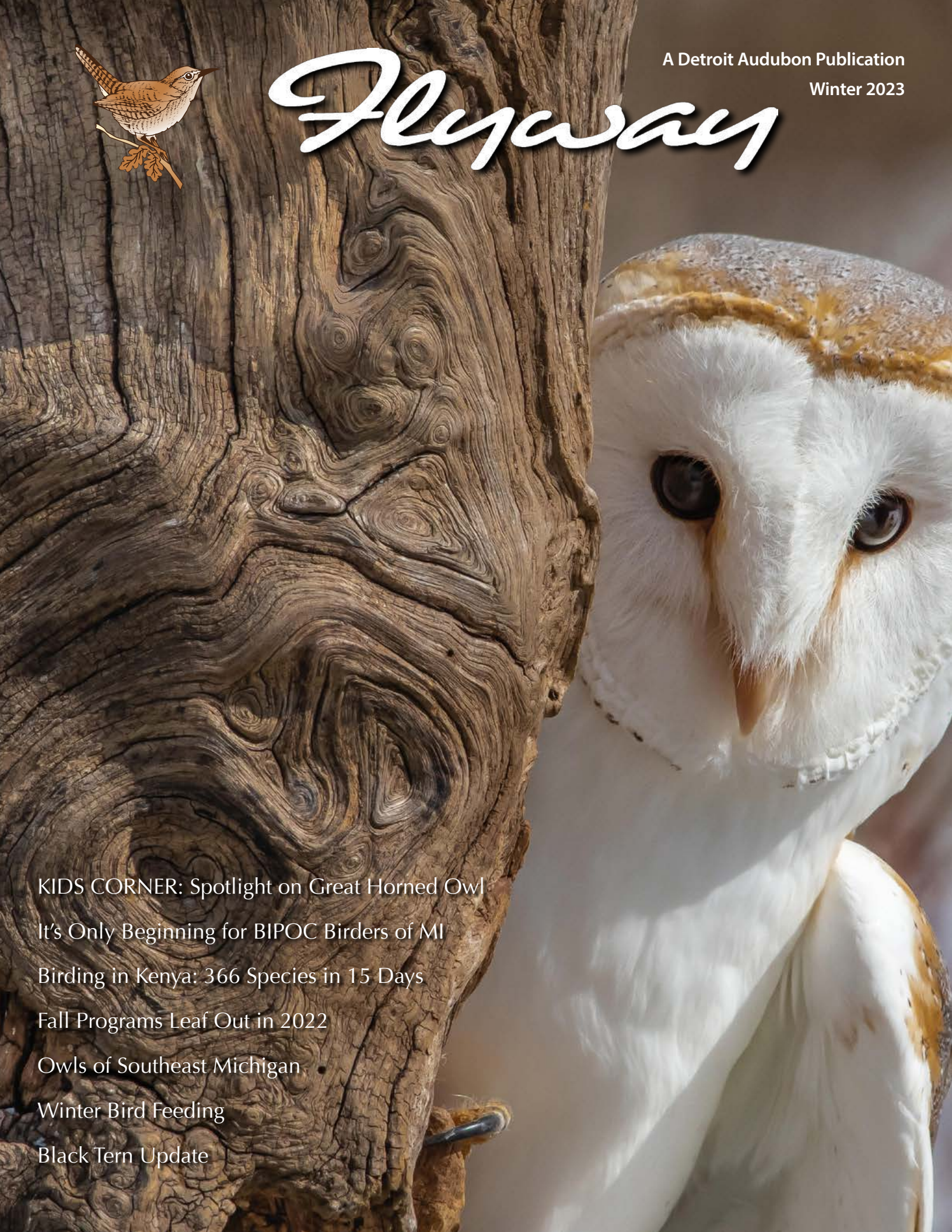

Flyway

A Detroit Audubon Publication
Winter 2023

KIDS CORNER: Spotlight on Great Horned Owl

It's Only Beginning for BIPOC Birders of MI

Birding in Kenya: 366 Species in 15 Days

Fall Programs Leaf Out in 2022

Owls of Southeast Michigan

Winter Bird Feeding

Black Tern Update

Flyway

A publication of Detroit Audubon

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Staff are often in the field, so there may be communication delays, but your calls and emails will be returned as soon as possible.

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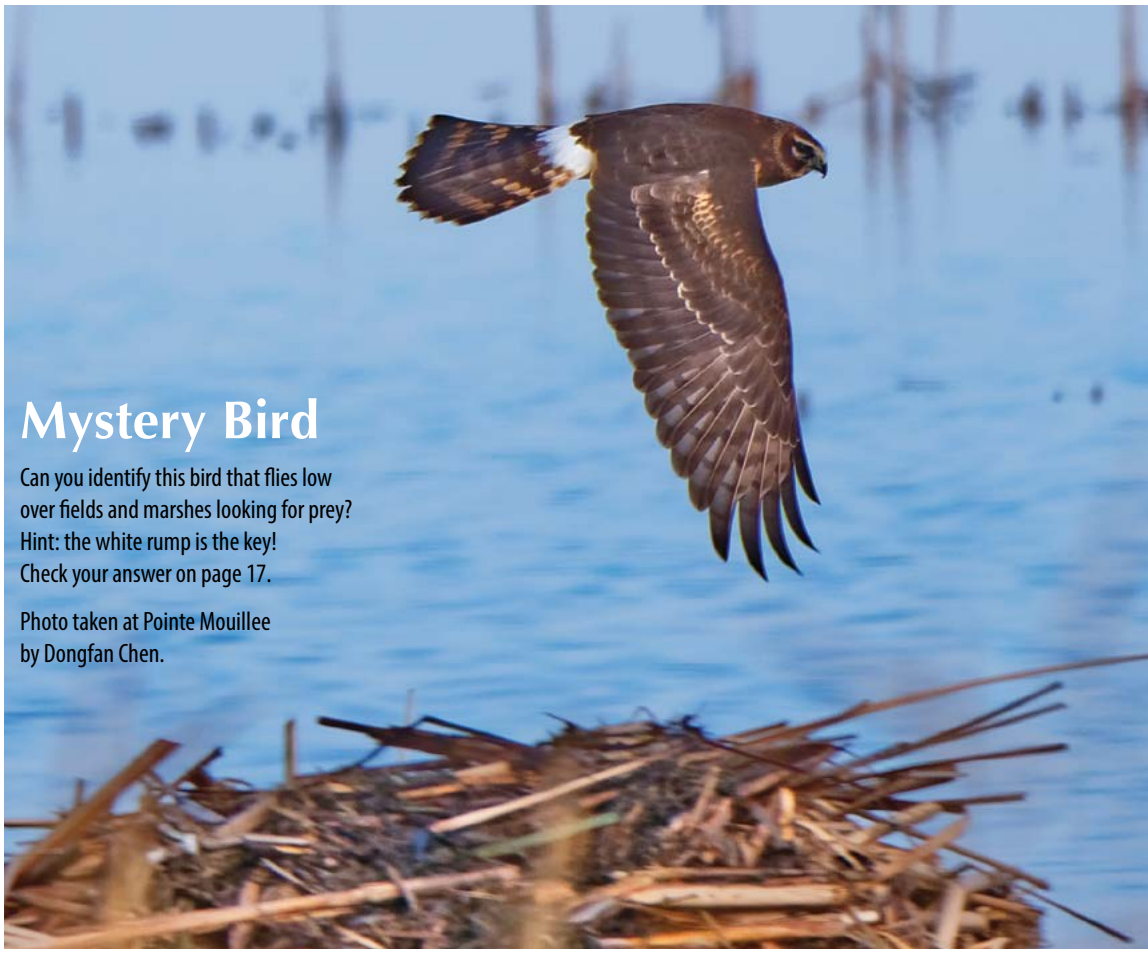
Flyway is published four times a year for Detroit Audubon members with at least basic membership status. Back issues are uploaded to our website.

The mission of Detroit Audubon is to foster the appreciation and conservation of birds and the environment we share. Our three mission areas are: Education, Research, and Action.



Mystery Bird

Can you identify this bird that flies low over fields and marshes looking for prey? Hint: the white rump is the key!
Check your answer on page 17.

Photo taken at Pointe Mouillee by Dongfan Chen.

Contents

ON THE COVER: Barn Owl. Photo by Tracy Wyman.

ERRATA.
Fall 2022 issue page 9: The photo labeled Swamp Sparrow is really a Marsh Wren. We regret the misidentification.
Fall 2022 issue page 17: While April Campbell was the leader of the field trip, she is not depicted in the photo at top of page.

A Message from the Executive Director

Warm Winter Greetings!

"There is no such thing as bad weather, only unsuitable clothing" (Wainwright). Or so the saying goes. In Michigan we'd spend a lot of time indoors if we didn't have the right clothing. Adopting this positive point of view has helped me not only embrace my least favorite season, but also become a better birder. Michigan's barren and sometimes white winter landscape is a great place for beginner birders to build confidence in their identification skills. And I think bird enthusiasts of all experience levels can agree that a Dark-eyed Junco hopping about on the freshly fallen snow, or a male Northern Cardinal perched on an ice-covered tree branch, brings moments of joy to an often bleak time of year.

For myself and staff at Detroit Audubon it is also a busy time of year. While hosting Christmas Bird Counts and Winter Waterfowl Counts we are also busy planning a year full of field trips, programs, and webinars led by our talented volunteers, staff, and partner organizations. We are wrapping up reports on the research we conduct with the largest Black Tern colony in Michigan, planning our fundraising strategy, moving forward the continued expansion of our Detroit Bird City project, looking for ways to expand our Safe Passage efforts, and more.

