



Michigan Raptor Migration Teaching Network Resources Toolkit for Educators

This document is a collection of resources available to formal and non-formal educators to help connect audiences to the wonders and magic of raptors. Resources are separated into various categories like ready to use curricula, useful websites, citizen science efforts, extended learning opportunities, identification tips, and raptor legends/lore.

The Michigan Raptor Migration Teaching Network supports educators with resources that are easily attained to engage students. This network also builds a community for educators interested in raptors, migration, birding, conservation and more. The Michigan Raptor Migration Teaching Network advocates raptors as readily available natural subjects found throughout the hemisphere that can engage learners in many topics. Raptors offer educational lessons applicable to many subjects and disciplines. Raptors are birds that are dramatic, fascinating, and breathtaking. Raptors can spark learning engagement multiple ways without limits.

Raptors have long been revered, hated, and often misunderstood. They are athletic birds that possess phenomenal traits. Falcons fly wickedly fast. Eagles are acrobatic yet graceful aerialists. Ospreys are skillful hunters able to see fish underwater with pinpoint precision. All raptors are devoted parents. These birds have captured our imagination. We recognize them for their strengths and fortitude. The Bald Eagle for example is the National Bird of the United States. It was selected as the national emblem by Congress in 1782. It is a bird that has been admired for centuries in America by many cultures. Its feathers and body parts appear in prehistoric settlements of Native American peoples.

When the Bald Eagle was designated as the National Bird of the United States, it was commonly found across the continent. This large raptor with its striking features including a white head and tail against its black body and wings that are attained by its 4th or 5th year of life was a bird that everyone knew. Primarily a fish-eating eagle, the Bald Eagle is also known to scavenge prey items for meals. This habit caused conflict for the Bald Eagle with certain populations. In the two hundred years after the Bald Eagle was selected as the National Bird of the United States, its population fluctuated. By the mid-1900's Bald Eagles were increasingly rare. In 1978, the Bald Eagle was listed as an endangered species under the Endangered Species Act of 1973

Like other raptors, Bald Eagles have been persecuted for their hunting skills. In 1917, bounties were placed on Bald Eagles to counteract the depredation of the Salmon fisheries and fox farms in Alaska. Some farmers raising cattle and sheep view raptors as threats to their lives and economic wellbeing. As a result, raptors have mixed public reputations. This duplicity has caused profound consequences to the long-term survival of raptors. Misunderstandings and false perception demonstrate the importance of education to ensure that these majestic birds can continue to thrive and grace the skies.

Look up and be amazed by these top avian predators. Remember the Bald Eagle became the National Bird because it was an emblem of democracy and freedom. Today this raptor also represents wilderness and environmental ethics. The effort to restore Bald Eagle populations to their former status is due to the public's concern for the environment and the majesty of Bald Eagles.

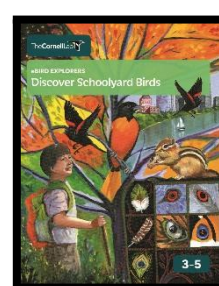
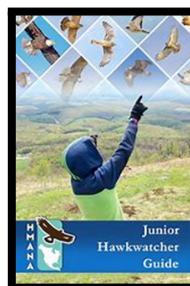
This document is prepared through the Michigan Raptor Migration Teaching Network led by Josh and Kara Haas.

Raptor Lessons:

Several organizations provide curricula to engage students and youth to learn about raptors. This table has a list of some of the well-known groups dedicated to supporting birds, conservation education and science. Some of these groups are over 100 years old and were formed at a time in America when birds of prey were disappearing. In considering lessons and curricula to use with your groups, always select organizations associated with universities and others with long-trusted reputations like the National Audubon Society. Other reputable groups include government agencies and non-profit organizations involved with research and conservation.

