



Washington  
Department of  
**FISH and  
WILDLIFE**

# Following Habitat

## 6-8th Grade

Themes: Bird Migration, Waterfowl

### Location:

**Remote learning modification:** Lesson can be taught over Zoom or Google Classrooms.

The PowerPoint, brainstorming, and assessments can be done in the classroom with student computers.

We encourage you to take students to [visit a wildlife area](#) during spring or fall migration. You can also visit a local green space, estuary, or wetland where there might be waterfowl.

### Standards:

#### NGSS

[MS-LS2-1](#)

Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

#### CCSS

[CCSS.ELA-LITERACY.RST.6-8.7](#)

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

[CCSS.ELA-LITERACY.RST.6-8.9](#)

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

### Modifications, Adaptations:

For COVID-19 distance learning, or other remote learning modification, look for **remote learning modifications** throughout the lesson plan.

### Materials:

WDFW PowerPoint, Ducks Unlimited Article PDF, Waterfowl Tracking PDF, Full Annual Cycle Assignment PDF, Full Annual Cycle Assignment example

### Objectives:

Students will..

1. Explain why birds and waterfowl migrate and the importance of stopover sites.
2. Sketch one waterfowl species' full annual cycle by researching how the species moves throughout the year and their different habitat requirements.
3. Compare and contrast differences in one species' movements using Google Earth and data from WDFW biologists.
4. Assemble a PowerPoint that analyzes why birds migrate to certain areas at different times of year.
5. Examine their results with their classmates and present on their findings.

### Vocabulary:

**Annual life cycle:** Distinct periods throughout the year that shape the habitat requirements and energetic demands of birds.

**Connectivity:** The network of sites throughout a flyway that migratory birds rely on to meet their habitat requirements and daily energetic demands.

**Competition:** When habitat requirements are limited (in small amounts), individuals may develop strategies or behaviors that enable them to gain access to that habitat requirement.

**Energetic demands:** The demands an individual must balance to survive and reproduce.

**Flyway:** The movement path along which a species can be found transitioning between regions containing habitat requirements.

**Habitat requirements:** The physical and biological resources (food, shelter, water, space) required by wildlife for survival and reproduction. Habitat requirements can vary by species.

**Migration:** The seasonal movement behavior when animals seek habitat (food, water, shelter, space) in different regions. For many bird species these regions are located on different continents or hemispheres of the Earth.

**Migratory birds:** A term used for 1,000+ species of birds that spend parts of their annual life cycle in different regions.

**Photoperiod:** The amount of daylight in a 24-hour period.

**Refuge:** Sites that provide critical habitat requirements for wildlife and minimize energetic demands.

**Staging sites:** Longer than seven-day length of stay at a site, typically sites where individuals are seeking food and refuge.

**Stopover sites:** Shorter than seven-day length of stay at a site.

**Sustainable:** Using resources in such a way that they will continue to be available in the future.

**Waterfowl:** Species of ducks, geese, and swans—all are types of migratory birds.

**Wetlands:** Areas where the land does not drain well. The ground in a wetland is saturated or full of water. Often the ground is covered with shallow water.

### Procedure:

#### Introduction to bird migration and flyways

*Slide numbers do not include slides where you insert text.*

Before this lesson, please have students read the article, "Why Waterfowl Migrate" from Ducks Unlimited. This will give them a good introduction to migration and waterfowl. Open the Waterfowl Migration PowerPoint and make sure presenter notes are on.

**Slide 1:** Ask students if they know what migration is. Put up their ideas on a whiteboard, PowerPoint Slide, or **remote**



**learning modification:** give them three minutes to explore the web and put up their ideas on a virtual [Google Jamboard](#). Discuss the ideas they found/shared and then introduce the definition of migration.

**Slide 2:** Many animals migrate, including fish, amphibians, and deer. Birds are perhaps the best-known example of annual migrations. Ask students: Why do you think birds migrate? Write answers on board, PowerPoint slide, or Jamboard.

**Slide 3:** Bird migration is described as the recurrent, seasonal movement of bird populations from one geographic location to another and back again.

**Slide 4:** The most common pattern of migration involves flying north in the spring to breed and returning in the fall to wintering grounds in warmer regions in the south. However, some birds like seabirds migrate east and west (open ocean during the winter and coast during the summer).

**Slide 5:** Reasons animals migrate include:

- Find food, find suitable breeding sites, avoid unsuitable weather.