While there is always work to be done on behalf of birds, whether it is from the warmth of our office or with the cold winter wind on our faces, we especially enjoy hitting the frozen and snow-covered birding trails with you.

Sincerely,

Gretchen Abrams

A Belted Kingfisher catches dinner. Photo by Evan Deutsch.

Red-headed Woodpecker at Kensington Metropark. Photo by April Campbell.

Upcoming Winter Programs

People of all ages, genders, ethnicities, experience levels, and walks of life love to go birding. With that in mind, we have a wide range of events we are planning for 2023. Go to www.detroitaudubon.org/birding/field-trips/ to see our comprehensive list of upcoming programs, to learn more, and to sign up!

Welcome to Birding

Our "Beginner Birders" field trips are changing. Not only will the new name be "Welcome to Birding," but we will be moving to different parks throughout the year with Detroit Audubon's Field Trip Leader, Evan Deutsch.

Winter dates and locations:

Sat. Feb. 4 at Kensington Metropark with Jim Mahon

Sun. Mar. 5 at Humbug Marsh with Jazmyn Bernard (Detroit River International Wildlife Refuge)

Winter Waterfowl ID Walk on Grosse Ile

We have a new program in partnership with the Grosse Ile Nature and Land Conservancy scheduled for Saturday, January 14. We'll start with a presentation on winter waterfowl identification before going on a walk along the shores of Grosse Ile with Erin Parker to search for Canvasbacks, Redheads, Red-breasted Mergansers, Buffleheads, and more.

Detroit Audubon chapter members receive priority registration. Please email us at staff@detroitaudubon.org if you have questions regarding field trips or your membership status. In order for us to notify you about a field trip prior to a public announcement, make sure we have your email address.

Fall Programs Leaf Out in 2022

by Brittany Leick

Autumn is apple cider, carving pumpkins, soft sweaters, and cool evenings around a bonfire. It's the time of year when people bask in a fiery, colored canvas of leaves. And fall migration begins. Birders anticipate rare sightings of warblers and raptors as they fly through. By the end of fall, when all the leaves have gone, the weather teases us with a soft snow; the waterfowl come flying in to stay for the winter.

In fall 2022, we expanded our horizons and tried out new field trips. By the end of December, Detroit Audubon offered, partnered on, or attended a total of 139 events and programs and connected with over 6,300 people. Not only was this fall an opportunity for us to bring back programs like the Swift Night Out, but we also introduced a Birds, Bikes & Wine program in Traverse City with Grand Traverse Audubon Club and Grand Traverse Bike Tour Company, as well as our Birding Paddle program with Friends of the Rouge at Newburgh Lake.

Imagine standing at the Historic Winery in Farmington while thousands of Chimney Swifts swoop in a tornadolike formation as they dive into the chimney with the sun setting over the trees. Is there a better way to welcome autumn than to sit among friends while watching Chimney Swifts dance overhead? The first ever Birds, Bikes & Wine event was a huge success as more than 30 people enjoyed a beautiful day biking, birding, and sipping local wines along the Leelanau Trail. The Birding Paddle trip was equally exciting as we paddled along Newburgh Lake, stopping for bird sightings as we enjoyed the beautiful fall colors and their reflections along the lakeshore on a crisp autumn morning. Our annual Owl Prowl and Sandhill Crane field trips allowed us both a close-up encounter with a Screech Owl and over 1,000 cranes flying overhead, their calls echoing across the landscape. In addition to our regular local fall field trips we also added a few new ones this season that will become annual events: Kitty Todd Nature Preserve, Fall Color Walk at Rouge Park, and Astronomy Night at the Belle Isle Nature Center.

Offering a wide range of field trips is as vital to our mission as conservation and research. We hope you join us on one of the many field trips we have planned this winter. If you have an idea for a field trip, or know a great birding spot you'd like to share with fellow Detroit Audubon members, get in touch. We'd love to hear from you.

CLOCKWISE FROM TOP: Birds, Trees & Poetry Program. Photo by Kahn Santori.
Sandhill Cranes at Haenle Sanctuary. Photo by Brittany Leick.
Chimney Swifts swirl at the Historic Winery. Photo by Brittany Leick.
Birds, Bikes & Wine Tour along the Leelanau Trail. Photo by Brittany Leick.

KIDS CORNER: Spotlight on the Great Horned Owl

Article and photos by Sandee Vartanian Dusbiber

Hi, I am a Great Horned Owl. We get our name from the tufts of feathers on our head. They look like ears, but our ears are farther down on the sides of our head and are just openings in our skull hidden beneath feathers.

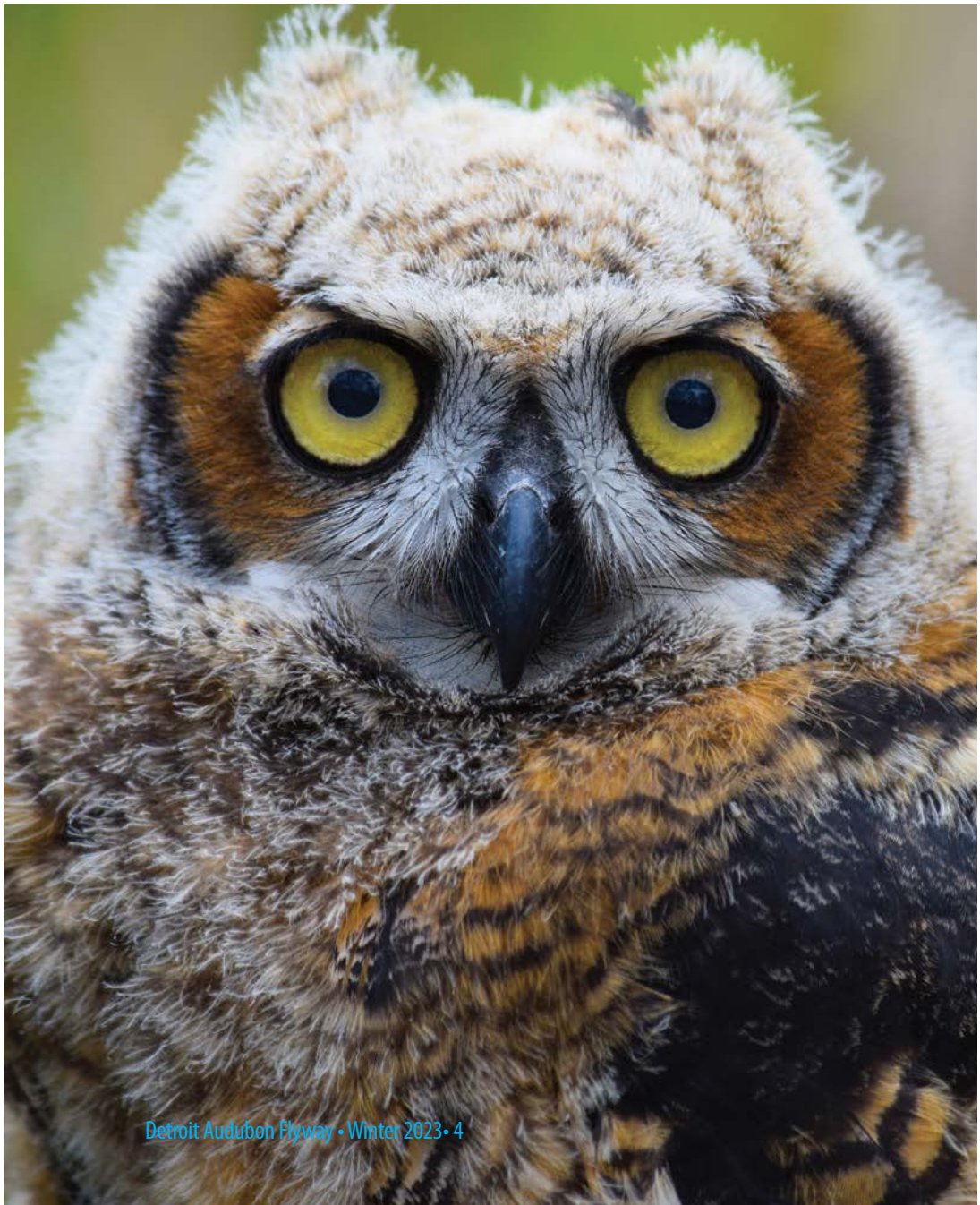
We are lucky to have large eyes, evident in my photos, because they help us see even in complete darkness. Even if there is no light at all we use our excellent hearing to hunt by sound. Did you know that we can hear a mouse walking from 75 feet away?

I am proud to say we are great hunters too. Most birds make a whooshing sound when they fly because they have stiff feathers, but not us owls. We have soft edges on our feathers that allow us to fly silently. We might even fly close to you without you noticing. We can sneak up on our prey because our fluffy feathers give us almost silent flight, and the prey cannot hear us approaching. When we do find our prey, we will dive and snatch it with our long sharp talons.

I know there are people that are very proud of their muscles; well, we are strong too and can carry animals several times heavier than ourselves... cool, huh? Like most owls we have an incredible digestive system. We swallow our prey whole and then regurgitate pellets packed with the bones, fur, and other unwanted parts of our meals.

