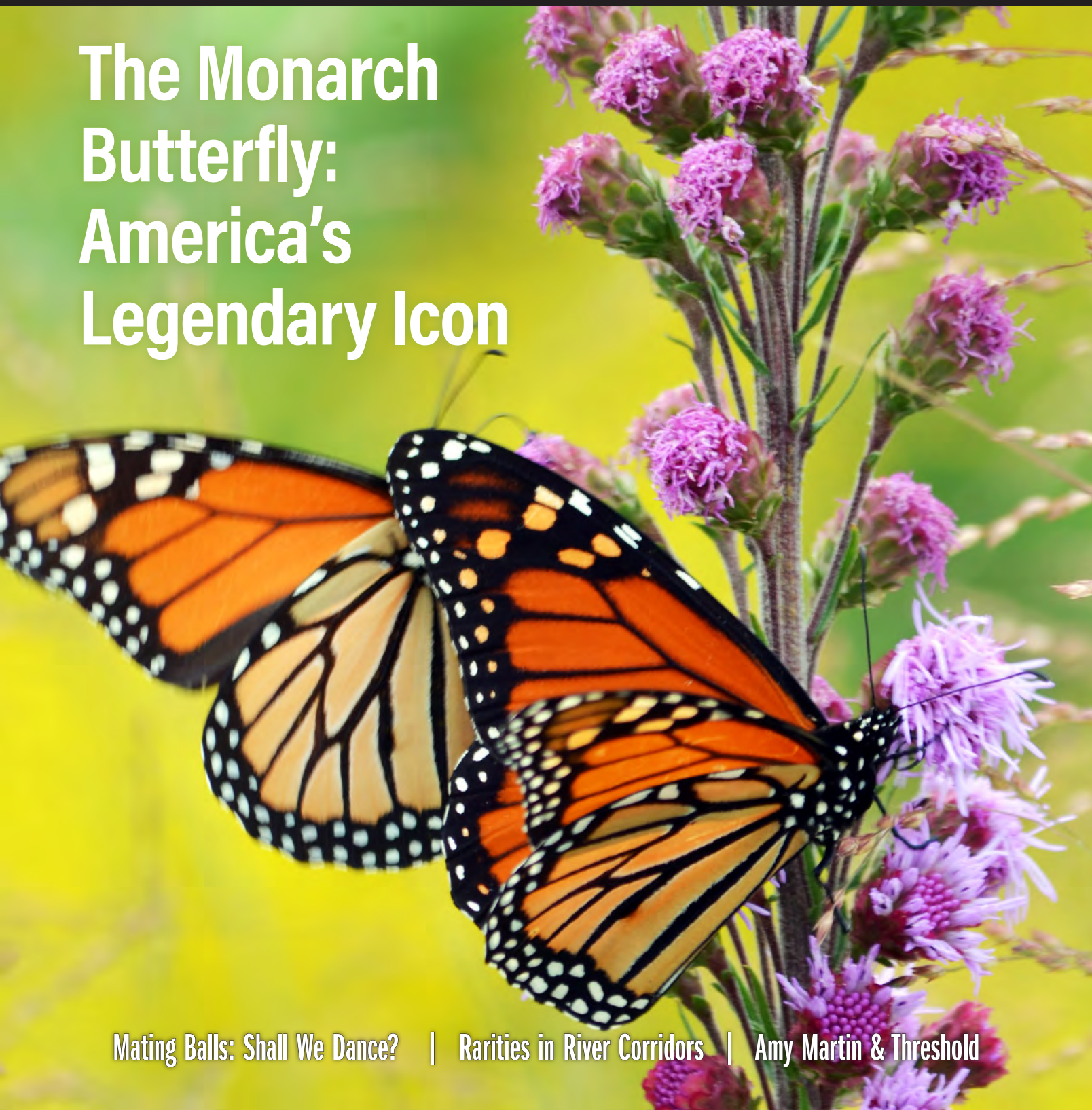
Montana Natural History Center

Spring/Summer 2025

MONTANA Naturalist

TO PROMOTE AND CULTIVATE THE APPRECIATION, UNDERSTANDING AND STEWARDSHIP OF NATURE THROUGH EDUCATION

The Monarch Butterfly: America's Legendary Icon



Mating Balls: Shall We Dance? | Rarities in River Corridors | Amy Martin & Threshold

MONTANA Naturalist Spring/Summer 2025

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Features

Cover – While monarch larvae feed only on milkweed, the adult butterflies find sustenance from many kinds of plants, including blazing star (*Liatris* sp.). Planting pollinator-friendly flowers in your yard can help monarchs and many other pollinator species.

Photo by Mara Koenig, USFWS.

Departments

Montana Natural History Center
Connecting People with Nature

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tidings

Naturalists of all ages spend a day doing community science: conducting a summer butterfly count on the beautiful public lands of the Rattlesnake Recreation Area.

MNHC PHOTO

It amazes me the way that good storytelling can help us travel to faraway places and feel them, hear them, and smell them like a memory. In fall 2018 I tuned in to Season 2 of *Threshold* podcast, "Cold Comfort," where host Amy Martin travels to all eight countries that touch the Arctic Circle, seeking out the stories of the people and wild creatures that make their homes there. I knew Amy as a musician and storyteller; she's a friend of MNHC, and I was intrigued about her new project.

I was not prepared for how immediately and powerfully I'd be drawn into the world of the Arctic. I'm used to podcasts being information-driven, or scripted stories and conversations. I'm accustomed to podcasts with studio-quality sound and little background noise. But from the first minute I knew *Threshold* was different. There were the sounds of barking dogs, of Amy's footsteps. Of the breeze coming off the ocean, and Amy's unfiltered wonder at her first glimpse of the Greenland ice sheet.

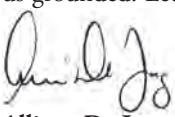
I was right there with her. And I was hooked.

I continued to be hooked as she made her circumpolar journey, sharing not only stories but soundscapes. *Threshold* combines Amy's raw experiences, from that first contact with the melting Greenland ice sheet to coming across an anti-Putin protest in St. Petersburg, with her own reflections on these moments placed in thoughtful context. As I listened to each new episode, I was impressed with her ability to craft compelling stories of the people and landscapes she encountered. Amy has the gift not only of storytelling but of connecting with people, and it is that combination that makes *Threshold* such a phenomenal podcast.

Stories have power. They connect us to each other, show us as complex individuals, and break down barriers between us. Stories inspire compassion and care. And not just those centered on people, but those of wild creatures, of ecosystems, of the natural world as well. *Threshold* reminds me of their strength and compassion.

And, of course, that is what *Montana Naturalist* does, too: it shares words and pictures and insight into our wide wild world and our relationship with it. So dive into the stories in this issue. Learn more about Amy and *Threshold* in writer Caroline Kurtz's wonderful piece (page 22). Read biologist Ken Walcheck's insights about monarch butterflies and the increasing challenges they face (page 4). Experience the wild, strange phenomenon of reptile and amphibian mating balls with Dr. Kara Cromwell, and be reminded of how many surprising, quirky adaptations exist in nature (page 8). Join educator Lily Haines as she explores one of Missoula's undeveloped areas, reveling in the species that make their home there while worrying about future management and human impact (page 24). Enjoy Nicole Emlen's vivid photographs, and ponder the stories and lives of the wild creatures she's captured on film (page 27).

This season, I encourage you to find more stories—and, with them, connections. In an increasingly tumultuous world, it is connections and stories and community that will keep us grounded. Let's look for them. Let's tell them. Let's be changed by them.



Allison De Jong
EDITOR
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America's Legendary Icon:

The Monarch Butterfly

BY KEN WALCHECK

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The brightly colored orange-and-black monarch butterfly once flew in massive flocks that, along with those of the now-extinct passenger pigeon, were two of the greatest wonders of the early American natural world—"winged projectiles of massive millions," as reported by early naturalists. Monarchs "were once so many that the sound of their wings was described as a turbulent stream flow or a sudden hard rain." Early newspaper reporters described branches breaking under the weight of too many monarch butterflies.

Those past days are now distant memories.

This remarkable migratory butterfly is not only a legendary North American icon, but was well known by many past observers as an ambassador of nature and a symbol of a healthy environment. The species now faces plummeting numbers and the possible threat of extinction. Monarchs have experienced a fragmentation and alteration of their breeding and hibernation habitats due to the extensive application of agrochemical pesticides and herbicides, unseasonal freezing temperatures in southern overwintering areas, and rising global temperatures triggered by the burning of fossil fuels and human activities providing a combination of environmental and climate change factors—all of which suggest dire consequences for the monarch butterfly, as well as numerous other species.

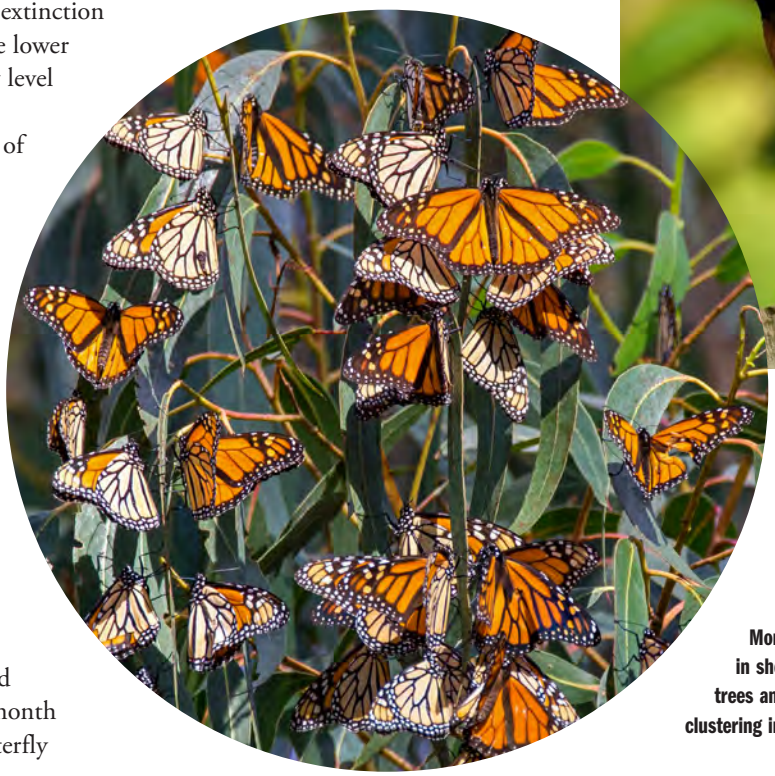
The red flag warnings of further losses of monarch butterflies are now flying at full mast across the nation, including Montana. The monarch's decline is a harbinger of widespread environmental changes.

Today, the environmental force that has the harshest and most far-reaching impact on plant and animal declines is that of humans and their activities. In a very few instances humanity's cultural interference with the natural environment has encouraged the spread of some species, many of which are not beneficial. But in numerous well-documented cases man has been the cause of species reduction, displacement, and extinction.

