



Lobsters in the Intertidal!



The Importance of Fine Scale Habitat in MPA Design



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MPAs and the Importance of Habitat

- Marine protected areas (MPAs) are a popular tool for fisheries management, conservation, and protection.
- It is important to incorporate all critical habitat utilized within a targeted species lifecycle into the design of an MPA
- Focusing on the Pacific spiny lobster (*Panulirus interruptus*) in a marine reserve on Catalina Island, CA, I asked the questions:
 - 1) What is the impact of the Wrigley MPA on spiny lobster population demographics?
 - 2) Is the intertidal habitat important within a spiny lobster's life cycle?

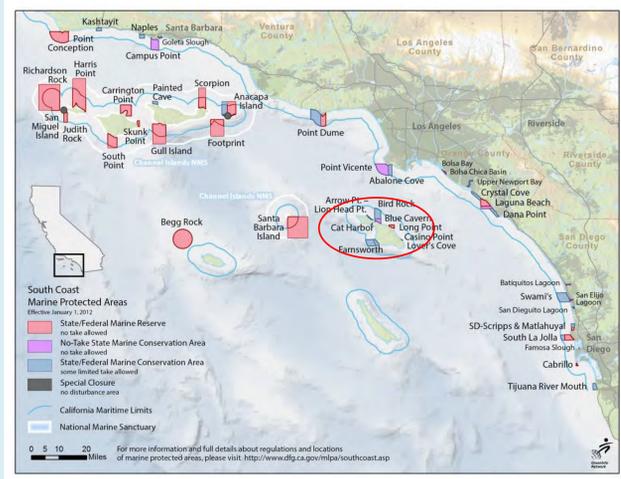


Fig 1 . 1) Map of Southern California MPAs with Catalina Island circled. 2) Photos of Wrigley MPA and spiny lobsters.

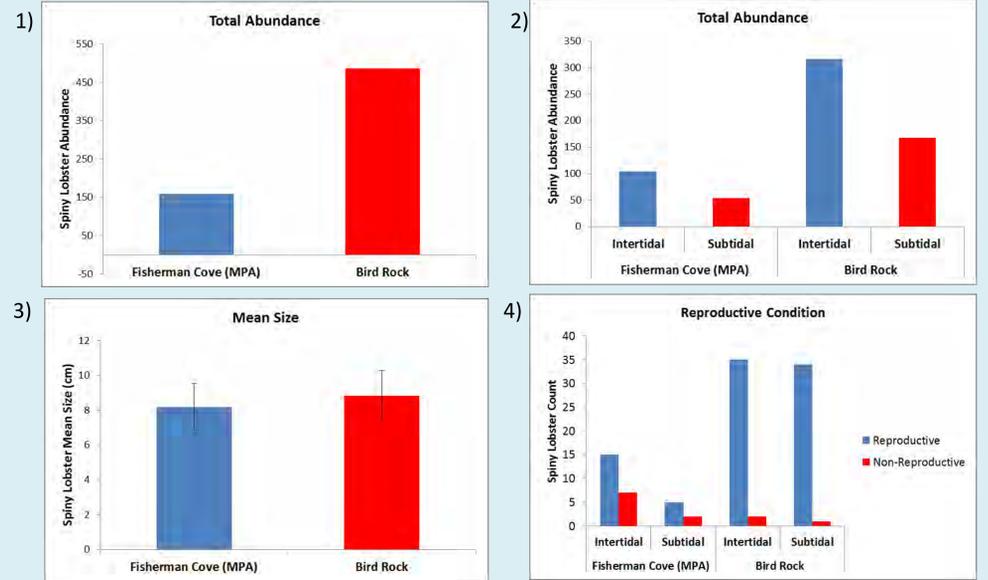
Survey Results

MPA vs Non-MPA

- More lobsters observed outside the MPA ($p < 0.001$)
- Larger lobsters observed outside the MPA ($p = 0.04$)
- Higher proportion of reproductive female lobsters observed outside the MPA ($p < 0.001$)

Intertidal vs Subtidal

- More lobsters observed in intertidal relative to subtidal
 - Bird Rock ($p = 0.05$), Fisherman Cove ($p = 0.02$)



Collecting the Data

Study Area: Fisherman Cove and Bird Rock located on Catalina Island, CA.

- Lobster count surveys and hand collections on SCUBA along 20 m transects.
- Surveyed during high tide, day and night, within the intertidal and subtidal.
- Collected lobsters were sized, sexed, and noted for the presence of eggs.

