

Ocean Country Partnership Programme

Dharavandhoo Thila Marine Protected Area

Conservation Action Plan 2025-2035



Submitted by Island Wetlands



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**Ministry of Tourism
and Environment**

For further information please contact:

Joint Nature Conservation Committee

Quay House

2 East Station Road

Fletton Quays

Peterborough

PE2 8YY

[https://jncc.gov.uk/our-work/ocean-country-partnership-programme/
Communications@jncc.gov.uk](https://jncc.gov.uk/our-work/ocean-country-partnership-programme/Communications@jncc.gov.uk)

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Ocean Country Partnership Programme:

The Ocean Country Partnership Programme (OCPP) is a bilateral technical assistance and capacity building programme that provides tailored support to countries to manage the marine environment more sustainably, including by strengthening marine science expertise, developing science-based policy and management tools and creating educational resources for coastal communities. The OCPP delivers work under three thematic areas: biodiversity, marine pollution, and sustainable seafood.

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Executive Summary:

Baa Dharavandhoo Thila was designated as a Protected Area under the Environment Protection and Preservation Act (4/93) on 2nd November 2023 under two protected area categories: Category 1 (Internationally Recognized Area) and Category 6 (Habitat and Species Management Area). Located within the UNESCO Biosphere Reserve of Baa Atoll, this protected area covers an area of approximately 133 hectares. It features diverse marine habitats including black coral gardens, sandy plateaus, and reef systems that support both megafauna and juvenile species. The site holds exceptional ecological value through its four manta ray cleaning stations and extensive soft coral communities, while also providing critical habitat for endangered and threatened species including bigeye tuna, guitar sharks, hawksbill turtles, green turtles, and Sunfish. The area has emerged as one of the top five dive sites in the region.

Key threats to the site include vessel traffic impacts due to congestion resulting in noise and disturbances particularly around sensitive cleaning stations, coral damage from anchoring, unsustainable fishing practices near juvenile areas, tourism pressure, and coral bleaching due to climate change. Monitoring efforts have documented instances of coral damage in upper reef sections, while stakeholders have raised concerns about navigation safety and declining manta ray sightings during peak seasons.

This conservation action plan is developed in accordance with Maldives Management Plan Guidance for Protected and Conserved Areas (August 2024) , to ensure the sustainable use and management of the protected area (PA) for the ten-year period 2025-2035. Formulated through extensive stakeholder consultations with local councils, tourism operators, dive centers, and environmental authorities, the plan integrates traditional knowledge and scientific understanding of the area.

The vision for Dharavandhoo Thila is:

"To establish Dharavandhoo Thila as a locally-governed marine protected area that preserves its diverse marine ecosystems and endangered species while sustaining traditional fishing practices and responsible tourism through effective community-based management within the Baa Atoll Biosphere Reserve framework."

To realize this vision, this conservation plan outlines a comprehensive framework with conservation as the primary objective, supported by six strategic management objectives:

Primary Conservation Objective: To preserve and enhance the exceptional marine biodiversity and ecological integrity of Dharavandhoo Thila, with particular focus on protecting manta ray cleaning stations, black coral gardens, and critical habitats for endangered species, in accordance with its Category 1 (Internationally Recognized Area) and Category 6 (Habitat and Species Management Area) designations.

Supporting Management Objectives:

Objective 1: By December 2027, establish a co-managed governance lead by the Dharavandhoo Island Council, with essential infrastructure and protocols for protected area management.

Objective 2: By December 2027, implement formalized integrated management framework that aligns with both local governance priorities and Baa Atoll Biosphere Reserve requirements.

Objective 3: By 2029, comprehensively reduce and mitigate anthropogenic threats to the marine protected area ecosystem, focusing on minimizing direct and indirect human impacts on marine habitats and species.

Objective 4: By December 2030, develop and implement a sustainable tourism management system that effectively balances conservation objectives with socio-economic benefits while minimizing ecological impacts.

Objective 5: By December 2030, develop a strategic stakeholder engagement system to support marine conservation efforts through targeted capacity building and community involvement.

Objective 6: By December 2034, establish comprehensive research and monitoring programs with defined protocols, focusing on key indicators such as marine biodiversity, ecosystem health, and socio-economic impacts, and ensure data collection is conducted quarterly and reported annually to inform adaptive management strategies.

The management structure employs a three-tiered system with clear responsibilities:

National Level: Policy direction and oversight by the Ministry of Tourism and Environment (MoTE) and technical guidance and enforcement by the Environmental Protection Agency (EPA).

Atoll Level: Coordination and support provided by the Baa Atoll Biosphere Reserve Office, which serves as a crucial intermediary between national authorities and local implementation.

Implementation Level: Daily operations and enforcement by Dharavandhoo Island Council through the MPA Management Unit.

