Sea Otters & Abalone: Can our Coasts Sustain Both?

The surprising answer is, yes! Based on field studies on Haida Gwaii, the Central Coast of BC, and the West Coast of Vancouver Island, our research shows that although sea otters do indeed lower the number and size of abalone, many abalone avoid otters' paws by hiding in crevices and living in the kelp forest at deeper depths.

We Found That...

Sea otter recovery leads to lower abalone numbers overall, but they can both live together. Even 30 years after sea otters have moved in, abalone are still found, mostly hiding in crevices.

Within 3 years of sea otters moving in, most abalone are hiding in crevices, safe from hungry sea otters. Habitats with abalone hiding places are very important to abalone survival where sea otters have returned.

Both sea otters and local environmental conditions affect abalone. Exposed abalone densities are 16 times lower in areas with sea otters, but hiding abalone may be slightly more abundant. Substrate and wave exposure are more likely to affect hiding abalone than sea otters.

Sea otters change underwater rocky reefs from urchin barrens to kelp forests, improving habitat for abalone. By eating a lot of hungry kelp-grazing sea urchins, sea otters allow kelp to grow deeper and over a larger area. These kelp forests provide abundant food for abalone and may keep their swimming larva around until they can settle on the sea floor. Sea otters also help abalone by eating smaller abalone predators such as sunflower sea stars, octopus and crabs.

Our Findings Support...

Restoration actions that mimic sea otter foraging to increase the extent and depth of kelp forests in areas not occupied by otters.

Return of sea otters to enable rapid expansion of kelp forests and their benefits to coastal ecosystems and people.

Protection of places that are good abalone habitat, where there are lots of places for abalone to hide.

Restoration actions that promote higher abalone densities, such as abalone re-location to good habitat with hiding places, especially before and just after sea otters return to a local area.

Working with First Nations communities to establish abalone stewardship areas or traditional food fishing areas that may be able to support well-monitored, small-scale intertidal food fisheries.

What We Asked

How does the recovery of sea otters affect their endangered abalone prey? What influences their relationship? We looked at how sea otters affect the number, size, distribution and behavior of northern abalone by surveying sites on Haida Gwaii where sea otters have not yet returned, and sites on the Central Coast and West Coast of Vancouver Island, where sea otters had lived for anywhere from 0 to 38 years. We also looked at how environmental factors affect this predator-prey relationship.

Why the Results Matter

We find that interwoven relationships between people, place, and abalone, highlight the need for holistic ecosystem-based conservation strategies that work for multiple species, ecosystems and people. These diverse strategies can address many conservation outcomes ranging from abalone enhancement areas where higher abalone densities are maintained, to sea otter protection areas where abalone will remain at lower densities.

Thanks For Your Support

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