

Oil Spill Response – Wildlife Rescue



Recommended for Grades:

7th – 12th grades

Alaskan Academic Standards

SA1.1, SC2.2

Nutshell

Students will learn how scientists assess and care for oil-coated marine animals during a simulated oil spill response activity.

Concepts

- Oil spills can have dire effects on wildlife populations, often for many years after a spill.
- Volunteers can be trained to help in the care of oiled and stressed marine animals.
- Caring for oiled animals is expensive and the survival rate is often low, causing some people to argue that the cost is not worth the effort.

Objectives

Students will be able to:

- Explain what is involved in caring for oiled animals after a spill
- Demonstrate in a lab setting how animals are initially cared for
- Discuss the pros and cons of wildlife rehabilitation efforts

Lesson Outline

10 minutes	Activity #1	Wildlife Rescue PowerPoint
10 minutes	Activity #2	Feathers in Motor Oil
20 minutes	Activity #3	Wildlife Rescue Simulation
5 minutes		Wrap-up and conclusion

Activity #1: Students will watch a PowerPoint and learn how oil spills can adversely affect marine animals.

Material:

- Wildlife Rescue PowerPoint

Show the images on the Animal Rescue PowerPoint as you read or provide an overview of the following for students:

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Slide #1: Oil spills can have a terrible impact on wildlife populations depending on a variety of factors, including the type and toxicity of the oil spilled and the size of the spill. While the Exxon Valdez was not the largest spill ever recorded (there have been more than 50 spills throughout the world that were larger) it was the most devastating spill to date in terms of its effect on wildlife. Why was the spill so catastrophic?

Slide #2:

- The spill occurred in remote, ecologically rich coastal waters
- It occurred when breeding populations of birds, fish and mammals were returning from their wintering grounds.

Slide #3: Thousands of birds and marine mammals were contaminated by swimming in the oil from the spill, or by eating foods that had been affected by oil.

Slide #4: During the spill teams of veterinarians, scientists and volunteers worked around the clock to clean and care for oiled animals.

Caring for oiled birds and mammals requires some understanding of the impacts oil has on these animals.

Slide #5: Oil can kill seabirds in several ways. Some seabirds (like the common murre) are apparently attracted to oil slicks and attempt to dive and feed in the oil. Their feathers become coated with oil, limiting the bird's ability to keep warm. Even a small amount of oil the size of a quarter can create a point of cold water contact that will chill the bird, leading to hypothermia and death. Birds coated in oil have difficulty flying, and when they attempt to clean their feathers they can ingest lethal quantities of oil that can lead to pneumonia, or liver and kidney damage. Other birds, like eagles, die from ingesting oiled fish, or in some cases survive but stop producing viable eggs for one or more years.

Slide #6: After the Exxon Valdez oil spill 57,135 birds were recovered and identified. This number is estimated to be 10% of actual fatalities. Of the birds identified, 74% were murre species. 20 years later murre populations in the Gulf of Alaska are still well below pre-spill numbers.

Slide #7: Seals and sea lions and especially sea otters depend on their fur to insulate them against the cold. Oil on their coats reduces the air trapped next to their skin, and diminishes the insulating properties of their fur. Sea otters are particularly vulnerable because they don't have a thick fat layer like seals and sea lions do. Instead they have incredibly dense fur that keeps them warm by trapping dry air next to their skin. Sea otters in an oil spill are in grave danger of hypothermia and death.

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Sea otters were nearly eliminated in the late 1800's due to pressures from the fur trade. With federal protection they recovered and numbered between 8,000 and 12,000 in the Prince William Sound area prior to the spill. An estimated 3,500 to 5,500 otters died in the spill, greatly reducing the local population.

Slide #8: Intertidal animals, like sea stars and clams, are impacted when oil reaches the shoreline because of suffocation by a layer of oil, and because of clean-up pressures such as heavy foot traffic and hot water clean-up that scalds them or washes them off the rocks. Most Intertidal animals consume plankton, and can ingest oil along with their food in an oil spill, resulting in death or deformity.

Slide #9: Oil spills can settle on the ocean floor and smother communities of animals like crabs and shrimp. Petroleum-based oil is toxic to fish smolt and eggs, and can devastate a local population.

The Exxon Valdez spill affected the pacific herring population, which was returning to spawn just off shore. It also affected juvenile salmon leaving freshwater streams to enter the ocean for the first time. Salmon and herring fisheries, and shrimping and crabbing operations, were shut down in the Gulf of Alaska for a year after the Exxon Valdez oil spill, resulting in more than \$200 million dollars in lost revenue. The salmon populations eventually recovered; however, the pacific herring population is still well below pre-spill levels.

Activity #2: *Students will use deductive reasoning to come up with strategies to assist oiled birds and mammals and test out these strategies in a laboratory setting.*

Materials:

- 4 bird feathers (larger is better)
- 4 large baggies
- motor oil
- 4 pair rubber gloves
- dish soap

Setup: Before students enter the classroom soak a feather in motor oil and set it aside in a plastic bag.

Remove the feather from the plastic bag and ask students to guess what it is. Ask students how they would go about caring for an oiled bird. Once a student suggests washing it in soapy water, give them rubber gloves and ask them to try washing the

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feather. After this is attempted ask the students to pass the feather around the room and examine it, including smelling it and smoothing it with their fingers.

Promote a discussion with the following questions: Did the feather come clean? What if a whole bird were coated in oil? If repeated washings were needed to remove oil, how would that affect the bird? Would washing it in a soapy solution cause other problems? What should be done with birds once they're cleaned - especially if their habitat is still oil-damaged?

