

Risks and rewards of stakeholder engagement in invasive species management

Frankie Read-Cutting 20034086

Stage 3 Marine Biology, School of Natural and Environmental Sciences

✉ f.read-cutting2@newcastle.ac.uk

Background:

The invasion of lionfish in the Western Atlantic is regarded as a key threat to marine biodiversity (Andardi-Brown, 2019). Several management and eradication measures have been proposed, but current literature disagrees over which are most effective. Stakeholder engagement is routinely highlighted as essential. This project determined how three interacting stakeholder groups perceived the risks and rewards of current lionfish management strategies in Utila, Honduras.

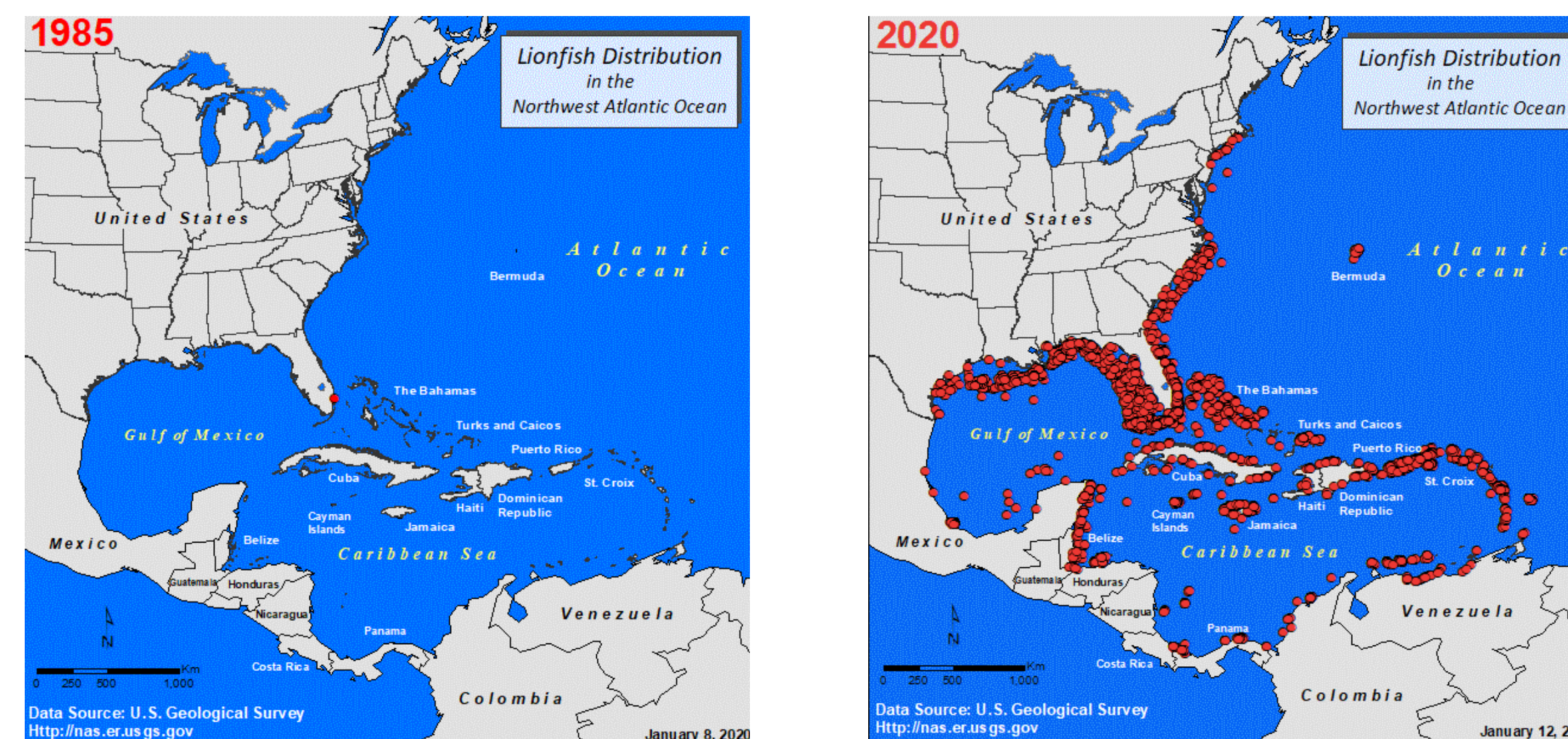


Figure 5. Expanding distribution of invasive *Pterois* spp. lionfish in the Western Atlantic between 1985-2020 based on reported sightings (Maps are based on USGS data and produced by the Wetland and Aquatic Research Centre, link: shorturl.at/duBV)

