

## Oceans for Life Lesson Plan

# Predators Among Us

### OVERVIEW

This lesson will focus on human beings as predators, specifically in coral reef ecosystems. Issues examined include over-fishing, pollution, global warming, coastal development, and passive "predatory" behavior that results from neglecting marine resources. Students will explore the various ways in which humans act as predators on coral reef ecosystems. They will define predator and discuss humans as predators. They will then describe and discuss the negative effects of human behavior on coral reef ecosystems. Finally, they will generate a list of ways in which human beings can help restore and protect coral reefs.

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

Human beings as predators, specifically in coral reef ecosystems

### FOCUS QUESTIONS

- What are direct actions that impact coral reef ecosystems?
- How are coral reef ecosystems impacted by the negative effects of human behavior?
- What can be done to restore and protect the coral reef ecosystem?

### LEARNING OBJECTIVES

Students will:

- define predator;
- describe the effects of human activity on coral reef ecosystems; and
- generate a list of ways in which humans can restore coral reefs.

### GRADE LEVEL

6-8

### MATERIALS

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

### AUDIO VISUAL MATERIALS

- [Predators Among Us Video](#)

### TEACHING TIME

Three to four hours

### SEATING ARRANGEMENT

Whole-class instruction and small group activities

### MAXIMUM NUMBER OF STUDENTS

No limit

### KEY WORDS

Predator, Prey, Ecosystem, Reef

### PREPARATION

- Download and prepare video clips



## LEARNING PROCEDURE

### Opening:

(Teacher note: Parts of this lesson draw upon knowledge gained in the first lesson of this series, "[Saved by a Shark](#).") To focus the students, ask them to define the word *predator* and give examples of predators. Write the list on the board or on chart paper.

Show students the [Saved by a Shark video footage](#) of predatory fish in action. Have students describe the role of predators in a marine ecosystem, focusing on their behavior and how they think it affects the rest of the members of the ecosystem. Remind them that the word predator is not necessarily negative; in fact, predators are required to maintain the balance in an ecosystem.

Ask students to name the most dangerous predator in the coral reef ecosystem. Collect all answers and write them on the board or on chart paper. Tell students that there is another predator that not only kills animals in the reef ecosystem, but also destroys the reef itself in other ways. Ask students if they can guess what this predator is. If no one guesses correctly, explain to them that human beings are perhaps the most dangerous predators in the coral reef ecosystem.

### Development:

Have students describe how humans interact with marine ecosystems (fishing, boating, swimming, surfing, scuba diving, etc.). Ask them which, if any, of these activities either help or hinder the marine environment, or have no effect either way. Help them understand that many activities that appear harmless do, in fact, affect the marine ecosystem. For example, while boats don't always touch or interact with the coral reefs, boating causes marine pollution and sometimes the death of marine animals. Likewise, fishing lines may not tangle in the coral reefs, but fishing can lead to a decrease

in a specific fish population or populations. Tell students that many other human activities, which we might never associate with the marine environment, also affect ocean ecosystems. Agricultural runoff may cause marine pollution, as may construction in coastal areas. Have students watch the [Predators Among Us video footage](#) to find examples of these activities and their results.

Explain to students that there are three ways in which humans affect coral reef ecosystems:

1. *Direct actions* include human activities in which there is a first-hand and immediate effect on the coral reef ecosystem. Examples include diving in coral reefs and removing pieces of coral, over-fishing of sharks, destructive fishing practices such as using dynamite, and ornamental fish collection.
2. *Indirect actions* include human activities which may not appear to affect the reef at first, and may not even take place in close proximity to the reef, but do, over time, cause degradation of the reef ecosystem. Examples include over-development of coastal areas, chemical runoff and pollution from agriculture and/or urban areas, sediment pollution from logging, and oil spills.
3. *Negligence* refers to our failure to effectively protect reef ecosystems. Negligent behavior includes inadequate or a lack of monitoring of the effects of human activities on reefs, failure to protect reefs from damage, and not providing adequate protected areas for reefs and their inhabitants.

Tell students that the news isn't all bad. Even though human actions have the potential to cause great damage to reef ecosystems, they also possess the knowledge and ability to restore and preserve reefs. Explain to students that they will be working on a public



awareness campaign aimed at various areas of the population. The goal of the campaign is to raise awareness of the value of coral reef ecosystems, the threats they face, what governments are doing to protect reefs, and what individuals can do to help.

