A Detroit Audubon Publication
Fall 2021

Flyway

Lizards of the Great Lakes Region

Book Reviews: Braiding Sweetgrass

Cicada Emergence Met X-pectations

Detroit Bird City Hits Major Milestone!

Birds of Early Autumn and Fall Warblers

Hopeful Re-Tern: Black Tern Monitoring 2021

Manistique Street Fair and Birdwatcher's Garden

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A publication of Detroit Audubon

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Original articles, photos and art welcome at Flyway@detroitaudubon.org

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 large raptor? For the answer, go to page 6.
By Bruce Szczechowski

Red-eared Slider turtle at Pointe Mouillee by Dongfan Chen.

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On the Cover:

Juvenile Black Tern with nanotag and color band by Jennifer Fuller.

Errata:

On Page 16 of the Spring 2021 issue there is a photo of Travis Kaye with Tim Nowicki that is credited to Jim Bull. It was in fact taken by Jill Noll, Travis's mother. We regret the error.

Sugar Maple photo by Jim Bull.

Staghorn Sumac at Sterling Heights Nature Center by Jim Bull.

2021 Fall Field Trips

How about joining us for a field trip this fall? We welcome birders of all abilities and expertise on our trips, and even have binoculars to borrow if you don't have your own. Any trip with a ($) next to it has a fee, otherwise they are free of charge. Go to **www.detroitaudubon.org/field trips** to learn more and to sign up! Detroit Audubon Chapter members receive priority registration. Please email us at **staff@detroitaudubon.org** if you have questions regarding these 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! Here are the field trips scheduled so far, but there could be pop-up field trips as well so keep checking our website or our Facebook page.

OCTOBER

$ Sat. Oct. 9 Lake Erie Metropark

$ Sat. Oct. 16 Humbug Marsh Field Trip

$ Sun. Oct. 24 Sandhill Crane Migration Field Trip

$ Sat. Oct. 23 Elmwood Cemetery Walk

Sat. Oct. 30 Eliza Howell Park Field Trip

NOVEMBER

$ Fri Nov. 5 Owl Prowl, Lake Erie Metropark

Sat. Nov. 6 Young Birder's Field Trip, Palmer Park

$ Sat. Nov. 6 Point Edward to Pinery Provincial Park, all day field trip, Canada

$ Sat. Nov. 13 Elmwood Cemetery Walk

Sat. Nov. 27 Belle Isle Field Trip

DECEMBER

Sat. Dec. 4 Young Birder's Walk, Palmer Park

$ Sat. Dec. 11 Crosswinds Marsh, Oakwoods, and Lower Huron Metroparks

Sun. Dec.19 Detroit Audubon Christmas Bird Count

Mon. Dec. 27 Rockwood Christmas Bird Count

Introducing Brittany Leick

OUR NEW PROGRAM and MEMBERSHIP COORDINATOR/ OFFICE ADMINISTRATOR (in her own words):

I graduated from Unity College in Maine with a Bachelor's Degree in Wildlife Biology. Every summer in college, I worked at a series of internships in New Hampshire (with Karner Blue Butterflies), in Maine (with Atlantic Puffins, Black Guillemots, Razorbills and three species of terns), in Minnesota (with Minnesota Valley National Wildlife Refuge visitor services) and in Iowa (with skipper butterflies).

Since college, I've worked with the Conservation Corps of Minnesota and Iowa as a lab technician with SGS, Environmental Services, helped rescue birds from buildings with Safe Haven Wildlife Removal, managed invasive species with Cardno, and was the Program Coordinator for River Raisin Institute for the last three years.

After moving to Michigan in 2017, I began working with Detroit Audubon as a volunteer helping with Black Tern banding and the Winter Waterfowl Count. I've always wanted to work with animals, but didn't know how much I loved birds until I worked with seabirds off the coast of Maine. It's an absolutely amazing opportunity to finally be able to dive back into working with and educating people about birds and their importance. My favorite bird is the Chimney Swift!

Brittany holding a Black Guillemot on an island off the coast of Maine.

Detroit Bird City Hits Major Milestone!

by Diane Cheklich, Detroit Audubon board member, Conservation Committee Chair, and DBC Project Director

Detroit Bird City volunteers by Ava Landgraf.

Detroit Bird City is a program to plant native wildflower meadows at five disused Detroit city parks. Detroit Audubon, along with the City of Detroit, nearby communities, and other partners, prepared and planted the first meadow in 2019, the second one in 2020, and earlier this summer, the final three meadows! This is a huge milestone for our project, and we are excited to have all five meadows established in Detroit.

THE DETROIT BIRD CITY PARKS:

Callahan Park: 3356 E. Ferry (2.19 acres)

Lifsitz Park: 2670 Gladstone (1.46 acres)

McKinley-Merrick Park: 5200 McKinley (.63 acres)

Bryant-Vermont Park: 5170 Vermont (.37 acres)

Palmer Nature Center: 19013 Woodward (2 acres)

The three new meadows are at Lifsitz Park, Bryant-Vermont Park, and McKinley-Merrick Park. Detroit Audubon worked with the local residents to clean up the parks and design spots for pathways, benches, and signs.

The oldest Detroit Bird City meadow is in Callahan Park. It is two years old now and almost fully mature. Its two acres are home to a variety of wildflowers, birds, bees, and butterflies. The beautiful Indigo Bunting is among the bird species that have been spotted at Callahan, along with American Robins, Chimney Swifts, American Goldfinches, and Ring-necked Pheasants.

Callahan's wildflower meadow has been well received by the nearby residents. One Callahan neighbor said, "At Callahan, it's really lovely to just take a walk and sit quietly on the benches and close my eyes, you know? I feel like Detroiters hold a lot of tension in their bodies because the environment does not always facilitate a relaxing feel. And so to have a quiet space that feels safe and calming to just close your eyes and listen to the birds is pretty amazing."

The second-oldest meadow is at the Palmer Nature Center. It was planted in 2020 and is growing into a healthy and colorful meadow as well. The two-acre meadow is part of a larger habitat restoration plan at the site, which is the former Palmer Golf Course.

The success of Detroit Bird City has inspired the city to double the combined footprint of these five parks from the original five acres to a full 10 acres. The city is also considering meadows to be included in other parks and greenway projects. In addition, some Detroit residents have sought to replicate the Detroit Bird City model in places like vacant alleys, community gardens, and privately owned parcels. We are thrilled by the positive reaction and are hoping this is the start of a "meadow movement" in the City of Detroit!

Callahan Park by Ava Landgraf.

Funky bird houses top the sign for the Bird Watcher's Garden.
Below right, Ava Landgraf helps students with bird beak activity while Bruce Szczechowski looks on.

Manistique Street Fair and Bird-Watcher's Garden

Story and photos by Jim Bull

On Saturday August 14, research coordinator Ava Landgraf, board member Jim Bull, and volunteer Bruce Szczechowski engaged visitors walking by Detroit Audubon's table with conversation about bird conservation while challenging kids of all ages to try out our tool set to simulate the action of bird beaks. Each "beak" was specialized to secure a particular kind of food. We also enjoyed some incredible music from a harpist, the Michigan Opera Theater, and the "get-down" Gabriel brass band on a beautiful sunny day with just very comfortable temperatures. The native gardens including Detroit Abloom and the Bird Watcher's Garden we helped create with the Manistique Community TreeHouse Center in the Jefferson-Chalmers neighborhood were a riot of color. Food offerings were nothing short of gourmet! And several artists displayed some amazing beautiful work! Bruce even got to watch a Monarch Butterfly caterpillar transform itself into a chrysalis attached to a cattail (at left), looking for all the world like a tiny jade locket trimmed with bright gold beads.

The Gabriel Brass Band added to the celebration.

Cicada Emergence Met X-pectations

by Jack Smiley, Detroit Audubon board member and Sanctuary Committee Chair

The forests of Washtenaw County were abuzz with activity earlier this year when millions of periodical cicadas emerged as part of the long-awaited "Brood X." Detroit Audubon took advantage of this rare opportunity and hosted a field trip to the Cherry Hill Nature Preserve on June 13, at the peak of this remarkable natural phenomenon.

Brood X did not disappoint. Brood X (Roman numeral 10) is the largest of over a dozen broods of periodical cicadas found in the eastern United States. The range for this 17-year brood spans 15 states, with core populations centered in Pennsylvania and northern Virginia, Indiana, and eastern Tennessee. The population in Michigan is disconnected from other populations, likely due to the loss of forest cover, and the remaining population in Michigan is primarily found in Washtenaw County. Superior Township, in the eastern part of the county where the Cherry Hill Nature Preserve is located, seemed to be the epicenter.