Name	Source	Gr. Level	Description	Link
Raptors	National Audubon	3-5	Supplementary curricula about raptors	AA_Raptors_final.pdf (audubonadventures.org)
Audubon for Kids	National Audubon	3-5	Several quick guides on various bird groups and topics like raptors.	Audubon for Kids Nature Activities, DIY, Lessons for Home Audubon
Jr. Hawk Watchers' Guide	HMANA	1-12	A guide that can provide multiple lessons about hawks.	HMANA-Junior-Hawkwatcher-Guide.pdf
Black Vulture Movement Ecology	Hawk Mountain	6-8	Tracks the movement of non-migratory raptor using satellite imagery and more	Curricula Hawk Mountain Sanctuary: Learn Visit Join
Eco Profile Broad winged Hawk	Hawk Mountain	9-12	Incorporated technology in the classroom. Need to check on permission	Curricula Hawk Mountain Sanctuary: Learn Visit Join

Life cycle of American Kestrel	Hawk Mountain	1-8	Observations of nest cam with journaling and predictions.	Curricula Hawk Mountain Sanctuary: Learn Visit Join
Raptors of Hawk Mountain	Hawk Mountain	All ages	An informational coloring book of 16 raptor species seen at Hawk Mountain.	The Raptors of Hawk Mountain Hawk Mountain Sanctuary: Learn Visit Join
Lesson Plans from Hawk Mountain	Hawk Mountain	K-12	Classroom lesson plans pertaining to the raptors seen at Hawk Mountain	Lesson Plans Hawk Mountain Sanctuary: Learn Visit Join
Feathered Friends	Cornell K-12	K - 5	General lessons about birds.	Feathered Friends – K-12 Education (cornell.edu)
The Basics of Bird ID	Cornell K-23	K-8	Lessons and activities to incorporate eBird and Merlin into bird identification.	Week 5: Bird ID - Google Docs
Wildlife Cams	Cornell k-12	All grades	Techniques and methods to use wildlife camera as part of your curricula.	Spark Student Curiosity Through Wildlife Cams Guide – K-12 Education (cornell.edu)
Beaks	Cornell K- 12	K-5	Supplement about adaptations of beaks	Beaks! – K-12 Education (cornell.edu)
Bird Superpowers	Cornell K-12	K-8	General workbook about extraordinary skills that birds possess to survive. Not specific to raptors but they are included.	Week 14: Bird Superpowers - Google Docs
Students as Scientists Guides	Cornell K-12	K-5 & 6-12	Free downloadable guides with activities to promote critical thinking and observation skills	Students as Scientists: Nature-Based Inquiry – K-12 Education (cornell.edu)
Games that teach and spark imagination	Cornell Lab Bird Academy Games	1-12	Several online games that challenge kids' thinking and test knowledge. Some with teacher resources.	Games Bird Academy • The Cornell LabBird Academy • The Cornell Lab (allaboutbirds.org)



Useful Websites:

1. **Mi Raptor Migration Teaching Network** – a collection of resources along with a community of educators supporting authentic learning options for students throughout the Great Lakes. The Junior Hawk Watcher's Guide is available to

classrooms and much more. The MI Raptor Teaching Network is associated with the Hawk Migration Association of North American. - [HMANA Junior Hawkwatcher Program](#)

