

LESSON 2 Taking a Closer Look

Lesson at a Glance

In this lesson, students work in expert groups to learn more about the threatened and endangered marine animals they saw in the Lesson 1 PowerPoint presentation *Are These Animals Extinct, Endangered, or Threatened?* Using information given to students on task cards, and from their own research, students plan a presentation to teach classmates about their animal, environmental conditions it needs to survive, threats to its survival, and possible actions to protect and sustain these animals.

Lesson Duration

Two 45-minute periods

Essential Question(s)

What conditions make so many species in Hawai‘i so vulnerable to become threatened or endangered?

Why does Hawai‘i have more threatened and endangered species than any other state?

Key Concepts

- Many animals need very specific environmental conditions to survive. Some species are so specialized that changes in their environment threaten their survival.
- In order to protect these animals and help them survive, one must understand species' characteristics and behavior, including where it lives, its life span and behaviors, what it eats, how it breeds, and how it dies.
- Why it is important to protect these species?

Instructional Objectives

- I can describe the environmental conditions a threatened or endangered marine animal needs to survive.
- I can describe the characteristics and behavior of a threatened or endangered marine animal in Hawai‘i.
- I can give examples of what has threatened the survival of a marine animal.

Related HCPSIII Benchmark(s):

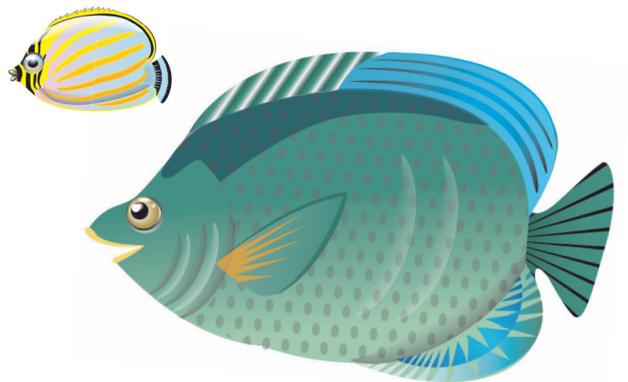
Science SC.4.5.3
Describe how different organisms need specific environmental conditions to survive.

Science SC.4.3.2
Describe how an organism's behavior is determined by its environment.

Language Arts 4.2.5
Summarize main points found in informational texts

Language Arts 4.6.1
Participate in grade-appropriate oral group activities

Language Arts 4.6.2
Give short, informal presentations to inform or persuade



Assessment Tools

Benchmark Rubric:

Topic		Interdependence	
Benchmark SC.4.3.2		Describe how an organism's behavior is determined by its environment	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Explain and give examples of how different organisms' behaviors are determined by their environments	Describe how an organism's behavior is determined by its environment	Identify a way that an organism's behavior is influenced by its environment	Recognize that an organism's behavior is influenced by its environment
Topic		Unity and Diversity	
Benchmark SC.4.5.3		Describe how different organisms need specific environmental conditions to survive	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Explain why different organisms need specific environmental conditions to survive	Describe how different organisms need specific environmental conditions to survive	List specific environmental conditions that organisms need to survive	Recall that organisms need specific environmental conditions to survive
Topic		Constructing Meaning	
Benchmark LA.4.2.5		Summarize main points found in informational texts	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Summarize the main points and describe their connection to the main idea or focus in informational texts	Summarize the main points found in informational texts	Produce a summary that mixes insignificant points with main points	Summarize information not necessary to understanding the main points of informational texts, or repeat original text rather than summarize
Topic		Discussion and Presentation	
Benchmark LA.4.6.1		Participate in grade-appropriate oral group activities	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Participate in grade-appropriate oral group activities, in a highly effective way	Participate in grade-appropriate oral group activities	Participate in grade-appropriate oral group activities, in a limited way or in a way that only partially facilitates the group's work	Participate very little in grade-appropriate oral group activities or participate in a way that does not facilitate the group's work

Topic		Discussion and Presentation	
Benchmark LA.4.6.2		Give short, informal presentations to inform or persuade	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Give creative, short, highly effective informal presentations to inform or persuade	Give short, informal presentations to inform or persuade	Give short, informal presentations that are somewhat informative or persuasive	Give short, informal presentations that do not inform or persuade

Assessment/Evidence Pieces

Lesson

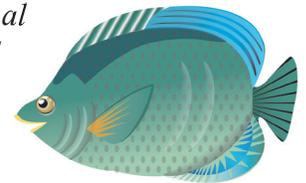
- Student Worksheet: *Looking Closer at a Threatened or Endangered Marine Animal*
- Teacher Resource Checklist: *Taking a Closer Look*

