Where Have All the Wetlands Gone? (3-6)

Overview: In this activity, students will pretend to be salt marsh animals feeding in a salt marsh habitat. As the salt marsh shrinks, it becomes more difficult to find food.

Content Standards Correlations: Science, p. 294, and History/Social Studies, p. 296 (2016)

Grades: 3-6

Key Concepts: 80% of the salt marshes around San Francisco Bay have been destroyed. They have been dredged, diked, drained, or filled, and buildings, roads, salt ponds, and landfills have been built on top of them. The loss of wetland around San Francisco Bay has resulted in a loss of habitat for wildlife, including two endangered species, the salt marsh harvest mouse and the California Ridgway's rail.

Objectives:
Students will be able to:
- explain why the loss of wetland habitats may result in endangered species
- describe ways that wetland habitats have been destroyed
- name one thing they can do to help protect wetlands and endangered species

Materials:
Provided by the Refuge:
- 1 long rope (to mark "wetland" boundaries, with percentages marked on rope)
- 4 bags of food pieces (one bag per round)
- 12 small cups (one per student to represent their stomach and food selections
- 1 wetland loss poster
- 1 food chart poster
- 5 animal clue cards

Time Frame for Teaching This Activity

Recommended Time: 30 minutes

Animal Clues (5 minutes)
- read animal clue cards and show animal posters
- point out the salt marsh or show salt marsh poster

Introduction to Activity (5 minutes)
- hand out stomachs (cups with food selections)
- discuss what each animal feeds on, using the food chart
- discuss the rules of play

Playing the Activity (15 minutes)
- place the rope out, marking the boundaries of the salt marsh
- play four rounds (100%, 75%, 50%, and 25%)

Discussion (5 minutes)
- show 20% poster and discuss reasons for marsh loss
- discuss ways to preserve the marsh
- collect stomachs

How This Activity Relates to the Refuge's Resources

What are the Refuge's resources?
- significant wildlife habitat
- endangered species
- migratory birds

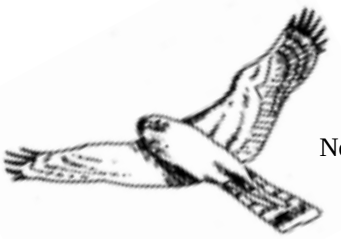
What makes it necessary to manage the resources?
- Loss of wetland habitat due to development, such as landfills, salt ponds, buildings, roads, airports, etc. The salt marsh harvest mouse and the California Ridgway's rail are endangered primarily due to loss of salt marsh habitat.

What can students do to help?
Refuge staff acquire and preserve wetland habitat, but we need your help.

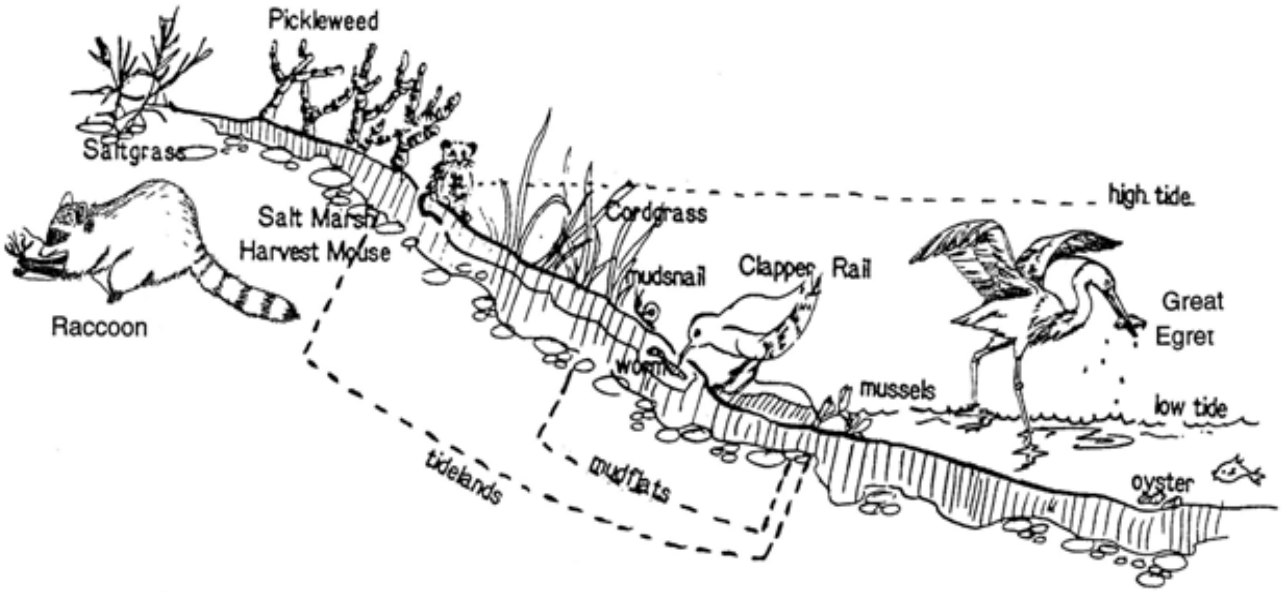
- Reduce, reuse, and recycle, decreasing the need for landfills
- Adopt a wetland or an endangered species
- Teach others what you have learned about habitats and endangered species

