

Examining Biodiversity near a Potential Clam Garden in Sitka, AK

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Introduction

Clam gardens are an example of a mutually beneficial relationship between humans and the species that inhabit the environment around them. When humans construct a clam garden they alter the shoreline to create habitat that is conducive to denser and larger clam populations by increasing the habitat in the optimal tidal range by reducing the slope of the beach (Deur et al., 2015, Groesbeck et al., 2014). Indigenous people along the west coast have constructed clam gardens to provide an abundant and reliable food source (Deur et al., 2015). Near the base of the O'Connell Bridge in Sitka there is a human-made rock wall that is thought to be a Tlingit clam garden.

Hypothesis

We predict that the level of biodiversity will be greater inside the clam garden because the clam garden would facilitate greater levels of biodiversity due to being an environment that was created to fulfill the habitat requirements of several different intertidal species (Cox et al., 2019).

Methods



Fig 1.



Fig 2.

Fig. 1. Location of the potential clam garden in Sitka, AK between Maksoutoff St. and Harbor Drive.

Fig. 2. Picture of the rock wall that forms the potential clam garden.

Sampling took place on a beach between Harbor Drive and Maksoutoff St on 02/07/24. First the length and width of the clam garden was measured to find the total area. Then 6 quadrats made up of squares of stiff PBC pipes were set out. Quadrats were placed below, outside and within the clam garden. Q4 and Q6 were within the clam garden while the others were outside. Photos were taken of each quadrat. In the lab the number of species were counted and identified.

Results

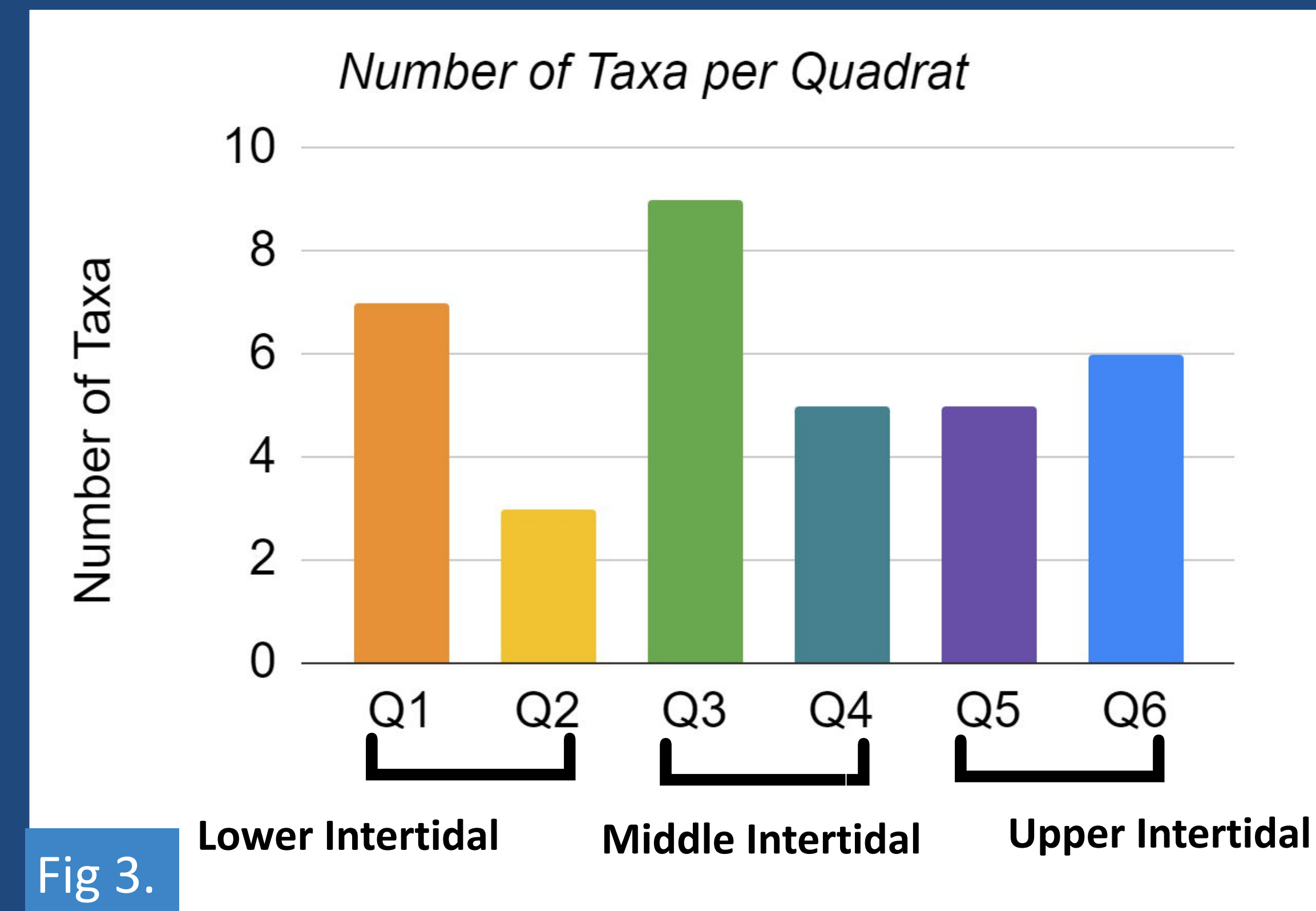


Fig 3.

- Q4 and Q6 were inside the clam garden
- Both inside the clam garden had an average of 5.5 and outside had an average of 6 taxa present
- There was eelgrass present in every quadrat (Fig. 4)
- Shell fragments were present in most quadrants (Fig. 4)
- Edible species were present within several quadrats

Presence and Distribution of Taxa

Taxa	Q1	Q2	Q3	Q4	Q5	Q6
black coralline algae						X
blue mussel shells and fragment						X
brown seaweed			X	X		
butter clam shell	X	X				
cockle shell	X					
cockle shell fragments				X		
coralline algae					X	
eelgrass	moderate	light	heavy	light	light	moderate
fucus seaweed			light		light	moderate
green seaweed				X		
jingle shells	X					
lacuna snail eggs			X			
sea star	X		X			
shell fragments	heavy	light		light	light	heavy
little neck shell	X					
red seaweed			light		heavy	
small barnacle			moderate			light
threadlike brown seaweed			X			
unidentifiable whole shell			X			
unidentified large shell fragment		X		X		

Discussion

The data does not support our hypothesis because there were a similar number of taxa present inside and outside the clam garden. A possible explanation for what was found is that there wasn't enough data collected. We are curious to see how future anthropogenic activity, such as the construction of new section of the sea walk will affect the conditions within and around the clam garden. Future research could examine the presence of live shellfish in the garden. One limitation to this study is the time of year, data was only collected in the winter and not any other seasons. A challenge of this study was the clam garden was only accessible -2 low tides which made sampling time limited. Since clam gardens can be an important food source it is important to study them.