

# A new Alberta locality for the Pacific Forktail (Odonata: Coenagrionidae)

By Robert Bercha

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The Pacific Forktail, *Ischnura cervula*, was previously known from only three locations in Alberta, Canada. During the summer of 2021 I discovered a new locality in Calgary, Alberta. A follow-up survey conducted during the summer of 2022 confirmed the presence of the Pacific Forktail at this locality. The discovery of this species in Calgary is a significant range extension into Alberta's prairie grasslands. During the surveys in both years water parameters were measured.

## Introduction

Historically, the Pacific Forktail, *Ischnura cervula*, has been considered a montane species, occurring in western Canada over the southern half of British Columbia and locally in southern Alberta (Cannings 2002, Hilton 1985, Walker 1953). This damselfly (Fig. 1) is identified by its coloration and slender appearance (Walker 1953). Males have the antehumeral stripes reduced to two light colored spots set in a dark background, blue on the sides of the thorax, and a black abdomen with a blue tip (Walker 1953, Cannings 2002, Acorn 2004). It is distinguished from the similarly marked *Ischnura damula* by the shape of the male caudal appendages (Westfall and May 2006) (Fig. 2). The females are typically more orange-brown or green with stripes rather than dots, a blue tipped abdomen, and the development of some pruinosity as they age (Cannings 2002, Acorn 2004).

## Known Alberta Localities

Before the author's discovery in July 2021, *Ischnura cervula* was known from three localities in Alberta (Fig. 3). All three of these localities fall within the Rocky Mountain Natural Region and specifically the Montane Subregion (Downing and Pettapiece 2006). These localities are: the Third Vermillion Lake near Banff (Walker 1953), at the southwestern edge of Cypress Hills Provincial Park (Hilton 1985), and in the Crowsnest Pass (R. Cannings, personal communication, 15 September 2021). Walker suggested that the presence of *I. cervula* at the Third Vermillion Lake location was associated with warmer water temperatures due to the presence of hot springs at this site (Walker 1953). The Cypress Hills are an outlier of Cordilleran environment

surrounded by prairie in southeastern Alberta—an ice age relic—and are not typical prairie grassland. The locality here consists of a marshy area in proximity to a small stream that has been dammed by beavers forming numerous ponds (Hilton 1985). In British Columbia, the Pacific Forktail is associated with a similar range of habitats including marshes, ponds (Cannings 2002) and slow-moving streams (Walker 1953, Acorn 2004). Typically, water conditions are neutral to alkaline with low salinity (Acorn 2004, Cannings 2004).

## New Calgary Locality

The new Calgary locality is located about 112 km west of Vermillion Lake and about 145 km north of the Crowsnest Pass, at the junction of highway 201 and 2A at the southern edge of the city. This location is within the Foothills subregion of Alberta's Grasslands Natural Region (Downing and Pettapiece 2006). It consists of two parts, a storm water drainage pond (50.89501, -114.06449) just northwest of the junction and an elongate slough that runs to the south along highway 2A for three kilometers (50.87303, -114.04766). The two water bodies appear to be isolated from each other as a culvert does not connect them under the highway.

The storm water drainage pond (Somerset Pond) (Fig. 4) lies in a man-made depression (300 m long by 175 m wide) with a gravel road running around it and a large grassy area just to the east. Growing in the shallow water along the margin of the pond is a narrow band of emergent vegetation consisting primarily of cattails (*Typha latifolia*). Between the pond and the road an assortment of terrestrial grass and weeds have taken hold, with localized patches of willow, poplar, and spruce trees growing along the rim of the depression. The primary water source for the drainage pond is storm water outflow from the neighbourhoods to the west. This water enters the pond below the water surface and may mimic a natural spring.

The elongate slough (Fig. 5) is endorheic with water present year-round. The surrounding land is still mostly in a natural state, although development is slowly encroaching as the new neighbourhoods of Belmont and Silverton grow. Due to shallow water at its edges the slough has a broad band



**Figure 1.** Composite photograph of male Pacific Forktail - September 2022 (top), female Pacific Forktail - July 2021 (bottom) and inset showing the reduced male antihumeral stripes. Photographs by R. Bercha.