Unlike annual cicadas, some of which emerge each year and can be heard every summer, periodical cicadas only emerge in unison after 13 or 17 years. Brood X is of the 17-year variety and last emerged in 2004.

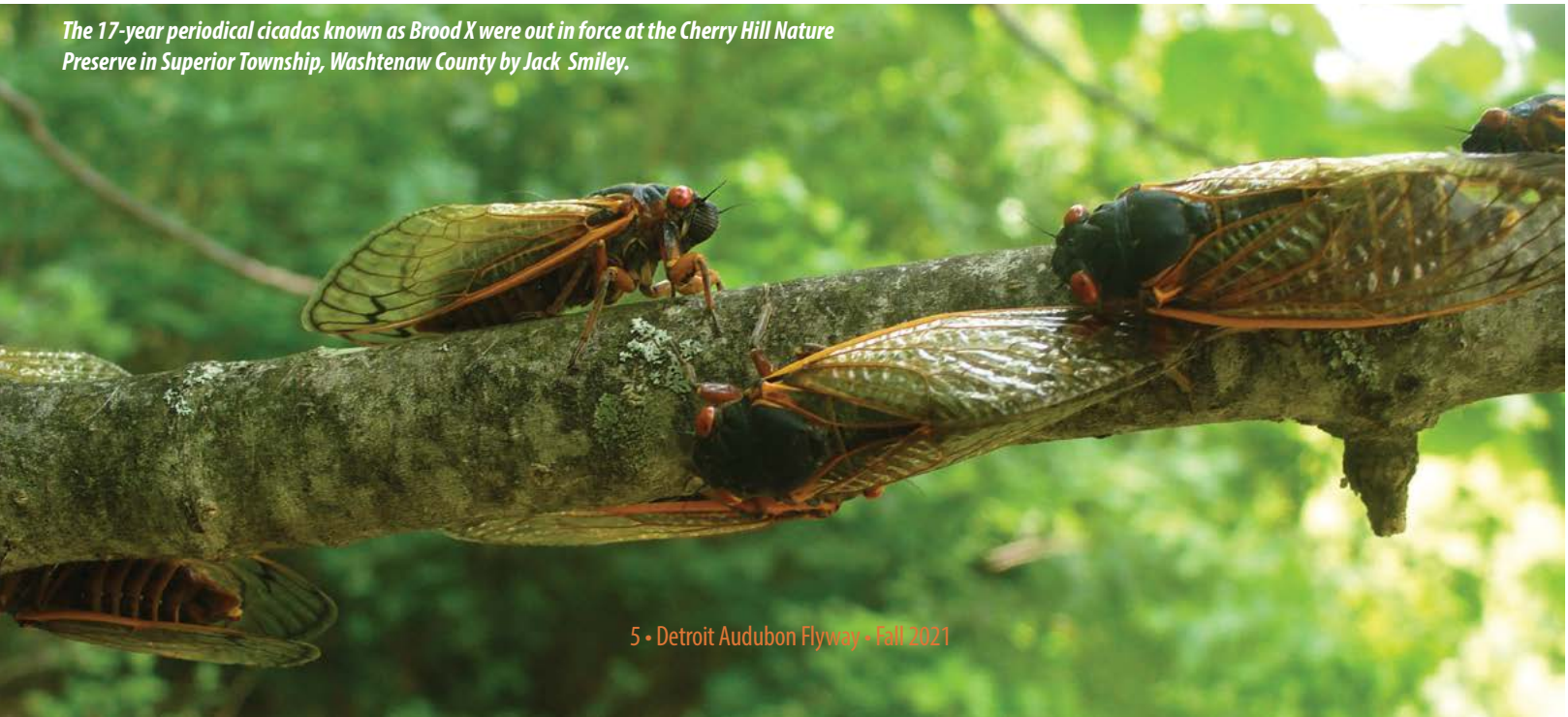
There are three species of cicadas in Brood X—all within the genus Magicicada, which seems a most appropriate name since the lifecycle of these cicadas is both magical and mystifying. No one fully understands how these insects are able to measure the passage of time or how they evolved to exhibit this remarkable survival strategy. By emerging only in the prime number years of 13 and 17, it is ensured that broods will rarely intersect and predators will be unable to rely on the cicadas as a food source. Of course, during the year of emergence, birds, frogs, snakes, squirrels, skunks, opossums, wasps, and many other predators are able to gorge themselves on cicadas, but each emergence is so overwhelmingly large that many cicadas are able to survive long enough to propagate.

The cicadas that we saw and heard in June began their journey by spending 17 years underground, feeding on the sap of tree and shrub roots. Cicada nymphs have been known to burrow as deep as 30 feet underground in search of food. After going through five development stages (molting four times underground), in the 17th year they tunnel their way to the surface when soil temperatures reach 64 degrees Fahrenheit. Locally, this began in mid-to late May, and their numerous exit holes soon pockmarked the forest floor.

Numerous exit holes show where cicada nymphs emerged from the forest floor after spending 17 years underground feeding on the roots of shrubs and trees by Jack Smiley.

A Brood X cicada emerges from its old skin by Jim Bull.

After emerging, cicada nymphs shed their skins to enter into their average four-week adult phase, leaving brown exoskeletons clinging to tree



The 17-year periodical cicadas known as Brood X were out in force at the Cherry Hill Nature Preserve in Superior Township, Washtenaw County by Jack Smiley.

branches, leaves, and shrubs. Only the male cicadas "sing" by vibrating the tympanic membranes located on both sides of their body at the base of their wings. Females indicate their receptiveness by making a clicking sound with their wings. The sound made by each male cicada is surprisingly quiet, but the sound of thousands, even millions, of them is truly amazing!

Females lay approximately 500 eggs. They use an appendage called an "ovipositor" to gouge slits into younger tree branches and deposit eggs into the bark. After six weeks, the eggs will hatch into tiny nymphs the size of a grain of rice. These tiny nymphs then fall to the ground and burrow into the soil to begin another 17-year odyssey. If you weren't able to witness this wonder of nature in 2021, make sure to mark your calendar for June 2038!

Editor's Note: Laura Herberg, a reporter from WDET, recorded much of this field trip for a program that aired on that public radio station. Here is the link to that report: **Hear Brood X Cicadas at Their Peak in Michigan | WDET**

An interesting sidenote: a Mississippi Kite was seen feasting on cicadas by many birders at Cherry Hill Nature Preserve from June 16 to June 29. This is a bird that normally lives in the deep south of the United States, although there was one at U of M Dearborn a few years back which came back for several years too. I've seen photos of a Mississippi Kite eating a cicada that it is clasping in its talons while flying!

A cicada hangs upside down from a twig with shed skin in the background by Jim Bull.

Preparing for the next generation, the sole purpose of the short-lived adult cicadas by Jack Smiley.

Mystery Bird Answer:

If you said immature Bald Eagle, you were right. Bald Eagles do not sport the characteristic white head and tail until their fourth year of life! You can still identify them in their sub-adult years by their huge size, and their long, straight, board-like wings. This adult was photographed at Pointe Mouillee by Dongfan Chen.

Wood Stork Winds Up in Michigan

How a Wood Stork, which would normally be found in the Florida Everglades or in National Audubon's Corkscrew Swamp Sanctuary, ended up near Ludington, Michigan, is a mystery. Luckily it was in the backyard pond of Cathy Young, a DA member, for four days! This stray bird proved to be quite photogenic as captured by Kevin Gerhart.

Hopeful Re-Tern: Black Tern Monitoring 2021

By Ava Landgraf and Jenni Fuller

Between 2013 and 2020, Great Lakes water levels rose higher than have been seen in decades. Where lakeside communities braced against flooding and watched their docks slip underwater, the Black Terns and other marsh bird species at Lake St. Clair suffered as well. Areas once full of the floating vegetation mats used for nesting were largely submerged or washed away. Our most recent season (2021) offered some relief for both people and Black Terns, as the average summer (May-July) lake levels in Lake St. Clair dropped 1.3 feet. Shallower waters supported a possible rebound for the terns and a season ending on a hopeful note.

Juvenile Black Tern with nanotag and color band by Jennifer Fuller.

