

# Human Impacts on the Reef



## Lesson at a Glance

Students will look at different impacts to the reef, try to figure out what is causing them and what could be done to remedy the situation.

## Objectives

Students will:

- Examine clues from the reef to try to determine where the the impacts are coming from
- Describe different ways that humans impact the reef and what be some solutions

## Materials Needed

- Student Reading, "Human Impacts on the Reef"
- "Searching For Clues" chart
- "The Case of Claude the Crab"
- "Coral Reef Benefits, Threats and Solutions" Crossword Puzzle

## Student Activities

### 1. Search For Clues

Have students read, "Human Impacts on the Reef" and answer the questions. Share the videos on human impacts (found in the KidScience programs and/or the Navigating Change Educators Kit). Discuss with students different things that can impact the reef. Have the students work in groups to complete the "Searching for Clues" chart. Encourage them to do some research on the internet for more ideas and solutions.

### 2. The Case of Claude the Crab

This is a creative writing activity. Give students a copy of the worksheet. Read the story about Claude the Crab. Students are then to pretend they are the detective and write about how they investigated the problem and figured out how to solve the problem.

### 3. Coral Reef Benefits, Threats and Solutions Crossword Puzzle

Have students work in groups to solve this puzzle. Some of the questions are tough. Encourage some internet research of the topics.



## Student Reading: Human Impacts on the Reef

### Questions

1. What impacts can coastal communities have on reefs?
2. Explain how marine debris can affect animal life.
3. How do introduced species affect the native animals in the ocean?
4. Explain how fishing vessels that have gone ashore can affect the reef.

As people visit the coral reef for recreation or commercial purposes, they change the reef. Many major cities are located on coasts near coral reefs, or along rivers that empty into the ocean. Many things that people put in the water can have an effect on the reef.

Communities near the ocean must be careful about what goes into the storm drains that carry runoff from streets and parking lots. Pesticides and fertilizers used on farms and lawns can also end up washing into the ocean. Municipal or residential sewage systems that release wastewater too close to shore cause an overabundance of algae to grow. Coastal communities and construction that replaces vegetation with bare soil and concrete also increase the runoff of freshwater and sediment into the water. Reef-building corals have a low tolerance for either of these.

Marine debris is another form of pollution. In the last few decades more and more things we use have been made out of plastic. If these objects wind up in the water they drift around, sometimes for years, until they end up on a shore or snagged on the reef. Some of the items are merely unsightly. Others are dangerous to marine life. Sections of old net can continue to entangle marine life long after they're discarded or lost. Items like cigarette lighters and small plastic toys are mistaken for food items by albatross and then fed to their young chicks who cannot digest or pass them. Many albatross chicks die from this each year.

People harvest fish from the reef for food and for the aquarium trade. These are activities that many of us have enjoyed, but must be done with care. Over harvesting of grazers like parrotfish, surgeonfish and sea urchins can result in an overabundance of algae. Anchoring in coral is a source of damage often seen also along our coasts. Divers and snorkelors need to be careful that they don't kick or grab onto fragile corals.

