Digging deep into the history and ecology of the human-driven near extinction of a North Pacific marine predator

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Population declines and extinction of apex consumers are strongly associated with human history and pre-history. Widespread indirect or “collateral” effects of apex consumer loss on biodiversity, ecosystems, and the human cultures and economies they support, however, are only recently being realized. Sea otters (Enhydra lutris) are apex consumers that strongly regulate nearshore rocky reef and kelp forest ecosystems of the North Pacific Ocean by controlling herbivorous sea urchin populations. The near extinction of sea otters as a result of the North Pacific Maritime Fur Trade (circa 1778-1911) provides a remarkable, but not unique, example of the far-reaching effects of top predators. Here, I draw upon paleoecological, archaeological, biogeographic, and historical literature, as well as my own quantitative subtidal ecological research, to discuss the deep ecology of the “otter-urchin-kelp” trophic cascade and the consequences of the near extinction of sea otters nearly 200 years ago. These effects continue to reverberate throughout North Pacific marine ecosystems and associated human cultures today.