Activity #1

Weren't There More of Us? Game

● ● ● Class Period One *Weren't There More of Us?*

Materials & Setup

- "Actual Size at First Reproduction" poster (included with this curriculum)
- "Reef Animal Photos" (master, pp. 18-24)
- One set of "Discussion Question Cards" (master, p. 25)

Per student group (Play with groups of four to eight students OR with an entire class of up to forty students.)

- One set of 40 "Weren't There More of Us?" game cards (master, pp. 9-13)
- "Weren't There More of Us?" Species List (one per student if playing with a single large group—master, p. 14)
- "Weren't There More of Us?" Instruction Card for small or large groups (one per student if playing with a single large group—master, pp. 15-16)
- Hawai'i fishing regulations flyers (included with this curriculum and available from the Hawai'i Department of Land and Natural Resources, Division of Aquatic Resources)

Instructions

1) Tell students they are going to play a game in which the objective is to work cooperatively to correctly match Hawaiian reef animals with exactly five corresponding characteristics and fishing regulations.

2) Play the game with a whole class of up to forty students or divide students into groups of four to eight. Groups will work independently, so they do not need to be of equal size. Hand out the game cards, species list, and appropriate instruction card.

3) Review game instructions with students.

4) Before starting the game, show pictures of all eight reef animals to students, and provide the name of each animal. You may choose to make the photos available for student viewing during the game or make the game more challenging by having student examine the photos only once at the beginning of the game. Do not give further information about the animals and their characteristics.

5) During the activity, do not give students any clues about the identity of the animals.

6) Conduct the game according to the appropriate game instructions for your group size.

7) After the game, divide the class into four groups and give each group one Discussion Question card. Give groups several minutes to come up with a response to the question and then lead a class discussion about the game using these discussion questions.

Notes

- "Sustainable yield" generally refers to taking animals at a time and in a way that enables the populations to maintain themselves over time.
- Examples of actions that could supplement government regulations protecting reef animals include education, enforcement, and setting up marine protected areas where animals can grow to reproductive maturity because they are not fished or hunted there.

Journal Ideas

- In traditional Hawaiian culture, fishermen offered their first catch to the gods. Do you do this or know anyone who does? Why is this practice significant?
- Do you think that people respect government regulations such as fishing limits and seasons? Why or why not?
- Hawaiians traditionally viewed the ocean as their icebox, taking only what they needed at the time and coming back for more when necessary. Do you think this view still influences people who fish in Hawaiian waters? Why or why not? If it has changed, what might have contributed to these changes?
- Do you think it is important that future generations be able to enjoy and use the reef animals that we do today? Why or why not?
- What do you think are the most effective ways to protect reef animals?

Assessment Tools

- Participation in the game
- Group reasoning ability and correct responses during the game
- Participation in group and class discussion
- Journal entries

Teacher Background

Weren't There More of Us? — Answer Key

Lauʻīpala, Yellow tang (*Zebrasoma flavescens*)

- I live on shallow reefs around islands from Hawaiʻi to southern Japan but am abundant only in Hawaiʻi.
- I graze on *limu* (seaweed) on the rocks near the shore in calm areas.
- I am bright yellow in color.
- I am a popular aquarium fish, and more of me are collected and exported than any other fish in Hawaiʻi.
- I am not protected by Hawaiʻi fishing regulations.

Moi, Six-fingered threadfin (*Polydactylus sexfilis*)

- I am silvery with a deeply forked tail and live near the ocean bottom.
- The lower part of my pectoral fin is very unusual in that it has six separate slender rays that I use to probe for food on the ocean bottom.
- I eat shrimps, crabs, worms and other invertebrates that I search for on the ocean bottom.
- Because I have become scarce from overfishing, I am being grown in aquaculture facilities and restocked into coastal waters.
- The season for me is closed June through August. I can be taken once I reach seven inches in length, but I do not reproduce until I'm 11 inches long. You can only take 15 of me.

ʻOpihi, Limpet (*Cellana* spp.)

- I am shaped like a volcano.
- I live on surf-swept lava rocks and hang on tightly with my muscular foot.
- I creep slowly and eat algae on the surface of the rocks.
- My populations are decreasing because I am collected off the rocks when I am too small and haven't had a chance to reproduce.
- I can be collected all year long, but my shell has to be at least 1 1/4 inches wide.