Materials Needed

Teacher	Class	Group	Student
<ul style="list-style-type: none"> • Computer and projector 	<ul style="list-style-type: none"> • Optional: In-class reference materials to supplement cards 	<ul style="list-style-type: none"> • Student Reading: <i>Threatened and Endangered Marine Animal Fact Sheets</i> • Optional: Access to computer for additional research 	<ul style="list-style-type: none"> • Worksheet: <i>Looking Closer at a Threatened or Endangered Marine Animal</i>

Instructional Resources

Student Worksheet: *Looking Closer at a Threatened or Endangered Marine Animal*
 Teacher Reading: *Looking Closer at a Threatened or Endangered Marine Animal*
 Student Reading: *Threatened and Endangered Marine Animal Card*
 Teacher Resource Checklist: *Taking a Closer Look*



Student Vocabulary Words

breeding behaviors: how an animal courts, nests, reproduces, and rears young.

range: the geographic area in which a species is found.

critical habitat: the living space that is important for the survival of the species.

Lesson Plan

Lesson Preparation

- Read the Science Background provided in the Unit's Overview.
- Make two copies of the Student Worksheet *Looking Closer at a Threatened or Endangered Marine Animal* for each student.
- Decide how to assign students into expert groups.

- Review the Student Reading: *Threatened and Endangered Animal Fact Sheets*. Familiarize yourself with what is on each of the suggested URL websites, especially http://www.fpir.noaa.gov/DIR/dir_mammal_turtle_seabird.html#MonkSeals
- Make copies of the Student Reading Threatened and Endangered Marine Animal Card, one per group.

I. *Becoming an Expert*

- Provide a brief overview of the lesson activities and assignments to the class, explaining that in this lesson the students will be working in groups to become experts on one of the threatened or endangered marine organisms mentioned in Lesson 1. Tell students that each expert group will make a presentation to teach classmates about its marine animal. The presentation may be a skit or a poster, or (time permitting) a PowerPoint presentation.
- Establish your expectations for how each group is to do its research, including using computers and in-class reference materials.
- Divide the class into expert groups. There are six different cards, so you may want six groups or twelve groups.
- Model what each expert group needs to do. Give each student a copy of the Student Worksheet *Looking Closer at a Threatened or Endangered Marine Animal*. Explain to the students that you will first give them an example of what they are to do in their expert groups using a marine animal that the class has not talked about yet. Introduce the *Hawaiian Petrel* as an example to show what is expected of each expert group. Show the Threatened and Endangered Marine Animal Card: Hawaiian Petrel, and project images using the suggested URLs on the task card.
- Distribute a copy to each group of the Threatened and Endangered Marine Animal Card: Hawaiian Petrel. Facilitate group work and whole-class discussions as the students search for information to describe the behavior, characteristics and environmental conditions needed by the Hawaiian Petrel, as well as past and present threats to its survival.
- Distribute cards and additional worksheets of *Looking Closer at a Threatened or Endangered Marine Animal* to the groups for their threatened or endangered species. Ask students to use the cards and the Internet as sources to complete the worksheet.
- Have expert groups present their findings of their animal research to the class.
 - Show students the teacher resource checklist so students are clear about the expectations for this assignment. Have students use the resource checklist to review their work.
 - Presentation may be used to assess students formatively.

II. *Check for Understanding.*

- Lead a whole-class discussion, asking each expert group to help you summarize for the class what the expert groups have learned about their animal.
- After reviewing what each expert group learned about its assigned information, lead a discussion to summarize the information learned about threatened and endangered marine animals in Hawai‘i. Here are some suggested questions:
 - What kinds of threats to survival do marine animals face here in Hawai‘i?
 - What threatens the animals that nest and lay eggs on land? What are their natural predators? What introduced alien species threaten their survival?
 - What threatens the animals where they live or forage for food?
 - In the past, which of these animals was hunted, and are they still being hunted today?
 - What kinds of human activities are taking place today that cause harm to these marine animals? What suggestions can the class make for protecting marine animals?



