

Hi there, I'm Diego Norena! Welcome to my conservation story postcard. I'm a student at the University of Alaska, and I've created this project to share with you what I see and learn about Alaskan environmental issues while I'm here. If you'd like to learn more about me or this project, check out the welcome video on my website.

I want to say what I'll share with you here is what I am learning and feel strongly about. The information I am sharing is not the final truth; there are many perspectives and dimensions to consider.

This episode is about sea otters, and the proceeds of this card go to two graduate students of Dr. Tobin, a local professor. They are studying sea otters and human interactions. Thank you for supporting their research by buying this postcard.

Now, let's get into the story of sea otters! First, I love sea otters because they are the cutest furballs; I call them the puppies of the sea. But sea otters do a lot more than just be cute; they are a keystone species, which means they play an essential role in maintaining the balance and health of their habitat, nearshore ecosystems. A keystone species is like the top stone in an arch; if removed, the entire structure collapses.

We know that ecosystems collapse from experience. In the 1900s, sea otters were extirpated or driven to local extinction in Kachemak Bay, many parts of Alaska, and worldwide due to colonial powers' overharvesting for the global fur trade. Their worldwide population went from 300,000 to less than 2000. **Let that sink in.**

Since then, people in Alaska have grown accustomed to not having sea otters, and they have used the species that thrived in their historical absence—like crab, shellfish, and octopus—for commercial, recreational, ~~and~~ subsistence purposes. For this reason, some people now *want to* kill sea otters to remove them as competitors for those species being harvested, traded, and sold.

There is an important distinction to make here: there is legal, traditional, sustainable harvest and use of fur by indigenous people in Alaska after sea otter populations have recovered.

However, protecting sea otters is essential because their impact on climate change may outweigh these losses. Kelp forests without sea otters become underwater deserts, incapable of supporting a diverse ecosystem. In contrast, kelp forests with otters flourish. The reason? Sea urchins are sea otters' preferred prey in kelp forests. Without sea otters in the mix, the urchins eat and topple the ecosystem. So, sea otters act as the keystone species by keeping urchin populations low, stabilizing the kelp forest, and sustaining a broad diversity of life.

Sea otter presence allows kelp forests to thrive, producing tons of oxygen, consuming CO₂ from the atmosphere, and reducing global warming. With this massive amount of primary greenhouse gas being removed from the atmosphere, otters are genuinely helping bring balance back to the world.

A cool study by Wilmers et al. (2012) quantified the contribution of sea otters. The scientists found that kelp forests with sea otter presence can store 6 million more tons of carbon than an otter-free area of 20,000 square miles, just the of West Virginia.

On a positive note, Sea otters show a success story in environmental conservation! The success began in 1911 with the signing of the International Fur Seal Treaty that ended the pelagic harvest of fur seals and regulated the harvest on the Pribilof rookeries, which are colonies of breeding rocks. Sea otters were actually thought to be extinct at this time but, this treaty prohibited the sale of their furs. The end of the commercial fur trade was crucial to sea otter recovery. Then, in 1972, the Marine Mammal Protection Act furthered their protection and reintroduction efforts and habitat restoration projects, allowing sea otter populations to recover, albeit at a reduced capacity.

After following the complex historical relationship that people have had with sea otters, sustaining their abundance is more important than ever; scientists have documented that their ecological role in the Kelp forest ecosystem provides a significant amount of carbon storage, which offsets carbon emissions and global warming. Thank you for watching. Please support the grad students by filling out their survey. Please continue supporting Alaska's wildlife. Check out the stories on sea ducks and Dall sheep.

Sources:

Chrobak, Ula. "How Sea Otters Can Fight Climate Change." *Www.bbc.com*, 15 Sept. 2021, www.bbc.com/future/article/20210914-how-sea-otters-help-fight-climate-change.

Rantanen, Mika, et al. "The Arctic Has Warmed Nearly Four Times Faster than the Globe since 1979." *Communications Earth & Environment*, vol. 3, no. 1, 2022, pp. 1-10, Aug. 2022, <https://doi.org/10.1038/s43247-022-00498-3>. Accessed 17 Apr. 2024.

Schrodt, Leah. "Sea Otters Are Unlikely Helpers in Our Fight against Climate Change | U.S. Fish & Wildlife Service." *FWS.gov*, 15 Sept. 2022, www.fws.gov/story/2022-09/sea-otters-are-unlikely-helpers-our-fight-against-climate-change.

Wells, Caitlin P., et al. "Life History Consequences of Climate Change in Hibernating Mammals: A Review." *Ecography*, vol. 2022, no. 6, June 2022, <https://doi.org/10.1111/ecog.06056>.

Wilers, Christopher, et al. "Do trophic cascades affect the storage and flux of atmospheric carbon? An analysis of sea otters and kelp forests" *Frontiers in Ecology and the Environment*, 10, no 8, September 2012, <https://doi.org/10.1890/110176>