

CENTRAL ALBERTA May Species Count 2020 Saturday May 30 and Sunday May 31

We invite you to help us document animals and flowering plants in Central Alberta! You can count in your own backyard, in a nearby park or natural area, or even by driving the backroads. We are interested in everything, from insects and spiders to amphibians, reptiles, birds and mammals.

This event provides a great way for you and your family to document wildlife in....



.....your own backyard, or get out into nature while still practicing social distancing.

Tally sheets can be downloaded at www.rdrn.ca. Completed sheets can be scanned and emailed to: judy.boyd@shaw.ca

or mailed to RDRN Box 785 Red Deer, AB T4N 5H2. To avoid overlap and duplication, all participants are encouraged to register with Judy Boyd 403-358-1098



Photos by Doug Pedersen, Rick Tallas and Myrna Pearman

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SEASONAL SIGHTS AND SOUNDS OF ALBERTA: FORMATION AND FUNCTION OF AN EVOLUTIONARY MARVEL: THE AMNIOTIC BIRD EGG

By Dr. Sally Stuart

This spring, I anxiously awaited the song of the first American Robin. Finally, at 4:00 PM on Thursday April 9, I heard him. It seemed important to feel some evidence of normality. How reassuring it is to see the birds returning to Central Alberta to nest!

As a physiologist, I am enthralled with bird eggs—they are incredible! Think of the female bird migrating back to Alberta after a winter in warmer climes. She arrives depleted of energy stores but still must set about the energy-intensive role of producing and laying eggs.

Eggs are a perfect example of a structure evolved to fulfill its function. Birds, like reptiles and mammals, belong to a group of vertebrates referred to as amniotes, which evolved in the Carboniferous Period approximately 350 million years ago. They all have embryos, which develop surrounded by four membranes. These membranes freed them from having to return to water to breed. One particular membrane—the amnion—surrounds the developing embryo, suspending it in a protective cushion of fluid. In the case of birds, the other membranes include the chorioallantois (a double membrane), which is stuck to the inner layer of the shell. It is rich in blood vessels, important for gas exchange and the storage of waste products. Finally, the yolk sac is a membrane that surrounds the yolk. It is from these membranes that mammalian placenta is thought to have evolved.

Birds are unusual amongst vertebrates, as all other groups have examples of members that retain embryos and give birth to live young. Birds, however, are exclusively oviparous, laying shelled eggs with external brooding. This adaptation makes sense, because carrying an internal embryo would add too much weight for flight. Furthermore, birds' body temperature (40 C to 42 C) is too high for internal development.

Female birds generally have only a left ovary. It is in this single ovary that, inside structures called follicles, the eggs develop. No matter the size of the birds, their eggs contain huge yolky structures (although the amount of yolk varies between species and determines the developmental stage of the young when they hatch). Nutrients obtained by foraging are delivered to the egg through the blood supply.

The yolk also contains certain hormones. Studies have shown that in some species the amount of testosterone varies between eggs. Sometimes eggs laid later contain more testosterone; the resulting chicks are smaller but have an advantage because they are more aggressive at competing for food.

Egg production is energy intensive and complicated. To begin with, the follicle ruptures, releasing the egg into the oviduct. It then travels to the uterus. When the single celled egg (ovum) is released, it will be fertilized by a single sperm (unlike humans, where many sperm are required for successful fertilization). The egg moves slowly down the oviduct (24 hours to several days), rotating as it goes because of muscular contractions of the tube. Glands lining the first part of oviduct, the magnum, will add the initial layer of albumen (egg white). Albumen provides buoyancy and protection as amniotic fluid, but it is also a mixture of proteins and water, so will

become an important source of hydration for the embryo. Studies have found that albumen also contains important antimicrobial proteins such as lysozyme (also found in saliva). It may also contain 100 or more disease-fighting antibodies. One of the layers of albumen, the chalaza, attaches to either end of the yolk, and looks somewhat stringy. It functions to hold the yolk and thus keeping the developing embryo (which now resembles a flattened pancake sitting on top of the yolk) on the dorsal surface. The egg then moves down the tube to the isthmus, where extraembryonic membranes are added. It finally arrives in the uterus, where shell glands complete the process.

Shells are made of a form of calcium carbonate known as calcite. Finding enough calcium is a serious problem for some birds. It must either come from the diet or their own skeleton. If you are a predator such as a shrike, you can readily access vast amounts of extra dietary calcium from the bones of consumed prey. Certain invertebrates can provide an excellent supply, but apparently birds also utilize minuscule fragments of skeletal structures from small mammals.

Female birds prepare for the extra calcium demand by developing—due to estrogen—a unique form of bone called medullary bone. These bones serve as calcium reservoirs.

