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Paddy Pallin Science Grant

Food-web dynamics of urchin barrens habitats; who is in control?

University of Newcastle

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Supervisors: Prof Maria Byrne and Dr Nathan Knott

Project Summary

Lobsters are natural predators of sea urchins which can reduce their numbers limiting their kelp grazing, and this can lead to kelp recovery. However, the impact of the common NSW species *Sagmariasus verreauxi* (Eastern Rock Lobster) on urchin populations has not been determined and it is unknown whether a keystone urchin predator exists for NSW as it does elsewhere. Investigating this will best inform urchin management and will lead to best-case management of crucial kelp stocks in in coming decades. Since other potential key urchin predators including *Achoerodus viridis* (Eastern Blue Groper), *Chrysophyrus auratus* (Australasian Snapper) and *Heterodontus portusjacksonii* (Port Jackson Shark) occur over the same range as *S. verreauxi*, comparative analyses also need to be undertaken to gain a full picture of how food-web dynamics operate. To achieve this, my PhD project investigates predator food webs within urchin barrens habitats and the potential for various predators to regulate grazing by barrens-forming *C. rodgersii* and *H. erythrogramma* urchins in NSW, with a focus on lobsters.

Biography of Jeremy Day

Jeremy is a 3rd year PhD candidate at the University of Newcastle in Ourimbah where he works on urchin diets and the importance of urchins in predator diets. He completed his undergraduate degree at James Cook University in Townsville in 2017 where he worked as a skipper and divemaster, before spending time in industry as a commercial pearl diver in Western Australia and Crown Of Thorns Starfish diver in North Queensland. In 2019 Jeremy returned to study in his hometown of Wollongong, NSW where he completed an Honors under Prof. David Ayre and Dr. Nathan Knott which was a novel assessment of urchin predation by Eastern rock lobsters. This work had some surprising results, which led to Jeremy's PhD thesis titled "food-web dynamics of urchin barrens habitat – Who is in control?". This work uses caged feeding trials and urchin tethering experiments as well as gut contents and stable isotope analysis to look at diets. Jeremy's work has a focus on non-lethal sampling and in his spare time he keeps a permaculture garden with chickens, ducks and a native beehive.