During the first six years (2013-2018) of monitoring Black Terns at St. Clair Flats (SCF) the lake level rose gradually, but we were still able to search the marsh walking in waders. Meanwhile, the Black Tern population at SCF began to plummet, and many nesting attempts were unsuccessful. By 2019, the deep water began to flood our waders, so we turned to kayaks. Compared to walking, kayaks were faster and prevented dangerous wading situations, but carrying kayaks took up the mud boat's limited space and prevented us from taking out more volunteers. With higher water levels, Black Terns struggled all the more to locate stable vegetation mats for nesting and often built their nests on floating debris, anything from logs, broken-up dock planks, or bright pink slabs of Styrofoam. In 2020, lake levels were the highest they had been since we started monitoring in 2013. Within the first days of the season, we had to locate a new boat launch as we found our regular site entirely flooded. We motored through vast open water where the Black Tern's usual swaths of marsh habitat once stood. Narrow tips of bulrush barely broke the surface and served as the only indication that this once had been an ideal Black Tern nesting habitat. The Black Tern population dwindled to only 115 individuals (only 23 percent of the original 2013 cohort), and those individuals struggled to raise successful broods. Compared to 2013, the known hatch rate had dropped 56 percent.

The change in scenery from 2020 to 2021 was unbelievable. Almost overnight massive floating "islands" of bulrush mat topped the shallower lake's surface. We could hardly contain our delight as we observed far more Black and Forster's Terns soaring over the tops of cattails and bulrushes or offering minnows to prospective mates on mounds of thick vegetation. The lower water level allowed us to wade through the marsh again. Knowing the benefits, we found a way to still bring our kayaks by strapping them to the sides of the mud boat. With them, we could quickly locate and vacate from nests and chicks to minimize disturbance.

The return of the marsh vegetation in 2021 supported about 45 more terns, more nests, and best of all, more surviving chicks. One of our priorities for 2021 was to track the Black Tern young both at SCF and across the country once they took flight. To do so we utilized nanotags, a rapidly advancing technology in wildlife tracking. These tiny radio transmitters are designed as incredibly lightweight harnesses, emitting unique ID numbers to receivers from long, thin antennae. The nanotags are attached to juvenile Black Terns that are within 10 days of flying (50-60 grams), and are hardly noticeable to the bird at all. After a couple of months, the harness wears away and falls off. Before the fledglings leave the colony, researchers look for their ID number using handheld receivers. Once they leave, however, it's up to Motus Wildlife Tracking towers installed throughout North and South America. These towers are capable of recording any nanotag that comes within a nine-mile radius, whether it is a Black Tern or an animal from an entirely different study. Data from the towers is available only after the end of the season.

In 2021, we deployed 20 nanotags, detected 6 with our handheld receiver, and spotted four fledglings flying with their harnesses attached. The most memorable of the juveniles was the first we ever tagged this summer. Hatched in a small sub-colony called "Little Muscamoot," it was one of only two surviving young after the other nests were eaten by Northern Water Snakes or destroyed by a particularly large storm we had captured on nest cameras. Whereas the other juveniles were rarely detected more than once, we tracked this bird three separate times, traveling miles apart with its parents to visit two other sub-colonies and the lakeside Brown's Bar. The nanotags have been an amazing way to track the juvenile birds after they fledge and to help us determine which nesting pairs successfully fledged young (raised them to the point they leave the nest and are flying).

Another exciting addition to our monitoring efforts in 2021 were nest cameras, loaned to Detroit Audubon by the Detroit Zoological Society. We were able to record 10 nests continuously using a one-minute time lapse setting. Unfortunately, some mats with nests floated completely out of view of the camera, confirming that the SCF mats can be highly mobile and can move surprising distances. Luckily, other cameras recorded chicks hatching and events that helped us understand both natural and unnatural causes of nest failure.

Eggs were eaten at two nests by native Northern Water Snakes, and another was recorded being completely washed away by a major storm surge. At another nest, mobile chicks had run off the nest in the morning. This is a common occurrence, especially among older young, but they still often return. However, in the late afternoon, this particular nesting mat was run over by a boat. Probably not coincidentally, this happened on July 5, likely a continuation of Fourth of July celebrations when many people are out on the water. This footage suggests that boater activity could contribute to nest failures, either by running over mats as happened in this case, or by creating a large enough wake to submerge eggs or chicks. Young chicks are especially vulnerable to the elements due to their soft down, which is not water repellent; thus wet chicks can get too cold and die. Both nests and chicks are incredibly well camouflaged, so increasing boater awareness may be an important step towards protecting breeding Black Terns in the future.

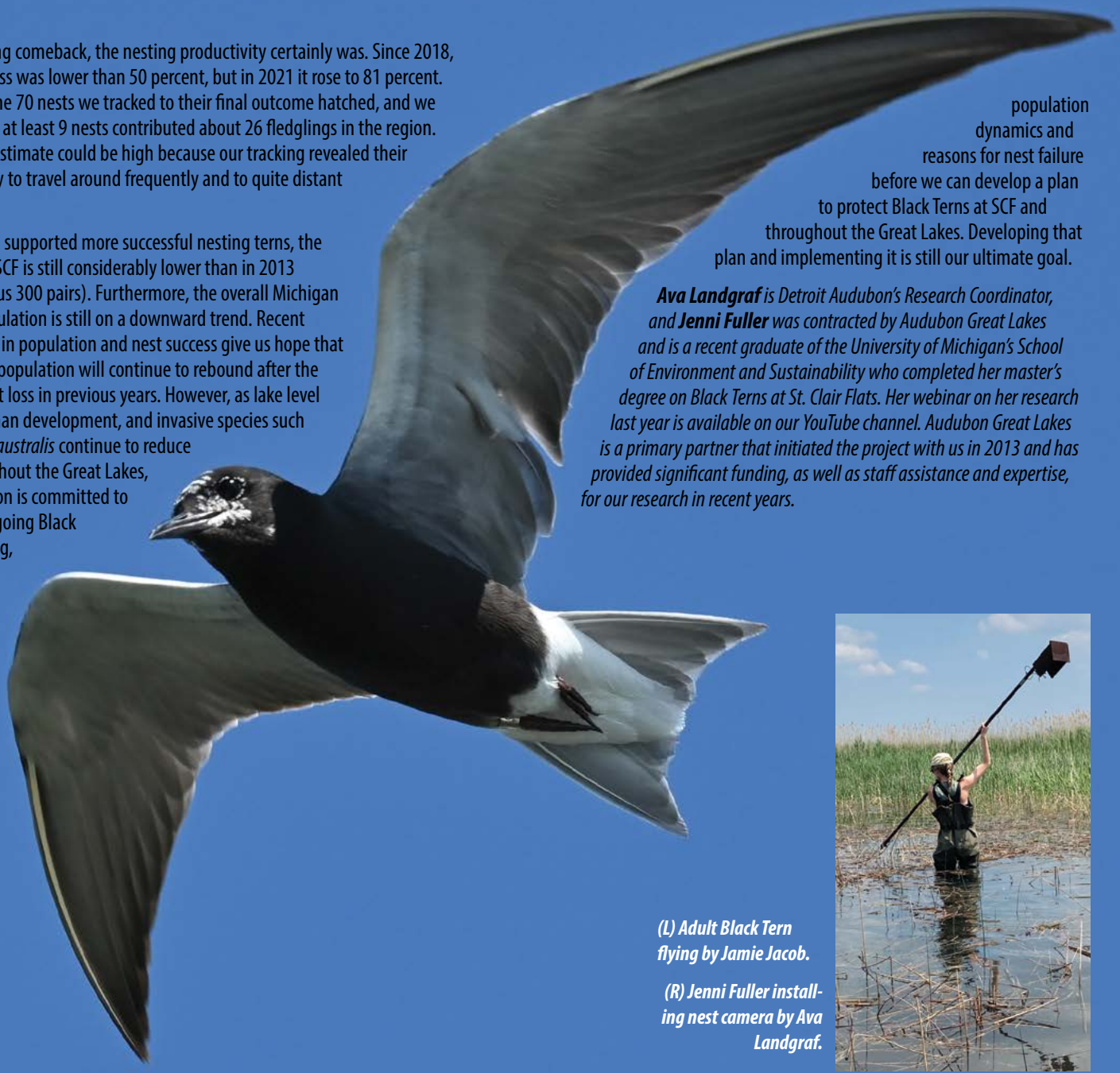
In 2021, we also continued deploying artificial nest platforms as a way to provide Black Terns with additional nest support. Despite the fact that many Black Terns chose to nest on debris in 2020, they surprisingly ignored nest platforms in the sparse remaining habitat. Still uncertain of their reception in 2021, we set out 12 nesting platforms to see if any terns would choose to use them. The platforms were left empty until mid-July. After several storms washed away or compromised the stability of large bulrush mats, three platforms were used by either late or re-nesting pairs, indicating that platforms were only of interest when mat availability diminished. Two of these nests failed, and we were unable to ascertain the outcome of the last nest. To date, we still have little data to support that man-made nesting platforms are a successful management strategy at SCF, but this merits continued research and potentially more site-specific designs.