2. **Cornell Lab K-12** – the educational staff at the Cornell Lab of Ornithology work with teachers/educators to support bird curricula at schools, homes, clubs, and camps. Cornell Lab K -12 offers webinars, classes, online support, and educator's retreat. [About Us – K-12 Education \(cornell.edu\)](#)
3. **All About Birds** – is an online guide to birds and birdwatching. All about birds has quick and easy to access information about birds to help with identification. This website can be a springboard to start research on hawks. It is highly visual and compares similar species. A must have resource for every classroom - [Online bird guide, bird ID help, life history, bird sounds from Cornell All About Birds](#)
4. **All About Birds – Bird Cams**. This website places video cameras to monitor the nesting of species of birds including raptors. At the Cornell Campus in New York, the nest cam evaluates the potential with the FAQ from the Red-tailed Hawk. This is one of the many Nest Cams - [Cornell Lab Bird Cams | Cornell Lab Bird Cams Cornell Lab Bird Cams \(allaboutbirds.org\)](#)
5. **All About Birds** – article about teaching ornithology in high school -[Perspective: Let's Start Teaching Ornithology in High School | All About Birds All About Birds](#)
6. **Hawk Mountain** – Curricula, lesson plans, ongoing annual hawk counts, a global raptor conservation center and much more. [HAWK MOUNTAIN SANCTUARY | Hawk Mountain Sanctuary: Learn Visit Join](#)
7. **eBird** – An online database for birders to share and archive birding checklists along with photos, sightings spots, videos, and sound recordings. eBird is the largest global birding community that collectively stores bird sightings. Anyone over 12 years of age can create an account. It is free and supported by the Cornell Lab of Ornithology in partnership with the National Audubon Society. eBird has harnessed the passion of the birders all around the world. Birders providing field observations have informed science and conservation. Additionally, eBird has created a birding community to improve birding experiences for all eBird users. [eBird Science](#)
8. **Merlin** – is one of several apps that can be used to identify birds. Merlin's Bird ID Wizard asks a series of questions to find the answer to "What is that Bird?" Merlin uses data from eBird which curates local bird sightings. By answering step by-step questions, bird identification is simplified, and possibilities are narrowed. Merlin also has a sound identification feature. Opening Merlin's sound identification feature in the field allows Merlin to listen and offer identification of the bird singing based on songs and calls cataloged on eBird and at the Cornell Lab of Ornithology's Macaulay Library. Merlin is linked to eBird and All About Birds. It is highly visual with billions of birder's observations including photographs and videos along with recordings of birds throughout the world, Using Merlin not only helps with identification it expands learning opportunities about each bird seen. Merlin is a free app that is frequently updated and supported by the Cornell Lab of Ornithology -[Merlin Bird ID – Free, instant bird identification help and guide for thousands of birds – Identify the birds you see \(allaboutbirds.org\)](#)

9. **National Audubon Society** – The National Audubon Society is one of the oldest bird conservation organizations in the Western Hemisphere. Audubon has a long and interesting history that dates to a time in North American when birds were harvested for food and fashion without regard to conservation or sustainably. Public reaction to this unchecked decimation of birds led to the formation of National Audubon. Today, National Audubon has chapters throughout north America. National Audubon Chapters provide education, field trips, programs, and advocacy for birds throughout the country. In addition, National Audubon provides many educational tools on their website to help the public learn about birds and how to protect them, their habitats and everything that they need to survive. National Audubon also has apps and other bird identification features. It supports citizen science projects like the Christmas Bird Count. The Christmas Bird Count is one of the oldest citizen science projects in the country. It started in 1899. Climate Watch is another citizen science project through the NAS. Birds are impacted by Climate change. Birds have long been used as environmental indicators. By following changes in bird distributions scientists can evaluate changes in the landscapes shared by people and birds. [National Audubon Society](#)
10. **National Wildlife Federation** – The National Wildlife Federation is a nationally known nonprofit which supports wildlife conservation. The National Wildlife Federation offers multiple resources from educator trainings, publication, lessons, and online learning opportunities for youth. [Educator Tools | National Wildlife Federation \(nwf.org\)](#). Most notable is NWF's iconic educator – Ranger Rick.- [Ranger Rick at Home - NWF | Ranger Rick](#) Dive into this website for specific lessons about raptors.
11. **Association of Fish and Wildlife Agencies** - This organization supports Flying Wild which is a curriculum for middle school students that offers a collection of activities about birds. Although it is not specific to raptors some lessons can be adapted. [Flying WILD: Association of Fish & Wildlife Agencies \(fishwildlife.org\)](#)
12. **Michigan Department of Natural Resources** – The educational staff at the Michigan Department of Natural Resources offers training and educator workshops for Project WILD. Lessons are not raptor centered; however, some lessons can be adapted for raptors, migration, habitat management and more. [Project WILD \(michigan.gov\)](#)

Raptor & Jr. Bird Watching Groups:

There are a few groups throughout the country that offer birding programs for youth and young birders' families. Educators are encouraged to visit these websites for information and to see what is being done. There are links to their websites.

