



October 2022 Editors: Myrna Pearman & Susan van der Hoek



Pollination and Climate Change: What are the impacts and what can we do about it?

Climate change is affecting all aspects of the environment, including pollination services by insects. As temperatures change in the severity of hot and cold weather and in the duration of these events, insects are being impacted. We will discuss these impacts in terms of the distribution of different pollinator species and the plants they visit. We will also address what we can do in our gardens to mitigate and adapt to these changes.

▶ **27**
October 2022
7:00pm
Kerry Wood
Nature Centre
Red Deer



photos by Dr. Ken Fry

Dr. Ken Fry, Entomology Instructor in the School of Life Sciences & Business at Olds College, has been involved in insect pest management research, teaching, and extension for over 30 years. His research is focused on biological control of insect pests and integrated pest management. Current research projects include the introduction of a parasitic wasp to manage the lily beetle, surveillance of invasive species affecting the urban forest, and evaluating the effects of Aphodiinae beetles on turfgrass. Ken's "happy place" is in the Olds College Insect Collection where he serves as curator for 100,000 specimens. Ken is co-author, with Doug Macaulay and Don Williamson, of *Garden Bugs of Alberta* and a contributing author to *Organic Farming on the Prairies*.

Non-members are welcome!

HOSTED BY



SEASONAL SIGHTS AND SOUNDS OF ALBERTA: THE UNIMAGINABLE COLOUR WORLD OF ODONATES

By Dr. Sally Stuart

Dragonflies are particularly abundant along the paths which border Lacombe Lake and the surrounding area. We have been observing them since about mid May, when they metamorphosed and emerged from the water after what may have been several years. It is a surreal experience cycling next to a fast flying, large odonate such as the Variable Darner (*Aeshna interrupta*). The opportunity to watch and keep pace with these brightly-colored insects provides a new perspective on these incredibly agile aerial acrobats.

Dragonflies and damselflies are insects from the order *Odonata*. According to the National Wildlife Federation's "Field Guide To Insects And Spiders Of North America," there are approximately 5,500 species worldwide. Of these, about 300 dragonfly and 150 damselfly species occur in North America. All are predacious with two pairs of wings.

John Acorn describes damselflies as "flying neon toothpicks," an apt description compared to the rather more robust dragonflies. Further differentiating characteristics include their eyes and the position of their wings at rest. They are an ancient, successful group of invertebrates. Extinct insects, distantly related to modern dragonflies, from the genus *Meganeura* known as Griffinflies are found as fossils from the Carboniferous and Permian era. Many were larger than extant species. *Meganeuropis permiana*, probably the largest fossil, had an estimated wingspan of about 75 cm and weighed as much as 450 grams! It is theorized that their large size was due to abundant oxygen availability, but since they evolved long before birds, a lack of vertebrate predators may also have been a contributing factor.

Odonates are superb predators, patrolling the skies at speeds of 35 km per hour or greater, even flying in reverse. They seize dipterans (e.g., mosquitoes) with their forelegs, chewing them up with their mandibular "teeth." Their massive compound eyes also enable them to be formidable predators. Eyes, among other things, enable them to find food and mates and to detect predators.

Compound eyes are typical of many arthropods and were present, as evidenced by fossil trilobites, for half a billion years. They are composed of individual hexagonal units, the ommatidia. This shape is the most efficient for packaging large numbers in small volumes. The cells are called cones and contain a pigment opsin which absorbs light. All are components of the functional unit the ommatidium which includes the lens and crystalline core. Incredibly, each odonate eye contains approximately 30,000 individual ommatidia, almost certainly greater than any other living insect! Each ommatidium feeds information via nerves to the brain, much of

which is devoted to processing visual information. The end result is probably a mosaic image with less detail than humans can see. However, imagine being an odonate and having an almost 360 degree view of the world. This superior vi-

sion can detect movement up to 12 m away and is important for flying and catching prey.

