March 2020

Birding Observer

Five Valleys Audubon Society, a Chapter of the National Audubon Society

Calendar of Events

- **Monday, March 2nd, 6:45-8:45pm:** The Five Valleys Audubon Society Board Meeting will be held in the Small Meeting room of the Missoula Public Library. Meetings are free and open to the public, where Chapter business is discussed.
- **Monday, March 9th, 7pm:** Bret Tobalske, Professor of Organismal Biology, Ecology and Evolution at UM will present on the Biomechanics, Aerodynamics and Thermal Balance in the Flight of Hummingbirds at our March meeting, in room 123 of the Gallagher Business Building at UM.
- **Sunday, March 15th:** The deadline for the April 2020 edition of the Birding Observer.
- **Saturday, March 21st:** Beginning bird walk at the Lee Metcalf NWR from 10:00 am-Noon. Meet field trip leader at the Refuge Visitor's Center. Please note that the Visitor's Center is not open on weekends, but there is an outhouse available at the Wildlife Viewing Area.
- **Saturday, March 28th:** All-day field trip to the Lee Mettcalf NWR. Meet in the northwest corner of the Adams Center parking lot at 7:50 am.
- **Saturday, April 4th:** Five-hour late day field trip to the Ninepipes area to look for Short-eared owls. Meet in the northwest corner of the Adams Center parking lot at 4:00 pm.

Calliope Hummingbird
Photo by Todd Goodrich, University of MT

The Flight of Hummingbirds

Join us at our March chapter meeting to hear from our speaker, Bret Tobalske, as he tells us about the Biomechanics, Aerodynamics and Thermal Balance in the Flight of Hummingbirds.

Hummingbirds are unique among birds in converging upon the capacity of insects for indefinite hovering and remarkable maneuvering during flight. They also are adept at forward flight and some species migrate. Bret will explore the diverse aspects of their biological form and function that facilitate their prowess in flight. The wing skeleton of hummingbirds is highly modified to maximize torque produced by the pectoralis and minimize inertial requirements for wing oscillation. They recruit their primary flight muscles out of phase with the motion of the wings to permit rapid onset and offset of muscle force. Their aerodynamics include the use of leading-edge vorticity on the wing, rotational circulation, and a shift in upstroke function across flight speeds. Their escape maneuvers involve asymmetric wing movements that increase with increasing body size. Because their mass-specific power output is extremely high, hummingbirds face challenges with heat dissipation in warm environments. Their heat dissipation areas include the eye, base of the wing, and the feet, and the use of the feet for dissipating heat changes as a function of flight speed.

Bret Tobalske is a Professor of Organismal Biology, Ecology and Evolution at the University of Montana and Director of the Field Research Station at Fort Missoula. He received his PhD at the University of Montana in 1994 and pursued post-doctoral work at Harvard University. As a comparative biomechanist, he explores how the form and function of organisms has evolved in relation to the attributes of the physical world.

Our meeting will be held Monday, March 9, 2020 at 7:00 PM in Rm 123 of the Gallagher Business Building on the University of Montana campus.

Peeps from the Board:
Why Are Bird Feathers Colored?
By Andrea Stierle

For seasoned and novice birders alike, the rich array of feather coloration is often the first thing we notice when viewing a bird. It can help us identify a particular bird, and can sometimes help determine its gender and level of maturity. But what is the nature of this coloration? Is it a chemical property associated with a specific pigment or is it a structural property associated with the feather itself and its ability to reflect light? Many colors are a function of a specific pigment or group of pigments that reflect light of a particular wavelength. For example, if we were to grind a red feather from a cardinal into powder, the powder would be red. However, if we were to grind a green feather from the speculum of a Green-winged Teal, that powder would be yellow. And a finely ground bluebird feather would yield a drab brown powder. Clearly, there is more to the color of a feather than meets the eye.

From bluebird blue to oriole orange, feather color is usually the result of both feather structure and chemical composition. Intricately arranged feather layers as well as specific pigments work together to produce the colors we see. Feathers grow in symmetrical branching patterns, with small branches called barbs growing out of a central shaft. Smaller branches called barbules grow out of each barb. A feather barb consists of a central core surrounded by a layer of color-producing structures and an outer region called the cortex which is made of keratin, a fibrous structural protein that is also found in hair and nails.

