



## SPOTLIGHT ON THE MARSH

Grade 3

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### Lesson at a Glance

Students create miniature props and characters to produce a play about people interacting with wetlands.

### Key Concepts

People have changed natural communities by introducing new plants and animals, by adding pollutants and by constructing houses, roads and other structures. As the number of people in the Islands increases, the need to balance human resource use with wildlife conservation becomes increasingly important.

### Objectives

Students will be able to:

1. Describe how people have changed wetlands since human settlement in the Islands.
2. Describe ways that human needs and the needs of wildlife can be balanced.
3. Express their attitudes toward conservation of wetland habitats.

### Time

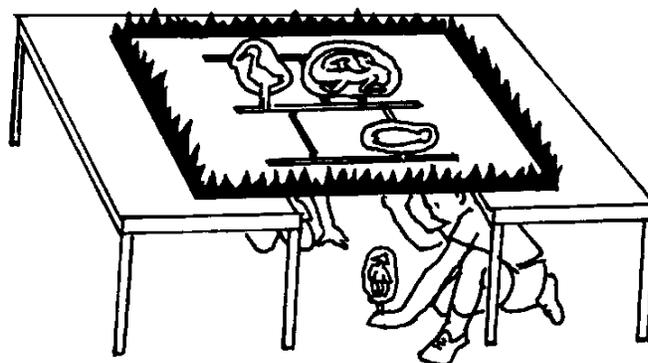
two to four class periods

### Subject Areas

language arts, science, Hawaiian studies

### Materials

puppet patterns (provided)  
play script (provided)  
a large piece of corrugated cardboard (4 x 3 ft)  
several sheets of oak tag  
colored markers  
scissors  
glue  
paint  
paintbrushes  
a package of chopsticks  
masking tape



### Preparation

Cut six slits into a large piece of cardboard to create a stage for the play (see illustration above).

### Prerequisites

“A Wild Wetland Journey,” and “Making Marsh Connections,” Plants and Animals, Grade 3.

## Teacher Background

The Hawaiian environment has been changed considerably since people first set foot in the Islands. To make way for human settlement, Hawaiians burned substantial areas of lowland forests and irrigated fields for wetland taro cultivation. By irrigating fields with stream water, Hawaiians created additional wetlands in the Islands. Some scientists believe that our native water birds colonized the Islands only after large wetland taro fields were created.

In the last 200 years, as waves of human immigrants came to the Islands, most of the remaining native forests were converted to human uses, and wetlands were transformed to meet a variety of needs. In the late 1800s, some wetlands were put into rice cultivation by the Chinese. Like taro cultivation, rice production provided wetlands for water birds. When rice was no longer profitable, wetlands were converted to cattle pasture or drained to divert water for other crops such as sugarcane.



Due to their proximity to coastal areas, wetlands are extremely vulnerable to human development. As human population increased, many wetlands were drained and developed into residential, resort or industrial areas. In addition to conversion of the land, wetlands near residential areas have been polluted by excessive nutrient enrichment from sewage dumping and runoff from chemical fertilizers applied to lawns. Sewage and fertilizers stimulate the growth of plants, which reduces or eliminates open water needed by native fish and water birds. Open water can also be reduced by soil eroding into wetlands from upland areas that are being developed.

Plants and animals introduced by people have had an impact on wetlands as well. Grasses and mangrove trees crowd out native wetland plants and reduce open water. Introduced rats, mongooses and stray cats and dogs prey on native water birds. All of these disturbances have caused populations of native water birds to decline. The Hawaiian stilt (*ae'o*), moorhen (*'alae 'ula*), coot (*'alae ke'oke'o*) and duck (*koloa*) are all officially listed by state and federal wildlife agencies as endangered species.

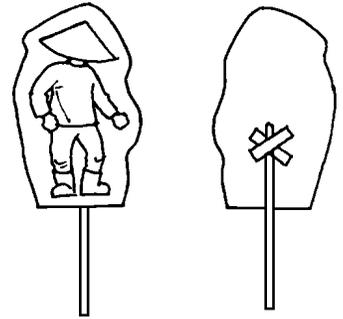
Preservation and management of wetland habitat is vital to the survival of these dwindling ecosystems. Since so few wetlands remain, human needs for housing and resorts, and wildlife needs for habitat could be balanced by preserving remaining habitat and allowing development in areas less critical to the survival of native species. To protect endangered water birds, a number of wetlands have been preserved as sanctuaries. See "A Wild Wetland Journey" for a list of wetlands that are protected and managed by government and private agencies. Management of wetlands includes: clearing introduced grasses to retain open water; replanting native plants; constructing artificial nesting structures that protect bird eggs and fledglings; and controlling predators by trapping and removing them or by constructing fences as barriers.

