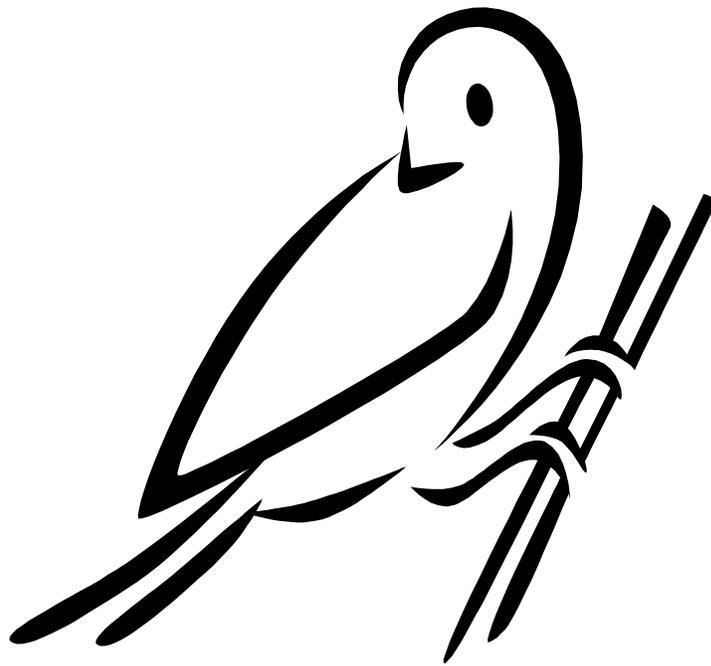


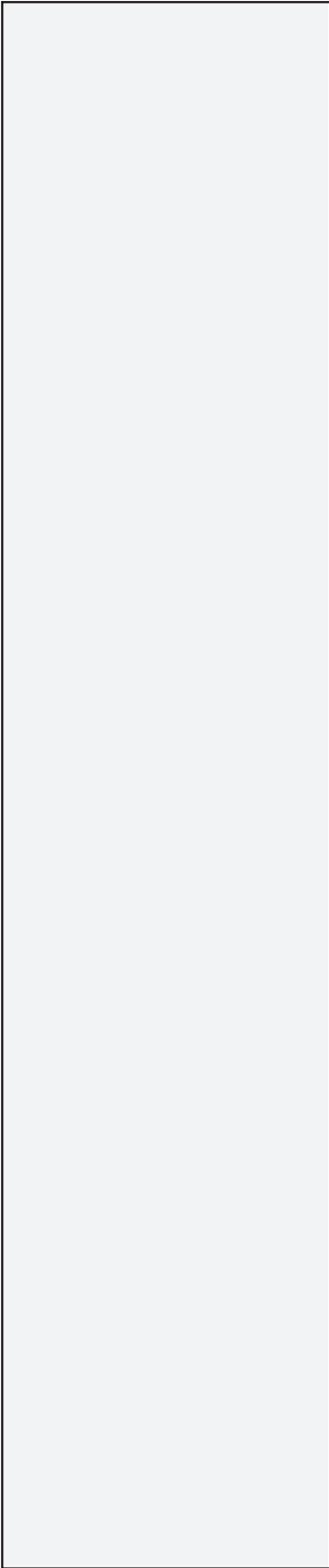
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WISCONSIN SOCIETY FOR ORNITHOLOGY

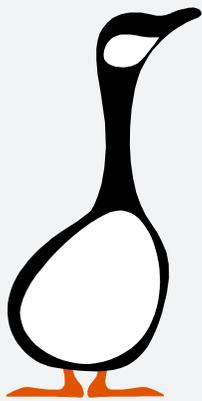
EDUCATOR'S GUIDE



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2007







"Never doubt that a small group of concerned citizens can change the world. Indeed it's the only thing that ever has."

*Margaret Mead,
Anthropologist*

Program Sponsors

Inspired by the Youth Mentorship Program of the Minnesota Ornithologists' Union, volunteers from the Wisconsin Society for Ornithology (WSO), and the Wisconsin Bird Conservation Initiative (WBCI) and staff from the Wisconsin Department of Natural Resources (WDNR) have developed this Birding Kit and the accompanying Educator's Guide. Generous support for the Kits has been provided by Eagle Optics of Middleton, Wisconsin and the Houghton Mifflin Company. WSO, WBCI, WDNR, plus various nature centers and individuals have all made generous contributions as well.

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WBCI Partners

1000 Friends of Wisconsin
About Place Consulting
Aegolius Bird Club
Aldo Leopold Audubon Society
Aldo Leopold Foundation
American Transmission Co. LLC
Baraboo Range Preservation Association
Bay Area Bird Club
Bay Beach Wildlife Sanctuary
Bayfield Regional Conservancy
Beaver Creek Reserve
Benjamin F. Goss Bird Club
Birders World
Bluebird Restoration Association of Wisconsin
Blue Heron Boat Tours
Cable Area Chamber of Commerce
Carpenter Lake Association
Cedarburg Science
Central Wisconsin Environmental Station
Chappee Rapids Audubon Society
Chequamegon Bay Birders
Chiwaukee Prairie Preservation Fund
Clean Wisconsin
Couderay Waters Regional Land Trust
Coulee Region Audubon Society
Daniel Boone Conservation League, Inc.
Door County Land Trust, Inc.
Ducks Unlimited
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Ferry Bluff Eagle Council
Foundation for Wildlife Conservation
Friends of the Cedarburg Bog, Inc.
Friends of Milwaukee's Rivers (FMR)
Friends of the Bird Sanctuary
Gathering Waters
Glacierland Resource Conservation & Development, Inc.
Grantsburg Business Improvement District
Green-Rock Audubon Society
Heart Lake Conservation Associates LLC
Highbridge Hills
Northern Lights Educational Center
Horicon Marsh Bird Club
Hoy Audubon Society
Hunt Hill Audubon Society
Ice Age Park & Trail Foundation
International Crane Foundation
Izaak Walton League of America - Wisconsin Division
Jacamar Birding Tours
Kenosha/Racine Land Trust
Kinnickinnic River Land Trust
Kumlien Bird Club
Lake Superior Alliance
Lakeland Audubon Society
Lawrence University
Madeline Island Chamber of Commerce
Madison Audubon Society
Madison Gas and Electric
Midwest Center for Environmental Science and Public Policy
Milwaukee Audubon Society
Milwaukee County Department of Parks and Recreation
Mississippi Valley Conservancy
Muskego Lakes Conservancy
National Audubon Society - Upper
Mississippi River Campaign
National Park Service - St. Croix National Scenic Riverway
National Wild Turkey Federation
Native American Tourism of Wisconsin
Natural Heritage Land Trust
Natural Resources Foundation of Wisconsin
Nature Education Center - Fifiield, WI
Navarino Nature Center
Ned Hollister Bird Club
North American Bluebird Society
North Central Conservancy Trust
North Lakeland Discovery Center

Welcome!

The Wisconsin Bird Conservation Initiative (WBCI) and the Wisconsin Society of Ornithology (WSO) welcome you to the exciting world of bird education! We hope your experiences with these resources will be rewarding, energizing, and meaningful. And remember... you don't need to be an expert to bring birds and bird watching into the lives of your students! Just bring your binoculars, your enthusiasm and your wonder of nature and you are in for an extraordinary adventure!

Purpose of the Educator Guide

Developed initially to support the WBCI/WSO Birding Kit (described below), the Educator's Guide can also be used independently as a bird education tool. The Educator's Guide includes suggested activities to help educators teach the use of binoculars and field guides, basic bird identification, awareness of diverse habitats, and to introduce relevant bird conservation issues. Activities may be led by a visiting bird expert or mentor, nature center staff, or a classroom teacher. Activities may be done before, after, during or without a mentor's visit to a class, as part of a unit, or independently. Activities may be reproduced for sharing or adapted for specific application as needed.

The Purpose of the Birding Kit

The purpose of the WBCI/WSO Birding Kit is to enable educators to introduce students to birds and their habitats, while exploring the outdoors. One way that many people have become interested in birds and their conservation has been by seeing them, watching them, and learning to identify them. It is our hope that the provision of the tools for an introduction to birds and their habitats will lead more people to an interest in birds and, ultimately, concern for their conservation.

Contents of the Kit

The Kit includes the following:

- 15 pairs binoculars
- 1 spotting scope with tripod
- 5 field guides
- posters
- 1 bird placemat
- 1 CD of Common Wisconsin Birds
- 1 Educator's Guide

WBCI Partners Cont.

Northeast Wisconsin Birding Club
Northeast Wisconsin Land Trust
Northeastern Wisconsin Audubon Society
Northern Thunder
Northland College
Oshkosh Bird Club
Otus Asio Tours
Ozaukee Washington Land Trust
Partners In Flight - Midwest Region
Pheasants Forever
Prairie Enthusiasts
Prairie Enthusiasts - West Central Chapter
Prairie Future Seed Co.
Prairie Nursery
Rainforest Biodiversity Group
Raptor Education Group
Ripon College
River Alliance of Wisconsin
Riveredge Bird Club
Riveredge Nature Center
Rock County Parks
Rock River Coalition
Ruffed Grouse Society
Savanna Oak Foundation, Inc.
S. Paul Jones Naturalists Society
Schlitz Audubon Nature Center
Science Kit & Boreal Laboratories
Sheboygan County Audubon Society
Sierra Club
Society of Tympanuchus Cupido Pinnatus Ltd.
Spruce Grouse Society
The Nature Conservancy
Town & Country Resource Conservation & Development
Trout Unlimited - Green Bay Chapter
Ulao Creek Partnership
Upper Green Bay Basin Partnership Team
Urban Ecology Center
USDA - Natural Resource Conservation Service
U.S. Fish & Wildlife Service
U.S. Forest Service - Chequamegon-Nicolet NFUSGS
Upper Midwest Environmental Sciences Center
University of Wisconsin Press
UW-Green Bay Cofrin Center for Biodiversity
UW-Madison Dept. of Wildlife Ecology
UW-Madison Kemp Natural Resources Station
UW-Milwaukee Field Station
Waupaca Field Station
Wausau Bird Club
We Energies
West Wisconsin Land Trust
Wild Bird, Wildlife & Backyard Habitat Expo
Wild Ones Natural Landscapers
Wildlife Society - Wisconsin Chapter
Wings Over Wisconsin
Wisconsin Association of Lakes
Winnebago Audubon Society
Wisconsin Audubon Council
Wisconsin Conservation Congress
Wisconsin Council of Trout Unlimited
Wisconsin County Forests Association
Wisconsin DATCP
Wisconsin DNR
Wisconsin Elementary & Middle Level Science Teachers
Wisconsin Humane Society - Wildlife Rehabilitation Center
Wisconsin Metro Audubon Society
Wisconsin NatureMapping
Wisconsin Outdoor Communicators Association
Wisconsin Sharp-tailed Grouse Society
Wisconsin Society For Ornithology
Wisconsin Waterfowl Association
Wisconsin Wetlands Association
Wisconsin Wildlife Federation
WISPIRG (Wisconsin Public Interest Research Group)
Wisconsin Woodland Owners Association
WWOA Foundation, Inc - Seno Woodland Center
Woodland Dunes Nature Center
Zoological Society of Milwaukee

Conservation Context

While it is possible to contribute to the conservation of birds without being able to tell one bird from another, bird identification is the cornerstone on which most bird conservation efforts are constructed. Scientists have become aware, through bird survey work, that many migratory bird populations have declined. Bird surveys depend on the surveyor's ability to identify birds by sound as well as by sight. Observations and research that begin with differentiating bird species can teach us how birds behave, migration patterns, habitat needs, and population fluctuations. Thus, while birding is a valid hobby, it is also an important tool for conservation.

Integrating Birds into the Curriculum

Learning about birds can easily be applied to many academic subjects: English/Language Arts, Mathematics, Social Studies, Science, Environmental Education, Foreign Language, and Art. This Kit provides an introduction, but there are many other bird-related resources and curriculum materials that can be used to create interdisciplinary or subject-specific units directly addressing educational standards. Readings, writing assignments, and math problems related to birds can be used to expand interest in birds while teaching the required skills. Bird migration lends itself to the study of geography. The story of bird conservation and the heroes and heroines involved is part of our history. Studying bird images in many cultures relates to social studies and to art. With so many colors and adaptations, birds inspire art in many forms. Learning how to observe, designing a simple research experiment, or collecting data from monitoring are examples of science applications. Bird-related letter and art exchanges with students in other countries can pertain to foreign languages, particularly Spanish, which is spoken in much of Latin America, where many birds that nest in North America migrate for the winter months. Habitat studies or issues investigations are examples of applications to Environmental Education.

Grade Level Adaptations

While this Educator's Guide is focused on grades 4-8, all of the materials can be adapted for a variety of audiences and grade levels. Share this resource with colleagues; we encourage creativity and innovation in developing and adapting activities.

Copy Policy

All of the materials found within this WBCI Educator's Guide can be copied and distributed as needed.