We are nocturnal, and because of this we can be very difficult to spot. After sunset or just before dawn you might be able to hear us calling "hoo-h'HOO-hoo-hoo!" You can find us from the Arctic to South America. We nest in stumps, caves, tree holes, or even nests that are left behind by other large birds. Both parents incubate our eggs, but the father also hunts prey to feed the mother bird. You know we are very powerful birds, and we are very protective. Anyone that comes too close to our babies will see how angry we can be. Some people call us the Cat Owl or the Tiger Owl.

Maybe one day you will hear us; but to see us, you must remember to be very quiet—especially if you want to photograph us.



It's Only Beginning for BIPOC Birders of MI

by April Deborah Campbell

While driving to the inaugural BIPOC Birders of Michigan walk at Palmer Park this past June, I worried, "What if no one shows up?" My nascent group had been invited to participate in the Blacks, Browns and Birds event celebrating Black Birders Week.

I needn't have worried. Indeed, by 8am a line of a dozen strong Black and brown faces had formed for loaner binoculars. After a short tutorial on how to adjust the "bins," we set off down the trail. As if on cue, a male Ruby-throated Hummingbird, its crimson gorget glistening in the early morning light, alighted on a nearby plant.

It was my first time ever leading a birding walk. The ground rules for the walk were simple: Rule #1: Have fun! Ruler #2: There are no dumb questions. Rule #3: See rule #1. And, boy, did we have fun! Everyone hooted as we spotted a pair of nesting Baltimore Orioles. Great Crested Flycatchers entertained us with their calls. We identified the infamous "mammal bird," aka the chipmunk. Children giggled, adults laughed, and the questions flew! Is that a woodpecker? What does that bird eat? Where can I buy binoculars? All the birds delighted, no matter how common. The walk reaffirmed for me the joy of maintaining a "beginner's mind."

Later in the day, we sat in a circle and talked about our experiences in nature. A recurring theme was the importance of feeling "seen." When Black people talk about being seen, we are not just talking about physical representation. We are asking you to understand us as people with a history and culture integral to the founding and development of this nation. Without "Blackness" there is no United States. Seeing our Blackness is not optional. It is a necessity.

BIPOC Birders of Michigan was born of a desire to see more birders who looked like myself. As a child growing up on an old dairy farm in Connecticut, I had no conception of birding as a "hobby."

What I did know was that I was enthralled with the birds visiting our property, particularly the acrobatic Barn Swallows. I didn't need to venture far to see more wonderful creatures. Our home sat behind a state park. It was a wonderland of deer and possum, muskrats and ducks, frogs and snakes, dragonflies and spiders, sweet fox grapes and black walnut trees laden with green orbs. Disneyland paled beside my backyard!

My professional life took me around the country. In each state I resided, I joined the local Audubon: Maryland, New York, Georgia, Pennsylvania and finally, Michigan. In the course of thirty years, I encountered no other person of color attending an Audubon meeting or walk. Was I some weirdo? Didn't Black folks love birds, too?

The sad fact is Black and Indigenous peoples' contribution to environmental history has been erased from the history books or ignored altogether. As an example, Lewis and Clark would not have survived their great Corps of Discovery Expedition were it not for a teenaged Shoshone mother named Sacagawea and an enslaved Black man named York. Many have heard of Sacagawea, but York's name never made the history books.

Some individual Audubon members were kind and generous with their knowledge, but it soon became clear to me why there was an absence of diversity in their ranks – Audubon (chapters) liked it that way. Local chapters often functioned more like elitist country clubs than community organizations.

But there is good news! Across the nation, environmental institutions are at last coming to grips with systemic racism. Dismantling an inherently inequitable power structure and reaching out to marginalized communities will discomfort many, but it is a necessary prologue to positive change. I'm extremely grateful for Detroit Audubon's willingness to venture into these uneasy waters with BIPOC birders.

My hope is for BIPOC Birders of Michigan to be an organization that truly welcomes people as they are and where they are. Know a little about birds, or nothing at all, you're welcome. List or don't list, you're welcome. Gay, straight, nonbinary, transgender, bisexual, you're welcome. Physically challenged, or an elite athlete, you're welcome.

Black as coal or light as cream, you're welcome. New to this land, or been here since the Mayflower, you're welcome. You will never be shushed, chastised, or made to feel less on our walks. Together we will reclaim our right to take up space on the land of our ancestors. We are the people who fly, now and forever. I invite you to fly with us.

Detroit Audubon looks forward to partnering with BIPOC Birders of MI with a series of field trips in 2023 led by April and DA Program Coordinator, Brittany Leick. Check the events calendar at **www.detroitaudubon.org** for dates and locations. To learn more about BIPOC Birders of MI, check out their website at **https://bipocbirdersofmi.wordpress.com/**.

Above, April Campbell.

R: April Campbell at Blacks, Browns & Birds event in June 2022. Photo by Brittany Leick.

For This Double-Crested Cormorant, Angling Is Alimentary

Celebrating a tenacious survivor

by Jim Bull

Lacking oil glands, the wet feathers of the Double-crested Cormorant have 20 percent less buoyancy than oiled ones. This allows them to dive more easily than other fish-eating birds, and they can reach depths of up to 30 feet! Propelled by their large webbed feet, they are also fast swimmers. This species specializes in fish about six inches long. They feed mostly on invasive species like alewife and smelt, but they also prefer sticklebacks and yellow perch. Because their feathers get wet during their dives, cormorants can often be seen perched on log or a tree, wings outstretched to dry.

Cormorant on Belle Isle drying its wings. Photo by Evan Deutsch.

Named for the two tufts of feathers on its head, the Double-crested Cormorant has been visiting the Great Lakes ever since records were first kept, but it was at first considered an uncommon migrant. The first documented breeding of the species was in 1927, and they have been nesting on the ground or in trees in colonies ever since. Nests are reused and added to each year, with some ground nests reaching nearly three feet in height. In the 1950s and 60s breeders were almost extirpated in the state due to high levels of DDT, which caused their eggshells to be so thin that they broke when incubated.

They have come back dramatically from that time, with numbers estimated between tens of thousands to one million in this state. Other toxins, most notably PCBs (polychlorinated biphenyls), have caused other problems for Double-crested Cormorants. Ornithologist Jim Ludwig rescued a chick he named Cosmos (at left) that had such a severely bent and crossed beak that he had to hand feed it. He traveled around the state in the 1980s with Cosmos in tow giving talks and media interviews to showcase the problem of toxins in the Great Lakes.

Controversy swirls about the impact this species has on Great Lakes fisheries, and whole colonies have been wiped out in past official and unofficial control efforts. Because cormorants are protected by the Migratory Bird Treaty Act, a federal court order now prohibits controlling their population except in limited cases to protect endangered species or inland fish farms. Wildlife and fisheries managers who argue for lifting that court order insist they just want a reduced but healthy population of cormorants, while some "sportsmen" have urged wiping out the species entirely.

One of the best places to view Double-crested Cormorants is at the Detroit River International Wildlife Refuge Dingell Visitor Center, where they have about 40 tree nests. and where migrants roost by the thousands in a line of trees on a long point just north of and paralleling the fishing pier.

In sequence: Cormorant captures and swallows a fish at Lake Erie Metropark. Photos by Jim Bull.

Letter to National Audubon Society

Executive Director's Note:

The Board of Directors (BOD) and staff believe the work to conserve birds and the environment we share is not mutually exclusive from the work for equity and justice. Our goal is to have our organization and name reflect our core values, the mission, and the community we serve. While the work for Detroit Audubon to reflect the diverse, equitable, and inclusive organization we strive to be is ongoing, disassociation with the name of an enslaver and anti-abolitionist is a strong start. The BOD and I cosigned this letter sent to the leadership team at National Audubon to urge them to take the lead on this change—a change that is already on their agenda at the National BOD meeting in February. Please take a moment to read; we think you'll agree this is the right move for the best representation of our organization and the work we do for birds and people.

December 2022

National Audubon Society,

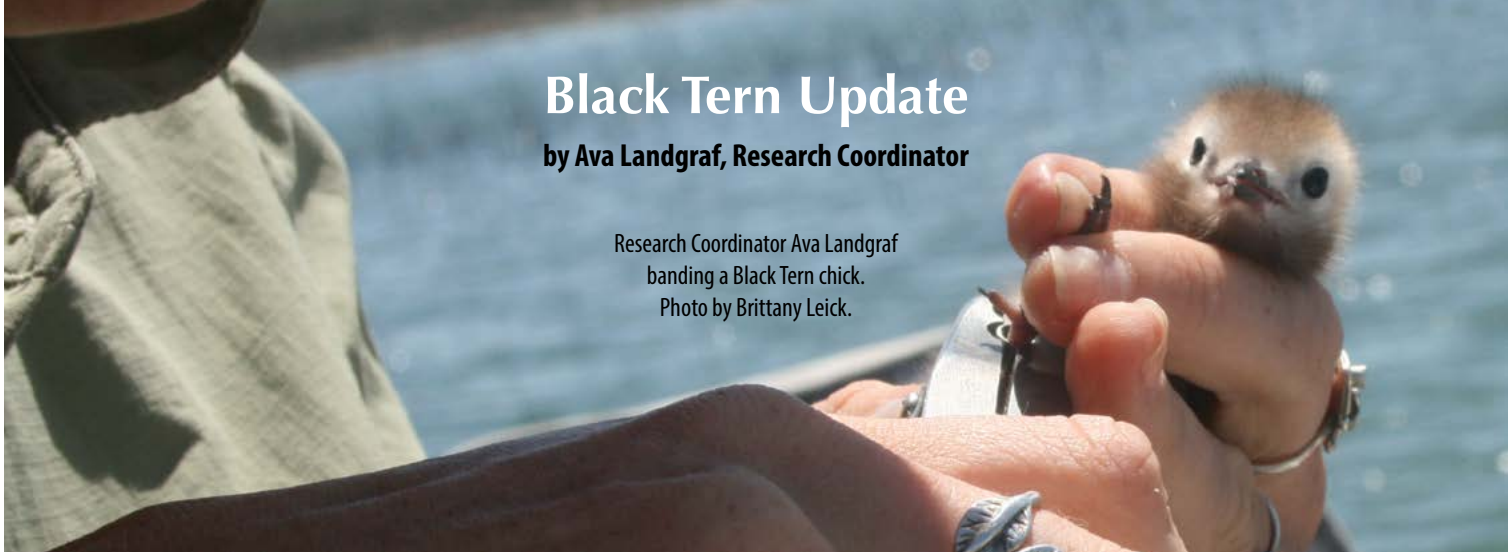
We are writing from Detroit Audubon, a large metropolitan chapter that includes a diverse membership of citizens concerned about the decline of bird species, the global loss of habitat, and the climate crisis. Like all members of Audubon across the US, we share a passion to protect the birds we have left and to share our love for all living things with others through volunteering, education, and spending time in wild places. These are the things that unite us, that bring us joy, and that keep us fighting to help those species that need us most. We are discouraged that despite these many positive causes that bring us together under one environmentally focused roof, our organization still carries the name of an enslaver, John James Audubon.

