

# *The Red Deer River Naturalist*



October 2023 Editors: Myrna Pearman & Susan van der Hoek



## AVIAN INFLUENZA:

A new chapter in  
an old book



▶ **26**  
**OCTOBER**  
**2023**

**7:00 PM**  
**KERRY WOOD**  
**NATURE CENTRE**  
**RED DEER**  
REFRESHMENTS SERVED

**Dr. Margo Pybus** is the Provincial Wildlife Disease Specialist with Alberta Fish and Wildlife. She leads high profile wildlife disease policies, investigations, management, and education programs for Alberta. Margo has been a driving force in the wildlife disease community for many years.

SPONSORED BY



**ALL ARE WELCOME**



# SEASONAL SIGHTS AND SOUNDS OF ALBERTA: INSECT ANTENNAE

By Dr. Sally Stuart

Macro photography became an increasingly popular hobby for me this past summer. Armed with a new cell phone, it was fascinating capturing the abundant insect life on our small piece of land. What is most surprising about the quality of the phone images is their photographic clarity, which allows structures such as antennae to be observed in remarkable detail.

Insect antennae are fascinating. Beetles, bees, flies, moths and butterflies exhibit antennal similarities but also striking differences. Antennae vary structurally, not only between species in their shape and length, but also between sexes. It has long been known that the antennae of insects have a plethora of functions. One of their major roles is chemosensory (detection of chemicals), used for a myriad of activities including location of food sources, sexual attractants such as pheromones, and predator detection. They also monitor temperature, humidity and other parameters. Thus, this constant stream of information collected by the antennae apprises the insect of environmental conditions. Perhaps their most surprising ability is sound detection. Male mosquitoes, for example, use their bushy antennae to respond to the unique frequency of a beating female wing.

Most antennae have three parts. The base is a single segment called the scape. Attached to the scape is the pedicel. The third component, which is the most observed, is the flagellum. The flagella are usually anatomically quite simple thread-like structures known as filiform antenna. However, some are far more elaborate. For example, the Yellow-collared Scape Moth (*Cisseps fulvicollis*), shown here, exhibits bipectinate antennae (comb or teeth-like structures on both sides).

All three antennal components serve many roles as sensory receptors. The scape and pedicel, amongst other functions, contain mechanoreceptors which monitor antennal movement. They can also help maintain balance and orientation in flight. Often there is a fold between the pedicel and flagellum, called the geniculate. While observing bees and wasps on flowers, you may notice this bend in the antenna as they forage for nectar.

It is the flagellum however, which contains most of the chemosensory organs: minuscule structures called sensilla. Sensilla, which house the sensory receptor molecules, can only be seen in detail under an enormously powerful microscope. Studies have shown that moths and butterflies have tens of thousands of sensilla! Chemoreceptors can be olfactory, detecting air borne volatile chemicals (scents) or can “taste” aqueous nonvolatile liquids or solids (gustatory). Sensilla are anatomically diverse but often are hair-like structures with a pore at the end through which chemicals enter. Inside this is lymph fluid and the dendritic ends of the neuron (nerve cell).

Sensory receptors must respond to one form of information (e.g., chemical) and convert it to an electrical signal, which is the only language the nervous system understands. This process is called transduction. It is a complex process and occurs when chemicals bind to the protein molecule receptors on the dendrite. The electrical message created passes to the axon of the neuron, then travels to the brain where the odour is identified. These minuscule proteins are extremely sensitive and diverse. Occurring in large numbers, they have a high affinity for specific chemicals. In some species of mos-

quito, scientists have found 79 different odorant receptors and 76 gustatory receptors. Humans do not have the same sensory perception in terms of chemoreception, yet the same protein receptors participate in many of our senses. This is not due to a common ancestor and is yet another example of convergent evolution.

One of the incredibly well-studied functions of antennae in male moths is their role in detecting female pheromones. Males often have more elaborate antennae than females. Larger, more intricate antennae have more surface area which house more sensory receptors, thus enabling better pheromone detection. However, it is more complicated than this. Detection is also determined by the quantity and chemical properties of pheromones. Scales which cover the antenna also influence the process. The arrangement and angle of scales help alter the pattern of airflow. Airflow is directed across the sensilla, thus increasing the chance of the chemical odorant interacting with the receptor protein. A single odorant molecule may be all that is required to trigger a nerve impulse. At the same time, scales deflect the still small but considerably larger particulate matter away from the sensilla. Research has also examined carbon dioxide detection by antennal sensory receptors. Female mosquitoes use this to help locate the source of their high protein blood meal.



