

The Great Migration

Technology's role in wildlife management and conservation

LESSON SUMMARY: Students will take the role of a migratory bird for an accelerated winter migration. Birds will survive by luck the first round, losing habitats at random. For the second round, habitats containing birds that are being monitored with tracking devices will be spared the doom of development.

<p style="text-align: center;">TIME</p> <ul style="list-style-type: none"> • Advance Preparation—30 minutes • Set Up—5 minutes • Activity—30 minutes 	<p style="text-align: center;">MATERIALS</p> <ul style="list-style-type: none"> • Cones or other station identifiers (5) • Blindfold/bandana • Pre-made laminated Species Cards • 5 “Tracking Devices” (Pipe Cleaners)
<p style="text-align: center;">GRADE LEVEL</p> <p>All (modifications and extensions provided)</p>	

OBJECTIVES

1. What are the migration patterns of migratory birds?
2. What role does loss of a habitat play in migration patterns?
3. What are some of the major causes of habitat loss to important migratory habitat like wetlands?

BACKGROUND

Over 360 bird species migrate annually between wintering grounds in the tropics and breeding grounds in North America and the Arctic. Many depend on wetland habitat like the productive salt marshes of the Chesapeake Bay for resting stops and nourishment.

Ospreys migrate south late each summer, heading to the Caribbean, Central America, and South America. They return to the Chesapeake Bay area in early spring, within days of their lifetime mate. Another common Chesapeake bird, the Great Blue Heron, migrates within the Chesapeake region, depending heavily on coastal wetlands for survival.

The Bay also supports *Bald Eagles* migrating from the winter and even pairs moving north for the summer from Florida. The *Red Knot* is a shorebird that can migrate over 9,300 miles between its breeding grounds in the Arctic and South America. *Red Knots* depend on horseshoe crab eggs for a food source. In recent years the *Red Knot* population has been found at a 50% decrease from its 1980s estimate. The *Canada goose* is another common Chesapeake species. The geese that breed further North and venture to the Chesapeake for winter along the Atlantic flyway depend on wetland habitat. However, there is an overabundance of *Canada Geese* that are year-round residents to the Chesapeake Bay region. These birds were released as live decoys and

as part of government and private stocking programs.

Historically, wetlands were drained and filled for agriculture and development. Wetlands disappear today because of development projects, succession within wetlands, coastal erosions, and natural disasters such as hurricanes. While a permitting process is in place to protect these wetlands under the Clean Water Act, many wetlands of North America have already been lost and are still filled today due to policy loopholes and a lack of alternative development sites.

New wildlife field technology is improving the understanding of critical wildlife habitat and life habits. GPS tracking devices, weighing less than 5 grams and powered by the sun can be attached to birds to track their migration journey and determine their habitat needs. Migratory birds are all sensitive to habitat loss by anthropogenic and natural causes. Determining critical habitat areas for threatened or sensitive species can prevent population declines.



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PROCEDURE

1. Set up 5 cones (or similar markers) in the field.
2. Select 3 students to be bulldozers, hurricanes, or predators.
3. Show students how to “perch”. Students may imitate a bird-like perch stance of your choice.
4. Hand out the laminated species journey cards.
5. Have students disperse throughout the field to head to their first migration station. The three bulldozers may tag birds on their way to their stations. When students reach their station, they should “perch” and may no longer be tagged.
6. When the birds are all at their stations, the instructor will choose a random number (1-5) to “develop”. The birds at that station must flee to a neighboring station without being tagged, while all other students remain at their stations.
7. The developed station is no longer available. Students should go to that station immediately, but will fly to a neighboring station when the next developed station is chosen.
8. The game continues until few birds are remaining.
9. For the second round, everybody begins at the start of their journey again. Hand out five pipe cleaners or other “GPS identifiers” to random students. This time explain to the students that the new props are GPS trackers, and will show wildlife conservationists which habitats are important to migratory birds. If a student with a GPS tag is in a station that is called out by the instructor, everybody in that station is safe and may remain. The station will not be eliminated.
10. In the second round, mortality should decrease. This should be evident to the students.
11. Play until the concept is clear and a wrap-up discussion will be effective.

WRAP UP

Facilitate a discussion where the students brainstorm the possibilities that GPS tracking devices have in the field of wildlife conservation and management. What does a location tell us about their habitat needs, food sources, pollution sensitivity, life habits? How valuable would tracking data be for endangered and threatened species? What role did the 3 students that tagged other students play? What sources of mortality are threatening to a bird during migration?

EXTENSION

As a take-home assignment, have students select a migratory bird species and research its migratory pattern online. Students can try to access any available online tracking data to determine important resting stops to that species. Use the attached worksheet as a template. Point them in the direction of available data for their species as it becomes available. Encourage them to use Fieldscope to look at water quality near migratory stops for certain species.

MODIFICATIONS FOR DIFFERENT AGE GROUPS

- **For younger students (K-2)**—A hopscotch style or smaller course may make more sense with younger students where their task is to get from one end to the other, while eliminating parts of their journey across.
- **For advanced students (9-12)**—This activity is a good lead-in to environmental policy discussions. Have students brainstorm what part of the policy process is demonstrated when development is halted because a sensitive species is found to use the area as habitat. Lead to discussions about Environmental Impact Assessments and the hierarchy of the policy process associated with proposed development in wetland systems.



Chesapeake Bay Migratory Birds Data Sheet

*For middle school students—make adjustments for other groups.

1. Choose your favorite Chesapeake Bay migratory bird species from the game, or choose another migratory bird in the region.

2. Research online to find out more about that species.
 - A. What is your species' food source?
 - B. What are their habitat needs (cover, large trees, etc.)?
 - C. Where do they nest/breed? Where do they winter?

3. Search online to see if you can find any published research detailing the migratory stops of your bird. If not, try to determine what areas of habitat in the Bay might be critical to their survival during migration.

4. Can you think of different threats to the migratory habitat that you determined for your bird? Natural and or human-caused?

Osprey

- 1st migration—Station 1**
- 2nd migration—Station 3**
- 3rd migration—Station 5**
- 4th migration—Station 3**
- 5th migration—Station 1**

Canada Goose

- 1st migration—Station 2**
- 2nd migration—Station 4**
- 3rd migration—Station 1**
- 4th migration—Station 4**
- 5th migration—Station 2**

Bald Eagle

- 1st migration—Station 3**
- 2nd migration—Station 4**
- 3rd migration—Station 5**
- 4th migration—Station 4**
- 5th migration—Station 3**

Red Knot

- 1st migration—Station 4**
- 2nd migration—Station 1**
- 3rd migration—Station 2**
- 4th migration—Station 1**
- 5th migration—Station 4**