Junk Food: The Role of Discards from the Spiny Lobster Fishery in Sustaining Marine Scavengers

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INTRODUCTION

In Bahamian lobster fisheries, most fisherman kill and remove the heads of the lobsters from the tails as soon as they are caught. These low-value heads are then thrown back into the ocean as discards.

The spiny lobster fishery is efficient, has no bycatch and is certified as sustainable by the Marine Stewardship Council (MSC). However, there are potential unknown impacts from the lobster fisheries.

The **aim of this study** is to discover the possible impacts (positive or negative) that the discarded heads have on the marine environment.

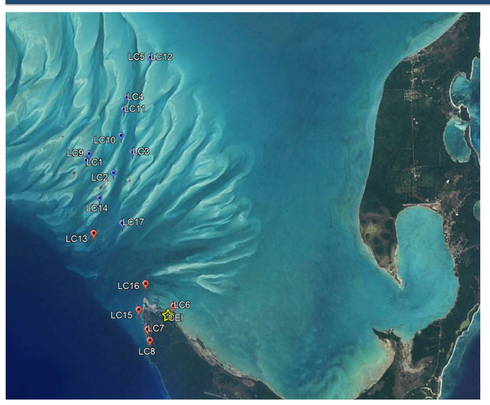
RESEARCH QUESTIONS

Do discards alter behaviors of lobster predators?

Which species interact with lobster discards?

Are there differences in communities scavenging between reef and soft sediment habitats?

METHODS

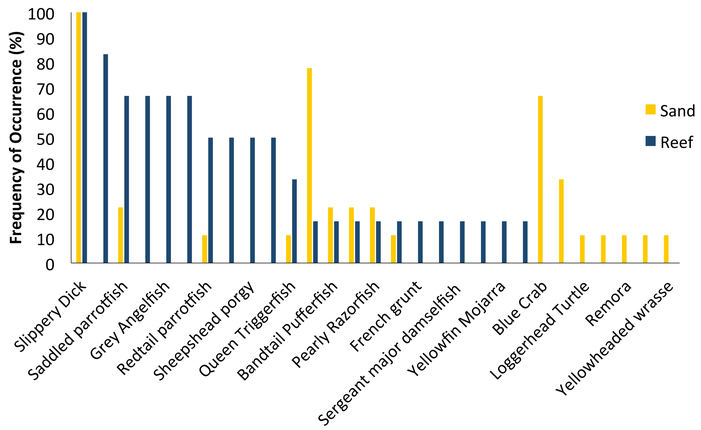


Prepare → Deploy → Recover

Lobster discards and BRUV (Baited Remote Underwater Video) (Malleta & Pelletiera, 2014) were deployed in the Schooner Keys, off of Cape Eleuthera, Bahamas. This is the 'striped' area to the North of the Cape. The dark channels within the lighter sandbanks are soft sediment habitats, such as sand and seagrass, which are typically used by Bahamian lobster fisheries. The cameras deployed here are shown by the blue GPS points on the map. In comparison, the red points represent reef habitats closer to the Cape, which were used as a natural control for the research. The cameras recorded any interactions between the bait and marine species over a four hour period, before being recovered and then analyzed.

RESULTS

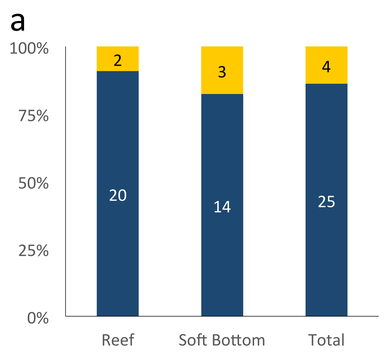
Figure 3: The frequency of species interacting with discards, in sand habitats compared to reef habitats.



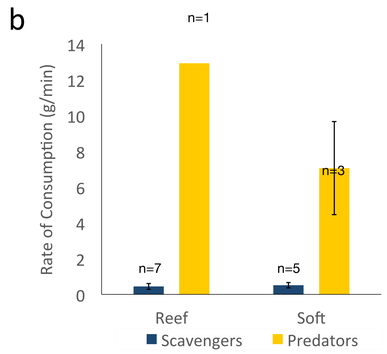
The frequency of species interacting with discards, in sand habitats compared to reef habitats. The slippery dick, the most common species, is equally present in both areas, but other species like the blue crab are only present in the sand habitats. The graph also depicts the diversity in each habitat. For example, the reef habitats have much greater diversity than the sand habitats.

Figure 4: Common lobster predators (Mintz et al., 1994): (a) Queen Triggerfish; (b) Loggerhead Turtle

Figure 5: (a) percentage of scavengers and predators at reef and soft bottom sites; (b) Rate of consumption by scavenger and predator species



There is an equal amount of natural lobster scavengers to predators at reef and soft bottom sites. We assumed that the natural lobster predators would be more adapted to finding discarded lobster heads, but it is the generalist scavengers that find it first.



This graph demonstrates the weight loss over time of the lobster head at soft and reef bottom deployment sites. When a predator is present, they consume the bait at a much higher rate. In addition, there is no difference between reef and soft bottom sites on the time of consumption.

DISCUSSION

This is the first project to investigate the effects of discards from the Bahamian lobster fishery, and has the potential to influence the Marine Stewardship Council (MSC) in certifying the fishery as sustainable.

The data shows that these discards provide food for a wide range of scavengers, including natural predators of Caribbean spiny lobster (e.g. Mintz et al., 1994). Lobster scavengers at soft sediment habitats typically fished by industrial lobster fishers were found to be less diverse and differed in species composition compared to those found in reef environments where lobsters would naturally be found. We did not directly observe any negative impacts of the lobster discards and estimate that discards are removed within 10 hours by scavengers and predators.

FUTURE STUDIES

Our results suggest that more research should be conducted on the blue-head wrasse and slippery dick populations in fishing areas to see if these discards obligate scavengers to have higher populations in common fishery areas.

A new study has begun that researches the effects of lobster head discards on triggerfish behavior. The triggerfish were a common predator in our study, this new study will be looking into their preference between a live lobster or a lobster head discard. This is important because triggerfish could be dependent upon these discards and lose their hunting instinct over time as they have a reliable food source in lobster heads.

LITERATURE CITED

Mintz J., Lipcius R., Eggleston B., & Seebo M.. 1994. *Survival of juvenile Caribbean spiny lobster: effects of shelter size, geographic location and conspecific abundance.* Marine Ecology Progress Series, pg. 255-266.

Malleta D. & Pelletiera D.. (2014). *Underwater video techniques for observing coastal marine biodiversity: A review of sixty years of publications (1952–2012).* Elsevier Journal, pg. 44-62.

TEAM

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