Strategic Areas and Key Management Measures

The plan focuses on specific management protocols. Key management measures include implementation of zoning schemes with clear activity protocols, daily vessel time limits of 2 hours per boat, and a maximum capacity of 4 vessels at any given time within the protected area. These restrictions aim to balance site preservation with sustainable use while minimizing environmental impacts and user conflicts. Infrastructure priorities include installing four mooring buoys and implementing a 5 knots speed restriction system within the Core Area (Figure 8). Visitor management incorporates a flexible fee structure, offering two options: an annual contribution for operators or an entrance fee per visitor. Specific protocols are in place for local dive operators, resort diver operators and safari vessels to ensure compliance and equitable contribution to the management of the protected area.

Monitoring and Enforcement

Monitoring efforts emphasize manta ray population tracking and reef health assessment, supported by local dive operators and environmental agencies. Enforcement mechanisms combine regular patrols with community-based monitoring, particularly during the peak season (May-November). Financing mechanisms rely on visitor fees and allocation from Baa Atoll Conservation Trust Fund for management of the PA.

Stakeholder Engagement

Stakeholder engagement through the Resource User Working Group ensures regular input, while adaptive management procedures enable adjustments based on monitoring results and feedback. These strategies address key challenges such as overcrowding, vessel conflicts, and declining manta ray sightings while fostering sustainable tourism development and local economic benefits.

Financing and Stakeholder Engagement

Financing mechanisms will rely on visitor fees, contributions from resorts and dive operators, and allocation from Baa Atoll Conservation Trust Fund for management of the PA.

Key Infrastructure

Key infrastructure needs addressed in the plan include the installation of mooring buoys to protect coral reefs and regulate vessel traffic, particularly around sensitive areas such as manta cleaning stations. The plan also outlines monitoring requirements, with particular emphasis on coral health monitoring and enforcement measures. Operating under the regulatory framework of the Environment Protection and Preservation Act (4/93), the plan aligns with both national conservation policies and the UNESCO Biosphere Reserve framework.

1. Introduction

Dharavandhoo Thila represents a significant marine ecosystem in Baa Atoll, Maldives, distinguished by its rich biodiversity, manta ray cleaning stations, and extensive soft coral gardens. Designated as a Marine Protected Area (MPA) on November 2, 2023, this 132.58-hectare site falls under two protection categories: Category 1 (Internationally Recognized Areas) and Category 6 (Habitat/Species Management Area), reflecting both its international significance and specific conservation focus. Located within the UNESCO Biosphere Reserve of Baa Atoll, this protected area features diverse marine habitats including black coral gardens, sandy plateaus, and reef systems that support both megafauna and juvenile species. The area has emerged as one of the top five dive sites in the region, serving the tourism sectors of Dharavandhoo Island and nearby resorts including Royal Island Resort, Reethi Beach Resort, and Dusit Thani.

Stakeholder consultations have highlighted that, in recent years, increasing pressures on marine ecosystems have been observed from various sources. Local dive operators have observed coral damage resulting from boat anchoring and fishing lines, alongside instances of coral bleaching, particularly affecting upper reef sections. The significant vessel traffic raises safety concerns for both marine organisms and divers. Furthermore, fishing activities conducted near juvenile and nursery areas pose potential threats to the ecosystem's sustainability. These challenges highlight the urgent need for comprehensive management measures to ensure the long-term health of this marine environment while maintaining sustainable use practices.

This conservation plan aims to establish a comprehensive framework for protecting and sustainably managing the Dharavandhoo Thila MPA. It seeks to balance the preservation of critical marine habitats, including manta ray cleaning stations and black coral gardens, with sustainable tourism and traditional fishing activities. The plan includes measures for vessel traffic management, such as speed restrictions and buoy installation, to enhance both safety and conservation outcomes.

The development of the Dharavandhoo Thila MPA Conservation Action Plan followed a systematic, stepwise approach (Figure 1). The process began with a comprehensive literature review, examining existing scientific literature, historical data, and management documents related to the site, as well as analyzing similar marine protected area management approaches and reviewing relevant national policies. This was followed by initial stakeholder consultations, where key stakeholders including local councils, resort operators, dive centers, and community representatives were engaged to gather local knowledge and understand their concerns and management priorities.

Building on these foundational steps, a tourist perception and market assessment was conducted to analyze current tourism patterns, evaluate carrying capacity, and assess economic opportunities. This information directly informed the identification of management objectives, where clear, measurable targets were developed based on stakeholder input and site values, ensuring alignment with national conservation goals.

The fifth step involved resource needs identification, carefully assessing infrastructure requirements, staffing needs, and financial resources necessary for implementation. Finally, all these components were integrated into the draft conservation plan, which includes specific action plans, monitoring protocols, and implementation frameworks.