Wildlife Watching Ethics

We encourage all educators to abide by common-sense and practical wildlife watching ethics. Please remind your students to:

- ✎ Respect all wildlife and their habitats!
- ✎ Do not approach wild animals. Stay at a safe and respectable distance.
- ✎ Do not handle any birds or eggs you may find.
- ✎ Do not pick flowers, grasses or seeds. Animals need those resources for food.
- ✎ Do not litter.
- ✎ Keep voices low to better hear birds and other wildlife.
- ✎ Do not collect feathers, eggs, or other items you may find. There are laws in place to protect feathers and other parts of many bird species. For more information on bird protection laws and treaties, visit <http://www.fws.gov/migratorybirds/intrnltr/treatlaw.html>
- ✎ Stay on marked trails where and whenever possible.

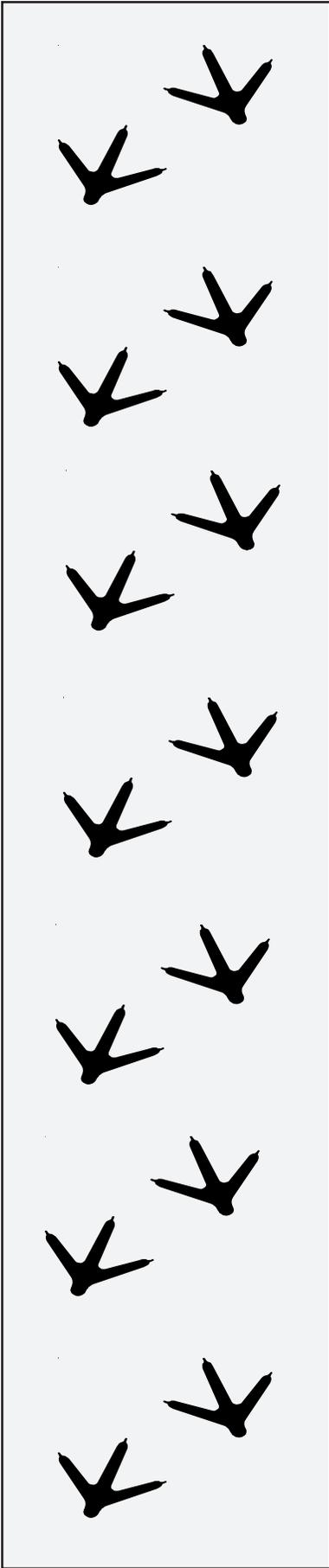
Wisconsin State Academic Standards

The Wisconsin Department of Public Instruction (DPI) notes that academic standards specify what students should know and be able to do, what they might be asked to do to give evidence of standards, and how well they must perform. For more information on academic standards, please visit www.dpi.state.wi.us.

To assist educators in applying Wisconsin's academic standards for grades 4 and 8 to classroom curriculum and activities, the Educator's Guide correlates each activity to appropriate Performance Standards in each of the core areas (English/ Language Arts, Mathematics, Science and Social Studies) as well as supplemental standards in the area of Environmental Education. Standards correlation can be found on the sidebars of each activity; correlation indicates that the activity either addresses the standard or can assist teachers in accomplishing it.

Evaluation

In order to demonstrate a successful program to our sponsors as well as to improve the effectiveness of the Kit itself, we would like feedback on these resources. Please help us by copying, completing, and returning the evaluation form on page 9.



The Story of WBCI

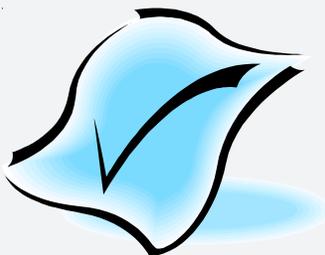
The Wisconsin Bird Conservation Initiative (WBCI) was formed by a dedicated group of agencies, NGOs, bird clubs, businesses and other conservation-oriented partners to implement coordinated bird conservation efforts across Wisconsin. The mission of WBCI is to deliver the full spectrum of bird conservation, including both game and non-game birds, by working together in cooperative initiatives. The vision for WBCI was first crafted at a Joint Venture meeting in 1999. Two years later key partners such as Madison Audubon, WI-DNR, USFWS, NRCS and many others officially endorsed the WBCI charter and the governor declared May 12, 2001 as Bird Conservation Day in Wisconsin. Since then WBCI has blossomed into more than 160 endorsing partners, 10+ active committees and has coordinated a number of key bird conservation efforts. WBCI partners have written a state bird conservation plan, implemented new research and monitoring programs, developed bird education materials and efforts, developed a statewide birding and nature trail, and have developed policies on a number of conservation issues impacting bird populations. Information about WBCI and its partner activities is available at www.wisconsinbirds.org. Read the latest issue of the WBCI newsletter or sign up for the WBCIing listserve to get the latest on bird conservation activities across the state and region. If you are a member of a conservation organization, business or NGO consider endorsing WBCI or contributing to the Bird Conservation Campaign found at the WBCI website.



Help us help you!

In order to demonstrate a successful program to our sponsors as well as to improve the effectiveness of the Kit itself, we would like feedback on your use of these resources. Please help us by copying, completing, and returning this evaluation form.

Send to:
WBCI Coordinator
Wisconsin
Department of
Natural Resources
101 S Webster St
Madison, WI
53707-7921



Evaluation



Program Date:
School:
Grade(s):

Please feel free to use the space provided or an extra sheet of paper for additional comments regarding any of the activities or resources.

How useful was the WBCI Background Information?
..... very useful useful not useful

How well did the activities fit into the classroom lesson plans?
..... very well adequately not well

How useful was the Educator's Guide in assisting teachers in satisfying the Wisconsin Model Academic Standards?
..... very useful useful not useful

Please check all the activities that you used, and rank their usefulness using the scale on each activity.

- A Diversity of Habitats very useful useful not useful
- Field Guide Fun very useful useful not useful
- Oh, Say! Did you see? very useful useful not useful
- Introduction to Bird Identification very useful useful not useful
- Taking a Stand on Issues very useful useful not useful

How many hours/classroom periods did you spend using the activities?
>1 1 2-4 5 or more

How could the format of the activities be improved?

How could our Educator's Guide be improved?

What additional activities or resources would you recommend?

Fold

Fold

WBCI Coordinator
Wisconsin Department of Natural Resources
101 S Webster St
Madison, WI 53707-7921



PLACE STAMP
HERE

Activities

"In a world that seems so very puzzling is it any wonder birds have such appeal? Birds are, perhaps, the most eloquent expression of reality."

*Roger Tory Peterson,
Ornithologist*



Vocabulary

Habitat

Objectives

Students will be able to:

- ✎ Differentiate at least four different bird habitat types
- ✎ Name at least one bird species that lives in each key habitat type
- ✎ Explain how bird identification relates to habitat type and habitat conservation

Materials

- ✎ Key Habitats handout
- ✎ PowerPoint of Common Wisconsin Birds

Key Points

- ✎ The key components of habitat are food, water, and shelter/cover, in a suitable arrangement with enough space for raising young.
- ✎ Birds are very diverse and they require diverse habitats.
- ✎ Migratory birds require at least two habitats.
- ✎ Some birds can use more general or mixed habitats, while others require specific habitats.
- ✎ When habitat is degraded, destroyed, or altered, it can affect bird populations.
- ✎ Knowing habitat types

A Diversity of Habitats

Background Information

An important step in learning to identify birds, whether for fun or for conservation, is to recognize what birds are likely to be seen in what type of habitat. Thus, we will consider different habitat types in relation to which birds are likely to live there.

Habitat refers to a place where an animal can live and where it can find food, water, and shelter (or cover) in a suitable arrangement with enough space to raise its young. An important step for conservation of birds is identifying them in relation to their habitat needs.

Likewise, an important clue for identifying birds is recognizing the type of habitat where the bird is observed. It is unlikely that you would see a wetland bird in a desert. Look for birds that live in forests when you are in the woods and grassland birds when you are in hay fields. When you look at birds, look at their surroundings as well.

Birds require food, water, and cover just as other animals do and to conserve their populations, we must conserve their habitats. But birds are very diverse. Different birds have different adaptations and eat different foods and require different habitats. To conserve bird populations, we must understand their habitat needs.

The main reason for bird population decline is destruction or degradation of habitat due to changing land use. Changes in land use alter the habitat. For example, a shrubby area might be developed into an urban area, a grassland which becomes overgrown could change into a woodlot, and a wooded parcel that has been cut might become a suburban area.

When one habitat is changed into another, the birds that depended on the original habitat lose out, while birds that depend on the habitat it becomes may make gains. The way that we use the land may impact different birds differently. Thus we can manage the land for different kinds of birds if we understand which habitat a bird needs.

Migratory birds require two habitats, one on their nesting grounds and another where they spend the winter months, and these habitats are not always the same. To conserve migratory birds we need to conserve habitat in both places.

(Key Points, cont.)

can help identify birds.

✎ Identifying birds in their habitat can help us learn which habitat to conserve for which birds.

Wisconsin State Academic Standards Correlations for Grades 4 and 8

Social Studies

Grade 4:
A.4.4, A.4.8

Science

Grade 4:
A.4.5, B.4.1, C.4.2,
E.4.5, F.4.1, F.4.2, F.4.4
Grade 8:
C.8.2, F.8.7, F.8.8,
F.8.9, F.8.10

Environmental Education

Grade 4:
A.4.1, A.4.2, A.4.3,
A.4.4, B.4.4, B.4.5, B.4.6,
B.4.8, C.4.1, C.4.2

Grade 8:
B.8.2, B.8.3, B.8.5,
B.8.6, B.8.10, B.8.14,
B.8.15, B.8.17, C.8.1

Procedures

1. Ask for a definition of habitat. Be sure the answer includes the key components of food, water, and shelter or cover. Explain that we will learn about bird habitats today.

2. Distribute the Key Habitats handouts listing eight habitats. Briefly go over the list of habitat types and ask where a bird in each habitat might find food, water, and cover. What kind of food, water, or shelter might be more accessible in that habitat? Ask:

- Where might birds find water in this habitat? (rivers, lakes, streams, ponds, puddles, bird baths, gutters, pipes, buckets, etc.)
- What kinds of foods might birds eat in this habitat? (seeds, amphibians, fish, small mammals, other birds, nuts, grains, fruits, nectar from flowers, insects, worms, berries, etc.)
- What kinds of shelter or cover might birds find in this habitat? (living and dead trees, shrubs, long grass, sheltering rocks, indentations or holes in the ground, buildings like barns and bridges, cattails and reeds, etc.)



3. Discuss. Ask what students noticed. Was there a lot of repetition? Were some responses unique to one habitat? In discussion, point out that, while each of these habitats may offer some of the same types of food, water, and cover, the arrangement may be different. Some birds are very specialized in their needs and may not be able to find their requirements in a different habitat. Other birds, such as crows, may be found in a variety of places.

When might one bird require more than one habitat? Point out that birds that migrate need two habitats, one for nesting in the north and another for over-wintering. These two habitats may not necessarily be the same.

Raise the question: what happens to the birds when their habitat is degraded or destroyed? If a wetland is drained, a forest cut down, or a grassland planted in trees, how might this affect the birds? Point out that people have changed the face of the land over time, and that changes to habitat can make survival harder or easier for specific species of birds.

4. Show the PowerPoint CD. Tell students to use the pictures as a resource and write the name of one bird that might be found in each habitat on their Key Habitat handout.

Water - streams, ponds, and lakes: Great Blue Heron, Wood Duck, Bald Eagle, Mallard

Wetlands - marshes, swamps: Canada Goose, Sandhill Crane, Red-winged Blackbird

Woodlands - forests of various sizes: American Redstart, Ruby-throated Hummingbird, Downy Woodpecker, Blue Jay, American Crow, Wild Turkey

parks: American Robin, Black-capped Chickadee, White-breasted Nuthatch, Northern Cardinal, Baltimore Oriole, American Goldfinch, Dark-eyed Junco, Red-tailed Hawk

Shrubby areas - old fields, suburban neighborhoods with shrub-planted yards: House Wren, Common Yellowthroat, Song Sparrow

Cliffs or bluffs - rocky heights: Turkey Vulture

Grasslands - prairies, unplanted fields, or lightly grazed pastures: Eastern Meadowlark, Eastern Bluebird

Urban areas - pavement and buildings and denser human populations: Rock Dove, House Sparrow

5. Consider your surroundings. Which habitat type does the area surrounding your school or nature center resemble most? Discuss the surrounding habitat(s).

Discussion

1. What did you learn from the PowerPoint presentation?
2. Which of these habitats do you see most frequently?
3. What happens with bird populations when one place is altered from one habitat type to another, such as from grassland to forest or urban area?
4. Where do we need to conserve habitat for migratory birds that travel between two homes in the spring and fall?
5. What are some common birds that seem to do well in a variety of habitats?

Adaptations and Extensions

1. Have students study the habitat surrounding their school or nature center to decide which of the eight defined habitats it most resembles.

2. Assign each of the eight identified habitats to a small group to study. Have each group find out about the birds that live in their assigned habitat.

3. Study a migratory bird. Find out where its two habitats are and what route it travels between them.

4. Take a field trip to several different habitats. Observe how the land is different. Look for birds in each place.

5. Paint a mural of a specific habitat, including appropriate



birds.

