

AN INNOCENT INTRODUCTION



Grade 5

Lesson at a Glance

A tale of an imaginary creature invading a small Hawaiian town brings home the concept of introduced species impact. Students are challenged to solve the problem in a simulated town meeting.

Key Concepts

Plants and animals have been introduced to Hawai‘i, some inadvertently and some for their agricultural, commercial, recreational, or aesthetic value. Many of these introductions have been damaging to native plants and animals.

Objectives

Students will be able to:

- 1) write a solution to the problem of an unwanted species in a human community; and
- 2) compare a hypothetical story of an unwanted species in a human community to the actual problems of introduced species in the natural environment.

Time

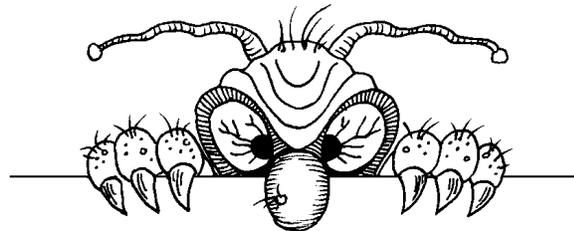
two to three class periods

Subject Areas

language arts, science, social studies, art

Materials

student reading (provided)



Teacher Background

Deliberate and accidental introductions of plants and animals have had a marked and often detrimental effect on native Hawaiian **ecosystems**. Domesticated animals that have become wild or **feral**, such as pigs, goats, sheep and cattle, have virtually destroyed the **understory** in some **native** forests. Loss of ground cover has led to increased flooding, soil erosion, and siltation of reefs. Feral animals have threatened the survival of many native birds, snails, insects and plants. Feral cats, dogs and mongooses eat young birds and bird eggs. **Introduced** plants, such as blackberry and strawberry guava, tend to squeeze out vulnerable native species. Introduced songbirds often carry diseases that are harmless to humans but detrimental to native birds. Visitors and residents introduce many new plants and animals every year, often accidentally. Ornamental plants, songbirds, fish, even snakes have been introduced! These innocent introductions of just a few “friendly” organisms can wreak havoc on native ecosystems.

Plants and animals introduced to new areas without the **predators** or diseases that control their **populations** can rapidly spread and take over native ecosystems. For example, *Clidemia hirta* or Koster’s curse (named for the man who introduced it) was brought to Hawai‘i from South America in 1941. Today it covers thousands of hectares in native forests. One *Clidemia* plant

produces about 3 million seeds in its lifetime and with the help of birds, the shrub spreads quickly, crowding out native mosses and ferns. To control this aggressive pest, scientists have introduced a moth whose caterpillar eats *Clidemia* leaves and a **fungus** that causes the leaves to develop an infection and fall off. Known as a **biological control**, this method of combating unwanted plants or animals holds promise, but much research is necessary to ensure that the controls don't create new problems.

Other introduced species that have adversely affected the native environment include:

- A cannibal snail introduced to Hawai'i in 1955 to control the giant African snail. The cannibal snail has made its way into the forest where it now preys on native tree snails.
- The Tahitian prawn introduced to two streams for aquaculture in the 1970s is now found in streams on all major islands. The Tahitian prawn is about twice the size of the native prawn (*ōpae*) and may be taking over its habitat. The native goby (*o'opu*) is similarly affected by tilapia, a fish introduced in the 1950s.
- The mongoose was introduced to Hawai'i in 1883 to control rats in cane fields. This was not entirely successful, as rats are nocturnal and mongooses are active during the day. The mongoose is omnivorous. Its diet includes native birds and bird eggs.
- The first of several mosquito varieties is believed to have arrived in Hawai'i in the 1830s as larvae in a ship's water barrel. While mosquitoes annoy humans, they spread potentially fatal diseases, such as pox or malaria, to native Hawaiian birds.