Conclusions:

- My findings support a need for effective education around the biodiversity risks associated with invasive lionfish to promote positive stakeholder engagement
- All stakeholders had heard about invasive lionfish and supported their removal to some degree.
- Unanticipated consequences have emerged, showcasing how complex and sensitive stakeholder participation can be for successful invasive species management.
- Nursesharks exhibit aggressive behaviour toward divers during lionfish hunts showing how culling strategies have to be carefully monitored.
 - It is suspected that someone has been feeding lionfish to native predator species to encourage natural prey recognition.
 - Rather than recognising live lionfish as prey, they react to dead and speared lionfish in association with divers. This behavioural change could result in **dangerous interactions** between divers and predatory organisms.

Methods:

Three key interacting stakeholder groups were identified:

- Lionfish spearfishers
- Recreational tourists
- Local restaurant owners

Semi-structured surveys were created and distributed electronically to each of these groups to assess their perceptions towards lionfish management strategies. Open answer results were thematically coded to identify response themes.

“I was **assaulted** by the nurse sharks and **felt violated**. I feel more **nervous** about diving in lionfish hunts in the future as a result. They **followed the boat** they were that keen. It was really intense” – WSORC lionfish hunter 2022



Figure 1. Nursesharks interacting with lionfish hunters on a hunt, July 2022

- Two nursesharks harassing diver holding a zookeeper containing speared lionfish
- A nurseshark inserting its head into a zookeeper abandoned by a harassed diver, attempting to consume the dead lionfish inside

(Photo Credits: Megan Beer)

