

"Songbird Travel Plans"
portions adapted from Ecosystems Matter "Fowl Play"

Mark Musselman
Audubon at the Francis Beidler Forest

Overview: This introductory lesson to a bird or environmental unit provides students the opportunity to incorporate prior knowledge, mapping and atlas skills, with information regarding the migration of neotropical songbirds from the Francis Beidler Forest in South Carolina. Students may ask, "Why should we care about birds?"

Birds are an 'ecological litmus paper'. Because of their rapid metabolism and wide geographical range, they reflect changes in the environment quickly; they warn us of things out of balance, sending out signals whenever there is a deterioration in the ecosystem...

-- Roger Tory Peterson

Connection to the Curriculum: This lesson incorporates math through the use of data tables and graphs, science through animal migration and ecosystems, geography through the elements and standards listed below, and language arts through the extension activities listed below.

Science Standards

- 4-1.1 Classify observations as either quantitative or qualitative.
- 4-1.5 Recognize the correct placement of variables on a line graph.
- 4-1.6 Construct and interpret diagrams, tables, and graphs made from recorded measurements and observations.
- 4-2.5 Explain how an organism's patterns of behavior are related to its environment (including the kinds and the number of other organisms present, the availability of food and other resources, and the physical characteristics of the environment).
- 4-4.4 Summarize the conditions and effects of severe weather phenomena (including thunderstorms, hurricanes, and tornadoes) and related safety concerns. (extension)
- 5-1.5 Construct a line graph from recorded data with correct placement of independent (manipulated) and dependent (responding) variables.
- 5-2.3 Compare the characteristics of different ecosystems (including estuaries/salt marshes, oceans, lakes and ponds, forests, and grasslands).
- 5-2.5 Explain how limiting factors (including food, water, space, and shelter) affect populations in ecosystems.
- 6-3.5 Illustrate animal behavioral responses (including hibernation, migration, defense, and courtship) to environmental stimuli.
- 7-1.4 Explain the importance that repeated trials and a well-chosen sample size have with regard to the validity of a controlled scientific investigation.
- 7-4.3 Explain the interaction among changes in the environment due to natural hazards (including landslides, wildfires, and floods), changes in populations, and limiting factors (including climate and the availability of food and water, space, and shelter).
- 8-2.7 Summarize the factors, both natural and man-made, that can contribute to the extinction of a species.

Social Studies Standards

- 7-7.3 Explain global influences on the environment, including the effects of increases in population, the growth of cities, and efforts by citizens and governments to protect the natural environment.
- 7-7.7 Summarize the dangers to the natural environment that are posed by population growth, urbanization, and industrialization.

Literacy Elements

- G. Make and record observations about the physical and human characteristics of places
- H. Construct maps, graphs, tables, and diagrams to display social studies information
- I. Use maps to observe and interpret geographic information and relationships
- J. Demonstrate responsible citizenship within the school community and the local and national communities
- L. Interpret calendars, time lines, maps, charts, tables, graphs, flow charts, diagrams, photographs, paintings, cartoons, architectural drawings, documents, letters, censuses, and other artifacts
- M. Use tables and graphs to observe and interpret geographic trends and relationships

Suggested Grade Range: 4-8

Time: 50 minutes

Materials Needed:

1. Student data journal with data table and graph paper pasted inside.
2. Markers or colored pencils.
3. Condition cards. (pgs. 5-9, http://www.na.fs.fed.us/spfo/pubs/misc/eco/Fowl_Play.pdf)
4. Materials to mark off wintering and breeding grounds.
5. Cones or other items to mark off activity area.

Objectives:

1. SWBAT describe five threats to migrating songbirds.
2. SWBAT describe why it is important for birds to have suitable habitat throughout their range.

Procedures:

1. Prior to this lesson, have students create decoupage covers for their journals (composition books). (see Decoupage_habitats.doc)
2. Students will use the journals throughout the unit on birds to record observations around school and home, any data collected during investigations, and answers to questions posed by the teacher or the student.
 - a. Students will record information about birds and habitats they chose to show on their journal.
 - b. Students will record information about birds observed, photographed or heard (see extension).
 - c. Students will record data from this activity (paste in data table).
 - d. Students will graph data from this activity (paste in grid).

