

Debris Free Seas: Assessing Lost Gear Removal in Southern California by a Nonprofit

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Spring 2023



ENVIRONMENTAL PROBLEM

Marine debris is a global environmental issue whereby human-made waste is intentionally or unintentionally abandoned or disposed of in the ocean. Ocean Defenders Alliance (ODA), is a nonprofit organization involved in the remediation of marine debris along the coast of Southern California and the Hawaiian islands. In Southern California, cleanup expeditions yield large quantities of derelict lobster traps, yet the impact of gear dereliction to the California spiny lobster fishery, and migrating cetaceans, is not well known. Furthermore, ODA's remediation efforts are currently hindered by their knowledge of debris hotspots and access to fishers.

OBJECTIVES

1. Evaluate whether derelict lobster traps threaten migrating cetaceans and hinder the sustainability of Southern California fishing communities.
2. Estimate the economic damages of ghost fishing on the California spiny lobster fishery and highlight gear loss "hot spots" for ODA to target their future marine debris removal efforts.
3. Curate partnerships and craft engagement materials that multiply ODA's impact and identify trust-building opportunities amongst Southern California fisheries.
4. Develop a data-driven webpage to display ODA's cleanup efforts and quantify the benefit of their work to fishing communities and drive investor engagement and donations.

FINDINGS

1

Our assessment shows that traps from the California spiny lobster fishery do not pose a notable entanglement threat.

We speculate this is due to lobster traps placement in shallow waters, where whales are less likely to become entangled due to their foraging behavior and depth.

2

Our analysis suggests that trap loss, and subsequent ghost fishing by derelict gear, can cause spiny lobster fishers to lose anywhere from \$216,000–\$931,000 USD in profits annually.

We discovered that fishers are willing to work with nonprofits like ODA to mitigate this revenue loss.

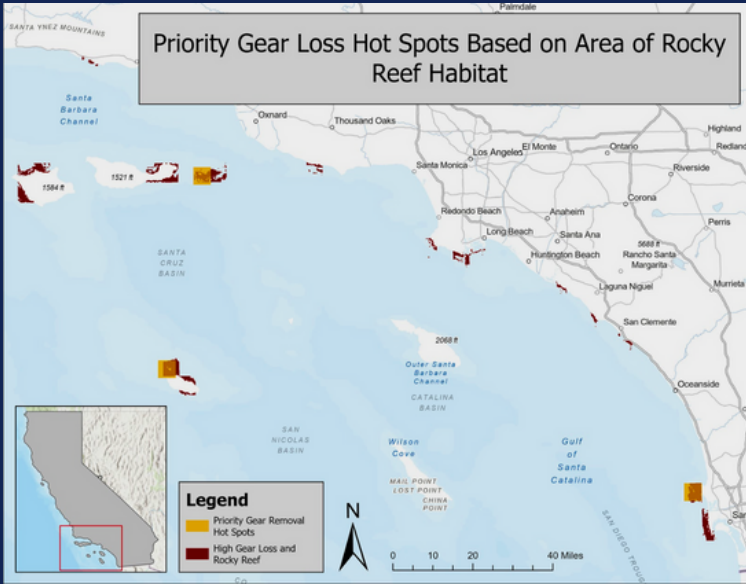
3

We identified areas of potential gear dereliction in Southern California by utilizing benthic substrate data and regional fishing intensity to determine priority gear removal hot spots.

ODA can utilize this information to target future marine debris removal efforts and reduce operational costs.

PROJECT IMPACT

Our research bolsters the effectiveness of ODA's marine debris cleanup efforts by identifying derelict gear locations that were previously unknown. Additionally, we developed a general framework to evaluate gear dereliction impacts for trap-based fisheries in any setting. Lastly, ODA can reduce operating costs by targeting outreach to areas where fishers are willing to collaborate and thereby increase volunteered locations about instances of lost gear.

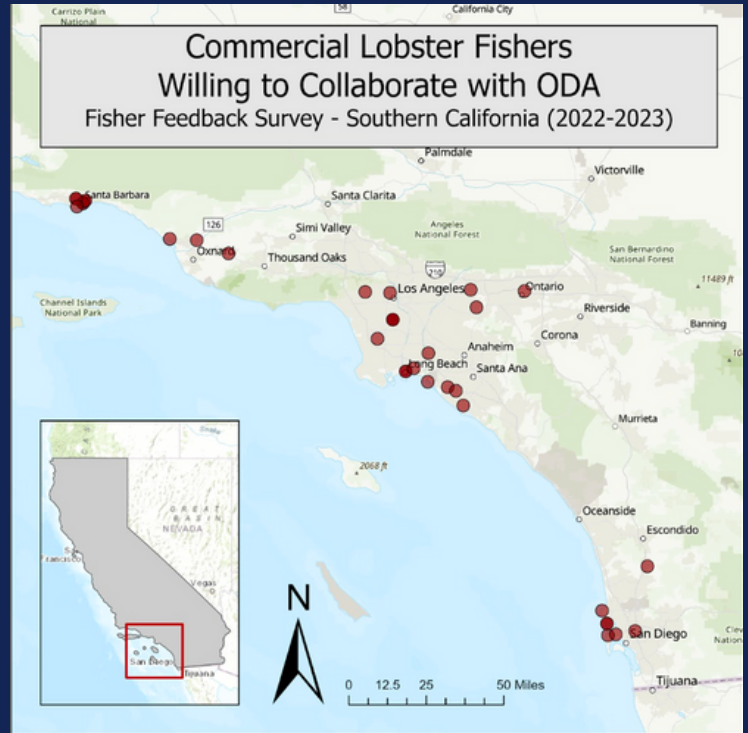


We identified areas of overlap between rocky reef habitat and gear loss locations to determine priority gear removal areas. Trap removals in these regions will effectively reduce ghost-fishing of California spiny lobster.

Locations where commercial lobster fishers reported interest in partnering with nonprofits like ODA include:
Santa Barbara | Ventura | Oxnard | Los Angeles |
Ontario | Long Beach | Huntington Beach | San Diego.

RECOMMENDATIONS

ODA's future remediation efforts should focus on derelict gear hotspot locations identified in this project. Strategic partnerships with enthusiastic fishers will improve ODA's ability to multiply impact and maximize efficiency. Additionally, discussions with coastal communities are likely to be most productive when centered around potential savings from pollution prevention. As a small nonprofit that's highly reliant upon volunteers and collaborators, ODA will benefit from strengthening its partnerships across communities for the ecological and economic benefit of all. Finally, ODA should direct some of its efforts toward streamlined data collection and reporting to provide quantifiable results of their work to community collaborators, volunteers, and donors.



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