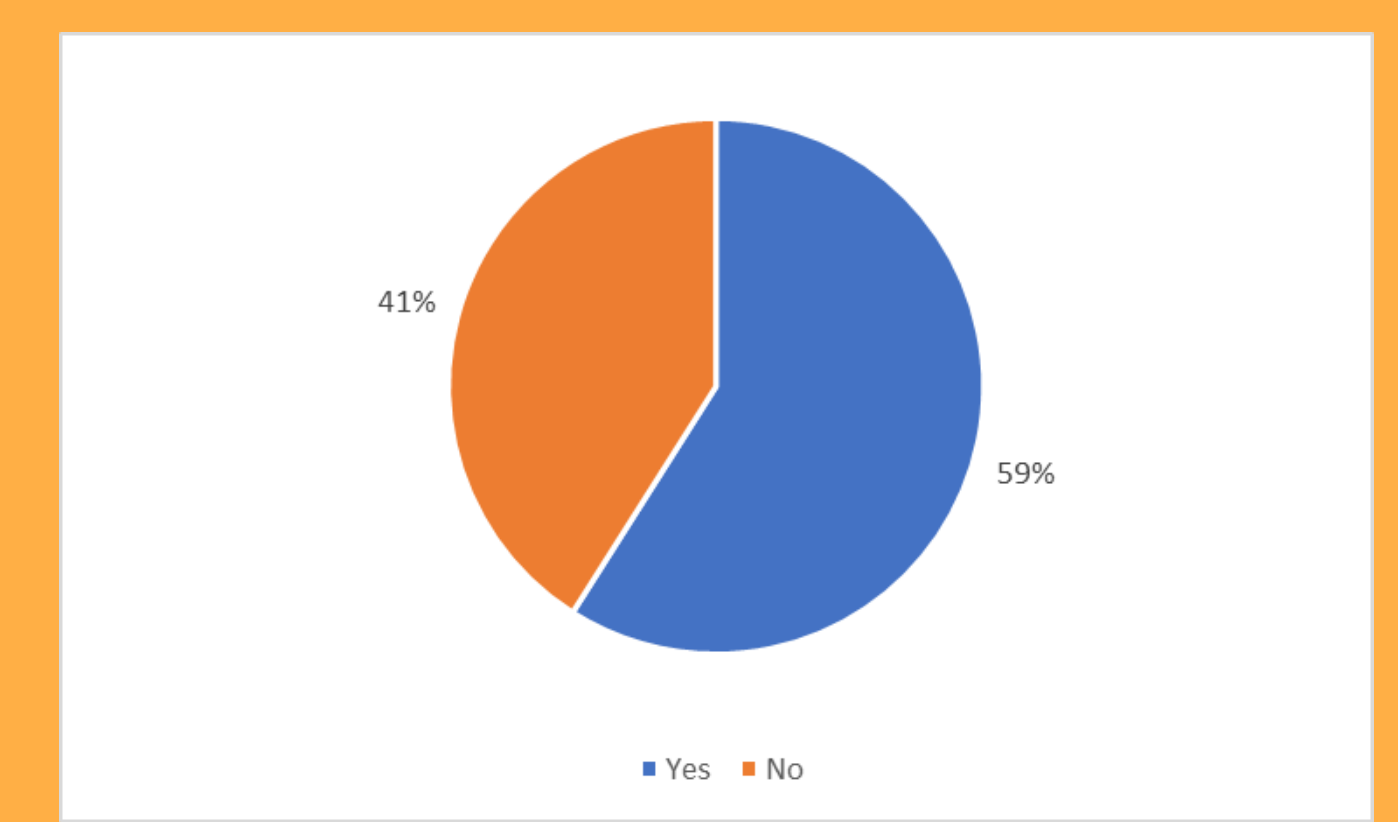


Figure 2. Proportion of divers (n=29) surveyed July-August 2022, that encountered nurse sharks during lionfish hunts in Utila, Honduras.

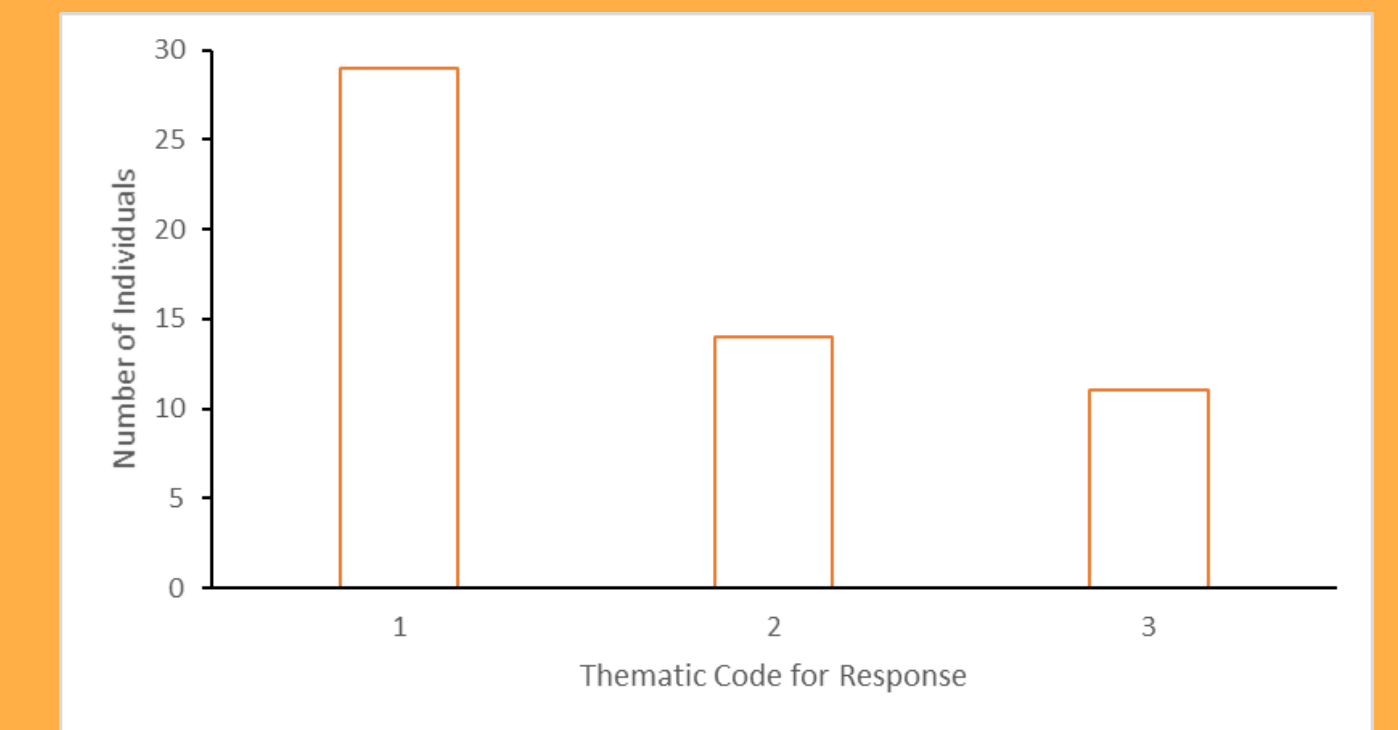


Figure 4. Responses from lionfish hunters (n=29) to the question “what motivates you to hunt lionfish?” Thematic code: 1 = conservation, 2 = fun, 3 = food source