We don't need to tell you about Audubon's past. We applauded and were moved by the series of essays that National Audubon published beginning in 2020. The historian Gregory Nobles wrote that Audubon "dismissed the abolitionist movement" and owned enslaved people on and off for decades, selling them whenever he faced financial difficulties. In Drew Lanham's lovely piece, we read that "[Audubon's] soured, inhumane legacy carried forward will define the future course of the movement he inspired." We were inspired by reading these essays to question how we could still call our organization, one that many of us have spent years and decades of our lives supporting, after a man who very clearly did not recognize many of the people around him as fellow humans. We are called to cherish all species. We treat non-human species with respect and rail against humanity's insatiable quest for dominance over the natural world. To be within an organization named after a man who saw nothing wrong with one man's dominance over another man, who had little respect for many of the people who helped him on his journey, seems like a collective exercise in cognitive dissonance. It is unacceptable.

We can be better. We are better. What this organization has done over the decades for conservation should be celebrated. We are proud to be part of such a revered and prominent collection of concerned citizen scientists, educators, birders, and bird lovers. Let's change our name to reflect that. Let our name be one that lifts up the reverence we feel for the living world. Let our name not tell others that they are less than, but they are as much a part of this movement as anyone else. Let this organization shed its conflicted and complicated past and embrace that which makes us good; that anyone who shares a concern about birds and this beautiful world is welcome at our table.

Respectfully,

Detroit Audubon



Black Tern Update

by Ava Landgraf, Research Coordinator

Research Coordinator Ava Landgraf banding a Black Tern chick. Photo by Brittany Leick.

The summer of 2022 was the ninth year Detroit Audubon monitored the Black Terns at St. Clair Flats (SCF). In 2022, SCF again had low lake levels, and the Black Tern population seemed to continue to increase as we saw impressive numbers of chicks and fledglings. We estimated around 200 adult Black Terns nesting at the SCF colony in 2022. This is an increase from the estimated 150 adult Black Terns in 2021, but it is still a disappointing fraction of the roughly 600 terns estimated at SCF in 2013 by Detroit Audubon and partners.

Adult Black Tern with metal and color band. Photo by Ava Landgraf.

In 2022 our research priority returned to banding adult Black Terns. In 2020 and 2021, we focused on banding juveniles for the nanotag study, but since this study has concluded, we are back to adult capture. We only banded chicks that were easy to reach, usually in a nest at the edge of the mat, to avoid disturbing the mat and other nests nearby. We utilized both drop-in and walk-in traps for adult capture. Usually, we began with a drop-in trap and switched to a walk-in trap if a Black Tern was staying to the side of the trap rather than flying above and dipping down or sitting on top as many Black Terns do. One Black Tern seemed to completely figure out the drop-in trap because it entered and exited the trap four times before we gave up on capture and removed the trap from the nest.

The Detroit Zoological Society loaned nest cameras to Detroit Audubon to monitor selected nests more thoroughly and with less disturbance. We installed eight nest cameras with excellent results. Not only did all of the cameras function without any issues, but eight out of eight nests on camera successfully hatched. We recorded several nests with the chicks staying around the nest for many days and likely fledging. At one nest we recorded the chicks utilizing a platform that we placed within a foot of their nest. Early on the little chicks would move back and forth between the original nest and platform. After around a week the original nest fell apart and the larger chicks moved onto the platform. We are excited to capture this occurrence on camera and use it to inform further platform use to support Black Terns.

Detroit Audubon also partnered with Audubon Great Lakes for completion of their Restoration

Continued on page 9

June 12th: nest with a platform placed nearby. Tiny chick and adult using the platform. Photo from nestcam.

June 24th: the nest has fallen apart and all three chicks are using the platform. Photo from nestcam.

Black Tern Update continued

for Waterfowl and Marsh Birds project funded by the Michigan DNR Wildlife Habitat Grant Program. Detroit Audubon monitored for Black Terns within the east and west wetland units of St. Clair Flats State Wildlife Area. The east wetland unit underwent cattail management through cutting this past fall, and the west wetland unit serves as a control. In 2023, we are expecting more cutting and treatment of Phragmites (an aggressively invasive marsh plant) where cutting could not occur. We hope that Black Terns will begin to nest in the east unit after large sections of cattail monocultures and Phragmites are cleared, and the habitat is improved for our vulnerable secretive marsh birds like Black Terns. If the Black Terns do move into the managed area, this will show that cattail and Phragmites removal, and creation of floating mats of vegetation for nesting, can serve as a significant way to support Black Tern nesting success.

Black Tern nest using an old life jacket as a nesting platform—very creative!
Photo by Ava Landgraf.

Two Black Tern chicks to be weighed and banded, then returned to their nest.
Photo by Brittany Leick.

YELLOW BISHOP. These birds and the related Red Bishops were seen in grain fields as well as in the parks. Lake Baringo.
Photo by Christy Chow.

Birding in Kenya: 366 Species in 15 Days

by Beth and Scott Jorgensen

Kenya is a little more than twice the size of Michigan, yet its many ecosystems are the home of over 1,100 bird species. So, naturally, birding in Kenya is a spectacular experience as four Detroit Audubon members found out on our summer 2022 bird safari. We visited the savannahs and woodlands of Amboseli and Masai Mara national parks in the south; lakes Naivasha, Nakuru, Baringo, and Baraga in the Great Rift Valley; the dry central uplands of Samburu national game reserve; and Nairobi National Park, which is literally separated from the capital city by just a tall fence.

Each park provided opportunities to see birds endemic to that area. Some species are vibrant and colorful, some have gorgeous patterns on their feathers yet blend so well into the landscape they are hard to see, others have such long tails it looks like they are floating above the grasses. Big and small, they all play an important part in the ecosystems in which they live. During our 15-day tour of the country, we saw 366 different bird species, as well as 50 animal species. Every day was a new and wonderful adventure–like being in a National Geographic special!

The key to seeing 366 species of birds in 15 days was our expert Kenyan bird guide, Willy Tiren, who truly is a bird whisperer. He knew just where to look for elusive birds and knew every bird in every plumage. A little luck doesn't hurt, and we were fortunate enough to see a few rare species too. Our driver, Geoff Safaris, had a similar knowledge of big animals, so we saw everything from baby rhinos to mating lions.

These pages show a tiny handful of the colorful and, in some cases, fantastical birds we had the privilege to observe. Each of us has hundreds of photos and hours of stories about the trip, the Kenyan people, the wildlife both big and small, and, most of all, the birds. Birding in Kenya is an unforgettable adventure and well worth the time and investment.

HAMERKOP. A distinctively shaped bird that makes very large nests. This one appeared to be gathering items for the outside of its huge nest in a nearby tree. Lake Baringo.
Photo by Scott Jorgensen.

AFRICAN PARADISE FLYCATCHER. One of several bird species in Kenya with extreme tails. In another location we saw the white morph of this bird, resembling a ghost of the one at left. Lake Nakuru NP. Photo by Scott Jorgensen.

LITTLE BEE-EATERS. You might not expect it, but July is a cool month near the equator. At half a mile elevation these Bee-eaters are huddling for warmth on a cold morning in Samburu National Reserve. Photo by Christy Chow.

GREY CROWNED CRANE. One of the many birds we hoped to see from watching TV specials about Africa. Amboseli NP. Photo by Scott Jorgensen.

