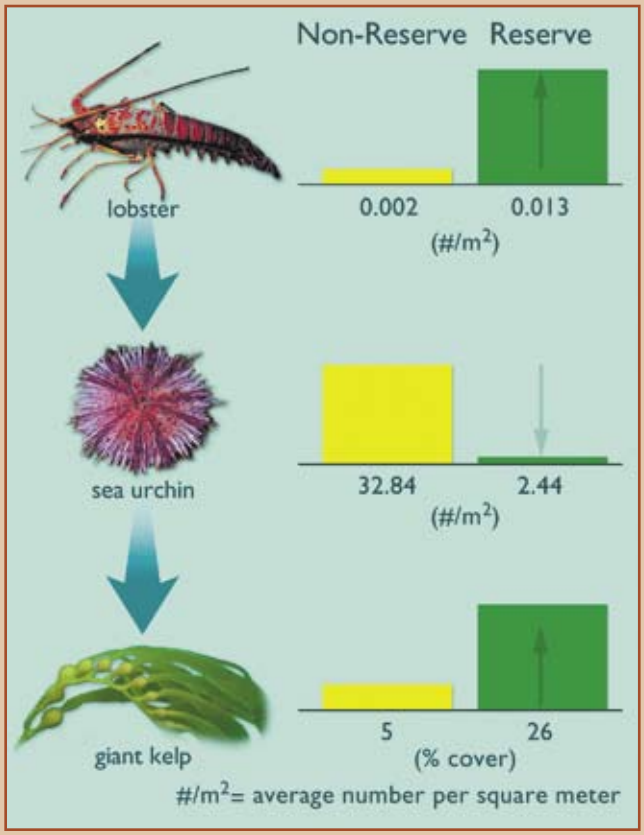
Ecosystem Responses in a Marine Reserve
Case Study: Anacapa Island, California, USA

In 1978, the National Park Service established the Anacapa Island Ecological Reserve in southern California. In 2003, the California Department of Fish and Game established 10 marine reserves in the Channel Islands region, including the North Anacapa Island State Marine Reserve, which encompasses the former Ecological Reserve. The ban on all fishing in the reserve protects lobsters, fish, sea urchins, and many other species living in the rocky reefs and kelp forest habitats.

Anacapa Island. *Photo: Laura Francis*

Ecosystem responses to the Anacapa Island Marine Reserve. Green bars indicate data from the marine reserve. Yellow bars indicate data from fished areas outside the reserve. *From Lafferty and Behrens (2005).*



Key Findings

- Lobsters are six times larger, and sheephead fish are three times more plentiful in the reserve than in nearby fished waters.
- Inside the reserve kelp forests grow five times more densely and persist longer because lobsters and sheephead, which are predators, reduce populations of kelp-eating purple urchins.
- The kelp forest ecosystem in the reserve is more productive and stable over time than kelp forests outside. Outside the Anacapa Island reserve, purple sea urchins have periodically destroyed kelp forests.
- Similar effects through the food web are likely to occur in other reserves because marine animals and plants often strongly affect one another.