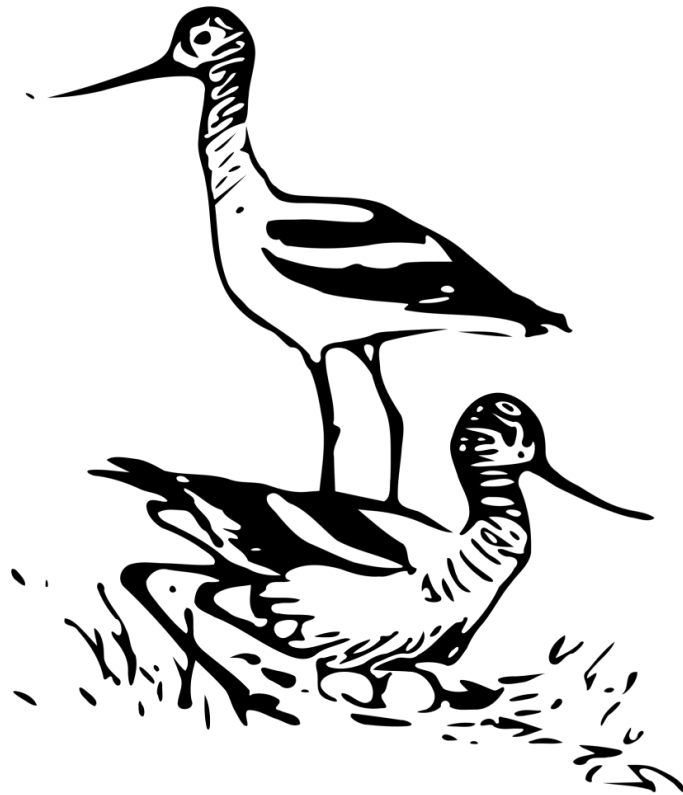




# Birds & Their Adaptations



NATIONAL  
**WILDLIFE**  
REFUGE SYSTEM



# Birds & Their Adaptations Field Trip

## Season:

All

## Objectives:

Students will be able to...

- Determine some of the important adaptations all birds have that allow them to successfully live in their chosen habitats.
- Explore a wetland habitat up-close and discover some of the living and non-living things birds depend on.
- Discover the importance of migration and how important good habitat is during a bird's journey.
- Observe some of the obstacles birds encounter during migration.
- Determine the benefits of bird banding and how this helps scientists to understand birds better.

## Key Concepts:

- Birds
- Adaptations
- Habitats
- Migration
- Survival
- Bird Banding

## Summary of Lessons & Activities

### Kindergarten-Second Grade: The Life of A Bird

The life of a bird is an incredible journey. Learn about some of the unique adaptation's birds have and their path from an egg to an adult. Explore some of the important habitat's birds depend on and witness actual birds in an important protected area originally designated for birds.

### Third-Fifth Grade: Birds & Migration

As the seasons slowly change throughout the year, birds need to prepare for those changes. One of the most important life events many birds prepare for is their long migration during the spring and fall. Learn about some of the ways birds prepare for migration and what their long journey entails. Explore some of the important habitat's birds depend on when traveling and witness actual birds in an important protected area originally designated for birds.

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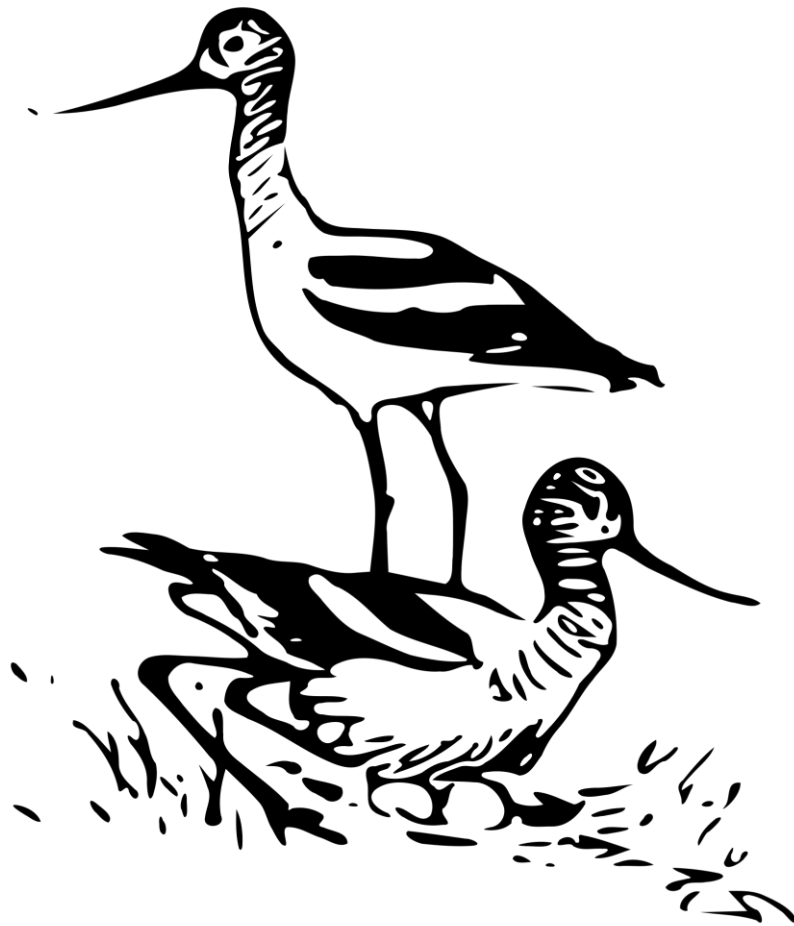
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# The Life of A Bird

(Kindergarten–Second Grade)





# The Life of A Bird

## (Kindergarten-2nd Grade)

**Time:**  
2 hours

**Season:**  
All

**Objectives:**  
Students will be able to...

- Determine some of the important adaptations all birds have that allow them to successfully live in their chosen habitats.
- Explore a wetland habitat up-close and discover some of the living and non-living things birds depend on.