Teaching Suggestions

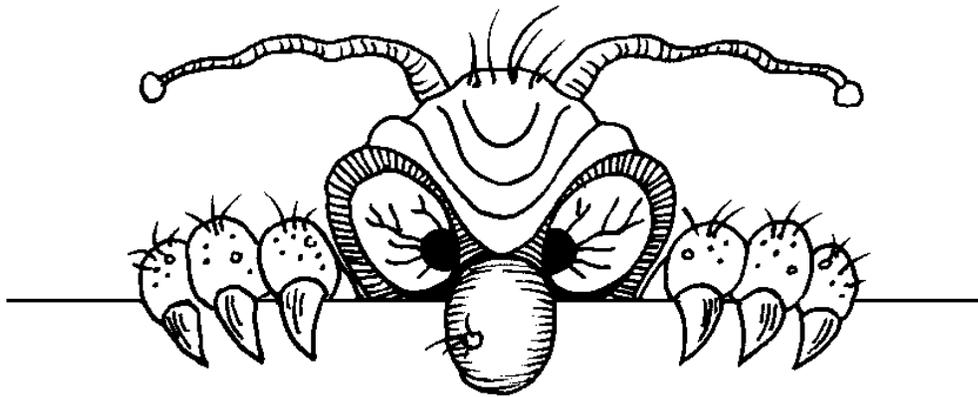
- 1) Read or have students read "An Innocent Introduction." Alternatively, have a group of students act out the story.
- 2) Call a town meeting and ask students to represent the mayor, old man Perreira, the teacher, students, and concerned citizens. Discuss the problem in the town meeting.
- 3) Divide the class into four or five groups. Ask each group to illustrate the shave ice monster and write a solution to the problem. Have students note the monster's special adaptations on the illustration.
- 4) Ask each group to present its monster and a recommended solution to the class. Discuss their ideas, and compare the story to actual problems of introduced plants and animals in Hawai'i.

Discussion Questions

- Which group's solution is the most promising?
- In what ways did the creatures compete with humans? (for basic habitat needs—food, water and shelter)
- How does the problem of aggressive introduced plants in a forest community compare to the problem of introduced creatures in a human community? (The plants were brought to Hawai'i without their natural controls, so they spread into forests where they compete with native plants for habitat.)
- How might introduced animals, such as rats, mongooses, pigs, snails or fish, have an impact on the native environment?
- How do we prevent introductions of plants and animals to Hawai'i? (People arriving in Hawai'i are asked to fill out forms declaring plants or animals carried in their luggage. Also, we must carefully research new plants and animals we would like to bring in to be sure they won't become pests.)

Extended Activities

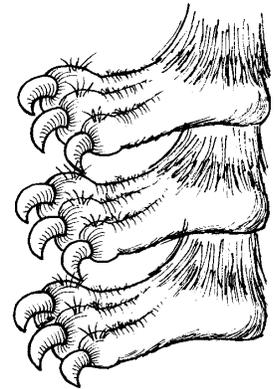
- Ask students to review current newspapers and magazines for news of introduced species' impact in Hawai'i and prepare class presentations on their findings.
- Invite a representative from the Humane Society to speak to the class about the problem of feral cats and dogs in Hawai'i.
- Show slides or pictures of feral pig or goat damage in Hawai'i, and discuss the effects on native species. Slides are available through the Moanalua Gardens Foundation Slide Bank at each DOE district office, at each regional public library, or at the Foundation office. Call 839-5334.
- Put on a show for other classes. Have some students act out the story while another narrates. Involve the audience by holding up "shaaaaave iiiiiicce" and "scratch" signs, and have the audience respond with appropriate sounds.



A most remarkable thing happened to my town last year. You probably won't believe it ... most people don't. They told us later it was just an innocent introduction. No harm was meant, really. But it changed my life and the life of my town.

One quiet afternoon at school during math class we heard a lovely whistle, repeated over and over again. It was music none of us had ever heard before. It sounded like "shaaaaave iiiiiicce, shaaaaave iiiiiicce." As the whistling grew louder we heard a scratching noise coming closer and closer. Our teacher jumped back from an open window just as a hairy, three-footed creature climbed through! Its long toenails scratched and scraped as its three long feet moved over the glass. It was about a half a meter long and only a few centimeters wide! Behind it came two more of the same creatures, scratching and whistling as they moved. When they finally noticed us they let out a long whistle and slid under the teacher's desk!