Group	Web link	Location
Hawk Mountain	HAWK MOUNTAIN SANCTUARY Hawk Mountain Sanctuary: Learn Visit Join	Kempton, PA
Detroit River Hawk Watch	Detroit River Hawk Watch – data posted on HMANA.	Brownstown, MI

Hawk Migration Association of North America	HMANA – throughout NA	Duluth, MN.
HawkWatch International	HawkWatch International – Conserving raptors and our shared environment	Salt Lake City, UT
Schoodic Institute ~ a NPS Resource Learning Center	2023 Cadillac Mountain Hawk Watch Summary Schoodic Institute	Winter Harbor, ME
Oakland Owlets – Young Birders’ Club	Young Birders oaklandaudubon (oaklandbirdalliance.org)	Oakland County, MI
Michigan Audubon Young Birders’	Young Birders - Michigan Audubon	Lansing, MI
Jr. Hawk Watchers’	HMANA Junior Hawkwatcher Program – HMANA	Michigan
Ohio Young Birders’ Club	OYBC - HOME (ohioyoungbirders.org)	Oregon, Ohio
Wisconsin Young Birders’ Club	Announcing the Young Birders Club of Wisconsin! - eBird	Madison, Wisconsin

Citizen Science Experiences:

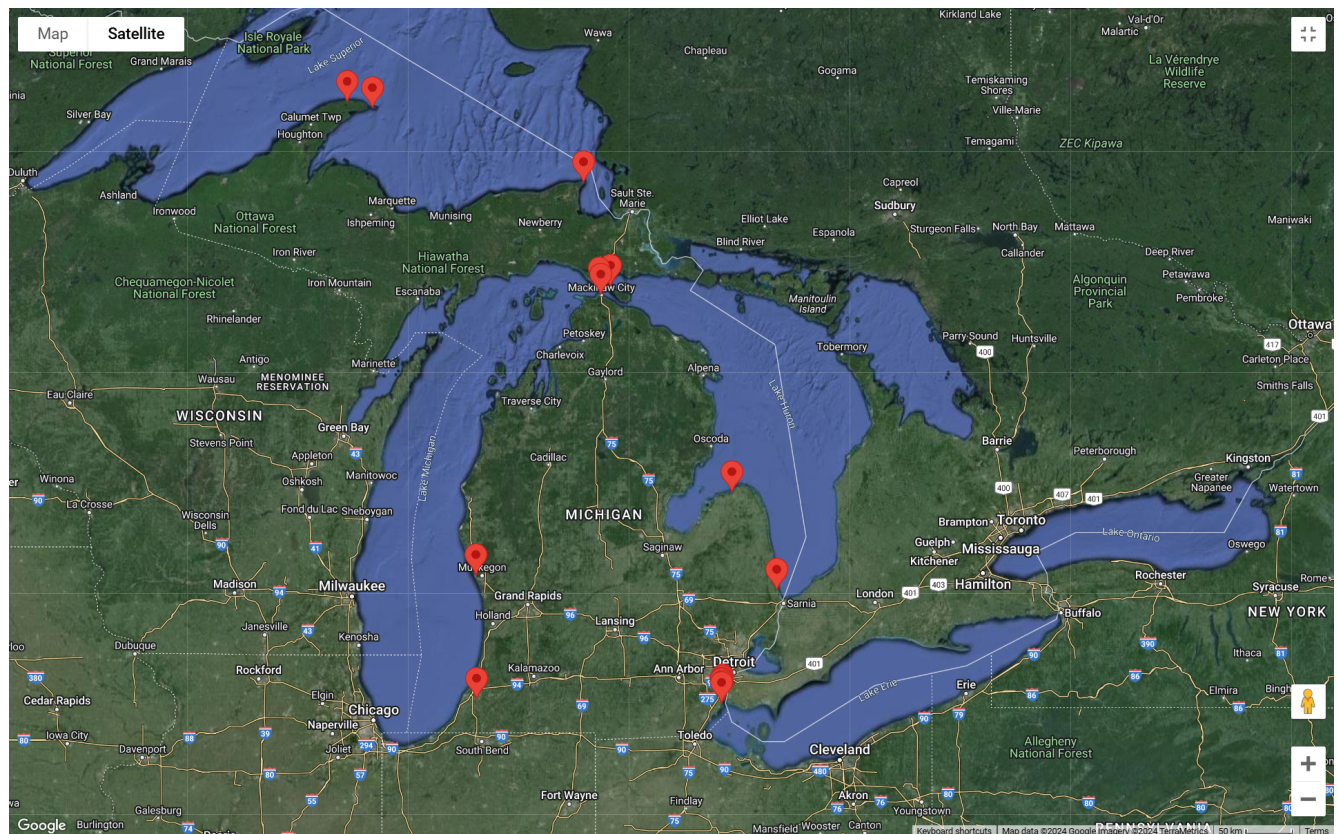
Hawk watching is one of many citizen science activities where the public can participate and contribute to science by counting hawks flying overhead during migration. Citizen science is a concept that encourages people to assist scientists in collecting data to advance scientific knowledge and research. National Geographic defines citizen science as “... *the practice of public participation and collaboration in scientific research to increase scientific knowledge.*” Hawk watching happens along flyways raptors use to move north in the spring and south in the fall. There are designated locations where trained hawk counters are stationed during migration. Depending on the day, the time of year and the weather, the hawks migrate along these flyways. Hawk watching is something that everyone can witness to better understand raptors. Hawk migration is dynamic and spectacular.