**Key Concepts:**

- Birds
- Adaptations
- Habitats

## Summary of Lesson

The life of a bird is an incredible journey. Learn about some of the unique adaptation's birds have and their path from an egg to an adult. Explore some of the important habitat's birds depend on and witness actual birds in an important protected area originally designated for birds.

## Theme

Birds have unique adaptations that allow them to successfully live in their chosen habitats.

## Outline of Lesson Activities

### 1. What Is A Bird Group Game (10 minutes)

- Test students' knowledge during an activity where they distinguish the unique features of birds and how they are different than other animals.

### 2. Introduction (10 minutes)

- Introduce Bear River Migratory Bird Refuge and any important safety or logistical information.

- Ask students what they know about birds and if they have a favorite.

- Give a brief breakdown of the day's schedule.

### 3. Bird Hike (45 minutes)

- Visit different areas of the hiking trails to discover mini-habitats.

- Search and listen for signs of birds.

### 4. Nest Building Activity (30 minutes)

- Build a nest out of natural and provided materials to see if it can hold a fake egg.

### 5. Dress-up Like A Bird (15 minutes)

- Learn about some of the important bird adaptations by dressing up as one.

### 6. Reflection (10 minutes)

- Review the theme and discuss reflection questions.



# State (SEEd) Standards

(Kindergarten–2nd Grade)

## Kindergarten

### Standard K.2, Living Things And Their Surroundings

Standard K.2.1, Obtain, evaluate, and communicate information to describe patterns of what living things need to survive. Emphasize the similarities and differences between the survival and needs of all living things.

Standard K.2.2, Obtain, evaluate, and communicate information about patterns in the relationships between the needs of different living things and the places they live.

Standard K.2.3, Obtain, evaluate, and communicate information about how living things affect their surroundings to survive.

## First Grade

### Standard 1.2, The Needs Of Living Things And Their Offspring

Standard 1.2.2, Construct an explanation by observing patterns of external features of living things that survive in different locations.

Standard 1.2.4, Construct an explanation of the patterns in the behaviors of parents and offspring which help offspring to survive.

## Second Grade

### Standard 2.2, Living Things And Their Habitats

Standard 2.2.1, Obtain, evaluate, and communicate information about patterns of living things in different habitats. Emphasize the diversity of living things in land and water habitats.

Standard 2.2.4, Design a solution to a human problem by mimicking the structure and function of animals and how they use their external parks to help them survive, grow, and meet their needs.



# What Is A Bird Group Game

(Kindergarten-2nd Grade)

Key Concepts:  
Birds &  
Adaptations

This activity is a large group introduction to the theme of the field trip and many of the key bird adaptations.

All students are brought to the open field next to the Nature Play Area. Three cones/signs will be set-up previously in the field. One of the cones will be labeled as the TRUE cone, another will be labeled as the FALSE cone, and the third will be labeled as UNSURE. Tell the students that you will be reading a series of statements about birds, and they will have to choose whether they believe that statement is true or false by choosing a cone. Remind them that it is ok to be unsure as science is constantly changing and even scientists are sometimes unsure. After each question, review and talk about the answer together as a large group.

## Statements About Birds

### 1. All Birds Can Fly...

**FALSE:** Not all birds are able to fly. While all bird species do have wings, some are too large to fly such as ostriches and emus, and some have lost the ability such as kiwis and penguins.

### 2. Birds Are The Only Animal That Can Fly...

**FALSE:** While birds are the only type of animal with hollow bones, there are other animals with wings allowing them to fly. This includes animals such as bats and insects.

### 3. Birds Are The Only Animal With Feathers...

**TRUE:** While there were dinosaurs that had feathers, birds are the only modern animal today that still has this feature. However, birds are also designated as a group of dinosaurs as well.

### 4. Birds Are The Only Animal That Lays Eggs...

**FALSE:** Eggs are actually super common among most animal species. Insects, fish, reptiles, and even two mammals can lay eggs!

### 5. Birds Do Not Have Teeth...

**TRUE:** Birds have unique beaks that help them to find and eat their food.

### 6. Birds Are The Only Animal With Beaks...

**FALSE:** There are a few other animals with beaks including turtles and even squids!



# Introduction

(Kindergarten–2nd Grade)

Welcome students to Bear River Migratory Bird Refuge and introduce yourself. Discuss the importance of the Refuge and why it was created. Ask if any of the students have visited the Refuge before.

Explain to the students that you will be their teacher for the day and that the Refuge is their classroom, so it is important to respect the Refuge just as they would with their classroom at school. Discuss any important safety/logistical items and concerns before talking about the theme of the day.

## Theme

Birds have unique adaptations that allow them to successfully live in their chosen habitats.

## Introduction Questions & Activities

- Ask students about some of the things they learned during the “What Is A Bird Group Game.”
- Ask students if they have a favorite bird.
- Ask students if all birds are exactly the same, and why birds have differences.
  - Discuss how different habitats and food choices play a role in this.
- Show students a few bird artifacts from different birds (such as skulls and feet) to demonstrate the differences various birds have.
- Give a brief overview of the schedule for the day and some of the activities they will get to try out.