A 2019 United Nations Global Environment Outlook report estimated the share of invertebrates at risk of extinction to be 42 percent for land-based species. These lower tiers of the animal-life pyramid support every level of animal life above them. When the bottom foundation of a life pyramid is in the process of eroding away, it doesn't bode well for the top level occupied by humankind and the large mammals we pay more attention to.

Monarch numbers have declined 85 percent nationwide in the past two decades. The western migratory population that overwinters in California has suffered a 99 percent decline—a heartbreaking loss. The eastern population, which makes up the bulk of the monarch population of North America, and which overwinters in the border regions of Texas and Mexico, has also undergone a dramatic decline in numbers due to climate change.

On December 20, 2020, the US Fish and Wildlife Service (USFWS) announced a 12-month finding on a petition to list the monarch butterfly



LISA ROEDER, FLICKR.COM

Monarchs overwinter in sheltered groves of trees and shrubs, often clustering in large numbers.

Predation by birds is a contributing factor of monarch mortality during overwintering migration. Two bird species, Black-headed Grosbeaks and Black-backed Orioles, are monarchs' main avian predators. Most birds stay away from monarchs, because eating them has an uncomfortable result: when monarch larvae eat milkweed, they consume toxins called cardiac glycosides. These poisons make monarchs distasteful to most vertebrate predators, often causing vomiting, which serves as a warning to avoid the attractive orange-black colors of the monarch for a repeat performance. Why this toxin does not apply to the two aforementioned bird species remains a mystery.

Black-headed Grosbeak

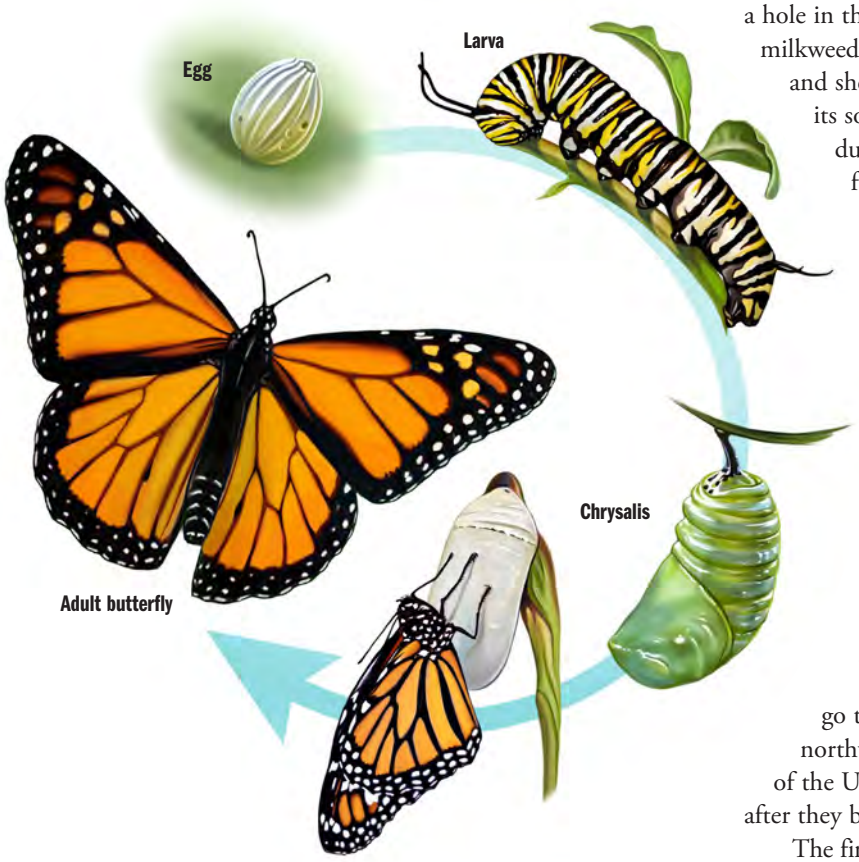
JERRY MCFARLAND, FLICKR.COM

under the Endangered Species Act (ESA). Based on an extensive research-based review of the monarch's status, the committee determined that adding the monarch to the list of threatened and endangered species was warranted, but was precluded at that time by continued studies on higher-priority ESA species. The monarch butterfly became a candidate for listing with its status to be reviewed each year, and a proposal for listing if so warranted. On December 12, 2024, the USFWS proposed that monarchs be listed under the ESA, followed by a 90-day public comment period that ended on March 12, 2025. At the time of publication, the question remains open as to what their decision will be. (We will share any updates in future issues.)

My memory banks vividly recall a Native American student that I had in my ornithology class who told me that the monarch butterfly served as a powerful cultural symbol to the tribe's members, representing change and transformation, comfort, hope, fullness, and the potential for a new beginning as well as a personification of happiness. I also vividly recall a sixth-grade classroom exercise decades ago where we patiently waited for striped monarch caterpillars to enter the final fourth stage of transformation into colorful adult butterflies. Each day was an adventure as we waited for the final transformation. We would not be disappointed when that day finally arrived.

TDLUCAS5000, FLICKR.COM

Female monarchs usually lay a single egg on the underside of a milkweed leaf; they may lay 300-500 eggs over the course of two to five weeks. Once hatched, the larvae go through several instars, molting multiple times before changing into their pupal form.



The monarch butterfly has a fascinating life history. There are four stages in the life cycle of a monarch, and multiple generations undergo these stages in one calendar year: egg, larva (caterpillar), pupa (chrysalis), and adult. The entire process is called complete metamorphosis.

A monarch starts life as a single cream-colored egg attached to the underside of a milkweed leaf, the plant essential for all four life stages. When fully developed, the worm-like larva chews a hole in the eggshell and starts to consume its first meal of milkweed leaves. It continues to eat and grow until it outgrows and sheds its skin. The larva then consumes more milkweed, its source of food for its remaining caterpillar phases, during which it sheds its skin several more times. Once fully grown, the caterpillar attaches itself, upside-down, to a stem or leaf. Then it molts for one last time, wriggling out of its skin to reveal the chrysalis waiting beneath. Inside the chrysalis, over the next several days, the pupa's body parts transform to become a butterfly.

The adult butterfly then emerges from the chrysalis and flies away, heading north to begin this year's spring migration. Yes, the first-generation adults migrate to a place they've never been, beginning a journey that subsequent generations will complete. They feed on flowers and fruits for two to six weeks as they travel north, then die after laying eggs on a milkweed to start generation number two.

The next two to four generations of monarchs will go through exactly the same cycle, continuing the species' northward migration to Canada and the northern reaches of the U.S. as the weather warms, and dying two to six weeks after they become butterflies.

The final generation differs from the previous ones. The adult butterflies do not die after a few weeks, but live for around

DEPOSITPHOTOS.COM

To attract monarch butterflies with floral backyard garden plantings, some excellent options include: goldenrods, asters, thistles, sunflowers, marigolds, coneflowers, Rocky Mountain bee plant, black-eyed Susans, lilacs, spotted Joe-Pye weed, and rubber rabbitbrush. Flowers on fruit-bearing trees are also excellent nectar sources. Monarchs also like to drink from mushy slices of bananas, oranges, and watermelon.

Milkweed can be difficult to grow from seed, but those interested in growing it can contact local/native plant nurseries to see what seeds—or better yet, young plants—might be available in their geographic area. If you want to attract monarchs, you will need more than one or even a few plants; make sure to plant a fairly large patch to make it easier for the butterflies to find and worth the effort when they do!

xerces.org/monarchs has some excellent resources and data for those interested in monarch conservation.


Purple coneflower


Marigold


Milkweed

LEFT TO RIGHT: TDLUCAS5000, FLICKR.COM; PETER MILLER, FLICKR.COM; MARK MOSCHEE, FLICKR.COM

eight *months.* Reversing the journey taken by the previous generations, they migrate hundreds or thousands of miles to warmer climates in Texas, Mexico, and California to overwinter. When the adult monarchs depart from the north in early fall, they are no longer reliant on milkweed plants. They feed on other nectar-producing flowers on their way to the wintering locations, averaging about 50 miles per day. Come spring, they mate and lay eggs on milkweed before dying at last, and the cycle begins again.

Warmer temperatures due to climate change will most assuredly have negative impacts on the growth and distribution of milkweed, the plant that monarchs need to survive. Milkweed distribution, according to range specialists, will need to shift northward to find the appropriate temperature growing conditions. This presents a valid concern about whether monarch butterflies will be able to adapt to these changing habitat sites and environmental differences. Longer migratory flights influenced by changing milkweed distribution could seriously reduce the time spent at the breeding grounds. The correct timing for migration is critical for monarchs.

It is difficult to watch monarch butterflies and their migratory travels teeter on the edge of collapse, but there are signs of optimism on the horizon, says entomologist Anna Walker, who is a current leader in the monarch assessment. One positive change from the recent Covid pandemic was a boost in home gardening, and a growing awareness about the importance of adding butterfly nectar-sustaining flowers to their landscapes. The dramatic decrease in monarch numbers nationwide has served as a rallying cry, encouraging conservation activists and environmental organizations to plant milkweed plants across rural America in suitable habitats in the determined hope that they will result in more monarch butterflies.

All of the numerous crisscrossing threads of relationship between the monarch butterfly and its environmental components make up Darwin's web of life, an intricate, dynamic network that depends on a delicate balance to maintain its stability. But let one or more threads of the web be cut or altered, then new adjustments are in order. Such is the current dilemma confronting the future outlook of the monarch butterfly.

The dramatic decrease in monarch numbers nationwide has served as a rallying cry, encouraging conservation activists and environmental organizations to plant milkweed plants...

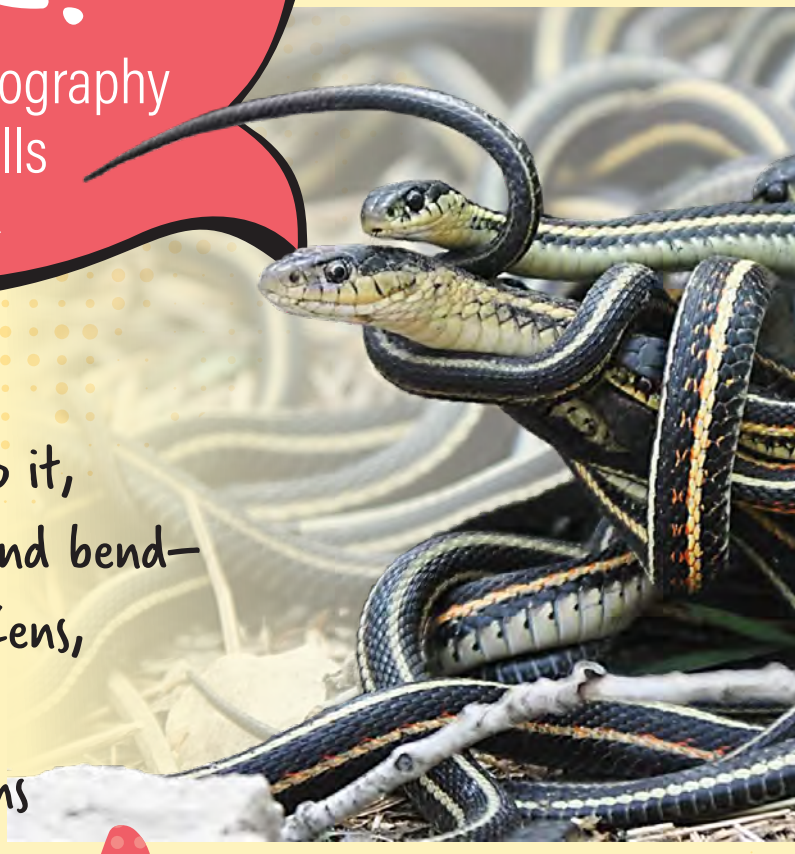
It is also our sincere hope that we will never have to erect a monument for the monarch butterfly, as we did for the passenger pigeon, to symbolize our sorrow for its disappearance.