6. Count how many different kinds of birds can be observed in the habitat surrounding the school or nature center.

7. Provide copies of the Checklist to Wisconsin Birds (available for download at <http://dnr.wi.gov/org/land/er/birds/trail.htm>) and compare as a tool for birding. Point out that it is, in part, organized by habitat type. Have students pick birds to study, using this guide as a resource.

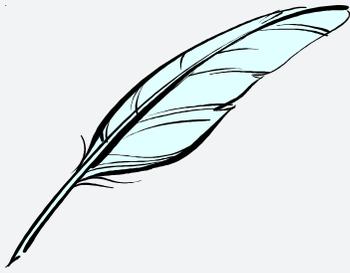
Assessment

1. Ask the students to name one bird that might be found in each habitat.

2. Show students habitat photos and ask what birds might live there.

3. Show students pictures of common birds and ask them to identify them with their habitats.

4. Have students identify the habitat surrounding them and state at least one bird they would expect to see there.



Key Habitats Handout

What birds might live in each of the habitat types listed? Write the name of at least one bird for each habitat.

Habitat Characteristics

Bird

Water - streams, ponds, and lakes _____

Wetlands - marshes, swamps _____

Woodlands - forests of various sizes _____

Trees and Open Areas - rural areas with pastures or fields near woodlands, suburban neighborhoods with open lawns, or urban parks _____

Shrubby areas - old fields, suburban neighborhoods with shrub-planted yards _____

Cliffs or bluffs - rocky heights _____

Grasslands - prairies, unplanted fields, or lightly grazed pastures _____

Urban areas - pavement, buildings, and denser human populations _____





Vocabulary

Eyeiece
Objective Lens
Barrel
Focus Screw
Binocular Housing
Housing Mechanism

Objectives

Students will be able to:

- ✦ Demonstrate how to focus both barrels of binoculars
- ✦ Utilize focused binoculars for viewing birds in an outdoor environment.

Materials

15 pairs of binoculars
Bird poster/placemat

Key Points

- ✦ Birds react to people's movements by taking flight.
- ✦ Using binoculars, students can observe birds, bird characteristics and behavior at a non-threatening distance.
- ✦ Bird behavior can be more readily observed by using binoculars.

Oh Say! Did You See...?

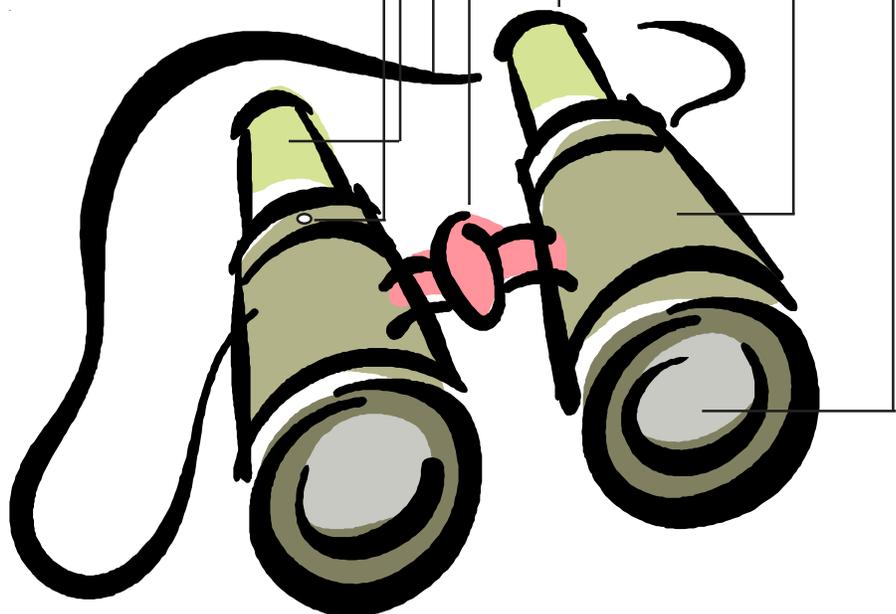
Background Information

This activity teaches students to "see" how binoculars are used by birdwatchers and scientists to enhance their appreciation for observing birds. The proper method for focusing the binoculars will aid the student, once out in the field, in having a successful bird watching experience. The human eye has a limiting factor that binocular lenses can compensate for in observing distant objects. It is easier to identify birds seen through binoculars because their field marks are more visible. This activity complements the *Field Guide Fun* activity for students observing birds in the outdoors.

Procedures

1. In a large group, display a pair of binoculars. Using the Background Information, briefly explain their use in bird watching and scientific investigations. Review the parts of the binoculars:

- ✦ Strap
- ✦ Barrels
- ✦ Eyeiece
- ✦ Objective lens
- ✦ Focus Screw
- ✦ Eyeiece housing
- ✦ White indicator dot



2. Demonstrate how the housing mechanism works when the focus screw is turned.

**Wisconsin State
Academic Standards
Correlations for
Grades 4 and 8**

Science

Grade 4:

C.4.4, G.4.1, H.4.3

3. Note that one of the eyepieces (the right one) has the ability to rotate. The left eyepiece does not have this capability. Rotate the right eyepiece at this time to illustrate.

4. Next, cup your left hand and place it over the right objective lens. This is the lens closest to the object at which you are looking. It is on the opposite end of the barrel from the eyepiece.

CAUTION: Stress that the students are not to put their fingers on any of the lenses as viewing will be distorted. Oil and dirt on the fingers will also distort the image.

5. Now look through the left eyepiece. Look at some distant object. If you are in a classroom, locate some wording on a bulletin board and attempt to read it. Use the focus screw to move the entire housing. The words will become clearer as you view through the left eyepiece. Remember, your left hand is still covering the right objective lens. Read the word or phrase.

6. Now place your left hand over the left objective lens. Look at the same object (bulletin board word). Use your right hand to rotate the right eyepiece.

When the words become clear, remove your left hand and hold the binoculars with both hands. The words should now be clear in both eyes. A slight adjustment using the focus screw may be necessary.



7. Show the students that there is a white dot (indicator dot) on the housing above the right eyepiece. Above the dot, there is a (-) symbol, a (o) symbol, and a (+) symbol. They should observe where the white dot is relative to the symbols. This is the focus point for the right eye. If they remember this point, they only need to move the focus screw for future focusing.

8. Distribute the binoculars to the class. Some students may need to share with a partner. **Explain that the binoculars in the Kit are expensive and care must be taken in handling them. Review handling techniques, and ensure that the binocular straps are always used. It is a comfort and safety issue and a precaution against dropping the binoculars to the ground.**

9. Allow students ample time to work on using the binoculars to focus at some distant object. Walk around the classroom and assist those students that may be having difficulty with the focusing.

10. Direct the students to place their binoculars down on the desk in front of them.

11. Display the poster or placemat with bird names under each bird. Have the students look through binoculars to read the name of a bird you point to on the placemat or poster. When they can read the bird's name, have them raise their hands. Call on a

student to answer and ask others to verify the bird identification. Repeat the process.

12. Tell the students they are ready to go out and look at birds with binoculars.

Discussion

1. How close to you think you can get to a bird outside? How do birds react when you approach them quietly, loudly, or too close?

2. How could binoculars help you learn about birds?

3. How are binoculars used as a scientific tool?

4. How do binoculars allow you to observe a bird's behavior differently?

Adaptations and Extensions

1. Ask students who have access to binoculars at home to practice using them prior to the next session.

2. Challenge those students to keep a list of all the birds that they have observed through their binoculars. These can be shared with their teacher and classmates daily.

3. Take your students outside and teach them how to use a spotting scope. To use the scope, practice by pretending it is an extension of the eyes. Have your students select a far away object they would like to see closer. Keeping their eyes on that object while standing directly behind the eyepiece, have them bring their eye to the eyepiece. The object will be in the field of view of the scope.

Assessment

1. Have students write down the steps taken to focus a pair of binoculars.

2. Call on a student to give the first step. Write it on the board.

3. Continue around the class in a step-by-step fashion.

4. Stop the process if a step is skipped and ask for another response.

5. Have all students check to see that the list is complete.





Vocabulary

Taxonomic order

Objectives

Students will be able to:

- ✎ Recognize that a field guide is a useful tool for bird identification.
- ✎ Recognize that field guides are organized according to groups/families of birds that share common characteristics.

Materials

- ✎ Kaufman Field Guide to Birds of North America or other guides

Key Points

- ✎ Field guides are important tools for bird watching.
- ✎ Field guides are generally divided into sections by the physical characteristics of birds.
- ✎ Knowing that all guides are divided in similar manner allows users to look to a specific portion of a guide rather than page through the entire guide.

Field Guide Fun

Background Information

The primary purpose of a field guide is to help identify objects around you. There are field guides for everything, from rocks, trees, and ferns to butterflies, frogs, and, of course, birds. A good field guide is one of the most important tools for successful bird identification.

Field guides to birds:

- provide both common and scientific names of the bird species
- illustrate or provide photos of the birds of a given geographical area
- describe the field characteristics of each species, including color, size and song, as well as males, females (when different) and juveniles
- provide range maps, including seasonal migratory movement information

There are numerous field guides for birds on the market, and each bird watcher seems to have a preference. The guides included in your Kit are just one example of this tool.

Spend some time with your students exploring the guides. Note that the book is categorized by *taxonomic orders* (page 12, Kaufman), or groupings made by scientists. This becomes useful in the field because generally those birds that have similar physical characteristics are grouped together.

Procedures

1. Divide the students into small groups. Give a field guide to each group. Have the students look through the guide and notice the organization, Table of Contents, index, etc. Explain that a field guide provides information about a bird's color, shape, field marks, behavior, songs or calls, habitat, and range. It is an invaluable tool for a birdwatcher.
2. Pass out one Field Guide Question Sheet to each group. Explain that one person in each group is responsible for each question in a round robin fashion until all of the questions have been answered. Note that the first, or odd number question, in each category is "easy." The even number questions require more investigation. By looking up all the answers to each question the students will have used the majority of the field guide. (Note that these questions are geared specifically to the Kaufman Field Guide. Similar questions can be written for other field guides.)
3. Review the Answer Key and explanations to the field guide activity, while asking volunteers to explain both the answer to each question, but, more importantly, how he or she found it in the field guide..

**Wisconsin State
Academic Standards
Correlations for
Grades 4 and 8**

Science

Grade 4:
B.4.1, C.4.3

Environmental Education

Grade 8:
B.8.14

Discussion

1. How would you use a field guide?
2. What did you learn from this experience?
3. Are all field guides the same? What are some similarities and differences among them?



Adaptations and Extensions

1. Have your students create field guides of their own featuring the birds they see on field trips in their schoolyard, around home feeders, etc. Notes and drawings made in birding journals will be especially helpful.
2. Have your students keep a running list of those birds that are identified using their guides. Review the list and the process by which each bird was identified.
3. Introduce the Checklist to Wisconsin Birds (available for download at <http://dnr.wi.gov/org/land/er/birds/trail.htm>) and have students check off birds they have seen and identified.

Assessment

1. Have students write down at least five things you can find out about a bird by using a field guide. Call on a student to give the first example. Write it on the board. Continue around the class in a step-by-step fashion.
2. Ask the students how the guides are organized and ask for a simple definition of the term "taxonomic order".



**Examples of
Categories Found in
Field Guides**

- ♣ Ducks, geese, swans
- ♣ Other swimming birds
- ♣ Aerial waterbirds
- ♣ Birds of Prey
- ♣ Shorebirds
- ♣ Chicken-like birds
- ♣ Wading birds
- ♣ Medium-sized land birds
- ♣ Hummingbirds
- ♣ Swifts and swallows
- ♣ Flycatchers
- ♣ Songbirds
- ♣ Warblers
- ♣ Tanagers and blackbirds
- ♣ Sparrows
- ♣ Finches and buntings

ANSWER KEY

1. c. blue
2. c. pink
3. c. pointed
4. b. short and wide
5. a. bars and stripes
6. b. huge with naked head
7. c. distraction display
8. b. standing and waiting
9. a. b. c. all three
10. no
11. c. Robin
12. no
13. no
14. up to the Rocky Mountains
15. Introduced species from Europe
16. Potato Chip

EXPLANATIONS OF ANSWERS.

