

Effects of Habitat Restoration on Soil Retention on Santa Rosa Island

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Introduction

- The removal of the last deer and elk from Santa Rosa Island (SRI) in 2011 marked the end of large herbivores that placed grazing pressure on native plants and compromised substrate integrity, which contributed to the loss the top soil on parts of the island.
- In 2015, a restoration project began on the island's interior Soledad Ridge to reestablish native plants and install erosion control structures to reverse sediment loss trends.

The restoration site, with erosion control structures that will be installed on the slope to slow or reverse sediment erosion.



Questions

- Has sediment erosion or deposition occurred at the restoration site since 2016?
- Do erosion control structures effect sediment deposition upslope and downslope from their installation differently?

Methods

- We measured nail exposure along nine 60-m transects located within the restoration. In January 2016 twelve inch long nails were inserted with 15 cm height exposed. The nails were placed at 5 m intervals, allowing for vegetation growth and sediment deposition to occur. Several transects passed over erosion control structures : measurements were taken both upslope and downslope from the structure.
- Along the transect, we recorded nail exposure to the nearest half cm. This measurement was compared against initial nail height. A decrease in height implied sediment deposition, while an increase in height implied sediment erosion.

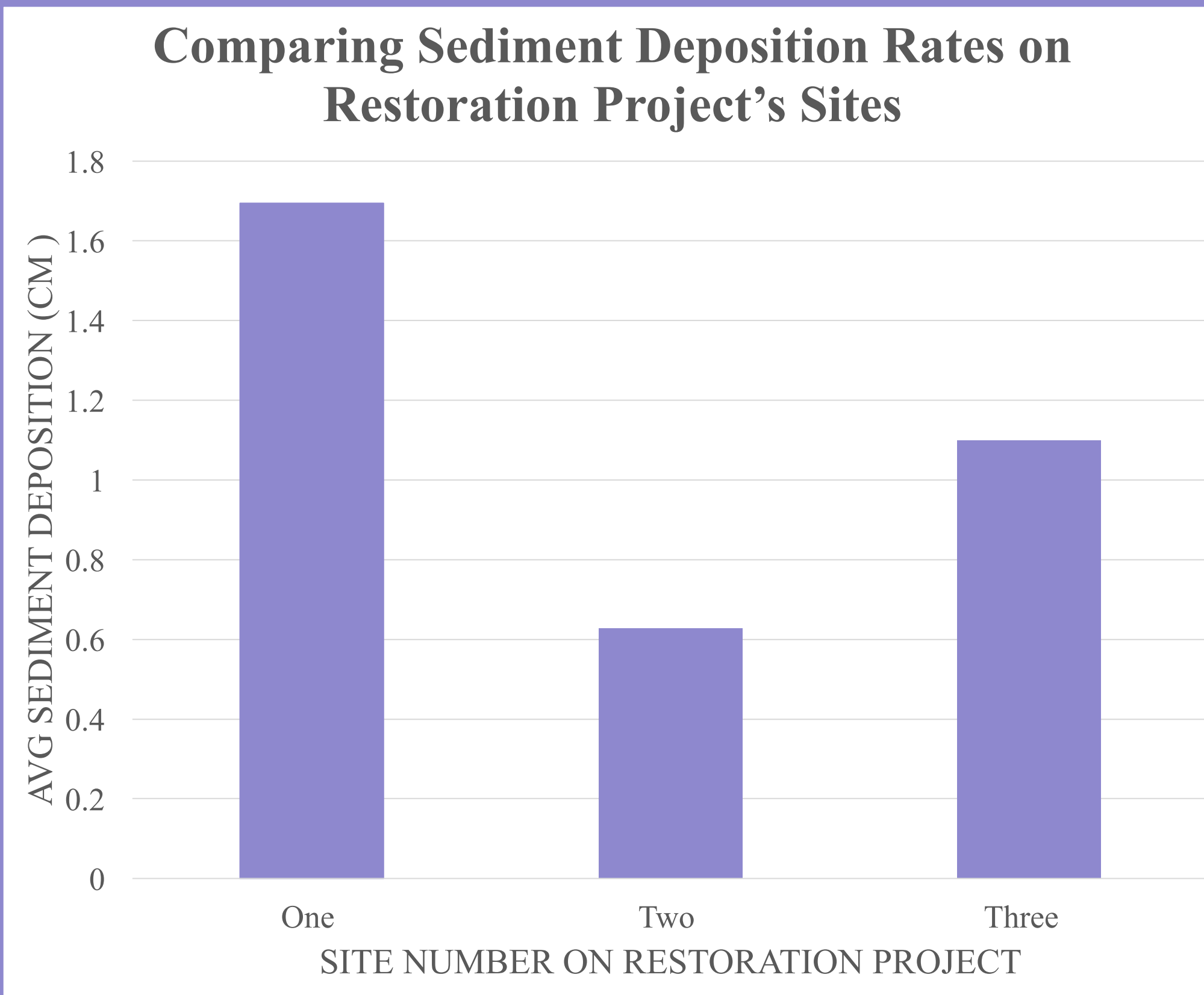


Figure 1 : Sediment deposition was measured at three different locations at the restoration site. Each site had three 60-meter transect lines placed going downhill. The results show that among the three different sites, Site One seemed to have had the highest average sediment deposition but there was a lot of variation in the measurements. p-value = 0.2373, f-value = 1.46, df = 2.