Bobby dived behind his chair, and Dana froze at the blackboard with her chalk in midair while our teacher clapped her hands and shouted for our attention. I jumped up on my desk and watched as three hairy feet came scratching out from under the teacher's desk. The creatures let out another long whistle and then scratched their way across the floor and down the hall. Soon we heard screams from other classrooms and the sound of running feet as students streamed out of the building. I looked out the window and saw a few three-footed hairy creatures climbing through the windows of other classes and two more headed right for me! And then I ran. We all ran in every direction trying to get away from those strange, hairy creatures.



At home that night, I told my parents about the creatures that invaded our school. They thought I was kidding until the story came on the six o'clock news. I didn't sleep well that night, and when I got up to get a drink of water, I heard a muffled whistle, "Shaaaaave iiiiiicce." Then I heard a scratching noise inside the pipe and out came a hairy foot and then another and another until the three feet were dangling over the sink! I watched in horror, and then screamed and ran to my parents' room. They thought I'd had a bad dream and sent me to bed. The next morning we knew it hadn't been a dream....



My father got up to make breakfast and when he opened the refrigerator he found a three-footed creature peering out! It had scratched its way through the rubber seals around the door and eaten most of the food. He ran to get my mother, but by the time they returned to the kitchen the refrigerator was empty. There was only a faint whistle of “shaaaaave iiiiiicce” as the creature scratched its way down the street.

That day there was a town meeting at the police station to discuss what to do. Our neighbors had found the creatures eating in their refrigerators, sleeping in their beds and clogging up their water pipes. We realized they had spread all over town. They were eating their way through the grocery stores and the school cafeteria, too! And we discovered that the first thing they always ate was the shave ice! They also seemed to prefer soft beds to hard ones. And why they got into our water pipes, we'll never know, but it was getting so that we hesitated to go near the sinks. We were all getting hungry and thirsty, but were afraid to go home.

How could we get rid of these strange creatures that were taking over our homes? What were they? Where did they come from? Would they have a poisonous bite? How did they get into our town? Why were they in our town? There were lots of suggestions: Perhaps the creatures were a secret weapon sent to destroy us, or someone's science fair project gone wild, or an invading army from outer space! We were all wrong. It was just an innocent introduction.

Old man Perriera stepped forward and explained what had happened. He and his son had been traveling in a rainforest in the Amazon when they heard a lovely whistled song. They peered through the ferns and watched the creatures scratch around the trees and whistle in the branches. Later they found the creatures sleeping in a soft bed of moss. They picked two of them up and put them in boxes to bring home as pets. When they got back to Hawai'i, they realized the creatures were not easy to take care of. They were friendly, but they ate too much, especially the shave ice. And when the creatures refused to sleep anywhere but in old man Perriera's bed, he decided it was time to get rid of them. He and his son took them way up into the forest outside of town and let them go. They never knew the creatures would cause such a problem. That was three months ago. Now the population had grown and there were hundreds of them all over town. How could we get rid of them?

My uncle sprayed them with bug spray, but they just whistled and curled up in his bed. Our neighbor tried to hit one with a shovel but the creature ran too fast. Bobby's dad tried to shoot them, but the bullets bounced off! We realized we were in deep trouble!

Someone asked old man Perriera if he knew what ate the creatures in the rainforest. If we could bring in some of their predators maybe we could control the creatures. But then what if their predators became a problem? How could we know if it was safe to bring the creatures' predators to our island? We wondered if we could move to a new area and build a strong fence that would keep them out. As we talked, we heard “shaaaaave iiiiiicce, shaaaaave iiiiiicce” and the sound of hundreds of scratching feet outside the windows....

This is a story for you to finish. Hold a town meeting with your classmates and decide how to solve the problem of this innocent introduction.