## Assess Student Knowledge

Knowledge levels of a topic between different classes can greatly vary. Assess the knowledge level of your group at the beginning of the day in order to determine how deeply to discuss topics and what to teach the class.



# Bird Hike

(Kindergarten–2nd Grade)

Key Concepts:  
Birds &  
Habitats

You have 45 minutes to choose your own adventure on this hike. Depending on the season, try to hike to places on the trail where birds are most likely to be seen. Hiking near the larger established bodies of water is always encouraged. Listen and look for birds along the way.

## Suggestions For The Hike

- Talk about the birds you see flying around and why they are important.
- Search for signs of bird food such as seeds on the ground and insects.
- Search for bird nests along the trail.
- Listen for birds and teach the students common bird calls.
- Take a look at the Kestrel bird boxes along the trail.
- Hike to the Photo Blind on Marsh Meander Trail (1.5 miles).
- Hike to the boardwalk on Bulrush Bridge Trail (3/4 mile).
- Hike to the dock on Wetland Wonders Trail (1/2 mile).

## Nest Building Activity

At some point during the “Bird Hike,” whenever it feels like a good transition time, lead the nest building activity. You may choose to do this in the middle or at the end of the hike.

Find an area with enough space for students to build their nests.





# Nest Building Activity

(Kindergarten–2nd Grade)

Key Concepts:  
Birds &  
Habitats

Sometime during the “Bird Hike,” find an open space to have students build their own bird nests. You may want to bring some provided materials to build the nest (sticks/other natural materials).

Before starting the activity, ask students why birds build nests. Discuss with them that nests are not bird homes but are a place to keep eggs and young baby birds protected. Once birds officially fledge, or leave the nest, the nest is typically abandoned.

## Types of Nests

Before sending students off to build their own nests, show pictures or artifacts of some of the basic nest types, so students know what real bird nests look like up-close.

1. Cavity Nests
2. Cup Nests
3. Ground Nests
4. Platform Nests
5. Burrowing Nests
6. Hanging Nests

After discussing some of the basic nest types, give each student their own fake egg. Ask the students to build their own bird nest to protect the egg. They make work individually or with partners/small groups. Go over nest building rules before allowing them to build.

## Nest Building Rules

- Nests can only be built out of natural materials found on the ground.
- You may not pull or take any live plants to build your nest.
- You may not take any materials other groups are using for their nests.

## Nest Building Reflection

After all nests are built, gather as a large group again and have each individual/small group share their nest with the large group. Collect all eggs and ask students to put natural materials back where they found them. Talk about Leave No Trace and why this is important.



# Dress Up Like A Bird

(Kindergarten–2nd Grade)

Key Concepts:  
Birds &  
Adaptations

Ask students if they remember some of the important adaptations all birds have from the game at the beginning of the field trip. Tell them that while all birds do have some things in common, different types of birds have unique adaptations that allow just their type of species to do certain things.

Ask for a student volunteer to become a bird. Explain to the class that the volunteer may look a little silly, and if you want to become the bird, you need to be ok with having some of your classmates giggling at you.

Once the volunteer is picked, tell the students that today we will be looking at some of the adaptations a raptor has. Ask if anyone knows what a raptor is.

Once everyone knows what a raptor is, pull costume pieces out of a pillowcase one at a time and discuss what each adaptation is for. After discussing each costume piece, have the student slowly start becoming a bird.

## Costume Pieces

1. **Talons**: The primary tool raptors use in order to catch food or prey.
2. **Wings**: Flying and looking down is essential for hunting food.
3. **Large Eyes**: Advanced eyesight and eyes in the front allow raptors to be ready to hunt. Depth perception, which is unique to raptors, allows for much better vision than other bird species.
4. **Sharp, Hooked Beak**: Important for helping to tear apart live food or prey.



# Reflection

(Kindergarten–2nd Grade)

10 minutes

Key Concepts:  
Birds

Find a quiet spot to discuss what students learned and some of their favorite activities of the day. Review the overall theme of the day again and talk through some of the reflection questions.

## Theme

Birds have unique adaptations that allow them to successfully live in their chosen habitats.

## Reflection Questions

1. What is the most surprising thing you learned about birds today?
2. What is an important adaptation that birds have that helps them to successfully live in their habitat?
3. What is something from their environment/habitat that birds depend on?
4. Where is somewhere besides here at the Refuge you can see birds?
5. What is your favorite thing you did today?

Thank the students for visiting the Refuge today and tell them about upcoming events. Let them know about other activities they can come back and try out with their parents (Jr. Ranger, Nature Play Area, Exhibit Hall, Auto Tour, Jr. Duck Stamp Contest).