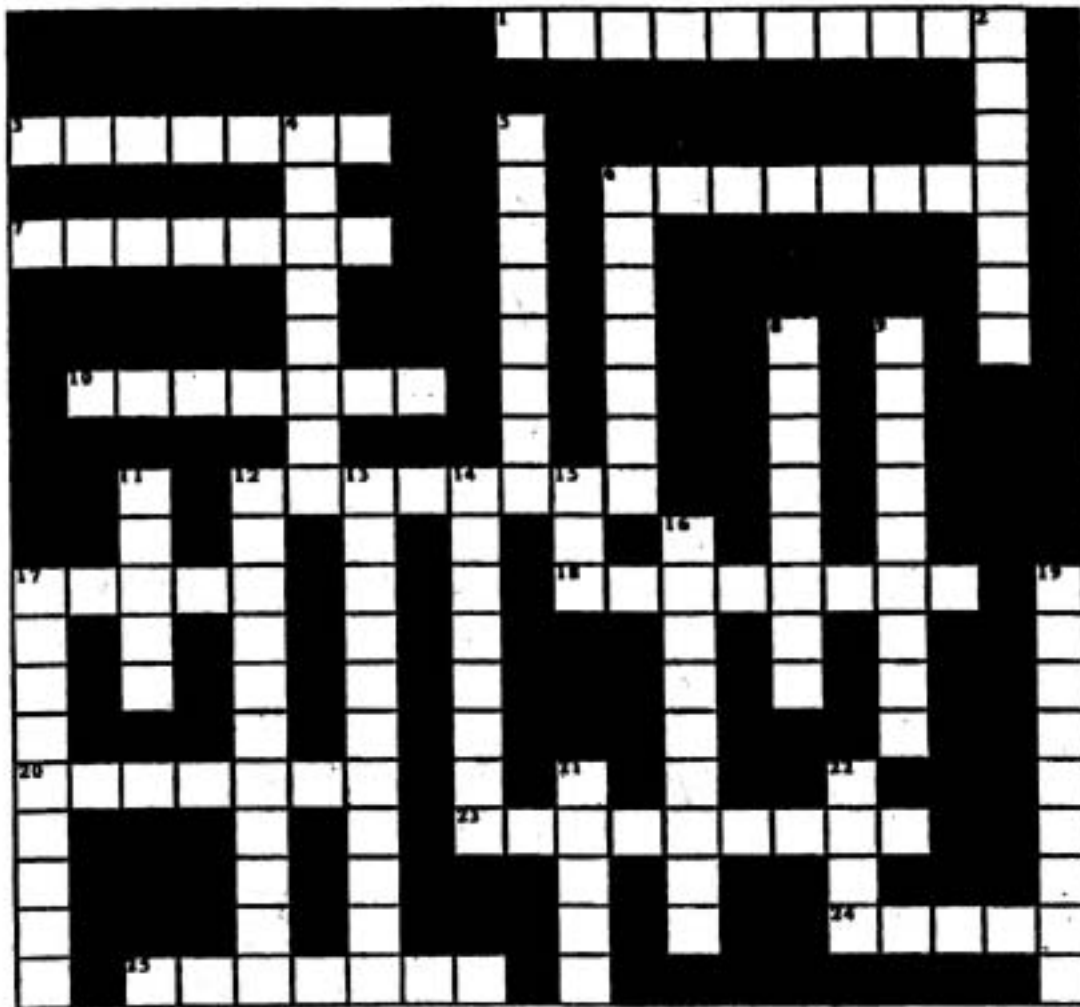
In the past few decades an increasing number of exotic (introduced) marine species have arrived in Hawai'i. In the 1950's several species of snappers and groupers were brought here and released on the reefs. Two of these (Blue-lined Snapper and Argus Grouper) have become very abundant, and are competing with native fish. Non-native aquarium fish and invertebrates have been released by people. These may pose a danger to the reef. If you have aquarium fish that you don't want anymore, you should return them to a pet shop.

Some introduced species arrived here by accident in the ballast water of ocean-going ships. Several species of algae, mollusks, and even fish have arrived this way and are now common, especially in areas like harbors where ships flush their ballast water tanks.

In recent years, at least two large fishing vessels have run aground on the reefs of the Northwestern Hawaiian islands. In addition to the direct damage caused by crashing into the coral, there was the danger that fuel oil from ships would escape into the water. Fortunately this did not happen, but in the past, several small oil slicks of unknown origin have come ashore in the main islands.