- e. Students will show migration and wintering habitat for selected birds (paste in map).
 - f. Students will record observations and answers to questions (see extension).
 - g. Students will for set time record species, numbers, and behavior of birds visiting a feeder throughout the school year (make a journal entry regarding observations; record data on classroom data table at the observation station; see extension).
 - h. Students will participate in the Great Backyard Bird Count (record data for classroom or individual submission; paste in data table; see extension).
3. Prior to this lesson, discuss the variety of threats facing songbirds. Some information can be found at http://www.na.fs.fed.us/spfo/pubs/misc/eco/Fowl_Play.pdf (pgs. 1-2), but additional information can be found on the web by searching for “bird population threats”. Sample returns for this search are <http://www.fws.gov/birds/mortality-fact-sheet.pdf> or <http://www.birds.cornell.edu/AllAboutBirds/conservation/planning/threats>.
 4. Provide students with a data table for this activity and graph paper. Have them paste these items into their journal on the next available pages with the data table entered first.
 5. Set up a rectangular activity area with a wintering ground on one end and a breeding ground on the other end. The two ends can be set farther apart as more students participate.
 6. Place four circles (hula hoops or string) at each end of the activity area. The carrying capacity (the number of birds that a habitat can sustain) for each circle is five birds.
 7. Place the cones or other items down the center of the activity area approximately ten yards apart.
 8. Divide the students into songbirds and cowbirds in a ration of 4:1. Have the cowbirds wear an armband, penny or other identifiable marking. Maintaining the ratio, split the class between the wintering and breeding grounds.
 9. Place the condition cards in the appropriate wintering or breeding ground area.
 10. Have the birds begin their migrations (with their journals), which must occur between the cones without running. With each migration, the cones on both sides will be moved closer (1') together to represent a loss of suitable habitat. As birds arrive at the wintering grounds and breeding grounds, the teacher will read a conditions card with the students following the instructions. There should be at least ten migrations per activity.
 11. During a migration and after several migrations have occurred, the teacher will add or remove suitable habitat on the wintering and breeding grounds. Additionally, birds will die from a variety of factors (cowbird parasitism, weather, habitat loss, predators, pollution, window strikes, automobiles, etc.), which may be detailed on a condition card or via a designated student tagging classmates. The student doing the tagging cannot run, must have one hand behind the back at all times, and must move outside the cones after each tag. Birds that have died (been tagged or been so instructed on a card) during migration will stand along the sidelines until changing conditions allow them back into the game.
 12. At the end of each migration, have students (including those on the sidelines) record the number of songbirds and cowbirds that have survived. Data should be recorded on the data table that was pasted into the journal prior to the activity.
 13. On the graph paper pasted into the journal, have each student graph the cowbird and songbird populations. Remind students to label their graph and to use separate colors for each group of birds.
 14. Have each student select a bird from the Audubon at Francis Beidler Forest bird list at <http://www.sc.audubon.org/education/birds.htm>. Have each student research the migratory information and habitat preferences for their bird and record the information in their journal.

15. Provide each student with a map of the Western Hemisphere to paste into their journal. Have students draw a circle around the general northern breeding and southern wintering grounds for their bird and draw a line connecting the two which shows the bird's general migration route.

Suggested Evaluation:

1. Describe five threats to migrating songbirds, including possible solutions to reduce or eliminate the threat. (*loss of habitat, bird trafficking, weather, predators, feral cats, window/tower strikes, aircraft/vehicle strikes, electrical transmission lines, pollution, pesticides, disease, cowbirds*)
2. Why it is important to protect habitat for birds throughout their range and not simply the rainforest? (*northern areas are required during the breeding season with successful reproduction helping to maintain the species population while fragmented habitat allows for increased parasitism by cowbirds; southern areas, where breeding does not occur, are required for adult birds to survive and return north to breed; areas along the migration route are required for birds to rest and add on energy stores, especially if they have experienced difficulties [weather, disturbance by humans or predators, poor food supplies prior to departure] during migration*)
3. Read Roger Tory Peterson's quote. In your journal, respond to the following question, "Why should we care about birds?"

