



Wikipedia

Kelp Forest

All organisms in an ecosystem are connected and are all necessary for keeping the ecosystem healthy. Humans can disrupt this balance in an ecosystem. Activities like overfishing, hunting top predators or causing climate change and ocean acidification can break down the connections in an ecosystem. Today, you will learn that sometimes there are unintended and unpredictable consequences of human impacts.

From Alaska to Monterey Bay, sea otters live close to shore in kelp forests. Previously hunted for their fur, sea otter numbers were low in the first half of the 20th century (1900-1950). In 1991, the populations of sea otters started crashing. Scientists knew that the otters had not just moved locations and they knew that the birth rates for baby otters were still high. For years, killer whales were observed swimming near sea otters but never eating them. Then scientists started seeing killer whales attack sea otters. Sea otters are about as nutritious to killer whales as popcorn is to us! Why would they bother? Scientists realized that the large whales, seals and sea lion populations that killer whales usually ate, had dropped to such low numbers because of whaling and climate-related changes so the killer whales had to start searching out other prey. In order to get their fill, killer whales have to eat a lot of otters!

The removal of otters from the ecosystem caused a chain reaction in the kelp forest. Do you remember what otters eat? What would happen to otter prey if there are no otters? How would this affect the rest of the ecosystem? Scientists collected data in 1987 on the kelp forest and again in 1997 to observe the impacts of removing otters. Plot their data to find out what happened.

Hint: Put "Year" on the X-axis. Put "Sea Otter Abundance" on the Y-axis and connect the dots between years. Then make two more scales on the right side Y-axis for kelp and Urchin abundance.



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Year	Sea Otter abundance	Urchin abundance	Kelp Density
1985	80		
1986	78		
1987	75	50	9
1988	73		
1989	70		
1990	68		
1991	66		
1992	63		
1993	60		
1994	50		
1995	43		
1996	32		
1997	20	320	1

Share your findings with the class:

- 1) Share your graph with the class.
- 2) What happened to urchin abundance and kelp abundance when the otters declined?
- 3) Can humans fix this change in the ecosystem?