LESSON 2 Looking Closer at a Threatened or Endangered Marine Animal

NAME _____ Date _____

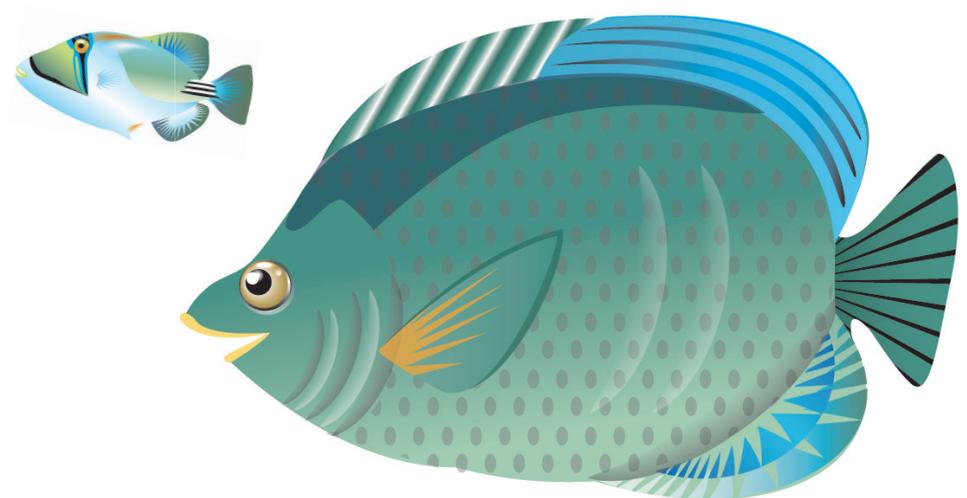
Purpose:

Work with others in your group to become experts on one of the threatened or endangered marine animals of Hawai'i. After you have become an expert, present what you have learned to the class.

Data Gathering – start with website:

http://www.fpir.noaa.gov/DIR/dir_mammal_turtle_seabird.html#MonkSeals

1. Summarize the main points found in the website.
2. Identify and describe your animal. Include its common name, its Hawaiian name, and its scientific name:
3. Where does it live? Include the range, distribution, habitat:
How does it move? Does it migrate?



NAME _____ Date _____

4. What does it eat?

5. Where does it breed?

6. How does it protect itself from predators?

7. What specific environmental conditions does your animal need to survive?

8. What kinds of human activities are taking place today that cause harm to these marine animals?

9. What suggestions can you make for protecting marine animals?



LESSON 2 Teacher Answer Key Looking Closer at a Threatened or Endangered Marine Animal

Data Gathering

1. Identify and describe your animal. Include its common name, its Hawaiian name, and its scientific name.

Hawaiian petrel or 'Ua'u or Pterodroma sandwichensis (endangered)

2. Where does your animal live? Include the range, distribution, habitat.

The Hawaiian Petrel is a marine bird that spends much of its life at sea. Its range includes 10,600,000 km² of the central Pacific Ocean, and it nests in colonies on the main Hawaiian Islands of Maui, Kauai, Hawai'i, Lanai and possibly Molokai. The nesting habitat of the 'Ua'u are burrows found in remote mountainous locations with large rocks, cinder cones, or soil under thick vegetation.

3. What does it eat?

In Hawai'i, 'ua'u (Hawaiian petrel) eat mainly squid, but also fish (like goatfish and lantern fish) and crustaceans.

4. Where does it breed?

The 'Ua'u (Hawaiian petrel) nest in colonies on the main Hawaiian islands of Maui, Hawai'i, Lanai and Kauai between March and October of every year. The largest colony is on Haleakala Crater, Maui and the summit of Lanai. Colonies are typically located in high elevation, dry habitats or wet, dense forests. Their nests are in burrows 3-30 feet (1-9 meters) long, crevices, or cracks in lava tubes. Most eggs are laid between May and June and most birds fledge (can fly away and live on their own) by December.

5. How does it protect itself from predators?

The Hawaiian petrel is a marine bird which spends a lot of time at sea. It has no natural defenses against predators on land other than to fly away and/or bite with its beak.

6. What specific environmental conditions does your animal need to survive?

To feed: Open ocean surfaces with adequate food sources which include squid and fish.

To breed: High elevation areas where burrows in dry habitats or in dense forests are protected from introduced predators or introduced animals which may trample and collapse burrows (ie. Cats, mongoose, rats, sheep and goats)

7. What kinds of human activities are taking place today that cause harm to these marine animals?

Hawaiian Petrels are attracted to and confused by bright lights at night, and may collide with power lines and telephone poles during their nocturnal flights to feed.