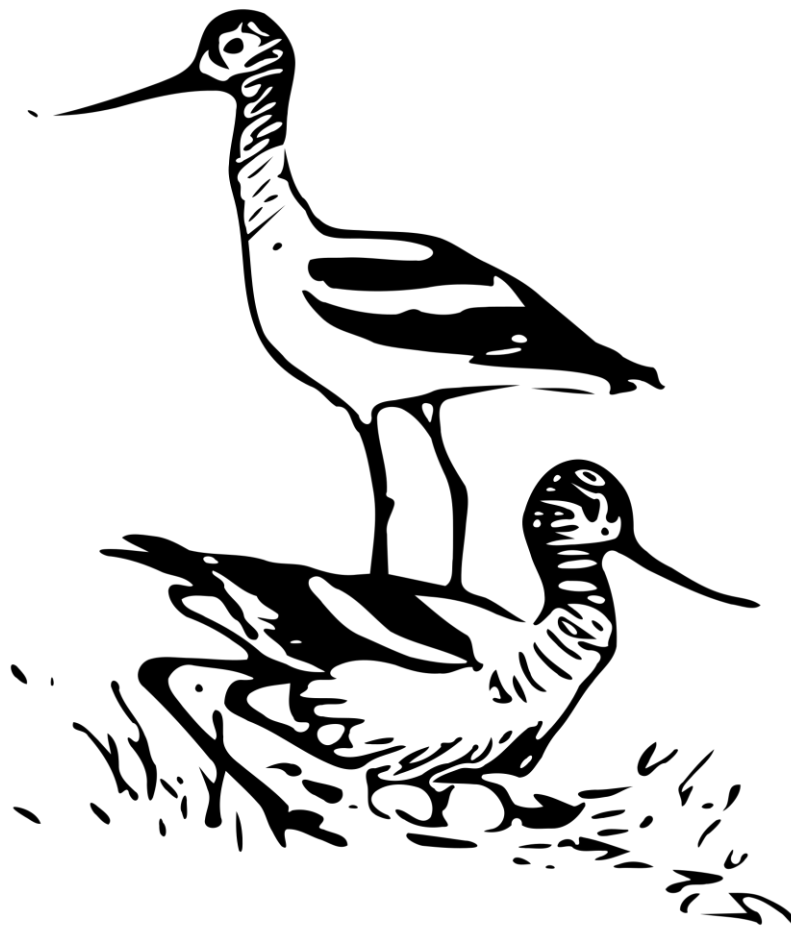
## Activities To Do With Extra Time/Longer Field Trip

- Explore Nature Explore Classroom
- Explore Exhibit Hall (Exhibit Hall Bingo)
- Puppet Show About Birds
- Bird Games (Raptor Vision Tests, Bills and Beaks Activity)



# Birds & Migration

(Third–Fifth Grade)





# Birds & Migration

(3rd–5th Grade)

## Summary of Lesson

As the seasons slowly change throughout the year, birds need to prepare for those changes. One of the most important life events many birds prepare for is their long migration during the spring and fall. Learn about some of the ways birds prepare for migration and what their long journey entails. Explore some of the important habitat's birds depend on when traveling and witness actual birds in an important protected area originally designated for birds.

## Theme

Bird migration is a dangerous journey centered around survival.

## Outline of Lesson Activities

### 1. Introduction (10 minutes)

- Introduce Bear River Migratory Bird Refuge and any important safety or logistical information.
- Ask students what they know about bird migration.
- Give a brief breakdown of the day's schedule.

### 2. Bird Hike (50 minutes)

- Visit different areas of the hiking trails to discover mini-habitats birds use during migration.
- Search and listen for signs of birds.
- Discuss bird sightings and observe what they may be preparing for.

### 3. Bird Banding Demonstration Table (10 minutes)

- Observe some of the tools used to band and track birds.
- Learn why bird banding is so important.

### 4. Migration Matters Game (40 minutes)

- Discover some of the dangers of migration and how important good habitat and food is for the survival of birds.

### 5. Reflection (10 minutes)

- Review the theme and discuss reflection questions.

**Time:**  
2 hours

**Season:**  
All

**Objectives:**  
Students will be able to...

- Discover the importance of migration and how important good habitat is during a bird's journey.
- Observe some of the obstacles birds encounter during migration.
- Determine the benefits of bird banding and how this helps scientists to understand birds better.

**Key Concepts:**

- Birds
- Migration
- Survival
- Habitats
- Bird Banding



# State (SEEd) Standards

(3rd–5th Grade)

## Third Grade

### Standard 3.2, Effects Of Traits On Survival

Standard 3.2.3, Construct an explanation that the environment can affect the traits of an organism.

Standard 3.2.5, Engage in argument from evidence that in a particular habitat (system) some organisms can survive well, some survive less well, and some cannot survive at all.

Standard 3.2.6, Design a solution to a problem caused by a change in the environment.

## Fourth Grade

### Standard 4.1, Organisms Functioning In Their Environment

Standard 4.1.1, Construct an explanation from evidence that animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Standard 4.1.2, Develop and use a model of a system to describe how animals receive different types of information from their environment through their senses.

## Fifth Grade

### Standard 5.3, Cycling Of Matter In Ecosystems

Standard 5.3.2, Obtain, evaluate, and communicate information that animals obtain energy and matter from the food they eat.

Standard 5.3.4, Evaluate design solutions whose primary function is to conserve Earth's environments and resources.



# Introduction

(3rd–5th Grade)

Key Concepts:  
Birds &  
Migration

Welcome students to Bear River Migratory Bird Refuge and introduce yourself. Discuss the importance of the Refuge and why it was created. Ask if any of the students have visited the Refuge before.

Explain to the students that you will be their teacher for the day and that the Refuge is their classroom, so it is important to respect the Refuge just as they would with their classroom at school. Discuss any important safety/logistical items and concerns before talking about the theme of the day.

## Theme

Bird migration is a dangerous journey centered around survival.

## Introduction Questions & Activities

- Ask students if they have learned about birds in the past and ask what makes birds special.
  - Brief review of bird adaptations.
- Ask students what migration is and if they can name a bird that migrates.
- Ask students if they see different birds in their own backyards during the wintertime and why they think that is.
- Give a brief overview of the schedule for the day and some of the activities they will get to try out.

