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From: TURFeffect

Subject: List of proposed indicators

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Since our meeting two weeks ago, we have been working on a list of proposed indicators to measure the effectiveness of marine reserves. These represent a subset of indicators from Afflerbach et al., 2014, Basurto & Nenadovic, 2012; Pomeroy et al., 2004, and are aligned with the list provided by Stuart Fulton. Indicators were selected based on ease of collection, analysis, and interpretation.

The present document contains our first draft of the list, divided into three main sections: biophysical, socioeconomic, and governance indicators. Biophysical indicators include those that can be extracted from COBI’s yearly ecological monitoring program for reserve and control sites. Socioeconomic indicators are those that can be compiled by addressing the fishers, or fisher organizations, the community, or directly from COBI’s staff. Governance indicators can be identified through the legal framework under which each community operate, expertise of COBI staff, or directly from fishers and their organizations. We must highlight that this list is based on the data description that we received, and that having access to the databases will enable us to look for different options, gaps, and solutions for said gaps.

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| Type of indicator | Indicator | Definition/Description | Data type |
| Biophysical | Species richness | Relative change in number of species across years within reserve and compared to control zone | Discrete |
| Size structure | Comparison of size of species inside/outside the reserve as well as before and after reserve implementation | Discrete |
| Density | Comparison of density of surveyed species inside / outside the reserve | Discrete |
| Natural Disturbance | Information on whether that year happened a major natural disturbance and its severity | Categorical/Continuous (scale) |
| Trophic niches | Calculate mean trophic level before and after reserve implementation and between reserve and control site | Continuous |
| Socioeconomic | Total landings | Have landings increased since the implementation of the reserves? And compared to control sites? | Continuous |
| Managed species landings | Have landings for managed species increased since the implementation of the reserves? And compared to control sites? | Continuous |
| Cost of implementation and monitoring | Initial cost of implementation (including time spent/distance traveled) and cost of monitoring and management in terms of present value | Discrete |
| Alternative economic opportunities | Opportunity for implementation of alternative economic activities to make up for closed/restricted fishing | Categorical |
| Community knowledge and understanding | Has the community’s understanding of environmental and social sustainability improved since implementation of the reserve? | Categorical |
| Governance | Access to the fishery | Describes the type of access to the fishery used (TURF, Permits, Open access) | Categorical |
| Actors of management | Who is involved in management, monitoring and enforcement | Descriptive |
| Number of fishers | Number of fishers with legal access to the area | Discrete |
| Legal recognition of reserve | Does the reserve have a legal recognition? | Binary |
| Type of reserve | Description of the reserve based on time (partial, permanent) and / or protection (all species, or some species). | Categorical |
| Who set up the reserve | The parties involved in setting up the reserve | Categorical |
| Decision-making body composition | Who is part of the decision-making body? | Categorical/Continuous (scale) |
| Community engagement in monitoring | Are users of near-by areas (fishers) and the community engaged in the monitoring? | Binary |
| Illegal harvesting | Degree of illegal harvesting | Categorical |
| Adaptive management plan | Does the reserve have an adaptive management plan | Binary |
| Reserve enforcement | Description of how the reserve is enforced | Categorical |
| Closed areas (for TURF-reserves only) | Percent of fishing grounds closed (for TURF-reserves only) | Continuous |
| Size of network | Whether there is a single reserve or a network of multiple reserves within or nearby. | Discrete |
| Reasoning for reserve location | Short explanation for why the reserve location was chosen. | Descriptive |
| Are fishers organized? | Yes or No? | Binary |
| How fishers are organized? | Whether the fishers are organized either in a coop, association, union or fisher organization. There may be multiple organizations of fishers for one reserve. | Categorical |
| Number of species managed | Number of species managed under the management tool. | Discrete |
| Type of species managed under the managed area | Group (fish, crustacea, mollusc,…) and category (pelagic, benthic, …) | Categorical |