**Slide 6, 7, and 8:** Migratory waterfowl.

### How do birds know to migrate?

As a class, read this [Ducks Unlimited blog](#) that explains why waterfowl migrate and how they know when to migrate. There is also an 11-minute podcast accompanying the article that you may choose to listen to. You can have students popcorn read this article or assign it as homework to be read before class.

**Slide 9:** According to the article, what factors cause waterfowl to migrate?

- Photoperiod (amount of daylight).
- Seasonal changes in habitat conditions (frozen in northern part of waterfowl's range).
- Precipitation (declining water levels are not favorable).
- Wind direction and velocity (Birds migrate more efficiently when they have a tailwind).

**Slide 10:** Three-minute CBS video of migrating waterfowl in Central California.

**Slide 11:** Introduces flyways. Migrating birds don't just migrate wherever; their path often follows a specific trail known as a flyway. Flyways are like highways that birds follow when traveling north and south. In North America, there are four flyways.

**Slide 12:** How do waterfowl know where to go?

**Slide 13:** Introduces stopover sites and refugia. On migration north and south, it's imperative for waterfowl to seek refuge at stopover sites. A stopover site, such as a small wetland, pond, estuary, or lake provides the bird with temporary habitat during its long journey.

Slide 14: Importance of agricultural areas. Migration is tough. Birds face many natural hazards such as weather, lack of food, lack of habitat, and many human hazards such as flying into windows, being hit by a vehicle, or flying into a wind turbine.

**Slide 15:** Importance of water

**Slide 16:** Full annual cycle

**Slide 17:** How do waterfowl managers use this information?

### Annual Cycle Activity

Distribute Annual Cycle sheet to students. Ask students to choose one duck species from [this waterfowl guide](#). Students will research the species and then fill out the

species' full annual cycle. [Examples can be found here](#).

Students can choose to write or draw their species' annual cycle, but it must be clear what the bird experiences at different times during the year. Students should cite their sources on a separate document. When the assignment is complete, have students share their work with a partner, and then have a handful of students share with the class.

### Tracking Waterfowl


Slide 18: Because birds migrate and cross different state and country borders, WDFW biologists and waterfowl managers work with various state, national, and international agencies to sustainably manage and track waterfowl populations. This means they often share data about where waterfowl are and how the birds move.

Slide 19: These data help wildlife managers make decisions about hunting and conservation.

To get this data, scientists capture and tag birds with a small GPS tracking device. This helps them know where birds go at different times of year.

### Tracking Waterfowl Activity

Pass out the Waterfowl Tracking Activity. In this part of the lesson, students will use real data to track and make estimations about waterbirds in the Pacific Flyway. All instructions and questions are in this document. We've provided both PDF and PowerPoint versions for you, depending on what you prefer. After students finish their project, ask them to compare with someone who chose a different species, either with a partner or in small groups. Compare and contrast differences and similarities between migration strategies between and among species. Have one representative present findings with the class.

 **Idea:** Show off your students' work! Share student projects from this lesson with WDFW.

Facebook: @WashingtonFishWildlife

Instagram: @TheWDFW

Twitter: @WDFW

#WildWashington #WildWa

**Did you teach this lesson? [Give us your feedback.](#)**



## **Additional Resources :**

*We encourage you to use the following resources as either a supplement to this lesson, or to share the resources with students for their project.*

## **Supplemental lessons:**

- [Migration Math Madness](#)-USFS
- [The Incredible Journey](#)-USFS
- [Investigating Bird Migration and Climate Change](#)-NPS
- [Science and technology unit on tracking birds](#)-National Zoo
- [Bird migration lessons and resources in Spanish](#)-Environment for the Americas
- [K-12 Spanish lessons](#)- Cornell Lab of Ornithology
- [Mallard Migration](#) (for K-4)- USFWS

## **Bird tracking websites:**

- [Alaska Science Center Wildlife Tracking Projects](#)
- [eBird Status and Trends](#)
- [Migratory Connectivity Project](#)
- [Migration Tools](#) (forecast maps, live migration maps)-BirdCast

## **Other:**

- [Waterfowl ID](#)-Ducks Unlimited
- [How birds navigate when they migrate](#)-The Cornell Lab of Ornithology
- [The basics of bird migration](#)- The Cornell Lab of Ornithology
- [Migration stories interactive game](#)-Audubon
- [Birds on the Move](#)-Audubon
- [Voices of the Pacific Flyway](#) (13 minute video)- The Cornell Lab of Ornithology