

# JUSTIN R. RIZZARI

**PhD Candidate 2012 to 2015**  
**IPRS, AIMS@JCU, Save Our Seas Foundation**  
**ARC Centre of Excellence for Coral Reef Studies**

**Supervised by:**

**Prof. Mark McCormick (JCU)**

**Dr. Mark Meekan (AIMS)**

**Dr. Ashley Frisch (JCU)**

**Dr. Andrew Hoey (JCU)**

## **Effects of apex predators on coral reef trophic ecology**

Justin grew up in Texas, along the Gulf Coast of Mexico where his interests in the ocean began at an early age with surfing and fishing. After trips to the Caribbean and Central America he began to gain a keen interest in tropical marine life. He graduated from Texas A&M in Corpus Christi with a BSc in Environmental Science with a focus on marine and coastal resources. Participating in a research program in tropical marine ecology in the Caribbean and working at a coral lab in the Red Sea solidified his desire to study the marine environment, specifically coral reef associated ecosystems. To this end, Justin moved to Townsville in 2011 to start a Masters of Applied Science at JCU, studying the effect of reef shark behaviour across different levels of management zoning.

Apex predators, such as sharks, are experiencing rapid world-wide declines. Evidence from terrestrial and oceanic habitats indicate that apex predators often have a disproportionate influence on ecosystems via a top-down control of community composition and prey behaviour. At present, our understanding of the ecological role and importance of apex predators on coral reefs is severely limited. Therefore, widespread declines in apex predator populations are of great concern to those who manage marine ecosystems, particularly coral reefs.

Justin's research aims to examine the trophic role and importance of apex predators on coral reefs and to what degree fishing disrupts these trophic interactions. This will be accomplished through use of manipulative experiments, diet analyses, stable isotope measurements and population assessments of apex predators and other key functional groups in fished, un-fished and no-entry zones of the Great Barrier Reef Marine Park. Project findings will identify the importance of apex predators in maintaining coral reef health and assess the effects of declining apex predator populations on the broader ecosystem. It is anticipated that this research will underpin innovative approaches to ecosystem-based management of coral reefs.

The most exciting part of the research thus far, has been the opportunity to survey shark and fish populations in no-entry zones of the Great Barrier Reef Marine Park from north of Cooktown to as far south as the Capricorn Bunkers.



# JUSTIN R. RIZZARI

## Publications

Frisch AJ, Cole AJ, Hobbs J-PA, Rizzari JR, Munkres KP (2012) Effects of spearfishing on reef fish populations in a multi-use conservation area. *PLoS ONE* 7:e51928

Rizzari JR, Frisch AJ, Connolly SR (2014) How robust are estimates of coral reef shark depletion? *Biological Conservation* 176 39-47

Rizzari JR, Frisch AJ, Hoey AS, McCormick MI (2014) Not worth the risk: apex predators suppress herbivory on coral reefs. *Oikos* 123(7): 829-836

Rizzari JR, Lönnstedt OM (2014) Cooperative hunting and gregarious behaviour in the zebra lionfish, *Dendrochirus zebra*. *Marine Biodiversity* (in press)