Owls of Southeast Michigan: Past and Present

by Rebecca Minardi At left, Snowy Owl. Photo by Bruce Szczechowski

Whether you're a birder or not, the sight of any owl is a special occasion. Many of us walk right by owls roosting in the day; unless they are moving or calling, they can be almost invisible. Even in flight they are silent, thanks to the serrated edges on their wings' flight feathers. But when found, a regal Great Horned Owl or a diminutive Northern Saw-whet Owl will stop us in our tracks. Though most owls are active mainly at night, some, such as the Barred Owl and the Short-eared Owl, can be seen moving in the day. Owls' big eyes face forward (better for hunting in low light) on their typically large round heads, which can rotate up to 270 degrees. Their facial discs, a concave group of feathers around their eyes, help to collect and direct sound waves toward their ears. They have sharp, hooked beaks, sometimes asymmetrical ears, shorter tails, and a reversible outer toe that can point forward and backward. There are two families of owls: *Tytonidae*, which includes Barn Owls, and *Strigidae* for all other typical owls. Owls tend to mate in late winter, which is a great time to hear their low-frequency hoots and toots for the smaller owls. Depending on the species, they tend to nest in cavities or abandoned nests from other birds of prey, and they hunt insects, small mammals, and birds whose indigestible parts can often be found within regurgitated pellets scattered on the ground under their roosts. Six of the seven owls featured here can be found in southeast Michigan either year-round or during winter. The seventh species, the Barn Owl, is at the very north of its range here so it is unlikely to be seen. They are discussed here as a relic of our past; a valuable part of Michigan's historic natural heritage and a very remote possibility for our future.

GREAT HORNED OWL This large owl's wingspan can reach over four feet. It is widespread across our hemisphere and common in southeast Michigan. They are nocturnal and thick-bodied, with two feather tufts on their heads. They can be found in a range of habitats, from forests and wetlands to fields and backyards. If an owl is perched on your suburban home's roof, there's a good chance it is this species. Their diet is diverse; they will dine on anything from mice to doves to skunks (they have little to no sense of smell) and can eat reptiles, insects, and fish. Great Horneds can even take other large birds of prey; their talons are very strong and need a force of 28 pounds to open them. They usually nest in large old nests they find and will readily defend them. Listen for their deep "hoo-h'HOO-hoo-hoo," which sounds especially lovely in mating pair duets. Photo by Tracy Wyman.

EASTERN SCREECH OWL This smaller owl (six to ten inches tall) is extremely difficult to spot in its cavity and perch roosts during the day. Though it needs at least some trees, this species can be found both in forests and in more urban areas with large and mature trees. Usually heard instead of seen, the screech owl makes a descending whinny or a bouncing trill call. The species can be either gray or rufous. This owl eats a diverse diet, including insects, reptiles, birds and small mammals, even bats. They nest in cavities created by other species and will readily use nest boxes; they don't technically build any nest, but the female lays her eggs on whatever happened to be in the cavity. Unfortunately, though screech-owls may dine on European Starlings, starlings may evict the owls from a nest site. The Eastern Screech Owl is often seen and heard on our Owl Prowls. Photo by Tracy Wyman.

BARRED OWL

A species near and dear to my heart (my spark bird!), the Barred Owl can be seen and heard in the day. Follow your ears to a group of mobbing birds in the forest, and you may spy this owl trying to take a nap. Their calls are the iconic "who cooks for you, who cooks for you all," and juvenile owls make an ascending hoarse whistle. Up to 20 inches tall, this modestly sized bird looks like a football in flight. With black eyes and mottled brown and cream feathers, the owl can sometimes be seen more easily than other species. They prefer forests with large trees, often near water, and typically nest in tree cavities up to 40 feet above the ground. Barred Owls can be quite aggressive toward other birds and species during nesting season. Their home range is quite small; over their lifespan they may only cover up to six miles. Their population could be on the decline with the loss of bottomland forests**.** Photo by Sharon Korte.

LONG-EARED OWL

This species can be confused with the larger and more common Great Horned Owl. Long-eared Owls have longer facial discs and ear tufts that are upright and close together. They roost, highly camouflaged, in the day and hunt mainly small mammals at night. Their habitat preferences are woodlands to shrublands and grasslands. In the winter, this species may roost together with as many as 20 owls, and during nesting season they usually appropriate other species' old stick nests. Their preferred habitat in Michigan for nesting tends to be forests near meadows. Long-eared Owls make steady, evenly spaced "whoo" sounds and also a variety of chucks, mews, beak snaps, and wing claps. Their population may be in decline, especially out west. They are known to winter here, with Lake Erie Metropark being one of the best places to find them. One year 11 overwintered there, but they are not seen every year. They have also been seen in recent years at Sterling State Park. Photo by Nicholas Hinnant.

NORTHERN SAW-WHET OWL

The one and only time I saw this species, I was shocked by its size. At a mere seven to eight inches tall, this puffball of an owl calmly gazed back at me from her evergreen roost (conveniently just above eye level, which is the norm). Though they are one of the most common owls in their range across northern North America, they are rarely seen. They hunt very small mammals, though they may branch out to birds if they migrate to the lower half of the United States, and make a merry "too-too-too" call like a toy whistle. Their size unfortunately makes them potential tasty snacks for larger birds of prey, including larger owls. They like mature forests with an open understory, but they can nest in a more diverse array of habitats. Their nests are in tree cavities abandoned by other species, and they will also use nest boxes. They nest in the northern Lower Peninsula and the Upper Peninsula, but they are regular winter residents in southeast Michigan. Some of the best places to looks for them in the winter are Belle Isle (on the Nashua Creek Trail), Lake Erie Metropark, and Grosse Ile. Photo by Jim Bull.

SHORT-EARED OWL

Another widely distributed owl, this species prefers open country such as grasslands, marshes, and even rock quarries and gravel pits in the winter. Though it is difficult to get a handle on global population sizes, Partners in Flight lists it as a common bird in steep decline due to fragmentation of grasslands. Short-eared Owls typically hunt small mammals but will also eat birds. They nest on the ground, where the female scrapes a bowl in the earth and then lines it with grass and feathers. When breeding, this owl can be seen during the day, though otherwise, they typically favor dawn and dusk for hunting, when they are most often seen. This owl roosts on the ground unless snow forces it into the trees. Short-eared Owls aren't very vocal, but they will make several sounds, including soft hoots. Pointe Mouillee is one of the best places to see them locally. They fly low and mothlike over fields and marshes, very similar to the way a Northern Harrier hunts during the day. Photo by Megan Kemp.

SNOWY OWL

Keep watch on your listservs and birdy social media, and you have a chance to hear about a Snowy Owl spotting somewhere in lower Michigan in the winter. Though their winter range does include our entire state, they are not considered common visitors in southeast Michigan. When you get to see one, as I once did after trekking up to the Thumb on what had to be the coldest day of the year, it is a truly magical experience. Snowy Owls can reach 27 inches in height; with their piercing yellow eyes and dazzling white feathers dotted with dark brown, this species is a showstopper. Circumpolar in distribution, these striking white owls nest on the ground in the treeless arctic tundra of northern Canada, Alaska, Europe, and Asia. In winter, numbers of this species peak periodically in the lower 48 states depending on food sources; Snowy Owls can show up as far south as Missouri. Some years few venture south, but other years are "irruption" years when larger numbers can be found. Bruce Szczechowski saw 11 at Pointe Mouillee in one day in 2014, and he managed to capture 4 in one photograph. Since they hunt in the day (lemmings up north and a menagerie of animals during the winter), they can be easily spotted if you know where to look. They can often be found in winter in large fields, including farmland, airports, beaches, and even concrete paddocks covered in snow. They sit on the ground (remember, their tundra home has no trees) hunched, yet regal, waiting for prey to show up. If you hear of a Snowy Owl spotting, please go. But also remember to respect these visitors from the north; they are facing steep declines and there may be as few as 29,000 breeding birds remaining. Photo by Bruce Szczechowski.

BARN OWL

Once part of our southeast Michigan avifauna, Barn Owls are now unlikely to be seen in this region. However, this species is the most widely distributed owl on the planet. They appear in countless stories and lore due to their global range and heart-shaped face. They prefer open habitats but are not picky; they can be found across farms, strips of forests, and urban areas. Barn Owls mainly eat small mammals and hunt strictly at night. They will nest either in tree cavities or in buildings such as, you guessed it, barns or even abandoned houses. Unlike many owl species that use old nests from other species, the female Barn Owl constructs its nest using regurgitated pellets that it shreds and molds into a cup. Barn Owls don't hoot or toot; instead, they blurt out an eerie, almost blood-curdling shriek that has even been used in horror films. With their haunting screams, almost white appearance at night (their species name *Tyto alba* means "white owl"), and silent flights in old barns, some people believed they had seen ghosts. Though incredibly widespread, they are declining in some regions due to the loss of old barns. The last confirmed breeding record for them in Michigan was in 1983. They were the Michigan Non-game Wildlife symbol in 1978-1979. They are still occasionally seen in Ohio, just to our south, so there is always a possibility, however remote, that one could slip over the border. We can hope! This is one of the many good reasons to preserve old structures. Photo by Tracy Wyman.

Short-eared Owl in flight. Photo by Bob Kemp.

Winter Bird Feeding

by Rosann Kovalcik, Detroit Audubon board member and owner of the Wild Birds Unlimited Store in Grosse Pointe Woods

The tradition of feeding birds in winter is one that brings us joy, providing a critical connection to the natural world when the weather keeps us inside.

When feeding birds in winter, consider the placement of your feeding stations. Will you be able to view the feeders when sitting at your favorite spots in the house? Can you easily fill them when snow has fallen?

In Michigan, we are fortunate to have as residents the brilliantly colored Northern Cardinals, the first and last visitors to our feeders. Cardinals will gather in larger groups in the winter as territory is not a concern in the same way it is in the breeding months. A favorite seed for cardinals is black oil sunflower, which they crack down upon with their large beaks, then roll with their tongues, continuing this process until the seed inside is shelled and ready to swallow.