Although pigments in either the core or the cortex of a feather are responsible for many colors, colors also occur in feathers in which the cortex is pigment-free. In these feathers, the layer between core and cortex – called either the *cloudy zone* or *the spongy layer* – produces colors through convoluted air cavities that act as tiny light-scattering prisms. This type of structural color is typical of the blue feathers of bluebirds and buntings.

Indeed, there are no known blue pigments. In the cloudy zone of blue feathers, the melanin layer and air cavities are so close that the distance between them is shorter than a wavelength of light. When scattering elements are this small, they interact with light through a process called constructive interference. The nanostructural array in blue feathers scatters light in an orderly way. The scattered light waves are in phase and reinforce each other. In the shade, a bluebird's feather appears rather gray because the intrinsic gray-brown color of the melanin pigments is visible. When you place it so that light falls directly upon it and is reflected to your eye, the feather will appear blue. Try the same with a cardinal's feather and it will be red every time.

For most birds, there are three major pigmentation groups: **Melanins,** which produce black, brown, rust and pale yellow and which are structurally similar to the melanins produced in human hair and skin. The dark black of a raven's wing or the brown stripes of an owl are the result of melanin. These colors are especially prevalent in birds' flight feathers—for good reason. Melanin itself is a rigid, stable chemical, and its presence strengthens hard working flight feathers to help them resist wear and tear.

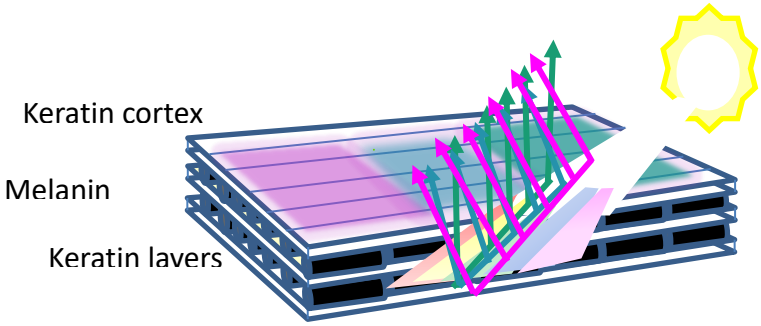
Carotenoids absorb blue light and transmit red, orange and bright yellow. These pigments are derived exclusively from a bird's diet, including flowers, roots, seeds, and fruits. A major source of carotenoids for the Northern Cardinal is the berries of the dogwood tree. Like most bright red birds, cardinals produce liver enzymes that turn yellow carotenoids into brilliant red pigments, although a rare mutation in the gene coding for this enzyme results in a cardinal with brilliant yellow plumage. Cardinals acquire carotenoids from many seed sources, continuously keeping red plumes vibrant. A caged cardinal fed carotenoid-free seeds would lose its brilliance with successive molts.

If red berries yield red and yellow plumage in birds it would seem to follow that green birds would acquire color from eating green plants. Most green feathers however are the result of a blue structural color overlaid with yellow cortical pigment.

P**orphyrins** produce pink, brown, green and rusty red feather colors. One type of green porphyrin was thought to occur only in the turacos, a family of African birds related to our cuckoos. But pigments with similar spectral qualities have been found in the green feathers of the Jacana, the Blood Pheasant, and the Crested Wood-Partridge. In addition, porphyrins create red feathers in

turacos and reddish-brown feathers in goatsuckers, bustards, and owls.

Parrots are the only birds with psittacin pigments. Also known as **psittacofulvins**, these pigments produce vivid red, orange, and yellow plumes, including, the red feathers of Scarlet Macaws. Carotenoids derived from fruits, nuts, and seeds are present in the bloodstream of parrots, but their feathers are colored with psittacofulvins – pigments that they internally synthesize. A parrot's diet, therefore, doesn't control its plumage colors.



Iridescent feathers are made up of complicated arrays of minute light reflectors that contain several ordered layers of melanin rodules, air cavities, and keratin layers. These structures act like minute prisms absorbing and reflecting a range of wavelengths when the feathers are viewed from different angles. Iridescence is most dramatic on bright sunny days when the incident light from the sun is at its highest intensity.

Specific colors and color patterns have important survival benefits for birds. They can help attract a mate or provide camouflage for nesting females and their young. Although coloration in birds did not evolve to elicit human admiration, that doesn't mean we can't enjoy the show!