—Ken Walcheck is a Bozeman resident, and retired Montana Department of Fish, Wildlife and Parks Information Wildlife Biologist. He continues to write Montana natural history wildlife articles.

SHALL WE DANCE?

The Chaotic Choreography of Mating Balls

BY KARA CROMWELL



Newts do it, snakes do it,
toads by shallow shores of lakes do it,
in balls they squirm and writhe and bend—
it's done in pools and ponds and fens,
in swamps or bogs or rocky dens
when winter ends and spring begins
...look out for the mating ball!

PHOTO BY CHRIS FRIESEN, COURTESY OF OREGON STATE UNIVERSITY

At first I wondered which usage of the word "ball" is really at work here: the fun, frolicsome ball, which is something you might have (mating season, let's have a ball!), or is it the shape you might make by rolling, bunching, or winding together? Perhaps a mix of both—a bit of whimsy and springtime decadence bound together by the laws of physics? It's true that the mating ball is both an object and an event—though not a lighthearted one. At its core this ball is a wild, striving competition to ensure the continuity of life.

Rather than fitting to a strict biological definition, mating balls are more of a know-it-when-you-see-it sort of phenomenon. And it turns out that *what* a mating ball is largely defined by *who* does it. The preconditions for mating in a ball mainly concern body style. Some length and litheness are required for bending and balling. The effort benefits from a smooth body surface. So to mate in a ball is the purview of creatures slimy and squirmy—think newts, toads, or snakes—creatures that can form a winding, writhing mass in which, to the outside observer, individuals fade into the collective chaos.

Within mating balls dozens of male garter snakes can surround a female, each attempting to entwine his tail with hers and be the one to inseminate her when the moment is right.

And yet, there is one individual we could regard as the central character. She's the Cinderella of the ball, if you will (but actually, please don't—if you put any weight on that metaphor it won't hold, as you'll see). A mating ball generally forms around a single female. With her at the center, males amass, perhaps ten, or even ten times that. Males compete by squirmery to win a place close to her side where they will insinuate themselves into a posture facilitating courtship. This is as close as we get to a definition of a mating ball—an entangled group of reproductive animals of a squirmy disposition, composed of many males vying for position near a female at the center.

She is likely awash in the pheromones males produce to signal their intentions and induce a mating mood, and she is subject to a swelling crush—not the fun flirty kind, but the actual lung-compressing kind. Of toads, Darwin observed that "though cold-blooded, their passions are strong….An unfortunate female toad [is sometimes found] dead and smothered from having been so closely embraced by three or four males" (Charles Darwin, *The Descent of Man*). In fact, suffocation is not necessarily an "unfortunate" side-effect, but perhaps a reproductive strategy taken to its logical, though most extreme, end. In garter snakes, for example, respiratory stress rather than any form of sexual openness is likely what prompts the female to permit copulation from a male within the mating ball.

The choreography of courtship differs between snakes and amphibians due to some key biological contrasts, mainly that most amphibian males deliver their sperm into the external environment rather than directly into the female. Consider the newt. The male first packages sperm in a shapely dollop of mucoproteins called a spermatophore and waits to deposit it onto a substrate, such as vegetation submerged under water, for the female to accept and pick up with her cloaca. (Let us marvel at the wonders of the amphibian cloaca. This apparently dextrous structure is more generically called the "vent" because it is the combined terminus of multiple pipelines that vent from the body into the outside world—the urinary, gastrointestinal, and reproductive tracts together. It is a feature of amphibian and reptile anatomy as well as birds, some fishes, and egg-laying mammals, present in both males and females). While the male delivers sperm externally, the female takes a different tack and keeps her eggs stored within the

Male toads vie for the chance to embrace a female in "amplexus," which is a tight grasp that keeps the pair aligned, ensuring he is positioned to fertilize her eggs the moment she releases them.

ASRA VALORSHON, FLICKR.COM

abdomen. After accepting a spermatophore during courtship she will use the sperm to fertilize her eggs internally.

In newts, then, the formation of a mating ball is a hectic bid for attention in which multiple males advertise their most personal wares, seeking to divert a female's attention toward their gelatinized sculpture of sperm. Despite the eagerness with which these males are marketing their widgets, one of the realities shaping male-female sexual interactions is that sperm are quite cheap to produce and in abundant supply. Eggs, in contrast, are rare and energetically expensive, being large and provisioned with a prepackaged nutrient supply for the embryo. The male can readily proceed to create and display more spermatophores to other females throughout the mating season. For him more matings predicts more offspring, and he can continue to fund those matings from a functionally inexhaustible production line of sperm, a cheap investment in his lifetime fitness.

Meanwhile, back at the garter snake den, the female at the locus of her mating ball is confronted by a different set of pressures, both mechanical and evolutionary. In snakes fertilization is fully internal, meaning that direct and sometimes prolonged contact between male and female is required to complete the transfer of sperm into the female's cloaca. This is accomplished by copulation, a luxurious efficiency not available to most amphibians, who cast their gametes into an unstable and unpredictable external environment. In snake copulation, the male effuses pheromones and uses a ritualized sequence of movements and tactile cues attempting to induce the female to copulate. When her cloaca gapes he is able to insert one of his hemipenes, which is capped with a rosette of spicules serving to lock the pair into copulation. (Yes, male snakes have two penes, and yes, that's the technical plural of penis, I'm sorry we don't have time for more here.)

Snake courtship can—in fact, usually does—occur within a solitary pair, perhaps with combat for dominance among a few males. Amphibian courtship tends to be more of a communal affair, but only some species experience the proclivity and environmental pressures that set the stage for mating in a ball. It's a maneuver that shines in "explosive" breeding scenarios, which are characterized by individuals crowded at high density attempting to mate in a transient environment. In such compressed conditions, things get hot really fast. Toads, for example, will track environmental cues and converge on ephemeral ponds during the brief window when they provide conditions required for egg fertilization and survival. Against this ticking clock unfolds a lawless "scramble competition" for mates, favoring speed and efficiency over the prolonged rituals of mate selection. Males embrace any moving object in a trial-and-error approach, eventually converging and grappling around a reproductive female, each trying to oust the others lest the moment passes him by.

Red-sided garter snakes are the flagship example of explosive mating in reptiles. It begins with an overwinter assemblage in a communal den—a strategy to increase overwinter survival in cold climates. These occur in Montana but are most famous farther north, especially in Manitoba where the springtime emergence and mating of tens of thousands of garter snakes has become a tourist draw (obviously, seeing this is on my bucket list). Snakes in these communal dens benefit from ready access to mates and also from temperature regulation. At such numbers competition between males can be fierce, and males can use pheromone-induced frenzy of competition to their advantage to boost their survival in early spring. When they first emerge from the dens they are chilled, stiff, and sluggish, and less able to escape predators. A male in this vulnerable state will stoke the mating fever of his cohort by producing female pheromones, beckoning other males to surround him in a ball so he can be warmed by more active snakes. But when the shivering male is sufficiently thawed he sheds the disguise, switches to producing male pheromones, and proceeds to scramble for mates himself.

Such antic, FOMO-based breeding aggregations as mating balls are more likely to form as the ratio of males to females increases and access to females becomes a limiting resource. Males will arrive at the breeding area sooner and stay longer, seeking to maximize the number of eggs they fertilize by mating early and often. Females, in contrast, may not equally benefit from multiple inseminations. Eggs are quite few in comparison to sperm and once they are fertilized, females can increase their fitness by redirecting energy toward other essential business, such as finding food and hiding from predators. Because this motivates females to disperse while males linger, breeding sites can become overcrowded with males who are propelled by their evolutionary self-interest to enter the mating scrum again and again.

Although a female may not benefit from numerous mating partners, we could

Overwintering in communal dens has risks, like attracting predators, but it also helps garter snakes thermoregulate over winter and find plentiful mates in spring.

predict that she benefits from selecting the "right" partner. For example, finding a newt-mate whose spermatophore is engorged with genetic material conferring heartiness and survival in her offspring. In mating systems where males compete for courtship rights, as they do in mating balls, we usually assume an element of female selectivity shapes male behavior. She is the audience for whom the competition is performed, and it provides her with information that bears on her choice of a mate.

But when males grapple in the chaos of the mating ball, can the female choose who fertilizes her eggs? There is no single answer, although in general explosive breeding environments don't facilitate choice for either males or females. For frogs and toads fertilization is fully external, resulting from the coordinated release of eggs and sperm. With multiple males scrambling for access to her eggs, a single female toad's clutch may be fertilized patchily by more than one male, or remain partly unfertilized—a haphazard outcome that dilutes reproductive success.

Some newts mate in riotous balls but some do a more ritualized nose-to-tail courtship dance—either way, mating culminates with the male depositing a sperm packet for the female to pick up.

J. MAUGHN, FLICKR.COM

Eggs-of-newt, on the other hand, are fertilized internally after the female opts to pick up the proffered spermatophore, although she may do so under respiratory duress. If she were wooed by a single undesirable mate she might signal disinterest by playing dead, but that can be a risky farce in the melee of multiple males. And finally, when a female snake is en-balled, the mechanics of internal fertilization demand that one male outmaneuver competitors to put the right parts in the right place at the right time—he vies for position flanking the female, but not for her approval.

Yet for snakes as well as salamandrids, there is a more cryptic strategy females can use to fertilize eggs at their own discretion. The female cloaca, jane-of-all-trades that it is, contains pouches specialized for sperm storage—hidden, climate-controlled holding areas that keep sperm viable until she releases them to fertilize her eggs. Therefore if a female has mated with more than one male, she can "choose" which sperm will fertilize the eggs, or she can selectively permit multiple paternity to boost the genetic diversity of her offspring.