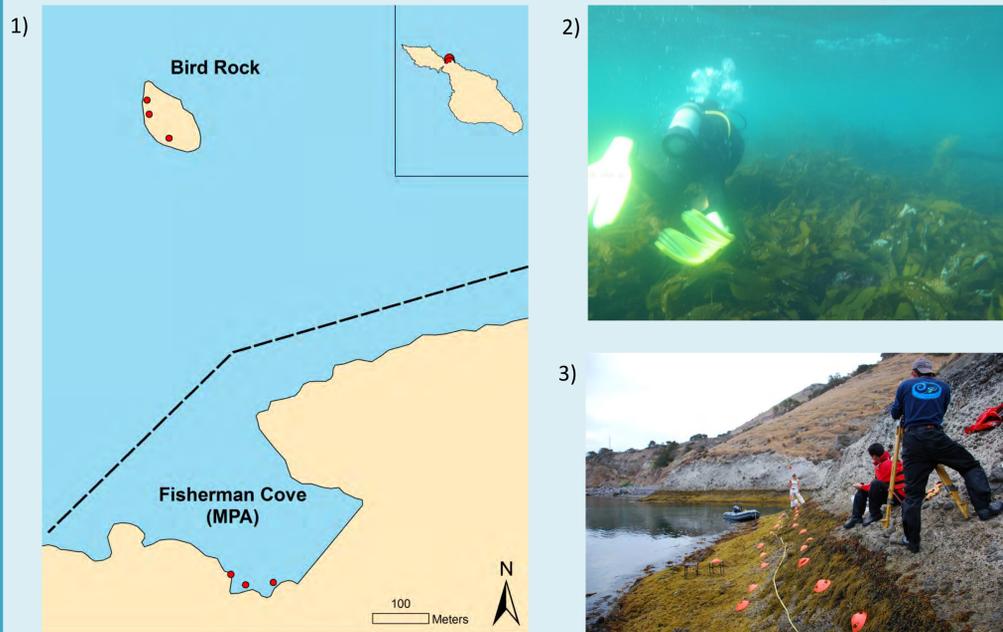


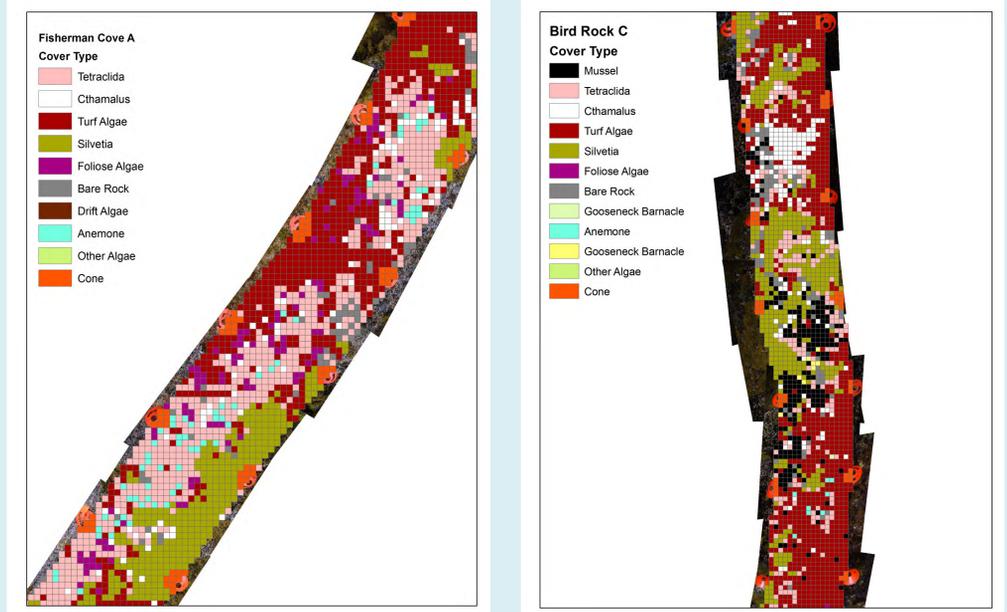
Fig 2. 1) Study area 2) Count survey on Scuba 3) Photo transect in progress 4) Photo transect in ArcMap.

Habitat Composition Classification:

- Photographic 20 m transects were created at every site at low tide and were spatially referenced using a Total Station.
- Spatially referenced points and photos were inputted into ArcMap 10 for manual classification.



- Intertidal mussels (lobsters' preferred prey item) only found outside of the MPA ($p < 0.001$)



Concluding the Story

- Intertidal mussels, the lobster's preferred prey item, are an energetic input into the population and are only present outside of the MPA.
- The fine-scale intertidal habitat acts as an important foraging ground for reproductive lobsters and is potentially a driver for lobster population dynamics.
- The current MPA on Catalina Island is not representing the range of suitable habitat that is available for this species.
- This study reinforces the concept of the importance of incorporating all crucial habitat within a targeted species lifecycle when designing an MPA and highlights the importance of considering fine-scale habitat.

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