Activity #3: In the following lesson students will learn how to assess oiled animals as if they were in the role of volunteers on site after an oil spill.

Materials needed per group of students:

- 1 realistic stuffed marine animal (seals, sea lions, sea birds, otters)
- 1 dog kennel (cardboard is fine)
- Leather gloves for two students
- Lab coats for each student (optional)
- Rubber boots for students (optional)
- 2 Bath towels
- 10 paper towels
- Hair dryer
- Rehab Husbandry Chart on clip board
- Emergency Response Kits (a tackle box) containing representations of the following equipment:
 - Thermometers
 - Electrolytes and glucose (blood sugar) meters
 - Feeding tube
 - hi-glucose formula with liquid vitamins and electrolytes added
 - Mild soap solution for eye wash
 - Cotton balls
 - Syringe with antibiotics
 - Syringe for blood draw
 - Nitrile (not latex) Exam gloves
 - Activated charcoal
 - Leg bands for birds (can use colored zip ties)
 - Small t-shirts for oiled birds
 - Bandages
 - Foil
 - camera

Time allotted: 20 minutes

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Set up: Before students enter the classroom place each animal on a bath towel and place them in individual kennels in a corner of the room. Put a closed medical kit at each station, along with the rest of the materials listed.

Oil Spill Event Simulation:

Explain that an oil spill has occurred nearby and reports of oiled animals have been coming in from oil clean up crews. Fish and Wildlife personnel and staff from the Alaska SeaLife Center have gone out to collect animals in the spill area and have brought some of them in before going out for more. As volunteers it is your job to provide initial care for these animals. Each group will take one animal into their care. Use the Rehab Husbandry Chart (at the end of this lesson) to guide you as you begin.

When students have completed the activity ask them to hand in their Husbandry Charts and replace the contents of the emergency response kit back into its tackle box.

Activity #4: Students will evaluate the cost of rehabilitation.

Time allotted: 10 minutes

Share the following information with students and encourage them to discuss the pros and cons involved in caring for injured and orphaned wild animals.

In order to save oiled animals they must be caught (often by boat), fed, cleaned, and housed in an appropriate facility until they can be released. The average cost of saving one sea otter after the Exxon Valdez oil spill was \$89,000. Sea otters feed largely on crabs, clams, and octopus, which are all expensive to obtain. They eat approximately 33% of their weight per day in order to maintain their body temperature in cold water. Plus sea otters need round-the clock care to keep their fur clean and fluffed to prevent hypothermia.

Some animals do not handle the stress of capture and containment well. Birds may be captured in a net, put into a box or a bag, then examined and plunged into a hot soapy tub of water and scrubbed by beings they see as their natural enemy, then rinsed with a sprayer, towel and blow-dried, and force fed. Their feathers may be too damaged to remain warm and dry in cold northern waters. They are then held in captivity until they can be released. Statistically, fewer than half the birds will survive to be released.

Encourage students to evaluate the benefits vs. costs of rehabilitating oiled animals. Ask them when it might be better to euthanize animals rather than attempting to save them. The object of this exercise is not to find concrete answers, but rather to uncover the complexity of this issue.

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REHAB HUSBANDRY CHART

Animal Name and # _____ Species _____

Gender _____ Age _____

Volunteer names: _____

Date	Time	Intake History (Check all that apply)
		<input type="checkbox"/> With leather gloves remove animal from carrier and place on exam table for intake exam.
		<input type="checkbox"/> Record species and gender and provide animal with a name
		<input type="checkbox"/> Assess animal for stress before treatment <input type="checkbox"/> animal appears calm and alert <input type="checkbox"/> animal is panting and active <input type="checkbox"/> animal is panting and lethargic <input type="checkbox"/> animal is prone and unresponsive
		<input type="checkbox"/> Wipe down with absorbent cloth to remove any surface oil. <input type="checkbox"/> Save a snip of fur in foil for toxicology lab. How heavily was the animal oiled? <input type="checkbox"/> less than 20% of body <input type="checkbox"/> 20% - 60% of body <input type="checkbox"/> more than 60% of body
		<input type="checkbox"/> Assess animal for injury <input type="checkbox"/> animal does not appear to have any injuries <input type="checkbox"/> animal appears to have injuries Describe: _____
		<input type="checkbox"/> Blood draw to look for anemia (low red blood cell count)
		<input type="checkbox"/> Bottle feed electrolytes, glucose fluids and vitamins
		<input type="checkbox"/> Tube feed electrolytes, glucose fluids and vitamins
		<input type="checkbox"/> Bandage injuries
		<input type="checkbox"/> Administer antibiotics for infection
		<input type="checkbox"/> Administer activated charcoal for oil ingestion
		<input type="checkbox"/> Wash eyes only to remove oil, making sure there is no chlorine in water.
		<input type="checkbox"/> Towel dry and then blow dry.
		<input type="checkbox"/> Assess animal for stress after treatment <input type="checkbox"/> animal appears calm and alert <input type="checkbox"/> animal is panting and restless <input type="checkbox"/> animal is panting and lethargic <input type="checkbox"/> animal is prone and unresponsive
		<input type="checkbox"/> Apply leg band to birds
		<input type="checkbox"/> Dress birds in a small t-shirt to prevent ingestion of oil from preening
		<input type="checkbox"/> When animal has been stable for 6 – 24 hours wash with warm soapy water <input type="checkbox"/> Towel and blow dry