Supporting Information for This Activity

- A wetland is defined as an area that is saturated or covered by water at least part of the year.
  - Wetlands are valuable ecosystems that provide habitats for plants and animals.
  - People also benefit from wetlands because they provide educational and recreational opportunities, they absorb flood waters, and they filter pollutants and sediment.
- Among the many diverse facets of a wetland, one of the most important is the habitat it provides for plants and animals.
  - In the United States, nearly 35% of endangered species either depend upon or inhabit wetlands.
  - Millions of waterfowl use wetlands as a migratory stopover or as breeding and nesting grounds.
  - Wetlands are also home to an overwhelming number of species of marine, plant, and animal life.
- More than 80% of the salt marshes around San Francisco Bay have been filled in to satisfy the needs of a growing and expanding population.
- Much of this loss of wetlands is attributable to the fact that historically, wetlands have been viewed as vast wastelands. Few people realize that the "wasteland" they may be dismissing is home to thousands of living things. 15,100 acres (9,600 acres on the Refuge) of former salt ponds are part of the largest wetland restoration project on the West Coast. Many of these ponds will be restored to salt marsh habitat providing additional habitat for the endangered salt marsh harvest mouse and the California Ridgway's rail.



Northern Harrier



How to Lead This Activity by Following the "Do, Read, Ask" Teaching Format

Animal Clues (5 minutes)

Read

"You are going to become salt marsh animals feeding in the salt marsh. First, we are going to find out which animals live in this habitat."

Ask

? **Can you name some animals that live in the salt marsh?** (Take a number of answers.)

Read

"I am going to read clues about salt marsh animals and you have to guess the animal I am describing. Raise your hand when you think you know the answer."

CLUE CARDS

1. I am a small shorebird.
2. You can find me in the mudflats with many of my friends.
3. I like to eat insects and snails.
4. I have black legs.
5. My bill is drooped at the tip.
6. I am a **Western Sandpiper!**

1. I have a white patch near my tail.
2. I soar over the salt marsh.
3. With my keen eyesight, I search for dinner.
4. With my talons, I grab small animals.
5. I am a bird-of-prey.
6. I am a **Northern Harrier (Marsh Hawk)!**

1. I am a nocturnal animal.
2. I am endangered.
3. I am less than 3 inches long.
4. I make my home in the salt marsh.
5. I feed on pickleweed.
6. I am the **Salt Marsh Harvest Mouse**.

1. I am a secretive waterbird.
2. I hide and nest in the cordgrass and pickleweed.
3. I feed on snails, crabs, mussels, clams, and insects.
4. I have an orange beak.
5. I am endangered.
6. I am the **California Ridgway's Rail**.

1. I am a nocturnal animal.
2. I hunt with my hands at the edge of water.
3. I wear a black mask.
4. I live in creeks, marshes, and even cities.
5. I have a tail with black bands.
6. I am a **Raccoon**.

Ask

? **What things do all of these animals need to live?** (Food, water, shelter, and space.)

Read

"The place where they find all of these things is called a habitat. Their habitat is the salt marsh."

Do

Point out the salt marsh or show the salt marsh poster if you are inside.

Ask

? **As a person, what is your habitat?** (In your house, you may find all of the things you need to survive: food, water, shelter, and space.)

Introduction to Activity (5 minutes)

Read

"You are going to pretend to be California Ridgway's rails, raccoons, western sandpipers, Northern harriers, and salt marsh harvest mice. All of these animals live in the marsh and two of them, the

Ridgway's rail and harvest mouse, are endangered species."

Do
Hand out the stomachs (cups) with food selections. Hand out similar number of each animal, i.e. 2 mice, 2 rails, 2 sandpipers, 3 harriers, and 3 raccoons. Adjust for less than 12 students.

