Effects of lionfish removal on coral reef fish communities at Roatan, Honduras

Friederike PEIFFER[1], Sonia BEJARANO[2], Giacomo PALAVICINI[3], Christian WILD[1]

[1] University of Bremen, Bibliothekstraße 1, 28359 Bremen, Germany, (fredi.peiffer@gmail.com); [2] Leibniz Center for Tropical Marine Ecology, Fahrenheitstraße 6, 28359 Bremen; [3] Roatan Marine Park, West End Road, Roatan, Honduras

INTRODUCTION

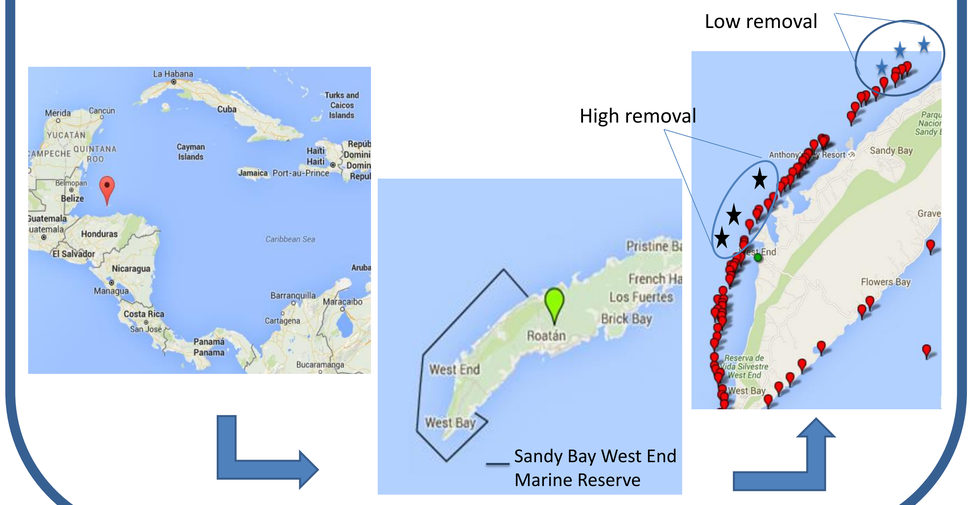
A pressing concern in the Caribbean is the invasion of the Indo-Pacific lionfish, *Pterois* sp. This invasive species poses a threat to native coral reef communities by competing with other predators and feeding on fish and invertebrates, some of which are commercially or ecologically important. Since 2010 a local non-governmental organisation, Roatan Marine Park (RMP), trains people of the community and tourists on targeted spearfishing in order to control the population of lionfish at Roatan, Honduras.

AIM OF STUDY

The aim of this study was to assess the effectiveness of local removal efforts in reducing lionfish populations and measure the impact of this management practice on native coral reef fish communities using a combination of stakeholder interviews and visual census reef surveys.

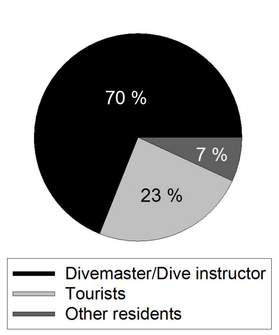
APPROACH

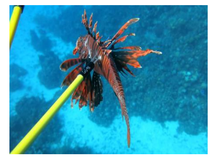
- Questionnaires were distributed among dive center and tourists to assess removal effort
- Six study sites: Three each for high and low removal; Reef wall (15 m depth)
- Fish belt transect (50 x 5 m) to quantify lionfish, snapper and grouper density
- Fish belt transect (25 x 2 m) to quantify prey-sized fish
- Point Intercept transect to quantify percent cover of benthic community

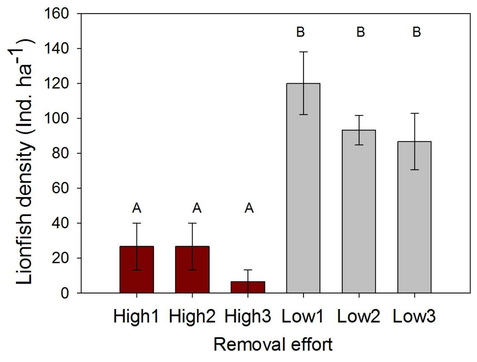


RESULTS: Effectiveness of lionfish removal

- Average catch per unit effort (CPUE): Three fish h^{-1}; Average monthly catch of eight fish per site
- Significant reduction of lionfish populations to 20 fish ha^{-1} compared to 100 fish ha^{-1} at unfished sites



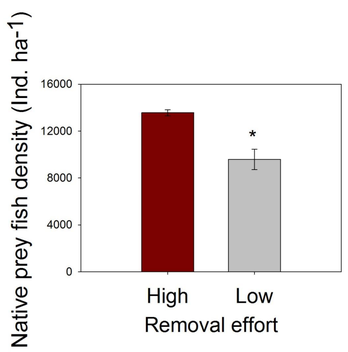




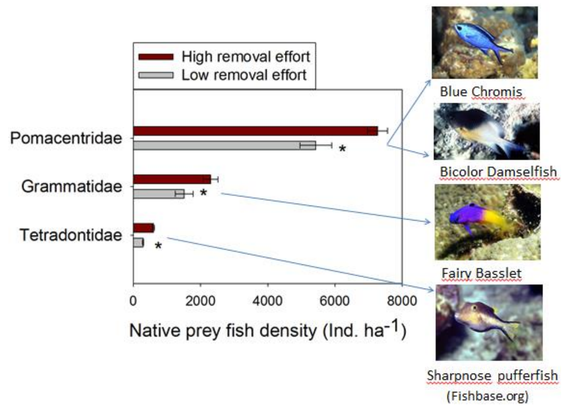
RESULTS: Impact on native reef fish community

- Removal efforts caused signficantly higher abundance of prey-sized fish (<15 cm)
- Pomacentridae, Grammatidae and Tetraodontidae significantly affected
- Abundance of invertivores and cleaners benefit from removals

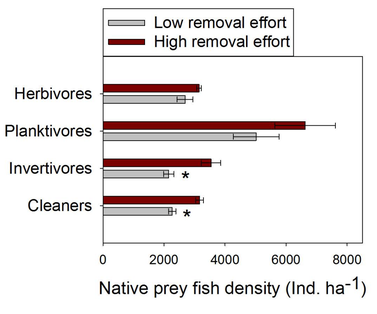
Native prey fish density



Families and species



Trophic groups



DISCUSSION and CONCLUSION

- On unfished sites lionfish as the dominant predator regulate population dynamics of prey-sized fish
- Threat of lionfish especially to invertivores and cleaners
- Voluntary and oppportunistic removals by local community help to reduce negative impact of lionfish
- Solutions for depth refugia and higher catch per unit effort are needed

ACKNOWLEDGEMENTS

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