Most insects, however, are more interested in nectar than blood. A 2004 study (C. Thom et. al) discovered newly opened flowers can produce high quantities of carbon dioxide, thus providing valuable information to insects in search of premium quality nectar (important due to high energy content). Furthermore, social insects such as bees may use carbon dioxide concentrations to locate their nest.

Since sensilla are so important, why don't all insects develop large antenna with an abundance of sensilla? As is often the case with adaptations, there is a compromise between the massive energy costs required to develop and maintain nervous tissue and the benefits provided.

Invertebrates often serve as important pollinators, attracted by the fragrant volatile chemicals emanating from flowering plants. As the climate rapidly changes, Alberta experiences many more smoke-filled days. Smoke contains air borne volatile chemicals and very small particulate matter, which may interfere with the tiny sensory receptors. Will this affect the chemosensory abilities of these invertebrates and thus their ability to pollinate?

As September draws to a close, fewer insects are flying, but every day I obsessively monitor the dandelion flowers and photograph the nectar-feeding hoverflies. Who knows how long it will be before another such opportunity arises!

**RDRN Social Media:**  
**1013 Facebook Members**  
**315 X Followers**  
**436 Instagram Followers**

- What a great turn out we had for our September meeting featuring Cathy Steele, Chris Olsen and Myrna Pearman. Thanks to everyone who attended! A special thanks to Daryl and Deena Beck for overseeing the refreshments.
- We are looking for board members, committee members as well as volunteers to help at our monthly meetings. Contact me if you are interested (ricktallas@gmail.com).
- Where has September gone? The fall colours are wonderful, and we have been treated to Northern Lights a few times. It seems like they will get better and better over the winter. Alas you may have to be up early in the morning to view this phenomenon!

## NATURE CENTRAL SEASON SUMMARY



By Cathy Steele (RDRN Liaison)

The goal of Nature Central is to "celebrate the protected areas in Central Alberta and to increase the appreciation, thoughtful exploration, non-consumptive use and ecological understanding of these areas."

Abbey Van Heuvel was our Naturalist-In-Residence and Education and Program Coordinator from May to September 2023. Abbey built her knowledge by attending Bird Focus Group walks and spending time with a number of naturalists with specialized knowledge. She surveyed, documented and inventoried the remaining 82 of the over 190 protected areas within 100 km of Red Deer. Jim Potter, retired from Alberta Conservation Association, clocked more than 1000 km visiting and sharing his knowledge about the protected areas with Abbey. Abbey also updated site information (descriptions, directions, stakeholders) and photos on the Nature Central website. She highlighted sites of the week and posted information about Nature Central events and collaborative events on the website and Facebook page.

Another component of the Nature Central activities this summer included hosting and participating in Central Alberta

nature-focused events. Nature Central events included a plant walk with Tony Blake, paddling on Magee Lake with David Delafield and Haunted Lakes with Myrna Pearman and Claudia Lipski, and an evening Bee Walk with Charity Briere. Nature Central was present at the Ferry Point Birding weekend hosted by the Bjorge family, Bat Night at DNA Gardens, the Butterfly Count at Dry Island Buffalo Jump Provincial Park and Family Nature Night at Kerry Wood Nature Centre.

Abbey updated the database for the Habitat Steward program, which recognizes landowners who conserve a minimum of 2 Ha (5 acres) of wildlife habitat. If you're interested in becoming a Habitat Steward, please complete the application on the Nature Central website: [www.naturecentral.org](http://www.naturecentral.org)

Abbey's closing remarks from her final report of the season included these comments: "I am deeply thankful for the opportunity to have had numerous mentors during the summer, who generously shared their wealth of knowledge that I will carry with me throughout my life. Thanks to their guidance, I have developed a profound appreciation of nature and wildlife, which has helped shape my future, my career path."



**IN MEMORIAM:** We were saddened to learn about the passing of two long-time RDRN members, **Janet Walter** and **Philip Anderson**. Philip, with his wife, Coleen, was a keen participant in the annual bird counts. Janet volunteered with the original Habitat Steward initiative in the 1980s.

**GET WELL WISHES TO MORRIS FLEWWELLING:** We wish Morris Flewwelling a speedy recovery from his recent serious health issue. If you would like to send a personal card, please contact ricktallas@gmail.com for his address.

## IN THE ALBERTA WILDERNESS! BY DON AUTEN

After spending the summer quietly and discreetly enjoying easy living, things change drastically this time of year for Moose. The main event in nature in October is the Moose rut. For a couple of intense weeks, bulls compete dramatically for the



right to spend time with the cows as they cycle into estrus. The normally quiet woods are now filled with the sounds of bulls grunting, fighting and chasing each other around as they monitor the cows, waiting for a chance to sire the next generation.