Overall in 2021, we estimated that about 150 individuals (or 75 nesting pairs) returned to SCF, bringing the population closer to the counts in 2019. While

not a staggering comeback, the nesting productivity certainly was. Since 2018, hatching success was lower than 50 percent, but in 2021 it rose to 81 percent. Eggs in 57 of the 70 nests we tracked to their final outcome hatched, and we estimated that at least 9 nests contributed about 26 fledglings in the region. Our fledgling estimate could be high because our tracking revealed their uncanny ability to travel around frequently and to quite distant locales.

Although 2021 supported more successful nesting terns, the population at SCF is still considerably lower than in 2013 (about 75 versus 300 pairs). Furthermore, the overall Michigan Black Tern population is still on a downward trend. Recent improvements in population and nest success give us hope that the Black Tern population will continue to rebound after the marked habitat loss in previous years. However, as lake level extremes, human development, and invasive species such as *Phragmites australis* continue to reduce habitat throughout the Great Lakes, Detroit Audubon is committed to continuing ongoing Black Tern monitoring, research, and well-informed restoration and wetland protection efforts. There is still more work to do in order to understand Black Tern population dynamics and reasons for nest failure before we can develop a plan to protect Black Terns at SCF and throughout the Great Lakes. Developing that plan and implementing it is still our ultimate goal.

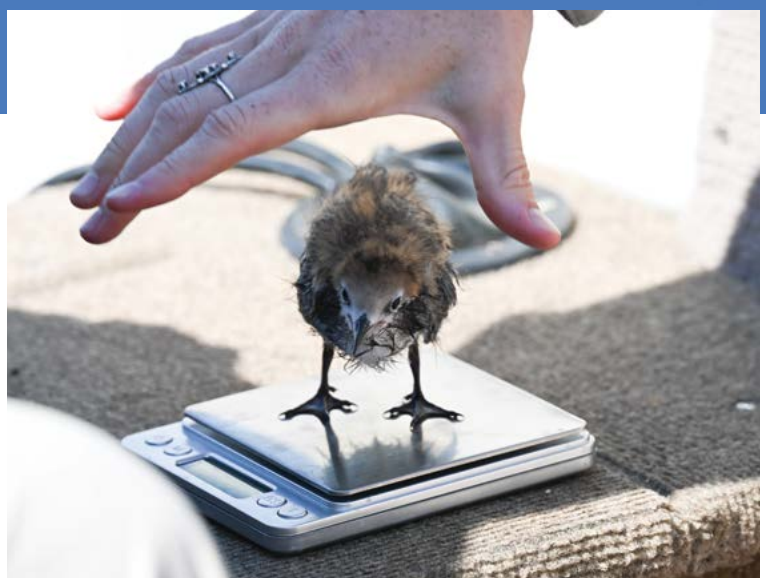
***Ava Landgraf** is Detroit Audubon's Research Coordinator, and **Jenni Fuller** was contracted by Audubon Great Lakes and is a recent graduate of the University of Michigan's School of Environment and Sustainability who completed her master's degree on Black Terns at St. Clair Flats. Her webinar on her research last year is available on our YouTube channel. Audubon Great Lakes is a primary partner that initiated the project with us in 2013 and has provided significant funding, as well as staff assistance and expertise, for our research in recent years.*



(L) Adult Black Tern flying by Jamie Jacob.

(R) Jenni Fuller installing nest camera by Ava Landgraf.

Three Black Tern chicks in a nest on floating vegetation mat by Jenni Fuller.



Black Tern chick being weighed prior to banding by Jamie Jacob

Black Tern Adventures

We took out Rep. Rashida Tlaib, her son, Adam, and her aide, Andy Goddeeris, to see our Black Tern research in action. She, Adam, and Andy were all thrilled and anxious to help. We hope to get other congressional representatives out to see our work as well. Rep. Tlaib was really excited about seeing young tern chicks being banded. She named the first one "Arthur," because she said, "He looks like an Arthur!" Her motherly instincts kicked in as she lamented that she didn't have a small fish or insect to feed him. When our research coordinator, Ava Landgraf, brought back two chicks from the next nest to be banded, Rep. Tlaib named the first one "Georgia," while Adam named the second one "Aqua" because he or she was found in pool of water on the mat and thus was little wet. Rep. Tlaib left even more excited about the work of Detroit Audubon and told us she'd help us find funding to support and expand our important work on behalf of birds and the environment we share!

(L-R) Rep. Rashida Tlaib, her son Adam, Ava Landgraf, and Jim Bull.

Rep. Tlaib takes care of little Arthur by Jim Bull.

Black Tern chicks Georgia and Aqua in Ava's hand by Jim Bull.

The Mighty … Acorn!

By Rebecca Minardi

Blue Jay flying with acorn in its mouth by Margaret Weber

Everyone knows that the mighty oak, the tree that elicits joy in all its magnitude, begins from the humble acorn. Acorns are the seeds of the genus Quercus, and of the over 500 species of oak around the world (with 90 just in the United States), a dozen species call Michigan home. These fall into two subgenera, white oaks and black/red oaks. Every oak tree produces acorns, the favorite seeds of children everywhere to collect in autumn. Across the species, acorns range from one to six centimeters long (from pea to gumball sized) and are all held in a small cup called a "cupule." Each acorn usually contains one seed, but it can rarely contain up to three. They take between six months to two years to mature depending on the type, and the crop varies depending on the year.

Many animals depend on acorns, which are high in the fat, protein, and minerals necessary to provide food to the oak seedling until it produces leaves for photosynthesis. Acorns are also often high in tannins that can be harmful to some animals and are quite bitter. Some species, such as jays, have evolved to learn that underground caches of acorns may lose tannins as ground water leaches them out over time. Caching is also what leads to new oak germination as acorns are too heavy to be moved by the wind or water. Many people believe this is why oak trees within proximity of each other "mast," or coordinate their seed production throughout the years. If all the oaks in the region make extra acorns one year, the squirrels and jays will likely be satiated with their cached acorns and forget many that are hidden. These lucky few are the acorns that get to sprout and become new trees. During mast years, neighborhoods with big oak populations can be daunting on a windy day; acorns zing and plonk across the ground like hail. I was recently enjoying lunch on a restaurant's patio while our daughter slept in my husband's arms; whenever the wind gusted, we shielded her head as acorns pinged around us.

Besides dodging acorns, humans can also enjoy eating them, preferably from the less bitter white oaks. To enjoy, acorns should be chopped and soaked through several changes of water until it remains clear. They can then be dried and ground into flour or eaten other ways. It's a lot of work, but this was a staple of American Indians' diets in California.

Here are acorns of six species of oak that can be found in Michigan. Keep your eyes peeled for the variety of acorn types you can find.

Eastern White Oak (Quercus alba Linnaeus): this tree's leaves have rounded lobes and it is common throughout the state. Photo courtesy of PxFuel.com.

Pin Oak (Quercus palustris Muenchhausen): this tree enjoys wet ground, has downward aiming lower branches, and makes small acorns. Photo courtesy of Chestnut Hill Nursery.

Northern Red Oak (Quercus rubra Linnaeus): this tree's leaves are wide with pointed lobes while its acorns are large with broad, flat cupules. Photo courtesy of PxHere.

Bur Oak (Quercus macrocarpa Michaux): the characteristic tree of oak savannas, its acorns have large woolly cupules looking like a tiny winter hat. By Dan Mullen, courtesy of Creative Commons

Swamp White Oak (Quercus bicolor Willdenow): this tree loves poorly drained sites and has large, shallowly lobed leaves. Photo courtesy of Tidewater Trees.

Below, Chinkapin Oak courtesy of Pixabay. (Quercus muehlenbergii Englem): with ridged edged leaves, this oak makes inch-long acorns that are sweet.