Hawks migrate during the day unlike most birds that migrate at night. Raptors depend on pockets of warm air known as thermal during migration. These pockets of warm air are created by the sun warming the earth. A column of warm air rises from thermals. Hawks use thermals during migration and glide along a series of thermals. This practice conserves energy expenditures for these raptors during their long migrations. Thermals do not form over water. Along the Great Lakes, raptors select the shortest distance when crossing the big lakes. These points are where hawk watch counters are placed during migration. These points are famous locations are mapped. Trained individuals and specialized groups count hawks during migration in the spring and fall. The field observations help researchers and scientists understand changes in populations of raptors. Hawk count data can also be used to determine climate change, pollution, habitat loss and overall status of each raptor species. Citizen science projects offer a chance to connect to a boarder community and support conservation globally.

Students can dive into data and explore the work of these projects. The following websites suggest places to go and see hawks migrating. The map is from the Hawk Migration Association of North America and shows sites in Michigan that are monitored. You can

explore other hawk migration spots on the Hawk Migration website. Michigan is unique because of the two peninsulas are surrounded by the Great Lakes. Hawks follow the shorelines to favorable spots to cross the water. There are tools that help forecast bird migration. Bird Cast is a website that tracks migration and will help educators know the best times and locations to view migration. It is a good idea to check this site prior to visiting a count site. Here the list for Bird Cast - [BirdCast - Bird migration forecasts in real-time](#)

[Eight of the Best Hawkwatch Sites in the U.S. for Photographers | Audubon](#)
[Where can I go to watch hawk migration? | All About Birds All About Birds](#)
[Audubon Guide to Hawk Watching | Audubon](#)
[New to Hawkwatching? – HMANA](#)
[Great Lakes Hawkwatch – HMANA](#)



Getting Outside:

Seeing migration is critical to connect learning to this natural phenomenon. Educators may not have financial resources to take field trips, however there are many agencies and programs that can support your travel. Here are a few programs in Michigan that support field trips for educators.

1. The Michigan Department of Natural Resources - [Nature Awaits: Michigan's fourth grade state park field trip](#) -This is a program that support field trips to state parks for 4th grade classes. The program offers free park entry and grants to support transportation. In addition, there are guidebooks and other benefits.