## Assess Student Knowledge

Knowledge levels of a topic between different classes can greatly vary. Assess the knowledge level of your group at the beginning of the day in order to determine how deeply to discuss topics and what to teach the class.



# Bird Hike

(3rd–5th Grade)

Key Concepts:  
Birds, Habitats,  
& Migration

You have 50 minutes to choose your own adventure on this hike. Depending on the season, try to hike to places on the trail where birds are most likely to be seen. Hiking near the larger established bodies of water is always encouraged. Listen and look for birds along the way. **Let students borrow binoculars for the hike, so they can see birds up-close and try to identify them.**

## Suggestions For The Hike

- Talk about the birds you see flying around and why they are important.
- Discuss how migration impacts the types of birds seen flying around.
- Search for signs of bird food such as seeds on the ground and insects.
- Search for bird nests along the trail.
- Listen for birds and teach the students common bird calls.
- Take a look at the Kestrel bird boxes along the trail.
- Hike to the Photo Blind on Marsh Meander Trail (1.5 miles).
- Hike to the boardwalk on Bulrush Bridge Trail (3/4 mile).
- Hike to the dock on Wetland Wonders Trail (1/2 mile).

## Bird Banding Demonstration Table

At some point during the hike, whenever it feels like a good transition time, take a look at the “Bird Banding Demonstration Table.” You may choose to do this in the middle or at the end of the hike.

This is a great way to transition into the “Migration Matters Game” and is another way to keep the topic centered on migration.





# Bird Banding Demonstration Table

(3rd–5th Grade)

Key Concepts:  
Bird Banding &  
Migration

Sometime during the “Bird Hike,” take a look at the Bird Banding Demonstration Table. This demonstration is a great way to introduce some of the tool's scientists use to band and track the status of birds throughout their lifetimes.

Before starting the activity, ask students why they think bird banding is important. After discussing their thoughts, go through each of the tools on the table and discuss their purpose.

## Items At Banding Station

- 1. Mist Net:** Tool or type of fine net used to catch birds in flight.
- 2. Bird Bands:** Individually numbered metal or plastic tag that is attached to a bird’s leg or wing to help identify a specific individual. The number on the bird band helps identify when that bird was last caught, when it was banded, how old that individual is, and how far that bird traveled based on the last location it was recorded.
- 3. Rulers:** These specific rulers are meant to measure the wing length and width of a bird.
- 4. Scale:** This is used to measure the weight of the bird.
- 5. Bird Artifacts:** To show how wings are measured and where bird bands go.

After discussing the purposes of each of the banding tools, talk about why bird banding is important in relation to migration using the reflection questions.

## Bird Banding Reflection

Ask students why bird banding is important especially during the spring and fall seasons. Discuss the importance of not just banding new birds but also recapturing previously banded birds.



# Migration Matters Game

(3rd-5th Grade)

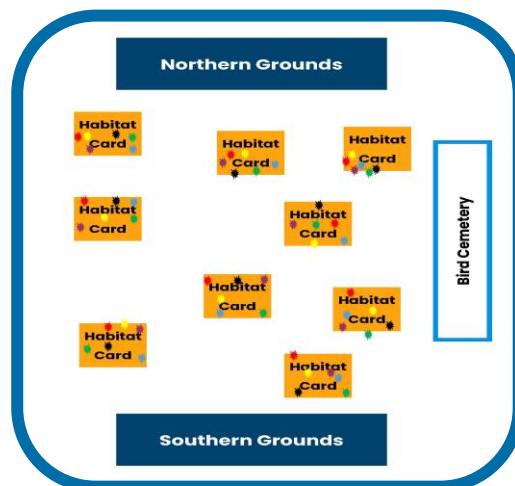
Key Concepts:  
Migration &  
Survival

Migration is a difficult but important journey for many bird species found here at the Refuge and around the world. Here at the Refuge, providing adequate food, water, and habitat for migratory birds is a major portion of the USFWS and the Refuge's mission. Migratory birds are the reason this Refuge exists.

However, even with protected migratory habitats such as the Refuge, migration is still a dangerous journey for most birds. This game demonstrates many of the obstacles birds face every year during the migration season.

## Game Set-up

1. Set up the "game board" in a large outdoor space. A large indoor space will work if weather does not allow outdoor time.
2. Start by placing your rope on the ground in two areas representing beginning and ending spots for migration. For example, one area will be roped off as *Northern Ground* - the starting area where a large amount of migratory bird's breed. About 30 yards away, will be the second area representing the southernmost portion of the migratory pathway the *Southern Ground*. Place the signs labeling each area.
3. Have a designated area on the side for the *Bird Cemetery*.
4. Between the two ropes place the 12 habitat cards. On each card place the sandwich bag with the colorful pompoms (food). \*If you are outside leave them in the bags along with the rock weights.
5. Before the game starts...explain to the students that they are each a migratory bird about to take a long trip along a flyway.





