

## Oceans for Life Lesson Plan

# SPLASH – Monitoring Humpback Whales

### OVERVIEW

As a follow-up to [Volunteer Monitoring - Gulf of the Farallones National Marine Sanctuary](#), in which students explored ecosystem monitoring, this lesson will focus on the monitoring of marine mammals. Students will first share what they know about marine mammals. They will discuss endangered marine mammals such as humpback, right, and gray whales, focusing on the reasons for their endangered status. They will then be introduced to different methods of marine mammal monitoring including observation and tracking studies, using the [Marine Mammals Monitoring Program](#) at Monterey Bay National Marine Sanctuary as an example. They will consider the ways in which such efforts can help in marine conservation efforts (could reveal feeding habits, migration patterns, depths frequented, etc).

This lesson is one in a series exploring the history, biology, and ecology of the [National Marine Sanctuaries](#). It was developed for National Geographic's [Oceans for Life](#) program, in collaboration with and with support from the [National Oceanic and Atmospheric Administration](#).

### FOCUS

Monitoring of humpback whales

### FOCUS QUESTIONS

- What is the importance of monitoring endangered marine mammals like humpback whales?
- How can monitoring help in marine conservation efforts to protect a species?

### LEARNING OBJECTIVES

Students will:

- discuss endangered marine mammals including humpback, right, and gray whales;
- explore marine mammal monitoring;
- examine different methods of monitoring marine mammals, such as observation and tracking; and
- describe the relationship between monitoring and conservation efforts.

### GRADE LEVEL

6-8

### MATERIALS

- Computer with internet access (Note: all information can be pre-downloaded and printed)

### AUDIO VISUAL MATERIALS

- [SPLASH — Monitoring Humpback Whales Video](#)

### TEACHING TIME

Two to three hours

### SEATING ARRANGEMENT

Whole-class instruction, and small group activities

### MAXIMUM NUMBER OF STUDENTS

No limit

### KEY WORDS

SPLASH, Humpback Whales, Monitoring, Endangered, Hawaiian Islands Humpback Whale National Marine Sanctuary



## PREPARATION

- Download and prepare video clips

## LEARNING PROCEDURE

### Opening:

Review some of the basics of ecosystem monitoring in the related lesson [Volunteer Monitoring - Gulf of the Farallones National Marine Sanctuary](#). If you are using this lesson as a stand-alone, the [Sanctuary Integrated Monitoring Network \(SIMoN\)](#), Gulf of the Farallones National Marine Sanctuary's [Beach Watch Program](#), and [Long-term Monitoring and Experiential Training for Students \(LiMPETS\)](#)

Web sites provide examples of three different types of ecosystem monitoring programs. Have students explore these resources in pairs, and then answer the following questions:

- What is ecosystem monitoring?
- What steps are taken in these monitoring programs?
- Who is involved?
- What are the time commitments of the people involved?
- What methods are used?
- What data are collected?
- How are the data used?

Have students identify the different creatures that inhabit the ecosystems being monitored by these two programs. Write all the suggested animal names on the board. Then discuss the term [mammal](#) with students. Introduce/discuss and list some of the characteristics/defining features of mammals (any of various warm-blooded vertebrate animals of the class Mammalia, including humans, characterized by a covering of hair on the skin and, in the female, milk-producing mammary glands for nourishing the young). Then ask students which of the animals from the list on the board are examples of marine mammals. (Be sure to lead students to the fact that whales are mammals). Next, review and

discuss the term “endangered” and ask students to name some possible reasons that animals are endangered (human involvement, loss of habitat/breeding/feeding area, poaching, etc.). Write these reasons on the board.

### Development:

Introduce students to different methods of marine mammal monitoring by having them examine the [Marine Mammals Monitoring Program](#) at Monterey Bay National Marine Sanctuary as an example. Ask students:

- What are some of the mammal monitoring projects being undertaken?
- What mammals will benefit from these efforts?
- Who is involved in these programs?
- What steps are being taken?

Next, have students, in pairs, explore information about the endangered [Blue whale](#) species living in the Monterey Bay National Marine Sanctuary. Have them determine the following:

- What are some reasons for their decreased numbers?
- How could monitoring of this species help conservation efforts?
- What monitoring methods would be helpful in this case?

Next, have your students view the [SPLASH - Monitoring Humpback Whales video](#), which offers information about the humpback whale, including how the [SPLASH program](#) is working to accurately count the number of humpbacks in the North Pacific. The short video also includes an interview with John Calambokidis, a research biologist and a SPLASH contributor. After you've viewed the video with your class, have students work in groups to answer and discuss these questions:



- What is the goal of the SPLASH program?
- Why is it important to learn how many humpback whales remain in the North Pacific?
- Why is it difficult to accurately count humpback whales?
- What methods are researchers using to identify and gather information on the population of humpback whales?
- What other information about humpback whales do researchers want to learn?
- How is the work of SPLASH important to scientists?
- How is the work of SPLASH important to the general public?