1. None needed
2. See text describing Herring Gull & pointer
3. Explanation of Falcon's (family Falconidae) pointed wings as contrasted to other Birds of Prey in their introduction.
4. Again see Birds of Prey introduction
5. Intro. pages to "field marks" helpful, see illustration pointers and text on Barred Owl
6. See pointer and text info. on Wild Turkey
7. An illustration of behavior and text explanation are provided
8. Note text on Great Blue Heron as well as illustrations offering a very common pose
9. Check text explanation of all three birds
10. Most humming birds make a soft "tew" sound or offer various "chattering notes". The wing beat makes a "humming" sound but is difficult to hear
11. Note behavior as explained in text on Robin and contrast to other choices as noted in introduction to swallow family and flycatcher family
12. See explanation to swift family, tiny feet do not allow "perching"
13. See both range maps and note the lack of seasonal changes and text explanation of them in winter woods
14. See range map provided
15. Note Old World vs American Sparrows on beginning pages on sparrow family
16. See explanation of call notes for American Goldfinch

Field Guide Question Sheet



COLOR

1. What color is the "bill" of the male Rudy Duck?
 - a. red
 - b. white
 - c. blue
2. What color are the legs of a Herring Gull?
 - a. yellow
 - b. white
 - c. pink

SHAPE

3. What is the shape of a Merlin or Kestrel's wingtip?
 - a. rounded
 - b. fingered edges
 - c. pointed
4. What is the shape of a Buteo's tail?
 - a. long
 - b. short & wide
 - c. forked

FIELD MARKS

5. What are the field marks for the Barred Owl?
 - a. bars and stripes
 - b. spots
 - c. ear tufts
6. What characteristic will help you recognize a wild turkey?
 - a. mating display
 - b. huge with naked head
 - c. long slender tail

BEHAVIOR

7. What "trick" does a Kildeer do?
 - a. dive into the water
 - b. hovering
 - c. distraction display
8. A Great Blue Heron spends a lot of time doing what?
 - a. soaring and searching
 - b. standing and waiting
 - c. walking through fields

SONG or CALL

9. Which bird seems to say its name?
 - a. Black-billed Cuckoo
 - b. Whip-poor-will
 - c. Black-capped Chickadee
 - d. all 3

-
10. Does a Hummingbird hum?
a. yes
b. no

HABITAT

11. Which bird is often seen running and hopping on lawns?
a. Tree Swallow
b. Eastern Kingbird
c. Robin
12. Are any members of the Swift family ever seen perching on wires?
a. yes
b. no

RANGE MAPS

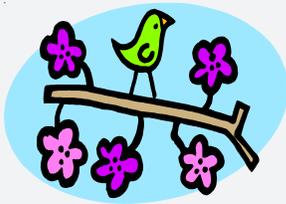
13. Does the Black-capped Chickadee migrate?
a. yes
b. no
14. How far West does an Eastern Bluebird usually range?

OTHER QUESTIONS

15. Why is the House Sparrow called "Old World"?

16. The American Goldfinch "talks" about what junk food?





Vocabulary

Bipedal
Field Characteristics
Furcula
Silhouette
Topography

Objectives

Students will be able to:

- ✦ Identify the topography of a bird
- ✦ Use the topographical information to identify at least four common birds
- ✦ Identify at least 10 other bird species in the field

Materials

- ✦ Topography of a Bird handout
- ✦ PowerPoint, poster, placemat, or other images of Common Wisconsin Birds
- ✦ Field Guides

Key Points

- ✦ Identifying birds using "field characteristics", or the characteristics of the bird's body, is a useful technique in bird watching.
- ✦ Birds are unique and each species has unique field characteristics.
- ✦ Answering detailed questions about size, color, beak, location, food, silhouette and behavior will help identify a bird.

Introduction to Bird Identification

Background Information

What makes a bird a bird? How do your students know that the thing they are looking at through their binoculars or at their bird feeder or on the sidewalk is a bird versus a cow or dog or raccoon?

The state of Wisconsin is home to approximately 400 species of birds. With over 9,000 recognized bird species worldwide - and more being discovered or reclassified all the time - it really is no wonder that birds have fascinated humans for eons. Birds, as a group of animals, are extraordinarily unique, and possess a set of characteristics that no other group of animals share. While other animals may share one or two of these features, only birds possess them all.

Birds have FEATHERS and WINGS.

Birds are BIPEDAL, or walk on two legs, just as humans do.

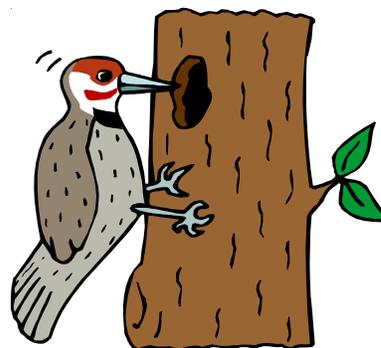
Birds have a WISHBONE, or furcula. (Have you ever made a wish on a turkey wishbone?)

Birds lay EGGS.

Most birds FLY. There are species of birds, however, that do not, such as penguins.

Birds have HARD BEAKS.

Birds are found all over the world, from the polar icecaps to the mountain tops to the deserts to the open seas. They are among the most mobile creatures on earth, and the most colorful.



Thousands of people around the world have developed a special interest in birds. Ornithologists are those that study the behaviors, characteristics, movements, and lives of birds. Most people are bird watchers to some degree, as we tend to notice birds moving or singing around us from time to time. However, once we learn to identify the differences in those birds (for example, a

Wisconsin State Academic Standards Correlations for Grades 4 and 8

Science

Grade 4:

B.4.1, C.4.2, C.4.5,
C.4.6, C.4.7, C.4.8, F.4.1,
F.4.3

Grade 8:

C.8.9, F.8.7

Environmental Education

Grade 4:

A.4.1, A.4.2, A.4.3,
A.4.4

Grade 8:

B.8.6

crane versus a song sparrow versus a pelican) a whole new world of enjoyment is open to us. Knowing what bird we are looking at creates a connection to birds almost like getting to know a new friend.

In this activity, students will learn the beginning steps to successful bird identification and will utilize tools that make the hobby of bird watching fun and relatively easy.

✍ Please note that it is especially important to follow wildlife watching ethics (see page 6) during the outdoor portions of this activity. ✍

Procedures

1. Ask students to point to their brow, crown, nape of their neck, cheek, shoulder, and rump. Point out that there are names/labels for the parts of a bird's body too. We use them to describe birds for identification.

2. Point out parts of a bird on the Topography of a Bird illustration (page 32). Learning the general, external characteristics of birds will be a tremendous help in identifying various species. All field guides, including those in the WBCI Kit, feature an illustrated topography of a typical bird, usually at the beginning of the book.

2. Divide the students up into groups, and give each group a field guide. Have the students find the topography illustration in the book, and note that they may reference this tool throughout their bird watching experiences.

3. Note also that the experiences of the field guide activity (how to use a field guide) and the binocular activity (how to use binoculars) will be of critical value throughout the bird watching experience. Field guides, as you remember, are used to identify birds using "field characteristics", or the characteristics of the bird's body.

4. While inside the classroom, hang either the bird poster or placemat included in the Kit, or display a slide from the PowerPoint presentation. Lead the students while they discover the field characteristics of a common bird in Wisconsin. For example,



utilizing the picture of the Black-capped Chickadee and the illustrated topography, identify as many external characteristics as possible.

5. After reviewing several birds in the classroom to familiarize the students with the concept of field characteristics, take the students outside. Whether you are in a city or in a rural setting, remember that birds can be everywhere!

6. By using the binoculars and the field guide, try and find one species of bird where you are standing. Ask the following questions to help discover clues to the species:

How big is it?

The size of a bird who is alone can sometimes be difficult to determine. One way to assess size is to compare the bird to one that you already know. For example, is the bird you are looking at bigger or smaller than a robin? Is it bigger or smaller than a crow?

What color is it?

Note as many colors and color patterns as possible. For example, a Northern Cardinal is mostly red, while a Red-winged Blackbird is mostly black with a red patch on the wing.

What does its beak look like?

Is the beak long and slender? Short and thick? Curved and sharp?

Where is the bird, and what habitat is it in?

Is your bird in a tree? In a wetland? On a prairie? On a sidewalk? Where does it seem to most like to be?

What is the bird doing?

Various groups of birds can exhibit different behaviors. For example, some birds eat seeds while others eat insects. Some will peck at the ground, while others will tap trees. Others will swim and dive, while still others can be found eating carrion on the side of a road.

In addition, you may want to note whether the bird is alone or in a larger group, the time of day that you are seeing the bird, and the season. Bird behavior may change based on these variables. The field guide notes these changes as they relate to different species.

What are some other field characteristics that you can identify?

Noting colors and patterns - these are called field marks - is the most important step in identifying the bird. For example, does the bird have an eyering? What color is it? Does the bird have a wingbar? What color is it? Is the breast a solid color or is it spotted? Is the back a solid color or does it have bars across it?



Is the bird making any sound?

Hearing bird calls and sounds is another useful tool to help identify a bird. Field guides include a description of bird calls and songs for each species. While connecting the written description to the audible call or song may be difficult, the use of bird song tapes/CDs can help. Your local library may be a good source for tapes and CDs.

All of these details will help you and your students identify your bird. Keep a list of all the birds you are able to identify. If you are unable to identify a particular bird, make observations and take notes on the above questions. Perhaps with additional study, you'll be able to figure it out.

Discussion

1. What makes a bird a unique type of animal?
2. If the students have been able to watch birds, review the steps you went through to correctly identify the bird species.
3. What was the most common species of bird identified? The least common?
4. What were the habitats or locations that you visited to find birds? How did your location impact the types of birds found?

Adaptations and Extensions

1. Take the students outside to see birds and identify them in the field together.
2. Set a bird feeder where the students can see it every day and practice identifying the birds that visit.

3. Have students keep a journal about each bird watching adventure and each bird identified. In the journals students can include observations, sketches and notes about how they knew which bird they were looking at.
4. Mount photos of birds in various places around the classroom or school. Students can use their binoculars to look at the photos from a distance. This is helpful when students are first learning to use binoculars because the birds don't move!
5. Have the students create field guides to the birds they were able to identify. Each page of the guide could include a hand-drawn picture of the bird and notes about the clues the students gathered to identify the bird. Students could also do research on the range, cultural significance, population, endangered status and other aspects of their species.
6. Get involved in a bird count. Several universities and organizations throughout the country offer backyard bird watchers the opportunity to submit data about birds they've encountered. For example, here are some of the bird surveys students could become involved in:

International Crane Foundation's Annual Midwest Crane Count: For more information, visit www.savingcranes.org.

National Audubon Society's Christmas Bird Count: For more information, visit www.audubon.org.

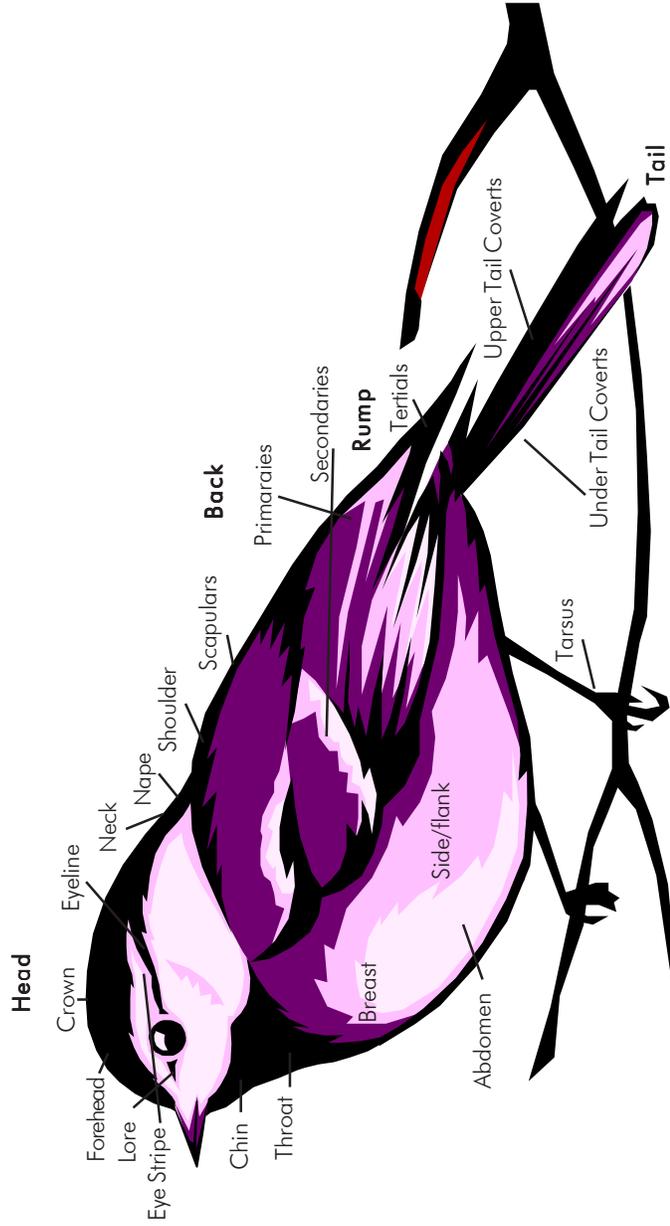
Cornell Lab of Ornithology's Project FeederWatch: For more information, visit www.birds.cornell.edu.

Assessment

1. Have the students list and describe ten field characteristics of birds.
2. Have the students display their field notes and observations. This may take more than one class period.
3. Have the students write a description of the process of bird identification, including useful questions to ask, important observations to make, and tools that can be used.
4. Describe the "topography" of a bird, and name at least ten field characteristics that can be found on birds.



Topography of a Bird



Black-capped Chickadee



Vocabulary

Values
Continuum

Objectives

Students will be able to:

- ✎ Discuss pros and cons of at least three bird conservation issues
- ✎ Name at least three potential threats to birds

Materials

- ✎ Issues Statements
- ✎ "Strongly Agree" and "Strongly Disagree" signs to post

Key Points

- ✎ Many bird populations are declining and there are a number of factors involved in the declines.
- ✎ There are things people can do to keep common birds common.
- ✎ There is more than one perspective about issues.
- ✎ Sometimes people change their minds based on the convincing arguments of others.

