

Birds and Wetlands

Objectives: Students will be able to

- Explain why wetland habitats are important for birds
- Compare beak structures of different birds to determine their adaptations
- Identify environmental factors that affect migratory birds

Overview: During this program students will examine how important wetlands are to birds. The activities involved will help students visualize the environmental factors that affect the survival of migratory birds and how birds are adapted to eating different foods.

Materials: Migratory birds kit (hula hoops (number based on students in class), migration cards, wetland bird pictures) / Bird Beaks kit (

Before Class Prep: Read background information. Get kit from staff (or storage building). Set up at arranged area where students can sit off trail as well as get up and move around. Arrange teaching items in a way where it is easy for you to present them and reset between groups.

Background Information: (multiple pages)

Background information is for your knowledge and contains much more information than needed to share during school programs but may help answer your or participants questions.

Wetlands are important bird habitats, and birds use them for breeding, nesting, and rearing young. Birds also use wetlands as a source of drinking water and for feeding, resting from migration, shelter, and social interactions. Some waterfowl, such as grebes, have adapted to wetlands to such an extent that their survival as individual species depends on the availability of certain types of wetlands within their geographic range. Other species, such as the northern pintail or the American widgeon, use wetlands only during some parts of their lives.

Because of the great variety of wetlands, bird adaptation to and use of wetland environments differs greatly from species to species. Birds' use of wetlands during breeding cycles ranges widely. Some birds depend on wetlands almost totally for breeding, nesting, feeding, or shelter during their breeding cycles. Birds that need functional access to a wetland or wetland products during their life cycle, especially during the breeding season, can be called **wetland dependent**. Other birds use wetlands only for some of their needs, or they might use both wetland and upland habitats. Of the more than 1,900 bird species that breed in North America, about 138 species in the conterminous United States are wetland dependent.

Many migratory birds are wetland dependent, using wetlands during their migration and breeding seasons. Birds that nest in the Northern Hemisphere tend to migrate northward in the spring to take advantage of burgeoning insect populations, budding plants and an abundance of nesting locations. As winter approaches and the availability of insects and other food drops, the birds move south again. Escaping the cold is a motivating factor but many species, including hummingbirds, can withstand freezing temperatures if an

adequate supply of food is available. Migratory birds may spend the winter in wetlands in the Southern United States, or farther south. Throughout winter, these birds use wetlands for food and nutrients to sustain them for their return trip north and the breeding season.

Bird migration is defined as the regular seasonal movement, often north and south along a certain route, between breeding (summer) and wintering grounds. Birds migrate primarily due to the availability of food and nesting locations.

Birds often migrate along a corridor known as a **flyway**. This is the most direct and quickest route for a bird to fly between north and south. It isn't exactly clear how birds navigate during migration, but scientists believe the birds take cues from the position of the sun, moon, and stars in the sky; geographic landmarks like rivers and mountains; and magnetic fields invisible to the human eye.

Colorado is part of the Central and Pacific flyways and provides important migration habitat for waterfowl. The eastern plains of Colorado, particularly the South Platte River corridor, are a prime example of the state's top-quality migration habitat. Other river corridors and wetlands throughout the state provide and resting areas for migrating birds, as well as wintering habitat.

The diversity of bird species that can be found in wetland habitats is exemplified by the differences in physical characteristics. One of the most prominent physical aspects of a bird is their beak, which is used for just about everything in a bird's daily life: building a home, catching and eating food, feeding their young, preening their feathers, and for defense. A bird's beak is an excellent clue for that specie's feeding habits. A bird that can't eat will not be able to survive for very long, and their beak is an essential tool for catching and eating. Hooked beaks are designed to eat meat by helping the bird tear off small bits of flesh for easier swallowing (such as the Great Horned Owl and Bald Eagle). Short, stout beaks are perfect for cracking open seeds to get at the meat inside (such as the House Finch and Blue Grosbeak). The diversity of beaks in the bird world shows how they have adapted as a group to fill in every possible ecological niche.

The abundance of food that can be found in wetlands is reflected in the variety of birds that can be found there. Examining their beaks can give insight to what type of food is available.