# Migration Matters Game

(3rd-5th Grade)

Key Concepts:  
Migration &  
Survival

## Game Instructions

1. All students start at the *Northern Ground* of their trek.
2. Each bird (student) needs to migrate to the *Southern Grounds*. They will be making 2-3 stops on their way. Direct students to walk to a habitat and “rest” there for a while (until you tell them to move on). Each habitat can only hold a certain number of participants. Be sure that they do not go over the carrying capacity. While they are there, they need to grab one food item (pom pom).
3. You will then direct them to move to a different habitat, paying attention to the carrying capacity, and grabbing a new piece of food. (Do this step 2 or 3 times depending on time)
4. Finally, after all students have gathered their food at 2-3 stops, have all students gather at the *Southern Grounds*. There you will explain this is where they will be spending the winter.
5. Have one or two students pull a *Wetland Dilemma Card* and follow the instructions on the card. If the card is talking about a habitat, take away the habitat and food as it will no longer be in use. If it is about the food (pom poms), any participant that has that color needs to go to the *Bird cemetery*.
6. The students will then be making their journey back north following the same methods they traveled south. During their first stop on the way back, pull a *Wetland Dilemma Card*. Any students on the habitat must move to a different one. If it is about the pom poms, any student with those colors must move to the *Bird Cemetery*.
7. As students move through their journey, there may not be enough food for everyone. There also may not be enough room at a few of the stopover habitats. If a bird does not get food or a habitat to rest, they must go to the Bird Cemetery.
8. Repeat this process back and forth between the *Northern* and *Southern Grounds* until you have 5 minutes or two habitats left. Depending on class size, you may need to redistribute the pom poms to habitats after each round.

## Reflection

Discuss with students regarding what they noticed as the game continued. Have students identify some of the dangers that face migratory birds during their journey. Discuss some of the causes of food and habitat loss and how we can help.



# Reflection

(3rd-5th Grade)

Key Concepts:  
Birds &  
Migration

Find a quiet spot to discuss what students learned and some of their favorite activities of the day. Review the overall theme of the day again and talk through some of the reflection questions.

## Theme

Bird migration is a dangerous journey centered around survival.

## Reflection Questions

1. What is the most surprising thing you learned about birds and migration today?
2. Do all birds migrate? What is something you could do to help the species of birds that do migrate?
3. Why is good habitat so important for migrating birds?
4. What is your favorite thing you did today?

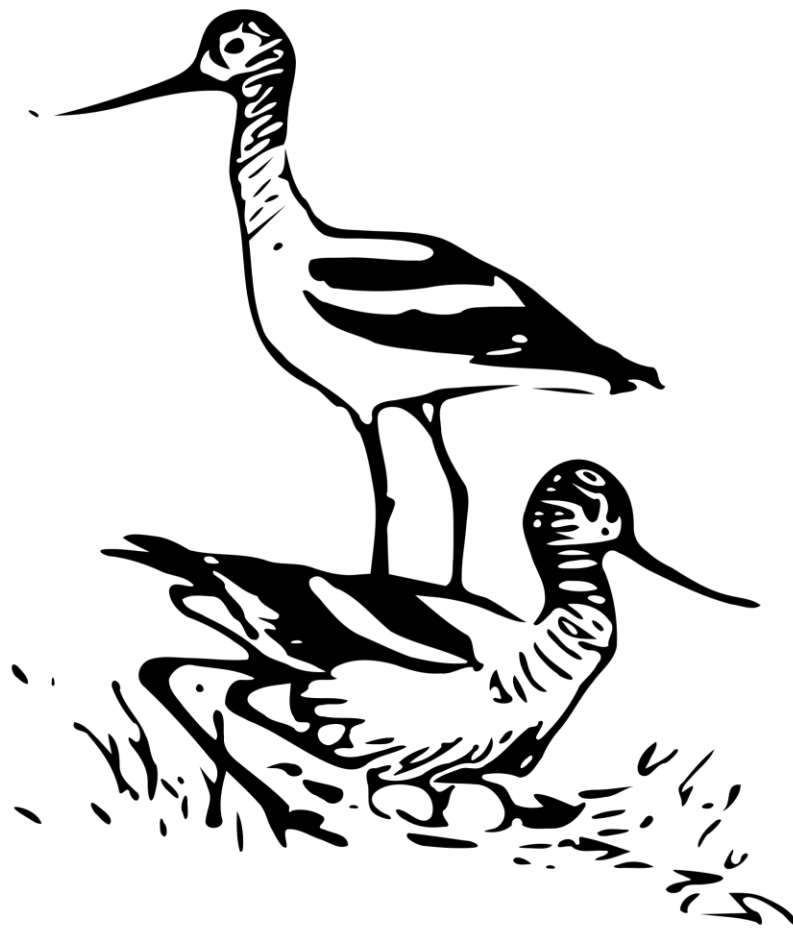
Thank the students for visiting the Refuge today and tell them about upcoming events. Let them know about other activities they can come back and try out with their parents (Jr. Ranger, Nature Play Area, Exhibit Hall, Auto Tour, Jr. Duck Stamp Contest).

## Activities To Do With Extra Time/Longer Field Trip

- Explore Nature Explore Classroom
- Explore Exhibit Hall (Exhibit Hall Scavenger Hunt)
- Bird Games (Raptor Vision Tests, Bills and Beaks Activity)
- Watch "Wings Of Thunder"



# Background Information





# Feathers, Wings, & Flight

Birds are designed for flight. The lightweight body of a bird paired with their strength and shape allows for almost all bird species to attain sustained flight. With that said, in order to remain in the air, birds have a few important adaptations that allow them to fly successfully.

One of the most important adaptations that all birds have is **hollow or pneumatic bones**. Hollow bones help to reduce the overall body weight of a bird and allow for easier flight. Even though their bones are hollow, bird bones are still quite strong. Internal struts and ridges, within their bones, help to increase strength and rigidity which allows for birds to remain just as strong as other animals with solid bones.

In addition to their lightweight bones, the feathers of a bird are also quite light in overall weight. However, similar to the fur of a mammal, feathers are designed to be strong and flexible giving birds a tough outer layer while also keeping birds dry and warm. In fact, bird feathers are made up of the protein **keratin** which is the same material human nails, hair, and skin are composed of.