PHOTO CREDIT: TRAVEL MANITOBA

Storing sperm also allows her to optimize a truly rare commodity: time. Especially in harsh climates with a truncated summer season, waiting for the goldilocks conditions that favor reproduction has a high opportunity cost. But if she mates then takes to the open road, she can attend to other business while waiting to fertilize her eggs until she ovulates, or until environmental conditions are favorable for egg-laying, or a winning habitat for her clutch is found. Sperm can be stored for weeks to months, even until the following year in the case of some snakes.

Because I craved some on-the-ground mating ball intel I scheduled a talk with Assistant Professor Dr. Erim Gómez of the University of Montana, who studies amphibian conservation and finds any opportunity to celebrate what he calls "charismatic minifauna." Erim tells me that his most memorable mating ball encounter featured rough-skinned newts *(Taricha granulosa)*, which are native to the Cascades and coastal Pacific Northwest but have a population, likely introduced, in the Idaho panhandle around the St. Joe drainage. These newts are enthusiastic communal breeders, with mating balls commonly reported throughout their range. Erim also highlights that Montana's native western toads and related species (genus *Anaxyrus*) will assemble in loosely-formed mating aggregations, especially in crowded breeding environments. But what they're most known for is an extreme commitment to the scramble style of mating; they're notorious for missing the mark and instead wrapping pretty much anything that moves or doesn't—fish, sticks, other males—in the coital embrace called amplexus. Probably the most widespread mating baller in Montana is the common garter snake *(Thamnophis sirtalis)*. Mating balls have been sighted opportunistically throughout the state in early spring in places where garter snakes are common, though no place in Montana—no place, in fact, on Earth—matches the density of snakes entwined in mating balls farther north at the Narcisse dens in Manitoba, Canada.

While we're circling the topic of cold-blooded courtship, Erim is also excited to remind me that mating balls are just one chapter in the saga. Columbia spotted frogs *(Rana luteiventris)* use more artful tactics, with males enticing their mates through vocalizations. Long-toed salamanders *(Ambystoma macrodactylum)* tend to court in pairs and a male will set the stage by fluttering his tail to waft pheromones around the female before presenting his spermatophore to her. Erim highlights an especially colorful detail on the reproductive habits of Montana's endemic tailed frogs *(Ascaphus montanus)*. They also eschew communal mating for a more intimate pairwise courtship. And get this: the male fertilizes the female eggs (internally!) with his "tail." Hmm—clearly there's more to that story that I encourage you to pursue in your extracurricular time. Meanwhile, I think I'm off to plan my Mother's Day outing to the garter snake dens.

—Dr. Kara Cromwell is a researcher and science communicator focused on understanding and conserving aquatic biodiversity—especially its squirmy, slimy, and tiny parts.

volunteer spotlight

This issue, we're honoring four of our amazing volunteers, four women who have given so much to MNHC: time, enthusiasm, energy, leadership, dedication, and more.

Crystal Brown


Crystal Brown

Crystal is a rockstar. From assisting with naturalist trivia nights to volunteering religiously in the classroom, Crystal provides reliable support to MNHC along multiple fronts. She is punctual and organized, always anticipating the needs of whichever naturalist she is assisting in the classroom. It is not unheard of for Crystal to spend hours of her free time baking treats to be used as prizes for Naturalist Trivia Night. Currently enrolled in our Master Naturalist II course, Crystal embodies an effortless curiosity for the natural world that is as infectious to elementary schoolers as it is to adults. Thank you, Crystal, for sharing your knowledge, dedicating your time, and continuing to support our programs!

~Ryan Mahar, Teaching Naturalist


Brooke Mulchin


Sarah Elsasser


Caroline Kurtz

PHOTOS COURTESY OF CRYSTAL, BROOKE, CAROLINE, AND SARAH

Caroline Kurtz

MNHC is incredibly grateful for the dedication and leadership of Caroline Kurtz! As a valued member of our Board of Directors, Caroline has been a steadfast advocate for our mission, bringing her passion, insight, and generosity to every project she takes on. Whether helping to throw an unforgettable community celebration as part of the Block Party Committee, guiding our fundraising efforts on the Development Committee, or ensuring MNHC's financial sustainability through the Operating Reserve Committee, her contributions have been invaluable.

Through both good times and challenging moments, Caroline has been a steady and thoughtful leader, offering her wisdom and kindness to help shape the future of MNHC. Her commitment goes beyond committee work—she is a true champion of our mission, always showing up with dedication, heart, and an unwavering belief in the power of connecting people with nature.

We are beyond fortunate to have Caroline as part of the MNHC family. Thank you, Caroline, for your hard work, leadership, and friendship—we appreciate you more than words can say!

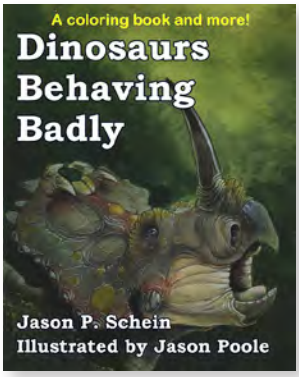
~Kellen Beck, Development Director

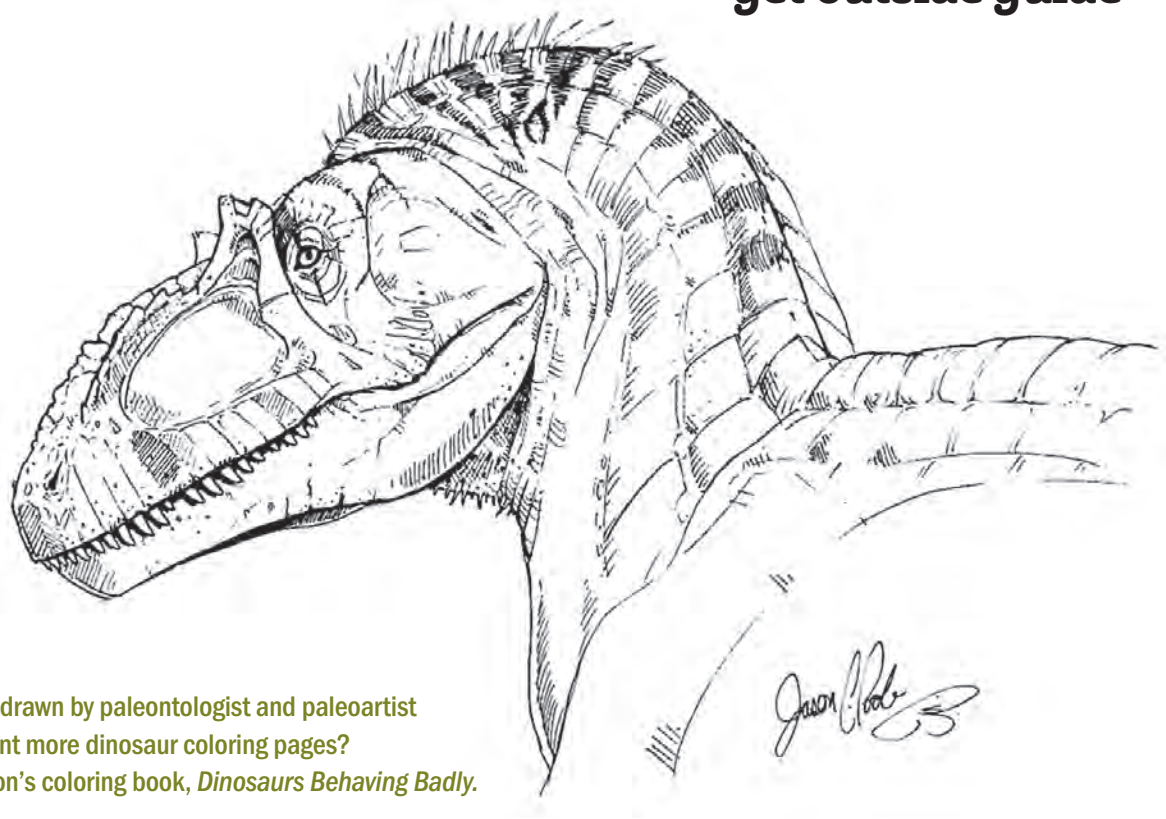
Brooke Mulchin & Sarah Elsasser

Master Naturalists Brooke Mulchin and Sarah Elsasser were our dedicated and courageous 2024 Adult Program Interns. They assisted with or led more than 25 programs (!) including lectures, art, birding, and foraging classes; naturalist field days; and the statewide two-day Master Naturalist Rendezvous held in Missoula. Their involvement was essential to the implementation of these programs—we could not have held them without Brooke and Sarah!

Sarah also provided an excellent lecture on meteorology and is always on hand to answer the meteorological questions that come through MNHC. She has returned to be our 2025 Adult Program Intern. Brooke used her talents to organize the 100+ recertifying Master Naturalists and their mailing addresses. Brooke and Sarah contributed enthusiasm, kindness, and wonderful insight to the success of our adult programs. I love working with them. Thank you, Brooke and Sarah!

~Christine Morris, Community Programs Coordinator





Allosaurus coloring page drawn by paleontologist and paleoartist Jason C. Poole. Want more dinosaur coloring pages? Stop by MNHC and pick up Jason's coloring book, *Dinosaurs Behaving Badly.*

Fantastic Fabulous Fridays at the Pea Green Boat

We're thrilled to announce a new partnership with Montana Public Radio and its excellent long-running children's show The Pea Green Boat, hosted by Vicki Chaney. Every Friday from 4ish-4:30ish, MNHC Teaching Naturalist Kevin Niehaus (and sometimes other MNHC staff) will be hanging out with Vicki at MTPR, chatting about all things nature. Be sure to tune in! For info on how and where to listen, visit mtpr.org.

Calling All Kids!

Do you have any nature art, photography, poetry, or stories you'd like to share? We showcase kids' work in every issue in our "Kids' Corner" —and here's your chance for that work to be yours!

Send submissions to Allison De Jong, Editor, at 120 Hickory Street, Missoula, MT 59801 or by email to adejong@MontanaNaturalist.org.

MNHC PHOTO

We can't wait to see you this summer!

Explore Outdoors with Us This Summer!

Our PreK-5th grade Outdoor Discovery Day Camps feature daily field trips, skilled instructors, unique opportunities to connect with scientists and naturalists, and lots of time for exploration and play outdoors.

We're offering ten full weeks of camps this summer, including four STEEM (Science, Technology, Engineering, Environment, and Math) camps for 6th-8th grade girls and nonbinary students. Learn more and register on our website: MontanaNaturalist.org/summer-camps/.

get outside calendar

Programs for Kids

From September through May, join us every Monday from 10:00-11:00 a.m. for our miniNaturalist program! Best for ages 2-4, though kids of any age are welcome. The miniNaturalist program encourages curiosity for the natural world through exploration and play. We start with stories, songs, and movement inside, then head outside to explore. FREE!