Extending the Lesson:

1. Use Wild Republic's Audubon toy calling birds (<http://www.wildrepublic.com/audubon/home/default.asp>) to demonstrate how birds of a species locate each other within the breeding range. Have matching pairs of any birds and give each student a bird. In a safe and open area, blindfold the students and have them locate a "mate" by listening for their matching call. Students may not speak or peek. Once a pair of students has located each other, they may remove their blindfolds and move to the side of the activity area. After the activity, students may research their bird, especially information on migration (if any), and record the data in their journal along with their observations regarding the activity.
2. Create cartoon or editorial cartoon using [Wildlife funnies.doc](#) lesson. Provide each group with a cartoon and have them write down their interpretation of the cartoon. They should identify any animal characteristics or behaviors that they have previously studied and be prepared to share their interpretation with the class. An example of *camouflage* is demonstrated in a *Far Side* cartoon. The water buffaloes have painted human beings on the side of their vehicle just as humans paint their vehicles to look like zebras on the plains of Africa. The buffaloes are attempting to blend in and not panic the "herd" of humans within their city habitat.
3. Have the students respond in their journal to the Bruce Beattie editorial cartoon from 8/7/2007 at <http://www.news-journalonline.com/column/beattie/>. How does it relate to the health of bird populations? (*loss of habitat, forest fragmentation, window strikes, vehicle strikes, cowbird parasitism, polluted water from runoff, predation by domestic cats, poisoning by pesticides or herbicides*)
4. Set up a bird feeder that can be observed from the classroom, even if that means using binoculars. Have several bird field guides at the station along with instructions on what

characteristics (color, size, markings, behavior, etc.) are useful in identifying birds. At a designated time and for a designated period of time each day, have students observe the birds that visit the feeder. Students should record the date, the time, the species of birds, the numbers of individual birds, and any observations, including bird behavior.

Date	Time	Species	# of birds	Observations
	Start/End			

- Participate in the Great Backyard Bird Count (<http://www.birdsource.org/gbbc/>) which occurs in February. Students can observe birds at school or at home during the designated timeframe. Observers do **NOT** need to be expert birders. Observation time can be as little as 15 minutes and can occur in any setting. Observers only report the birds that they can identify, which can be as few as one individual bird. However, the cumulative data collected across North America is valuable to ornithologists and the data collection itself allows students to participate in real-world science. Have students record their observations in their journal. The students can report the data to the Great Backyard Bird Count website from home or at school, while any observations by students at school can be tallied together and reported as one set. A variety of dot maps are produced showing the data collected across North America, which provides an opportunity to study map types.
- Set up a computer station with SCGA’s *South Carolina Atlas of Environmental Risks and Hazards* CD. Many of the same risks and hazards for humans apply to birds, especially during migration. Additionally, birds suffer losses through strikes (planes, cars, buildings, windows, towers, wires) or through human disturbance (chased by pets or children on the beach when they are resting or feeding; flushed by boats, ATVs or motorcycles when they are resting or feeding). During the course of the unit, have students review one or more of the sections on the CD and write a paragraph describing their reaction to the information (Did they learn something new? Have they had an experience with the hazard they reviewed? How might the hazard affect birds?)
- Set up a station to play the National Audubon Society’s *Mission: Migration Game* at http://ny.audubon.org/BirdSci_game.html#. Next, use Google Earth to give students a bird’s-eye view of habitat in their area. Have students fly over their community and then over Beidler Forest. What areas look like the good places to land? What evidence is there of human activity (farming, housing, roads, power lines, forest fragmentation) that pose threats to songbirds?
- Ask students to respond in their journal to the following: “Birds around the world suffer from a variety of predators, including snakes. What might happen if snakes were completely removed from the birds’ habitat?” After students have responded, read aloud *The King, the Mice and the Cheese* by Nancy and Eric Gurney. Ask students to respond again to the question posed above.

Resources:

- Audubon Center at the Francis Beidler Forest, <http://www.sc.audubon.org/beidlerforest.html>.
- Francis Beidler Forest education calendar, <http://www.localendar.com/public/fbf>.
- Adams, M., & Brickell, R., & Hanophy, W. (Eds.). (1995). *Ecosystems Matters: Activity and Resource Guide for Environmental Educators* (“Fowl Play”). U.S. Government Printing Office, http://www.na.fs.fed.us/spfo/pubs/misc/eco/Fowl_Play.pdf.

4. National Geographic Society. (2004, April). *Bird Migration: Western Hemisphere* [map]. Washington, D. C.
5. The Cornell Lab of Ornithology, & The National Audubon Society. *The Great Backyard Bird Count*. <http://www.birdsource.org/gbbc/>
6. South Carolina Geographic Alliance. (1999). *South Carolina Atlas of Environmental Risks and Hazards*. [CD]. University of South Carolina Press.
7. Google Earth, <http://earth.google.com/>.
8. National Audubon Society, *Mission: Migration Game*, http://ny.audubon.org/BirdSci_game.html#.