8. What suggestions can you make for protecting marine animals?

The Hawaiian Petrel is being helped on Maui and Lanai by protecting its burrows from introduced predators and on Kauai, street lighting is being shielded or turned off. On Maui, Lanai and Kauai young birds which have become tired from circling lights are collected, cared for and released away from buildings and lights.

9. What are similar species?

Juan Fernandez Petrel Pterodrom. externa, White-necked Petrel Pterodroma cervicalis and the Galápagos Petrel Pterodroma phaeopygia

LESSON 2 Threatened and Endangered Marine Animal Card

Student Example: 'Ua'u Hawaiian Petrel



Summary: The 'Ua'u, Hawaiian Petrel is an endangered seabird which feeds in the open Pacific Ocean and breeds on some of the main Hawaiian Islands. This species was once found on all main Hawaiian Islands (except *Ni'ihau*) but was heavily hunted for food. Today the 'Ua'u continues to be endangered because of road and building development, attraction to and collision with lights, predation from cats, mongoose and rats, and destruction of their nesting burrows by feral goats and sheep.

Habitat: The open ocean for feeding. It nests in long burrows found in high rocky outcrops, cinder cones or cracks in old lava with little vegetation, or in burrows in *Obi'a* forests.

Feeding habits: 'Ua'u (Hawaiian petrel) can feed thousands of kilometers from where it nests, usually looking for food with other seabirds on the open ocean. They feed on fish and squid near the surface of the water. The 'Ua'u (Hawaiian petrel) can feed on prey while sitting on the water or by flapping just above the ocean surface, and 'dipping' their beak in the water for prey while 'pattering' the ocean surface with their feet. Recently, scientists found that some of the birds from *Lana'i* feed in waters around the Aleutian Islands.

Breeding: The 'Ua'u, Hawaiian Petrel lay 1 egg in each 3-30 foot long burrow between May and June every year. Both parents incubate, feed and take care of the chick until it is ready to leave the nesting colony by December. It takes 5-6 years before these birds are old enough to lay their own egg.

Natural and manmade threats: Natural threats are mongoose, feral cats, and rats that prey on nestlings, and the sheep and goats which may step on and crush nest burrows. Manmade threats are hunting, road and building development, power lines, and artificial lighting on islands.

What can we do/what is being done to protect this species? Humans are building fences around Hawaiian Petrel colonies on *Maui* and *Lana'i*. On *Kauai*, street lights are being shielded or turned off. On *Maui*, *Lana'i* and *Kauai* young birds which have become tired from circling lights are collected, cared for and released away from buildings and lights.

Photo Credit: NPS Haleakalā National Park

Similar species: Juan Fernandez Petrel / *Pterodroma externa*, White-necked Petrel / *Pterodroma cervicalis* and the Galápagos Petrel / *Pterodroma phaeopygia*

Online sources to acquire additional information:

FWS

<http://www.fws.gov/pacificislands/teslist.html>

<http://www.fws.gov/pacificislands/fauna/uau.html>

Birdlife International

<http://www.birdlife.org/datazone/species/index.html?action=SpcHTMDetails.asp&sid=3896&m=0>

Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife

<http://www.state.hi.us/dlnr/dofaw/cwcs/files/NAAT%20final%20CWCS/Chapters/Terrestrial%20Fact%20Sheets/Seabirds/Hawaiian%20petrel%20NAAT%20final%20!.pdf>

LESSON 2 Threatened and Endangered Marine Animal Card

Humpback Whale *Megaptera noveangliae*



Summary: Humpback whales are enormous endangered marine animals. They live in the open ocean, but return to the coastal waters for feeding and breeding. There are 5,000–7,000 humpback whales on Earth. The humpback whales are grouped according to where they live. One group lives in the waters off the coast of Alaska and migrates to the Hawaiian Islands during the winter.

Habitat: Humpback whales live in all of the oceans of the world. The group of humpbacks most familiar to residents of Hawai‘i lives in the

North Pacific Ocean, feeds around the Gulf of Alaska, Southeast Alaska, and Central California, and winters around the Hawaiian islands.

Feeding habits: Humpback whales feed near shore and eat krill, which are tiny shrimp-like creatures. Humpback whales swim toward their food with their mouths open. They take in both water and krill, and then force the water out, keeping the krill in their mouth with their baleen.

Breeding: Between the ages of 4 and 8, humpback whales become reproductively mature. They mate during their winter migration southward, and return to their winter breeding grounds to give birth. Mothers give birth to only one calf. A female humpback whale can have one calf every two or three years.

