

# **BROWN PELICANS - OIL SPILL VICTIMS**

**Master Teacher: Helen Mebane**

**GRADES:** 6 –8

**TIME ALLOTMENT:** 3 fifty-minute class sessions

## **OVERVIEW:**

In this lesson, students will view the devastating effects oil spills have on shore birds. Flo Tseng, the veterinarian, who works at the International Bird Rescue Center in Berkeley, California, shows how they treat brown pelicans. Students will be able to follow the procedures needed to rehabilitate the oil covered birds, distinguish between normal waterproof feathers from a brown pelican, *Pelecanus occidentalis*, and impaired oil-covered feathers, and describe how useful information is gained from blood work and a bird's necropsy. Finally, students will use their math skills to make a life-size model of a brown pelican.

**SUBJECT MATTER:** Science

## **LEARNING OBJECTIVES**

Students will be able to:

- Describe the rehabilitating process for an oil covered brown pelican
- Describe how normal waterproof feathers look
- Describe how and why blood samples are taken from the shore birds
- Describe how necropsy gives the veterinarians useful information
- Make a life size model of a brown pelican

## **STANDARDS:**

(8.2) **Scientific processes.** The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:

(B) collect data by observing and measuring;

(E) construct graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate data.

(8.6) **Science concepts.** The student knows that interdependence occurs among living systems. The student is expected to:

(C) describe interactions within ecosystems.

(8.11) **Science concepts.** The student knows that traits of species can change through generations and that the instructions for traits are contained in the genetic material of the organisms. The student is expected to:

(A) identify that change in environmental conditions can affect the survival of individuals and of species;

(8.12) **Science concepts.** The student knows that cycles exist in Earth systems. The student is expected to:

(C) predict the results of modifying the Earth's nitrogen, water, and carbon cycles.

(8.14) **Science concepts.** The student knows that natural events and human activities can alter Earth systems. The student is expected to:

(B) analyze how natural or human events may have contributed to the extinction of some species; and

(C) describe how human activities have modified soil, water, and air quality.

### **MEDIA COMPONENTS:**

Real Science #405 Birds of a Feather

### **MATERIALS:**

500-ml beaker or mayonnaise jar

A teaspoon of motor oil

One plastic spoon

A package of store purchased feathers (to be shared among all students)

A magnifying lens for every three students or one per team

Activity Sheet #1 - one per student

Vocabulary Sheet - one per student

Brown Pelican Sheet -one per student

One inch grid sheet - one per student

Roll of brown wrapping paper

### **PREP FOR TEACHERS:**

Gather materials for learning activity, bookmark websites, cue video tape to correct starting point, handouts (Activity #1, Vocabulary, Brown Pelican, 1 inch grid) should be ready to distribute.

## INTRODUCTORY ACTIVITY:

Step 1: Distribute Vocabulary Sheet to students and familiarize students with vocabulary terms.

Step 2: In a 500-ml beaker, place one teaspoon of motor oil into 200 ml of water and mix. Pass around several feathers and magnifying lens for students to examine how feathers look.

Step 3: Ask the students what would happen if they dipped one of these feathers into the beaker with oil. Dip one feather into the oily solution and again pass the feather around the room for students to examine the effects.

## LEARNING ACTIVITY:

Step 1: **Focus For Media Interaction:** Say, "While you are viewing this video, look for the answers to questions on the Activity Sheet #1. "We will be determining the damaging effects oil spills have on wildlife such as the brown pelicans."

Step 2: **Begin** the video when Lydia Chang says, "But first I had the opportunity to spend the day with a veterinarian Flo Tseng at the International Bird Rescue in Berkeley California." In the fall of 1996, 8000 gallons of oil leaked from a cargo ship in San Francisco Bay, which threaten wildlife and closed local beaches. Eleven oil sick birds were brought to the International Bird Rescue in Berkley California where veterinarian's staff cleaned dehydrated seagulls, pelicans, and other birds. Flo says, "I'm going to have you hold the bird's head. When you do this, place one finger in its mouth to hold its mouth open a little and the other hand is to stabilize its head."