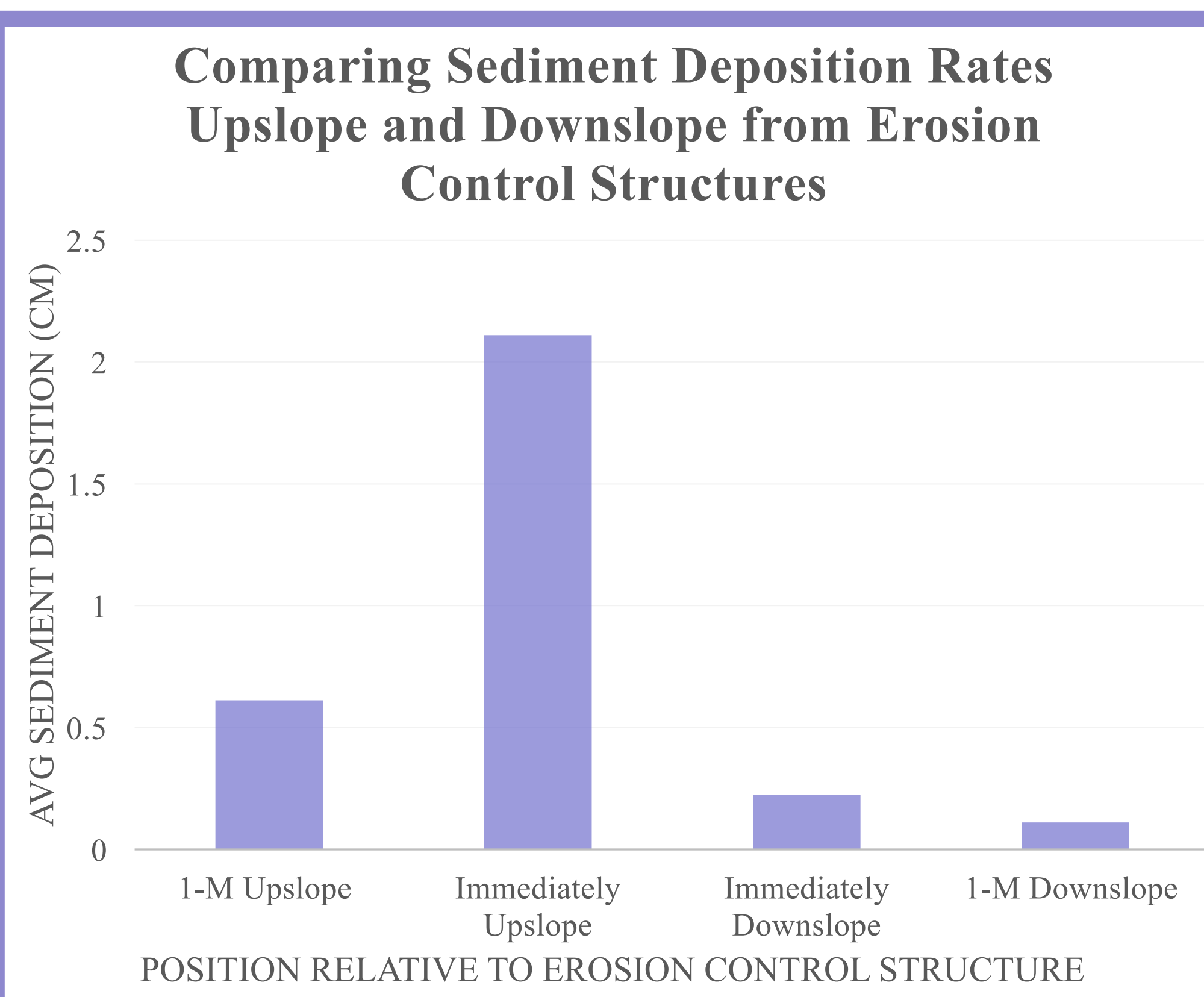


Figure 2 : Sediment deposition was measured both upslope and downslope from wattles, which are soil erosion structures installed at the restoration site. The results show that among the four different locations, immediately upslope of the structure experienced the highest average sediment deposition of 2.11 cm. p-value = 0.0105, f-value = 4.41, df = 3.



An example of wattles, soil erosion control structures

Results & Discussion

- All sites experienced sediment deposition. There is not a significant difference in the sediment deposition rates among the three sites where transects were placed on Soledad Ridge.
- Areas immediately upslope of soil erosion barriers have significantly greater sediment deposition with an average of 2.11 centimeters.



An example of vegetation naturally stabilizing sediment

Acknowledgements

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