Taking a Stand on Bird Conservation Issues

Background Information



Both scientists and backyard birders have observed serious declines in the populations of certain species of birds. While changing land use may be the most significant factor in this decline, other factors have an impact too.

Changes in land use affect different birds differently. For example, if trees take over a formerly open meadow, the change may be good for the birds that prefer woodland habitat, but bad for the birds needing open grasslands. With most issues there is more than one perspective to be considered.

As you read about the four current issues below, note that they are all human-related. That means that the problems are largely caused by human behaviors. Therefore it is possible to help resolve the problems by altering human behavior. However there are a variety of human perspectives on each issue. This activity explores student values, problem solving skills, and the significance of both sharing your opinion and listening to the opinions of others.

CATS

Many cat-lovers believe that cats should be free-roaming so that they can fulfill their role as hunting predators. Unfortunately, cats like to hunt birds. If there were just one cat in the area, such a practice might be fine. However, the density of the free-roaming cat population is huge, with approximately 77 million pet cats in the US, 65% of which are free-roaming, plus another 60 to 100 million homeless cats in the country. Across the US, cats kill hundreds of millions of birds each year. They are not selective in terms of exotic species, common species, or endangered species. While keeping cats indoors could save hundreds of millions of birds, it could also protect

**Wisconsin State
Academic Standards
Correlations for
Grades 4 and 8**

Social Studies

Grade 4:

A.4.4, A.4.9, C.4.3,
C.4.5, C.4.6, E.4.1, E.4.2,
E.4.6, E.4.7, E.4.8, E.4.9,
E.4.10

Grade 8:

A.8.4, A.8.11, B.8.4,
C.8.7, D.8.11, E.8.1, E.8.2,
E.8.4, E.8.13

Science

Grade 4:

F.4.2, F.4.4, H.4.2,
H.4.4

Grade 8:

A.8.1, F.8.9, F.8.10,
G.8.5

Environmental Education

Grade 4:

A.4.2, A.4.3, A.4.4,
B.4.6, B.4.10, C.4.1, C.4.2,
C.4.3, C.4.4, C.4.5, D.4.1,
D.4.2, D.4.3, D.4.5, E.4.1

Grade 8:

A.8.1, A.8.4, A.8.5,
A.8.6, B.8.5, B.8.8, B.8.10,
B.8.14, B.8.15, B.8.16,
B.8.17, C.8.1, C.8.3, D.8.1,
D.8.2, D.8.5, D.8.7, D.8.8

the cats. Millions of cats are run over by cars every year; others are damaged or die from attacks from other animals or exposure to diseases, and some are cruelly tortured by people. Free-roaming cats that are unaltered reproduce, leaving an increased over-population of cats to kill birds and small mammals. Millions of homeless cats are euthanized every year, yet millions still roam.

LEAD POISONING

Many people are aware that lead poisoning is serious. We test our wells to be sure the water is safe to drink. We replace lead water pipes in our houses. But many birds and other wildlife depend on the water in our lakes, rivers and streams, where lead poisoning is killing our eagles, swans, loons, and other water birds. When duck and goose hunters used lead shot year after year, the shot accumulates on the lake bottom where it could be ingested. Hunters are becoming aware of the problems caused by using lead shot over water and, prompted by legislation, they are using alternatives. But when anglers use lead tackle, they pose the same threat to waterbirds and other aquatic wildlife. Just one lead sinker can kill a loon. Sinkers are similar to pebbles that loons ingest to help them digest their food. Anglers can replace lead jigs and sinkers with non-toxic alternatives made from tin, bismuth, steel, tungsten, or ceramics, disposing of the lead pieces properly through local hazardous waste collection. If businesses that sell fishing tackle do not carry non-lead products, customers can request that they do so.



Sometimes the cost of non-lead products may be a few pennies more, but the difference is exactly that: pennies. Steel jigs are generally less expensive than lead.

COMMUNICATIONS TOWERS

In modern America, people rely on a wide array of communications services, such as broadcast television and radio, cellular phones and personal communications services like digital voice services, paging, text messaging, email, and advanced beepers. Public safety services such as law enforcement, ambulances, and other emergency services depend on dispatch, two-way radio, and state-of-the-art mobile communications systems. Towers and other

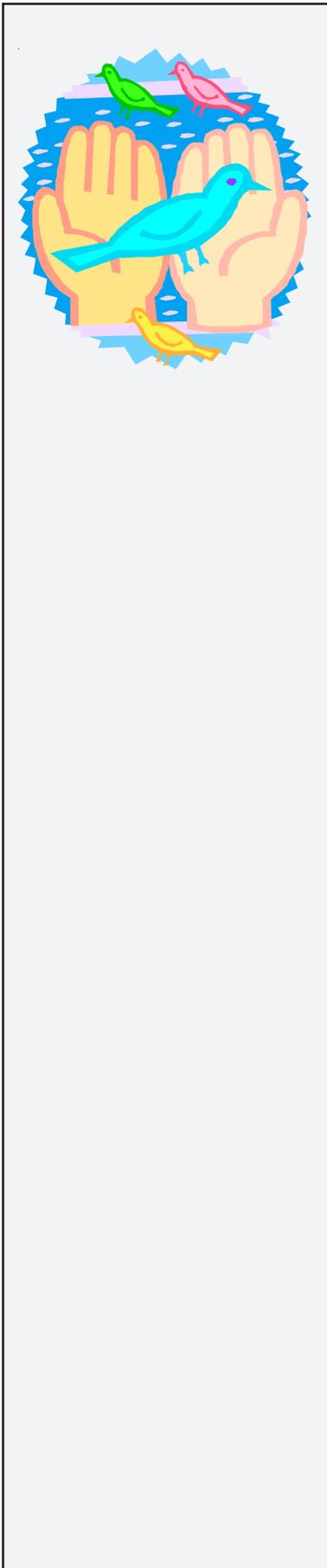


structures form the platform for providing these communication services. In the 1990s, due to the introduction of the cell phone and Personal Communications Services industry, the Federal Aviation Administration estimated that new tower construction in the US has accelerated to more than 5,000 a year. Even more towers are needed to meet the expanding demand for these services. The end to the telecommunications monopoly created competition among many companies, with every company wanting their own towers. While it is hard to calculate tower-related bird mortality, a 1979 estimate suggested that 1.2 million birds a year were killed by communications towers across the US. When birds are flying in poor visibility, they may not see the structure in time to avoid collision. Many birds migrate at night. Even when towers are lighted, the lights can serve to hold birds in the illuminated vicinity, when cloud cover is low and they may be disoriented. When they fly around and around the lighted tower, collisions are likely to occur. Birds have blind collisions with guy wires attached to the towers as well as the tower structures themselves. To reduce bird mortality from collisions with towers, companies can share towers rather than constantly building new ones. When new ones are required, placement of the towers should be considered to avoid coastlines and bird migration routes. Shorter towers can be left unlit, and taller towers can be lit with minimum intensity strobes rather than red incandescent lights, which seem to hold the birds around the tower.

Procedures

1. Announce that we are going to discuss some issues related to birds. Explain that many populations of birds are in serious decline. While there are many factors that affect bird populations, we are going to discuss three current issues.
2. Introduce the concept of a continuum of agreement. Post a sign saying "Strongly Agree" at one end of the wall, "Strongly Disagree" at the other end. Introduce the wall between the two signs as a continuum. Explain that you will read a point of view on an issue, and students will line up along the continuum, depending on whether they agree or disagree. They should be prepared to explain why they are standing where they are standing.





3. Read one issue statement. Have the students move to the place that represents their opinion on the continuum. Call on the outliers initially, asking them why they are standing where they are. Then ask some individuals in the core of the cluster. Students can ask one another for clarification and raise points to confirm or disagree with one another, so that a discussion ensues. The teacher can add missing information or information that might correct misassumptions. Ask students for alternative responses to the issue. Sometimes students will stand in the same place on the continuum, but for very different reasons. Sometimes students will stand at one point just because their friend is standing there. That is an acceptable answer. If no one says this, ask: "Did anyone choose their place just because your friend is there?" Point out that people often consider the opinions of their friends in making decisions. Thus each of us has an opportunity to influence other people as well.
4. After discussion, reread the issue statement and give students an opportunity to change their place along the continuum. Ask if anyone changed their place. Ask why. If appropriate, point out that sometimes individuals can make a difference when we discuss our opinions.
5. Repeat the process with another issue statement.

Discussion

1. What do you think about the issue statements?
2. How do people choose sides/make decisions on an issue?
3. What do these issues have in common? (They are all related to human behaviors.)
4. What might be done to help resolve the issues?
5. What can you do to help resolve these issues?
6. What other bird conservation issues are you aware of?

Adaptations and Extensions

1. Have students study one of the issues and write a report.
2. Divide the class into small groups. Provide background information (provided in the Resources section of this Educator's Guide) on one issue to each small group. Have them discuss the issue and what might be done about it, then report to the whole class.
3. If students want to take action on any of the issues, support them in writing a letter to the editor or legislators, or making presentations to their school or community.
4. Have students interview people who fish and people who sell tackle to find out what they think about using lead tackle.
5. Conduct a study of cat owners in the school or community. Survey them to find out how many free-roaming cats are known to be in the area.
6. Find out where the closest communication towers are and visit them to see how birds might collide with them.
7. Set up a citizen monitoring program to check communications towers regularly for dead birds, especially during migration.

Assessment

1. Ask students to list and discuss three current threats birds face.
2. Have students create a video or an educational campaign to teach others in their school or community about these current issues.
3. Assign an essay on the issues presented in this activity.

Issues Statements



- Cats that are not kept indoors are killing millions of birds.
- Every cat that is outdoors should be trapped and removed.
- It's okay for my cat to roam outside because I have never seen her catch a bird.



- Eagles, loons, swans, and other waterbirds die from ingesting lead shot and lead tackle.
- I should still be able to use whatever jigs and sinkers I have.
- The damage with lead poisoning was done long ago so it isn't a problem now.



- Many birds, especially during migration, collide with communications towers and their guy wires.
- Because towers are a threat to migratory birds, cell phones should be banned.
- Communications towers can be placed in places that pose less danger to migrating birds.

Appendices

"I never for a day gave up listening to the songs of our birds, or watching their peculiar habits, or delineating them in the best way that I could."

*John James Audubon,
Artist and Ornithologist*

Appendix A

The Effects of Free-ranging Cats on Birds in Wisconsin: Wisconsin Bird Conservation Initiative Issues and Guidelines

C.A. Lepczyk, S. Diehl, N. Cutright, K. Etter Hale, W. Mueller, J. Trick

Introduction

Studies in Wisconsin and elsewhere indicate that free-ranging domestic cats (*Felis catus*) pose a threat to birds and other wildlife.

In Wisconsin, concern about free-ranging cats was first highlighted in the mid 1990's, when a study by Coleman and Temple attempted to study predation by free-ranging cats on birds in rural locations across the state. Extrapolating the results from this study indicated that millions of birds were being killed annually in Wisconsin by cats. Because of the difficulty in studying any species living outdoors across the entire state, the exact number of birds killed annually by free-ranging cats will never be fully enumerated. However, over the past decade additional studies in the Midwest and elsewhere have suggested similar problems with cat predation on birds and should alert us to the fact that free-ranging cats are killing large numbers of birds in Wisconsin each year. Moreover, other studies have shown that cats in some habitats may be directly competing with native avian predators, such as American Kestrels (*Falco sparverius*), Northern Harriers (*Circus cyaneus*) and Red-tailed Hawks (*Buteo jamaicensis*) for prey. Finally, in some habitats and locales even very low cat depredation could negatively impact the breeding success and survival of a species, especially if that species is rare or endangered.

Because of concerns raised by these and other studies, a number of nationwide efforts have been developed to encourage responsible cat ownership, most notably the American Bird Conservancy's *Cats Indoors!* program and the Humane Society of the United States' "Safe Cats" program. In our effort to address this concern in Wisconsin and provide assistance to both WBCI partners and the general public, we have outlined a set of recommended conservation actions and research needs pertaining to outdoor cats.

Recommended Actions

The reduction of cat predation on native birds and other wildlife will be achieved through the involvement of cat owners, WBCI partners, state and federal agencies, non-governmental conservation, animal welfare, and animal sheltering organizations. At the present time we recommend the following guidelines to reduce the negative impacts of free-ranging cats on birds in Wisconsin:

For the welfare of both cats and birds, keep your cats indoors or under your supervision and control when outdoors, and encourage others to do the same. According to the Humane Society of the United States, cats that are not allowed to roam outdoors typically live substantially longer than free-roaming cats. Indoor-only cats are much less likely to get lost, get parasites, become exposed to serious diseases, get hit by a car, attacked by a predator, or get in fights with other cats. Moreover, lost cats often go unclaimed at local pounds and animal shelters. For instance, in Milwaukee, only about 4% of cats that enter that city's animal control shelter are reclaimed by their owners.

Help in "converting" your free-ranging cat to an indoor-only cat can be found at the

HSUS' "[Safe Cats](#)" website. Overcoming attitudinal barriers among the general public to keeping owned cats indoors or under their control when outdoors is one of the keys to long-term solutions to predation by cats on birds and other wildlife and reducing suffering for cats in our communities.