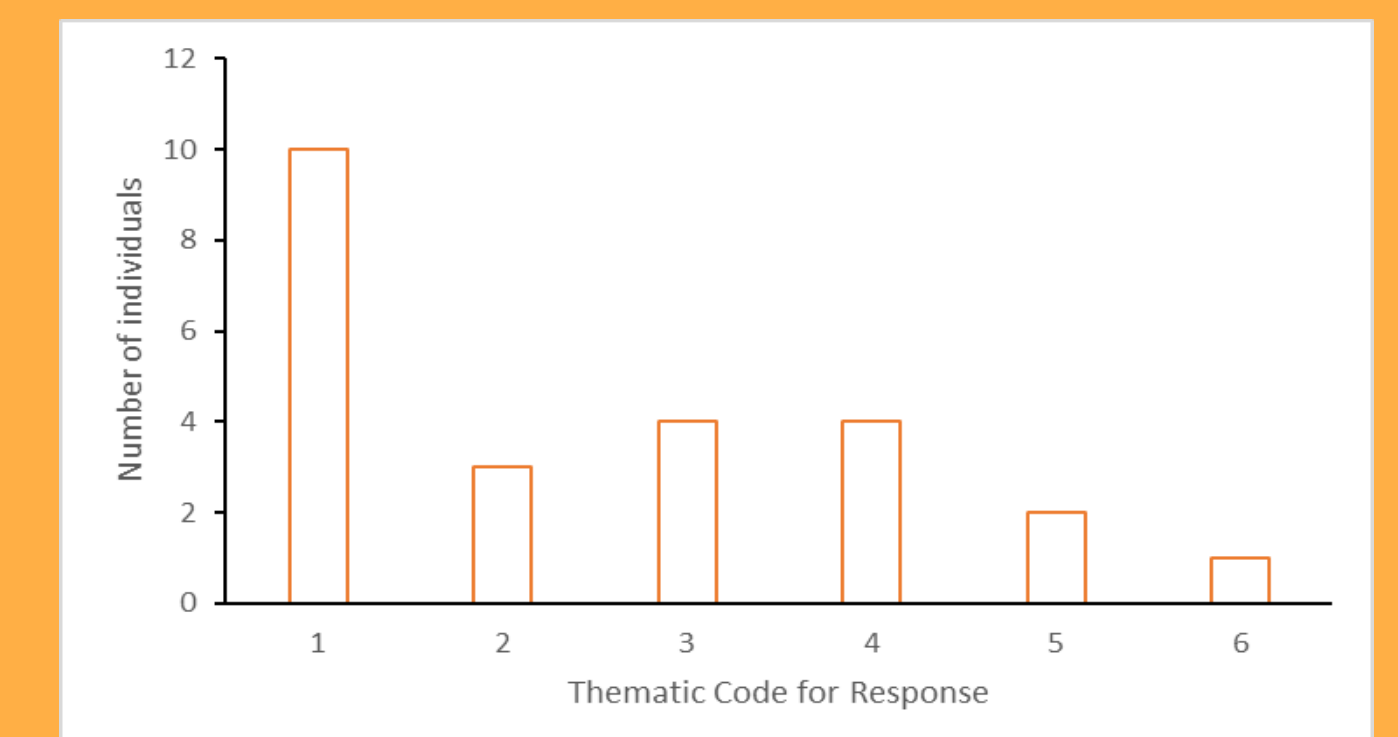


Figure 3. Responses from tourists and restaurant owners (n=19) to the question “how do you think lionfish removal should be incentivised?”

Thematic code: 1 = education, 2 = consumption, 3 = participation on hunts, 4 = increase accessibility to hunting, 5 = sport, 6 = increased local support

Acknowledgements:

Dr. Heather Sugden – **Project Supervisor**
 Whale Shark Oceanic Research Centre
 Michelle Cerrato
 Carolyn Corley
 Eli Myron

