



**Title: Wildlife Rescue**

By Elizabeth Trowbridge

**Theme:** Oil spills can have a wide variety of effects on wildlife.

**Objectives:**

- Students will identify major habitats of southcoastal Alaska and their inhabitants.
- Students will identify wildlife impacted, directly and indirectly, by the oil spill.
- Students will devise clean-up and rescue procedures for impacted wildlife and habitat.

**Duration:** 90-120 minutes (can be divided into 2 periods)

**Age Range:** 8<sup>th</sup>-12<sup>th</sup> Grade

**Materials:**

- Notebooks
- Pencils
- Map of local area
- Oil spill overlay
- Large pad of paper
- Markers
- Articles:
  - Otter Rescue Questioned
  - Should We Clean Oiled Animals?
- Worksheets:
  - Oil in the Food Web
  - Wildlife and Oil
  - Wildlife Rescue Information

**Background:**

Oil spills can have devastating effects on wildlife and ecosystems as well as people. There is much debate about whether it is cost effective and humane to clean and rehabilitate individual animals after an oil spill. Other options include leaving animals to fend for themselves in their natural environment or euthanizing animals that are too injured to survive.

**Preparation:**

Visit <http://www.adn.com/evos/stories/EV227.html> and <http://www.thedailybeast.com/newsweek/2010/06/08/should-we-clean-oiled-animals.html> to print out copies of “Otter Rescue Questioned” and “Should We Clean Oiled Animals.” Visit <http://www.evostc.state.ak.us/> to learn about species of wildlife affected by the *Exxon Valdez* Oil Spill and to print out or write down the list of injured animals. Print out worksheets as well. Print the map(s) of the oil spill on a transparency for students (<http://www.evostc.state.ak.us/index.cfm?FA=facts.map>).

### **Introduction:**

Review field guides about the local area and, as a class, identify the major habitats found in the region.

On map provided, have each student place at least three species of wildlife in each habitat. This can be done by either drawing the wildlife or cutting and pasting from the wildlife worksheets. This can also be done as a class activity by making the map into a mural or bulletin board. Have each student place at least one species on the map. After the maps are completed ask the students how they think these species relate to each other. Try to identify obvious food webs.

### **Activities & Procedures:**

Hand out the “Wildlife and Oil” worksheet. Using oil spill overlays, trace the development of the oil spill on the map. After each day/week, have students record in their notebooks how much area the spill is covering and the wildlife the oil has covered. Use a large pad of paper to trace the oil spill’s movement and impact on wildlife.

Discuss why these animals have been impacted and what characteristics they have that may have caused them to live or die because of the oil. Discuss predator/prey relationships. What animals feed upon them and what animals do they feed upon? Then complete the “Oil in the Food Web” worksheet and discuss results as a class.

Do the “Wildlife and Oil” worksheet. This activity will demonstrate the properties of oil in the water and on wildlife. If you have them, use results from the Critter Clean-Up experiments to analyze wildlife rescue techniques.

Ask students, “What would you do? Have the class brainstorm ideas for clean-up and rescue of habitat and wildlife. Read “Otter Rescue Questioned” and “Should We Clean Oiled Animals” Divide the class into small groups. Each group should pick one idea or method for rescue, protection and clean-up of habitat and wildlife.

Use the “Wildlife Rescue Information” worksheet provided as an outline for considerations that must be taken into account (cost, logistics, weather, human impact, stress, etc.). Have each group present their plan of attack. Vote, as a class,

on the most viable solution to the problem.