For additional information on the animals included in the play, see the prerequisite activities and "Waterfall Wizards," Plants and Animals, Grade 2.

## Teaching Suggestions

1. Conduct the prerequisite activities to familiarize students with wetland areas and relationships among wetland plants and animals.
2. Use the puppet sheets to introduce the characters and distribute the script for students to take turns reading aloud. Ask students to summarize the main points of the play.
  - How have people changed wetlands?
  - How have these changes affected wildlife?
3. Divide the class into five or six groups and distribute one set of the wetland puppet sheets to each group. Challenge the groups to write the final scene for the play (or write an entirely new script) and make the puppets to produce it. Students may choose to create additional puppets to fit their scenes.
4. After deciding on a storyline for the final scene, students in each group should divide the following tasks:

- a. Write the final scene.
- b. Cut out the puppets.
- c. Glue the puppets to oak tag and cut again.
- d. Color the characters and tape a chopstick to the back of each puppet.
- e. Help to decorate the cardboard stage. Paint it green and cut strips of paper to glue around the edges as grass. Make houses or other props as needed.



5. Balance the stage between two tables and secure the edges with masking tape. Have two students demonstrate how to kneel beneath the stage and move their puppets through the slits cut into the marsh.
6. Have students take turns practicing their scenes on stage, and then let the show begin!
7. After all scenes have been presented discuss students' beliefs about conservation of wetlands and the conflicts between human needs and needs of wildlife. How can they balance these needs? Describe ways that people are conserving and managing wetlands.
8. Ask students to write a poem or short essay expressing their values about conserving wetlands. Have students share their ideas and discuss differences of opinion.

## **Extended Activities**

- Stage the entire play for other classes in the school.
- Show students a video about human use of the Kawainui Marsh on O‘ahu. (See Unit Resources.)
- Create mobiles using the puppets included in each play and suspend them from the ceiling. Make sure the mobiles include a banner displaying the name of the play and names of authors and performers (both students’ names and those of the marsh plants and animals).
- Have each student compose a question relating to marshes and their inhabitants. Each question should start with one of the following words: who, what, when, where, or why. Students should write the question and its answer on a piece of paper. Collect slips of paper. Reassemble original groups and play a marsh quiz game challenging students to answer questions created by their classmates. The group that answers the most questions correctly wins!
- Play a new version of the food web game in “Making Marsh Connections” from the previous unit. Alter the game by adding more algae to the water as a result of nutrients from sewage. Remove some of the animals from the game as their open water habitat is reduced.

**Characters:**

taro farmer  
rice farmer  
home builder

goby (*'o'opu*)  
guardian *mo'ō*  
mongoose

stilt (*ae'ō*)  
moorhen (*'alae'ula*)

**SCENE 1**

**Narrator:** About 1,500 years ago, Polynesians came to the Hawaiian Islands. (Place taro farmer on stage.) They cleared land and channeled water from the streams and made big wet fields to grow taro, which was their most important crop. In this big wetland a giant *mo'ō* made her home. She was the guardian spirit of the wetland. She made sure that there was always plenty of taro and fish for the people to eat. She welcomed the new birds that came to live in this flooded land.

**Stilt:** Kip-kip-kip. This looks like a good place to live. Ahh, the water feels cool on my feet. And there are fish to eat. This is my kind of home!

**Goby:** Oh, oh! I don't like the looks of that big beak. That bird probably eats fish. I better let Mo'ō know there's a new bird on the block!

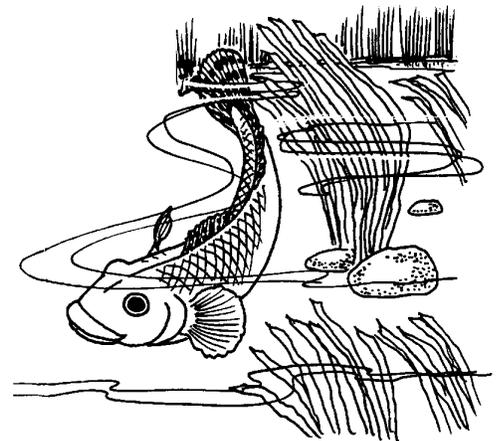
**Mo'ō:** You don't have to tell me, goby. I can see for myself. And look, she's brought a friend.

**Moorhen:** Aloha! I've flown a long way to find a nice wet home like this! That is, I think I flew a long way. I can't really remember.

