

# Rachel Carson Centennial

## *Oil Spill!*

Rachel Carson's *Silent Spring* sounded the alarm on how dangerous chemicals and contaminants can affect wildlife and people. In the post-*Silent Spring* era, our need to understand the impact of environmental contaminants on the natural world has not diminished.

Biologists with the U.S. Fish and Wildlife Service's Environmental Contaminants Program continue to increase our understanding of contaminants in our environment and help create a healthier world for all living things. They detect toxic contaminants in fish, wildlife and environmental samples; restore habitats and communities damaged by contaminants; minimize the risks of contaminants entering our environment; and are experts on the effects of pesticides, hazardous materials disposal, and oil and chemical spills in our environment.

Oil spills commonly occur when ships and barges transporting oils in large quantities accidentally run aground or spill product containers. When crude oil, fuel oil, diesel oil or kerosene spill into our waterways, the Fish and Wildlife Service plays a critical role in reducing the impacts of spilled oil on fish and wildlife and their habitats.

### Activity

The purpose of the activity is to conduct an experiment and demonstrate how oil spills can affect wildlife, focusing primarily on birds.

You'll need the following materials:

- Feathers – you can find feathers at a local pet store or at a local craft store
- Vegetable oil – you'll also need some bowls to pour the oil into
- Food coloring
- Hard-boiled eggs

### Group Discussion

#### Step 1.

Ask the group some questions about how oil can come into contact with and harm wildlife and its habitat.

*Question:* What kinds of wildlife could come into contact with oil?

Answers:

- Fish and other organisms that live in the water
- Mammals that live nearby or eat food from the river
- Birds like ducks, geese and gulls that swim in the water or dive into the water to find food

*Question:* How can oil harm wildlife?

Answers:

- Oil can affect various species in an environment, depending on the way oil floats on water, sinks in water, and washes ashore
- If the oil sinks, then it can smother aquatic organisms that live along the bottom of the river, including clams or fish.
- Mammals, birds and reptiles can suffer from eating oiled fish, clams or lobsters.
- When birds come into contact spilled oil, the thick and heavy oil coats their feathers and affects their ability to stay afloat on water surface.
- Oil also damages the interlocking mechanism of a bird's feather, preventing them from being able to keep themselves warm.

- When birds preen their feathers, they can unintentionally ingest oil and poison themselves with the toxic chemicals.

- In addition, oiled birds can transfer oil to nesting material and eggs, which can be lethal to young.

- If the oil washes up on shore, then it can impact nesting habitat of birds, turtles and crabs.

### Before the spill

#### Step 2.

Closely examine your feather and write down the characteristics that describe it.

What does it feel like?

Put the feather in your hand, hold it out in front of your body and drop it. What happens?

Gently break apart the interlocking mechanisms of the feather to see how the tiny barbs break apart. Then stroke your fingers with the contour of the feather and watch how the barbs hook back together to keep feathers strong and smooth.

#### Step 3.

Peel one hard boiled egg and write down your observations when you peel off the shell.

### Oil Spill!

#### Step 4.

Get one bowl and add vegetable oil. Then stir in a few drops of food coloring to the oil so it will be easy to distinguish the oil during the experiment.

#### Step 5.

Get a second bowl and add water until you fill it to about 2 inches from the top. Add a few drops of the colored

vegetable oil and watch as the oil disperses on the surface and then breaks up into smaller globs. Just like in the bowl, oil changes rapidly once it is spilled into water, and can be difficult to clean up as it floats in a thin layer on the surface or under the surface in smaller globs. Add the colored vegetable oil until you are filled near the top of the bowl.

*Step 6.*

Take a feather and submerge it into the bowl. This is just like how a duck would swim in a river and come into contact with spilled oil on the surface and just below. Then take your feather out and examine it. How does it compare to when you examined it earlier?

What does it feel like?

Put the feather in your hand out in front of your body and drop it. What happens? Does it fall with the same speed as the un-oiled feather?

Gently break apart the interlocking mechanisms of the feathers to see how the barbs break apart. When you stroke your fingers with the contour of the feather, do the barbs hook back together?

*Step 7.*

Place one hard boiled egg into the bowl and let it sit for 15-20 minutes. Peel the eggs and make observations on what happens when you peel off the shell. Then, compare the observations to the un-oiled egg.

**Group Discussion**

*Step 8.*

Discuss the changes in the feather and egg-peeling before and after submerging it in oil.

- What are the possible effects of oil on a wild bird?
- How could an oil spill affect birds with nests near the water?

**U.S. Fish & Wildlife Service**  
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