

## Baiting and citizen science: a comparative study of BRUVs and eDNA surveys throughout estuaries in New South Wales.

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The monitoring of fish assemblages is fundamental to fisheries research and Baited Remote Underwater Videos (BRUVs) have traditionally been used as the method of choice for a non-destructive approach to conducting fish surveys. The use of environmental DNA (eDNA) to study fish assemblages is an emerging technique increasing in popularity. The application of eDNA in aquatic ecosystems is revolutionising the detection of biodiversity, and is proving to be a cheaper, quicker, more sensitive and a citizen-science friendly approach. eDNA is proving to be a powerful complementary technique enabling enhanced sampling capacity previously unattainable by scientists alone. Previous research in estuaries demonstrates an increase in fish species richness from eDNA samples when compared to traditional BRUVS surveys. Our research will fill a knowledge gap by expanding the method comparison of detecting fish assemblages using BRUVs and eDNA across multiple estuaries throughout NSW, and the results will inform the design of biomonitoring programs of estuaries in NSW. Furthermore, our work will investigate the latitudinal distribution and potential range shifts of fish assemblages throughout estuaries in NSW. This research will play an important role in demonstrating the importance of involving citizen-scientists in the collection of water samples for eDNA analysis. The integration of citizen-scientists into the collection of samples is fundamental to expanding and developing longitudinal datasets that are required to improve our understanding of the issues facing aquatic ecosystems, how these systems respond to changes and will ultimately inform on ground conservation and management approaches.