**Goby:** Yikes! I suppose you like to eat fish too.

**Moorhen:** Hmmmm, you look a little slimy to me. I prefer plants.

**Goby:** Slimy? Hey, wait just a minute.



**Mo‘o:** Now, now, goby let’s calm down. Our friend the moorhen is a special bird. Do you know how she got that red beak?

**Goby:** I don’t know. She’s pretty funny-looking if you ask me!

**Moorhen:** Hmmph! Now, how did I get this red beak? I must say I can’t remember.

**Taro Farmer:** I can tell you that story. Moorhen’s friend the coot, or *‘alae ke‘oke‘o*, had the secret of fire-making. The demigod, Māui, wanted to know the secret, but the coot wouldn’t tell. Māui became angry and rubbed the coot’s white beak in a fire. The beak was scorched and turned red! This new bird, the moorhen or *‘alae ‘ula*, has had a red beak to this day.

**Stilt:** Wow! It’s a nice bright red beak, but it’s not as good for snatching food as mine. Watch out, goby, I’m hungry!

**Goby:** Yikes!

[Remove all characters from the stage.]

## SCENE 2

**Narrator:** Hundreds of years later, the taro was replaced with rice brought in by Chinese farmers. (Place the rice farmer on the stage.) The animals of the marsh still had a wet and wonderful home. But a new type of animal was sneaking into the marsh.

**Rice farmer:** The rains of this new homeland help our rice to grow tall. And the birds always come to keep me company.

**Moorhen:** Now where did I put that nest. I know it’s here somewhere. My, my, my I wish I could find my way around this marsh.

**Stilt:** *‘Auwe*, *‘Ula*, your nest is over here. Come, these eggs need your warmth.

**Moorhen:** Ah, there it is. Thanks. Ah what’s your name there, pink legs?

**Stilt:** Well! You can call me Ae‘o (eye-o), my Hawaiian name.

**Moorhen:** Thanks, Ae‘o. Oh, nooooooo! Help! The mongoose stole one of my eggs!

**Mongoose:** Heh, heh, heh! I've got another egg! I'll have a tasty dinner tonight!

**Moorhen:** That sneaky mongoose has got to go!

**Mongoose:** That's what you think. Heh, heh, heh! I'm sneaky all right and I'm not leaving!

**Stilt:** Oh, he's an awful pest. Since people brought him here there aren't as many birds as there used to be. What are we going to do?

**Mo'o:** We will have to think of something. I'm afraid that mongoose is going to cause too much trouble.

**Mongoose:** Heh, heh, heh!

[Remove all characters from the stage.]

### SCENE 3

**Narrator:** One hundred years later many new people had come to the Islands. They built roads and bridges, schools and shops and lots and lots of houses. (Place the home builder on the edge of the marsh.) The rice fields were long gone. The sounds of saws and hammers could be heard all over the marsh.

**Moorhen:** Boy, I am sick of all that racket! Hammer, hammer, hammer all day long.

**Goby:** Well, it's not just the noise. Look at how small the open water is now. We hardly have room to swim!

**Moorhen:** Yes, I need open water too. How will I ever find my way around with all this new grass! Why do we have all this grass anyway?

**Stilt:** I can see from up here that people are moving in around us. This marsh is getting smaller and smaller.

**Goby:** But people need a place to live too.

**Stilt:** Yes, they do. But water from their toilets is coming into the marsh, so....

**Goby:** Gulp. (coughs) Yuk!

**Moorhen:** Well, now Oh-e. Your name was Oh-e wasn't it? Will you tell me how toilets can have anything to do with grass?!

**Stilt:** The name is Ae'o (eye-o) and yes I can explain. You see, sewage has nutrients that help plants to grow. Grasses keep growing and we lose our open water!

**Home builder:** Look at all that grassland out there. It's just filled with mud and water. I have so many people who need houses. Why don't we just drain out the water and fill the land in with soil. Then we can build a new community!