Step 3: **Pause** the video when Lydia is holding the pelican's beak. Answer question #1 from activity sheet 1. What is the average salary for a veterinarian with ten years experience? (\$73,000) **Resume** video.

Step 4: **Pause** the video when you see a close-up of the pelican's head. Answer question #2. Do you try to wash it as soon as you get it in? (No, because the birds aren't real stable. We get them fed, make sure its weight is up, and get blood work normal before we wash them. It usually takes 2 or 3 days before we wash them. **Resume** the video.

Step 5: **Pause** the video when you see the pelican being washed. Answer question #3. If you wash them too early, will it not work as well? (No, sometimes you will kill them because they are so weak.) **Resume** the video.

Step 6: **Pause** the video when Terry (the man) is washing the pelican with the water nozzle. Answer question #4. In 1996, the oil cleanup in San Francisco Bay cost over \_\_\_\_\_ million dollars. (3). **Resume** the video.

Step 7: **Pause** the video when Lydia, Flo, and Terry are at the sink. Answer question #5. What do normal waterproof feathers look like? (The water beads off the feathers. When you get all the detergent off like you are suppose to do, the feathers start looking dry. That is what waterproof bird looks like instead of drenched feathers.) **Resume** the video.

Step 8: **Pause** the video when there is a close up of Lydia. Answer question #6. Of all the birds that come in here, how many are you able to save? (We got about 50 birds from the San Francisco Bay area and about 30 will be released. Some aren't doing as well because they were brought in later which means they were not eating, more stressed, and some are more difficult to catch such as the loons, grebes, and moors (common name for *Gallinula chloropus* common moorhen.) **Resume** the video.

Step 9: **Pause** the video when you see "the answer to how many species there are" on the bottom of the screen or after Flo says, "loons, grebes, and moors." Answer question #7. How many species of birds are there? (9,000). **Resume** the video.

Step 10: **Pause** the video when you see several pelicans in outside area. Answer question #8. How long will you keep Lydia (bird) after you clean them? (We keep them for three or four days to about a week or so if they are eating well, acting normally and their blood work looks ok.) **Resume** the video.

Step 11: **Pause** the video where a man and woman are placing a transmitter on a pelican's back. Answer question #9. After being released, will they do ok? (Part of the reason for the transmitters is to see how long they survive. After they are cleaned, they are dried by a blow dryer and warmed with a heat lamp. Then they are placed in an aviary. Then they are given a routine test to determine their health status). **Resume** the video.

Step 12: **Pause** the video when Flo is checking a needle inserted into the pelican's vein. Answer question #10. Why do you need a blood sample? (We do blood parameters for release. We are working on a cooperative study with U. C. Davis and looking for stress enzymes to see what effects oil may have on them. We also do a series of serum chemistry, liver and kidney enzymes, and electrolytes such as calcium and phosphorous. We take blood work throughout this process, from the time they are admitted, midway, and release time to track all that as we go along). **Resume** the video.

Step 13: **Pause** the video when Flo is holding cotton on the pelican's vein. Answer question #11. How do you know where to put the needle? (I don't know if you could tell when I wiped it with alcohol but there is a little vein there. Part of the problem of the pelican, which makes them very interesting, is that they are subcutaneous; they have air

under their skin. When they dive into the water, it cushions them for looking for fish. We sometimes get air from one of these pockets from them moving around). **Resume** the video.

Step 14: **Pause** the video when Flo wipes the vein with alcohol. Answer question #12. How much blood do you take? (5 cc not much at all for the bird.) Birds of a feather are fed a nutrient-rich mash to regain their strength. But unfortunately, sometimes the bird dies and we perform a necropsy. It provides information, for example, gummy feathers become that way because of the oil spill. **Resume** the video.

