Abstract

This dataset is composed of clamshell litter data, for which the cause of death of each clam was estimated using the physical condition of the valves. Causes of death include predation by sea otter, crab, snail, and seastar/natural death. Specifically, data on the proportion of estimated cause of death of clams for each site were collected to compliment a sediment pit dataset (pits dug by identified predators above) to correct for the most likely number of pits dug by sea otters versus other animals. Clamshell litter was collected at intertidal sites that included eelgrass beds, in which three 100-m transects were placed for shell collections: within the eelgrass bed, along the edge of the eelgrass bed, and outside the eelgrass bed. Collections were conducted at 21 sites in Southeast Alaska on Prince of Wales Island. These data were collected to compliment a larger, interdisciplinary project called APECS (Apex predators, Ecosystems, and Community Sustainability), the focus of which investigated the role that sea otters have on seagrass habitats, their ecological function, and influences on traditional and subsistence harvest of specified marine organisms.

Methods

Step 1

Description

Fieldwork; collection of clamshell litter: At each site, three 100-m transects were placed parallel to the waterâ€™s edge in three distinct locations within each site: inside an eelgrass bed ('Inside'), at the edge of an eelgrass bed ('Edge'), and outside the eelgrass bed ('Outside'). These three classifications required that the tidal elevation for each was different, with the 'Edge' being the lowest (approx. -0.37 and -1.10 MLLW) and the 'Outside' transect the highest (0.5 to 1.5 ft higher than the respective 'Inside' transect). Often, the 'Outside' transect corresponded with butter clam habitat. Each transect was divided into four sections: 0-25 m, 26-50 m, 51-75 m, and 76-100 m. Along each segment, clamshells were collected within a 1-m swath centered on the transect line; shells were pooled into appropriately labeled bags for each segment on each transect.

Only shells from recently deceased clams were collected; this was determined by the amount of fouling on the shells. Large or dead barnacles, or barnacle scars, on the exterior of the valves disqualified the shells for collection. Any barnacles or barnacles scars located on the inside of the shell also disqualified the shells for collection. Mussels can quickly attach their byssus and were therefore not a disqualifying factor, nor were mobile fauna (e.g. limpets) or fast-growing seaweeds (e.g. Ulva). Additionally, only shells that still had the hinge ligament and material from both valves (even if minimal) were collected.

All shells were transferred to the lab for estimation of the cause of death for each clam. All clam sizes were recorded to the nearest millimeter.

Labwork; estimation of the cause of death for each clam and shell measurements: Back at the lab, clamshells were sorted by species for each segment in each transect. Shell size was then measured to the nearest millimeter. For each clam, the cause of death was first estimated for each clam; causes of death included predation by sea otter, crab, snail, or seastar/natural death. Predation by sea otter typically leaves one valve uncracked and the second valve significantly broken; often at least half of the second valve is missing. Crabs typically pinch the edges of both valves on either the anterior or anterior end of the clam, but for thin clams (e.g. bentnose Macoma), both valves may be broken anywhere along the edge. Snail predation was discernable by the characteristic circular drill hole near the umbo of one of the valves. Both seastar predation and natural death were lumped together because it was impossible to determine the difference given the nature of predation by seastars, which leaves clamshells undamaged. This combined category was recorded as 'Whole' for the death estimate.