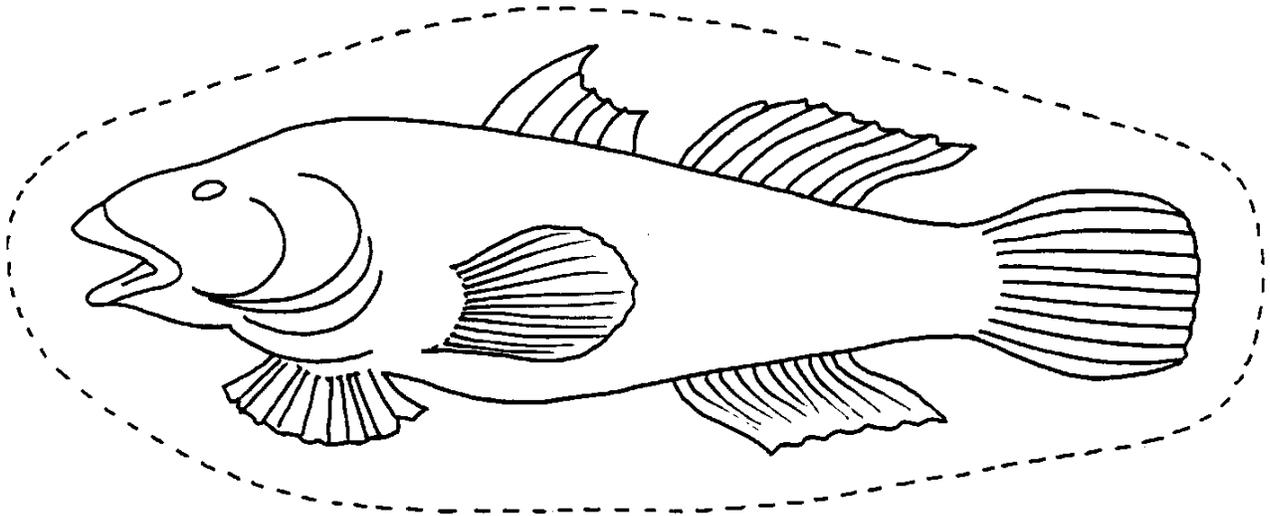
**Moorhen, Stilt and Goby:** Oh, oh!

#### SCENE 4

This is a scene for you to write! The Hawaiian water birds are endangered, gobies are becoming rare and people need more places to live. What should we do?

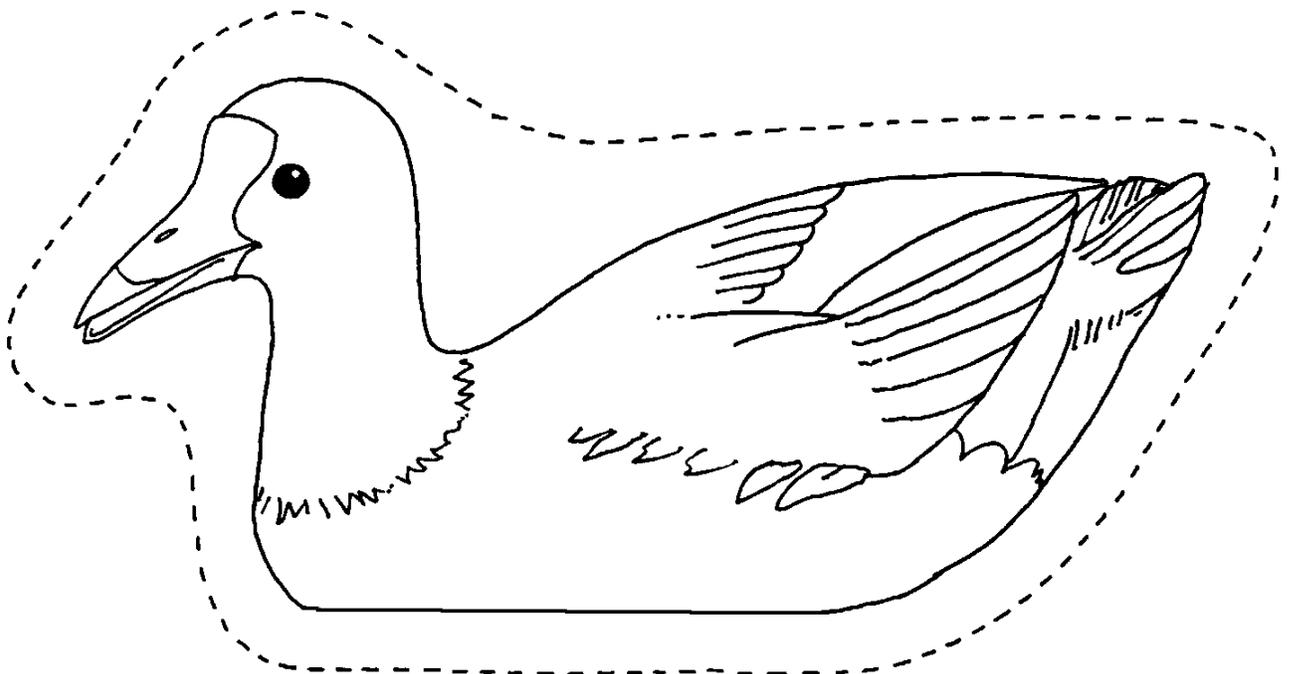
Goby ('o'opu)

I'm a fish with a suction cup fin. I can stick to rocks and climb up streams. My brown body matches the rocks and mud so I'm hard to find. I eat algae and young prawns.