Step 15: **Pause** the video when Lydia and Flo are touching the gummy feathers of a black crown night heron. Answer question #13. How does the oil affect the birds? (Feathers normally interlock. It causes the bird to become hypothermic when their body temperature drop. They can't keep the cold water out and then they get really cold quickly. They end up beaching themselves. They then become subject to predation. They are not normally able to feed, and then when they try to preen themselves they ingest the toxins. This then causes stomach and intestinal problems, and anemia.) **Resume** the video.

Step 16: **Pause** the video when Lydia has a mask on her face. Answer question #14. So what can we learn from necropsy? (We can see sometimes with the naked eye what a problem is. But we also take tissue samples and tell on a microscopic level what happened. You can see that there is no fat on the heart of this bird where there should be fat, abnormal muscle wall. Notice the right muscle is thin because it doesn't do much of the pumping. The left side pumps into the lungs and right side pumps to the body.) **Resume** the video.

Step 17: **Pause** the video when Flo drops a part of the heart into a bottle. Answer question # 15. What conclusions can you make by looking at this bird? (He was really emaciated. There is no body fat that I can see and no evidence of heart or lung problems. It's liver is very abnormal and we must get microscopic work but I would guess it's the toxic effect of the oiling.) **Resume** the video.

Step 18: **Stop** and **eject** the video after you see the birds fly back into the San Francisco Bay habitat.

### **CULMINATING ACTIVITY:**

Step 1: **Say**, "Now that we have finished answering the Activity Sheet #1, you are ready to begin making a life size outline of a brown pelican with your team."

Step 2: Research using the Internet, find the body length and the wingspan of the brown pelican (Body length is 31.5 inches in length from the tip of the head to the bottom of its feet. It's 20 inches in width from the tip of the tail to tip of bill in a standing position.)

Step 3: Distribute sections of the brown paper.

Step 4: Have different group draw the pelican in different positions - one group "in flight", one group "nesting" or "gliding", one group "feeding" or "with young".

Step 5: Display the brown pelicans out in the hallway for the student body to view.

## **CROSS-CURRICULAR EXTENSIONS**

Place a bird feeder in your school or backyard to keep a record of the native birds in your area.

### **LANGUAGE ARTS**

Write a short story about the unusual method that the brown pelican uses to catch its food. Or, use another shore bird of your choice.

### **SOCIAL STUDIES**

Have students locate on a United States map and label all the areas where brown pelicans or other shore bird of your choice may be found. (Brown pelicans live along the coasts of North and South America.)

### **SCIENCE**

Take the students on a field trip where they can observe more shore birds. For example: white or brown pelicans, black skimmers, laughing gulls, seagulls, kingfishers, white ibis, or great egrets. An excellent location to find white or brown pelicans is behind the Texas State Aquarium in Corpus Christi.

Have the students record interesting characteristics of the brown pelicans. For example, they can hold a gallon of water in their bills. Students can write the characteristics on an index card and glue it to the chest area of the life size model (cardboard) of the brown pelican.

For review of the parts of the bird, during the video of the brown pelicans...pause the video and use a dry-erase marker and label these parts on the TV screen and labeled these parts: forehead, bill, chin, throat, breast, belly, flank, tarsus, webbed feet, tail, rump, back, hind neck, nape, crown, and eye-ring.

## **COMMUNITY CONNECTIONS:**

Find out when the next meeting is for the bird watching organization in your area.

## **WEBSITES:**

Feeder-Watch of Cornell University

<http://birds.cornell.edu/PFW/>

An annual survey of birds that visit feeders in winter.

Bird watching

<http://www.birdwatching.com/>

A website for everyone who's interested in bird watching and enjoying nature.

Environmental Defense

<http://www.edf.org>

Environmental Defense is a not-for-profit environmental advocacy group with four main goals: **(1)** Stabilizing the Earth's climate, **(2)** Safeguarding the world's oceans, **(3)** Protecting human health, and **(4)** Defending and restoring biodiversity.