Young Cedar Waxwing

Rusty Blackbird Lake Erie Metropark

Red-eyed Vireo eating dogwood berries

The Birds of Early Autumn

Photos by Bruce Szczechowski

Juvenile Red-tailed Hawk in flight; note belly band.

Downy Woodpecker

Eastern Phoebe

Philadelphia Vireo

Ruby-crowned Kinglet, Lake Erie Metro Park

White-crowned Sparrow

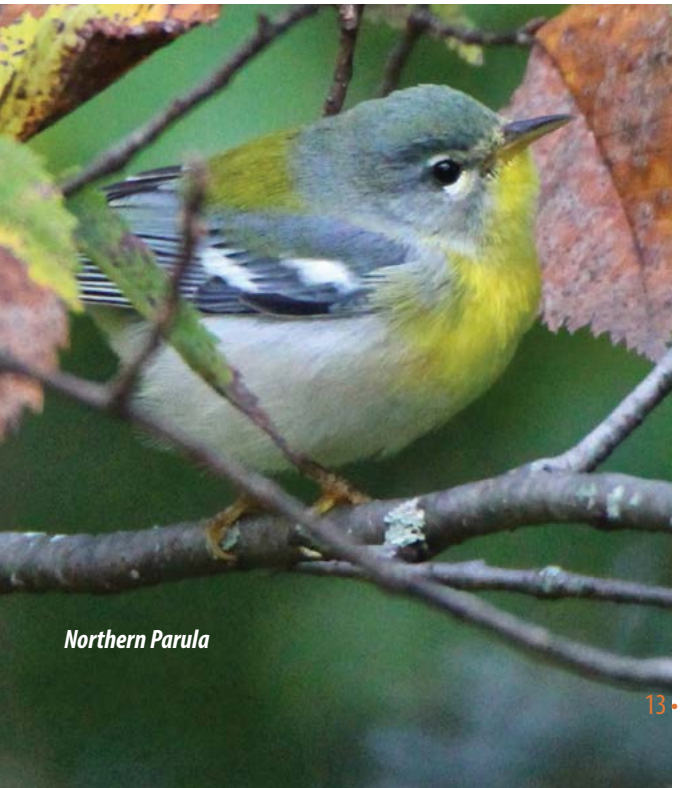
Blue-headed Vireo

Fall Warblers

Birders' favorite time of the year is unquestionably the first three weeks of May when our most colorful songbirds, the warblers, stop by to refuel on their way to their nesting grounds in northern Michigan and the boreal forest of Canada. Fall is a great time for warblers too, but they are not compressed into just three weeks as they are in May, and the males are no longer so colorful. Their bright colors in spring help them ward off other males from their territories and attract females. With breeding done for another year, bright colors are not only no longer necessary; in fact, they can be downright detrimental by making these birds more visible to predators. Subdued colors suit this season when survival, not reproduction, is in the forefront. These birds are still beautiful, but males often more closely resemble the subtle hues of the females. There is a whole section in the **Peterson's Field Guide to the Birds** *devoted to helping birders identify birds in fall plumage; it is aptly titled "Confusing Fall Warblers." Here's a selection of these beautiful songbirds in their less showy fall colors, all taken by master bird photographer Bruce Szczechowski unless otherwise noted.*

Bay-breasted Warbler by Jamie Jacobs

Black-throated Green Warbler



Northern Parula

Chestnut-sided Warbler in fall plumage

Common Yellowthroat fall female

Nashville Warbler

Tennessee Warbler

Cape May Warbler in fall plumage with dogwood berries

Monarchs feeding by Rebecca Minardi.

The Migrating Butterfly

by Rebecca Minardi

The summer I started raising a newborn (my son born in May) was the summer I started raising Monarch butterflies. My mother down in Ohio had been occasionally collecting caterpillars off her backyard's Common Milkweed after her landscaper had mentioned he did it. That's the way of these things: you know someone who marveled as a newly formed butterfly emerged from a chrysalis, and suddenly you're hopping fences to pluck milkweed leaves for your small brood of caterpillars. Once I started reading about the steep declines of Monarch butterflies across their wintering grounds and in coastal California, I felt compelled to do anything I could to increase the chance that each tiny egg becomes a butterfly.

You can't help but call out, "A Monarch!" whenever this iconic orange, black, and white butterfly graces your yard. Its range is actually quite large, and it can be found throughout the Americas and Caribbean, west to the South Pacific, and even occasionally in Europe. Of the three species of Monarchs, *Danaus plexippus* is the one we see in the United States. Though the eastern and western populations of this species typically function separately, they are still one species. The population east of the Rockies is the one that famously overwinters in Mexico (and Florida too), while the western population typically spends the winter on the California coast.

While breeding, Monarchs can be found in farmland, roadsides and fields, and residential areas, wherever there is milkweed. A little more about milkweed: there are dozens of species, but in Michigan Monarch caterpillars mainly eat Common Milkweed along with Swamp Milkweed and Butterfly Weed. Common Milkweed used to be everywhere in the corn belt of the Midwest, but with today's high herbicide use in both conventional farming and our yards, milkweed populations have drastically declined. Monarch butterflies can sip nectar from a whole host of plants, but they lay their eggs only on milkweed as that is the only kind of plant their caterpillars can eat.

The life cycle of the Monarch has four stages. After mating, the female Monarch lays eggs one at a time, usually on the underside of a milkweed leaf. After a few days, the egg hatches and a teeny caterpillar emerges. There are five stages of growth for the caterpillar (called "instars"), after each of which the insect molts. After about two weeks, the caterpillar attaches to a hard surface and hangs upside down in a J position for about a day. Now, I've seen the J position several times but never this next part which is like magic. The hanging caterpillar abruptly straightens out its body, and then its skin splits behind the head, revealing a beautiful pale green chrysalis that hardens over the next few hours into a thing of beauty. Nine to fourteen days later, the chrysalis becomes translucent (so exciting!) and the butterfly emerges, crumpled and wet. It hangs for a few hours to expand its wings and dry before flitting away on the hunt for nectar, mates, and milkweed. They only live about two to five weeks more, unless they are in the final migratory generation.

Monarchs migrate, and though they only weigh half a gram, they can fly up to 3,000 miles! Even more amazing is that their migration cycle covers four generations. This generational cycle is incredible:

Generation 1, the offspring of overwintering Monarchs in Mexico, hatch in early spring and head north to the U.S. They lay eggs producing

Generation 2 which emerges in June and July. The eggs they laid through late August (and into October in the south) hatch to produce

Generation 3. Some of the early hatchers of this generation lay eggs that produce

Generation 4, which does not reproduce until after overwintering in Mexico.

Generation 3 and 4 monarchs cluster *en masse* preparing to head south to Mexico on thermal currents, turning whole trees in staging areas like Pt. Pelee National Park in Leamington, Ontario orange and black. At their overwintering destination in southern Mexico's Sierra Madre mountains, the butterflies cluster by tens of thousands on oyamel fir trees, making the mountain forest shimmer with orange. The following spring, they mate and head north, laying eggs along the way.

As with many bird species, migration is fraught with peril, and there has been a large decrease in their limited overwintering habitat. Monarchs are in decline. It's difficult to know what the biggest problem is (milkweed decline, climate change, disease, habitat loss?), but Monarchs have suffered a devastating reduction in numbers in both overwintering populations (50 percent since 1997 in the west and a whopping 90 percent decline since 1995 in the east). In fact, the U.S. Fish and Wildlife Service said that close to a billion Monarchs have disappeared from their overwintering sites since 1990. It's awful.

So please, plant milkweed or just allow it to grow in your yard (this plant is tenacious). Support conservation organizations that protect the Monarch's Mexican overwintering sites. Slow down when one flits in front of your car. In fact, always slow down when you see a Monarch, because these beautiful insects will be gone by fall, soaring south to rest before beginning their life cycle anew.

Monarchs roost at Point Pelee National Park ©Parks Canada by Jim Flynn.

Supporter Spotlight: Jerry Jung

By Jim Bull

In 2015 a large check came in from new donor, Jerry Jung. I called him up to find out more about him and how he came to donate to us. We had a wonderful conversation for almost an hour. When he told me that one of his passions was restoring prairies, what he calls "eco-restoration," on 40,000 acres of farmland he owns in Michigan, Tennessee, and Iowa, I put him in touch with Diane Cheklich, our Conservation Committee chair, who was just in the beginning stages of putting together our Detroit Bird City project to turn five small Detroit city parks into native prairies or "intentional meadows." (See article on page 3.)

