

ProjectWILD Aquatic: Migration Headache

11/17/05

Purpose / rationale:

The purpose of this lesson is for students to dynamically experience some important factors that affect habitat quality and the associated survival of migratory water bird populations. Students will accomplish this by portraying migrating water birds traveling between nesting habitats and wintering grounds.

SOLs:

LS.4 – Students will investigate and understand that the basic needs of organisms must be met in order to carry out life processes.

LS.7 – Students will investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment.

LS.11 – Students will investigate and understand that ecosystems, communities, populations, and organisms are dynamic and change over time (daily, seasonal, and long term).

LS.12 – Students will investigate and understand the relationships between ecosystem dynamics and human activity.

NSES C – Students will understand that the number of organisms an ecosystem can support depends on the resources available and abiotic factors.

Materials and Resources:

Large playing field or gymnasium

2 bases (paper plats or carpet squares, for example) for every 2-3 students

Printouts of bird migration routes (10)

Life science textbook

Science notebooks

Safety:

Students need to use caution when hurrying from base to base during the activity. The teacher should ensure that students walk slowly until they get the hang of the activity. The pace can then be increased to a level that students can handle responsibly (will vary for individual classes).

Procedures:

Engage

1. The teacher will engage students in learning about organisms' dependency upon a variety of habitats, as well as habitat quality factors that influence animal populations, by showing students a world map that shows major bird migration

routes. The teacher will ask students: (1) *What do you think this map is showing?* (If needed, tell them it has something to do with animals, then ask them again); (2) *Why do you think this?* (Get students to explain their train of thought); (3) *If I told you these were bird migration routes, could you then explain to me what you think this map is showing, and why?* **(5 minutes)**

Explore

2. Students will dynamically experience some important factors that affect habitat quality and the associated survival of migratory water bird populations by completing the activity “Migration Headache” as found in the ProjectWild Aquatic curriculum guide (2003, pgs. 15-18). **(40 minutes)**
 - A. In science notebooks, students will copy from the overhead: **(10 minutes)**
 1. 6 basic needs of all living things (food, water, space, temperature, gas exchange, and energy)
 2. What does *migrate* mean? To move to a difference place for a certain part of every year
 3. Birds depend on many suitable habitats:
 - a. Breeding grounds = where birds pair up and have their chicks (needs = space w/ competition)
 - b. Stopovers = resting and feeding sites (needs = food, water, energy)
 - c. Wintering grounds = where birds go to escape cold temperatures or lack of food/water (needs = temperature, food, water)
 4. Birds depend upon wetlands (*turn to page 538 in textbook*)
 5. Lose of wetlands due to agriculture, houses, and other buildings)
 - B. Students will then complete the Migration Headache ProjectWILD Aquatic activity. **(30 minutes)**
 1. On a large playing field, students will place an equal number of bases in three areas on the playing field as shown below:



(Nesting Habitat) (Stopover Habitat) (Wintering Habitat)

2. The class will designate one of the end areas the “wintering habitat,” the other end as the “nesting habitat,” and the area in the middle as “stopover habitat.”
3. The teacher will explain to students that they are water birds and will migrate between these three areas at his/her signal. The bases represent wetlands. At the end of each migration, students will have to have one foot on a base in order to be allowed to continue (survive). Only two water birds can occupy a habitat (base) at one time. If they can’t find a habitat that isn’t “filled,” that means they have not found any suitable habitat. They “pass away” and have to

move on, at least temporarily, to the sidelines. During migration, students may want to “flap their wings,” moving their arms like birds in flight.

4. The teacher will make sure to explain to students that many factors will limit the survival of populations of migrating water birds. Some involve changes in wintering, stopover, and nesting habitat. There will be periods of time where food, water, shelter, and space are 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 the birds’ survival.
5. The activity will begin with all students at the wintering habitat. The teacher will announce the start of the first migration. All students will successfully migrate to the stopover habitat.
6. The teacher will explain that most water birds need these areas to rest and eat before continuing the migratory journey. Students will then migrate from the stopover habitat to the nesting habitat. The teacher will explain that there has been no loss in the area of available high-quality habitat. Thus, a successful nesting season is at hand.
7. Before the students migrate back south, the teacher will remove one base from the stopover habitat. This will be due to a developer receiving a permit to drain a wetland to build a mall. The teacher will repeat the instruction to migrate, and send the birds to the stopover habitat. Those students that “die” due to loss of habitat can rejoin the game as surviving hatchlings when favorable conditions prevail and there is habitat available in the nesting ground.
8. The class will continue the migrations by reading the Habitat Scenarios on the attached page (see below). The teacher may want to appoint two students as monitors to remove and add bases (habitats) as required on the cards. The teacher may also either appoint a student to keep track of the effects on population sizes with each scenario, or keep a log him/herself.

Explain

3. During the activity, the teacher will ask students questions in order to make sure they are understanding how the scenarios affect the various needs of migrating birds. As a group, the class will go over what is happening at each step. Students are free to ask any questions that helps with comprehension

Evaluate

4. The teacher will check students for notes completion and for participation in the activity.

Habitat Scenarios (teacher copy)

These scenarios can be used during the activity to assist educators with the factors that may reduce or enhance a wetland habitat.

- A marsh has been dredged to allow a marina to be built. Remove one habitat from the stopover habitat.
- A landowner has agreed to re-flood fields after harvesting, increasing acreage for wintering birds. Add one habitat to the wintering habitat.
- A joint federal and state wetland restoration project involved removing drain tiles, allowing a former wetland to flood and return to its natural state. Add one habitat to the stopover habitat.
- A large increase in the number of mink and raccoons has reduced the value of a marsh nesting area. Remove one habitat from the nesting habitat.
- Wintering habitat is reduced by the conversion of bottomland hardwood forests to cropland. Remove one habitat from the wintering habitat.
- New legislation restricts motorboat traffic on a number of lakes and large marshes, reducing the human disturbance to wildlife. Add one habitat to stopover habitat.
- Several years of sufficient rain and snow has replenished the water supply, thus increasing the food supply. Add one habitat to the nesting habitat.
- A timber company has agreed to preserve a forested wetland in exchange for tax credits. Add one habitat to the stopover habitat.
- Filling and diking reduces the amount of tidal wetlands available to waterfowl. Remove one habitat from the wintering habitat.