

No Water off a Duck's Back



Before Oil Spill

After the Oil spill

Introduction:

We have all seen pictures and videos of wildlife covered in black, sticky oil after an oil spill. These pictures are usually of oiled birds. Many people are not aware that it is not just birds that get oiled during a spill. Other marine life such as marine mammals can also suffer from the effects of an oil spill. Even small spills can severely affect marine wildlife.

Not all oils are the same. There are many different types of oil and this means that each oil spill is different depending on the type of oil spill. Each oil spill will have a different impact on wildlife and the surrounding environment depending on:

- the type of oil spilled,
- the location of the spill,
- the species of wildlife in the area,
- the timing of breeding cycles and seasonal migrations,
- and even the weather at sea during the oil spill.

Oil affects wildlife by coating their bodies with a thick layer. Since most oil floats on the surface of the water it can affect many marine animals and sea birds. Sadly, birds and marine mammals can't avoid an oil spill. Even animals and birds that haven't come directly in contact with the oil can still become endangered by its effects. Some fish are attracted to oil because it looks

like floating food. This endangers sea birds, which are attracted to schools of fish and may dive through oil slicks to get to the fish.

Oil that sticks to fur or feathers, usually crude and bunker fuels, can cause many problems. Some of these problems are:

- hypothermia in birds by reducing or destroying the insulation and waterproofing properties of their feathers;
- hypothermia in fur seal pups by reducing or destroying the insulation of their woolly fur (called lanugo). Adult fur seals have blubber and would not suffer from hypothermia if oiled. Dolphins and whales do not have fur, so oil will not easily stick to them;
- birds sink or drown because oiled feathers weigh more and their sticky feathers cannot trap enough air between them to keep them buoyant;
- fur seal pups drown if oil sticks their flippers to their bodies
- inflammation or infection in dugongs and difficulty eating due to oil sticking to the sensory hairs around their mouths;
- disguise of scent that seal pups and mothers rely on to identify each other, leading to rejection, abandonment and starvation of seal pups;

Oil in the environment or oil that is ingested can cause:

- poisoning of wildlife higher up the food chain when they've eaten an organism that has ingested oil;
- decrease in the thickness of egg shells;
- damage to fish eggs, larvae and young fish;
- contamination of beaches where turtles breed causing contamination of eggs, adult turtles or newly hatched turtles;
- poisoning of young through the mother, as a dolphin calf can absorb oil through it's mothers milk.

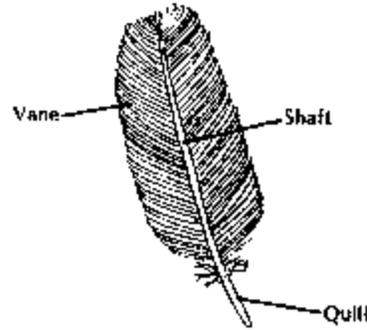
THE AFFECTS OF OIL SPILLS ON BIRDS

Question: What happens to bird feathers and eggs when they are covered with oil? Can bird feathers covered with oil be brought back to its original form?

Hypothesis: ?

Materials:

- hard-boiled eggs
- cooking oil or baby oil
- shallow pan or tray
- a small magnifying glass
- a flight feather
- a jar that will hold oil
- Dawn detergent
- Paper towels



1. Examine a feather with a magnifying glass or a dissecting microscope. Sketch the feather below, label the **shaft**, **vane** and **barbs**.

2. Use your fingers to rub the feather *against* the vanes. This should mess the feather up. Now gently stroke your fingers of the feather with the vanes. This should cause the vanes to zip back together and return the feather to its original shape.

3. Submerge the feather for 5 seconds in your pan of water. Remove the feather and shake it gently. Compare the feather wet to the way it looks dry.

4. Lay the feather on a paper towel and record the amount of time it takes for it to completely dry.

5. Now simulate an oil spill by dipping the feather in oil. Remove the feather and record your observations (what does it look like). Do you think this bird could fly?

7. Birds caught in oil spills are washed with liquid Dawn to remove the oil. Wash the feather with one or two drops of dawn and rinse well.

8. Lay the feather on a paper towel and wait for it to dry completely. Record the time it takes for it to dry now.
9. Why does the feather remain wet longer after it has been washed with soap?
10. Do you think a bird after being washed with Dawn will have trouble flying or swimming?

Effects of Oil Spills on the Egg

1. Make a prediction about whether an egg is porous to oil.
2. Carefully peel the egg. Record your observations.
3. Was the shell permeable to oil?
4. What do you think would happen to the embryo in an egg that has been soaked in oil?

Do some research on your own. Find out if **Dawn** is the detergent used with oil spills. Would a different detergent work?

http://www.ibrrc.org/dawn_alice.html

Objectives:

Science:

SCI.5.6 The student will investigate and understand characteristics of the ocean environment. Key concepts include

- biological characteristics (ecosystems); and
- public policy decisions related to the ocean environment (assessment of marine organism populations, pollution prevention).
- Make informed decisions regarding contemporary issues taking into account the following:
 - public policy and legislation
 - respect for living things
 - personal responsibility