Volunteer Opportunities

MNHC PHOTO

Join us at the Native Plant Garden this summer! On Sundays, come out from 9:00-11:00 a.m. to volunteer with Garden Manager and Master Naturalist Elena Ulev. Learn about plants, birds, and ecology while weeding, transplanting, and pruning. Help our garden stay healthy and beautiful!

On Tuesdays from 9:00-11:00 a.m., Elena will lead a variety of naturalist courses, from wildflower ID to nature journaling to birdwatching. Learn more and register at MontanaNaturalist.org/garden.

Help with our Visiting Naturalist in the Schools field trips this May! We invite and strongly encourage all volunteers to participate in our VNS staff field trip training at the end of April. For more information and to sign up, contact Erin at vnsvolunteer@MontanaNaturalist.org.

For more information on volunteering at MNHC, visit MontanaNaturalist.org/volunteer/.

Come find community and inspiration for your nature photography passion at our Scavengers Photography Club!

Everyone is welcome—hobbyists, enthusiasts, professionals, and new beginners! Peggy Christian, artist, author, and Master Naturalist, hosts this unique club on the third Thursday of every month from 6:00-8:00 p.m. at MNHC.

At each session members share photos (up to 6 per person) and discuss current projects, interests, successes, and challenges. Some sessions will feature a guest presentation on an aspect of photography. **FREE!**

The Montana Natural History Center is located within the traditional homelands of the *Tátáyaqn* (Bitterroot Salish) and *Qlispélixʷ* (Kalispel) peoples who have lived here since time immemorial. The Montana Natural History Center is dedicated to the recognition of the first peoples of Missoula and the integration of Salish language, culture, and Indigenous knowledge.

MNHC is open Tuesdays - Saturdays, 10 a.m. - 4 p.m.
Please check our website and social media for details.

Admission Fees:
$5/adults (18+), **$2**/children (4-18), **$10**/family rate, **Free**/children under 4, **$4**/seniors and veterans

FREE admission for MNHC members, ASTC Travel Passport Members, tribal members, and EBT card holders!

Programs and events held at MNHC, 120 Hickory Street, unless otherwise noted.

Programs subject to change. Please check our website calendar for the most up-to-date information.

Visit MontanaNaturalist.org to register for programs and become a member. For more information, call MNHC at 406.327.0405.

PHENOLOGY FOR APRIL-SEPTEMBER

APRIL

Shooting stars bloom purple on the hillsides

Look for the mating balls of common garter snakes

Song Sparrows trill

MAY

Ospreys are incubating eggs

Look for the shimmering pink and green plumage of Lewis' Woodpeckers

Penstemon are blooming

JUNE

Pronghorn fawns are born

Calliope Hummingbirds incubate eggs

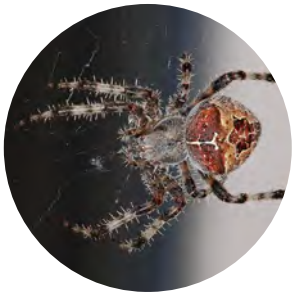
Cutthroat trout begin to spawn

JULY

Young bald eagles fledge

Huckleberries (and other berries) are ripening

Young rodents become more abundant for predators



AUGUST

Cat-faced spiders are back up in the eaves

Pikas are busy cutting and drying grasses to store for winter use

SEPTEMBER

Milkweed goes to seed

Black bears roam widely to find enough food to make a sizeable fat store for the winter

SHOOTING STAR: EILEENMAK,FLICKR.COM; WOODPECKER: JOSHUA MAYER, FLICKR.COM; PRONGHORN: NPS / JACOB W. FRANK, FLICKR.COM; HUCKLEBERRIES: AUBREE BENSON, LOLO NATIONAL FOREST, FLICKR.COM; SPIDER: JOSEPH BERGER, BUGWOOD.ORG; BEAR: JIM PEACO; NPS, FLICKR.COM

In-person programming may include masks and distancing, depending on COVID numbers.

Adult Programs

Stay tuned for other spring and summer programming including naturalist presentations, First Fridays, trivia nights, field experiences, and more. Check our website and social media for the latest information, or sign up for our e-newsletter at MontanaNaturalist.org.

MARCH

March 27
Naturalist Trivia Night, 7:00-9:00 p.m. This month's theme is Beetles! FREE, but please register.

MNHC PHOTOS

March 29
"Booming" to Lee Metcalf NWR with Birder/Author Sneed Collard, 9:00 a.m.-1:00 p.m. $55; $50 MNHC members. Registration required.

APRIL

April 4
First Friday with Nicole Emlen, 5:00-7:00 p.m. "Lives and Lessons of Zoo Animals." FREE and open to the public.

April 5
Walking, Nature, and You at Council Grove State Park, 2:00-4:00 p.m. $45; $40 MNHC members. Registration required.

April 7
Connecting to Land Through an Indigenous Lens with Lailani Upham, 5:45-8:00 p.m. FREE, but please register. This program will take place in Cooper Room B on the 4th floor of the Missoula Public Library.

April 16
Resilient Recreation – Partners & Public Lands Seminar Series with the BLM, 7:00-8:00 p.m. FREE, but please register.

April 22
Earth Day Garden Tour, 9:00-11:00 a.m. Celebrate Earth Day with a tour of the Native Plant Garden at Fort Missoula with Garden Manager and Montana Master Naturalist Elena Ulev. Cookies and drinks provided. $10 suggested donation. Registration required.

April 23-26
National Association of Interpretation Heartland Region Conference, at the Holiday Inn Downtown, hosted by MNHC. We invite interpreters, educators, and all who are interested to attend this exciting event. See page 17 for more information.

MAY

May 10
Nutrition-Dense Eating with Wild Foods, 1:00-3:00 p.m. $55; $50 MNHC members. Registration required.

May 12
Nature Writing Workshop with Chandra Brown, 4:00-8:00 p.m. $115; $105 MNHC members. Registration required.

May 14
Spring Scholarship Luncheon, 12:30-2:30 p.m. at the Governor's Ballroom in the Florence Building. $150. Tickets available April 1; registration required.

May 20
Birding for Beginners in Greenough Park, 8:15-10:15 a.m. $35; $30 MNHC members. Registration required.

May 21
Tribal Reconnections – Partners & Public Lands Seminar Series with the BLM, 7:00-8:00 p.m. FREE, but please register.

JUNE

June 2-6
Summer Montana Master Naturalist Course, 9:00 a.m.-4:00 p.m. Earn your Master Naturalist certification with our one-week intensive summer course! $450; $425 MNHC members. Registration required.

June 23-27
Summer Montana Master Naturalist Course for Teachers, 9:00 a.m.-3:00 p.m. This course is specially designed for educators! We will emphasize learning methods and activities that can be adapted for a wide age range in formal or informal education settings. $350; $325 MNHC members. Registration required.

AUGUST

August 6-9
Beartooth Nature Writing Retreat. MNHC is partnering with Elevation Science Institute and Turnstone Nature Education on this amazing new program! Spend three days writing, reflecting, and exploring, surrounded by the beauties of the Beartooth Mountains and the Bighorn Basin. $655 for Red Lodge locals/staying offsite; $855 with room & board. Learn more and register at elevationscience.org/beartooth-nature-writing-retreat.

JASON POOLE DRAWING

Drop-In Nature Journaling

Fellow naturalists! Are you looking for community, accountability, inspiration, and more? We're excited to offer monthly drop-in nature journaling sessions this year. Bring your nature journals, phenology wheels, pens, pencils, and paints, and have fun crafting your observations in community. Come join us for fun, creativity, and naturalist exploration!

Scheduled over the lunch hour (11:30 a.m.-1:00 p.m.) on the last Wednesday of the month, this is a perfect mid-day break; please feel free to bring lunch or snacks. This program is FREE with admission/membership!

UPCOMING DATES:

March 26th
April 30th
May 28th
June-August - TBD
September 24th

Nature Writing Hush Hour(s)

Writing can help us connect with and reflect on our natural surroundings in deeply personal, unexpected, rewarding ways. But finding the time to write can often be challenging. Led by MNHC writers/editors Allison De Jong and Beth Conway, this writing "hush hour(s)" is designed to provide nature writers with a quiet, supportive setting to work on your craft. This isn't a workshop; this is space to write.

ALLISON DE JONG DRAWING

Bring your notebook, journal, or computer. Writing prompts will be available if you're feeling stuck, or just want to play with words.

Hush Hour(s) are from 6:00-8:00 p.m. on the second Monday of the month. Program is FREE, but please register, as space is limited.

UPCOMING DATES:

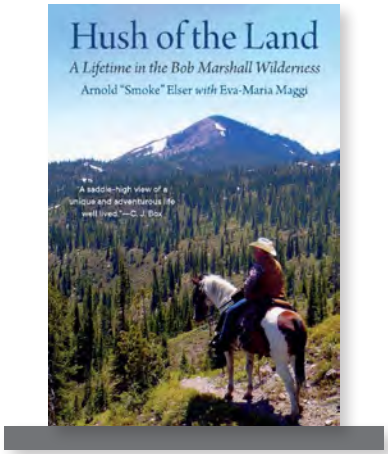
April 14th

May 12th - *no Hush Hour this evening; please consider signing up for Chandra Brown's Nature Writing Workshop at MNHC instead (see calendar listing)*

June 9th
July 14th
August 11th
September 8th

Book Reviews

REVIEWED BY ALLISON DE JONG



Hush of the Land: A Lifetime in the Bob Marshall Wilderness

By Arnold "Smoke" Elser with Eva-Maria Maggi

Hush of the Land is the powerful story of a life lived outdoors, entwined with the natural world in ways most of us only dream of. Arnold "Smoke" Elser spent nearly six decades leading pack trips into the wild places of western Montana, and this book is rich with his stories. Pick it up, and you'll feel like you're sitting around a campfire with Smoke, being regaled with tales of everything from grizzly bear encounters to sitting deep in the wilderness beneath a star-strewn sky during the moon landing. This is the story of Smoke's journey from an Ohio kid who couldn't ride a horse to a Montana outfitter who knows intimately the wild landscapes, creatures, and history of this place and spent more than half a century sharing its wonders with people from all walks of life.

These pages are imbued with a sense of wonder. Whether leading hunters to just the right spot to get their elk, waking up under a manty covered with four inches of snow in August, or planning a packing trip for 35 people, Smoke's love for his life's work, the people he meets, and the sheer wild beauty of our state shines through. And we see that this care translates into advocacy: Smoke is a tireless defender of wilderness, of conservation of this land so that it, and the flora and fauna that depend on it, will be here for our children and our children's children to revel in, too.