(L-R) Derek Sederlund and Jerry Jung at a Detroit Bird City park by Diane Cheklich.

After they met a few times, the three of us met for lunch, and conversations and partnerships grew from there. In addition to investing his funds into helping Detroit Audubon achieve its mission, Jerry has donated the time and talents of Derek Sederlund, a big-equipment operator who does a lot of work on Jerry's farms, to help establish the meadows at Detroit Bird City parks. Derek has removed old concrete slabs, ripped up turf grass, plowed the ground to prepare it for seed, and then mechanically planted the native prairie seed mixture donated by the U.S. Fish and Wildlife Service. These in-kind donations allowed us to repurpose many of the grant funds from National Geographic, which were originally designated to prepare the sites and buy the seeds, to instead provide interpretive signs, benches, and other amenities to help folks enjoy these oases of green nestled into the urban landscape.

Jerry graduated summa cum laude and Phi Beta Kappa with a degree in economics from Tulane University. For over 20 years, he was CEO of Michigan Caterpillar, which sells the kinds of big equipment that Derek uses to prepare the ground at Detroit Bird City parks. Jerry founded Oak Adaptive, a company that provides software to Caterpillar dealers, and Landfill Energy Systems, which harvests methane produced by decomposing garbage in landfills to generate electricity. A past president of the Michigan Construction Equipment Dealers Association, he also chaired of the Michigan State Transportation Commission for five years.

He serves on the boards of the National Wildlife Federation and the Michigan League of Conservation Voters, and is a past board member of the Michigan Nature Conservancy. He chairs the Michigan Colleges Alliance board, a group of 15 private colleges in Michigan, and serves on the board of the Public School Academies of Detroit.

Jerry is a visionary, a person who gets things done—lots of things done, and does them all very well. And he is extremely passionate about conservation work and equity for minorities. He agreed to sit down with me for a telephone interview recently.

I first asked him what led to his passion for conservation and environmental sustainability. Without hesitation he credited his biology teacher at Seaholm High School in Birmingham, Michigan. "She took us on field trips to the University of Michigan's Matthei Botanical Gardens, to area wetlands and other habitats. That's where my love focused on nature, both botany and zoology."

During part of the pandemic in the spring of 2020, Jerry spent much of the time on his boat cruising around the Caribbean. One day I got a call from Jerry, just bubbling over in excitement—a Kirtland's Warbler had landed on his boat to rest up a bit during a storm. He knew of my passion for the bird and just couldn't wait to tell me. He has reminded me of that story several times, and I love to hear it every time!

The one issue he is most passionate about is stopping ethanol subsidies. In fact, he is the founder of a nonprofit organization called Rethink Ethanol. Why is he against ethanol? "It is highly subsidized and mandated and given a green label so people think it is good for environment, but it is not. First, we are destroying 70 million acres of native grasslands to grow corn and using lots of chemicals that are polluting waterways. The worst of it is that it takes more energy to produce ethanol than it yields. This is affecting grassland birds—Eastern Meadowlarks are in trouble and so are Monarch butterflies. And it has caused food prices to rise as we've taken 40 percent of our land out of food production to grow corn for ethanol. It drives the destruction of the remaining rainforests, which are also being converted to corn for ethanol, and it only works economically because of the government subsidies. Those need to stop." Then he added, "It is not farmers who are benefiting from those subsidies but chemical and fertilizer companies." For more information on his take on the issue, go to **RethinkEthanol.com**.

Finally, I asked Jerry why he supports Detroit Audubon. He said it is because he loves nature and Detroit Audubon does too, and because Detroit Audubon is "extremely active at the grassroots level and in doing ecological restoration. Too many national organizations are infiltrated with pro-biofuel corporate interests. Local organizations like Detroit Audubon are free from that and thus more helpful to the environment."

We are lucky to have Jerry Jung as part of our Detroit Audubon family!

Lizards of the Great Lakes Region

by Jim Bull

Most people would not have Michigan top-of-mind if they were asked where they might find lizards. They might think of Arizona for the colorful and large Gila Monster, or southern Florida for the Common Anole (mistakenly called a chameleon) that is often found on the walls in houses as they patrol for mosquitoes. You may think of Marine Iguanas guarding the rocks on the shores of the Galapagos Islands, Komodo Dragons in Indonesia, or horned lizards in the deserts of the southwest U.S., or one of the many lizards of the Amazon rainforest. But Michigan? The Great Lakes region?

Slender Glass Lizard by Todd Pierson. Courtesy of Creative Commons. Attribution-Non-Commercial ShareAlikek 2.0 Generic (CC BY-NC-SA 2.0)

Yes, Michigan (to coin a slogan, wink wink)! We haves two species of native lizards in our fair state: the Five-lined Skink and the Six-lined Racerunner. Just over the border in northwest Indiana in Lake Michigan dune country, Six-lined Racerunners are very common, and there is one other amazing species, the Glass Lizard.

Before describing these species, it is important to understand what they are and what they are not. One person posting on the Michigan Department of Natural Resources website insisted she had seen "blue-spotted ones under logs in a nearby woods." Those would be salamanders, not lizards. Salamanders, with their smooth skin, are amphibians closely related to frogs, while lizards have scaly skin more akin to snakes. But lizards also are not "snakes with legs." There are several differences, but one that stands out to me is that lizards have ears—holes on either side of their heads well to the rear of the eyes—while snakes have no ears at all, and thus can only feel vibrations.

Five-lined Skink by Ray Churchill

FIVE-LINED SKINK (*Plestiodon fasciatus*)— is Michigan's most abundant lizard. Adults are black, are five to eight inches long, and have five yellowish stripes running down their backs to their tails. The ground color in juveniles may be brown. Females have blue tails while males' stripes may be faded or nonexistent. They are found in every county in the Lower Peninsula, and in the center of the Upper Peninsula.

They prefer woodlands with grassy openings or field edges, which can either be wet or dry. Unlike salamanders, amphibians which like to hide under logs, Five-lined Skinks like to be on top of the logs, basking in the sun to warm up their cold-blooded bodies.

Males are territorial and chase off other males, while females are not. The female lays 5 to 15 eggs under a log. She curls her body around the eggs, protecting them until they hatch, turning them, cleaning them, and discarding rotten eggs. She may even protect the hatchlings for a while as well.

They feed on insects, spiders and other arachnids, and have been observed eating small fruits and berries.

While they are found in every county, they are not evenly abundant. I have never seen one in the wild. From the Michigan DNR website, the Houghton Lake area seems to be an extra good spot for finding them. Bruce Szczechowski tells me he's seen lots of them in a garden with rocks in front of a golf course at Houghton Lake.

SIX-LINED RACERUNNER (*Aspidoscelis sexlineatus*)—This 6 to 10 inch-long lizard is greenish with yellow stripes and is more slender than the skink. It likes a drier open habitat than the skink which includes sand dunes, rock piles, and shrubby places. They feed on insects, arachnids, and other invertebrates, and stick out their tongues smelling in a similar way to a snake. Females lay two to eight eggs in an underground burrow, but do not care for the eggs or the young.

This species is only known from one county in Michigan: Tuscola County in the Thumb. However, I worked for almost six years at Indiana Dunes National Lakeshore on the southern shore of Lake Michigan, and they were abundant there. In fact, it would be rare on my walks in the dunes in the warmer months to not see at least one, and usually I saw several. Each time, they always made me smile.

They are fast and thus almost impossible to catch. I know, because I've tried catching them so we could put one on display at our interpretive desk in the bathhouse, but I was unsuccessful. Felix, a graduate student, studying frogs and toads of the dunes, did catch one for me that we kept for about two months, then released. While the only spot they have been confirmed in Michigan is clear on the other side of our state, in the Thumb, I wouldn't be surprised if one day they show up at Warren Dunes State Park, just over the border from Indiana! Their range also includes some of Wisconsin. The Michigan DNR wants folks to report any sighting of this species.

SLENDER GLASS LIZARD (*Ophisaurus attenuatus*)—There are no confirmed records for Michigan, but I have seen it twice at Indiana Dunes National Lakeshore in northwest Indiana on the southern shore of Lake Michigan, so it is in the Great Lakes area and is close enough to the Michigan-Indiana border that it could show up here one day. It is just too cool to not mention! This lizard is a long one; 22 to 36 inches long! Its head and body are usually no more than 12 inches long; the rest is all tail. It has long tan bands or stripes bordered by narrower black stripes running the length of its body. And here's the weirdest part—it has no legs!

