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Ecological Survey Report Structure (Minimum Content Requirements)

1. Introduction

An introduction about the area including the general conditions and characteristics of the area.

2. Survey methodology

Describe the method used for surveying.

3. Survey sites

- GPS Coordinates of the proposed OECCMs sites.
- Map including location plan, minimum A-3 size scaled site plan showing all aspects of proposed OECCMs sites.

4. Benthic area

Information about coral reefs, sea grass beds and benthic conditions.

5. Fish community

Information about the different varieties of fish and their abundance.

6. Vegetation surveys

If the proposed area includes a terrestrial area, vegetation surveys should be carried out and results included in the report.

7. Coral community, coral health and structural complexity

Details of coral community dynamics and indicators for coral health, and information about reef complexity.

8. Endangered Species

Information about the IUCN endangered species found in the survey area.

Minimum requirements for management plan

Introduction	An overview of the area giving details of its history and current status (environmental, social, and economic aspects)
Goal/ Objectives	Specify the goals and objectives for management.
Boundary and Zonation	Identify the boundary of the OECM and include the different zones if any within the area.
Management approach	This section should give details about how the area would be managed.
Governance	Highlight how the area would be governed.
Ecological and socioeconomic benefits	Give details of the ecological significance of the area and the socio-economic benefits from the area.
Enforcement and compliance	Should include the regulatory measures that are applicable to the area and the enforcement measures that would be in place as well as approaches for ensuring compliance.
Monitoring	This section should highlight how the monitoring of the area will be carried out with parameters and indicators to be monitored and frequency of monitoring.

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Monitoring parameters

The following approach in line with the Maldives National Coral Reef Monitoring Framework should be used for monitoring of OECMs.

Standardised Approach:

- Depth: 5-10m
- Frequency/timing: once a year or based on availability of capacity and resources twice a year preferably between April – May to capture bleaching / immediate post bleaching impacts and between September – November.
- Method: 8 fixed transects 20m long x 5m wide. Fixed means the starting point is marked on the reef with stainless steel rod, so the transect is attached to the same point every year
- If you want to demonstrate the reserves are effective, you may want to compare each with a nearby area, so 1 survey location in the designated OECM, 1 survey outside the designated OECM on a nearby reef
- Should record location, depth, date, time and name of person recording data
- Data should be submitted by year end to the Ministry of Environment, Climate Change and Technology and the data can also feed into the National Coral Reef Monitoring Framework Database.

Indicators to collect:

- **Fish:** within each 20m x 5m transect:
 - Abundance and size (within 5cm groupings which allows biomass calculation) using an instantaneous count approach
 - Specific indicators to family:
 - Herbivores (parrot and surgeon),
 - Reef health and coral cover (butterfly),
 - Fishing (grouper, snapper, grunt),
 - Aquarium trade species (clownfish, angelfish, lionfish)
 - Megafauna (shark, turtle, ray).
 - Number of IUCN red-list species (presence/absence): 30-minute roaming survey (2 people) recording presence of species from a checklist. Easy way to do this is by using a visual checklist that can mark the species seen, or taking photographs of all different species to identify later.
- **Benthic:** every 50cm along 20m transect (under the tape not counting the start point): This could also be carried out using the National Coral Reef Monitoring Framework Photo-quadrat Collection Protocol.
 - Live coral (by growth form: branching, table, boulder, foliose, solitary, encrusting, hard coral data to the highest level possible – eg hard coral genera)
 - Macroalgae, coralline algae, cyanobacteria

- Sand, silt, rubble, bare rock (includes dead coral)
- Soft coral
- Sponge
- Other
- Coral recruit density (2 x 50cm quadrats at each of 0m, 10m, 20m along the transect giving 6 quadrat counts per transect, recording the number of corals <5cm in diameter/size within each quadrat)
- **Complexity:** can be visually estimated with provision of a visual guide 0-5m or using chain method
- **Reference:** two photos of each transect, start (looking in direction of transect) and end (looking back in to transect).
- **Invertebrates:** count within the 20 x 5m transect area (this follows National Coral Reef Monitoring protocol)
 - Grazers – urchins (long-spined, pencil and collector)
 - Important corallivores (COT, Pin cushion)
 - Fishery targeted – sea cucumbers (redfish, greenfish, pinkfish)
 - Threatened/fishery targeted – triton, giant clam, lobster, banded coral shrimp
- **Optional parameter (subject to availability of resources and capacity):** abiotic indicators such as water quality (including physical appearance, pH, salinity, temperature, Total Suspended Solids, Turbidity, Nitrate, Nitrite, Phosphate)

In addition to the above-mentioned parameters OECMs representing seagrass ecosystems can be monitored using Maldives Seagrass Monitoring Network Methods (<http://maldivesresilientreefs.com/resources/MaldivesSeagrassMonitoringMethods.pdf>)

OECMs representing mangrove and other terrestrial ecosystems can be monitored based on the Guidelines for Coral Reefs and Small Island Vegetation Surveys (<https://www.environment.gov.mv/v2/en/download/11067>)