

## That's An Otter Story

**Lesson Concept** Ecosystems change due to natural causes or human impact.

**Link** In the last set of lessons, students learned that matter cycles and energy flows in food chains and webs. They were introduced to the concept that if something impacts one member of the web, it can have multiple impacts on other members. In this lesson, students learn that humans impact ecosystems (including food webs) in both positive and negative ways.

**Time** 60 minutes

**Materials** Whole Class  
Computer and projector/speakers  
Individual  
That's an Otter Story Packet

**Advance preparation**

1. Find the web site: Jean Michel Cousteau Ocean Adventures/Kelp Forest/PBS ([www.youtube.com/watch?v=v\\_aSI3iL7rM](http://www.youtube.com/watch?v=v_aSI3iL7rM)) and set up the computer and projector.
2. Duplicate Otter Story packet for students.

**Procedure:**

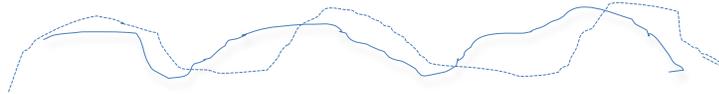
**Engage** *(10 minutes) Organisms depend on resources in the environment; without them the population decreases.*

1. Ask students to review their notes in their science notebook from the Oh Heron! Lesson (lesson #5). Have them work with a partner to recall what they learned in the simulation game. What happened in the first couple of rounds? What happened when the area became polluted? What occurred when the housing development began?
2. Ask several partners to share making sure students understand that Oh Heron helped them know that organisms need food, water, shelter and space, and that changes to the environment and its resources can result in dead organisms.
3. Explain that today, they will learn about a real life situation where human actions impacted the balance of an ecosystem.

**Explore #1** *(5 minutes) An ecosystem is balanced when, overtime, the various populations in the system are neither increasing nor decreasing, but holding steady.*

4. Write the words “balanced ecosystem” on the board and ask students in partners to discuss what the words mean. What does it mean if something is balanced?
5. Build on the student ideas using the Oh Heron discussion to inform this conversation. When was the Oh Heron ecosystem in balance? When was it out of balance? Ask students what happened when the number of herons went up (resources decreased); when the resources increased (herons increased); which resulted in (decreased resources and decreased herons).

*Teacher Note: the balance is the cumulative effect over time. At any one moment there might be more resources or more organisms, but over time, it is in balance.*



*When the heron population (dotted line) increases, the resources (solid line) start to decrease, which decreases the herons, which increases the resources etc.*

6. Work with the class to define a balanced ecosystem incorporating the idea that it is balanced, when over time, the various populations in the system are neither increasing nor decreasing, but holding steady.

**Explore #2 (10 minutes) Unbalanced ecosystems occur when a living thing is removed from the food web or chain.**

7. Explain that today the students will learn about how human action can impact a balanced ecosystem.
8. Distribute the “That’s an Otter Story” and ask students to work individually to read and complete the first page.
9. Have them share their answers with a partner and then check with a few partners to make sure they have draw appropriate arrows and labeled consumers and producers.
10. Ask this is ecosystem is balanced. Why or why not? Chart their ideas.
11. Ask students to turn to page 2 in the packet and complete it with a partner.
12. Have several partners share their thinking.

**Explore #3 (10 minutes) Humans have a negative or positive impact on the ecosystem.**

13. Ask the whole class if this change in the ecosystem was a positive or negative change. Can they think of other times that an ecosystem has changed in a negative way due to human actions. Chart their ideas.
14. Ask students if human impact is always negative. Can they think of positive things humans do to the environment. Chart their ideas.
15. Ask students individually to read page 3 of the packet and complete the questions.

16. Ask several students to share their responses, leading a class discussion of their ideas.

**Explain** (10 minutes) *A balanced or unbalanced ecosystem can change due to human impact or naturally.*

17. Show the Jean Michel Cousteau Ocean Adventures video of the Kelp Forest Ecosystem.
18. Ask students to use ideas from their packet and the video to conduct a class discussion on the importance of keeping an ecosystem healthy.

**Extend** (5 minutes) *Ecosystems change due to natural disturbances.*

19. Ask student to think-pair-share about natural disturbances that could upset an ecosystem. Have them share out and chart their ideas