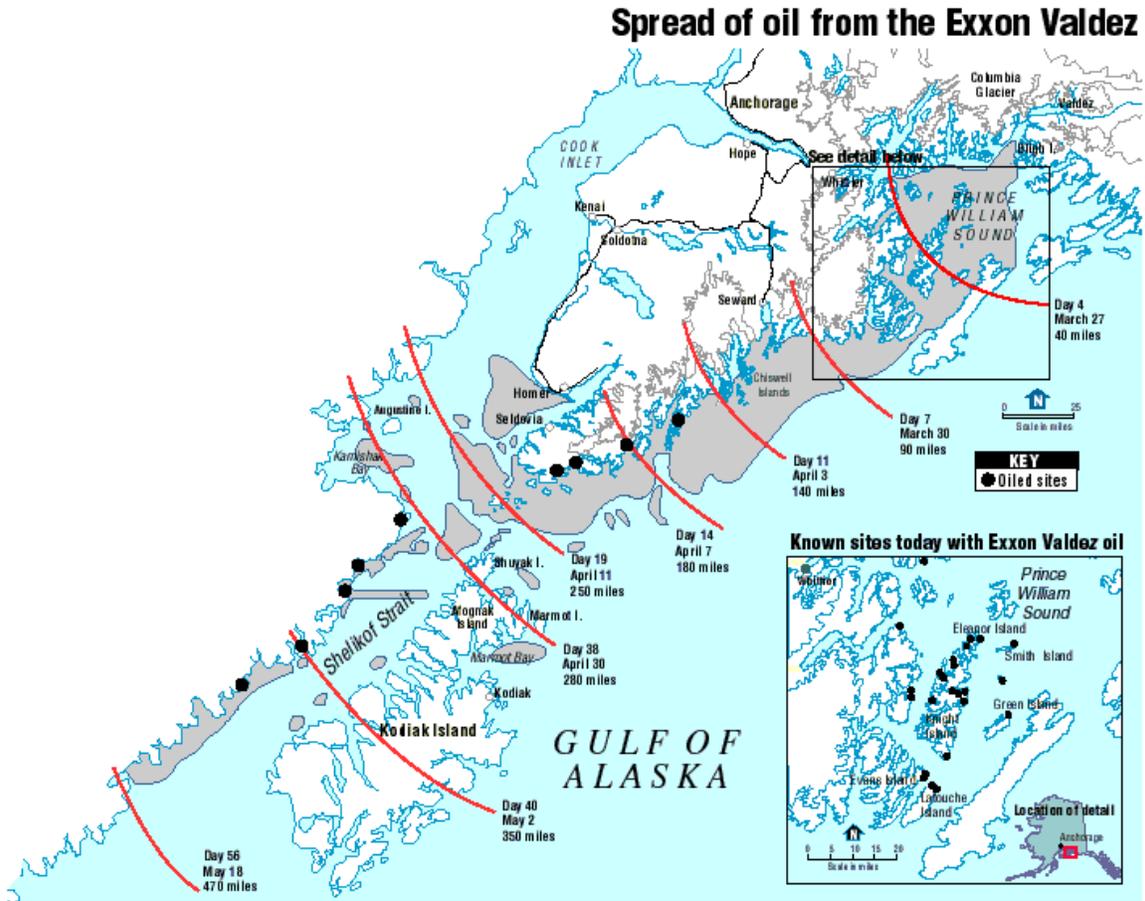
**Wrap-Up:**

Have students do a fast write in their journals about their impressions of the clean-up, protection and rescue process. What were their frustrations in coming up with a solution? What are their feelings about the animals and ecosystems they were working with?

**Evaluation:**

Use worksheets and suggested answers to assess student comprehension. Evaluate worksheets, maps, and notebook entries for completeness and accuracy. Observe student participation and cooperation during group work.

# Oil Spill Overlay (published in the Anchorage Daily News, 1999)



Source: Alaska Department of Environmental Conservation, National Marine Fisheries Service

RON ENQSTROM / Anchorage Daily News

## Oil In the Food Web

All animals and plants must have food to survive. Are coastal waters are particularly rich in food resources and support many unique life forms. See if you can figure out the predator-prey relationships in this picture. Who eats whom? Draw arrows from the predators to the prey.



What runs this whole ecosystem?

How might oil move through this ecosystem?

## Wildlife and Oil Worksheet

Oil on beaches damages shoreline life. Oil seeps downward into sand and remains there for years. Rocky shorelines can clean themselves naturally through wave action, but bays, estuaries and marshes have few waves. Oil spills in such areas are very damaging because wetlands are the nursery grounds for fish, birds and shellfish.

Oil causes serious harm to birds by coating their feathers. An oily bird does not float, and it has no insulation against temperature changes. Also, birds poison themselves by eating the oil that coats them.

Oil can smother communities of animals that live on the sea floor. This really affects clams, mussels, shrimp and crabs important to the shellfish industry. Most of these areas will eventually become settled again, but some organisms, like mussels, cannot survive in an oiled area.

Adult fish are not affected by oil pollution as much as other organisms. A massive spill can kill large numbers of fish, but, ordinarily, adult fish are able to escape injury from minor accidents. Smolt and eggs are extremely vulnerable to oil spills, however.

Marine mammals, such as whales, sometimes swim away from oil spills. But the oil affects them internally as they breathe its toxic fumes. Sea otters die when their fur becomes matted; they do not have any protection from the cold ocean water.

Different petroleum products have different effects on organisms. Diesel or heating oils are the most poisonous, while heavy crude and fuel oils are the worst for smothering animals.

### **Now, answer these questions:**

1. Describe a kind of oil spill that could kill large numbers of adult fish, smolt, or eggs.
  
  
  
  
  
  
  
  
  
  
2. What kinds of petroleum products have the most undesirable effects?

3. How do these affect the organisms?

4. Are all areas of the coastline affected in the same way by oil pollution?

If not, explain these differences.

5. Success in cleaning up an oil spill depends upon rapid action by the spiller and by federal, state and local agencies. When a spill occurs, it is reported to the U.S. Coast Guard. If the spiller does not clean up the pollution, the Coast Guard takes over and the spiller pays the clean-up costs. To be effective, containment must be done as soon as a spill is detected. In the case of the Exxon Valdez, Exxon headed up the clean-up efforts with suggestions from the Coast Guard and the State of Alaska. Unfortunately, the spill was not contained immediately through the use of booms and mechanical skimmers-so the oil spread over 1,000 miles.

