

Study area

We sampled crab assemblages, eelgrass biometrics, and sea otter density along the west coast of Prince of Wales Island and nearby islands in Alaska, with sites ranging 93 km from the most southern site in Dunbar Inlet up to the most northern site in Naukati Bay (Figure 1). Sites were sampled from April to August during 2017–2020. Sites were selected following methods described in Raymond et al. (2021), briefly summarized here. We used the ShoreZone database and site visits to identify coastline segments with 100 m of eelgrass habitat with no overlapping kelp canopy (Harper & Morris, 2014, National Oceanic and Atmospheric Administration, 2021). Crab abundance and size composition and sea otter density were quantified at 21 sites in 2017 and 2020, 22 sites in 2019, and 6 sites in 2018. Eelgrass biometrics were sampled at 21 sites in 2017, 6 sites in 2018, 19 sites in 2019, and 6 sites in 2020 (Figure 1).

Eelgrass shoot density

We characterized eelgrass shoot density at sites where crab pot and sea otter surveys were conducted. In 2017, 2018, and 2020 eight 0.5-m \times 0.5-m quadrats were evenly spaced every 12 m along a 100-m transect placed approximately -0.5 m relative to MLLW (Figure 2) (Raymond et al. 2021). Eelgrass shoots were counted in each quadrat. Shoot density was then averaged across the eight quadrats per site. At each site in 2019, five 0.5-m \times 0.5-m quadrats were randomly placed roughly 5-m linear distance below the upper edge of the eelgrass bed at all sites (Figure 3). From each quadrat, eelgrass shoot density was measured. Shoot density was then averaged across the five quadrats per site.

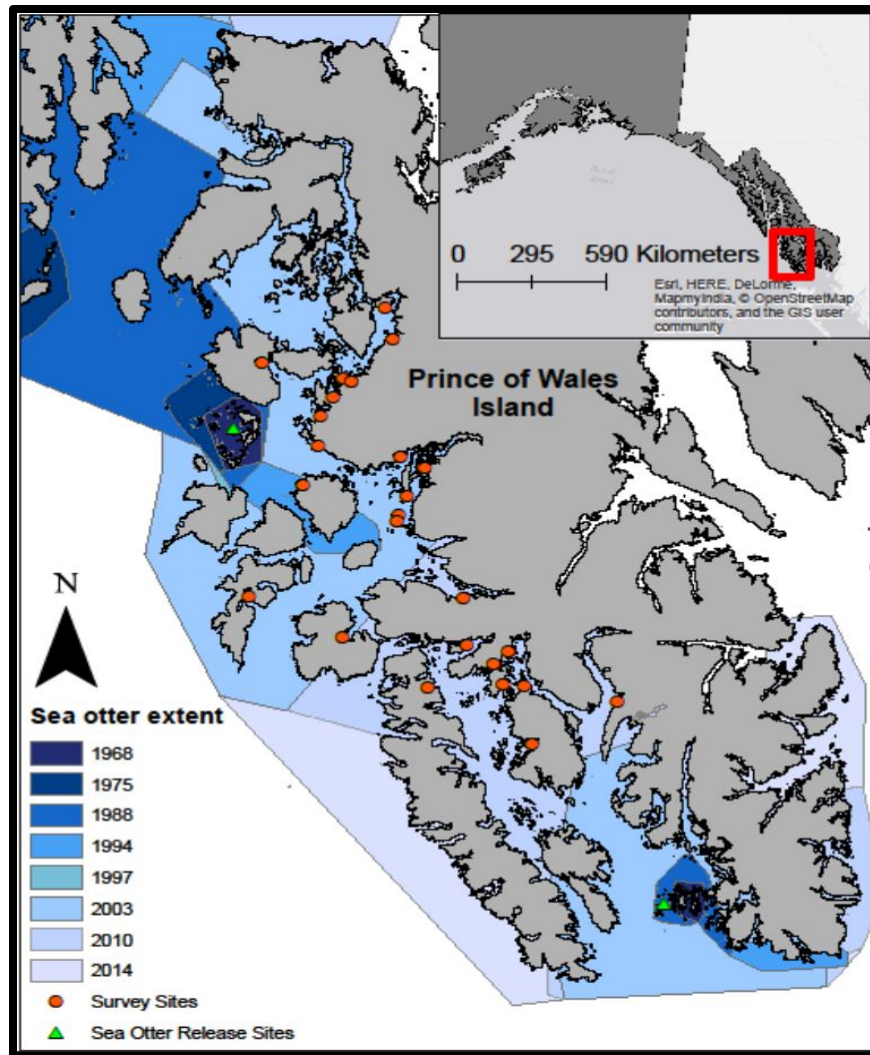


Figure 1 – Study area in Southeast Alaska near Prince of Wales Island. Orange circles indicate sample sites, green triangles indicate sea otter reintroduction sites, and sea otter colonization through time is color coded by year (blue).



Figure 2 – Raymond et al. 2021 seagrass transect methods characterizing shoot density.



Figure 3 – 2019 seagrass transect methods characterizing shoot density.

Literature Cited

Harper JR, Morris M (2014) Alaska ShoreZone coastal habitat mapping protocol. Nuka Research and Planning Group, LLC.

National Oceanic and Atmospheric Administration (2021) ShoreZone.

Raymond WW, Hughes BB, Stephens TA, Mattson CR, Bolwerk AT, Eckert GL (2021) Testing the generality of sea otter-mediated trophic cascades in seagrass meadows. *Oikos* 130:725–738.