Shark Ecotourism and the Effects on Coral Reef Ecosystems

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Introduction
In my project, I will investigate the effects of no-take Marine Protected Areas (MPAs) on coral reef biodiversity in Fiji as well as the influence of marine ecotourism and the food provisioning associated with shark ecotourism on the protection and sustenance of coral reef ecosystems. I hypothesize MPAs with ecotourism will have higher biomass and richer species diversity, linking shark diving to a healthier ecosystem. Not only could this support the implementation of MPAs but it could also have direct benefits for local Fijians by boosting economy and restoring old cultural traditions.

Materials and methods
I will be taking measures of biomass and species richness through the use of visual censuses and belt transects, as delineated in Lirman et. al. (2007), in three areas of Fiji:
1) Beqa (est. 2004): an MPA with Shark Diving
2) Namena (est 1997): an MPA without shark diving
3) Nigigi: a control area under no protection

To measure the effects of food provisioning on the ecosystem I will take five water samples at each site, differentiating 5 samples before chumming and five samples after chumming in Beqa. I will also videotape two shark dives with Beqa Adventure Divers (BAD) to quantify how much of the food is consumed and how many non-shark species are directly consuming the chum. Additionally, BAD, who video tape all shark dives run through their business, has offered to make their catalog of videos available to us. This will enable us not only to look at long term changes to the area but also to compare seasonal variations at this particular site.

Research Question:
Does shark based ecotourism have impacts, either good or bad, on the health and sustainability of nearby coastal ecosystems?

Implications:
MPAs conservation efforts have been proven effective ways to restore coral reef ecosystems. However, it requires lots of time and space (Mumby, 2006). If I can provide additional support for this there may be more enforcement of this legislature and/or more MPAs put into practice. This will ideally help restore many of the extant species around Fiji and other tropical marine areas that have been overexploited. Additionally, this locally founded business helps Fijians provide for their families without continuing the fishing tradition that has caused such major damage to their local ecosystems. Finally, the cultural impact of restoring Fijian reefs to even a fraction of what they once were is immeasurable.

Thesis Statement:
H₀: There will be no difference in the species abundance of fish or biomass inside and outside no-take MPAs.
H₁: There will be greater fish species abundances and biomass inside no-take MPAs than in non-protected areas.
H₂: There will be greater fish species abundance and biomass inside reserves that also practice food provisioning for shark dives than in areas that do not practice food provisioning for ecotourism.

Predictions:
I suspect that there will be the greatest species abundance and biomass inside reserves that also practice food provisioning for shark dives than in areas that are neither protected reserves nor provisioned shark dive sites.

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Literature cited

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