripennis* | G5 / S2S3 | 3 | 5 | | |
| *Libellula axilena* | G5 / S1S2 | 3 | 5 | | |
| *Sympetrum semicinctum* | G5 / S3S4 | 29 | 351 | Stable | 0 |

## Request for South American *Orthemis* and North American *Dythemis* Specimens

I am looking for specimens of *Orthemis levis* from South America for DNA studies, as well as *Orthemis schmidti* specimens from Honduras and Nicaragua. I am also looking for specimens of *Dythemis maya* from North America for DNA studies. If you have any specimens I could borrow, I would appreciate it. Let me know if you have any questions. Thank you very much!

Jerrell Daigle <jdaigle@netally.com>