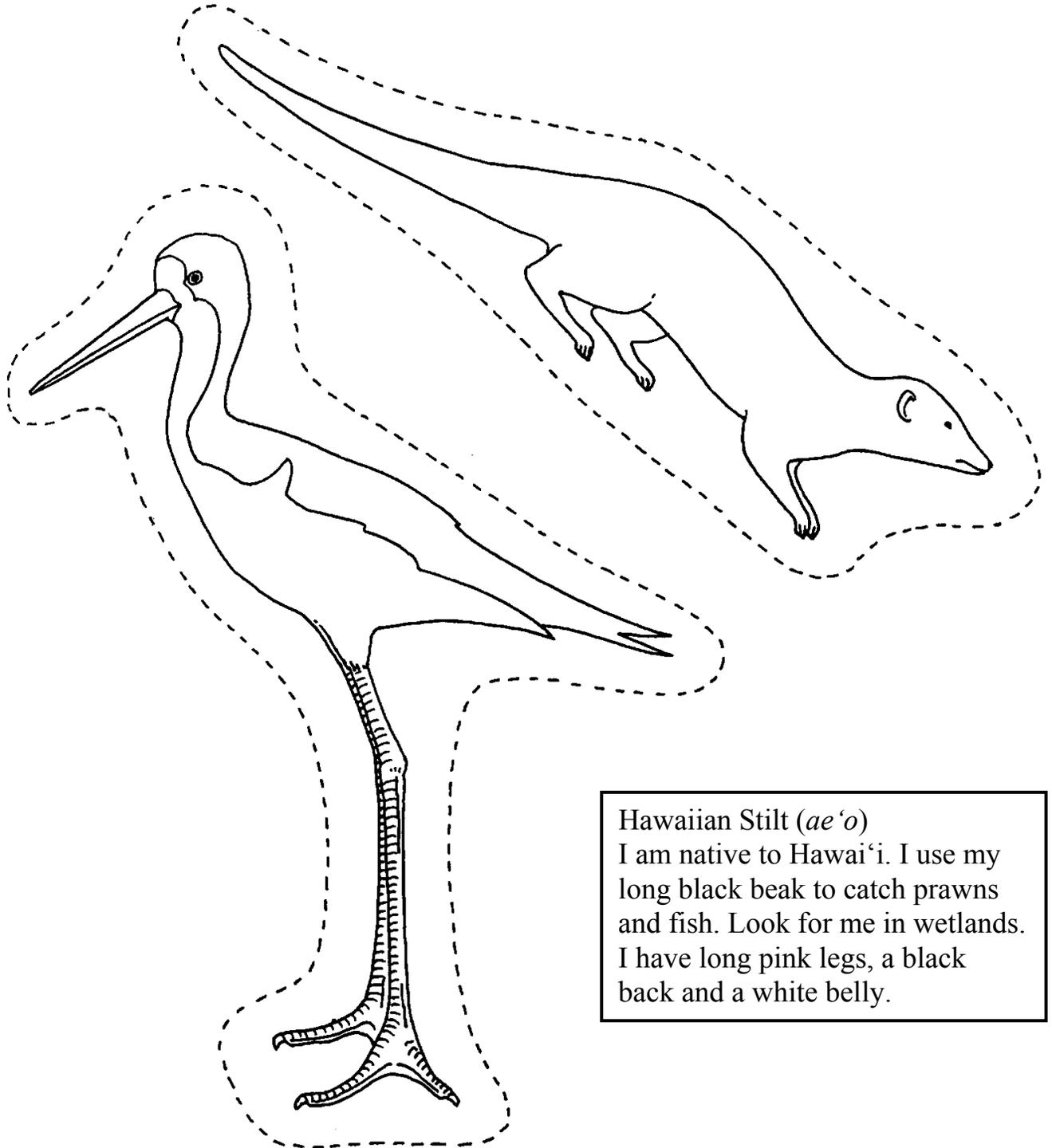
Moorhen ('alae 'ula)

I cackle like a chicken and I'm good at hiding in marshes. My feathers are dark gray. My beak is red with a yellow tip. It's good for eating snails.



Mongoose

People brought me to the islands to eat rats, but I eat birds and bird eggs too. My fur is brown and my teeth are sharp!



Hawaiian Stilt (*ae'o*)

I am native to Hawai'i. I use my long black beak to catch prawns and fish. Look for me in wetlands. I have long pink legs, a black back and a white belly.

