



Student Handout: Scenario Cards

DECISIONS! DECISIONS!

Student Name _____

Marina Sauce

When divers explored a marina off the Australian town of Darwin, they saw something they knew did not belong: tiny mussels related to the zebra mussel, which have clogged up North America's Great Lakes. Hundreds of millions of these mussels were clinging to piers and boat hulls and lines where there had been none just six months earlier. The **divers**, who were part of an inspection team from a scientific agency, identified the mussels as coming from Central America. They believed the mussels had arrived on the hull of a yacht. Within a week, **government officials** took drastic action. First, they refused to let any boats in the area leave the port, despite the objections of **boat owners**. Then they poisoned the waters of the marina with chlorine and copper.

The poison killed all of the mussels, but it also killed everything else that lived in the marina waters. Now, though, the native species are coming back and the Central American mussels have not returned. But was it worth the \$1.5 million price tag? What happens if the mussels show up again? And is it ecologically acceptable to poison natural areas and kill off so much life? These are issues that have yet to be resolved.

What to Do

The main characters in your scenario are shown in bold type above. Use them, along with any others characters you would like, to portray some of the conflicts and complexities involved in getting the Central American mussels out of the Darwin marina.

Ballast-ing Acts

In certain parts of San Francisco Bay, you can find as many as 3,000 Asian clams per square foot! The Asian clam is just one of the 250 alien species threatening the habitats and fisheries of the bay. Many of these aliens originally traveled to San Francisco Bay with ships delivering goods from across the ocean. These huge ships take water, called ballast, into large tanks to help balance their load. When the ships arrive in a new port, they discharge the water before reloading. But as this water is discharged, so are all the creatures that were taken in at the last port and that survived the trip. As many as 50 species have been found in the ballast water of a single ship. There may not be anything that eats these alien species in their new home, and they may start to take over and crowd out the species that belong there. For this reason, concerned people in the San Francisco Bay area, as well as in other ports, are trying to figure out a way to get the aliens out of the ballast water.

Some **conservationists** advocate having ships pause before they get to port, dump out their ballast water (since most coastal species cannot survive that far out at sea), and replace it with deep-sea water. But some **ship captains** say that it is a dangerous practice, leaving ships temporarily unstable. They think it would be foolish to comply with the regulations. **Biologists** are researching the possibility of using filters, UV radiation, or other processes that could strain out or kill organisms in ballast water. But more research (and funding) is needed to see if these methods will work.

What to Do

The main characters in your scenario are shown in bold type above. Use them, along with any others characters you would like, to act out a situation that shows the conflict over ballast water treatment in the San Francisco Bay area.



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Discord Over Cordgrass

The Willapa Bay region of Washington State is one of the most productive coastal areas in the world. Oyster, clam, and salmon fisheries are a huge part of the economy. Thousands of birds come here to feed and nest. Unfortunately, the health of this region is threatened by several exotic species, including *Spartina*, or cordgrass. *Spartina* was brought to the region in the 1800s as packing material for eastern oysters, which were introduced to revive the oyster industry after native oysters were harvested to near extinction. Unfortunately, *Spartina* has grown out of control in its new home, reducing the habitat for native crabs, snails, salmon, shorebirds, and other organisms. Not surprisingly, people are working hard to get rid of *Spartina* to protect the ecosystem and the economy. They have tried mowing and hand-plucking the grass, and some people are advocating the introduction of a *Spartina*-eating insect to the area. But so far the most cost-efficient control method seems to be an herbicide that, when dumped into the water, kills off much of the grass. Many **people involved in the oyster industry** favor this control method.

But members of the **Shoalwater Bay Indian tribe**, which has a reservation on the edge of the bay, are concerned. They do not think it makes sense to put a poison in the water, since other living things in the bay can absorb it. They are especially concerned because members of their tribe have been having serious health problems. Instead, the tribal members and others insist, people should investigate other ways of controlling *Spartina*. They suggest, for example, that **people in the paper industry** could mow and hand-cut the *Spartina* and make it into paper and other products. This would not get rid of the grass as cheaply or quickly as the herbicides do, but it could be much better for people and the ecosystem over the long run.

What to Do

The main characters in your scenario are shown in bold type above. Use them, along with any others characters you would like, to portray the conflict over controlling *Spartina* grass in Willapa Bay.

Swan Song

Almost everyone agrees that mute swans are majestic, beautiful birds. What they do not agree on is whether mute swans belong on lakes and bays in the Northeast and Mid-Atlantic states. Mute swans were introduced to the United States from Europe in the 1800s, and they are continuing to spread. Now biologists say that these invasive swans are damaging wetlands. They say the birds force out native water birds, making it impossible for the native birds to nest and reproduce. In Vermont, **wildlife managers** concerned about the effects of mute swans recently began shooting and killing the swans on their lakes after other control

methods did not work. Some **local residents** were furious, especially because the shootings were unannounced and because they happened right in front of their eyes.

What to Do

The main characters in your scenario are shown in bold type above. Use them, along with any others characters you would like, to act out a situation depicting the conflict over mute swans on Vermont's lakes.