ICRS-0747

Baited video reveal fish diversity in the vast soft bottom habitats of a tropical lagoon BALETAUD F.*^{1,2,3,4}, GILBERT A.², MOUILLOT D.⁴, COME J-M.³, VIGLIOLA L.¹

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Introduction

- Tropical soft bottoms represent a vast overlooked ecosystem. Whereas this inter-reef habitat matrix cover 50-90% [1] of the tropical continental shelf, research has always focused on the much less extended coral reefs
- The lack of attractiveness of soft bottom habitats to research could be linked to their low structural complexity, therefore low faunal diversity, or the inherent difficulty linked to their vast extent, depth and scarce fauna.
- Baited Remote Underwater Video Stations (BRUVS) are the most widespread low-cost video technique [2] that can provide large collection of field data [3]
- Small scale sampling design using BRUVS still needs to be addressed to assess their ability to study **soft bottom fish community**

Can BRUVS discriminate soft bottom fish assemblages in a South Pacific island's lagoon?



Fig. 1: Noumea's lagoon map showing the two survey sites divided in three habitats (Bay, Lagoon, Barrier)

Methods

- of three
- using Permanovas
- were plotted for each habitat [4]

References

[1] S. Andréfouët, G. Cabioch, B. Flamand, B. Pelletier, Coral Reefs. 28, 691–707 (2009). [2] S. K. Whitmarsh, P. G. Fairweather, C. Huveneers, Rev. Fish Biol. Fish. 27, 53–73 (2017). [3] M. Cappo, G. De'ath, P. Speare, Mar. Ecol. Prog. Ser. 350, 209–221 (2007). [4] A. Chao et al., Ecol. Monogr. 84, 45–67 (2014).

[5] M. Dufrêne, P. Legendre, Ecol. Monogr. 67, 345–366 (1997).

[6] L. Wantiez, M. Harmelin-Vivien, M. Kulbicki, Mar. Biol. 125, 801–812 (1996).

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- Standardized
- > Replicable
- Data perennity

60 BRUVS were deployed along an inshore-offshore gradient (Bay, Lagoon, Barrier soft bottoms) in two sites (Aboré reef / M'béré reef) of New-Caledonia, South Pacific

Sampling took seven day-trips on a small boat with a crew

Species richness and fish abundance were compared

Rarefaction curves using Hill numbers (Chao's estimator)

Assemblage structure was highlighted using NMDS and Indicator Species revealed using Legendre's method [5]





curves per habitat (both sites combined, C)

- NMDS revealed an inshore assemblage offshore (Lagoon Bays) & and an assemblage (Barrier)
- Indicator species of the offshore assemblage included small or reef associated species while commercial species were indicator of the inshore assemblage
- sampling effort
- of the New Caledonian lagoon [1]
- to deploy





Results

Fig. 2: Overall ordered species cumulated abundance (A). Species richness boxplot per site-habitat (B). Rarefaction

- > 2888 recorded fish of 34 families and 148 species
- > Half of the species were of commercial interest
- > Diversity and abundance increased from bays to barrier
- > Asymptotic estimates reached 240 species overall and 216, 68 and 42 for the Barrier, Lagoon and Bay habitat, respectively



Fig. 3: NMDS on the 44 significant indicator species highlighted by Legendre's indicator species analysis (10 first shown).

Conclusion

Our study is one of the few addressing interest to vast inter-reef sandy environments using BRUVS [2]. We show that BRUVS can assess fish assemblage structure over these environments with a relatively low

While the most diverse habitat was near and most probably under the direct influence of coral reefs, lagoon and bay were key habitats for many commercial species. These latter habitats represent the vast majority

Our results are consistent with previous trawl studies [6] while BRUVS remain non-destructive and easy

BRUVS should have applications for lagoon fishery management and conservation planning