Then have your students further explore endangered marine mammals. Working in groups, have students select one animal from the [Marine Mammal Endangered or Threatened Species](#) page and become “experts” on that animal. Once a marine mammal is selected, students can visit the [Encyclopedia of the Sanctuaries](#) to learn more about the animal they are interested in. Ask students to research information about their animal, the reasons their selected marine mammal is being monitored, and the monitoring methods for that animal. Have groups report back to the class, giving a brief presentation that provides background facts about their selected marine mammal, as well as the following information:

- Why is this marine mammal endangered?
- Why is this mammal being monitored?
- What monitoring methods are being used for this mammal?
- Who is involved in these efforts?

Students can create posters, diagrams, charts, or other visuals for their presentations.

After all presentations are given, have the class compare and discuss the different methods of monitoring:

- What are some of the different reasons these animals are threatened?
- How are they being monitored?
- What are some of the differences? Similarities?
- What is the value of monitoring each of these species?
- What can we hope to gain from the efforts?
- How will these efforts help conservation?

### Closing:

Tell the class that they have been asked to prepare a public education campaign, using the information they gathered on endangered marine mammals. The campaign should educate people about the work of researchers in programs such as SPLASH, SIMoN, and the Beach Watch program. Have students create a PowerPoint presentation that provides information on each marine mammal studied by the class, including the reasons the animal is being monitored and the efforts being made by researchers on the animal's behalf. Note that public domain images and videos can be downloaded from the [Encyclopedia of the Sanctuaries](#) Web site to be used in student PowerPoint presentations.

- Have students first brainstorm a title for their campaign, such as “Imagine a World Without Whales.” Then have the class vote on their favorite title.
- Have each group work to create 2–3 slides for their selected animal, which includes the required information.
- Each group should also prepare a slide that explains how monitoring their selected marine mammal is important not only to scientists, but to the general public.
- Each group should also describe the relationship between monitoring and conservation efforts for their chosen topic.
- Additional tasks needed to complete the presentation can be assigned to small teams of students, or you can solicit volunteers. The



presentation will need an introductory slide that explains the basics of ecosystem monitoring, a final slide, and background music or audio, for example.

- When all groups have created their slides, combine them into a single presentation.

Alternately, or if your classroom lacks access to Microsoft PowerPoint, students can create booklets containing the same information.

### SUGGESTED STUDENT ASSESSMENT

Observe students as they work in groups and complete their projects, and make an informal evaluation of teamwork, cooperation, and ability to work in a group. The PowerPoint presentation can also be informally assessed:

- Did each student participate?
- Is all the required information included for each animal in the presentation?
- Does the presentation clearly illustrate the work of researchers who are monitoring marine mammals?
- Does the presentation clearly demonstrate the relationship between monitoring and conservation projects?

### EXTENDING THE LESSON

- Have your students further explore the efforts of researchers studying marine animals by visiting the [Crittercam](#) Web site.
- On a large, wall size map of the world, or an outline of a world map you've drawn/traced on a large sheet of butcher paper, have students make a map showing the location of the endangered marine mammals they've researched. Each group can draw pictures on the map indicating where their selected animals live. Alternately, they can find magazine pictures, or printed pictures from the Internet to place on the map.
- Have each student select one of the monitoring projects outlined on the [Marine Mammals Monitoring Program](#) Web site.

Then have each student step into the shoes of one of the participants in their selected project and create a journal that describes the participant's work in the project. Students should include sketches or photographs (printed from the Web or clipped from magazines) in their journals. Ask students to write a piece of fiction based on ecosystem monitoring efforts. For example, they could write a fictionalized account of a monitoring team or participants in a monitoring program, use a program's work as the setting for a short science fiction or mystery story, or write a story from the point of view of one of the marine mammals they have studied. Encourage students to incorporate facts from their research into their stories.

### RELATED LINKS

[Journey North Gray Whale Monitoring](#)  
[NOAA Encyclopedia of the Sanctuaries](#)  
[NOAA Endangered Marine Mammals](#)  
[NOAA SPLASH Research](#)  
[National Geographic: Animals—Mammals](#)  
[National Geographic: Critter Cam](#)  
[National Geographic EdNet: Oceans for Life](#)  
[Northern Right Whale Monitoring Program](#)  
[NOAA SIMoN](#)  
[Wheelock College: Whale Net](#)

### CONNECTIONS TO OTHER SUBJECTS

Geography, ecology, biology, history, language arts

### NATIONAL SCIENCE EDUCATION STANDARDS

- A: Science as Inquiry: "Use appropriate tools and techniques to gather, analyze, and interpret data."

### NATIONAL GEOGRAPHY STANDARDS

- Standard 8: "The characteristics and spatial distribution of ecosystems on Earth's surface"
- Standard 18: "How to apply geography to interpret the present and plan for the future"



[Ocean Literacy: Essential Principles and Fundamental Concepts](#) (PDF, [Adobe Reader](#) required)

- Principle 5: The ocean supports a great diversity of life and ecosystems

#### FOR MORE INFORMATION

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#### ACKNOWLEDGEMENT

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