Genes are responsible for producing the opsin proteins, which absorb different wavelengths of light. They are ancient and found in a wide variety of organisms. Interestingly they have evolved independently several times in unrelated lineages (convergent evolution). Futahashi et al (2015) found up to 33 opsin genes in odonate eyes, although it is unclear how many opsin proteins are present, possibly five or six. These opsins enable them to absorb not only the complete range of wavelengths from the visible spectrum, but also UV light and possible polarised light. By contrast, humans have three opsins responsible for colour vision (trichromatic), and research suggests only nine coding genes.

Opsins differ in adult and larvae, and between the dorsal and ventral surfaces of the odonate eye. The benefits of this arrangement is that they can detect objects against both the bright sky and also the ground. It is impossible for us to image colour vision through the eyes of an odonate, but it must be superb.

Colour and the ability to perceive colour obviously plays a key role in odonate lives, as evidenced by the range of colours exhibited by different species and even variations in colour of different body parts.

How do they produce these colours? The answer is similar to colour production in birds: specialized cells called chromatophores contain a variety of pigments which selectively absorb different wavelengths of light. Melanin pigments impart black, brown, reddish brown, even yellow, others red. Some of the incredible metallic colours (e.g. blue) may be structural due to miniscule light scattering particles found in the cuticle. Interestingly, some species have the ability to secrete a waxy crystalline nanostructure which also influences colour.

Colour is not consistent through the lifespan of an adult odonate. In some species, changing colour indicates sexual maturation (e.g., males changing from yellow to red). Others undergo colour changes during mating and oviposition or even in response to the temperature.

Pearse and Buchsbaum, in their book "Living Invertebrates," refer to a species of damsel fly found in a mountainous region of Australia. Apparently it has a brilliant blue abdomen which changes to dull black at night. It is theorized that this colour change helps with temperature regulation, as black bodies absorb heat and thus helps them warm up faster in the morning. In lab experiments, the colour blue has proven to offer protection from excessive heat. It was found that blue males, even when heated up to 43 C suffered no deleterious effects, while black ones died. Pigments are also protective in other ways (e.g. reflection of damaging UV radiation)

Sight and colour perception enable odonates to recognise species, choose mates (males may be brighter and more conspicuous), detect enemies, select habitat, defend territories and of course hunt prey. Finally, odonates appear to be able to detect polarized light, which may help them locate water or identify sites to deposit eggs.

Despite all the research into colour and its functional significance in dragonflies and damselflies, there is much scientists do not know about their physiology and ecology.

As the vegetation transforms to autumnal colours, odonates engage in one final breeding frenzy. Short-lived as adults, their only role is to find a mate, breed and pass genes onto future generations. By early October, very few adults are observed on the wing as it is too cold for them. Most will overwinter as eggs or larvae in ponds, some may even undergo long migrations. Look for their brilliant flashes of colour once spring returns.



BIRD FOCUS GROUP

By Chris Olsen

All walks start at 10:00 AM and usually finish between noon and 1:00 PM

October 8 – Slacker’s Tour (Slack Slough, Cootie Ponds, Fleming Slough) – meet at Slack Slough

October 15 – Dry Island Buffalo Jump Park – meet at the overlook

October 22 – Nova Nature Trails – meet in the parking lot

October 29 – Dickson Point/Trout Pond (south of Dickson for 4.1 km on Rge Rd 31)

November 5 – Riverbend Upper trails – meet in the main parking lot

November 12 – Bower Woods – meet on the street across from 37 Selkirk Blvd

November 19 – Crimson Lake Amerada Trail – meet at the parking lot

November 26 – McKenzie Trails – meet in the main parking lot

Dry Island Trip Details: We will be going to Dry Island Buffalo Jump for a longer walk during a combined birding and paleontology tour. Expect to see a lot of fossils with Tim Schowalter along as our guide, and with luck we’ll also get some migrating raptors. We meet at the overlook at 10:00, and will set our route from there depending on moisture conditions. Note, that the full walk leads around and back over the ‘Island’. Tim describes it as an ‘intermediate’ hike, and there will certainly be rough and steep portions. Wear good hikers and bring poles if you use them. The hike will take about four hours from the day use area, so allow five hours overall (lunch and water along). If some people are hesitant about the steeper portions, they can join us for the early stages along the river and circle back to return by those trails (the first 2-3 km).