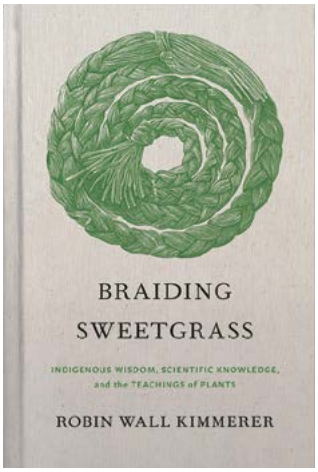
Let me tell you about my first encounter with this beautiful, yet strange being. I was driving on a road near Indiana Dunes State Park when I saw what looked to be a snake writhing in the road. It was not getting anywhere. I stopped to investigate, and realized it didn't look like any snake I'd ever seen. I took several photos and then decided to pick it up to look at it more closely. It was like a rigid piece of hard plastic and very muscular—it was not easy to keep holding it with it pushing against me with such strength. Smooth and slick, and gleaming, I could tell this was no snake. The head was not a snake head, it had ear holes, and a long longitudinal slit for most of the length of its body to allow expansion of its lungs in what was a very rigid body. It was this weird legless lizard. It was having such trouble making any headway on the road because it has no scutes like a snake. (These are the scales on a snake's belly that are rectangular and attach only on one long edge. The other unattached edges push against the ground to move a snake forward.) In the grass or leaves the glass lizard does fine, but on the smooth pavement it was pretty helpless. After a few more photos, I released it into the woods on the side of the road. I had one more encounter with this species near this same spot—another one that got onto the road and couldn't get off.

Their bodies are hard and rigid due to osteoderms ("osteo" means bone and, "derm" means skin), which are bony deposits in the scales that are embedded in the dermis layer of the skin. They are found from Texas up to Illinois, Wisconsin and northwest Indiana, and south to the tip of Florida. There are two subspecies: eastern and western. The one we have in the Great Lakes area is the eastern.

Their diet includes lots of insects, especially grasshoppers, but can include small mammals, snakes, and other lizards. As if this species isn't weird enough, ilt has one other bizarre characteristic: it can break off its own tail to get away from a predator. The predator doesn't even have to touch it. That's not all. The broken-off tail writhes back and forth, often distracting the predator, while the business end of the lizard slithers away quickly. They can move very fast, by the way! Unfortunately, once broken, the new tail is much shorter when it grows back. Experts say that a large percentage of individuals of this species have tails that have been broken off. Both of the ones I saw had very long tails intact. How can you tell what is tail and what is not? The tail begins just beyond the anal opening.

Ain't nature cool?

Six-lined Racerunner by Carole Carnovale



Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants

By Robin Wall Kimmerer • Milkweed Editions • Book review by Emily Simon

Readers looking for a measure of hope for our planet would do extremely well to read Robin Wall Kimmerer's book **Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants**. It is magnificent. Superlatives fail in light of the depth, breadth, eloquence, and humility of this beautiful collection of essays, which Kimmerer offers as "a braid of stories meant to heal our relationship to the world."

Kimmerer is SUNY Distinguished Teaching Professor of Environmental Biology and the founding director of the Center for Native Peoples and the Environment, whose mission is to create programs that use both Indigenous wisdom and scientific knowledge to create sustainability. An enrolled member of the Citizen Potawatomi Nation and holder of a Ph.D. in botany, she has sought to blend the teachings of her Indigenous culture with academic science throughout her education and career.

Healing our relationship to the world is an ambitious goal, and Kimmerer is more than up to the task, showing how Indigenous teachings could help us begin to mend our destructive habits. Restoration requires a reorientation of how humans relate to other life forms as well as to the land itself. This entails seeing other living things—both plants and animals—as coequal members of the living community, each with gifts to offer and responsibilities to all other members. It means viewing the land as our common home. In "Learning the Grammar of Animacy," for example, Kimmerer points out that the English language lacks a way to recognize other living things as persons. Referring to beings using the objectifying pronoun "it" allows mindless exploitation of our fellow inhabitants of the earth.

Other pieces reflect on reciprocity and the need for maintaining a sense of gratitude for all the earth provides in maintaining life. In "The Gift of Strawberries," she describes a worldview born of a gift and reciprocity mindset rather than one of scarcity and commodity. "Maple Nation: A Citizenship Guide" is an eloquent catalog of the importance of the Maple tree's contributions to New England life, not only timber and the region's iconic syrup, but shade, soil, windbreak, bird habitat, wildlife cover, tree forts and swings for kids, and air and water purification. We are asked to be as good a citizen, using our voices to protect these trees, which, if climate change is not slowed, will be extirpated from New England altogether within the next 50 years. The essay "Allegiance to Gratitude" alone is worth the price of the book.

"The Sacred and the Superfund" is one of the most hopeful pieces in the book. It expounds perhaps most directly on the need to redefine our relationship to the land. Recounting the almost unbelievable extent of the pollution and subsequent efforts at restoring Onondaga Lake, near Syracuse, New York, Kimmerer notes how environmentalism has become synonymous with dire predictions, powerlessness, and despair. The antidote to this despair, she says, is the concept of restoration. "Restoration offers concrete means by which humans can once again enter into positive, creative relationship with the more-than-human world, meeting responsibilities that are simultaneously material and spiritual." What this looks like depends on how we view our relationship to the land. "If land is just real estate, then restoration looks very different than if land is the source of a subsistence economy and a spiritual home. Restoring land for production of natural resources is not the same as renewal of land as cultural identity." Imagine what could happen if people took up the banner of restoring our land, seeing possibilities rather than defeat.

Kimmerer seamlessly weaves into the collection many stories from her own life along with accounts of the devastating catastrophes faced over four centuries by the Native peoples of North America, including her own family from the Potawatomi. Soldiers forcibly marched her ancestors, who once lived near Lake Michigan in Wisconsin, on the "Trail of Death" first to Kansas and then to allotments in Oklahoma. Her grandfather was removed from his family at age nine to the Carlisle Industrial Indian School in Pennsylvania, where Indian children were trained to speak English, forget their families, language, and heritage, and assimilate into the dominant culture. Amazingly, the heartbreaking stories presented are also studies in healing and resilience.

The theme of motherhood also runs strongly through **Braiding Sweetgrass**. Left to raise her two daughters alone, Kimmerer parallels her diligent efforts to make a home for her girls with her felt sense of the earth's continual nurturing and care years later as she becomes an empty nester. Her maternal nature carries over into the stories about her desire to pass on her love and appreciation for the natural world through her teaching. One of them, the remarkable "Sitting in a Circle," shares experiences during an outdoor course helping students discover all the ways cattails can provide for their needs, both physical and spiritual.

Originally published in 2013, **Braiding Sweetgrass** reached the ***New York Times*** bestseller list in January 2020, after Milkweed Editions reissued the hardcover version (pictured here) in celebration of the nonprofit publisher's 40th anniversary. Kimmerer explained in a SUNY online news release interview, "[A]ccording to the booksellers, people come in . . . and buy a copy because they've heard about it. Then they're back in a week or two to buy a stack because they want to give them to people. And that's how the book is moving. . . . It's people connecting to it and saying, 'Yes, this. This! And I want to share it with others!'"

The audiobook, which Kimmerer reads in her gentle maternal voice, is also a treat. It's a great way to hear the pronunciations of the numerous Native words used throughout. The ebook may also be a good option if you wish to be able to search back through content since there is no index. Kimmerer has also done a TED Talk and appears in numerous online interviews and presentations.

Braiding Sweetgrass is a powerhouse of a book—complex, finely crafted, and memorable. Its concepts make you feel as though you are reading something completely new and, at the same time, like you are coming home, finally recognizing what you knew deep down all along. What has been mentioned here barely scratches the surface of the book's riches. Be forewarned that you may need to put it down frequently to savor and contemplate it.

Kimmerer feels a serious responsibility for making Indigenous principles widely known. "[It] is often said in Native communities that . . . it was so important we hold tight to those teachings because there would come a time when the world would need that which they tried to eradicate," she noted. "One can imagine that those times are now."

Braiding Sweetgrass—a second review of an important book

By Jim Bull

Elizabeth Gilbert called it "a hymn of love to the world."

Orin Gelderloos, professor emeritus of ecology and founding director of the Environmental Interpretive Center at UM Dearborn wrote, "I rate it as the modern equivalent of Aldo Leopold's conservation classic, **A Sand County Almanac**."