Heʻe mauli, Day octopus (*Octopus cyanea*)

- I am very hard to see because I can change my skin texture and color to blend in with the reef.
- When frightened, I can jet away or squirt out black ink.
- I mainly eat crabs, which I pounce on with the web between my arms spread wide.
- I am strongly attracted to certain cowries which were used in old times as lures to catch me.
- I can be taken all year long but need to weigh at least one pound.

Ula, Spiny lobster (two species of *Panulirus*)

- I have ten legs and a hard outer shell with forward-pointing spines.
- I hide in caves and crevices and come out at night to feed.
- The meat in my tail is a highly prized food.
- Since I am easy to catch in traps or tangle nets, I am vulnerable to overfishing.
- I cannot be taken from May through August. You can keep me only if my tail is at least 2 3/4 inches wide. You cannot fish for me with a spear or take me if I am a female with eggs.

Uhu, also *Pālukaluka,* Redlip parrotfish (*Scarus rubroviolaceus*)

- I am a sand maker. I bite off pieces of dead coral, then grind it to sand in hard plates in my throat.
- If I am a female, I can change sex and color and become a beautiful blue male.
- I am an herbivore. My teeth are fused together to form a beak for scraping algae off rock and dead coral.
- I have large scales covering my body, which help protect me.
- I can be speared or sold once I reach one pound. I am 14 inches long when I first spawn.

Ulua aukea, Giant trevally (*Caranx ignobilis*)

- I am silvery with a deeply forked tail and swim in midwater.
- I feed on fishes that I chase down.
- I can be five feet long and weigh 145 pounds.
- I can reproduce once I reach 21 inches in length, but you can legally catch me when I'm only seven inches long.
- I am usually caught by polefishing from the shore between dusk and dawn.

Kūmū, Whitesaddle goatfish (*Parupeneus porphyreus*)

- I am pinkish red in color and stay near the bottom of the reef.
- I have two barbels or sensory "feelers" on my chin that I wiggle while probing the bottom for crabs, worms, and snails.
- I can be taken at seven inches but don't reproduce until I'm 11 inches long. You can fish for me all year long, and there is no limit to the number that can be taken.
- I am found only in Hawai'i. In the old days I was used as an offering to the gods when a red fish was needed.
- I am one of the largest of my type of fish, reaching 16 inches in length.

Weren't There More of Us? cards (cut on dashed lines)

I live on shallow reefs around islands from Hawai'i to southern Japan but am abundant only in Hawai'i.

I am not protected by Hawai'i fishing regulations.

I graze on *limu* (seaweed) on the rocks near the shore in calm areas.

I am silvery with a deeply forked tail and live near the ocean bottom.

I am bright yellow in color.

The lower part of my pectoral fin is unusual in that it has six separate slender rays that I use to probe for food on the ocean bottom.

I am a popular aquarium fish, and more of me are collected and exported than any other fish in Hawai'i.

I eat shrimps, crabs, worms and other invertebrates that I search for on the ocean bottom.

Weren't There More of Us? cards (cut on dashed lines)

Because I have become scarce from over-fishing, I am being grown in aquaculture facilities and restocked into coastal waters.

I am shaped like a volcano.

The season for me is closed June through August. I can be taken once I reach seven inches in length, but I do not reproduce until I'm 11 inches long. You can only take 15 of me.

I live on surf-swept lava rocks and hang on tightly with my muscular foot.

I creep slowly and eat algae on the surface of the rocks.

My populations are decreasing because I am collected off the rocks when I am too small and haven't had a chance to reproduce.

I can be collected all year long, but my shell has to be at least 1 1/4 inches wide.

I am very hard to see because I can change my skin texture and color to blend in with the reef.

Weren't There More of Us? cards (cut on dashed lines)

When frightened, I can jet away or squirt out black ink.

I have ten legs and a hard outer shell with forward-pointing spines.

I mainly eat crabs, which I pounce on with the web between my arms spread wide.

I hide in caves and crevices and come out at night to feed.

I am strongly attracted to certain cowries which were used in old times as lures to catch me.

The meat in my tail is a highly prized food.

I can be taken all year long but need to weigh at least one pound.

Since I am easy to catch in traps or tangle nets, I am vulnerable to overfishing.

Weren't There More of Us? cards (cut on dashed lines)

I cannot be taken from May through August. You can keep me only if my tail is at least 2 3/4 inches wide. You cannot fish for me with a spear or take me if I am a female with eggs.

I am a sand maker. I bite off pieces of dead coral, then grind it to sand in hard plates in my throat.

