

Migration Headache



Section 3 Wetland Activities WETLAND INHABITANTS

Grade: 4 - 8

State Standard: Geography E-5

NGSS: 5-ESS3-1, MS-LS1-4, MS-LS2-1
MS-LS2-4, MS-LS2-5, MS-ESS3-4.

Subjects: science, language arts, math,
social studies, physical education

Skills: analysis, classification,
comparing similarities and
differences, computation
(limited), discussion, evaluation,
generalization, hypothesizing,
inference, interpretation, listing,
observation, prediction, psychomotor
development, synthesis, using time
and space

Duration: one 45-minute session

Group Size: 20-40 students or more

Setting: gymnasium or large outside
area

Vocabulary: migration, habitat,
wetlands

Objectives:

Students will:

1. List limiting factors affecting populations of migrating water birds.
2. Predict the effects of such limiting factors.
3. Describe the effects of habitat loss and degradation on populations of migrating water birds.
4. Make inferences about the importance of suitable habitat for migrating water birds.

Teaching Strategy:

Students role-play migrating water birds traveling between nesting areas and wintering grounds. The birds are subject to hazards at either end of the migration path as well as along the way.

Background

See INSIGHTS: Section 2 Wetland Inhabitants “Alaska’s Waterbirds and Wetlands” fact sheet,

Section 3 Wetlands in a Changing World fact sheets, and Section 4 Wetland Policy and Management “Important Migratory Bird Regulations” fact sheet.

Note: this activity simplifies the events of migration in order to keep the simulation manageable. In actuality, many of the hazards faced by migrating waterbirds are hazards en-route. We guide the teacher to emphasize these in discussion rather than during the simulation. Each student (assuming a class size of thirty) represents thousands if not tens of thousands of waterbirds. Thus, occasional losses to predation and other events of relatively minor magnitude during the course of migration are not emphasized in the simulation. The major purpose of this activity is for students to dynamically experience some of the important factors that affect the survival of migratory waterbird populations.

Materials:

Large playing field or gymnasium, two paper plates for every three students (clearly mark the plates to differentiate top from bottom).



Procedure

1. Select a large outside area about 70 feet in length or mark off an area in the gym. Place the paper plates on either end of the playing field so that there is one plate for every three students at each end of the field. Designate one end of the field as the “wintering habitat” and the other the “nesting habitat.” *Please see diagram at end of this activity.*

2. Explain to the students that they are waterbirds and will migrate between wintering and nesting habitats at your signal. Tell them that the paper plates represent important wetland habitat for the “waterbirds”. In order to survive, students must have one foot on a paper plate at the end of a migration (up to 3 students can have their foot on one plate). If a student is unable to find suitable habitat, that is he or she cannot get a foot on a plate, he or she dies and has to move - at least temporarily - to the sidelines and watch. During migration, the birds may want to “flap their wings,” moving like birds in flight.

3. Discuss with the students how many factors limit the survival of populations of migrating waterbirds. Some involve changes in the wintering and nesting habitats. There will be times of abundant food, water, shelter, and space suitably arranged to meet the habitat requirements of the birds. There will be other times when the habitat is stressed, with many factors limiting the potential for survival. Sometimes the area of available habitat is reduced.

4. Begin the activity with all the students at the wintering habitat. Announce the start of the first migration. Have the students migrate in slow motion until they become familiar with the process. Then they can speed up. On the first try, all the birds will successfully migrate to the nesting habitat.

5. Explain that there has been no loss in available nesting habitat. Thus, a successful nesting season is at hand.

6. Before the students migrate toward the wintering habitat, turn over one plate from the wintering region. Explain that a large wetland area has been drained and used for agricultural purposes. Repeat the instruction to migrate and send the birds to the wintering habitat. Have the three students that will be displaced stand on the sideline. Tell the students that these three have died as a result of loss of habitat. Remind any “dead birds” that they will have a chance to get back into the activity. They can come back

as surviving hatchlings when favorable conditions prevail and there is habitat available in the nesting ground.

7. Record the changes in population, so that students can analyze and graph the data when the simulation is complete.

8. Before the next migration to the nesting region, turn over four plates in the nesting habitat. This represents a catastrophic loss. Tell the students that this is the result of a period of unusually heavy rain during nesting which flooded many of the nests. Instruct the students to migrate. *This flooding may result in a large number of students waiting on the sidelines to reenter the nesting habitat. Before many cycles are repeated, provide them with an opportunity for reentry.*

9. Two students can be made permanent monitors to turn the paper plates over as you instruct them.

10. Repeat the process for eight or ten migration cycles to illustrate changes in habitat conditions with resulting effects on the birds. Give examples of factors that might affect the wetland habitat. (See following page for suggestions.)

11. You may want to add “stop over” sites in between the migration. Birds that do not use a stop over site reach the habitat, but become exhausted and start the return trip a few seconds later than the other birds.

POTENTIAL FACTORS REDUCING WETLAND HABITAT

- wetland drainage
- drought
- shrub expansion due to climate change
- pollution and contamination of water (e.g., oil or chemical spill)
- urban expansion
- industrial development
- conversion of wetlands to farm land
- increased runoff and turbidity from fire
- conversion of natural waterways to canals
- invasive species
- lead shot in the wetlands
- disturbance from boats, ATVs, and snow machines



POTENTIAL FACTORS IMPROVING WETLANDS HABITAT

- preservation of wetlands
- high rainfall
- creation and restoration of wetlands
- creative construction that maintains wetlands – such as boardwalks.
- mitigation of invasive species
- cleanup or elimination of lead shot
- dynamic balance with predators
- limiting 4-wheelers and snow machines to set trails

Some limiting factors are a natural and dynamic part of any environment, however overall, the availability of suitable habitats for migrating waterbirds are diminishing. This decrease can be illustrated by ending the activity with fewer areas of available habitat than can accommodate all the birds. There is general agreement that the greatest long-term threats to the survival of populations of migratory waterbirds are the loss and degradation of habitat.

12. What kinds of things can and should be done to protect and restore habitats for migrating waterbird populations? Discuss potential tradeoffs related to any recommendations.

Evaluation

1. Students identify human activities and environmental factors that might interfere with waterbird migration, distinguishing between effects on individual birds and effects on populations of birds and whether the effect is short or long term.

2. Students discuss why suitable habitat is important for migrating waterbirds? Include in your response a description of the different kinds of habitat that are needed by migrating waterbirds.

Credits:

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Project WILD workshop. For information on how to take a Project WILD workshop in Alaska, please contact the Alaska Department of Fish and Game at (907) 267-2216.

Extensions

1. Explore local factors affecting habitat loss and degradation, or gain and restoration. Contact a wildlife biologist or manager and research the causes for long-term habitat loss, as well as any major efforts underway to prevent these increasing losses.

2. Visit a National Wildlife Refuge, state wildlife area, bird observatory, private sanctuary, seashore, or other habitat for migratory waterbirds.

3. Research other animals that migrate. Are the problems they face similar to those of migratory birds?

4. Ask an Elder to share changes to local wetlands that they've seen through their lives.

Curriculum Connections:

(See Appendix for full citations).

Books:

The Atlas of Bird Migration: Tracing the Great Journeys of the World's Birds. (Elphick, 1995).

Winged Migration (Perrin 2003).

Video:

Winged Migration (Perrin 2000).



MIGRATION HEADACHE DIAGRAM

