

Investigation Four - Wetland Adaptation and Migration

Standard V Students will understand the physical characteristics of Utah's wetlands, forests, and deserts and identify common organisms for each environment.
Objective 2 Describe the common plants and animals found in Utah environments and how these organisms have adapted to the environments in which they live.
Intended Learning Outcomes <ol style="list-style-type: none">1. Use science process and thinking skills3. Understand science concepts and principles4. Communicate effectively using science language and reasoning

Standard
V
Objective
2

Background Information

Migration is a seasonal movement from one area to another, usually a breeding and a non-breeding area. Migration allows birds to take advantage of the seasons. Most migrant birds spend only two to four months of the year on their nesting grounds. The majority of the year is spend elsewhere.

Not all birds migrate. Some find the resources they need throughout the year; other switch to different food sources as the seasons change; and a few become inactive during lean times.

Research shows that approximately 75 percent of the bird species in the state of Utah (about 300) are dependent on the corridors of trees and shrub that grow along streams and rivers throughout the state. Areas like the Jordan River are especially important. Local biologists suspect that about 150 species of birds in Utah absolutely require riparian habitat. If this habitat disappears from our state, these 150 species of birds will disappear with it. In the western United States we have less than five percent of our riparian habitat remaining in its natural condition. Because western riparian habitat is scarce and rapidly becoming more so, wetland areas are of vital importance to breeding and migrating birds. The Jordan River offers a migration and habitat corridor between Utah Lake and the Great Salt Lake, and a biological sanctuary between Utah's Western Desert and the Wasatch Range. This area is know as the Great Salt Lake flyway, and is a crucial stopover for hundreds of thousands of migrating birds each season. The Great Salt Lake has been identified as a vital link in an international chain of sites that provide critical habitat for birds.

Pre-Assessment/Invitation to Learn

Ask students to imagine that the next time they go to the grocery store, it has disappeared. What would they do? Go to another store? What would happen if the next store they tried is also gone? Where would they get their food? How would this affect their behavior?

Because wetlands are so important to birds, they are often called “quickie marts” or places where they can get a “snack” that will help them as they travel. When these areas disappear, it causes problems for them, just like it would for humans if all the grocery stores and “quick stop” places were no longer around.

Discuss with the students the importances of wetlands. On a map have the students point out the biggest wetland in the state (The Great Salt Lake). Make an overhead of the Wetland Quiz and cover the answers. Record students’ answers. After the migrating activity, go back and review questions. Do the students change their answers? Reveal the answers. Discuss how transportation and urban development are destroying wetlands.

Students should be aware of the importance of wetlands. Make a list of the important reasons on a large piece of paper to be posted in the classroom.

Instructional Procedure

Materials

- ▣ A large area such as a gym, classroom or outside
- ▣ 10-15 hula hoops or jump-rope sections
- ▣ Migration cards (Copy each card on cardstock. On the back of each card write a number 1-5)
- ▣ Cones to mark edges of playing field

1. Set up a large area. Have opposite sides of the area represent the bird wintering and summer grounds. The birds must migrate from one end to the other. Place hula hoop or jump rope circles between the winter and summer grounds. Each circle represents a wetland. Try to make different size circles that would represent different size wetlands.
2. Tell the students that each of them is a migratory bird and must migrate to their summer/winter grounds. They can only stop in the wetlands. Any other area is unsafe and birds who don’t make it to a wetland die because of lack of food and safety.
3. The birds can fly so far a day. So, the students can only take 5 steps per day of flight. The steps can be as big as they want, but only 5 steps.
4. Each wetland has a card with a description of the wetland. Students will read the card when instructed.
5. Have the entire class go to the area. The key to making this work without losing control is to do one day at a time. As everyone is taking their steps, you will notice some birds change directions because the wetlands are filling up. After everyone has taken their 5 steps, the ones who are not in the wetlands are dead and must line up at the side of the course.
6. Have one bird from each wetland read the migration card. The birds must follow the directions on the card. When all the wetlands have been read, the birds migrate again to the next wetland.

7. When the birds that are still alive reach the summer ground, explain that they will lay two eggs. For each bird in the summer resting grounds, two birds from the sidelines will join the migration. This will give students who died early in the game an opportunity to get back in. The birds can only lay eggs once a year in the summer nesting ground.
8. Now the weather is starting to get cold. It is time to migrate to the winter resting grounds. Repeat the same steps above. You will notice that the birds will start making adaptations so they can avoid the dangerous wetland.
9. After the activity is over, discuss with the students the patterns of migration they took and why they avoided certain wetlands.
10. Have the students write in their science journals the importance of wetlands and how destroying them can hurt the birds and animals.