RDRN MEMBERS ENCOURAGED TO COMMENT ON THE CITY OF RED DEER'S DRAFT RESPONSIBLE PET OWNERSHIP BYLAW

By Dean Baayens, Issues Committee Chair

In February 2021, The City of Red Deer asked residents for their input to help inform a new bylaw – the Responsible Pet Ownership Bylaw. Many RDRN members provided comments to help create this bylaw. From review of the current bylaw, it appears that some of our main concerns are being addressed, but it may not be going far enough. Of most interest is the licensing of cats. This is a big step forward and it provides a mechanism to control roaming cats and fine negligent owners. It doesn't, however, suggest or indicate that cats should be on leash or tethered when outdoors and simply states that they can't leave the owner's property, which leaves it up to the cat to decide whether or not to stay on the property. This arrangement partially defeats the purpose of the bylaw. Cats can have a major impact on small animal populations, such as songbirds, when they are allowed to roam free, and they need to be properly controlled.

Please go to the following link and provide your comments. <https://www.reddeer.ca/whats-happening/news-room/city-drafts-responsible-pet-ownership-bylaw-based-on-public-input.html>

The RDRN Board of Directors will also be providing comments to the City of Red Deer on the proposed bylaw.

Photo by Jim Potter



Board Notes

RICK TALLAS, PRESIDENT



On behalf of RDRN, I would like to thank Peggy Birse for her enthusiasm and dedication during her one-year position as RDRN Managing Director (September 2021 to September 2022). Peggy acted as our Recording Secretary, supported committee work, submitted a successful CIP grant application, updated the Standard Operating Procedures manual, assisted with and supported outings/social events, assisted with getting documents uploaded to the board website, and oversaw various other important organizational tasks. Thank you again, Peggy, and all the best in your future endeavors.

- Our September meeting was very informative, with a small but very enthusiastic audience. It was a treat to have an in-person meeting and to talk to everyone. My thanks to Graeme Gissing and Natalia Lifshitz for their hard work on behalf of Nature Central and for their engaging presentations about this RDRN program.

IN THE ALBERTA WILDERNESS

By Don Auten

Northern Flying Squirrels are very common in Alberta but they are strictly nocturnal so we never get to see them. Where ever there are Red Squirrels living you can bet there are also Flying Squirrels.

I discovered an old hollow Black Poplar tree that some Northern Flying Squirrels were living in, so I made a camera trap nearby using an old deer skull as an attractant. It worked well, as I've had many visits by adult Flying Squirrels. I was hoping to get photos of some babies but no such luck. I'll try again next year.



DID YOU KNOW

By Susan van der Hoek

A group of spiders is called a **cluster** or a **clutter**. Many people are terrified of spiders and find them extremely creepy. This is unfortunate because they are crucial to our environment and are incredibly interesting creatures! Luckily, most spiders are harmless, and they control the insect population. Spiders don't have ears—generally a prerequisite for hearing. So, despite the vibration-sensing hairs and receptors on most arachnids' legs, scientists long thought spiders couldn't hear sound as it traveled through the air, but instead felt vibrations through surfaces. The first clue they might be wrong was a 2016 study by Jay Stafstrom, a sensory ecologist at Cornell University, that found that a species of jumping spider can sense vibrations in the air from sound waves. According to Dr. Heather Proctor, University of Alberta there are 657 species of spider in 28 families known in Alberta. Two of them, the western black widow and the hobo spider give poisonous bites and require medical aid. Most spider bite symptoms are minimal and may cause itching, swelling, and mild pain.



Social Media: 696 Facebook Members 303 Twitter Followers 377 Instagram Followers

The Red Deer River Naturalists, the first natural history organization to be established in Alberta, was incorporated as a society in 1906. The objectives of the society are to foster an increased knowledge, understanding and appreciation of natural history, and to support conservation measures dealing with our environment, wildlife and natural resources.

Annual membership is \$15.00 for individuals and \$20.00 for families.

Regular meetings are held at 7:30 PM on the fourth Thursday of most months by Zoom. Non-members are welcome.

Members are encouraged to contribute to this newsletter. The deadline is the last Friday of the month.

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