While feathers serve many purposes depending on the bird species, the flight feathers are essential for a bird to attain sustained flight. **Primary feathers** are the largest flight feathers that help to propel a bird through the air. These feathers are located on the outer wing of a bird. If these feathers are damaged, a bird can no longer fly demonstrating how important the maintenance of these feathers is.

The wings of a bird are probably the most important adaptation for a bird when attempting to fly. The wings of a bird allow for lift, off the ground, and serve as the power source behind the action of flight.

Depending on the type of bird, there are many different forms of flight. These differences in flight are often based off of different wing adaptations. For example, seabirds, such as albatrosses, which fly low over the ocean for long periods of time, have long narrow wings adapted for long periods of gliding without flapping. This differs from smaller birds, such as songbirds, which have short, rounded wings adapted for quick flapping in order to fly from perch to perch.



## Bird Nests

The primary purpose of a bird nest is to provide a safe place for parent birds to lay their eggs and raise their young after hatching. Additionally, the nests of a bird also serve as a place to protect young birds from potential predators and difficult weather conditions.

Depending on the bird species and their habitat, different types of birds build unique types of nests. While other types of animals build nests too, including fish, reptiles, and small mammals like squirrels, bird nests are often unique by species. Here are a few of the common nest's birds may build:

- 1. Cavity Nests:** Nests built within a hole inside of a tree, cliff, or human-made structure. Primary cavity-nesting birds include birds that can dig-out their own cavity nesting site. This includes woodpeckers and nuthatches. Secondary cavity-nesting birds are birds that nest in previously created cavities. This includes tree swallows, house wrens, and kestrels.
- 2. Cup Nests:** Nests built out of natural materials in the shape of a cup. Typically, the nests are a round shape with a depression in the center to shelter the eggs. Birds that build cup nests include swallows, warblers, and flycatchers.
- 3. Ground Nests:** Hidden nests built of natural materials found on the ground. Birds that nest on the ground include meadowlarks, sparrows, and bobolinks.
- 4. Platform Nests:** Large, flat nests that can be built in trees, tops of vegetation, or on the ground. Many platform nests are continually used year after year by the same birds. These nests can get rather large. Birds that build platform nests include osprey and many raptors, egrets, and herons.
- 5. Burrowing Nests:** Nests built within the shelter of the ground. Many birds that nest in burrows dig them out themselves using their beaks and feet. Birds that nest in burrows include many seabirds. However, burrowing owls also prefer these nests though they do not create their own.
- 6. Hanging Nests:** These nests are often created from thin twigs and grasses. Hanging nests are an elongated sac which hang from a tree branch. These nests are often created by orioles and weavers.



# Bird Communication

All birds have unique methods of **communication**. With that said, not all birds just communicate through “bird song.” There are many different forms of communication birds use depending on what they are doing and who they are trying to communicate with. Here are some of the methods birds use to communicate:

1. **Songs:** Bird songs are typically used by male birds as a way to attract mates to their territories. These mating songs are often heard during the springtime as birds began to search for a new partner or mate. Additionally, bird songs are also used as a method to establish and defend territories from other rival male birds.

2. **Calls:** Calls are one of the most common ways to communicate danger. Both male and female birds can be heard communicating through calling. Bird calls are also used as a way for younger birds to communicate with their parents that they are hungry. Calls are also a way for larger flocks of birds to communicate with one another that a food source is near.

3. **Drumming:** Drumming is a noise-making technique that woodpeckers will use in the place of a song. Drumming is often used to establish territory. This form of communication is achieved by male woodpeckers rapidly pecking on large hollow trees or branches.

4. **Wing Noises:** Some species of birds will actually use their wings as a source of communication. Arrangement of individual flight feathers and vibrations during flight can be used as methods to communicate with members of their own species as well as scaring off predators.