To help reduce the numbers of abandoned/unwanted cats, spay or neuter your cats and encourage other cat owners you know to do the same. Support low-cost or free cat spay and neuter programs at your local humane society or animal shelter and support efforts to spay or neuter all cats adopted from your local animal shelter. Many animal shelters and humane societies are poorly funded and the only way such efforts can be undertaken is through public donations and support.

Have your veterinarian "microchip" your cats to aid in their being returned to you should they become lost, and promote voluntary identification of cats in your community. A microchip is a rice-grain-sized identification device that is quickly and easily inserted under the skin of a cat's back and can be read electronically to determine the cat's owner.

Support ordinances and initiatives in your community designed to humanely and effectively reduce the numbers of unwanted cats, decrease the number of homeless stray cats, increase the return of lost cats to their homes, increase the number of cats adopted into permanent homes and reduce the number of cats surrendered to shelters.

Treat stray cats on your property humanely. Contact your neighbors to find out if the cats frequenting your property are owned. If they are, explain to the owners the impact their cats have on wildlife, the risks cats allowed outdoors face, and ask them to keep their cats indoors or under their control. If a cat's owner cannot be found, contact your local animal control agency for advice.

Use "habitat modification" on your property to minimize the likelihood that free-ranging cats will cause problems for wildlife: avoid feeding birds on the ground where they may be more vulnerable to predation; place your bird feeders at least several feet away from shrubs and other cover cats may use to stalk birds; utilize non-toxic commercial repellents designed for cats or humane scare devices such as the [Scarecrow](#).

Farmers and others in the agricultural community are urged to spay or neuter the cats on their properties to control their numbers, and instead of depending on cats for rodent control, control rodents by the use of pest-proofing and environmentally safe rodent control methods. Avoid the use of rodenticides (i.e. poisons), especially outdoors, since birds-of-prey (hawks and owls) can become ill or die when they eat rodents that have consumed rodenticides.

Bird and wildlife conservation agencies and organizations, and animal welfare and sheltering agencies and organizations should work together to achieve common goals concerning cats and wildlife.

Ongoing Research and Additional Research Needs

While the overall impact of cat predation on specific bird species at the population level in Wisconsin has not been enumerated exactly, it is clear that many free-ranging cats prey on birds. Thus, there are legitimate concerns that free-ranging cats may be a significant cause of bird mortality. With bird populations under pressure from numerous other human-initiated or -controlled threats (e.g., habitat loss and fragmentation, tower and building collisions, climate change, pollution, etc.), we need to reduce as many of these threats as possible. We have identified a number of research needs to help us better understand the effect of cat predation on birds in Wisconsin.

In an effort to enumerate numbers of cats allowed outdoors, and measure the success of educational programs that encourage people to keep their cats indoors, the WBCI Issues Committee is currently attempting to study the numbers of free-ranging cats within Christmas Bird Count (CBC) circles in Wisconsin. While covering an area of a CBC circle, participants record the number of cats seen **outdoors**, and note how many of these cats are seen close to a house, barn or farm outbuilding, and the number observed that are not close to such structures. If desired, the participant may simply record numbers of individuals. Collection of data began with the 2003 CBCs in Wisconsin. To include this cat survey in your Wisconsin CBC, contact Bill Mueller, Wisconsin Bird Conservation Initiative Issues Committee chair, at iltlawas@earthlink.net.

The following information is needed in order to have a more complete picture of the impacts of free-ranging cats on birds and other wildlife in Wisconsin:

- In 2004, Lepczyk, Mertig and Liu studied the effects of owned, free-ranging cats on birds across urban to rural landscapes in Michigan. Ideally, similar studies should be conducted across varying landscapes and communities here in Wisconsin.
- The level of bird predation by feral cats in managed colonies across varying landscapes in Wisconsin should also be studied. Nationwide, the animal welfare community is searching for humane and effective means of controlling feral cat populations, and the establishment of managed feral cat colonies is growing in popularity. It is not well understood what threat managed feral cat colonies might pose to native bird species across urban to rural landscapes.
- Conservation biologists lack data on how specific levels of cat predation depress wildlife populations and if there are thresholds at which cat densities become a biologically significant source of mortality.
- Relatively little information exists on the human rationale of allowing cats outdoors and what factors underlie this human behavior.
- Public education efforts on this issue need to be assessed over time to investigate if people's attitudes and behaviors change.
- What role bird window collisions play in the numbers of birds recovered by free-ranging cats.

These six points represent specific next steps for conservation research on the free-ranging domestic cat in Wisconsin, but by no means is an exhaustive list.

Educational Information and Resources

- **American Bird Conservancy's "Cats Indoors!" program:** Public Service Announcements; poster competition; coloring page.
- **Humane Society of the United States' "Safe Cats" program** printable PDFs: Cat Care Basics; The Uninvited Cat; Guide to Cat Law; A Safe Cat is a Happy Cat.
- **Project Bay Cat.** A cooperative effort between Sequoia Audubon Society , the Homeless Cat Network and Foster City municipal government to humanely manage feral cats along the scenic Bay Trail in California. This area includes habitat for the endangered California clapper rail. A "tool kit" for others who wish to take similar action can be obtained free from info@homelesscatnetwork.org or call (650) 286-9013.

Position Statements and Links to Online Resources

Organizations with Policy Statements and Guidelines

The American Bird Conservancy

[Cats Indoors! Campaign](#)

[Resolution on Free-roaming Cats](#)

American Humane Association (AHA)

[Position statement on feral cats and their management](#)

American Veterinary Medical Association

[Position statement on feral cats and their management](#)

Cooper Ornithological Society

[Resolution on Public Policies Regarding Feral and Free-ranging Cats](#)

Florida Wildlife Commission

[Position Statement](#)

Minnesota Department of Natural Resources

[Statement on Cats and Birds](#)

National Audubon Society

[Resolution on Cats](#)

[Reducing Threats from Cats](#)

The Wildlife Society

[Policy statement on feral and free-ranging domestic cats](#)

Articles Available Online

[Cats and Wildlife: A Conservation Dilemma](#) John S. Coleman, Stanley A. Temple, and Scott R. Craven. Succinct discussion of the problem and what you can do to help. University of Wisconsin Extension.

Florida Fish and Wildlife Conservation Commission. [Commission project to increase public awareness of the effects of free-ranging cats on wildlife.](#)

[Minnesota's Killer Kitties](#) from Minnesota DNR.

[Missouri Conservationist](#) article by Joan McKee. Conservation Commission of Missouri.

[University of Florida IFAS Extension Impacts of free-ranging pets on wildlife](#) by Joe Schaefer.

Wisconsin Natural Resources magazine article by John Coleman and Stanley Temple.

Additional Literature

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- Patronek, G.J. 1998. Free-roaming and feral cats—their impact on wildlife and human beings. *Journal of the American Veterinary Medical Association* 212:218-226.
- Pearre, S. Jr., and R. Maass. 1998. Trends in the prey size-based trophic niches of feral and House Cats (*Felis catus*) L. *Mammal Review* 28:125-139.
- Turner, D.C., and P. Bateson. 2000. *The Domestic Cat: The Biology of its Behavior*. Second Edition. Cambridge University Press.
- Woods, M., R. A. McDonald, and S. Harris. 2003. Predation of wildlife by domestic cats (*Felis catus*) in Great Britain. *Mammal Review* 33:174-186.

Appendix B

Lead Poisoning of Wisconsin's Birds A Wisconsin Bird Conservation Initiative Issues Paper N. Cutright and S. Diehl

Introduction

Lead is a toxic metal, yet tons of lead are deposited in Wisconsin's environment annually through hunting, fishing, and recreational shooting. Lead deposited in the environment will persist indefinitely and will not break down over time into less-toxic compounds. Mortality due to lead poisoning has been documented in a wide variety of birds. Lead toxicity can have sub-lethal consequences that can compromise avian survival and reproductive success. Signs of lead intoxication in birds can vary but include behavioral changes (e.g., loss of escape response); lethargy; anorexia; paralysis of the crop, esophagus, proventriculus, gizzard, legs, or wings; vomiting; diarrhea; incoordination or lack of muscle control; convulsions; anemia; and emaciation (starvation/muscle wasting).

Facts and Research Findings

The literature on lead poisoning of North American wildlife is extensive (see "Links" and "Additional Literature" below).

- Lead poisoning has been documented in 25 species of water birds.
- Poisoning from lead sinkers and jigs used in sport fishing is a significant source of adult Common Loon mortality, accounting for 46% of deaths in New England, 30% in Canada, and 17% in Minnesota.
- In Wisconsin, lead poisoning is a significant mortality factor for the Trumpeter Swan, an endangered species in the state. Of 110 Trumpeter Swan carcasses submitted to the Wisconsin Department of Natural Resources (WDNR) for post-mortem examination between 1991 and 2004, 34 deaths (~31%) were attributed to lead poisoning.
- Of 559 Bald Eagle carcasses submitted to the WDNR between 1994 and 2003, 68 (~12%) of those deaths were attributed to lead poisoning.
- A WDNR study published in 2004 found that some American Woodcock in Wisconsin are accumulating unusually high levels of lead in their wing bones. The exact source of the lead is not known at this time, but a dietary source for the lead is likely, and the study could not rule out lead shot in soils as the ultimate source of the lead.
- In 1992, at least 200-300 Canada Geese died as a result of acute lead poisoning from ingesting lead shot on a former trap and skeet shooting range near Lake Geneva in Walworth County, Wisconsin. The US Environmental Protection Agency reportedly spent ~ \$1.88 M on a Superfund cleanup of the site, removing ~28,000 tons of lead-contaminated soils. The most recent large-scale lead poisoning event in Wisconsin occurred when ~200 Canada Geese were collected in 1999 and again in 2000 from a location in Outagamie Co.
- Nationally, lead poisoning of waterfowl and the Bald Eagle resulted in a 1991 federal ban on the use of lead shot in waterfowl and coot hunting. In 1997 alone, the U. S. Fish &

Wildlife Service (USFWS) estimated that the ban on lead shot saved 1.4 million ducks. In Canada, a study showed a decrease in lead levels in bone in waterfowl of 50-70% as a result of the ban on lead shot for waterfowl hunting in that country. These and other studies have demonstrated that switching to nontoxic shot, defined as any shot type that does not cause sickness and death when ingested by birds, can help protect bird populations and improve the environment.

Nontoxic shot is becoming increasingly available. There are now nine shot types approved by the USFWS as nontoxic. Affordable, suitable alternatives also exist for lead fishing tackle. (See links below for sources, especially the REGI website).

- In order to help protect birds from lead toxicity, certain lead fishing tackle has been banned in New Hampshire, Maine, New York, Great Britain, the Canadian national parks and national wildlife areas, and in three USFWS wildlife refuges.

Research Needs

WBCI encourages research aimed at understanding the extent of the problem of lead poisoning in birds in Wisconsin. Suspected cases of lead poisoning in birds should be reported to your local WDNR Warden or Wildlife Manager, so that the WDNR can better monitor the extent of the problem in the state.

Recommended Actions

- Use fishing sinkers and jigs made from nontoxic materials such as tin, bismuth, steel, and tungsten-nickel alloy.
- Use one of nine shot types approved as nontoxic. Nontoxic shot is available at many locations where lead-shot ammunition is sold.
- Ask your local bait and tackle shop and your ammunition dealer to carry a variety of non-lead products if they don't already carry them.
- Dispose of old lead sinkers and jigs properly. Turn these items in at your local hazardous waste collection site or contact a local metals recycling company. Keep lead out of the reach of children while you are awaiting proper disposal.
- Spread the word. Tell others about the problem and encourage them to switch to non-lead fishing tackle and ammunition. You can help by distributing "Get the Lead Out" educational "rack cards" to your friends, local sporting goods distributors, and sportsman's clubs. Go to <http://www.wisconsinbirds.org/leadpoisoning.htm> to view the card online and obtain cards for distribution.

Acknowledgements

Special thanks to Sean M. Strom of the WDNR for statistics pertaining to lead poisoning in Bald Eagles and Trumpeter Swans, for information about lead exposure in American Woodcock, and for reviewing this Issue Paper before posting.

