

<b>CHAPTER 1</b>	<b>Thought Lab 1.2: Energy Fluctuation in an Ecosystem</b>	<b>BLM 1.2.13</b>
<b>HANDOUT</b>		

**Purpose:** To consider the effect changes in the numbers of Pacific herring have on other species in an Arctic ocean ecosystem.

### Procedure

Examine the following table and answer the Analysis questions that follow.

#### Available Energy in Two Types of Fish

Type of fish	Fatty or non-fatty?	Available energy (kJ/g)
Pacific herring ( <i>Clupea pallas</i> )	fatty	4.4–11.7
walleye Pollock ( <i>Theragra chalcogramma</i> )	non-fatty	3.2–5.9

### Analysis

- How might the change in energy content of the sea lions' prey affect the body size of the sea lions?
- How might the body size of sea lions relate to their overall population numbers?
- Suggest two reasons why the number of sea lion pups might be decreasing each year.

<b>CHAPTER 1</b>	<b>Thought Lab 1.2: Energy Fluctuation in an Ecosystem (cont'd)</b>	<b>BLM 1.2.13</b>
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4. You are an ecologist who has recently discovered a decrease in the numbers of kelp (a type of seaweed) in the same Arctic ecosystem. You have also found an increase in the numbers of sea urchins that feed off of the kelp and a decrease in the number of sea otters (*Enhydra lutris*) feeding on the sea urchins. You know that there are no longer enough sea lions in the area to support the orcas (“killer whales”), *Orcinus orca*, but the numbers of the whales remains stable. Draw a food web to explain the feeding relationships in this ecosystem. Using your food web, explain how a change in the diet of the sea lions could result in a decline in the numbers of kelp. (**Hint:** What dietary change have the killer whales most likely made?)