Assessing the outcomes of the west Hawaii roi removal project

How would removal of the introduced predatory fish roi impact restoration of coral reef systems?

Working in collaboration with The Nature Conservancy Hawaii marine team and with field assistance from expert local fishers, we seek to answer this question by removing roi from a targeted patch reef in Puako, west Hawaii.

Our research questions are:

- Is it possible to fish down roi populations?
- What is the time and cost?
- Does removal have an effect on native fish populations?

Initial work in 2010-11 focused on characterizing the reef fish community and mapping roi populations. Next came catching, tagging and releasing of roi outside the area targeted for complete roi removal. The tagging study allows our team to observe where tagged roi travel and if they recolonize the cleared reef.

Then fishers removed all roi from the targeted reef, and the next step is monitoring how the reef community changes in response to the removal of roi. Monitoring has begun and will take place over the next several years.

Our results so far; one year after roi removal

Is it possible to fish down roi populations?

Yes, for a 3 acre patch reef it is possible to maintain depleted roi populations. Four roi have re-colonized from the surrounding area in the period of six month following removal. Roi have been observed to move between 50-150m from the periphery of the removal zone towards the center of the removal reef.

What is the time and cost?

It costs 77-person hours to clear 1 acre of reef via SCUBA spear diving in Puako, west Hawaii. At about ~1K/acre, the estimate to remove roi from all coral reef habitats (30’-60’) in west Hawaii would amount to $4,147,964.
Does removal have an effect on native fish populations?

Not immediately after roi removal. We will have to be patient and keep monitoring over the next few years, as it takes multiple seasons for a predator removal experiment to indicate an effect on a coral reef fish community.

The good news is that our study site and project design are just right to answer our question! The removal and reference sites are similar in fish abundance and composition, so we should be able to detect differences in the fish community, if there are any, following roi removal.

Next steps

- Maintain depleted roi population in the removal site
- Examine the reef fish assemblage over time through bi-annual monitoring
- Engage the local community in learning about effects of introduced species
- Strengthen collaborative partnerships with managers, scientists, and community members

Mahalo nui loa

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Mahalo for your contribution to this research!

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