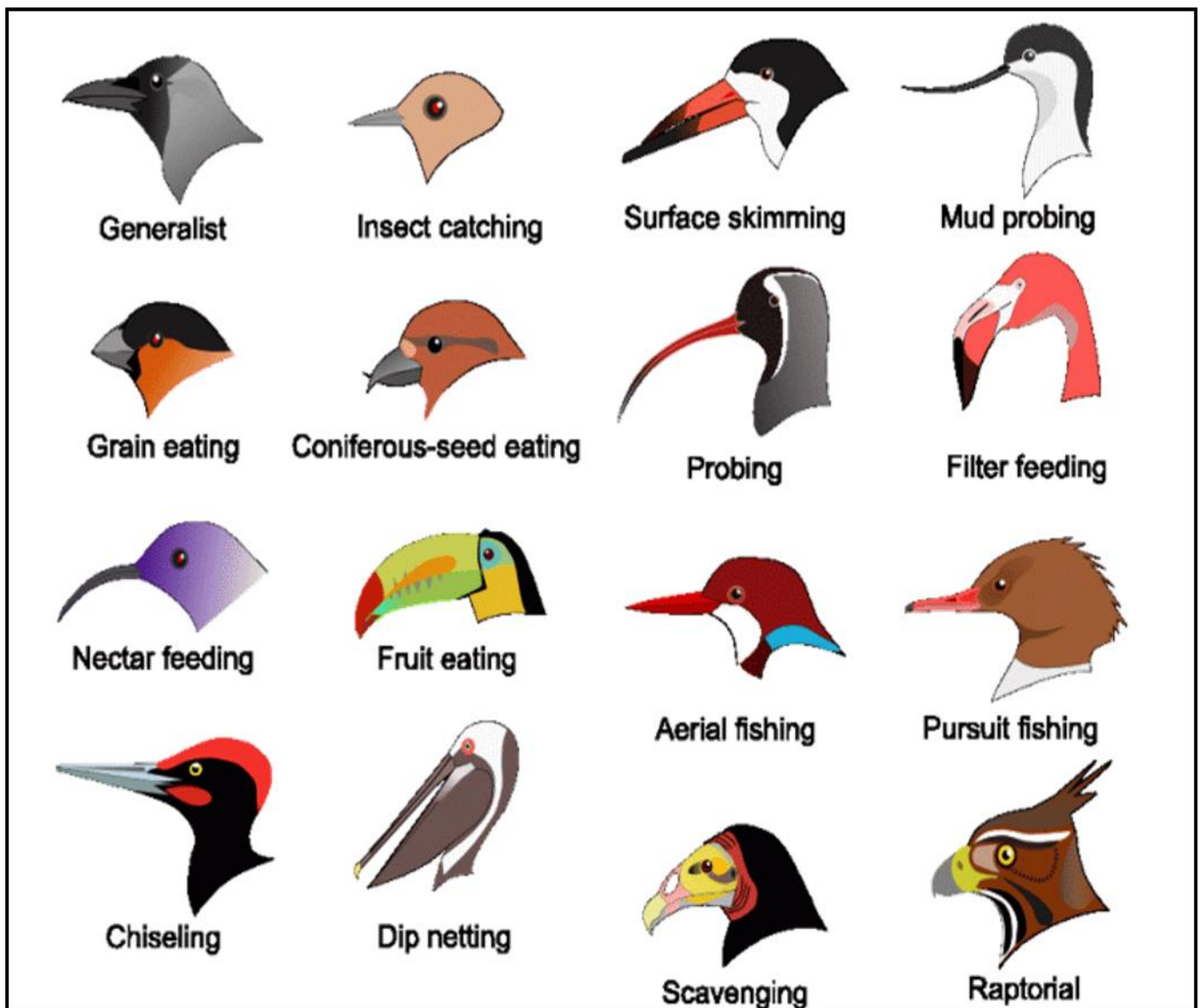




# Bird Beaks

**Bird beaks** are one of the defining characteristics of birds. The primary function of a bird's beak or bill is for eating and gathering food. Depending on the size and shape of a bird's beak, the beak can be used for different food-related tasks. Some of these tasks include tearing, crushing, breaking, shearing, picking, and probing. In addition to acting as a utensil for food, bird beaks are also used as a tool for birds to clean and preen their feathers.

Here is a list of some of the common bird beaks:





# Migration & Wayfinding

Prior to the months of the year, typically wintertime in the United States, when there are lower amounts of resources available to birds, birds will **migrate** or travel south to areas with higher resources present.

During the colder months of the year, the availability of insects and other food resources dwindle. Therefore, birds will migrate south to find food. This process is then reenacted with birds migrating north during the springtime as warmer temperatures bring booming insect populations. While **food** plays a large role in the action of migration, the availability of **nesting sites** also is important to birds. While southern climates may have insects year-round, the wintertime increase in birds leads to less available nesting locations which motivates birds to return north during the springtime.

While migration does serve as an important annual event for many bird species, it is quite dangerous and can take a toll on overall bird populations. Collisions with buildings and other human-made structures, habitat destruction, bright light pollution, predators, unpredictable weather events, natural disasters, and just general lack of experience all serve as potential threats to the survival and success of birds during migration. In fact, 24% of birds do not make it back from their journey.

## **Migration Statistics (Study From Cornell Lab of Ornithology):**

Migration from Canada to U.S. – 4 Billion Birds

Migration from U.S. to Central/South America – 4.7 Billion Birds

Migration back from U.S. to Canada – 2.6 Billion Birds

Migration back from Central/South America to U.S. – 3.5 Billion Birds

**Overall Survival Chance: 76% Return Rate/24% Don't Return**

Birds that are successful when migrating use wayfinding tools to assist with their long journeys. Some of these tools include:

1. The Sun/Moon/Stars
2. Magnetic Fields
3. Memory
4. Landmarks
5. Smell



# Bird Banding

Similar to tagging or using collars to track mammals, bands are used to track individual birds. **Bird bands** are typically small metal, aluminum, or colored bands placed on the leg of a bird. Each band is engraved with a unique set of numbers which helps scientists and bird banders to know which specific individual bird they are looking at.

Prior to placing the band on the leg of a bird, birds must be caught. For smaller birds, scientists often used **mist nets**, or long nets made of fine threads that blend into the surroundings. These nets easily entangle birds without hurting the bird in the process.

After catching a bird to be banded, each bird is weighed and has its wing length and width measured. Fat stores are also checked as well as the size of the bird's leg. This measurement is taken in order to successfully band the bird with the correct band size. The bird is then recorded, and the information is sent to a federal record. This information is important because if a bird with a band is recaptured, scientists want to know where this bird was originally banded and how far it traveled.

In addition to these measurements, bird banders also record the age of the bird when caught as well. All of these measurements are important because bird banding can reveal a lot of valuable information such as:

1. **Migration Behaviors:** Where is the bird recorded location-wise?
2. **Population:** Are more or less of this species being caught this year?
3. **Life-span and Survival Rate:** How long are specific bird species living?
4. **Behavior and Dispersal:** Are certain bird species moving out of an area?