Curriculum Extensions

Science-

- Find a movie from the district that actually shows the birds in action. (ILO 2)
- Visit a bird refuge or sanctuary where students can witness birds in their natural habitat. (ILOs 1,4)
- Play the game a few more times. You might want to have each student carry a small Ziplock Bag of beans to represent eggs. If any of the birds survive, they can trade their beans for students that will represent young birds who were hatched in the breeding grounds. (These can be students who originally did not survive.) These birds will need to remain with their parent to journey back. If they land in a wetland that cannot support that number of birds, the last one to get to the site will die. (ILO 1)
- Another extension to the activity would be to have students gather poker chips from each hula-hoop (all colors). Each chip will represent food. At the end of the first migrations, have each student tally different colors and amounts. Then tell them that red “food” is polluted with chemicals and blue “food” is also polluted. Only the white “food” is safe. Discuss how this affects their survival. Would food supplies that are unsafe create problems for migrating birds? (ILO 1)

Language Arts-

- Let the students write a story about their experience as a migratory bird. Have the students put in important details like how they survived the dangers of a wetland or what happens to them after a wetland was destroyed.
(Standard VIII, Objective 6)

Math-

- Using a poster called Shorebird Migration Stopover Locations on the Pacific Flyway, have students compute the distance between various identified stopovers.
(Standard I, Objective 5)

Fine Arts/Visual Arts-

- Draw or paint from a bird's-eye view, what the world looks like to a migrating bird. Then have them draw or paint a picture of the world from this angle and, if desirable, include a view of the clouds, wetlands, towns, etc. Encourage students to accurately portray the habitat the bird might pass over, but to use their imagination so that their picture conveys the length of the journey, the altitude the bird flies at, and the feel of the air. (Standard I, Objective 1)
- Create wetland patterns to make a Wetland Mud Cloth. (See last page of this Investigaion.) Use the mud cloth to highlight wetland poetry that students have created after a visit or study of birds and wetlands. (Standard I, Objective 1)

Assessment Suggestions

- Use the notes made in the students science journal to see if more understanding is needed.
- Let the students create a book about how birds migrate and the importance of wetlands.
- Create a graphic organizer to show cause and effect of loss of wetland areas and bird populations in individual student journals (see attached suggestions). Have students write two statements of conclusions they draw from their experience. (Ex: Wetlands are placed where migrating birds can rest and eat during migration. Birds need to have places to stop along their journey to survive.)
- Collect journals and evaluate for correct use of science vocabulary, information, and student inferences.

Resources

Agencies:

- Utah Society for Environmental Education (USEE). Phone number (801) 328-1549. They will visit classrooms and help students explore a variety of issues relating to birds and wetlands.
- Project Wild
- *WOW, The Wonders of Wetlands*, and *Educator's Guide*, Environmental Concern, Inc.
- Utah Division of Wildlife Resources

Homework and Family Connections

Encourage families to find an area that might contain a wetland and then go on a hike. Develop a scavenger hunt as a way for family members to focus on different aspects of the area.

<p>Urban development has taken over your wetland. You are very tired and must find a wetland fast. Since this wetland is destroyed, you must take two steps to find another wetland.</p>	<p>Urban development has taken over your wetland. You are very tired and must find a wetland fast. Since this wetland is destroyed, you must take two steps to find another wetland.</p>
<p>There have been very heavy rains in this area and the wetland is flooded. There is some food but not a lot. The last two birds to arrive find no food and die.</p>	<p>Boys playing near a stream have spotted you. They decide to throw rocks. The third bird to this wetland is killed.</p>

<p>A coyote lies hidden in the brush. The third bird in this wetland is eaten.</p>	<p>Kids playing with matches have started a fire and damaged this wetland. The first two birds who landed here die. The rest must fly away to find another wetland. Take only three more steps to find a wetland.</p>
<p>A new mini-mall is being built right next to your wetland. People make you very nervous. The second bird here gets tangled up in a plastic bag and dies. This wetland can only have two birds now.</p>	<p>An extra rainy season has let this wetland become a smorgasbord of insects. Eat as much as you like. You may take an extra step on your next turn.</p>

<p>There is an abundance of food in this wetland. You may take an extra step on your next turn.</p>	<p>You land in a wildlife refuge. There is plenty of clean food. Take an extra step on your next turn.</p>
<p>Urban development has taken over your wetland. You are very tired and must find a wetland fast. Since this wetland is destroyed, you must take two steps to find another wetland.</p>	<p>The state has decided to build a highway through this wetland. This wetland is destroyed and all the animals in this wetland are killed.</p>

<p>The wetland is polluted causing the aquatic insect population to lower. The birds have less food to eat. Take only 4 steps on your next turn.</p>	<p>The wetland is polluted with toxins. You eat toxic insects and get sick. Take only 3 steps on your next turn.</p>
<p>You are shot by hunters. The first three in the wetland are dead.</p>	<p>The last bird in this wetland is eaten by a predator.</p>

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<p>This popular marshy wetland has become polluted by chemicals from the fertilizers local farmers used. It is no longer a safe stopover site.</p>	<p>Some loose dogs from a nearby group of homes has made this area unsafe. If you land here, you will be destroyed.</p>
<p>This wetland has lots of predators. If you land here, you will be eaten by a red-tailed hawk.</p>	<p>A local business accidentally spilled some poisonous materials into the water of this wetland. If you land here, you will die.</p>

<p>This critical wetland has been drained and filled to build four apartment buildings. The developer leveled the area so there are no plants or water. It no longer exists.</p>	<p>Several new housing developments have been built. This wetland is much smaller than it was last year. Only two birds can stop at this site.</p>
<p>Some kids on bikes have flattened areas in this wetland where you stopped to rest and eat. There is no safe place to land.</p>	<p>There is a golf course where this wetland was, and only a small lake remains. Three birds can land in this area.</p>