I wrote in the margin of one chapter, "She paints vivid evocative emotional pictures with the paintbrush of her words and phrases. Inspiring! It is written in prose, but it's really poetry!"

Kimmerer begins her book with an indigenous story about how North America began. It is about Skywoman, who one day falls to earth. The animals dive down to bring up soil to place on turtle's back so Skywoman has a place to rest. She then plants seeds she brought as a gift, turning the earth green as her thanks for the kindness of the animals. Kimmerer writes, "When we braid sweetgrass, we are braiding the hair of Mother Earth, showing her our loving attention, our care for her beauty and wellbeing, in gratitude for all she has given us." Children hearing this story from birth, she writes, know in their bones the reciprocity between people and the earth.

Stories like this, Kimmerer tells us, "hold our beliefs, our history, our relationships" telling us not just of the past but helping us figure out how to move forward as well.

In Western culture, we think of people as the pinnacle of the natural order, having "dominion" over all. In indigenous thought, humans are acknowledged as the most recent arrival and thus the youngest members of the community of life, the least experienced, and the ones with the most to learn. Trees and other beings, which have been around much longer than our species, are our elders. They are our teachers, Kimmerer writes, if we would only learn to listen and to pay attention.

Read her chapter "Witness to Rain," and you'll never look at water the same way again. She describes becoming one with the Oregon rainforest. "Here in the rainforest, I don't want to just be a bystander to rain, passive and protective; I want to be part of the downpour, to be soaked. . . I want to feel what the cedars feel and know what they know."

Immersed as she is in the wetness of the rainforest, Kimmerer notices that water droplets on the moss hanging from a branch in front of her look bigger to her than the drops flowing to the tip of her own hair and then falling to the forest floor. But aren't all water drops the same? She wonders if this is an illusion, until she decides to do an impromptu experiment; water drops on moss turned brown like tea from decaying leaves are larger and heavier than pure drops of dew. She dips a plant into what she calls "alder tea," brewed as leaves give off their brown tannic acid, and another into a pool of pure rainwater. The pure water forms small drops that "are in a hurry to let go" while the drops of alder water "grow large and heavy, then hang for a long moment before gravity pulls them away. . . aha," she tells us. "Paying attention acknowledges that we have something to learn from intelligences other than our own. Listening, standing witness. . . creates an openness in which the boundaries between us can dissolve in a raindrop."

In her chapter "Goldenrod and Asters" she writes about losing her indigenous ways and then finding her way back. It started in her freshman Botany Department intake interview to study at a university. She told the university adviser about how she had collected seeds and pressed leaves all her life, continually identified new species, that she knew a lot about plants and their habitats, how much she enjoyed studying plants, how much she had learned, and then added that she "wanted to learn why asters and goldenrod looked so beautiful together." The adviser frowned and told her that was NOT science, but he would put her into introductory botany where she'd learn the difference; and she needed to learn the difference. Kimmerer writes that she later realized that it was an echo of what happened when her grandfather was taken away from his parents and sent to "Indian school," to be stripped of his language, culture, and family." There was one major difference—the college didn't cut off her hair. Some consolation.

Later, as a Ph.D. student, she was invited to join a group of native elders to hear a Navajo woman talk about traditional knowledge of plants—including not only the names, but what other plants like to grow with it, what birds used it for nesting material, and so much more. She later learned that purple and yellow are complementary colors—that if you stare at yellow, for instance, then look away to a white wall or piece of paper, you will often she a shadow image in purple; and if you stare at purple, you see yellow when you look away. Turns out bees see these colors much the same way as humans, and that research has shown that when goldenrod and purple asters grow together, both receive more pollinator visits. Is this why they look so beautiful together? Being beautiful together in the eyes of humans and apparently of bees works. It is a thin veneer on a much deeper structure, like the tip of an iceberg.

Kimmerer suggests that maybe science and indigenous knowledge are complementary colors as she opines that, "We see the world more fully when we use both." The indigenous way is to fully understand something only when it is apprehended by four aspects of our being: mind, body, emotion, and spirit. . . (and that) Science uses mostly one and maybe two at times. It takes a full human being to apprehend the beauty and truth of our 'good green earth.'" Then she adds that comprehending this beauty that comes from blending science and indigenous knowledge evokes in her the indigenous sense of reciprocity: the need to "make something beautiful in response."

In the book's introduction she tells about asking her ecology class about human interactions with the environment. They could think of many negative ways that happens, but most could think of no positive ways people relate to their environment. She asks, "How can we begin to move toward ecological and cultural sustainability if we cannot even imagine what the path feels like?"

Detroit Audubon's president, Rochelle Breitenbach, and I have had many discussions over the years about what is the key to growing an organization like Detroit Audubon, and we always agreed it is about cultivating and nurturing relationships. "Relationships" is the key word for Kimmerer too, but she broadens it beyond humans to relationships with other living things and the abiotic environment as well (water, rocks, soil, air). Being in a healthy relationship according to Kimmerer includes honoring each other, and also giving to each other. That is so missing in our science and business oriented society. And it is the missing puzzle piece that is sorely needed.

This idea that humans have no beneficial effect on ecosystems has some important consequences. Turns out that many plants and indigenous cultures have evolved together and that certain of these plants, like sweetgrass and wild rice, do better when humans are in the picture in a good way, harvesting but also giving back.

In "Sitting in a Circle" her students, who are in the wilderness for five weeks in a required biological station experience, brainstorm a list of human needs, then head out to a cattail marsh to harvest this plant and see how many needs they can meet with them. They really get immersed in the marsh, jumping out of their canoes and wading in up to their waists, and as one student said, "becoming one with their inner muskrat." They wind up building a shelter, mats to sleep on, and prepare meals using the tubers, flour from the pollen, and eating buds like corn on the cob. Wetlands, Kimmerer reminds us and her students, are some of the most productive ecosystems on earth, but that very fact has led to the loss of almost 90% of them.

Kimmerer writes that her students have gotten used to the preharvest ritual in which she asks the cattails in this case for "their kind permission for digging." She continues, "I ask if they will share with these dear young people what only they can give, their physical bodies and their teachings. I'm asking for something more than roots, and leave a little tobacco in return." A student named Claudia then speaks to the group, "I think it's great to ask the plants if we can take them, and give them tobacco, but is that enough? We're taking an awful lot of stuff. . . we just took all this stuff without paying for it. . . When you really think about it, we just shoplifted the swamp." The students brainstorm what they can give back in return. There are lots of ideas: joining an environmental organization, boycotting fertilizer for their lawns, weaving coasters from cattails to be used as presents to friends and family to remind them to love wetlands, and the list goes on. Kimmerer admonishes us, "This is our work, to discover what we can give," asking if the ultimate goal of education isn't to learn what our gifts are and how to use them to "do good in the world."

One gift I recommend giving yourself, and then using to gift others, is to read and heed the inspiring message of this book, or as Elizabeth Gilbert called it, "a hymn of love to the world."

So Long, Senator Levin

Birds and the Environment Are Better for His Service

By Jim Bull • Photo courtesy of Creative Commons

It was with great sadness that I opened up the Detroit Free Press on July 30 only to learn that Sen. Carl Levin, an amazing public servant and staunch conservationist, passed away on July 29. Detroit Audubon gave him its Conservationist of the Year Award when he was still serving on the Detroit City Council for initiating several environmentally friendly initiatives, including a Detroit ordinance protecting and prohibiting trade in endangered species. In the U.S. Senate he did support the auto industry's position on emission standards, but name any other environmental piece of legislation and you'll find he was strongly behind it.

Senator Levin was an extraordinarily decent man. I treasure the few times I was able to meet and talk with him in person; I just wish there could have been more of them. The last time we talked was at Shimmer on the River in 2019. He was excited to tell me he was becoming a birder and was interested in going on some Detroit Audubon field trips. He told me he was fascinated with a large gathering of birds he saw recently out west. I was sorry I couldn't help him identify those birds. His wife couldn't remember the name of the birds either, but she did tell me about a book they both loved, **The Genius of Birds**, which I not only immediately ordered and read, but wrote a book review of it for the *Flyway*. Rest in peace, Sen. Levin; —you worked so hard, and left this world a much better place because of your tireless efforts! I'm sure the birds and other creatures we share this planet with thank you too!

A spider and sunset over Grand Lake by Bruce Szczechowski

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