If I am a female, I can change sex and color and become a beautiful blue male.

I am an herbivore. My teeth are fused together to form a beak for scraping algae off rock and dead coral.

I have large scales covering my body, which help protect me.

I can be speared or sold once I reach one pound. I am 14 inches long when I first spawn.

I am silvery with a deeply forked tail and swim in midwater.

I feed on fishes that I chase down.

Weren't There More of Us? cards (cut on dashed lines)

I can be five feet long and weigh 145 pounds.	**I can reproduce once I reach 21 inches in length, but you can legally catch me when I'm only seven inches long.**
I am usually caught by polefishing from the shore between dusk and dawn.	**I am pinkish red in color and stay near the bottom of the reef.**
I have two barbels or sensory "feelers" on my chin that I wiggle while probing the bottom for crabs, worms, and snails.	**I can be taken at seven inches but don't reproduce until I'm 11 inches long. You can fish for me all year long, and there is no limit to the number that can be taken.**
I am found only in Hawai'i. In the old days I was used as an offering to the gods when a red fish was needed.	**I am one of the largest of my type of fishes, reaching 16 inches in length.**

Weren't There More of Us?

Species List

1. *Lau'īpala*, Yellow tang *(Zebrasoma flavescens)*
2. *Moi*, Six-fingered threadfin *(Polydactylus sexfilis)*
3. *'Opihi,* Limpet *(Cellana* spp.*)*
4. *He'e mauli*, Day octopus *(Octopus cyanea)*
5. *Ula*, Spiny lobster *(*two species of *Panulirus)*
6. *Uhu,* also *Pālukaluka,* Redlip parrotfish *(Scarus rubroviolaceus)*
7. *Ulua aukea*, Giant trevally *(Caranx ignobilis)*
8. *Kūmū*, Whitesaddle goatfish *(Parupeneus porphyreus)*

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Weren't There More of Us?

Game Instructions for Teams of Four to Eight Students

Object

Work cooperatively to match Hawaiian reef animals with exactly five corresponding characteristics and fishing regulations—the first team to make all the correct matches wins.

How to Play

1) Choose a dealer who gives one card to each player.

2) Play begins with the player to the right of the dealer and proceeds in a counter-clockwise direction.

3) The first player reads the information on his or her card aloud.

4) The entire group discusses which of the animals on the Species List the characteristic belongs to. The player with the card becomes that animal's "keeper." Consult the fishing regulations flyer and "Size at First Reproduction" poster for help when you need it.

5) The second player reads the information on her or his card.

6) After group discussion, the group may decide that the second animal is the same as the first animal. If so, the card is given to the first "keeper." If the second animal is different than the first, the second player keeps the card and becomes the "keeper" of the second animal.

7) Continue until all the first round cards have been read and assigned to a keeper.

8) Continue dealing rounds of cards and assigning them to animals, as before.

9) After the second round, there may be some players without animals to "keep" and some with more than one animal. When that happens, a player without an animal to keep should "adopt" one from a player who is keeping more than one animal, so each player has an animal to keep. If there are fewer than eight players, some will have more than one animal.

10) When all the cards have been assigned, keepers should have exactly five fact cards for each animal. If some animals have more than five cards, you must determine which cards have been incorrectly assigned. Some features may overlap slightly, so your team will need to discuss the possibilities and look for clues to the correct match.

11) When you think you have the correct matches, ask your instructor to check your team's work.

Weren't There More of Us?

Game Instructions for Groups Up to Forty Students

Object

Work cooperatively to match Hawaiian reef animals with exactly five corresponding characteristics and fishing regulations

How to Play

1) Pass out all the cards. Some players may have more than one.

2) Players read the information on their card(s) and try to determine the identity of the animals.

3) When players think they know what their animal(s) is, they call out the name. For example, a person with the card that says, "I have a lush fur coat," calls out, "Monk seal!"

4) Other players listen to the names being called out and try to fit the information on their cards into one of the animal groups. They give their cards to the first person who called out the name of a particular animal. That person is designated the "keeper," and the other students join him or her to find the other correct matches for that animal.

5) When all the cards have been added to a set, keepers should have exactly five fact cards for each animal. If some animals have more than five cards, players must get together to determine which cards have been incorrectly assigned. Some features overlap slightly, so you will need to discuss the possibilities and look for clues to the correct match.

6) Consult the fishing regulations flyer and "Size at First Reproduction" poster for help as needed.