Even more vocal than the bulls, the cows do a lot of moaning and bellowing as they come into heat, making sure any nearby bulls know that they are now ready for some attention.

It's an exciting time of year for me as my trail cams start picking up increased moose activity around mid September, about the time the bulls shed their velvet, and continue till about mid-October as the rut starts to wind down.



## DID YOU KNOW: BY SUSAN VAN DER HOEK

Beavers are typically referred to by the collective nouns "colony" and "family." A colony of beavers is a group of beavers living together in a shared habitat, while a family of beavers is a group of related beavers living together in a lodge.

The North American Beaver (*Castor canadensis*) is one of two beaver species, along with the Eurasian Beaver (*Castor fiber*). It is native to North America and has been introduced in South America (Patagonia) and Europe (primarily Finland and Karelia). North American beavers are widespread across the continental United States, Canada, southern Alaska and some parts of northern Mexico. The beaver was given official status as an emblem of Canada when an Act to provide for the recognition of the beaver as a symbol of the sovereignty of Canada received royal assent on March 24, 1975.

Beavers are the second-largest living rodents, after capybaras. They usually weigh from 11 to 32 kg (24 to 71 lbs), with 20 kg (44 lbs) being typical. Very old individuals can exceed normal sizes, weighing more than 40 kg (88 lbs) or even as much as 50 kg (110 lbs).

Beavers are herbivorous, consuming tree bark, aquatic plants, grasses and sedges. Adult males and females live in monogamous pairs with their offspring. Their dams create wetlands used by many other species, and because of their effect on other organisms in the ecosystem, beavers are considered a key-stone species.



## FLOWER FOCUS WITH DON WALES

### Revisiting the Flowers of Southern California

**Wednesday October 18, 2023**

My previous visits to the Palm Springs area have been in mid-winter, prior to the major March desert blooms. This presentation will include new flowers as well as images taken with my new macro lens.

**NOTE: I am hoping to find someone to take on the role of leading Flower Focus. Please contact me if you are interested.**

**THANK YOU!** RDRN has received several grants over the past two years. We are especially grateful for a grant from the Alberta Government's Community Initiatives Program (CIP) in the amount of \$34,235 to support our stewardship initiatives. The final report for this grant has just been submitted. We also received \$5,000 from ECO Canada to help with Abbey's wages and \$5,000 from the Red Deer and District Community Foundation to cover the cost of Habitat Steward signs. We were also grateful for a \$1,000 grant from the Red Deer Community Better ParticipACTION program. These funds were used to purchase two good-quality binoculars which Chris Olsen loans out to new birders on his walks.



## BIRD FOCUS WITH CHRIS OLSEN

Outings start at 10:00 AM unless otherwise noted. Trip schedule details and updates are posted on the RDRN website "Calendar of Events." Birders of all skill levels are welcome! **Navigation:** Use the Alberta Discover Guide, the Birding Trails Alberta website or your favorite mapping app. Call Chris (780-581-4430) if you have questions or potential medical issues. Participants are encouraged to carpool, but you are responsible for your own arrangements.

**Safety:** Wear sturdy, water resistant hiking footwear. Some trails are on rough or steep terrain. Dress appropriately, and carry water and a snack.

October 7 – Thanksgiving weekend – no schedule

October 14 – Alix Lake Nature Trails – meet at the campground

October 21 – Maskepetoon Park – meet in the playground parking lot (Kerry Wood Drive/Oak Drive)

October 28 – Heritage Ranch Trails – meet in first parking lot

November 4 – Riverbend Upper Trails – meet in main parking lot

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 7:00 PM on the fourth Thursday of most months at Kerry Wood Nature Centre. Non-members are welcome.

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

Box 785 Red Deer, AB T4N 5H2 Phone/Fax: 403.347.8200

[rdrn.nature@gmail.com](mailto:rdrn.nature@gmail.com)

[www.rdrn.ca](http://www.rdrn.ca)

[wearenaturalwise.blogspot.com](http://wearenaturalwise.blogspot.com)

Facebook

Twitter #RDriverNats

Instagram @RDriverNats

*Our thanks to McElhanney for generously donating the printing of this newsletter and NOVA Chemicals for covering postage costs.*



Cover  
Poster by  
Judy  
Fushtey

Photos,  
unless  
otherwise  
noted, by  
Myrna  
Pearman