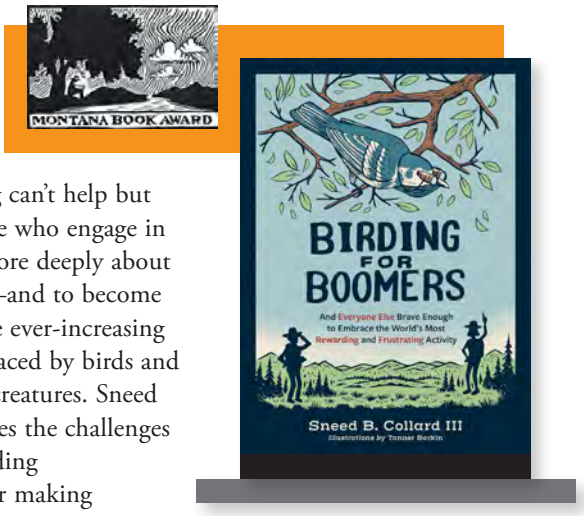
Read Smoke's stories, compiled so compellingly by writer Eva-Maria Maggi, and be transported to another time—and wild places that are still within reach.

MNHC will be hosting Smoke and Eva for a presentation and book signing this fall! Stay tuned for details.

Birding for Boomers: And Everyone Else Brave Enough to Embrace the World's Most Rewarding and Frustrating Activity -

a 2024 Honor Book from the Montana Book Award

By Sneed B. Collard III, illustrated by Tanner Barkin



I'm not a Boomer, but fortunately you don't need to be one to find this book utterly delightful. Sneed shares the ins and outs (and ups and downs) of birding in a fun, frank, and accessible way. This guide is peppered with whimsical illustrations and humorous asides, and I found myself chortling throughout.

With charming self-deprecation, Sneed shares his story of becoming a birder at a later stage of life, not shying away from the challenges that age brings (hearing loss, eyesight issues, mobility challenges). He provides insights and resources for accommodating those challenges, as well as a wealth of information for beginning—or even intermediate—birders. There's information about field guides and birding apps; gear, from clothing to spotting scopes; IDing birds by appearance, habitat, and sound; and great birding destinations, from your backyard to international hotspots.

Sneed also touches on the importance of making birding available to all—not only older folks and others with physical limitations, but those in the BIPOC and LGBTQ+ communities, and those who face economic barriers—sharing ways we can "welcome everyone to the flock."

Birding can't help but inspire those who engage in it to care more deeply about the planet—and to become aware of the ever-increasing challenges faced by birds and other wild creatures. Sneed acknowledges the challenges while including resources for making yards more wildlife-friendly, lifestyle changes we can make to help birds, lists of conservation organizations to support, and more.

With this book, you'll have all the information you need to join the quirky, enthusiastic community of nature-loving bird-nerds. Welcome!

Sneed is leading an MNHC birding trip to Lee Metcalf on March 29. See the calendar for details!

imprints

Notes from Our ED

Partnerships are growing at MNHC!

MNHC PHOTO

Just in time for spring, we are tending some new partnerships. We look forward to nurturing these collaborations for years to come.

Let's start with dinosaurs! We are doubling down on dinos with the **Elevation Science Institute.** We've loved having paleontologist and artist Jason Poole in residence. Jason spends his days building dinosaur skeletons in our museum and spends his evenings and weekends sharing his talents via lectures or art classes. Jason's original artwork is on display in our gallery! And in summer the partnership goes outside, as naturalist/writer/teacher/editor Allison De Jong joins ESI in the field for a nature writing workshop—see page 18 for details!

I'm super proud of MNHC's Education Director Jennifer Robinson for her work alongside **Teller Wildlife Refuge** and several other Bitterroot conservation groups to build a home-grown Conservation in the Classroom program for Bitterroot schools. Jennifer's warmth, enthusiasm, and knowledge create the perfect spark to ignite a top-tier conservation program for teachers, students, and professionals. Thank you Teller and Bitterroot Water Partnership for bringing MNHC into the fold.

Thanks to Community Programs Coordinator Christine Morris, we are hosting several evening talks with experts from the Bureau of Land Management (see page 18 for details). With so many state and federal agencies based in Missoula, we look forward to showcasing more local expertise.

Starting in March, you'll find our friends at the **Montana Folk School** engaging your old-timey interests at the Native Plant Garden at Fort Missoula. Our forte here at MNHC is observation and joy, but boy howdy there are a lot of traditional hands-on skills to learn outside. Take a free workshop to make a charcoal bowl, spend a weekend making all natural baskets and dyes—we support all activities that get you out in nature. Visit MontanaNaturalist.org/garden for all our Fort Missoula offerings.

In April MNHC is hosting the annual conference of the **National Association of Interpretation** Heartland Region. It's kind of a big deal! More than 100 interpreters will be congregating in our own Missoula to learn from Montana educators and each other. Thank you, Destination Missoula, for supporting this conference with a grant. MNHC staff and local partners are working hard to make this a success.

University of Montana museums! Paleo! Botany! Zoology! Oh my! I dream of all the future undergrads interning at MNHC. We feed on their youthful optimism! We have the space and the public programming; UM has the specialty scientists and deep collections to showcase. Kallie Moore, the Fossil Librarian from the Paleo Museum, graced us with a fun Valentine's Day lecture, and there is so much to look forward to. In summer, the UM Herbarium (plant museum) will be hosting an exhibit in our Naturalist Field Station, thanks to curator Giovanna Bishop. We hope you'll come see!

Our MNHC community of staff, volunteers, teachers, and supporters share so much talent and enthusiasm. It is my honor to work with all of you. When our efforts intertwine like vines (maybe like the vines of white clematis trailing through a rocky scree slope in summer), our partnerships grow stronger and more resilient. Let's bloom where this journey takes us.

Marilyn Marler

Marilyn Marler
Executive Director

STORIES ON THE LANDSCAPE

Join Us at the 2025 NAI Heartland Region Workshop!

April 23rd–26th, 2025

The Montana Natural History Center is proud to be hosting the National Association for Interpretation's (NAI) 2025 Heartland Regional Workshop here in Missoula this spring! NAI is a nonprofit professional organization dedicated to advancing the profession of heritage and natural resource interpretation, and currently serves about 7,000 members in the United States and Canada, and over thirty other nations. Each year the region hosts a regional workshop. Members come from all over the region to learn new skills in interpretation, discuss trends in the field, network with professionals, share successes, and collaborate with partners.

The theme for the 2025 Heartland Regional Workshop is *Stories on the Landscape.* Learning the stories of our region can provide the foundation for understanding our landscape, its plant and animal communities, and our place within it.

We invite interpreters, educators, and all those who provide opportunities to inspire people to attend and/or participate in this exciting event. Visit naiheartlandregion.weebly.com/2025-montana.html to learn more and register.

Partners & Public Lands

The Missoula Field Office, Bureau of Land Management is excited to announce the "Partners & Public Lands" seminar series! Hosted by the Montana Natural History Center, staff from BLM are teaming up with their partners to share some of our common treatment activities and deep dive into the "why" behind these land restoration actions. In this four-part series, learn about forest management, riparian treatments, recreation management, and BLM's new co-stewardship partnership with the Confederated Salish and Kootenai tribes.

Upcoming programs:

April 16 – Recreation Resiliency – Exploring a Community-Driven Approach to Recreation Stewardship; featuring Blackfoot Challenge

May 21 – Tribal Reconnections – Sharing BLM & CSKT's Tribal Co-stewardship Partnership and what this means for land management; featuring partners from the Confederated Salish and Kootenai Tribe

Save the Date for MNHC's Spring Luncheon on May 14th benefitting camp scholarships!

We're excited to host this year's event in the lovely Governor's Ballroom in the Florence Building in downtown Missoula. Tickets will go on sale April 1st. Join our email list or follow us on Facebook or Instagram for updates and to learn more.

MNHC PHOTO

A Heartfelt Thank You to the Louis L. Borick Foundation

The Montana Natural History Center extends our deepest gratitude to the Louis L. Borick Foundation for their continued generosity and commitment to our mission. This year, they have increased their support to $75,000, with $25,000 dedicated to general operating funds and $50,000 supporting our Visiting Naturalist in the Schools program. Their investment helps us inspire the next generation of nature enthusiasts and scientists, bringing hands-on science education to classrooms across Montana. Thank you for making a lasting impact!

THE LOUIS L. BORICK FOUNDATION

ELEVATION SCIENCE

Nature Writing Workshop in the Beartooths

The Montana Natural History Center is partnering with the Elevation Science Institute and Turnstone Nature Education on an amazing new program!

Join MNHC's Allison De Jong and naturalist Drew Lefebvre in the foothills of the Beartooth Mountains to enhance your observation skills, stimulate your creativity, and learn to document your natural world encounters in the Beartooth Nature Writing Workshop.

Each day is thoughtfully designed to provide the environment and resources needed to deepen your writing practice. Together, we'll respond to writing prompts, read and discuss nature writing, and engage in supportive workshopping. And don't worry—there will be ample unstructured solo time to simply write and/or revel in the natural beauty surrounding us. By the end of the weekend, you'll feel refreshed, inspired, and brimming with new ideas.

Dates: August 6-9, 2025

Cost: $855 for full room and board, $655 for those local to Red Lodge/staying offsite

Learn more and register at elevationscience.org/beartooth-nature-writing-retreat.

MNHC PHOTO

Welcome, Jennifer!

PHOTOS COURTESY OF JENNIFER AND KEVIN

We are thrilled to introduce you to **Jennifer Grigg**, our new Front Desk Administrator! You'll see her friendly face whenever you stop by MNHC. Raised in the Midwest, Jen has lived in Missoula for nearly three decades. She attended the University of Minnesota, earning a B.A. in English Literature, then promptly headed West to explore as many new places as possible. Since settling in Missoula, Jen has spent as much time as possible becoming familiar with the trails in and around Missoula. Over the past decade or so she has worked getting folks geared up for outdoor adventures, as well as sharing her own outdoor experiences. In her free time, you will find her hiking with her husband and two dogs, tending to her flower beds at home, volunteering with Run Wild Missoula and the Missoula Marathon, and travelling to new places around the globe.

Welcome, Kevin!

Kevin Niehaus joined our Teaching Naturalist team last fall. Originally from southern Indiana, Kevin grew up exploring the forested hills and muddy river bottoms along the Ohio River. Obsessed with wildlife, evolution, paleontology, and sharing the curiosities of the natural world with anyone who would listen, Kevin has always sought out every outlet to learn and teach others about finding new ways to see and experience the landscape. He came out West in 2014, exploring the coasts of western Oregon before spending four years working for Canyonlands Field Institute in Moab, Utah. Kevin moved to Missoula in 2020 to complete a B.S. in Wildlife Biology from the University of Montana. While at UM, Kevin volunteered on various large-scale research projects and worked for Ecology Project International's Yellowstone Program. In his free time, Kevin loves straddling the line between nerd and naturalist, playing fantasy tabletop games with friends, creating ceramic sculptures, soaking in natural spaces, and rafting rivers. He is excited for the opportunity to build community through MNHC and help more students connect to this beautiful region we call home.