Links to Information Sources

WBCI "Get the Lead Out" webpage <http://www.wisconsinbirds.org/leadpoisoning.htm>

Wildlife Without Lead http://www.hawkwatch.org/lead_site/index.htm
Raptor Education Group, Inc. "lead sinker exchange" webpage, with a list of nonlead tackle suppliers/manufacturers http://www.raptoreducationgroup.org/View_Special_Projects.cfm?title_bar=Lead%20Sinker%20Exchange&NewsID=11
Lead and Wildlife: A Bibliography of Selected Citations – 2001 http://www.hawkwatch.org/lead_site/background/lead&wildlife_bibliography.pdf
Let's Get the Lead Out! (Non-lead alternatives for fishing tackle) (Minnesota) <http://www.moea.state.mn.us/reduce/sinkers.cfm>
Loons and Lead Poisoning (Tufts School of Veterinary Medicine) <http://www.tufts.edu/vet/loons/loon.html>
Fish Lead Free (Canadian Wildlife Service) http://www.cws-scf.ec.gc.ca/fishing/index_e.cfm
Lead Poisoning (Michigan) http://www.michigan.gov/dnr/1,1607,7-153-10370_12150_12220-26676—CI,00.html
The Use of Nontoxic Shot for Hunting in Washington <http://www.wdfw.wa.gov/wlm/game/water/nontoxicshotfinal.htm>
Lead Toxicosis in Michigan Loons from Ingestion of Lead Sinkers and Jigs: A Real Problem <http://www.michiganloons.org/lead.htm>
Fact Sheet: Lead Poisoning in Migratory Birds (National Wildlife Health Center, Madison) http://www.nwhc.usgs.gov/disease_information/other_diseases/lead_poisoning.jsp
Lead and Fishing – Sinkers and Animals (U.S. EPA) <http://www.epa.gov/owow/fish/animals.html>
Lead Fishing Tackle (State Environmental Resource Center) http://www.serconline.org/lead/pkg_frameset.html
LoonWatch: Get the Lead Out!: <http://www.northland.edu/Northland/Soei/Programs/LoonWatch/Programs/GetTheLeadOut.htm>
Numbers of lead poisoned Bald Eagles by state <http://biology.usgs.gov/s+t/imagefiles/b213f02.htm>
Environment Canada - toxicity of lead shot and sinkers http://www.cws-scf.ec.gc.ca/publications/papers/88/chap3_e.cfm
Swans and lead poisoning (info from a die-off in 2000 in the Pacific Northwest) <http://www.swansociety.org/issues/lead/0102lead.html>
Trumpeter Swan society - more on lead poisoning of swans <http://www.trumpeterswansociety.org/washington/lead.htm>
Minnesota Public Radio - lead sinkers and poisoning (a still effective re-telling of this information) http://news.minnesota.publicradio.org/features/200005/09_engerl_fish-m/index.shtml
Loon Preservation Committee (search their pages for info on loons and lead; other contaminants) <http://www.loon.org/>

Additional Literature

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Sanborn, W. n.d. Lead Poisoning of North American Wildlife from lead shot and lead fishing tackle . Draft. HawkWatch International, 1800 South West Temple, Suite 226, Salt Lake City, UT 84115. (This 31-page review is the best single source of information and contains 125 references through 2002.)

Scheuhammer, A.M., S.L. Money, D.A. Kirk, and G. Donaldson. 2003. Lead fishing sinkers and jigs in Canada: Review of their use patterns and toxic impacts on wildlife. Occasional Paper 108. Canadian Wildlife Service, Ottawa.

Scheuhammer, A. M. and S. L. Norris. 1995.

A review of the environmental impacts of lead shotshell ammunition and lead fishing weights in Canada .

A review of the environmental impacts of lead shotshell ammunition and lead fishing weights in Canada. Occasional Paper 88. Canadian Wildlife Service, Ottawa.

Strom, S. M., K. Patnode, J. Langenberg, B. Bodenstern, T. Scheuhammer, and B. Beard. 2004. Determination of the extent and source of lead contamination in woodcock (*Scolopax minor*) from Wisconsin. Wisconsin Department of Natural Resources Final Report.

Appendix C

Clear the Way for Birds! IMBD Explores Bird Collisions

IMBD Information

web - <http://birds.fws.gov/imbd>

phone - 703 /358-2318

IMBD Materials

web - <http://www.BirdDay.org>

phone - 1-866/334-3330

March 2005

Collision Course

Flight is a magnificent means of transportation, allowing bats, insects, birds and even humans to travel great distances. For many birds, however, a journey across the skies may be a veritable obstacle course of human related hazards. International Migratory Bird Day (IMBD) is an opportunity to examine the obstacles birds may encounter in flight and explore the many ways we may minimize their impacts. The towers erected for our cell phones and pagers, the lines that bring us power, our vehicles, the windows on homes and office buildings, and even sources of renewable energy, such as wind turbines, create obstacles for birds in flight.

Collisions with these obstacles may cause the death of one bird or tens of thousands of birds in a single incident. Biologists estimate the combined death toll from aerial collisions may exceed 700 million birds each year and affects all types, from ducks, gulls, plovers, owls, and hawks, to woodpeckers, hummingbirds, warblers, sparrows, and finches. The problem is urgent, and biologists, conservation organizations, communities and individuals are joining forces with industry representatives to unravel the causes of bird collisions and to explore ways of making a bird's journey safer. Individual participation in these efforts can have significant results. Small changes at home, involvement at work, and active contribution to your community can make a world of difference to bird conservation.

Power Lines

Birds with large wingspans, such as raptors, cranes, and swans, are less maneuverable and thus most vulnerable to collisions with power lines. The impacts may be especially high when power lines are located near marshes, lakes, and other habitats where birds congregate in winter, when breeding, or on migration. Wind and stormy weather also make avoiding lines a challenge. New guidelines that are used by utility companies are helping to lower the impact of power lines on birds.

Solutions ~ Burying power lines eliminates bird collisions. Flags or marker balls on lines located above ground help to increase their visibility, helping birds to see and avoid them. When lines are parallel, the likelihood that birds will see one line and avoid it only to hit another are decreased.

Communication Towers

Communication towers provide coverage for cell phones, pagers, television and radio—

technologies that are central to our lives. Over 140,000 towers are located in the United States, and as many as 5,000 new towers are erected each year. Bird collisions at towers have been reported for over 50 years, and studies are ongoing to determine the causes and solutions. The towers that are the most hazardous to birds are those that are over 200 feet, are illuminated at night with red lights, are supported by guy wires, and are located in migration corridors, near wetlands and in areas prone to fog, low clouds, and precipitation. Birds that migrate at night are drawn to tower lights, especially in poor weather. Disoriented, they circle the area, eventually striking the guy wires, the tower, or even one another.

Solutions ~ Birds are less likely to be harmed by shorter structures that do not require lighting or guy wires, lights that are white or green, and towers that are located away from migration corridors and cloudy areas. Creative placement of new towers includes using existing buildings.

Wind Turbines

Harnessing the wind's energy is an economical means of producing electricity. As early as 200 B.C., windmills were used to pump water and grind grain. Today, wind farms may include hundreds of turbines, tall structures which support fan-like rotors connected to generators. The electricity produced by the spinning rotors supplies power to towns and cities. Like communication towers, turbines are most harmful to migrating birds on cloudy nights and when turbine height requires the use of lights. Because turbines are not supported by guy wires and rarely involve lights, their impact on birds in flight compared to other structures is relatively low.

Solutions ~ Proposals for new wind farms that consider bird migration routes, bird abundance, and turbine height will help to minimize fatalities.

Plate Glass

One of the greatest hazards to birds is plate glass, with windows in homes and offices killing as many as one billion birds each year. Glass is invisible to birds, and if it reflects the images of trees, bushes, the sky or other natural habitat, a bird may fly directly into it. The presence of houseplants behind windows, the distance of vegetation or bird feeders from windows, and the angle of reflection may all influence the likelihood of a bird flying into glass. Studies indicate that one of every two strikes is fatal. If not killed outright, birds stunned after striking glass often fall prey to hawks, dogs, cats, raccoon, and even squirrels. In addition, tall buildings and vanity signs that remain lit throughout the night are as hazardous as lighted towers. Birds may be attracted to these structures, confused by the lights, and circle repeatedly, dying of exhaustion or by colliding with the building.

Solutions ~ There are many ways to reduce bird strikes at windows.

- Hang ribbons, wind chimes, or hawk silhouettes the full length of the glass outside windows, using a suction cup. Movement is more effective in deterring birds than static images on the glass.
- Move house plants away from windows.
- Place bird feeders, birdbaths, and plants less than half a meter from windows, so that birds are less likely to build up enough momentum to harm themselves.
- Close curtains and blinds whenever possible.
- Use window films that lessen the glare and transparency of glass.
- Extinguish building lights or draw blinds from dusk until dawn.

Transportation

Travel by air and car is a convenience that is relatively safe for humans, but results in death for as many as 2 million birds each year. The over 8 million miles of roads in the U.S. and hundreds of airports are often bordered by fences and vegetation, which are used by birds for perching, foraging, and nesting. The heat emitted by road and runway surfaces, puddles that form beside roads, and the salt used for de-icing are just a few of the other factors that attract birds. Collisions with cars are also influenced by location of the road, proximity of vegetation, and vehicle speed.

Solutions ~ Erect road signs or speed bumps to lower vehicle speeds where bird activity is frequent and remove plants from roadsides and medians that attract birds. Landscaping with taller trees and bushes will cause birds to fly higher. Better planning of new roads and highways will benefit birds by avoiding valuable habitats.

For More Information on Bird Collision Issues:

American Bird Conservancy Wind Energy Policy - www.abcbirds.org

Avian Power Line Interaction Committee - www.aplic.org

Birds & Buildings - www.birdsandbuildings.org/index1024.html

Fatal Light Awareness Program - www.flap.org

National Wind Coordinating Committee - www.nationalwind.org

U.S. Fish & Wildlife Service - <http://migratorybirds.fws.gov/issues>

Links to further information on Collisions and Birds

William P. Mueller, WBCI Issues Committee Chair

Resources from the U.S. Fish and Wildlife Service, for International Migratory Bird Day's 2005 theme (Clear the Way for Birds!)

Clear the Way for Birds! IMBD Explores Bird Collisions

<http://www.fws.gov/birds/documents/Collisions.pdf>

The Danger of Plate Glass – Understanding and Avoiding that Painful Thud

<http://www.fws.gov/birds/documents/Glass.pdf>

The Trouble with Towers – A Guide to Bird Collisions at Communications Towers

<http://www.fws.gov/birds/documents/tower.pdf>

A Fine Line for Birds – A Guide to Bird Collisions at Power Lines

<http://www.fws.gov/birds/documents/powerlines.pdf>

Other resources:

American Bird Conservancy - Window collisions and birds

https://www.abcbirds.org/birdconservationalliance/members/window_paper.PDF

Avoiding bird/window collisions – Fatal Light Awareness program

<http://www.flap.org/new/diurnalfr.htm>

“Lights Out!” Programs and Related Links

Terrain.org - A Journal of the Built and Natural Environments - on Chicago's "Lights Out!" Campaign

<http://www.terrain.org/articles/15/kousky.htm>

Chicago Bird Collision Monitors <http://www.birdmonitors.net/>

Chicago Audubon and “Lights Out!” <http://www.lightsout.audubon.org/>



Appendix D

Additional Bird Education Resources

“Where do I find information about...?”

A Wisconsin Society for Ornithology Publicity Committee Fact Sheet
William P. Mueller – WSO Conservation Chair

Conservation of habitat for birds

Habitat Management Guidelines – Cornell Lab of Ornithology
<http://www.birds.cornell.edu/programs/AllAboutBirds/Conservation/HabProtection/HabProtection.html>

Conservation of forest areas for birds – Cornell Lab of Ornithology
<http://www.birds.cornell.edu/programs/AllAboutBirds/Conservation/HabProtection/ForestedAreas.html>

Backyard habitat conservation – Cornell Lab of Ornithology
<http://www.birds.cornell.edu/programs/AllAboutBirds/Conservation/HabProtection/BackyardHabitat.html>

Conservation of grassland areas for birds – Cornell Lab of Ornithology
<http://www.birds.cornell.edu/programs/AllAboutBirds/Conservation/HabProtection/Grasslands.html>

Conservation on farmland areas – Cornell Lab of Ornithology
<http://www.birds.cornell.edu/programs/AllAboutBirds/Conservation/HabProtection/Farmlands.html>

“Top ten things landowners can do for birds”, North Carolina Partners in Flight

<http://www.faculty.ncwc.edu/mbrooks/pif/Fact%20Sheets/Top10forBirds.htm>

Saving snags for birds and other wildlife – Wisconsin DNR

<http://dnr.wi.gov/org/land/wildlife/publ/deadwood.pdf>

Saving snags – North Carolina Dept. of Environment and Natural Resources

http://www.dfr.state.nc.us/stewardship/stew_snags.htm

Hazards to birds

Window collisions and birds

https://www.abcbirds.org/birdconservationalliance/members/window_paper.PDF

Avoiding bird/window collisions – Fatal Light Awareness program

<http://www.flap.org/new/diurnalfr.htm>

Cats and birds – American Bird Conservancy

<http://www.abcbirds.org/cats/>

Bird Checklists

Bird checklists for the world

<http://www.bsc-eoc.org/avibase/avibase.jsp?pg=checklist&lang=EN>

Climate change and its effects on birds

Smithsonian Migratory Bird Center – Climate change and migratory birds
http://nationalzoo.si.edu/Conservationandscience/Migratorybirds/Research/Climate_Change/default.cfm

Bird Populations

State of the World's Birds, BirdLife International
<http://www.birdlife.net/action/science/sowb/index.html>
State of the Birds USA 2004, National Audubon Society
<http://www.audubon.org/bird/stateofthebirds/index.html>

Miscellaneous topics

Controlling Woodpecker Damage, by Scott Craven, UW Cooperative Extension
<http://cecommerce.uwex.edu/pdfs/G3117.PDF>
Or contact Professor Craven at srcraven@facstaff.wisc.edu or 608-263-6325

Other Websites

Wisconsin Bird Conservation Initiative: www.wisconsinbirds.org
Virtual Birder: www.virtualbirder.com
Wisconsin Society for Ornithology: www.uwgb.edu/birds.wso
International Migratory Bird Day: www.birdday.org
Cornell Lab of Ornithology: www.birds.cornell.edu
Partners in Flight: www.partnersinflight.org
National Audubon Society: www.audubon.org
Patuxent Wildlife Research Center: www.pwrc.nbs.gov
Whooping Crane www.bringbackthecranes.org
Operation Migration: www.operationmigration.org
International Crane Foundation: www.savingcranes.org
The Owl's Roost: www.mindspring.com/~owlman/
American Bird Conservancy: www.abcbirds.org
American Birding Association: www.americanbirding.org/programs/ygbgen.htm
Copyright-free bird photos: www.yankeegardener.com/birds/index.htm
BirdSource: www.birdsource.com
Wisconsin Department of Natural Resources: www.dnr.state.wi.us
U.S. Fish and Wildlife Service: www.fws.gov/birds
eBird: [//ebird.org](http://ebird.org)

Books

The following list of children's literature and age level correlation is adapted from The Children's Environmental Literature Bibliography (available for download courtesy of Wisconsin's Project WILD, Project Learning Tree and Project WET programs at <http://www.dnr.state.wi.us/org/caer/ce/eeek/teacher/childlit.htm>).