2. MI Pines - [MiPINES | MAEOE](#) – The Michigan Alliance for Environmental and Outdoor Education in collaboration with MiPines offers an online map with tools to find outdoor sites plus offers transportation grants for classroom teachers.
3. Michigan Nature Association - [Michigan Nature Association](#)- Michigan Nature Association offers \$500 grants to teachers K- 12 for transportation and admission to a natural area.
4. Huron Clinton Metroparks Grants – Huron Clinton Metroparks is a regional park district serving southeast Michigan. This governmental entity offers grants to educators for field trips to their parks. There are two grant options. Visit this website to learn more - [Education – Huron-Clinton Metroparks](#)
5. Target - [Grants & Corporate Giving | Target](#) – A grant that allows teachers to apply for \$700 grant per year for field trips.

Hawk & Bird Identification Apps:

Several bird identification apps can help with bird and specifically raptor identification. Here are just a few. Start with free applications. Look further into more costly applications depending on your interest. Be sure to check the app before suggesting it to youth. Always involve parents if students are downloading any of these apps. Some of these apps have been mentioned already in this document.

- [Your Guide to the Audubon Bird Guide App | Audubon](#) - **FREE**
- [The New Raptor ID App | \(ornithologi.com\)](#) - **FREE**
- [eBird Mobile - eBird](#) - **FREE**
- [Merlin Bird ID – Free, instant bird identification help and guide for thousands of birds – Identify the birds you see \(allaboutbirds.org\)](#) - **FREE**
- [The Sibley eGuide to Birds App – Sibley Guides](#) - **\$**
- [Sibley Birds v2 app – Sibley Guides](#) - **\$**
- [BirdsEye Bird Finding Guide | BirdsEye Nature Apps \(birdseyebirding.com\)](#) - **\$**

Identification Tips, Videos and Charts:

The listing below offers some posters and lessons to aid anyone with raptor identification. Raptors identification at times can be obvious however there are species that look similar. Sometimes there are slight subtle differences that observers must distinguish to discern the species. For instance, two species that look alike are the Sharp-shinned Hawk and the Cooper's Hawk. There is a size difference, but it is small and hard to determine. These charts and art can help with challenging identifications and provide deep learning for students and others. Art is an essential component of field identification. Many of the most widely used field guides are created by artists like Peterson, Sibley, Crossley, and others.

Organization	Details	Website – Link
Cornell Lab Bird Academy	A sample lesson from the bird academy with key features to focus hawk identification.	Sample Lesson: Hawk and Raptor Identification Bird Academy • The Cornell Lab (allaboutbirds.org)

Project FeederWatch	A poster from Project Feederwatch that helps with Hawk ID.	PFW-Hawk-Poster.pdf (feederwatch.org)
Project FeederWatch	A comparison to help distinguish Sharp-shinned and Cooper's Hawks.	Sharp-shinned Hawk and Cooper's Hawk - FeederWatch
HawkWatch International	A variety of raptor identification tools	Raptor ID – HawkWatch International
Cornel Lab of Ornithology~ All About Birds	Living Bird Magazine	Bird Profile: American Kestrel All About Birds All About Birds
Cornel Lab of Ornithology~ All About Birds	Living Bird	Raptors of Winter All About Birds All About Birds
Cornel Lab of Ornithology ~All About Birds	Living Bird	ID Tips for Raptor-Watching Season: Use Tail and Wing Shape All About Birds All About Birds
National Audubon	Audubon Magazine	A Beginner's Guide to IDing Cooper's and Sharp-Shinned Hawks Audubon
National Audubon	Audubon Magazine	Count Down: Are Hawk Ridge's Storied Goshawk Migration Booms Over? Audubon
Hawk Watch International	YouTube Video HWI	Raptor ID – HawkWatch International

Extended Learning Opportunities:

- [Riveted by Raptors: A Look at Migration | Bird Academy • The Cornell Lab \(allaboutbirds.org\)](#)
- [Be a Better Birder: Hawk and Raptor Identification | Bird Academy • The Cornell Lab \(allaboutbirds.org\)](#)
- [Three Basic Ways to Identify Hawks, Eagles, Falcons, and Other Raptors | Audubon](#)

Raptor Lore & Legends ~ Stories, Films & Lesson Plans:

Stories, videos, and movies can provide substantive lessons. Stories make deeply personal connections to learners. Stories should be included in lesson plans. Students remember stories and they have an impact on learning. It is interesting to know the stories behind why people go birding and why some people follow the long traditions of being falconers. The Public Broadcasting Service's "**Nature**" series has some outstanding movies about raptors along with lessons for classrooms. Adding movies and stories always enriches learning for everyone. Here is a short listing of resources.