Ask you teacher for PowerPoint: "Humpback Whale Migration"

Natural and manmade threats: Whaling or whale hunting is a great threat to whales. Exposure to pollution in the ocean is also a threat to whales. Recently scientists have noticed that sonar used by the navy may result in mass beachings of whales.

What can we do/what is being done to protect this species?

While most countries do not hunt whales currently, Norway, Iceland, and Japan, and native peoples of Siberia, Alaska, and northern Canada continue to hunt. Decreasing pollution in the ocean and decreasing use of sonar may also help whales.

Similar species: Finback whales, right whales.

Online sources to acquire additional information:

<http://animals.nationalgeographic.com/animals/mammals/humpback-whale.html>

http://www.nmfs.noaa.gov/pr/pdfs/education/kids_times_whale_humpback.pdf

Photo Credit: celebrating200years.noaa.gov



LESSON 2 Threatened and Endangered Marine Animal Card

Hawaiian Stilt *Ae'o*



Summary: The Hawaiian Stilt lives in the wetlands on the Hawaiian Islands.

Feeding habits: The Hawaiian Stilt needs mud flats found in wetlands and marshes in order to feed on small fish, worms, crabs, and insect larvae. The Hawaiian Stilts feed alone and in groups.

Breeding: Information on Hawaiian Stilt breeding is sparse. Adults may pretend to have a broken wing to lure predators away from their nests before they fly away.

Natural and manmade threats: Land development often results in the drainage of marshes and wetlands. This destroys the habitat for the Hawaiian Stilt. They are also threatened by mongoose, cats, and dogs.

What can we do/what is being done to protect this species? The Hawaiian Stilt has been listed as an endangered species since 1970. Protecting the habitat for the Hawaiian Stilt would help preserve the populations. Stilts are also being raised in zoos in order to increase their numbers.

Online sources to acquire additional information:

<http://www.fws.gov/pacificislands/fauna/Stilt.html>

http://www.honolulu zoo.org/Hawaiian_Stilt.htm

<http://www.state.hi.us/dlnr/dofaw/cwcs/files/NAAT%20final%20CWCS/Chapters/Terrestrial%20Fact%20Sheets/Waterbirds/Hawaiian%20Stilt%20NAAT%20final%20!.pdf>

Ae'o - Photo credit USFWS

LESSON 2 Threatened and Endangered Marine Animal Card

Hawaiian Monk Seal



Summary: The Hawaiian Monk Seal is an endangered seal in the isolated Northwestern Hawaiian Islands and to a lesser extent in the main Hawaiian Islands. Human encroachment on their habitat threatens their survival.

Habitat: The Hawaiian Monk Seal lives in the Northwestern Hawaiian Islands and main Hawaiian Islands in particularly isolated locations. It spends part of its life at sea and part on land. The monk seals do not migrate.

Feeding habits: The Hawaiian Monk Seal eats fish, eels, octopi, and crustaceans. They can remain in the ocean for long periods of time, diving as deep as 600 feet.

Breeding: Breeding occurs on the Northwestern Hawaiian Islands, usually in the spring and summer. Hawaiian Monk Seal mothers have their pup on the beaches near shallow water. This protects the mother and pup from sharks. Mothers have been known to abandon their pups when there is too much visible human activity in surrounding areas.

Natural and manmade threats: Monk seals can become entangled in fishing nets and lines. Sharks, particularly tiger sharks, are also a major threat to monk seals.

What can we do/what is being done to protect this species? Hawaiian Monk Seals are protected by federal laws. Their breeding islands are also protected as part of the Hawaiian Islands National Wildlife Refuge. However, because Hawaiian Monk Seals are extremely sensitive to humans, it is extremely important to stay away from them.

Similar species: Caribbean Monk Seal and Mediterranean Monk Seal.

Online sources to acquire additional information:

http://www.fpir.noaa.gov/PRD/prd_Hawaiian_monk_seal.html

<http://www.fws.gov/pacificislands/wesa/monkhi.html>

<http://www8.nos.noaa.gov/onms/park/Parks/SpeciesCard.aspx?PID=12&refID=1&CreatureID=1078>

http://oceanexplorer.noaa.gov/explorations/02Hawai'i/background/monk_seals/monk_seals.html

LESSON 2 Threatened and Endangered Marine Animal Card

Newell's Shearwater or 'a'o



Summary: The Newell's Shearwater is a threatened migratory seabird, and one of 55 species of shearwater birds. Shearwater birds are strong flyers with weak legs, and spend most of their time at sea.