Colorful Quotes
By Claude Monet

"Color is my daylong obsession, joy, and torment."

"What I need most of all is color, always, always."

"I would like to paint the way a bird sings."

What Do I Do If I Find A Baby Bird?

Reprinted from "Birds FAQs" on www.audubon.org

Every spring and early summer, baby birds are hatching and the parents are busy feeding and protecting their valuable offspring. As chicks mature, they may venture from the nest as they prepare to fledge. This is their start to the difficult but instinctive task of learning how to fly. During this time many chicks may fall out of the nest or from the tree or shrub that the nest rest in. If you should happen to find a chick, leave it alone! This is sometimes a difficult thing for us to do, but it is the best thing for the baby bird. If a chick falls from the nest, the parents are aware and will continue to feed and protect the baby to the best of their ability. Chicks and parents communicate by calling to each other and parent birds will find their young easily.

When folks remove these fallen babies, they are actually doing the birds more harm than good. A burden is placed on the individual that finds the bird to locate wildlife care givers that must rehabilitate the chick. Not all baby birds can be saved and these rehabilitators are understaffed and resources are stretched thin during this time of year. Remember, raising baby birds is illegal unless you are a registered wildlife rehabilitator.

If you have an idea where the baby came from, it is ok to place it back into the nest. Touching the bird will not harm it or make the parents not want to take care of it. If the nest is too high to reach, a good practice is to place the baby in a shoe box or hanging basket in the tree or shrub that holds the nest. The parents can hear the chick's calls from a relatively long distance. If you're not sure exactly where the nest is, putting the chick back in any nearby shrub will do.

Nature is hard to accept sometimes, but the fact is that a large amount of baby birds become food for other animals and these chicks play a vital role in the food chain. Snakes, other birds, raccoons, and opossums all prey on live and dead chicks. Let nature take its course by doing the right thing and leave them alone or place them back in a shrub or tree.

Field Trip Summary
By Larry Weeks

Saturday, January 25th: We caught a break with the weather for the Long-eared Owl trapping field trip. The temperature was near 30 degrees F and although it was foggy, it didn't negatively affect the trip. After assembling at the University, we carpooled to Deschamps Lane and hiked one mile to the capture site. Several people challenged me that my mile wasn't correct. There were people spread out all over the terrain so it took a while before we got together and met Denver Holt and his crew. After some introductory remarks and a demonstration on how a mist net works, we climbed to the top of the clay hills and waited for Denver and his crew to "drive" the ravine. The capture net had been setup while we were hiking in. As the "drive" proceeded, we were able to see some owls flying back behind the drivers. A little later, Denver returned with a Long-eared Owl, and everyone started taking photos. Three of his assistants went back to make a second "drive". Once Denver has an owl in his hand and an audience, he becomes a non-stop entertainer. He proceeded to describe the owl's winter roost, its silent flight due to the barbs on the leading edge of the primary feathers, the location of the ears, an average of 5 eggs per clutch, and that they swallow their prey (voles) whole. He has been able to sex the owls by using a soil color chart to define the color of the underwing. The males have a lighter brown than the females. This method has proven to be over 95% correct. The average weight of a male is 280 grams and 320 grams for a female. This bird weighted 290 grams and the underwing was light colored; it was declared a male. The bird was measured, banded and released. In the meantime, his assistants returned with 3 more owls. Two of them had previously been banded and were released after a photo op. The fourth owl turned out to be a female and it was measured, weighted, banded, and released. Denver has been studying Long-eared Owls for 32 years and has banded about 2000 owls. Thirty-five people made it to the capture site. Four people dropped out because they weren't prepared for the hike.

Denver Holt used a soil chart to help identify the sex of this Long-Eared Owl. Photo courtesy of Owl Research Institute

Advanced Birding Workshop
By Larry Weeks

An advanced birding workshop has been scheduled for February, March and April 2020 that will include seven sessions on Thursday evenings from 7:00 - 9:30 pm at the Fish, Wildlife & Parks Regional Office on Spurgin Road. Each session will be devoted to one bird group. The date, subject and presenter of each session are as follows:

Date	Bird Group	Presenter
Feb 20	gulls	Dan Casey
Feb 27	owls	Matt Larson
Mar 12	flycatchers	Steve Flood
Mar 19	shorebirds	Jim Brown
Mar 26	sparrows	Larry Weeks
Apr 2	forest birds	Jim Sparks
Apr 9	raptors	Larry Weeks

A person may decide to attend a single session, any combination of sessions or all seven. The cost is $15 per session or $70 for all seven. To sign up, please contact Larry Weeks at bwsgenea@gmail.com or 549-5632.