List of Common Wetland Dependent Birds in Boulder County

Cranes and Allies

- American Coot
- Virginia Rail

Heron and Allies

- American Bittern
- Black-crowned Night Heron
- Great Blue Heron
- Great Egret
- Snowy Egret
- White-faced Ibis

Passerines (Perching Birds)

- Tree Swallow
- Northern Rough-winged Swallow
- Common Yellowthroat
- Lincoln's Sparrow
- Red-winged Blackbird
- Yellow-headed Blackbird

Gulls

- Franklin's Gull
- Ring-billed Gull
- California Gull

Raptors

- Osprey
- Bald Eagle

Waterfowl

- Canada Goose
- Green-winged Teal
- Mallard
- Wood Duck
- Northern Pintail
- Cinnamon Teal
- Northern Shoveler
- Gadwall
- American Wigeon
- Canvasback
- Redhead
- Lesser Scaup
- Ring-necked Duck
- Bufflehead
- Common Goldeneye
- Hooded Merganser
- Common Merganser
- Red-breasted Merganser

Grebes

- Pied-billed Grebe
- Western Grebe

Kingfishers

- Belted Kingfisher

Pelicans and Allies

- American White Pelican
- Double-crested Cormorant

Shorebirds

- Killdeer
- American Avocet
- Willet
- Spotted Sandpiper

Resources:

<https://water.usgs.gov/nwsum/WSP2425/birdhabitat.html>

<https://www.allaboutbirds.org/news/the-basics-how-why-and-where-of-bird-migration/>

<https://www.ducks.org/colorado/colorado-conservation-projects>

<https://www.birds.cornell.edu/k12/beaks/>

Guiding Questions:

- How do migrating birds depend on wetlands during migration?
- What are some threats facing wetlands?
- Why is it important to save wetlands?
- How do certain adaptations help birds adapt to their environment?

Colorado Academic Standards:

Preschool: Life Science 2.1 - Recognize that living things have unique characteristics and basic needs that can be observed and studied.

Preschool: Life Science 2.1 - Recognize that living things develop in predictable patterns.

Kindergarten: Life Science 2.1 - To live and grow, animals obtain food they need from plants or other animals, and plants need water and light.

First Grade: Life Science 2.1 – All organisms have external parts that they use to perform daily functions

First Grade: Life Science 2.2 – Young organisms are very much, but not exactly, like their parents, and also resemble other organisms of the same kind.

Second Grade: Life Science 2.2 – A range of different organisms lives in different places

Third Grade: Life Science 2.1 – Organisms have unique and diverse life cycles

Fourth Grade: Life Science 2.1 - Organisms have both internal and external structures that serve various functions.

Lesson Outline (Migration)

Opening/Introduction (~3 min)	Welcome students to station and what you will be talking about today. Ask questions to gain an understanding of the group's knowledge and start point. Hook: Has anyone ever been on a long car trip? Did you stop at place to get some food or take a break from being in the car?
Key Talking Points (~5 min)	<ul style="list-style-type: none">• Wetlands are important rest stops for migrating birds• Wetlands provide food and water to fuel a bird's journey and shelter from storms or predators• The loss of wetlands affects the survival of migratory birds
Hands-on Activity (15 -20 min)	Migration Activity
Conclusion (~3 min)	Wetlands are essential to the survival of migratory birds and should be protected against development or pollution.
Assessment Questions	Why did some birds not survive the game? How do migrating birds depend on wetlands? Why is it important to preserve wetlands?

Lesson Outline (Beak Adaptation)

<p>Opening/Introduction (~3 min)</p>	<p>Welcome students to station and what you will be talking about today. Ask questions to gain an understanding of the group's knowledge and start point.</p> <p>Hook: What kind of foods do you like to eat? Are there certain foods that are easier to eat than others?</p>
<p>Key Talking Points (~5 min)</p>	<ul style="list-style-type: none"> • The size and shape of a bird's beak is a good indicator of the type of foods they eat • Wetland environments support lots of different types of food, so many different species of bird can be found there
<p>Hands-on Activity (15 -20 min)</p>	<p>"What's on the menu?" and "The Right Tool for the Job" activities</p>
<p>Conclusion (~3 min)</p>	<p>Birds have different beaks to better suit the type of foods they eat.</p>
<p>Assessment Questions</p>	<ul style="list-style-type: none"> • How do birds beaks differ from one another? • How might their behavior differ because of the beaks they have?

