

Recreational Debris distribution on Annette Island Beaches

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Introduction

Marine debris can be carried by the ocean currents over thousands of miles over a number of years. Marine debris can negatively affect traditional food sources through microplastics preventing them from absorbing nutrients. Debris such as abandoned fishing gear can lead to ghost fishing resulting in marine life being entangled and prevented from roaming freely. Marine debris can transport invasive species to a new area resulting in it competing with the local wildlife for resources. The European Green Crabs are an example of an invasive species that were brought to Annette Island by the currents in the ocean. The movement of marine debris through the ocean currents is a topic that's currently under study, and as well as how it's weathered by the environment its in (Turner et al.2020). Ghost fishing and its impacts are another topic that is under study as well (Wasave et al.2025)

Hypothesis

I predict that front beach will have more recreational debris (aluminum cans, fireworks debris, food wrappers, cigarette butts, glass, etc) at Front Beach than Colby Creek because it is a popular place for recreation (for example the 4th of July).

Methods

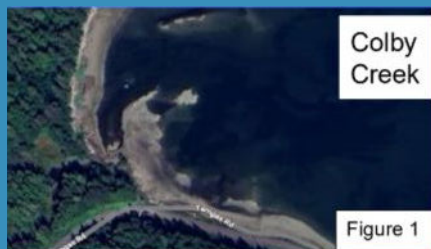


Figure 1



Figure 2

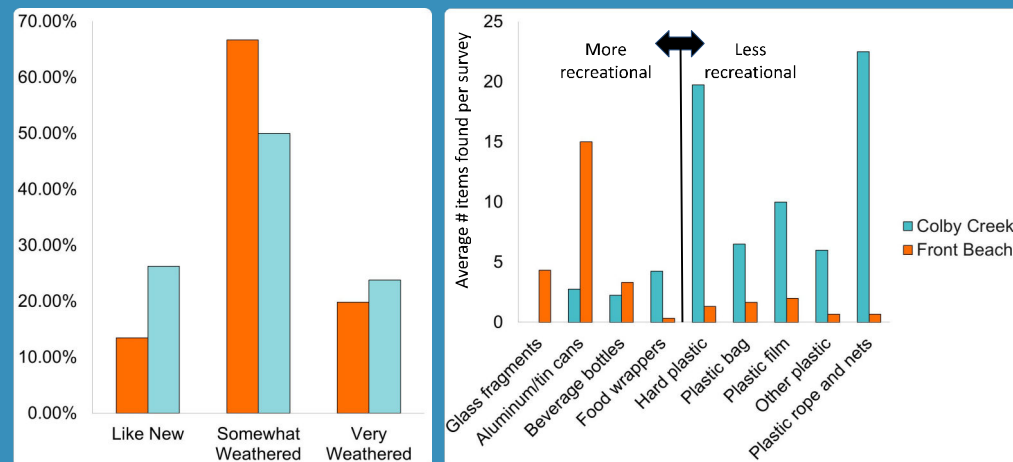
Figure 1: A Map of the Colby Creek study site on Annette Island.
Figure 2: A transect line survey being conducted on Front Beach.

Samples of marine debris were gathered from Colby Creek and Front Beach in Metlakatla. Samples were gathered on Jan. 22nd, and 27th, and on Feb. 5th, the 17th, and on the 26th. Samples were collected of both foreign and local debris such as tin cans, and fishing gear. They were gathered by conducting transect lines (The line is was 100 meter rope with twenty tags on it, with tags every 5 meters, two tags are randomly selected to search between). The line would start near the entrance of the beach and would continue until the end of the rope, and three transect lines were conducted at each site with each survey. Tide height often varied with each survey with it almost reaching the back beach on some. Data on the samples is gathered on site by marking down what the sample is, how many of it there are, and what condition it is in. The condition of samples ranged from new, somewhat weathered, and weathered. Currently 50 samples have been gathered from these two beaches.

References: Andrew Turner, Rob Arnold, Tracey Williams (2020) Weathering and persistence of plastic in the marine environment: Lessons from LEGO, Environmental Pollution, Volume 262.

Suha Wasave, Sushil Kamble, Tousif Kazi, Sangita Wasave, Sreekanth G. B., Arpita Sharma, A bibliometric review on ghost fishing: Impacts on marine environment and governing measures, Marine Pollution Bulletin, Volume 212, 2025.

Results



- No glass was found on Colby Creek.
- More recreational samples were found on Front Beach.
- Plastic nets were the most abundant samples found.
- More like new debris was found on Colby Creek.
- More very weathered debris was found on Colby Creek.
- A Large number of metal fragments and machinery were found on Colby Creek.

Discussion

My hypothesis was correct in that there was more recreational debris on Front Beach than on Colby Creek. Front Beach is more accessible than Colby Creek, and it is a popular spot for celebrations. This would indicate why the largest amount of samples from Front Beach were soda and beer cans. More metal machinery and metal fragments were found on Colby Creek than on Front Beach. More research could be conducted on where the metal debris could have originated from. It should be noted that the transect lines were randomly selected and only covered small sections of each beach. Research was done during both high and low tide, and was conducted during the late winter and early spring. The beaches may have been cleaned up before samples could have been collected from them. The community of Metlakatla should be concerned about the number of plastic nets that were found on these beaches. Much of these nets were entangled with one another resulting in a larger area where marine life could have been caught. Areas such as Colby Creek where more foreign debris are found are also at higher risk for invasive species coming in as the debris can carry them in from other regions.

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