Eggshells are important because they provide protection from predators and invading microorganisms. Their porous structure allows for the diffusion of oxygen into the embryo and carbon dioxide out. However, there is a serious risk of dehydration due to water loss. Several studies have shown that potential water loss can be mitigated by altering the number of eggshell pores. Eggshell pores are capped and an external cuticle covers the shell. As the embryo matures, it withdraws calcium from the shell at the same time that a thinning of the shell allows increased gas exchange.

Egg colour is added in the uterus. There are many theories as to why birds have colored eggs, only some of which are obvious (they provide camouflage). Colour may also play some role in temperature regulation, which can be a serious challenge during the incubation stage.

Strangely, birds don't use melanin, a ubiquitous and readily available pigment. Instead, a group of chemicals called porphyrins are used. These pigments are manufactured by the female's body. Their production is a further drain on her resources and energy.

What about the beautiful blue eggs of birds like the American Robin? Scientists theorize that the male bird may use egg colour to determine female fitness. Eggs with a brilliant colour suggest that the female is exceptionally fit, because she has enough spare resources to produce the pigments. It is also theorized that, because the more brilliantly pigmented eggs contain more antioxidants, bright eggs indicate that the female has an excellent immune system. The male may respond to these cues by investing more time foraging for his offspring.

Next time you observe a bird egg, think of the incredible resources the female invested in producing it. Historically, humans have been obsessed with collecting eggs. Almost every natural history museum in the world has vast egg collections. Thankfully, egg collecting is now banned in most places except for scientific studies. To see a really incredible egg belonging to the huge extinct elephant bird, go online to the Natural History Museum, London, and enjoy their fascinating displays. <https://www.nhm.ac.uk/natureplus/community/nature-live/blog/tags/eggs.html>



RARE RED-BREASTED SAPSUCKER IN RED DEER

By Darren Peterson

Nothing makes me happier than the return of the birds in spring following a drawn out winter season. As the river and sloughs thaw and the birds start to roll in my wife Deborah and I do regular visits to local hotspots looking for firsts of the year and anything extra special. After a quick morning visit to Kerry Wood on April 27th where we saw a Townsend's Solitaire, courting Red Necked Grebes and 2 Pair of Hooded Merganser we returned to our home in Woodlea, as a crow flies not far from Kerry-Wood Sanctuary. At 10:00 AM, I looked out the kitchen window to see what birds were at the feeder and instantly noticed a bird that I hadn't seen before on the mature mugo pine just beyond the feeders. Pretty exciting to recognize that a new species to me was in my backyard! I have been a dedicated birder in Alberta for 40 plus years so new species sightings within the province are not that frequent. I frantically found my camera while pointing out the bird to Deborah. After capturing a couple quick shots thru the window I went out on the deck and spent the next hour photographing this beautiful and unique Sapsucker species while it developed several sap-well rings around 3 of the trunks on the mugo pine. The gridded rings were created 2 to 3 ft above the ground on trunks 4-6 inches in diameter. My yard has been designed gradually over the years to attract birds with trees, shrubs and a couple water features. If I sat still, the sapsucker did not appear to be concerned with my presence within 6 ft. and went about the business of acquiring a meal. After it left I went inside and consulted my field guides. I had guessed early on that it was a Williamson's sapsucker but quickly determined that was not the case and that it was actually a Red-breasted Sapsucker. In *Birds of Alberta* it is listed as accidental with only a few Alberta sighting. They apparently breed in central BC and winter along the west coast. My guess based on Sibley's description is that it is an adult female based upon the extra bit of white on the side of the head (purely a guess). It returned mid afternoon for a feed and a siesta then again at the end of the day when Judy Boyd was able to come by get a good look at it. A rare bird form and images were submitted to the Alberta Bird Records Committee.

SPRING SIGHTINGS—PHOTOS BY RICK TALLAS



NORTHERN SHRIKE—AN INTERESTING BACKYARD VISITOR!

Jim and Bonnie Potter of Delburne had a Northern Shrike visit their yard on a regular basis during the late winter/early spring. It began feeding on hamburger placed out for magpies on February 16, 2020 and was also observed picking at a deer hide. It graduated to mice on March 16 and – over the next couple of weeks – ate both frozen mice as well as hamburger. Here are some images that Jim and Bonnie were able to take of their unusual wild neighbour



eBird

<https://ebird.org/globalbigday>



Jim and Bonnie have documented a variety of backyard wildlife. We will feature more of their unique visitors in the September 2020 newsletter.

FLOWER AND BIRD FOCUS

Postponed until further notice

Please contact Keith Kline about “solitary” bird walks: redkline@hotmail.com



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 p.m. on the fourth Thursday of most months at the Kerry Wood Nature Centre, 6300-45 Ave., Red Deer, AB. 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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Photos, unless otherwise noted, by Myrna Pearman