**Evaluate** (5 minutes) *Humans impact ecosystems.*

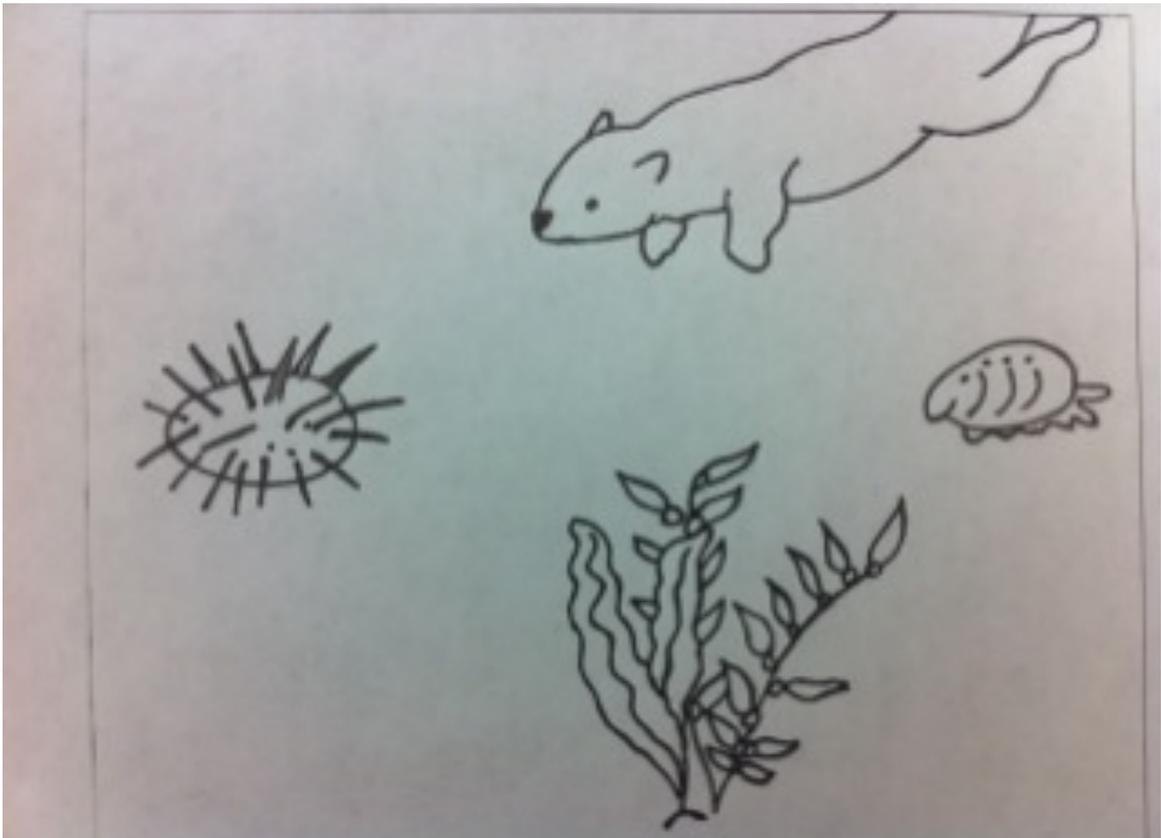
20. Lily says, “We have affected ecosystems in almost every way imaginable! Every time we walk out in the wilderness or bulldoze land for a new parking lot we are drastically altering an ecosystem. Justice says, “It has no impact, what so ever.” Who do you agree with and why? Write your answer in your science notebook.
21. Review the answer to this prompt, as well as student writing on their Otter Story to evaluate student learning.

## That's an Otter Story

Sea otters are marine mammals that live along the northern part of the Pacific coast.

Sea otters are carnivores. What does that mean? They mostly eat abalone and sea urchins. Abalone and sea urchins eat kelp. Kelp plants grow on the ocean floor and form kelp forests. The kelp forest provides a home to many ocean animals.

**1. Draw arrows in the box below connecting the organisms in a food web.**



**Name the producers in this food web** \_\_\_\_\_

**Name two consumers** \_\_\_\_\_

**Identify two food chains in this food web;**

1. \_\_\_\_\_

2. \_\_\_\_\_

**Which organism(s) is/are common to both food chains?**

\_\_\_\_\_

### **The Sea Otter Story continues**

Sea otters have very fine, dense, soft fur to keep them warm. Sadly, in the past sea otters were hunted for their soft fur until there were only a few left.

*Using your food web, discuss with a partner what you think would happen when the sea otter is taken out of the Kelp Forest food web.*

### **Answer the following questions:**

1. What organisms would there be more of if the sea otter were removed? Explain why!

I predict there would be more \_\_\_\_\_  
because \_\_\_\_\_  
\_\_\_\_\_.

2. What organisms would there be less of

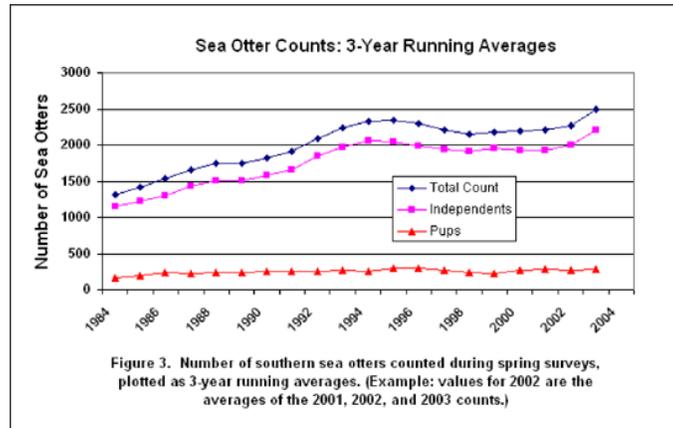
I predict there would be less \_\_\_\_\_  
because \_\_\_\_\_  
\_\_\_\_\_.

3. Is the ecosystem you described above balanced or unbalanced? Why

The ecosystem is \_\_\_\_\_ because \_\_\_\_\_  
\_\_\_\_\_.

## The Return of the Sea Otter

To help save the sea otters from extinction, laws were passed making it illegal (against the law) to hunt sea otters. Since then the sea otter population around the California coast near Big Sur, has grown to more than 2,500 animals in 2004.



What do you think happened to the Kelp Forest ecosystem when the sea otter returned?

I think the ecosystem \_\_\_\_\_

because \_\_\_\_\_

\_\_\_\_\_

Why is a balanced ecosystem important?

Balanced ecosystems are important because \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_