Every feeding station has adorable Black-capped Chickadees visiting, and they are likely to be the first to discover new feeders in your yard. Part of their success in surviving winter is that they will eat so many different foods, including sunflower seeds, peanuts, tree nuts, suet, mealworms, and safflower seeds. In preparation for winter, chickadees will cache seeds into crevices and are capable of storing up to 1,000 seeds in a day. How do they remember where the seeds are stored? Their hippocampus, the part of the brain involved in spatial memory, grows larger in the fall and shrinks again in the spring.

Blue Jays also cache seeds, especially peanuts in the shell that you offer them. Many other foods will satisfy jays, including sunflower seeds and tree nuts. Watch how they hold onto seeds with their feet and then hack away with their large bills to remove the shells.

White-breasted Nuthatches are quite entertaining to watch at feeders as their natural position is upside down. Nuthatches are equipped with a longer back toe, which they use to cling as they travel on bark or position themselves on a longer feeder such as a seed cylinder feeder. This is when you can observe the action that earned them their original name of "nut hacker." This year we have had an influx of Red-breasted Nuthatches, smaller and faster than their white-breasted cousins. As their names imply, both of these species love peanuts, as well as sunflower seeds and suet.

Our resident woodpeckers can be a mainstay at our feeders as they eat sunflower seeds, peanut splits, and suet. Diminutive but common Downy Woodpeckers can be enticed to most feeding stations. Less common are Hairy Woodpeckers and Red-bellied Woodpeckers, who also avail themselves of these protein- and fat-rich food sources. Hosting a Northern Flicker would be very unlikely, although not unheard of. Pileated Woodpeckers are becoming more common at feeding stations throughout the state, so keep your eyes glued to the windows for this large crow-sized woodpecker with a pointed red crest. Watch carefully for a glimpse of any woodpecker's long tongue, which is wrapped around its brain and attached at the front of the skull. Woodpeckers can project their tongues to reach out and grab an insect or that last bit of suet.

A foundational feeder that has a large capacity, providing a reliable quantity of food, is the cornerstone of your feeding station—a steady platform for Northern Cardinals, Mourning Doves, and Dark-eyed Juncos. In this feeder, offer a blend that includes white proso millet and sunflower seeds, the favorite seeds of most bird species. Add safflower seeds and shelled peanuts and you have a winning blend. Some seed blends have no shells, leaving less mess to clean. Avoid using seed blends with red millet, wheat, milo, and other grains birds do not prefer. Even robins will visit feeding stations to eat shelled sunflower, as well as dried fruits that are available in seed blends. This year there has been a movement of Evening Grosbeaks in Michigan. Their larger bodies need a larger perching area in order for them to feed.

Perching birds, including chickadees, titmice, and both species of nuthatches, will welcome the option of a tube feeder. Fill it with either straight sunflower seed or a blend without millet, which is not a preferred seed. Finches are attracted to tube or mesh feeders that hold nyjer (thistle) seeds or a combination of nyjer seeds and sunflower chips, a finch blend where every seed is usually eaten. While American Goldfinches are the most common finches in our state, Purple Finches and Pine Siskins may also show up as welcome winter visitors.

Seed cylinders are another great bird-feeding option, formed of tightly packed seeds that the birds excavate individually, offering extended opportunities to observe feeding birds. Seeds in cylinders also take more time for birds to consume, which equates to fewer trips outside to refill the feeders.

No winter feeding station would be complete without suet, which is made of rendered beef fat. Place it in a specialty feeder to entice insect-eating birds. Suet is especially helpful to birds when ice and snow cover those places where insects would normally be found. Suet with added peanuts and mealworms provides extra fat and protein.

Mealworms take the place of wild insect larvae in a bird's diet. They can be offered in any feeder with smooth sides that prevent them from crawling away. In the winter, mealworms can be a lifesaver for American Robins, Eastern Bluebirds, and Carolina Wrens.

In addition to high-fat and high-protein foods, birds also need water throughout the winter. Heated bird baths draw birds that might not otherwise come to feeding stations.

Knowing that small birds can lose 10 percent of their body weight overnight as they sleep can be motivation to keep our feeders full to help them regain the weight they need to make it through another wintry day. Enjoy your birds!

PHOTOS:
Pine Siskins at feeder. Photo by John Graffius. Printed by permission of Wild Birds Unlimited Corporate office.
Blue Jay with peanut. Photo by Stuart McClay.

Shooting Birds. Well, Not Literally.

by Evan Deutsch

It was the 2921 Christmas Bird Count at Humbug Marsh. Scott Bowdich, a frequent Detroit Audubon photo contributor, showed me a Brown Creeper he'd just captured on his camera. This tiny little bird that I barely could see in my binoculars was tack sharp on his screen. One year later I'm now the guy showing others images of an Osprey snagging fish from the Detroit River, Red-tailed Hawks on the hunt, hummingbirds feeding on flowers, and macro shots of bees pollinating flowers. Bird photography is a lot like fishing – you never know what you'll see or catch.

So, what type of camera do you buy? The simplest one to operate, aside from your cell phone, would be a bridge camera. The camera body and lens are one unit. You adjust the focus, depress the shutter button, and you have your picture. The lens that comes on the camera cannot be swapped out with another one. Two other types of cameras, DSLR and mirrorless, provide that option so you can select a lens for a particular application. Camera manufacturers are shifting to mirrorless, which means you can probably get a good deal on a previously owned DSLR. There is plenty of information online explaining the two types and you can also visit your local camera shop for more details. As for manufacturers, Canon and Nikon are the two dominant players, but they are not the only ones. I shoot Olympus and Panasonic (Lumex). There are a host of others out there. Getting the best camera will not make you the best photographer. Patience and practice are more important.

If you do go the mirrorless or DSLR route, invest in a good lens (there are a number of inexpensive third-party lenses to choose from). Low-quality lenses introduce abnormalities into pictures and don't produce the sharpest images. The bigger the lens, the more reach or increased detail you will get. For bird photography, a 400-mm zoom is the minimum length you should get. A good lens will last you a long time. It does not need to be the latest, greatest model to deliver quality pictures. You could have a spanking-new, whizbang camera body with a 10-year-old lens and get super-sharp images.

As for where to buy camera gear you could shop online from one of the behemoth sites. But they can't answer your questions, set you up with the model you need based on your objectives, or give you tips on how to use your camera. Your local camera store can, and their pricing is competitive. In the Detroit area, there are several camera stores to choose from. I go to the Camera Mall in Ann Arbor. The employees are knowledgeable, helpful, friendly, and provide great customer service.

So how do you use this thing? Modern cameras can be intimidating. You have several modes you can shoot in (there is also a point-and-shoot capability). If your local community college offers photography classes, take them. You will learn a lot. Also, check out the wealth of online videos and books on photography. If you want to be a good photographer, take LOTS of pictures (you'll take a lot of bad pictures when you start out, so don't be disappointed; everyone starts out this way). Experiment with different shooting modes, shutter speeds, apertures, and angles. Look at pictures. Even if they are not about birds, you will learn something. Go on a Detroit Audubon field trip or visit a popular birding spot and ask a photographer if you can join her or him and ask questions. Become a member of a photography club. I joined the Motor City Camera Club, where I am learning from the best photographers in the Detroit area.

One other thing you may want to do is learn a photo editing program such as Photoshop or Lightroom Classic (a popular and easy photo editing program) to enhance the quality of your images. Your camera takes the picture. An editing program turns it into a work of art. You can learn online, get a book, or take classes at local community colleges.

I photograph birds and other aspects of nature several times a week and lead Detroit Audubon field trips for beginners once a month. Join me. While I too am a newbie, I like sharing what I know. I hope to see you on a Detroit Audubon field trip soon.

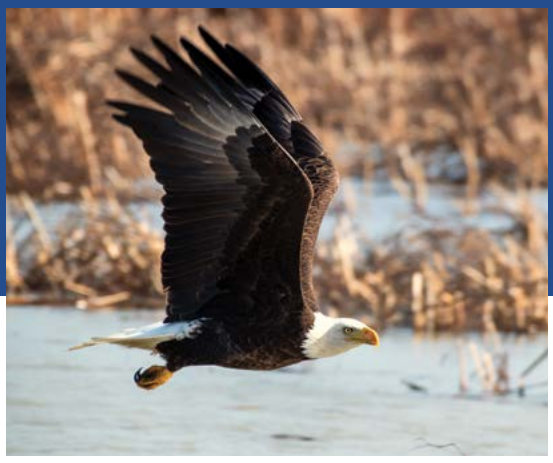
PHOTOS FROM TOP:
Evan stalked by a Black-capped Chickadee. Photo by Jan Armstrong.
Close-up of a Sandhill Crane's eye. Photo by Evan Deutsch.
Sandhill Crane in flight. Photo by Evan Deutsch.

Winter Nature Gallery

At left: **MALE AMERICAN KESTREL.** For information on this little falcon that used to be called the Sparrow Hawk, see the cover photo and caption inside our Fall 2022 issue. Photo by Josette Shindak on Belle Isle.

Below left and at right: **TRUMPETER SWAN.** This is our largest native swan. They were almost extirpated from Michigan, but they were reintroduced by the Michigan DNR in northern Michigan. They now nest in several places in northern Michigan and increasingly in southern Michigan as well. Another friend of ours in Ann Arbor has reported watching nesting Trumpeter Swans at her condominium complex for years. Their bill is all black (Mute Swans have an orange bill with a black knob, and Tundra Swans have a patch of yellow between their bills and their eyes—called the lores). Photo below left taken at Gallup Park by Brittany Leick.
At right, photo of swan in flight taken in Muskegon, Michigan by Glenn Miller.