Hands-on Activities

Activity & Materials

Instructions

Migration

Hula hoops (15-20)
Migration cards
Pictures of wetland birds

- Set up a large area. Have opposite sides of the area represent the bird wintering and summer grounds. The birds must migrate from one end to the other. Place hula hoop or jump rope circles between the winter and summer grounds. Each circle represents a wetland. Try to make different size circles that would represent different size wetlands.
- Tell the students that each of them is a migratory bird and must migrate to their summer/winter grounds. They can only stop in the wetlands. Any other area is unsafe and birds who don't make it to a wetland die because of lack of food and safety.
- The birds can fly so far a day. So, the students can only take 5 steps per day of flight. The steps can be as big as they want, but only 5 steps.
- Each wetland has a card with a description of the wetland. Students will read the card when instructed.
- Have the entire class go to the area. The key to making this work without losing control is to do one day at a time. As everyone is taking their steps, you will notice some birds change directions because the wetlands are filling up. After everyone has taken their 5 steps, the ones who are not in the wetlands are dead and must line up at the side of the course.
- Have one bird from each wetland read the migration card. The birds must follow the directions on the card. When all the wetlands have been read, the birds migrate again to the next wetland.
- When the birds that are still alive reach the summer ground, explain that they will lay two eggs. For each bird in the summer resting grounds, two birds from the sidelines will join the migration. This will give students who died early in the game an opportunity to get back in. The birds can only lay eggs once a year in the summer nesting ground.
- Now the weather is starting to get cold. It is time to migrate to the winter resting grounds. Repeat the same steps above. You will notice that the birds will start making adaptations so they can avoid the dangerous wetland.
- After the activity is over, discuss with the students the patterns of migration they took and why they avoided certain wetlands.

Bird Beaks

What's on the Menu?

Bring out pictures of birds with different bills. Below is a list of groups that would be good to present.

- **Hummingbirds:** birds that have long, hollow beaks that protect the bird's tongue; they use their tongue to slurp up nectar
- **Hérons and egrets:** birds that hunt for fish in shallow water have long, sharp beaks that they use to catch or spear fish
- **Birds of prey (raptors):** birds that eat other animals have strong, sharp beaks to tear the meat into pieces small enough to swallow
- **Shorebirds:** birds with very long, thin beaks that they use to probe for food in the sand or mud
- **Woodpeckers:** birds that drill for food under bark have strong beaks which are sturdy and taper at the tip, forming a chisel for pecking holes in trees
- **Seed eaters:** birds that have short, strong, triangular-shaped bills that can crack open seeds
- **Aerial insectivores:** birds that feed while in flight, catching and eating airborne insects have beaks that are very short and flat; their mouths open very wide and act like nets to trap flying bugs
- **Flamingos and some ducks (only certain ducks are filter feeders.):** birds that have beaks that act like strainers; they filter their food, plants, seeds, and small animals, from the water using the comb-like edge of their beak; water enters at the tip of the beak and exits out the sides
- **Warblers and thrushes:** birds with sharp, pointed beaks; used to pick insects from leaves, logs, and twigs

Give them to students or groups of students (separate into groups if older students, work together is younger students). Ask:

- What do you think this bird eats?

- What makes you think that?
- What bird do you think this is?

As a follow-up to “What’s on the Menu?” Gather a number of common household objects:

- an eyedropper
- chopsticks
- a nutcracker or blunt-nose pliers
- a small strainer
- a letter-sized envelope with the flap removed (pushing the sides of the envelope together makes the opening gape wide like the mouth of an areal insectivore – nighthawk, etc.)
- long tongs
- a hammer and nail
- tweezers or forceps
- a plastic knife and fork.

Pass out the photos from the “What’s on the Menu?” activity. Have students match the beak in the picture to the tool to which it most closely corresponds.

- Discuss with the group their reasons for making the matches they did.
- *(Possible matches, but accept all reasonable explanations: 1. eyedropper – hummingbird, 2. long tongs – herons and egrets, 3. plastic knife and fork – birds of prey (raptors), 4. chopsticks – shorebird, 5. hammer and nail – woodpeckers, 6. nutcracker or blunt-nose pliers – seed eaters, 7. envelope – aerial insectivore, 8. strainer – Flamingos and some ducks, and 9. tweezers or forceps – warblers and thrushes.)*