- [When Goshawks Ruled the Autumn Skies | All About Birds All About Birds](#) – Article from the Living Bird about Goshawks.
- [Silent Alert: The Cooper's Hawk's Reputation Precedes It | All About Birds All About Birds](#) – An article about the hunting stealth of Cooper's Hawks.

- [By Hunting Rodents, Raptors Help With Flood Control | All About Birds All About Birds](#) – Article from the Living Bird about raptors' importance in controlling rodents.
- [Q&A with Brian Sullivan, Coauthor of Crossley ID Guide: Raptors | All About Birds All About Birds](#)
- [A Galaxy of Falcons: Witnessing the Amur Falcon's Massive Migration Flocks | All About Birds All About Birds](#)
- [American Eagle | Bald Eagles' Evolutionary Ancestors | Nature | PBS](#)
- [Pale Male | About | Nature | PBS](#)
- [Raptors: Fistful of Daggers: Extreme Lives | About | Nature | PBS](#)
- [Raptors: Fistful of Daggers: Meet the Family | About | Nature | PBS](#)
- [Raptors | Nature | PBS](#)
- [Season of the Osprey | About | Nature | PBS](#)
- [THE EAGLE HUNTRESS | Sony Pictures Entertainment](#)
- [Home - Michigan Hawking Club \(clubexpress.com\)](#)
- [Free Book Guides \(3-5 grade\) – K-12 Education \(cornell.edu\)](#)



Thoughts & Raptor Wrap-Ups:

Raptors, like all birds, are important environmental indicators. They are sensitive to changes in air quality, weather, water, habitat, wildlife communities and pollution. Birds are some of the first animals to exhibit the impacts of environmental degradation. The 2019 State of Birds Report dramatically documented the steep decline in several bird populations. The headlines from the report “*3 Billion Birds Lost*” sounded an alarm that birds are declining across America. Even common birds are disappearing. Here is a link to this document -[Steep Declines – State of the Birds 2019](#). Teams of scientists, birders, volunteers, and others tracking birds across the continent provided the statistics to evaluate bird population to inform land managers of the situation. This report also emphasized the need to understand how conservation can reverse negative trends. Raptors were birds of concern in the past, but conservation initiatives have stopped raptor decline in most species. Raptors are case studies about how people can take action to conserve birds like raptors. Raptors are resilient and provide lessons that can be applied to other species of birds.



Why study birds?

Birds can provide lessons that are measurable and meaningful. In addition, birds impact the quality of life for many populations from hunters to birdwatchers and gardeners to feeder

watchers. Here is a list of reasons why birds are important to people and deserve our attention and care.

1. Birds are everywhere.
2. Birds have interesting complex stories.
3. Birds provide a voice to dynamic natural cycles.
4. Birds perform important ecological services.
5. Birds are vital to multiple recreational activities.
6. Birds display beauty and inspire art.
7. Birds are cultural symbols.
8. Birds can teach important biological principles.
9. Birds are portals to outdoor learning.
10. Birds are critical environmental indicators.
11. Birds connect people to values & create deep interpersonal connections.
12. Birds are part of human history.

Falconers and bird banders have special relationships with birds. These relationships are powerful. Raptors happen to be among the most powerful birds. They possess strengths and abilities that are unmatched and noteworthy. Raptors count!



Raptors can spark learning engagement across multiple educational disciplines. For the reasons listed above and the excitement that studying these birds brings to classrooms is why the Raptor Migration Teaching Network exists. Raptors can make learning come alive.

Opinions are those of the writer. Questions and comments should be directed to the writer. This paper should be updated as research and science dictate.