Below right: **MALE RED-BREASTED MERGANSER.** Mergansers as a group can be identified by their long, thin, serrated bills that are ideal for holding on to slippery fish, which they dive for. They are mostly seen here during fall and spring migration, but some do stick around all winter. Male Red-breasted Mergansers have a green head and crest, along with a rusty brown breast. Females have a light reddish head and crest and a gray lower body including the breast. They nest in the extreme north of the Lower Peninsula and in the Upper Peninsula. Photo taken in Muskegon, Michigan by Glenn Miller.



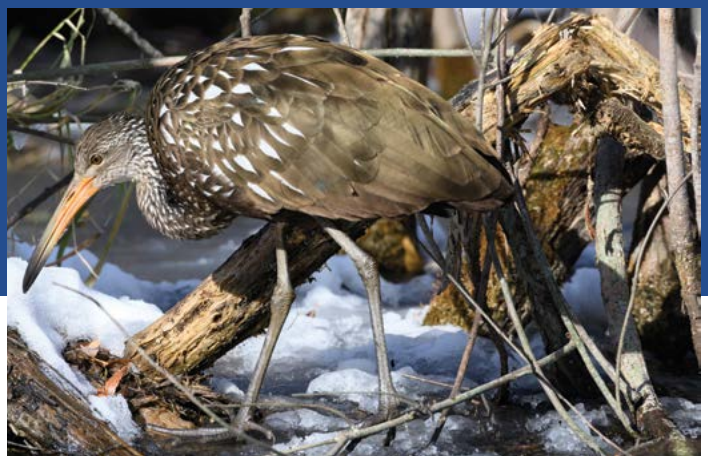
Above L-R:

TUFTED TITMOUSE. These are common year-round residents in woodlands, suburbs, and urban neighborhoods with sufficient tree cover, and they are frequent visitors to bird feeders. Their loud call is distinctive and sounds like they are saying, "Peter, Peter, Peter!" quite insistently. Photo by Evan Deutsch at Kensington Metropark.

BALD EAGLE flying over the marsh on January 2020 at the Ottawa National Wildlife Refuge in Oak Harbor, OH. Photo by Jeff Warneck.

COYOTE. Although persecuted for decades, including a bounty for dead ones presented to authorities in Michigan and many other states, coyotes have adapted very well to humans. The bounty was repealed decades ago. They are common in every one of the lower 48 states but are quite secretive and seldom seen. People tend to panic when they do see them and may even keep children in from outdoor recess. While small dogs should be kept on a leash, otherwise the best advice is to just enjoy these amazing wild predators and count yourself lucky to see them. They are an important part of our Michigan ecosystems. Listen at night and you might even hear them howling, or pups yipping. Photo by Dongfan Chen at Pointe Mouillee.

At left, **FEMALE NORTHERN CARDINAL.** Originally southern in distribution, this bird has become a resident Michigan bird and resides even further north, most likely due to bird feeding. The male is bright red while the female is just as striking in her more muted colors that enable her to blend in with the nest while incubating eggs and brooding chicks. Unlike most songbirds, both males and females sing. Photo by Brittany Leick at Elmwood Cemetery.



Above L-R:

AMERICAN TREE SPARROW. Note the black spot in the middle of the plain gray breast which the Chipping Sparrow does not have. (These two species are often confused because they both have chestnut caps and a whitish eyeline.) Named for its habits in migration and its winter habitat, this species nests primarily in the treeless Arctic tundra of Canada and Alaska. They will be around all winter, but come April they will leave, and Chippies will replace them. Photo by Evan Deutsch.

LIMPKIN IN THE SNOW—NOW THAT'S NOT A JUXTAPOSITION ONE NORMALLY SEES! This photo was taken in November 2019 at Ottawa National Wildlife Refuge in Oak Harbor, Ohio, on the southern shore of Lake Erie. Primarily a South American bird, this species is also common in marshes throughout Florida. In Ohio and Michigan, it is an extremely rare stray migrant. They mainly eat the large apple snails that are common and indigenous to the Everglades and other parts of the Panhandle State.
They would have to switch to other nutritious fare up here. Photo by Jeff Warneck.

Rockwood Christmas Bird Count

Article and photos by Jim Bull

Birders of all levels of experience gathered on Tuesday, December 27, 2022, for the annual Rockwood Christmas Bird Count sponsored by Detroit Audubon. My team, which covered Grosse Ile, included Larry Urbanski, Bruce Szczechowski, Emily Simon, and me. We counted owls from 5 a.m. until it got too light at about 7:45 a.m. We found 18 Eastern Screech Owls, 4 of which came in close for good looks, and two Great Horned Owls that we heard hooting for a one-mile stretch. Other highlights included about 25,000 Redheads and about 15,000 Canvasbacks off the southern end of Hickory Island. Nine other birders joined us for the public field trip at Westcroft Gardens, a centennial farm, which was part of the count day. Luckily the temperature had risen to the 30s from the subzero temperatures of Christmas weekend, and there was no wind to speak of until the end of the day at Hickory Island. Here we also had 17 Bald Eagles roosting on the ice. Periodically they would fly up and dive at the rafts of ducks, not really seeming to seriously be trying to predate any, but causing them to fill the sky and then settle back down until the eagles stirred them up again. This happened several times. We observed a total of 50 species in our count area. Official results for the entire Rockwood Count will be published on our website in the near future.

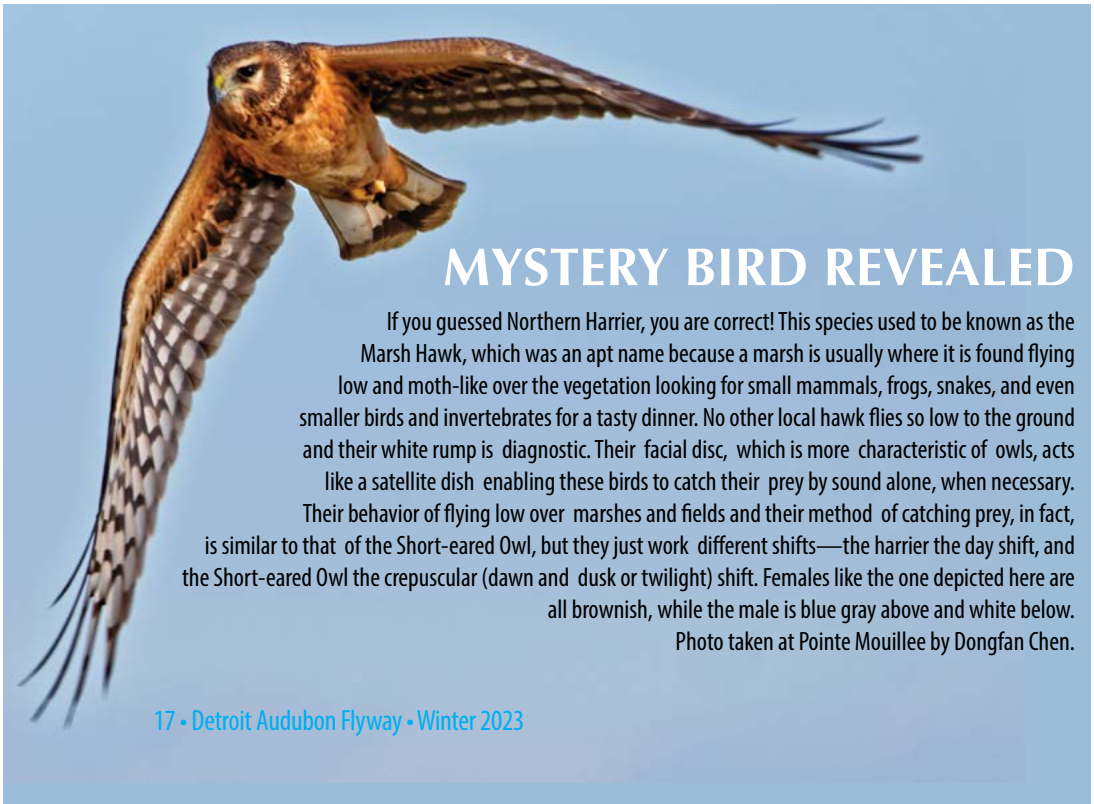
FROM TOP LEFT:

Emily Simon and Larry Urbanski use spotting scopes to count thousands of ducks rafting on the Detroit River.

Bald Eagles roosting on the ice just behind a raft of ducks off the south end of Hickory Island.

Eagles kept diving at ducks, causing them to fill the sky.

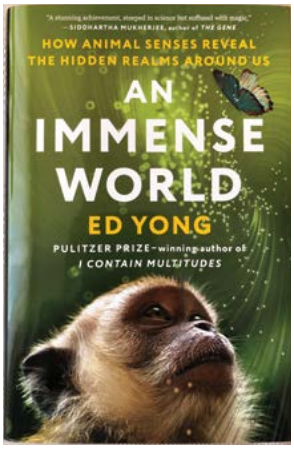
Raft of Canvasbacks and Redheads on the Detroit River off the coast of Grosse Ile.