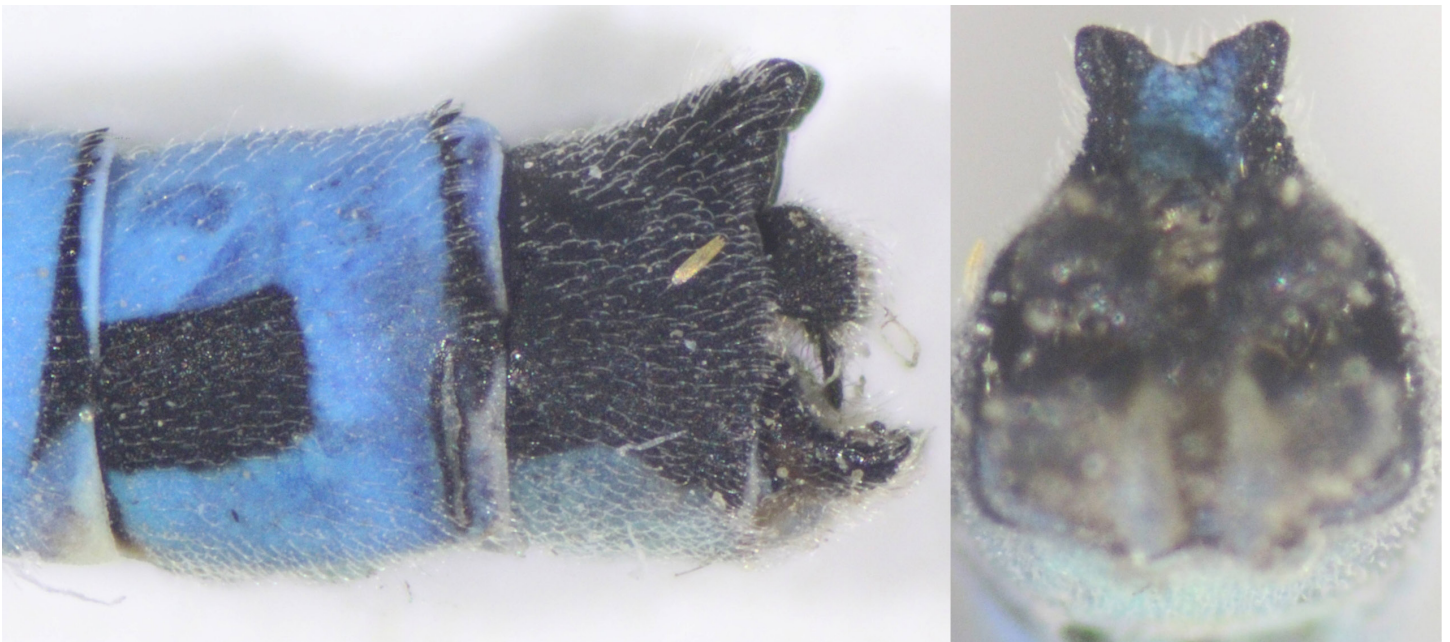
of emergent vegetation consisting of cattails and bulrushes (*Scirpus spp.*). Based on my previous surveys, the slough has moderate fluctuations in water levels, with some portions of it drying out. More recently, storm sewer inflow has provided a source of water.

### Damselfly Survey

*Ischnura cervula* was first found on the north side of the Somerset Pond on 24 July 2021. I was on a lunch-time walk on the road surrounding the pond when I noticed several dark damselflies in the shade of a spruce tree. The damselflies were unusual and unexpected — Pacific Forktails! Two specimens were collected and photographed to confirm

the identification. Following the initial discovery, two more surveys were conducted on 29 July 2021 and 7 August 2021. Two damselflies were seen and identified on each day. Additional surveys on 12, 15, and 21 August and 5 and 19 September did not turn up any additional forktails. Before encountering Pacific Forktails, I conducted regular surveys of the damselfly fauna at this location over sixteen years (2006 to 2022). Based on these surveys, the species that inhabit this pond are *Enallagma boreale* (Boreal Bluet), *E. hageni* (Hagen's Bluet), *E. ebrium* (Marsh Bluet), *E. annexum* (Northern Bluet), and *Lestes congener* (Spotted Spreadwing).

On 10 September 2022, while conducting a late-season survey of the elongate slough, I came across a single *Ischnura cervula* roughly 2.8 km south (50.872946, -114.049487)



**Figure 2.** Stacked microphotograph showing a lateral view (left) and rear view of the *I. cervula* male caudal appendages. Photos by: R. Bercha.



**Figure 3.** The inset map shows the locations of the three known localities of Pacific Forktails in Alberta: 1) Banff, 2) Crowsnest Pass, and 3) Cypress Hills. The new location in Calgary is indicated by the yellow star on inset map. The larger map shows the location of the storm water drainage pond and elongate slough. The location of the 2021 and 2022 encounters are also marked on the map. Maps courtesy of Google.

of the original sighting. The individual was collected and photographed to confirm its identification. Additional damselfly species known from this site, based on previous surveys that I conducted in 2021 and 2022 are: *Coenagrion angulatum* (Prairie Bluet) and *Lestes congener*.

### Water Samples

Water measurements were taken on 7 August 2021 from the Somerset Pond, and on 10 September 2022 and 8 May 2023 from the elongate slough. At each locality, a set of three measurements for total dissolved solids (TDS) and three for temperature were recorded and average values were computed. Measurements were taken with an HM Digital TDS-3 Handheld TDS Water Meter. This TDS meter automatically compensates for temperature variations. The average TDS and temperature measurements on 7 August 2021 were: 385 ppm and 23.5 °C, on 10 September 2022: 1130 ppm and 21.9 °C, and on 8 May 2023: 982 ppm and 16.0 °C. The pH was measured from the three water samples collected on 8 May 2023 using a Dr. Meter PH838 digital pH meter; the average was 8.52.

### Discussion

The data from these encounters provide some initial insights into the seasonality of *Ischnura cervula* and the water conditions and habitat that it prefers in Alberta. Mature adults flew between 24 July and 10 September in Calgary. These 2021 and 2022 records provide a seasonal range for this locality that falls within the published range of late May to September for Alberta (Acorn 2004) and



**Figure 4.** Panoramic photograph of the storm water pond looking east from the gravel road. Note band of cattails forming a thin band around the edge. Photograph by R. Bercha.

within the general western Canada range of March to September (Paulson 2009). The emergence dates at a specific locality vary due to local weather, water, and other related habitat conditions. While the elongate slough falls within the expected habitats, the storm water drainage pond is an interesting addition to these environments. The potential mimicking of natural spring-like hydrology from the underground flow of storm water into this pond may be one factor attracting Pacific Forktails. The water salinity and pH fall within the expected characteristics reported by other authors. Water salinity ranged from 385 to 1130 ppm, categorizing it as fresh to slightly saline (USGS.gov). The pH of 8.52 also falls within the reported range of neutral to alkaline. Finally, the presence of Pacific Forktails in Calgary, Alberta marks a significant range expansion of the species out of montane environments in Alberta and British Columbia into the prairie grasslands.

#### Acknowledgements

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#### Citations

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**Figure 5.** View of the elongate slough looking south from the road cutting across it 2.8 km south of Somerset Pond. Distance to the south end of slough is about 700m. Photograph by R. Bercha

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