Read
"Your cup shows you the animal you will be during the activity. What do you think you will eat?The choices for food are pickleweed, snails, fish, insects, and small mammals and reptiles."

Do
Hold up the food chart poster. Ask the students to name the foods that their animals will eat. After they suggest answers, reveal the correct answers.

Read
"We are going to create a salt marsh habitat for you to feed in."

Do
Place the rope on the ground in a circle, with the ends of the rope meeting. This identifies the salt marsh habitat. Have the class stand around the outside of the salt marsh.

Read
"There are some rules you have to follow during this activity:

- You may only eat the food in your animal's diet. The colors on your cup correspond to the colors of your food.
- You may only pick up one piece of food at a time. Put it in your stomach and then pick up another.
- You may not take food from another animal.
- You may not push or shove any other animals.
- I (the leader) am an eagle soaring over the marsh. If anyone is not following the rules, I will swoop down and tap you on the shoulder. This means you have to leave the salt marsh."

Playing the Activity (15 minutes)

Do

- For the first round, sprinkle the "food" pieces from the bag marked "Round 1" throughout the salt marsh habitat.
- Allow the animals to forage (feed) for 30-60 seconds or until all the food is gone. When time is called, all animals must stop foraging and return to the outside of the circle.
- Check each stomach. If any are empty, those animals have starved to death and they should remain sitting around the salt marsh.
- Explain that when the animals die they decompose and return to the bottom of the food chain and help other organisms grow. The "dead" animals should chant "decompose, decompose, decompose...." Collect all the food and put it back in the "Round 1" bag.

Ask

? Part of the salt marsh has been turned into a landfill so that people have a place to put their garbage. How will this affect the animals? (Loss of habitat also means loss of food for many animals.)

Do
Take in the rope until it reaches the 75% mark. Scatter the "food" in the "Round 2" bag around the salt marsh and send the animals off to forage. Remember, the animals who starved to death do not forage again.

Do

- After Round 2 is over, play Round 3 at 50% and then Round 4 at 25%. You will want to use different reasons for the shrinking of the salt marsh for each round.
- Ask the students what reasons they think people would fill in the salt marsh. Answers may include: *the marsh was filled to build houses, airports, office buildings, roads and/or salt ponds*.
- Salt marshes may also be degraded by people who pour pollutants down storm drains or companies that illegally dump pollutants in the bay.

Discussion (5 minutes)

Do

After Round 4 is over, show the students how little less than 20% of the wetland is by setting the rope at 20%, but do not play a round with only 20% (the circle is too small). Hold up the 20% poster, and point out how much 20% is in each of the diagrams on the poster.

Read

"Less than 20% is only four squares out of twenty, or four birds out of twenty, or a small slice of a pie or rectangle. Around San Francisco Bay, there is less than 20% of salt marsh left."

Ask

? **What is the effect of a shrinking habitat on an animal that depends on it?** (Loss of shelter, food, water and space.)

? **Is it necessary to build marinas, housing developments or landfills in wetland areas?**

What are some of the alternatives?

- (People need to have places to live. Housing developments might take priority over marinas, but much discussion should occur before these decisions are made.
- Build in areas that do not have endangered species or in areas that have been built on already.
- Reduce the need for landfills by reducing the amount of garbage we produce. Recycle more of our garbage. Companies could produce less packaging.)

? **Why did some of the animals do better than others in this activity?** (They were more adaptable and had a larger selection of food sources. The salt marsh harvest mouse, is not as adaptable because it mostly feeds on pickleweed.)

? **Why don't these animals go somewhere else to live, such as a forest?** (Each species has specific requirements in order to live. Usually, food found in one habitat is not available in another habitat.)

? **Why can't the animals exist in smaller, but more crowded marshes?** (Crowding causes competition for food, shelter, water and space, which would cause a number of the population to starve and die.)

? **How can you help protect wetland habitats and the endangered animals that depend on wetlands?** (Learn more about wetlands and the animals that live there; tell others what you have learned; reduce, reuse, recycle; become involved in restoration projects.)

Do

After each suggestion, "restore" the wetlands by making the rope circle a little larger. Congratulate efforts. Every little bit makes a big difference!

Food Chart Poster

Animal \ Food	Pickleweed	Fish	Insects	Snails	Small Mammals and Reptiles
Raccoon	X	X	X	X	X
Sandpiper			X	X	
California Ridgway's Rail		X	X	X	X
Northern Harrier		X	X		X
Salt Marsh Harvest Mouse	X				