# CORAL REEF BENEFITS, THREATS & SOLUTIONS CROSSWORD PUZZLE



## ACROSS

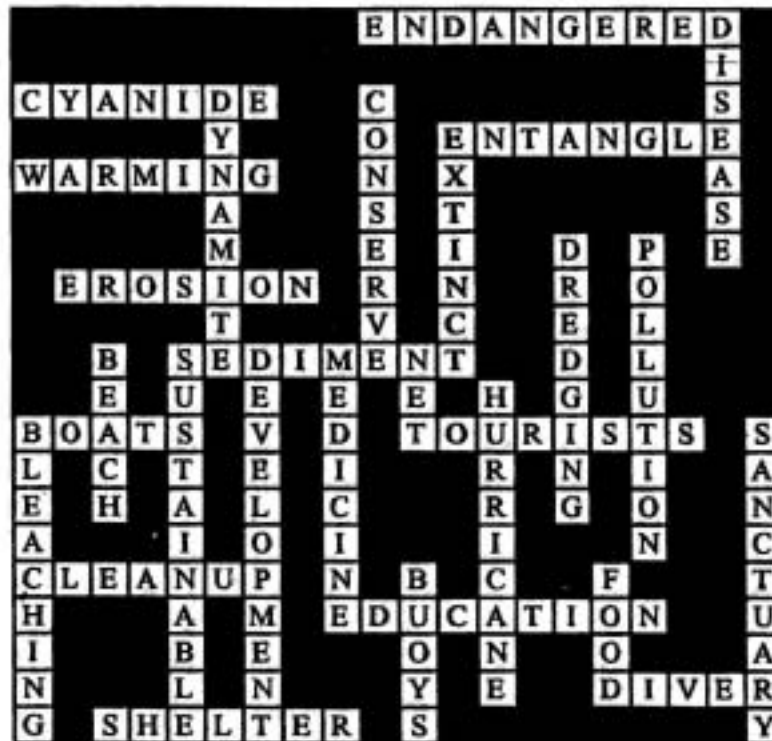
- 1 In danger of becoming extinct
- 3 A type of poison used to catch fish
- 6 To get caught in nets, fishing lines, garbage
- 7 Global \_\_\_\_\_, increase in water temperature
- 10 The washing away of soil
- 12 Fine particles of solid matter suspended in water or settling to the bottom of it
- 17 Vehicles that cause damage by anchoring and grounding
- 18 A source of income that wears tacky shorts and cameras
- 20 Picking up trash
- 23 Learning
- 24 Someone who wears SCUBA gear underwater
- 25 One of the things the coral reef provides to countless thousands of species of plants and animals

## DOWN

- 2 Illness

- 4 An explosive used to kill fish
- 5 To preserve from loss
- 6 No longer in existence
- 8 The clearing of channels
- 9 That which makes something foul or unclean
- 11 Sandy shore
- 12 Non-exploitative use of natural resources
- 13 Building and construction
- 14 A substance of preparation used in treating disease
- 15 A nylon or fiber mesh used in fishing
- 16 A tropical cyclone with winds of 74 miles per hour or greater
- 17 The expelling of endosymbionts from coral polyps due to stress
- 19 A marine protected area
- 21 Moorings used by boats
- 22 One of the things the coral reef provides to thousands of species of plants and animals

**CORAL REEF BENEFITS, THREATS & SOLUTIONS**  
**CROSSWORD PUZZLE**  
**ANSWER KEY**



**ACROSS**

1. ENDANGERED
3. CYANIDE
6. ENTANGLE
7. WARMING
10. EROSION
12. SEDIMENT
17. BOATS
18. TOURISTS
20. CLEANUP
23. EDUCATION
24. DIVER
25. SHELTER

**DOWN**

2. DISEASE

4. DYNAMITE
5. CONSERVE
6. EXTINCT
8. DREDGING
9. POLLUTION
11. BEACH
12. SUSTAINABLE
13. DEVELOPMENT
14. MEDICINE
15. NET
16. HURRICANE
17. BLEACHING
19. SANCTUARY
21. BUOYS
22. FOOD

## **"The Case of Claude the Crab"**

*Your job is to solve the problems of Claude the Crab. Read the story below. Write your own story about what you, the Detective, was able to find out and how the problem got solved.*

It was a hot muggy day and I was sitting sleepily at my desk when in rushed the largest crab I had ever seen. He introduced himself quickly as, Claude the Crab, and told me he desperately needed to hire a private detective. Of course, my first question was what crime was it that needed to be investigated. Immediately, he started talking very fast and clicking his claws together in obvious panic. When I could finally get him calmed down so I could understand him, I started to get the picture.....

The crime was attempted murder. This poor crab's home was being destroyed, and he was in grave danger of being killed! He did not have any idea of what was going on or why someone would want to kill him, Claude was sure that he had no personal enemies, and certainly none capable of the magnitude of destruction he was describing.

Then he gave me the first clue. He said that every day, the beaches and the ocean waters became more crowded with dead objects that he did not recognize. He described many shapes, colors and textures. He said that none of the objects were good to eat, and all they did was clutter up the beach. But the most dangerous, by far, were these funny loops of some strange, thin stuff that was almost invisible. Once you had gotten caught in it, it was almost impossible to get free. He was sure that someone was laying traps for him!

The second clue was his story of how some days the very ocean waters turned poisonous with strange colors and disgusting flavors. He said that on those days, he had no choice but to stay out of the water and go hungry until the poisons had dissipated. The water burned his gills too much to go in.

Furthermore, he said that he was not the only one in danger from there criminals. All of his friends in the ocean were in danger. The fish, seals, dolphins and birds were all fighting for their lives against an enemy that they did not understand. I went right to work and after extensive investigation discovered the following...*(You finish the story)*