Write a story about what you would do to protect the wildlife if you were in charge of cleaning up a spill.

### Suggested Answers

1. Describe a kind of oil spill that could kill large numbers of adult fish, smolt, or eggs.

*An oil spill near in an estuary or bay where smolt or eggs exist could kill large numbers of fish. Adult fish aren't usually as affected by oil spills, unless the spills are very large.*

2. What kinds of petroleum products have the most undesirable effects?

*Diesel or heating oils are the most poisonous, while heavy crude and fuel oils are the worst for smothering animals.*

3. How do these affect the organisms?

*Toxic fumes can poison marine mammals. Diesel and heating oils can poison animals that ingest them while grooming their feathers and fur. Crude and fuel oils can smother animals on the sea floor, and in intertidal zones.*

4. Are all areas of the coastline affected in the same way by oil pollution?

If not, explain these differences.

*No. Rocky shores with lots of wave action can "clean themselves," whereas protected bays and estuaries trap the oil. Plus these areas tend to be important nurseries for marine animals.*

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Write a story about what you would do to protect the wildlife if you were in charge of cleaning up a spill.

*A thoughtful story might include some of the following components: immediate efforts to contain the spill using booms, skimmers or efforts to get the oil off the surface waters through burning or dispersal; protection of sensitive areas by booming them off or monitoring for oil; active cleaning of coastlines; "shepherding" of wildlife away from spill areas; efforts to capture, clean, and rehabilitate oiled wildlife.*

## Wildlife Rescue Information Worksheet

Take all of these factors into consideration as you develop a strategy for wildlife rescue operations. Be prepared to defend your rationale.

<p><b>COST</b> What will be the cost of rescue, rehabilitation, and relocation? (It cost \$89,000 to rehabilitate one sea otter after the Exxon Valdez Oil Spill)</p>	Upper Cost Limit	Lower Cost Limit
<p><b>LOGISTICS</b> Where will the facilities be located? What buildings could be used? Whose boats? What collection method will be used? How will staff be recruited and trained?</p>	Facilities - 1 <sup>st</sup> Choice	Facilities – 2 <sup>nd</sup> Choice
	Boats – 1 <sup>st</sup> Choice	Boats – 2 <sup>nd</sup> Choice
	1 <sup>st</sup> Collection Method	2 <sup>nd</sup> Collection Method
	Training/Recruitment - 1 <sup>st</sup> Choice	Training Recruitment- 2 <sup>nd</sup> Choice
<p><b>WEATHER</b> What kind of weather might your crews encounter? How would this affect your recovery efforts? What weather is acceptable to work in, and what weather would force the suspension of operations?</p>	Acceptable Weather Conditions - (How would you adjust?)	Weather Conditions Forcing Suspension of Operations
<p><b>STRESS &amp; HUMAN IMPACT</b> Is it better to leave the impacted animals to fend for themselves, or to capture them and risk having them die from stress or disease? For many wild animals the trauma of human impact is often greater than most environmental impacts.</p>	Negative Effects of Human Impact	Positive Effects of Human Impact

## Wildlife Rescue Standards

Concepts of Life Science: Students develop an understanding of the concepts, models, theories, facts, evidence, systems, and processes of life science.

### SC3

Students develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.

The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by:

[11] SC3.2 analyzing the potential impacts of changes (e.g., climate change, habitat loss/gain, cataclysms, human activities) within an ecosystem

Science and Technology: Students develop an understanding of the relationships among science, technology, and society.

### SE1

Students develop an understanding of how scientific knowledge and technology are used in making decisions about issues, innovations, and responses to problems and everyday events.

The student demonstrates an understanding of how to integrate scientific knowledge and technology to address problems by:

[6] SE1.1 recognizing that technology cannot always provide successful solutions for problems or fulfill every human need

[9] SE1.1 recognizing that the value of any given technology may be different for different groups of people and at different points in time (e.g., different uses of snow machines in different regions of Alaska)

[11] SE1.1 researching how social, economic, and political forces strongly influence which technology will be developed and used

### SE2

Students develop an understanding that solving problems involves different ways of thinking, perspectives, and curiosity that lead to the exploration of multiple paths that are analyzed using scientific, technological, and social merits.

The student demonstrates an understanding that solving problems involves different ways of thinking by:

[6] SE2.1 identifying and designing a solution to a problem

[7, 8] SE2.1 identifying, designing, testing, and revising solutions to a local problem

[9] SE2.1 questioning, researching, modeling, simulating, and testing a solution to a problem

[10, 11] SE2.1 questioning, researching, modeling, simulating, and testing multiple solutions to a problem

SE3 Students develop an understanding of how scientific discoveries and technological innovations affect and are affected by our lives and cultures.

The student demonstrates an understanding of how scientific discoveries and technological innovations affect our lives and society by:

[10, 11] SE3.1 researching a current problem, identifying possible solutions, and evaluating the impact of each solution