Pelicans and other Creatures

<http://www.naples.net/~nfn04208/Gallery.html>

Pictures and information on brown pelicans and other creatures.

Peterson ID's Brown pelicans

<http://www.petersononline.com/birds/>

Peterson Multimedia Guide to North American Birds.

## **STUDENT MATERIALS:**

Activity Sheet #1 - one per student

Vocabulary Sheet - one per student

Brown Pelican Sheet -one per student

One inch grid sheet - several per student

## Activity Sheet #1

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Period: \_\_\_\_\_

Directions: Answer these questions from viewing the video. (7 points each)

1. What is the average salary for a veterinarian with ten years experience?
2. Do you try to wash the bird as soon as you get it in?
3. If you wash them too early, will it not work as well?
4. In 1996, the oil cleanup in San Francisco Bay cost over \_\_\_\_\_ million dollars.
5. What do a normal waterproof feathers look like?
6. Of all the birds that come in here, how many are you able to save?
7. How many species of birds are there?
8. How long do you keep Lydia (birds) after you clean them?

9. After being released, will they do ok?

10. Why do you need a blood sample?

11. How do you know where to put the needle?

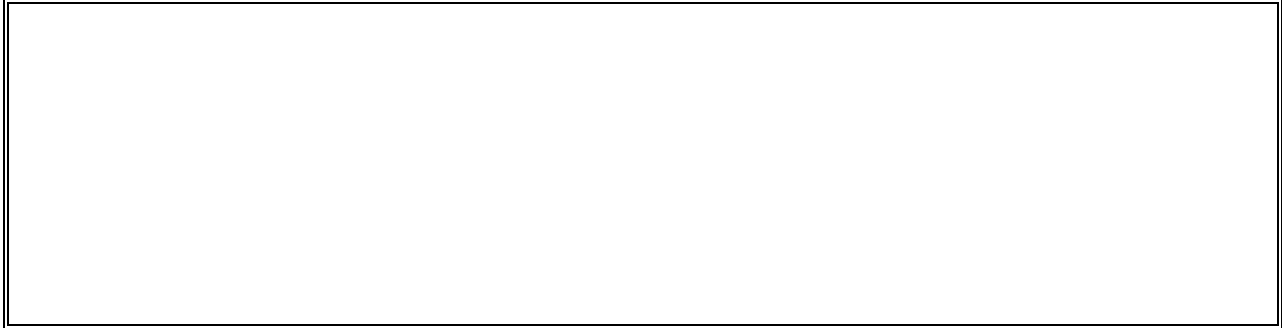
12. How much blood do you take?

13. How does the oil affect the birds?

14. So what can we learn from necropsy?

15. What conclusions can you make by looking at this bird?

**Brown Pelican**  
*Pelecanus occidentalis*



## VOCABULARY

*veterinarian* – use medicine to cure, prevent, and treat injured or diseased animals. They may also return the animal to its natural environment.

*dehydrated* – the condition whereby the animal loses a great amount of water from its body.

*waterproof* – the condition whereby feathers bead up when water falls on them. Oil removes this characteristic of the beading and therefore, the feathers become drenched when they become wet.

*aviary* – a large cage for keeping birds.

*electrolytes* – salts solution which are in the body.

*cc* – cubic centimeters the same as milliliter.

*subcutaneous* – under the skin.

*preening* – the process whereby birds remove oil from their oil gland and spread all over their feathers to waterproof themselves.

*necropsy* – bird dissection to determine what caused the bird to die.

*hypothermic* – a condition whereby the animal's body temperature drops below normal levels.

*predation* – where the animal is subject to being eaten by another animals.

*anemia* – a condition whereby the animal has a low amount of red blood cells.

*emaciated* – where the bird loses a large amount of its body's weight.