***About Birds: A Guide for Children* four - eight**

Cathryn P. Sill, 1997
#12561451479

Text and 15 watercolor illustrations introduce the world of birds from eggs to flight, and from songs to nests.

***All About Owls (All About Series)* four - eight**

Jim Arnosky, 1995
#043905852X

Arnosky uses easy-to-understand text and wonderful illustrations to cover owl biology and behavior. Other birds in this series include the Wild Turkey. CLCL

***Backyard Birds (HarperCollins Nature Study Book)* seven - ten**

Jonathan Pine, 1993
#0060210400

This chapter book introduces the habits and behaviors of house sparrows, starlings, robins, wrens, hummingbirds, and nighthawks, with clues for easy identification. Numerous, large watercolor illustrations accompany the text.

***Bald Eagle* five - ten**

Gordon Morrison, 1998
#0395873282

Through watercolor illustrations and clear text, the reader learns about the eagle's life-cycle. Two levels of information are included; a children's story about a baby eagle plus supplementary information for the older child. OSTB

***Bald Eagle, The* nine - twelve**

Cheryl L. DeFries, 2003
#0766050572

Examines the habitat and physical characteristics of the Bald Eagle. Includes internet links to Web sites related to Bald Eagles. CLCL

***Barn Owl, The (Animal Lives Series)* seven - ten**

Sally Tagholm, 2003
#0753456060

Lyrical text and realistic images reveal the life of a Barn Owl, as a breeding pair court, mate, nest, hunt, and raise their young. OSTB **24**

***Beaks!* five - ten**

Sneed B. Collard III, 2002
#1570913889

Simple text describes the structure and function of different bird beaks.

***Bird Boy* eight - twelve**

Elizabeth Starr Hill, 2003

#0374406596

Chang, a mute Chinese boy whose father uses cormorants to fish, is pleased when he is old enough to help raise a new chick. In the process he learns hard lessons about untrustworthy friends and what it means to prove himself. Youngsters, especially those with disabilities, will identify with Chang. CLCL

Birdsong

four - eight

Audrey Wood, 2001

#0152000143

This beautifully illustrated book covers a unique topic for kids, 14 birds and their songs. A great way of helping children develop focused listening skills in nature.

Birds: Nature's Magnificent Flying Machines

nine - twelve

Caroline Arnold, 2003

#1570915164

Focuses on bird anatomy and the physics of flight, including wing and feather design, taking off, flapping, gliding, soaring, and migration. Each spread contains one or two paragraphs with a full-color illustration. CLCL

Book of North American Owls, The

ten and up

Helen Roney Sattler, 1995

#0395900174

A look at the natural history of owls. CLCL

Catching the Wind (A Just for a Day Book)

four - eight

Joanne Ryder, 1989

#0688071716

Transformed into a bird for a day, a child joins a flock of wild geese in flight. WSN

Counting Cranes

three - eight

Mary Beth Owens, 1993

#0316677191

The magnificent Whooping Crane is North America's largest bird. The author uses haiku and exquisite illustrations to count cranes while also featuring a variety of spring and fall migration scenes. Diet and mating information is included.

Dancers in the Garden

four - ten

Joanne Ryder, 1992

#0871565781

This engaging book follows a hummingbird and his mate on a beautiful summer day. The exquisite watercolor pictures combined with lyrical poetry accurately depict the delicate beauty and amazing flight acrobatics of this little marvel. **25**

Ducks Don't Get Wet

four - eight

Augusta Goldin, 1999

#0064451879

Describes the behavior of different kinds of ducks and, in particular, discusses how all ducks use preening to keep their feathers dry.

Eagle & the Wren: A Fable

four - eight

Jane Goodall, 2002

#0735817065

When the birds have a contest to see which one can fly the highest, they all learn a valuable lesson about cooperation.

Egg, The

four - eight

Galimard Jeunesse and Pascale de Burgoing, 1992

#0590452665

Follows the growth and development of a hen's egg. Also introduces other egg-laying animals, such as birds, snails, and snakes.

Feathers for Lunch

three - eight

Lois Ehlert, 1990

#0152305513

An escaped housecat fails to catch 12 different birds, getting only feathers for lunch.

Filling the Bill (Bowmar Nature Series)

three - eight

Aileen Fisher, 1973

#0837208645

Naturalist and poet Aileen Fisher authored over 90 nature books for children, uniquely presenting both factual information and sensory experiences from a child's point of view. In this book, she describes in rhyme how hens, hummingbirds, herons, and other fowl use their bills.

Flute's Journey: The Life of a Wood Thrush

five - nine

Lynne Cherry, 1997

#0152928537

A young Wood Thrush makes his first migration from his nesting ground in a forest preserve to his Costa Rican winter home, and back again. Along the way he encounters many perils, including natural predators and habitat loss. WSN

Gay-Neck: The Story of Pigeon

ten and up

Dhan Gopal Mukerji, 1968

#0525304002

This book effectively combines information on birds and bird behavior with a perspective on the Great War and the author's boyhood in India.

Hawk Highway in the Sky: Watching Raptor Migration **nine - twelve**

Caroline Arnold, 1997

#0152000402

Provides information about hawks, eagles, and falcons, and efforts to study them. Profiles the Hawk Watch International Raptor Migration Project in Nevada. OSTB **26**

Hawk, I'm Your Brother

nine-twelve

Byrd Baylor, 1976

#0689711026

Rudy Soto dreams of floating on the wind and soaring over canyons, just as Hawk does. Determined to achieve his dream, Rudy adopts a hawk hoping that their kinship will help him.

***Ko-Hoh: The Call of the Trumpeter Swan* nine - twelve**

Jay Featherly, 1986

#0876142889

Explains the life-cycle and behavior of the Trumpeter Swan.

***Legend of the Loon, The* four - ten**

Kathy-Jo Wargin, 2000

#188694797X

This legend is a story of the deep love that stays forever and ever in the sound of the loon that calls across the northern lakes. The *Legend of the Loon* is the story of a magical grandmother and her cherished relationship with her grandchildren.

***Little Green* three - six**

Keith Baker, 2001

#0152929596

With playful, rhyming text and vibrant collage illustrations, Keith Baker captures the energy and excitement of a hummingbird's zigzagging flight. Budding artists will be inspired by the boy's artistic rendering of this little dynamo's flight.

***Loon at Northwood Lake (Smithsonian's Backyard)* four - eight**

Elizabeth Ring, 1997

#1568993935

This engaging and realistic look at wildlife features Loon and his mate as they protect their chicks from curious people, egg-hunting eagles and hawks, and ferocious pike throughout a summer at Northwood Lake. Vivid watercolor illustrations accompany the text. CCBC

***Luck* four-eight**

Jean Craighead George, 2006

#0060082011

The story of Luck, a Sandhill Crane whose neck is from a plastic six-pack holder by a young girl in Texas. The book follows Luck's migration adventures.

***Our Yard is Full of Birds* four - eight**

Anne Rockwell, 1992

#002777273X

Describes backyard birds, from the phoebe and wren to crows and Blue Jays.

***Owl Lake* four - eight**

Keizaburo Tejima, 1982

#0399214267

As the sun slips behind the lake and the sky darkens, Father Owl comes out and hunts for fish to feed his family. Illustrated with the author's woodcuts.

***Peeping in the Shell: A Whooping Crane is Hatched* nine - twelve**

Faith McNulty, 1982

#0060241349

The true story of the hatching of an endangered Whooping Crane chick at the International Crane Foundation in Wisconsin.

Rabbit and the Moon

four - eight

Douglas Wood, 2001
#0971997128

In this retelling of a Cree legend, through the help of Crane, Rabbit fulfills his dream of riding across the sky to the moon. This tale explains how the Whooping Crane came to have long legs and a red blaze on its head.

Raptor! A Kid's Guide to Birds of Prey

nine - twelve

Christyna M. Laubach, et. al, 2002
#1580174752

Over 100 full-color images enhance this "kid friendly" guidebook to the physical characteristics, behavior, and different species of raptors. OSTB 27

Secrets of Animal Flight, The

eight - twelve

Nic Bishop, 1997
#0395778484

In text and photographs, find out the secrets of animal flight - the principles that keep fliers as different as ladybugs and eagles aloft. CLCL

She's Wearing a Dead Bird on her Head

five-nine

Kathryn Lasky, 2005
#0786811641

The story of two strong-willed women who found the Massachusetts Audubon Society at the turn of the 20th century, when wearing hats adorned with stuffed birds was the raging fashion.

Sky Dancer

four - eight

Jack Bushnell, 1996
#0688052286

The story of the friendship between a young girl and a wild, Red-tailed Hawk. This thought-provoking book on the relationship between wild animals and man captures both the beauty of nature and the reality of farm life.

Soaring with the Wind: The Bald Eagle

six - nine

Gail Gibbons, 1998
#068813730X

Gail Gibbon's thoroughly researched text and dramatic illustrations present the Bald Eagle in all its grandeur — hunting, courting, nesting, and hatching. Words that may be unfamiliar are introduced in italicized print and pronunciation guides are provided for difficult words. OSTB

Song for the Whooping Crane

five - twelve

Eileen Spinelli, 2000
#080285172X

A poetic celebration of the Whooping Crane, an endangered species. The "song" refers to the seasonal rhythms of these birds as they migrate to Texas and Florida in October, return to Wisconsin and Canada for the nesting/hatching season in spring, and the graceful courtship dances that bind a mated pair. CLCL

Stellaluna

five - eight

Janell Cannon, 1993
#0152802177

Knocked from her mother's embrace by an attacking owl, Stلالuna lands headfirst in a bird's nest. The baby fruit bat's world is literally turned upside down when she is adopted by the nest's occupants and adapts to their bird habits.

The Boy Who Drew Birds: A Story of John James Audubon
nine - twelve

Jacqueline Davies, 2004
#0618243437

An award-winning account detailing a short period of the famous ornithologist's youth.

The Legend of Old Abe **nine-twelve**

Kathy-Jo Wargin, 2006
#1585362328

The story of Old Abe, a remarkable and beloved Bald Eagle who became the mascot of the Eighth Regiment of the Wisconsin Volunteer Infantry during the Civil War.

Watching Water Birds **six - twelve**

Jim Arnosky, 1997
#0792270738

Arnosky's full-color artwork and first person text provides a look at various species of fresh and saltwater birds, including loons and grebes, mergansers, mallards, wood ducks, Canada Geese, gulls, and herons. OSTB, CCBC, CLCL

When Birds Could Talk and Bats Could Sing **seven - eleven**

Virginia Hamilton, 1996
#0590473727

A collection of stories, featuring sparrows, jays, buzzards, and bats, based on African-American tales. CLCL **28**

Whooping Cranes **nine - twelve**

Karen Dudley, 1997
#0817245642

A factual look at cranes covering crane biology, habitat, and folklore.

Wings on the Wind: Bird Poems **four - ten**

Kate Kiesler, 2002
#061813333X

This beautifully designed and illustrated collection of serious and humorous poems about birds includes such authors as Eleanor Farjeon, Margaret Wise Brown, Carl Sandburg, and Edward Lear. CLCL

Other Bird Education Programs

Flying WILD: www.flyingwild.org

Cranes in the Classroom: www.savingcranes.org/teachers/teachers/workshops/classroom.cfm

One Bird; Two Habitats: www.birds.cornell.edu/pifcapemay/gilchrist.htm. Contact susan.gilchrist@wisconsin.gov and Susan.Gilchrist@sbcglobal.net for more information.

Cornell Lab of Ornithology citizen science projects:
www.birds.cornell.edu/LabPrograms/citSci/index.html

Shorebird Sisters: <http://66.241.214.202/>

Songbird Blues Educational Trunks

Feathered Travellers: <http://nationalzoo.si.edu/ConservationAndScience/MigratoryBirds/> (Smithsonian Migratory Bird Center, National Zoo, Washington D.C. 20008)

Wild Turkey Trunk: www.nwft.org (National Wild Turkey Federation)

Birds, Birds, Birds! (Ranger Rick's Nature Scopes):
www.amazon.com