Divide students into groups, each of which will focus on one target audience including kids, tourists to reef areas, people who live near a reef, national governments, and commercial operations.

Tell students to use the Web sites below to conduct research and design their campaigns. Tell them that they will eventually be creating campaign brochures, each of which should include, in this order, sections that:

- convey the value of coral reefs;
- outline the threats they face;
- describe protection efforts already in place; and
- offer specific tips regarding what the target audience can do to help.

They should focus on these section topics as they do their research, and each student should take notes individually.

*Value of coral reefs*  
[Coral and Coral Reefs](#)  
[Coral Reef Adventure](#)  
[The Value of Coral Reefs](#)

*Threats to coral reefs*  
[Earth's Coral Reefs in Decline, Researchers Say](#)  
[Humans and the Tropical Reef Ecosystem](#)  
[Coral Reefs: Assessing the Threat](#)

*Reef protection efforts/tips to help out*  
[Success Stories](#)  
[The Coral Reef Alliance](#)  
[NOAA Coral Reef Conservation Program](#)

When students have completed their research, form new “jigsaw” groups comprised of one student from each of the previous groups. Students should share and discuss their notes and ideas with their new groups. Using their pooled information, groups should develop awareness campaigns designed for the general public, taking into account the research each student did for the specific target audiences mentioned earlier.

Campaigns should be designed to encourage people to get involved, and should focus on the *positive* direct and indirect actions that will help, rather than hinder, reef ecosystems. Students can create brochures highlighting their campaigns.

When students have finished creating their brochures, have groups briefly present their public awareness campaigns to the class. The sections outlined in the brochure should be covered in the presentations, and students should take questions from the class and teacher at the end of their reports.

### **Closing:**

Tell students that they will now be considering the effects of human activities on their local region. Using newspapers (online or print), students should create scrapbooks depicting the direct, indirect, and/or negligent impacts human actions have had in their area. They should also include stories of local environmental stewardship projects and other human actions that have helped the local environment. Lead a class discussion about the local information touching on the overall results of human actions in the area—are they positive or negative? What could individuals do to help mitigate one of the negative effects identified? What could the class do?

### **SUGGESTED STUDENT ASSESSMENT**

Use the brochures and presentations



previously created by the students in order to assess understanding of the concepts and objectives of this lesson. Evaluate the brochures by determining if the students successfully:

- conveyed the value of coral reefs;
- outlined the threats they face;
- described protection efforts already in place; and
- offered specific tips regarding what the target audience can do to help.

### EXTENDING THE LESSON

- As a class, devise and implement a plan to protect, restore, or preserve a local area. Ideas include cleaning up a park or waterway, performing trail maintenance, researching and educating others about local ecosystems, etc.
- Have students take on the persona of a person or group responsible for reef destruction and consider ways in which that person or group could mitigate their negative effect. Some options include commercial fishermen, a local diver who collects fish and coral for resale, a coastal developer, a farmer, etc.
- Have students choose a reef in trouble and research its unique problems and possible solutions.
- Explore the ways in which global warming may be affecting coral reefs, and consider ways we might tackle such a large, global problem.
- Have students play games and take quizzes related to coral reefs at the [Coral Reef Adventure](#) Web site.

### RELATED LINKS

[CNN: Earth's Coral Reefs in Decline, Researchers Say](#)  
[Encyclopedia of the Sanctuaries](#)  
[NOAA's Coral Reef Activities](#)  
[National Geographic EdNet: Oceans for Life](#)

[National Geographic Magazine: Coral Reef Photo Gallery](#)

[National Geographic News: Belize Reef Die-Off Due to Climate Change?](#)

### CONNECTIONS TO OTHER SUBJECTS

Geography, ecology, biology, social studies

### NATIONAL SCIENCE EDUCATION STANDARDS

- F: Natural Hazards: "Human activities can induce hazards through resource acquisition, urban growth, land-use decisions, and waste disposal. Such activities can accelerate many natural changes."

### NATIONAL GEOGRAPHY STANDARDS

- Standard 14: "How human actions modify the physical environment"

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

- Principle 6: The ocean and humans are inextricably linked

### FOR MORE INFORMATION

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### ACKNOWLEDGEMENT

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Explore more classroom resources from the

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