MYSTERY BIRD REVEALED

If you guessed Northern Harrier, you are correct! This species used to be known as the Marsh Hawk, which was an apt name because a marsh is usually where it is found flying low and moth-like over the vegetation looking for small mammals, frogs, snakes, and even smaller birds and invertebrates for a tasty dinner. No other local hawk flies so low to the ground and their white rump is diagnostic. Their facial disc, which is more characteristic of owls, acts like a satellite dish enabling these birds to catch their prey by sound alone, when necessary. Their behavior of flying low over marshes and fields and their method of catching prey, in fact, is similar to that of the Short-eared Owl, but they just work different shifts—the harrier the day shift, and the Short-eared Owl the crepuscular (dawn and dusk or twilight) shift. Females like the one depicted here are all brownish, while the male is blue gray above and white below.
Photo taken at Pointe Mouillee by Dongfan Chen.

An Immense World: How Animal Senses Reveal the Hidden Realms Around Us by Ed Yong (Random House, 2022, 450 pages) • Book review by Emily Simon



"It's a small world." Doesn't it feel like this well-worn cliché becomes more real each day? We are continually bombarded with reports of global events that directly affect our daily lives, our wallets, and our stress levels. Our social media accounts flourish in ever-cascading networks; our smartphones retrieve answers for any question we can think up. Paradoxically, however, although we move in a world of unlimited information, we can be often left wondering what's happened to our sense of awe.

Fortunately, Ed Yong's new book, *An Immense World*, provides refreshment for anyone in need of a big dose of wonder. Yong, a science writer for *The Atlantic* magazine, won a 2021 Pulitzer Prize for his reporting on the COVID-19 pandemic. His first book, the bestselling *I Contain Multitudes: The Microbes Within Us and a Grander View of Life*, dives deep into recent research revealing that half(!) the cells of the human body are actually not human cells, but nonhuman microbes.

In *An Immense World*, Yong explores the realm of animal senses. His delightful introduction asks the reader to picture a school gym being shared by 10 animals (an elephant, a robin, a mouse, an owl perched on an overhead beam, a bat hanging from the ceiling, a rattlesnake, a spider in a corner web, a mosquito, a bumblebee on a potted flower, and a human) and describes over several pages how each of these animals experiences "the same physical space . . . in wildly and wondrously different ways." The human can't hear either the elephant's deep infrasonic rumble or the mouse's ultrasonic squeak but is able to listen to the robin's song. When the room is plunged into darkness, the human can't hear the mouse's skittering feet, but the owl can. As it swoops to catch the rodent, it is struck by the rattlesnake, which sensed the mouse's body heat. As the mosquito entangles itself in the spider web, the bat, guided by its high-frequency sonar, sails in to pluck the spider up. Each animal is "enclosed within its own unique sensory bubble, perceiving but a tiny sliver of an immense world."

Thus begins an imaginative, surprising journey through the universe of animal sensory experience. Each chapter covers a different sense and offers several in-depth examples of how specific animals experience it. Yong begins with the more familiar senses—smell and taste, sight (both color and light), pain, and temperature. From the fine-tuned sensitivity of dog noses to the complexities of bird sight (for example, vultures and other raptors can simultaneously scan the ground for food and also see other birds flying next to them without having to turn their heads), Yong showcases the incredible range of animals' sensory abilities, adaptations, and anatomies.

An Immense World really takes off, though, in memorable chapters about the senses that seem perhaps more remote: touch, surface vibrations, sound, echolocation, and electric and magnetic fields. (Sound is included among these chapters because the way sound works is most closely related to touch.) Yong presents many, many extraordinary examples of amazing phenomena. Elephants and whales may communicate over hundreds and even thousands of miles by emitting low-frequency sounds. From inside their eggs, embryonic tadpoles of some frog species can distinguish among different vibrations in their environment well enough to know to hatch early and escape when the eggs are about to be eaten by snakes. More than half of the 160,000 species of butterflies and moths have ears, which are believed to have evolved to avoid the echolocations of predatory bats. Scientists studying treehoppers have learned that perhaps as many as 200,000 species of insects exchange messages by using their abdominal muscles to create surface vibrations that move along the leaves on which they stand, and up the legs of other insects.

All the chapters are jam-packed with fun and fascinating facts. Yong deftly integrates historical and cutting-edge research discoveries with understandable explanations of the biology of the sensory experience along with the evolutionary forces that have shaped sensory development. And he puts it all together in engaging ways. A sea otter can dive to the bottom of an ocean bed, use its highly sensitive paws to feel around for food items on the sea floor, and then return to the surface for its meal—all in the time, Yong says, it takes to read a 200-word paragraph. Sea otters also have the densest fur in the animal kingdom, with more hairs per square centimeter than we have on our entire heads!

An Immense World also enlarges our understanding of the scope of the damage humans are perpetrating on the animals we share the planet with. Yong pretty much skips the lament over rampant development, pollution, and climate change, opting to add sensory pollution (noise and light) to the list of hazards decimating animal populations and underscoring the need to preserve quieter, darker "sensescapes" in which animals can thrive. On a hopeful note, he points out that "sensory pollution is an ecological gimme—a rare example of a planetary problem that can be immediately and effectively addressed" by merely shutting off lights and creating more quiet spaces, especially in our backyards and public parks.

By any measure *An Immense World* is an immense book. One hundred pages are dedicated to extensive notes, a bibliography, and an index that comes in handy for finding discussions that Yong refers to that occur earlier in the book. Two sets of color plates beautifully illustrate many of the animals portrayed. The sheer number and breathtaking range of topics might be best enjoyed a chapter at a time. But as we bird-lovers know, any experience that broadens our appreciation of the astonishing creatures just outside our doors (and beyond our screens) is totally worth the effort. *An Immense World* is no exception.

Flyway

A publication of Detroit Audubon

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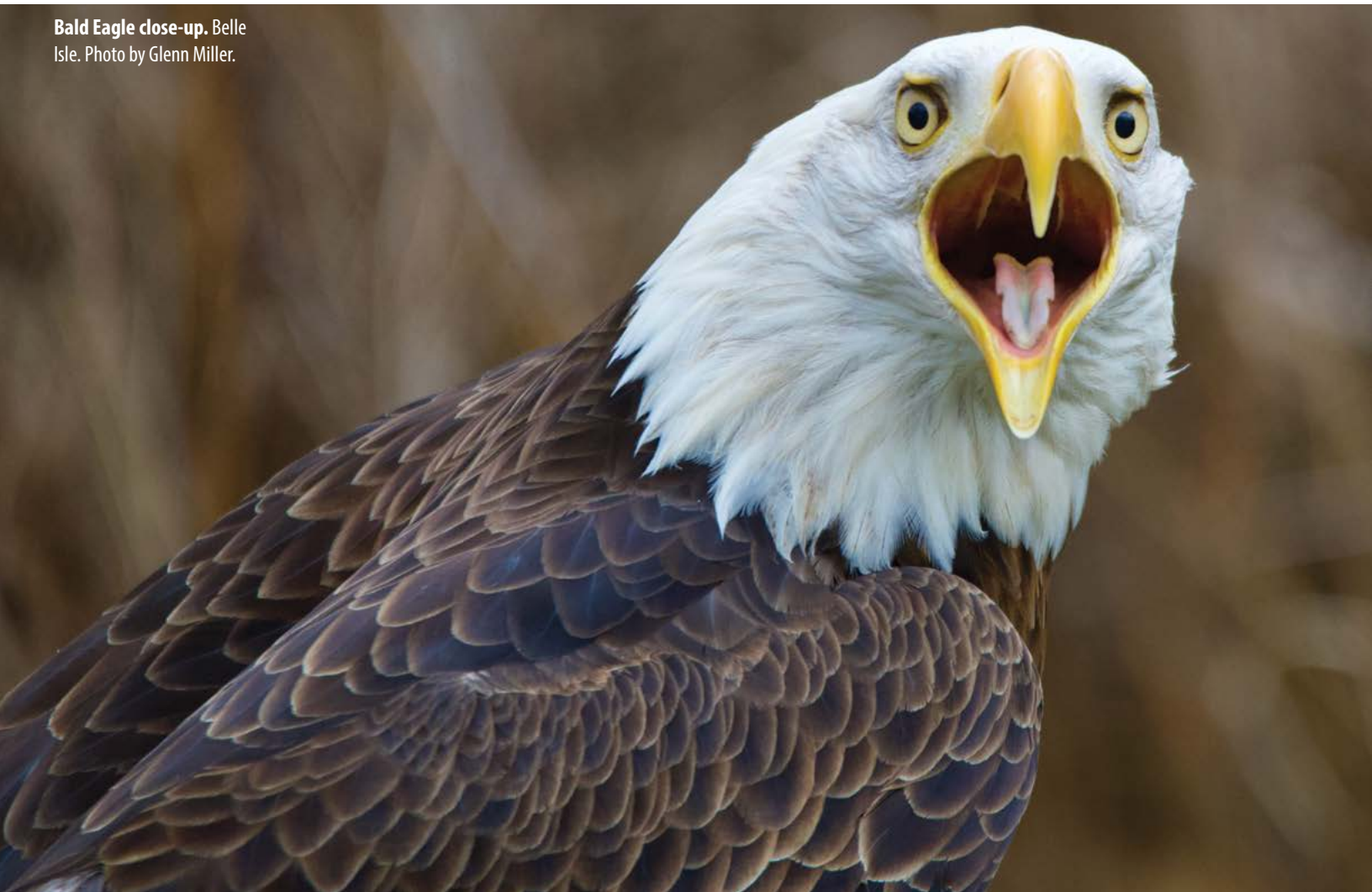

Bald Eagle close-up. Belle Isle. Photo by Glenn Miller.