

# **Effects of ancient First Nations clam garden walls on the abundances and diversity of fish and motile invertebrates**

**By: Chrissy Schellenberg**

**VIU Faculty Advisor: Dr. Eric Demers**

Ancient First Nations clam gardens increase shellfish productivity; however, it is unknown if these anthropogenic structures alter the abundance and diversity of fish and invertebrates in the surrounding area. The primary objective of this study was to compare fish and motile macroinvertebrates on clam garden walls and non-walled beaches. GoPro video cameras were deployed on a total of 10 study sites, located on Calvert and Quadra Islands, B.C. For each site, the camera was positioned in two directions: downshore, which faced away from the beach; and upshore, which faced towards the beach. Increased abundances were observed on clam gardens compared to reference sites, although not significant. On clam gardens, when the camera was facing downshore, 2,717 individuals of 17 taxa (13 fishes and 4 invertebrates) were observed; and 1,235 individuals of 13 taxa (8 fishes and 5 invertebrates) were observed in the upshore direction. On reference sites, when the camera was facing downshore, 849 individuals of 16 taxa (11 fishes and 5 invertebrates) were observed, and 683 individuals of 14 taxa (9 fishes and 5 invertebrates) were observed in the upshore direction. No apparent differences in the number of taxa was observed, although more functional groups were seen on clam gardens. Differences in abundances were detected between clam gardens on Calvert and Quadra Islands ( $p = 0.03$ ). This study provides preliminary data to support that ancient First Nations may increase local marine abundances and functional diversity.