MNHC PHOTO

Conservation in the Classroom: Fostering Youth Engagement in Conservation and Stewardship in the Bitterroot Valley

In the heart of the Bitterroot Valley, a groundbreaking initiative is transforming the way students engage with conservation education. Conservation in the Classroom (CitC), a collaborative effort between the Montana Natural History Center, Teller Wildlife Refuge, and the Bitterroot Water Partnership, brings a unified, science-based conservation curriculum to K-12 students. By integrating local, place-based water, wildlife, land, and natural resource topics into classroom learning, CitC aims to cultivate a lifelong commitment to stewardship and environmental responsibility.

One of the most exciting developments is the creation of a K-8th grade conservation curriculum, set to launch in fall 2025. Each grade-level curriculum includes three structured lessons: a pre-lesson introducing foundational knowledge, a field experience for hands-on outdoor learning, and a post-lesson for reflection and reinforcement. These lessons are designed to be flexible, allowing teachers to integrate expert-led programs and outdoor activities seamlessly. The best part? They are free to use! Just check out conservationintheclassroom.org.

CONSERVATION IN THE CLASSROOM (CITC)

Congratulations to MNHC's Jennifer Robinson!

Our very own Jennifer Robinson has won the Distinguished Interpretive Manager Award for the National Association for Interpretation's Heartland Region! Jennifer is a rock-star human, a compassionate leader, and a caring and creative educator. Her passion for leadership, interpretation, and education is second to none, and she is eminently deserving of this award. We are so grateful to have her at MNHC!

What fun it was to celebrate together last October at our Annual Banquet and Auction!

It felt so good and festive to be back at the UM Ballroom, and it was wonderful to see so many of you for another grand evening of revelry, community, and celebration. Thank you for your generous support! 320 members of our community helped us raise more than $207,000 (our best year ever!) to support us in inspiring curiosity, passion, and stewardship of the natural world. And, of course, we couldn't have done it without the following businesses and individuals whose generosity and hard work made this event possible. (Please accept our apologies for any missed names.) ***Thank you!***

AUCTION CONTRIBUTORS:

Allez!
Acorn Naturalists
Amy Shawley Paquette
Anonymous
Atelier Nail Spa
Bake Sale Cookies Etc.
Bedrock Sandals
Ben Burda
Bernice's Bakery
Betty's Divine
Big Dipper
Big Sky Brewing Co.
Big Sky Documentary Film Festival
Bill Gabriel Estate
Birdie Thatcher Charming Interiors
Bitterroot Flower Shop
Black Coffee Roasting Co.
Blue Heron Nature Tours
Book Exchange
Boone & Crockett Club
BZook Ceramics
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Montana Folk School
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Rich Adams Fine Art
Rick Oncken & Courtney Schulz White
Rocky Mountain Elk Foundation
Rocky Mountain Eye Center
Roxy Theater
Runner's Edge
Run Wild Missoula
The Sapphire Gallery
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Smoke Elser
Soup Farm
spectrUM Discovery Area
Spruce Missoula
Susan Fletcher
The Sweet Palace
Sweetwater Travel Company
The Trailhead
The Vespiary
Wendy Ninteman
Western Cider Co.
Winding Pine Pottery / Kara Shapiro
Xplorer Maps
Yellowstone Dog Sled Adventures
Yellowstone Wildlife Profiles

And a Montana-sized THANK YOU to our auction committee—we couldn't have done this without you:
Ashley Parks (auction chair extraordinaire)
Rhonda Callison
Hank Fischer
Laura Henning
Graham Roy
Nancy Seiler

And special thanks to designer Eileen Chontos; Mignon Hess of Stitches Embroidery and Screenprint; Stephanie Lambert of 44 Rental and Design; Aaron and Samuel Conway for creating the creature cutouts; and Mandela van Eeden and Mark Heyka for donating their time and talent to help make this evening special.

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Save the Date for MNHC's Fall Banquet & Auction!

Friday, October 24, 5:00-9:00 p.m at the University Center Ballroom

Join us at our largest fundraiser and celebration of the year! All funds raised go directly to supporting our work of connecting people of all ages with the natural world.

Many thanks to all of our donors and sponsors who make this fundraiser possible. Interested in sponsoring our auction or donating an item? Please contact Beth Conway at bconway@MontanaNaturalist.org.

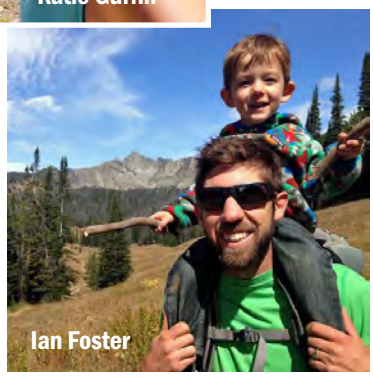
MNHC PHOTO

Thank you Peggy, Ian, and Katie

In 2024 we said goodbye to three wonderful board members who have been deeply dedicated to MNHC and have done so much for our organization over the years: Peggy Christian, Ian Foster, and Katie Guffin. We so appreciate their commitment and energy and passion for MNHC: all their shoes will be hard to fill. *Thank you for your service and generosity and friendship to MNHC!*

Peggy Christian

Katie Guffin



Ian Foster

IN MEMORIAM

In February, we were saddened to hear that long-time MNHC volunteer and supporter **Rod Snyder** passed away. Rod volunteered with our Visiting Naturalist in the Schools Program for many years, teaching hundreds of children to appreciate the natural world. He was an amazing educator, an infinitely kind person, and a good friend, and we will miss him dearly.

Amy Martin and *Threshold:*
From Montana to the World…and Back

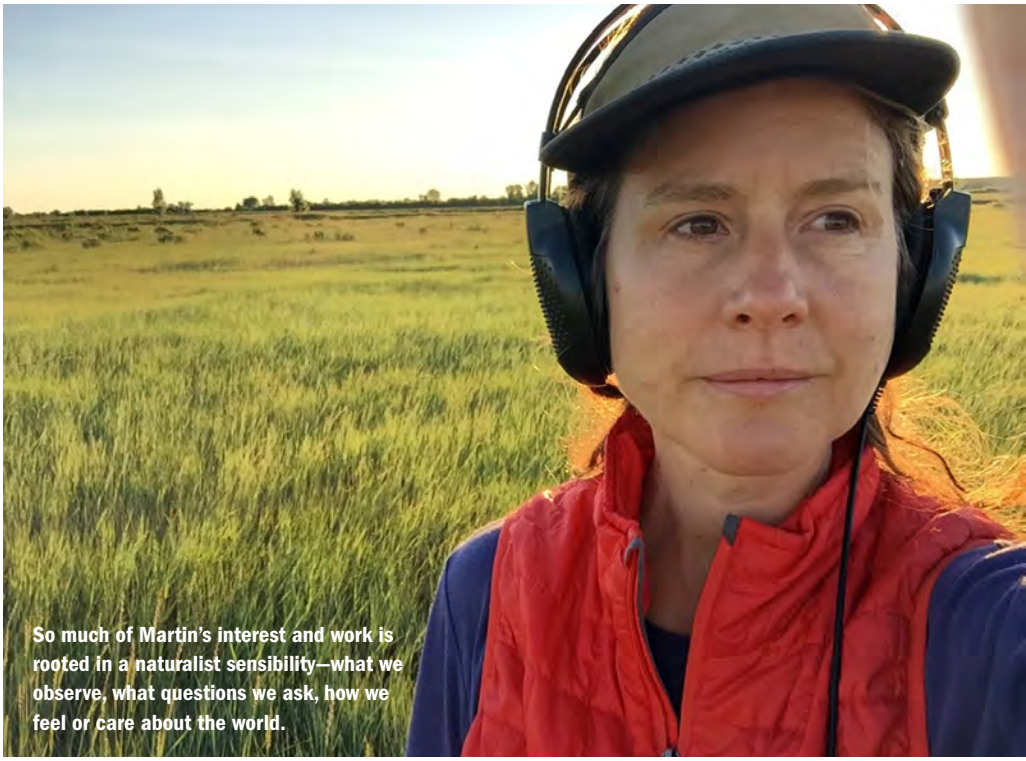
BY CAROLINE KURTZ

Many folks around Missoula and throughout Western Montana will remember musician Amy Martin. She arrived in town in 1999, drawn to the area's natural beauty and to the vitality and creativity of the human community. She plunged headlong into being a singer/songwriter, performer, leader of children's choirs, and the impetus behind numerous community music projects for all ages. She told stories about life and the world—particularly the natural world—through lyrics, and sought to connect people through the actions of singing and making music together, regardless of experience or ability. And she was beloved for all of it.

Nowadays, her voice and stories are eagerly anticipated—and heard globally—via her Peabody Award-winning podcast brainchild *Threshold*. Her focus today is nothing less than the exploration of humanity's complicated and inextricable relationships with the non-human world. Through interviews and explanation, observations and rich soundscapes, she illuminates the myriad threads of these relationships and leads us to consider why we should care.

"Music is where it all started," she says. "Sound has always had a huge impact on me," including the natural sounds that can be found outside in one's own place. Through helping people make music she found she was particularly drawn to the affinity young people had for the natural world. "I wanted to help kids connect with their inherent love of being outside. I loved that work…. I started to think, Oh, you know what the world needs? The world needs a podcast that features kids' voices [and focuses on] their connections with nature."

Amy worked on that idea for a time, but eventually, she says, "I realized this wasn't quite the show [I was thinking of], this was a season of a *different* show…a show that is really trying to think deeply about environmental issues." So she set her recording with kids aside and turned her attention toward building this other show. "I remember thinking pretty quickly [that it] should be called '*Threshold*,' because I loved the idea of both standing on the cusp of something…and the ambivalence and uncertainty of that, and the idea of hitting a threshold, like a climate threshold," she says. "I just got really interested in making this other show and that's what I've been doing ever since."



So much of Martin's interest and work is rooted in a naturalist sensibility—what we observe, what questions we ask, how we feel or care about the world.

AMY MARTIN

Being a person of near-boundless curiosity, and living and spending lots of time on public lands around the state, she continues to increase her understanding and appreciation for Montana ecology and ecosystems, as well as its human history and the impact settler expansion had and has on the Native people who lived and still live here. Interconnections between natural history, human history, science, politics, and culture, regardless of the specific topic, are threaded throughout every season and episode of *Threshold*.

Amy now splits her time pretty evenly between homes in Missoula and Umeå, Sweden, which she shares with her partner Ulf, who she met during a reporting trip several years ago. Though Sweden and the U.S. are quite different in some ways, Umeå and Missoula are "amazingly similar." They are both smallish cities located in rural areas, both are defined by rivers crossed by many bridges, and both are university towns. "I never intended to move to a different country, but I find I now have these deep connections in two different places, two different versions of the local-global." The dual perspective helps her look at environmental issues from a broader context. "I'm constantly reminded

"Hark," Season 5, began airing last November. After a short hiatus, it begins again in March. You can listen to all seasons of *Threshold* and more on the website at thresholdpodcast.org, or find it wherever you stream podcasts. Through a long-standing partnership with Montana Public Radio, "Hark" also began airing there on January 26th–listen in on Sundays at 4:00 p.m.!