Habitat: The Newell's Shearwater bird lives over the shallow ocean and travels to land in order to breed. The shearwater is considered pelagic, meaning it lives primarily on the open ocean. The Shearwater birds need fern-covered slopes with scattered trees and soft clay soils to dig their burrows for breeding.

Feeding habits: The Newell's Shearwater bird feeds on fish and squid while over the ocean. They regurgitate their food to feed their young.

Breeding: The Newell's Shearwater bird spends the winter over the open ocean, and flies to the breeding grounds in a small area of *Kaua'i* in April. Egg laying takes place during a three-week period in May and June, and eggs hatch 51 days later. Breeding and incubation occur in shearwater burrows in the clay or sand.

Natural and manmade threats: The black rat is the biggest threat to the Newell's Shearwater. It locates the burrows and eats the young. Newell's Shearwaters have been known to fly into power cables and become disoriented by lights in urban areas. Their habitat is also being destroyed by development. Feral cats are also reducing the numbers of population.

What can we do/what is being done to protect this species? Programs have been started on *Kaua'i* to rehabilitate Newell's Shearwaters after they run into cables or become disoriented.

Similar species: Magenta Petrel, Fiji Petrel, Reunion Petrel, Chathams Islands Petrel, Barau's Petrel, Beck's Petrel, Jamaica Petrel, Zino's Petrel, Galapagos Petrel, Bermuda Petrel, Black-capped Petrel, Hawaiian Dark Rumped Petrel, Heinroth's Shearwater, Townsend's Shearwater and Hutton's Shearwater.

Online sources to acquire additional information:

<http://www.fws.gov/pacificislands/fauna/newellsshearwater.html>

<http://www.state.hi.us/dlnr/dofaw/cwcs/files/NAAT%20final%20CWCS/Chapters/Terrestrial%20Fact%20Sheets/Seabirds/newell%27s%20shearwater%20NAAT%20final%20!.pdf>

<http://www.botany.Hawaii.edu/gradstud/eijzenga/seabirdsHawai'i/Newell%27s%20Shearwater.htm>

LESSON 2 Threatened and Endangered Marine Animal Card

Green Sea Turtle



Summary: Green Sea Turtles are a threatened species of turtles that spend most of their lives in the ocean. The turtle population in Hawai‘i migrates between the Northwestern Hawaiian Islands, where they breed, and the main Hawaiian Islands.

Habitat: Hawaiian Green Sea Turtles live in three different habitats: nesting beaches, the pelagic zone, and the benthic feeding ground.

Feeding habits: Green Sea Turtles eat only plants as adults, but as juveniles, they eat jellyfish and invertebrates.

Breeding: Adult females lay their eggs on the beach on which they were born. Both males and females migrate from their feeding areas on the coasts of the main Hawaiian Islands to their nesting beaches in the Northern Hawaiian Islands. They mate off shore, mainly on the French Frigate Shoals.

Natural and manmade threats: Human activities on beaches have resulted in the loss of these beaches as nesting beaches for turtles. Turtles are still hunted for their shells, leather, meat, and their eggs are stolen. Turtles get caught in nets at sea (driftnets, gillnets, trawling nets). Fibropapilloma, a disease that causes turtle tumors, also has affected many green sea turtles in Hawai‘i.

What can we do/what is being done to protect this species? Although turtles are fully protected under federal law, they continue to be hunted, as well as injured at sea. A number of government agencies have formed a team to help the population of Hawaiian Green Sea Turtles recover.

Similar species: Hawksbill turtle, Leatherback turtle.

Online sources to acquire additional information:

http://www.fpir.noaa.gov/PRD/prd_green_sea_turtle.html

<http://www.turtles.org/hawgrnd.htm>

When looking through this site, when you reach the “Threats” section, you can click on the; “Threats to Marine Turtles” phrase and it will bring you to the link below:

<http://www.turtles.org/threats.htm>

Photo Credit: Andy Bruckner, NOAA

LESSON 2 Teacher Resource Checklist

Taking a Closer Look

- What kinds of threats to survival do marine animals face here in Hawai'i?
- How do these species protect themselves from predators?
- What environmental conditions do these animals need to survive?
- What kinds of human activities are taking place today that cause harm to these marine animals?
- What suggestions can the class make for protecting marine animals?

Name	<i>Summarized main points found in informational texts</i>	<i>Can describe threats to survival do marine animals face here in Hawai'i.</i>	<i>Can describe kinds of human activities taking place today that cause harm to marine animals</i>	<i>Makes a connection between the organism and environment</i>
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