7) At the end of the game, ask your instructor to check the sets to determine if they are correct.

Lauʻīpala, Yellow tang (*Zebrasoma flavescens*)

Photo: John P. Hoover, Hawaii's Fishes, *Mutual Publishing*

Moi, Six-fingered threadfin (*Polydactylus sexfilis*)

Photo: John P. Hoover, Hawaii's Fishes, *Mutual Publishing*

ʻOpihi, Limpet (*Cellana* spp.)

Cellana exarata *pictured (Photo: Ann Fielding)*

He'e mauli, Day octopus (*Octopus cyanea*)

Photo: David R. Schrichte in John P. Hoover,
Hawai'i's Sea Creatures, *Mutual Publishing*

Ula, Spiny lobster (two species of *Panulirus*)

Panulirus marginatus *pictured*
(Photo: John P. Hoover, Hawai'i's Sea Creatures, *Mutual Publishing)*

Uhu, also *Pālukaluka,* Redlip parrotfish (*Scarus rubroviolaceus)*

Photo: Bruce Carlson

Ulua aukea, Giant trevally (*Caranx ignobilis*)

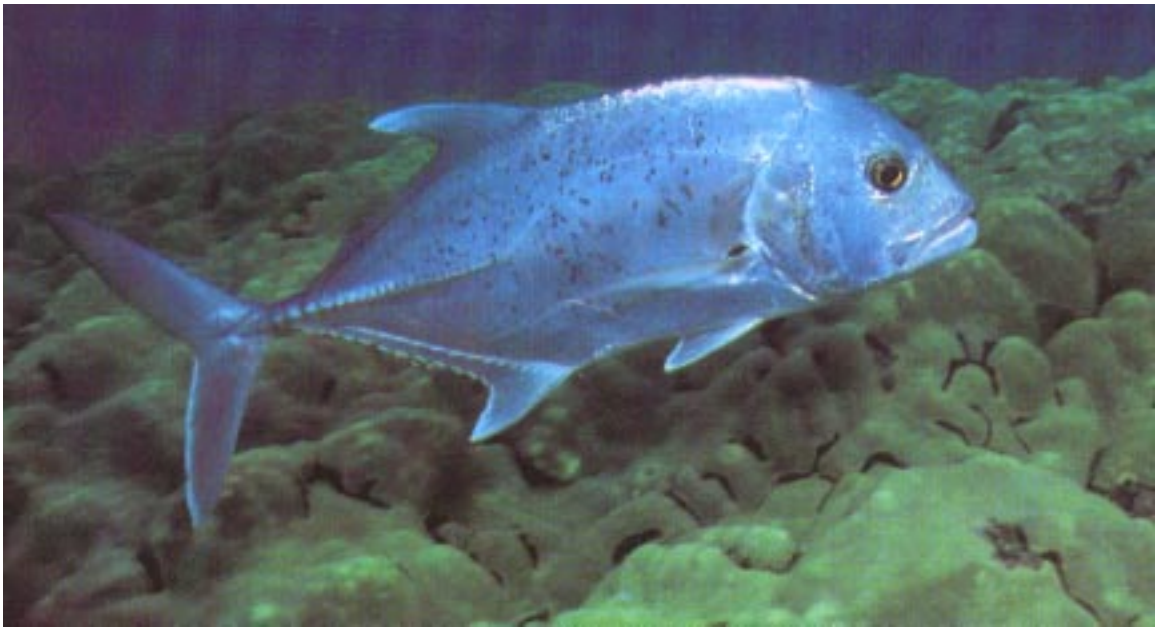

Photo: David R. Schrichte in John P. Hoover,
Hawaii's Fishes, *Mutual Publishing*

Kūmū, Whitesaddle goatfish (*Parupeneus porphyreus*)

Photo: John P. Hoover, Hawaii's Fishes, *Mutual Publishing*

Discussion Question Cards

Cut apart on dashed lines

Most of the reef animals in the game are protected by regulations such as closed seasons, size limits, and limits on numbers of animals that can be taken. But, as you learned, the size limits on some species allow people to take animals that have not been able to reproduce yet. Does this seem smart to you? Why or why not?

What do you think the best way is to protect populations of reef animals? Explain your answer.

What do you think the term "sustainable yield" means when it comes to catching or collecting reef animals?

The government regulates the taking of reef animals that have been determined to be at risk for overfishing/harvesting. Do you think fishing/hunting regulations are effective tools for protecting reef animals? Do you think they can work by themselves?