

EFFECTS OF SUBTIDAL HARVEST OF GEODUCKS ON BENTHIC INFAUNA IN PHYSICALLY DYNAMIC HABITATS OF THE STRAIT OF JUAN DE FUCA

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The tradition harvest of wild geoduck clams involves localized liquification of sediment with a high-pressure water jet, allowing relatively easy removal of intact clams one by one. The process of harvesting creates small, localized physical disturbances that have the potential to alter the structure and dynamics of infaunal benthic communities in harvested tracts. Frequent small-scale natural disturbances are known to be important to benthic community structure and function in other locations.

During summer 2004 we marked a series of local disturbances made with water jets in a manner simulating commercial geoduck harvest. We monitored the size and appearance of marked holes over a period of 2 months, and we sampled subsets of the holes at 6 and 20 days after disturbance, using diver-operated hand corers, to evaluate infaunal densities. Holes made by the water jets initially averaged 15 cm in diameter. Hole edges collapsed over time, causing the holes to fill slowly but expand in diameter. At day three the mean hole diameter was 25 cm, and by day 50 the mean increased to 70 cm. Holes were no longer recognizably different from adjacent sediment surfaces after day 50. Responses of infauna to disturbances varied by taxonomic category. Mean densities of crustaceans increased above undisturbed densities in the first week following disturbance, but had returned to pre-disturbance levels at three weeks. Mean densities of polychaete worms were diminished by disturbance at one week, but increased above pre-disturbance levels at three weeks. Densities of mollusks did not vary substantially over time following disturbances. At any one time visible holes comprised about 5% of bottom area during the survey period.

None of the changes observed in our infaunal data were profound. During our dives we observed substantial erosion and bottom disturbance in the area associated with strong tidal currents. Given the physically dynamic nature of the habitat and the relatively minimal changes in animal abundance observed in our work, we conclude that disturbances associated with geoduck harvesting are not likely to cause substantial alteration of resident infaunal communities in our study area. Resident infaunal species likely are well accommodated to physical disturbances and probably do not suffer significant ill effects as a result of geoduck harvest. Results may be different in more physically protected locations where natural disturbance regimes are less intensive.