JED ALLEN

Amy records a soundscape during a reporting trip to Kenya for Season 5 of *Threshold*

that there is always more than one way to do things, to manage your forests, to get elected, to heat your home."

Now in its fifth season, *Threshold* podcast is the current flowering of Amy's desire to write, create, and engage people with ideas and questions at all scales—from the hyper local to the global. Each season takes fully a year to 18 months to develop and involves much reading, thinking, writing, interviewing, more research, more interviewing, more writing, and recording. "Oh Give Me A Home," the title of the first season, was entirely conceived, recorded, and produced in Montana, and explores the perennial debate about bison and whether they can ever be free-roaming again.

AMY MARTIN

A bison herd in the Fort Peck Indian Reservation.

"I wanted to begin with something I was close to, and had been gaining understanding of," she says. She brings listeners with her on a tension-filled bison hunt outside of Yellowstone National Park, to listen to pithy and poignant observations of a rancher in the Paradise Valley as she goes about her daily chores, to hear the anger and pride of Indigenous people whose connections to the buffalo are deepest. Through the personalities and voices of local people on the front lines she unveils beauty, tragedy, complexity, and hopefulness in the ongoing story of America's national mammal.

Subsequent *Threshold* seasons have taken Amy much farther afield: to all eight countries that touch the Arctic Circle to talk about issues that affect the human and non-human inhabitants of those places; to the National Arctic Wildlife Refuge and specific threats facing life there, for which she won a Peabody Award for Environmental Reporting; and to the topic of climate change directly, starting with an immersive visit to COPP 26 in Glasgow, Scotland, and continuing with explorations of the origins of the Industrial Revolution in England; the rise and fall of Gary, Indiana; making green steel in Sweden; the dual face of rising sea levels in Lagos, Nigeria, among many other stories. In every story, she's careful to consider who are the people or beings that are *not* being asked questions or invited to the conversation. "It's not just humans, what about the non-human elements? What is their part of the story?"

In Season 5—"Hark —she takes a step back and considers a much more pervasive and fundamental phenomenon: that of listening and the evolutionary importance of sound. She doesn't like to say too much about upcoming episodes or possible future seasons. But listeners can be assured that later "Hark" episodes will feature some more Montana voices and research.

There's never any shortage of fodder for new seasons of *Threshold*, she says, "but something has to hook me at a deep enough level to spend up to a year and a half researching, reading, thinking, talking to people about it, looking for those big connections.

"I want to tell stories—not ones no one has ever told because those don't exist—but ones that maybe reveal some deeper or new layers….[ones] that don't fall easily into the evening news. I want to talk about things that play out on longer timescales."

Ultimately, Amy says, *Threshold* always has to be moving in and out, back and forth in scale, from local to global. "I don't want to only be thinking and working at the largest level, that's too abstract. The challenge of telling stories and reporting from that connective tissue between what's happening in our backyards and what's happening elsewhere on the planet is just really interesting."

—Caroline Kurtz proudly and happily serves on the boards of both Threshold *and the Montana Natural History Center.*

RARITIES HIDING IN OUR REMAINING

SCENIC PHOTOS BY JESS WALTER

Riparian corridors like those surrounding McCauley Butte are essential wildlife habitat and rich in species diversity. The ever-present challenge is finding ways to balance the needs of wildlife with human activity.

We begin slowly, perched on an old roadcut up the McCauley Butte, known as *Smlk^{w}sšná* to the Bitterroot Salish, on the southern edge of Missoula. Through spotting scopes we scan two large open-water ponds, formerly gravel quarries, below us. I've seen loons paddling these waters in the springtime, but today it's Common Goldeneye and American Wigeon. The Bitterroot River glides just beyond, juxtaposed with the man-made still water. Inquisitive chatter fills the air. "How long has this been here?" "Will it be open to the public?" "People walk their dogs here ALL the time."

Fifteen of us have gathered for an annual Spring Migration Watch, and every bird we'll see today is tied to the unique conservation value of this four-mile mosaic of grassland and pine forest, cottonwoods, abandoned oxbows, and riparian habitats. This is a special area. Uniquely undisturbed by parks, trails, or any other real development. It is the most species-rich site for birds in Missoula County, by far.

As interest wanes on the butte, we head downhill to explore the cottonwood forests that flank the river. Stands of deciduous trees are interrupted by the swales and sloughs of past river meanders. Here we must be quiet. Up on the butte, our lively chatter was no cause for alarm to wildlife residents. Down here, a different strategy is needed.

Hush. In these guarded habitats, quiet creatures comfortably act out their seasonal lives. Secretive Wood Ducks might be right around the corner. **Look carefully.** Before the cottonwoods unfurl their leaves, we can see the Red-tailed Hawk hatchlings, barely

PHOTO BY RT COX

Sandhill Cranes build their nests from available vegetation, arranging it in a mound with a cup-shaped hollow in the middle. The female lays one to three eggs, but generally only one colt survives to fledging.

RIVER CORRIDORS

BY LILY HAINES

downy, draped across the edge of their sky nursery, and warming in the spring sunshine.

Then, from my left, a whisper. "There's a Sandhill Crane on a nest." Disbelieving, I glance toward the whisper's source and confirm the thrill of discovery shining in my fellow birder's eye.

With its full body flattened across its nest, stretched out long and low, this crane is so camouflaged, so still, it takes me a full minute to find her. My surprise grows. She is also *so* close. Quickly and quietly, we move well away, reconvening in wonder at a more respectful distance.

A relatively small number of the Sandhills we see in Montana breed in-state. They'll nest in quiet wetlands with shallow water and dense vegetation, hiding their nests in secluded spots, even atop small self-made islands. Isolation offers protection. The young cranes, called colts, will walk and swim within hours of hatching, but will need several months to become strong flyers, able to avoid the perils of ground-bound life. For now, these uninterrupted habitats along the river provide just the right conditions to ensure their success.

Conservation-minded landowners and easements, active floodplains, and public closures protect the wildlife here. But there is no guarantee for this crane family.

Ambitious development plans capitalizing on this prime riverfront location pop up every few years. The number of people recreating here increases each spring. Back on the bluff, I watch an enthusiastic pup run from its owner through the spotting scopes. Will it stray and discover a flightless colt? I think about the crane family throughout the summer, often with almost desperate uncertainty. Will the rare and secretive treasure of a crane's nest eventually disappear from our valley? How close could we get before we simply become too close?

> Will the rare and secretive treasure of a crane's nest eventually disappear from our valley?

Soon, our community will begin to chart the future management of 84 acres of this corridor, just next door to the crane family's private island. What would it take for a growing mountain town, full of anglers and Labradors, to value this stretch of river as a rarity, as well as an amenity?

Management for wildlife habitat and recreation can be a tricky balance.

For our crew of curious birders, ages six to sixty, the shared amazement of this uncommon discovery confirms a commitment to protect each precious piece of wild river corridor we have left.

—Lily Haines manages community education initiatives for the Clark Fork Coalition, an organization dedicated to protecting and restoring the Clark Fork Basin, based in Missoula, MT. She is a proud daughter of Montana, with strong ties to the ridgetops and river rocks of the Flathead Reservation, home to the Bitterroot Salish, Kootenai, and Upper Pend d'Oreille people.

Nicole Emlen is a graduating senior studying biology at the University of Montana. A native Montanan, she sees beauty and diversity in every life form—from grizzly bears to wood frogs, crane flies, and glacier lilies. For her, science and biology are intertwined with art and self-expression. Photography helps Nicole capture some of the beauty that exists in the world and share what she sees with others. See more on her website: sites.google.com/view/nicoleemlenphotography/home.

Come see Nicole's photography at MNHC!
Her show "Lives and Lessons of Zoo Animals," part of her senior capstone project inspired by a summer internship with ZooMontana in Billings, will be on display from March 24th-April 4th. Join us for her First Friday Art Show on April 4th from 5:00-7:00 p.m.

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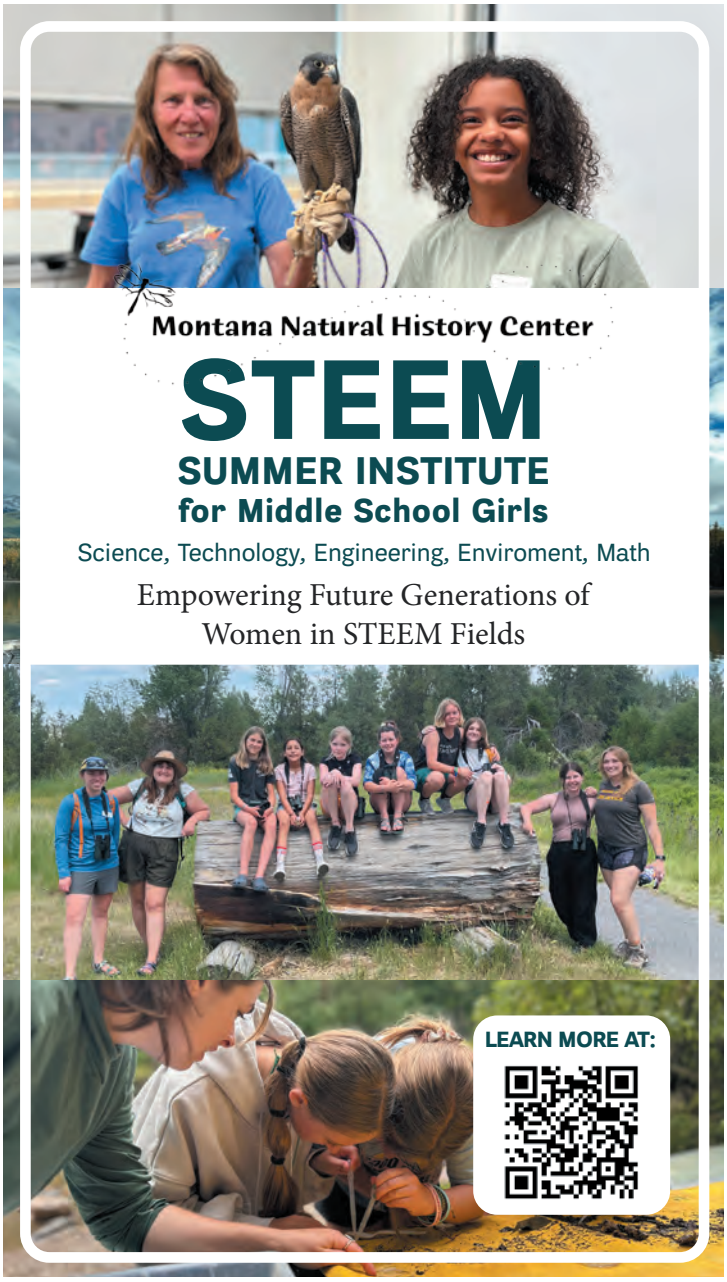

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