Progress Report STP 2019-038 (FY 2019-2020)

Habitat quality as a driver of epinepheline serranid productivity and replenishment

Marine Science

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Understanding the habitat requirements of animals and how this influences their distribution is essential for effective management. Ongoing shifts in habitat due to changing climate and acute environmental disturbance emphasise the need to understand how changes in habitat affect associated fauna. Epinephelid serranids are ecologically important predators on tropical reefs that are an attraction for both tourists and fishermen. This project will focus on the habitat requirements of epinepheline serranids at Ningaloo Marine Park, exploring mechanisms that influence their distribution, abundance and productivity. The project will examine fish within two prominent habitat types at Ningaloo, macroalgae and corals, that also represent extremes of the current regime shift paradigm on tropical reefs.

Analysis of surveys within macroalgal and coral reef habitats have found that two of the most common epinephelids, *E. fasciatus* and *E. rivulatus,* are typically found on coral reefs and macroalgal meadows, respectively. More detailed microhabitat surveys within macroalgal meadows revealed that *E. rivulatus* have a close association with hard structures that are >50cm in diameter and holes >10cm diameter. To assess the influence of seasonal fluctuations in macroalgal canopy on *E. rivulatus* distribution, more than 120 fish were tagged on macroalgal patches of different canopy structure in the summer. Follow up surveys will determine if breakdown of macroalgal canopies in the winter affects site fidelity and microhabitat associations of *E. rivulatus*.