CORRECTION

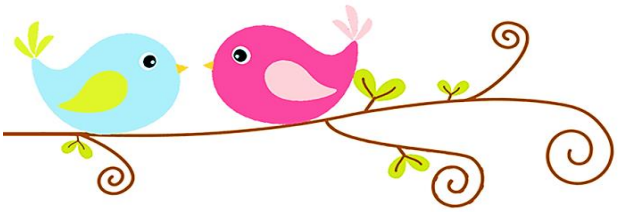
We apologize for an error we made on the Field Trip Schedule in the February 2020 newsletter. Please note that the field trip to Twin Falls, Idaho will occur on June 19th - 21st, not in July as reported in the January newsletter. Rose Leach will be leading this field trip, and the target bird is the Cassia Crossbill, which was recognized as a full species in 2017. Unlike the nomadic Red Crossbill, the Cassia stays put year-round in a single county in Idaho, feeding on lodgepole pine cones that the Red Crossbill can't open. The bird occurs in campgrounds south of Twin Falls; watch for trip details later.

FIELD TRIP to Lost Trail National Wildlife Refuge
June 12-14, 2020

This popular trip has filled up, but we usually get cancellations, so it is not too late to get on our waiting list. Contact Jean: treasurer@fvaudubon.org or 406-396-1171. **Please see January Newsletter for details.

Welcome New Members

Diana L. Clark
Christopher Frandsen
Julie M. Larson
Carol Miller
Jacob Person
Diane Schofield
Ginny Therriault
Charles Wayland
Roy Curet
Alexander Kearney
F.J. (Mike) McMichael
Carol Nichols
Jude Rowe
Lee Silliman
Sherry Toft



Five Valleys Audubon Society greatly appreciates those who renewed their membership this past month. We generally encourage members to receive their newsletter via email (to conserve resources and our expenses), which is the default mailing option if provided by new members. If you want to change how your newsletter is delivered or have any changes to your mailing preferences, please contact the Membership Chair, Poody McLaughlin, at poodymc@gmail.com.

Five Valleys Audubon Society Membership Application

Please support Five Valleys Audubon Society (FVAS). There are several ways to donate. Any method ensures that you will receive our *Birding Observer* newsletter and may participate in all chapter activities. *Please help us reduce our $3,700 annual newsletter cost by signing up for email delivery. FVAS is a 501 (c) (3) nonprofit.

Make checks out to Five Valleys Audubon Society and mail to: PO Box 8425, Missoula, MT 59807
Or donate on our website: fvaudubon.org/join

$_____$15 FVAS membership only, includes newsletter sent via email.

$_____$25 FVAS membership only, includes newsletter sent via USPS.

$_____ General Fund, use as needed for conservation, field trips, education and outreach.

$_____ Phillip L. Wright Fund, small grants for student research.

$_____ Legacy Fund, creating and supporting local urban bird habitats for citizen enjoyment without leaving the city.

$_____Total contribution

_____ Volunteer - Please contact me. I would like to know more about how I may help birds and FVAS.

Name: _____ **Phone:** _____

Address: _____

City: _____ **State:** _____ **Zip:** _____

Email: (Required to receive the newsletter and birding alerts via email.) _____

Please note: FVAS does not share email addresses with anyone except Montana Audubon. Your email address is safe with us!

Please be aware that membership in Five Valleys Audubon Society (FVAS) alone does not confer membership in the National Audubon Society (NAS). FVAS and NAS are separate 501(c)3 nonprofit organizations. To become a new member of NAS and receive Audubon magazine (or to renew a current or lapsed membership) visit the website: fvaudubon.org/nas. Using this website will ensure that FVAS receives a $20 one-time credit for your NAS membership. All NAS members become members of FVAS. A third organization, Montana Audubon (MTA), is also an independent organization and receives no financial support from NAS. MTA handles statewide issues and is responsible for its own fundraising. To assist in this important statewide work you may contact MTA through their website: http://mtaudubon.org/. Please give generously to each organization. Although independent, we work together to protect what we all love.

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