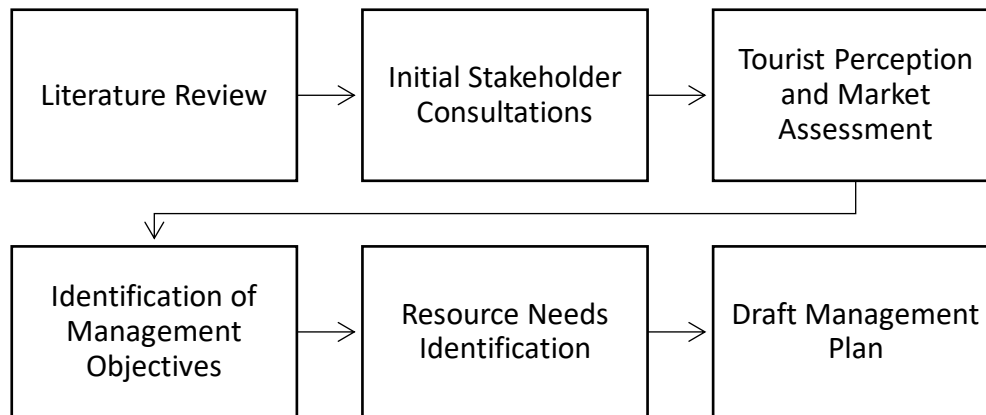


Figure 1 Process of development of Management Plan

Stakeholder Consultation:

A comprehensive stakeholder engagement process for the Guraidhoo Kandulhi Marine Protected Area (MPA) was conducted between August and November 2024. The consultation involved multiple key stakeholders:

- Guraidhoo Council representatives
- Maafushi Council representatives
- Gulhi Council representatives
- Local tourism operators from Guraidhoo island
- Local tourism operators from Maafushi island (dive and excursion centers)
- Local tourism operators from Gulhi island (dive centers)
- National Boating Association of Maldives (NBAM)
- Resorts in South Male' Atoll (Waldorf Astoria, Fihalhohi, COMO Cocoa Island, Kandooma).

The consultations revealed the area's ecological significance as one of the region's top five dive destinations, featuring four manta ray cleaning stations and a rich biodiversity including rare species like guitarfish and long fin gobies. These consultations revealed valuable insights about site usage patterns, environmental observations, management priorities, and socioeconomic considerations. Local ecological knowledge provided critical information about manta ray behavior, coral conditions, and seasonal patterns. Participants identified critical management needs, including installation of marker buoys to regulate speedboat traffic with a suggested 20-knot speed limit, restrictions on fishing near juvenile nursery areas, implementation of a coral monitoring program, and establishment of a ranger post for oversight. While dive operators and resorts acknowledged the importance of conservation, concerns were raised about management costs and visitor fees, with resorts suggesting that entry fees might deter tourists and proposing a broader Biosphere Reserve fee model instead. Most notably, the Dharavandhoo Island Council expressed strong opposition to applying the Hanifaru Bay management model, insisting on local governance and revenue management for the MPA. The National Boating Association questioned the necessity for stringent management given the site's relatively low usage, while stakeholders unanimously emphasized the need for enhanced education and awareness programs for visitors to protect the area's unique marine ecosystem.

Ten- year Conservation Action Plan (2025-2035)

This ten-year Conservation Action Plan (2025-2035) divides the Dharavandhoo Thila MPA into two management zones with different protection levels and permitted activities. The Core Area, covering 20% of the MPA, encompasses the actual Thila area where protection measures are required, including the marine biodiversity hotspots that are crucial for the area's ecological balance and marine species survival. This zone aligns with the protected area's designation under Category 1 (Internationally Recognized Area) and Category 6 (Habitat/Species Management Area), focusing on actively protecting the manta ray cleaning stations, black coral gardens, and diverse coral communities while enabling controlled tourism activities through a permit system. The Buffer Zone serves as a buffer around the core zone, allowing for sustainable tourism activities, traditional fishing practices (exclusively for local residents with valid permits), and other regulated uses while maintaining environmental protection. The zoning strategy implements specific management protocols, including a maximum capacity of four vessels at any given time, vessel speed restrictions of 5 knots within the Core Area, and standardized 2-hour time limits for site visits.

2. Description of the Site

2.1 Location and Boundaries

Dharavandhoo Thila MPA is located in Baa Atoll, a UNESCO Biosphere Reserve in the Republic of Maldives. Designated on November 2, 2023, this protected area encompasses 132.58 hectares of marine ecosystem. The MPA falls under two protected area categories: Category 1 (Internationally Recognized Area) and Category 6 (Habitat and Species Management Area) (Figure 2), reflecting both its international significance and commitment to sustainable resource management at a national level.

The designated MPA is enclosed within the following GPS coordinates presented in Table 1, which define its boundaries:

Table 1: GPS Coordinates of Dharavandhoo Thila

Point	Longitude (E)	Latitude (N)
1	73.12323708	5.17010637
2	73.12889215	5.16525962
3	73.12004696	5.15479306
4	73.11385785	5.16076636

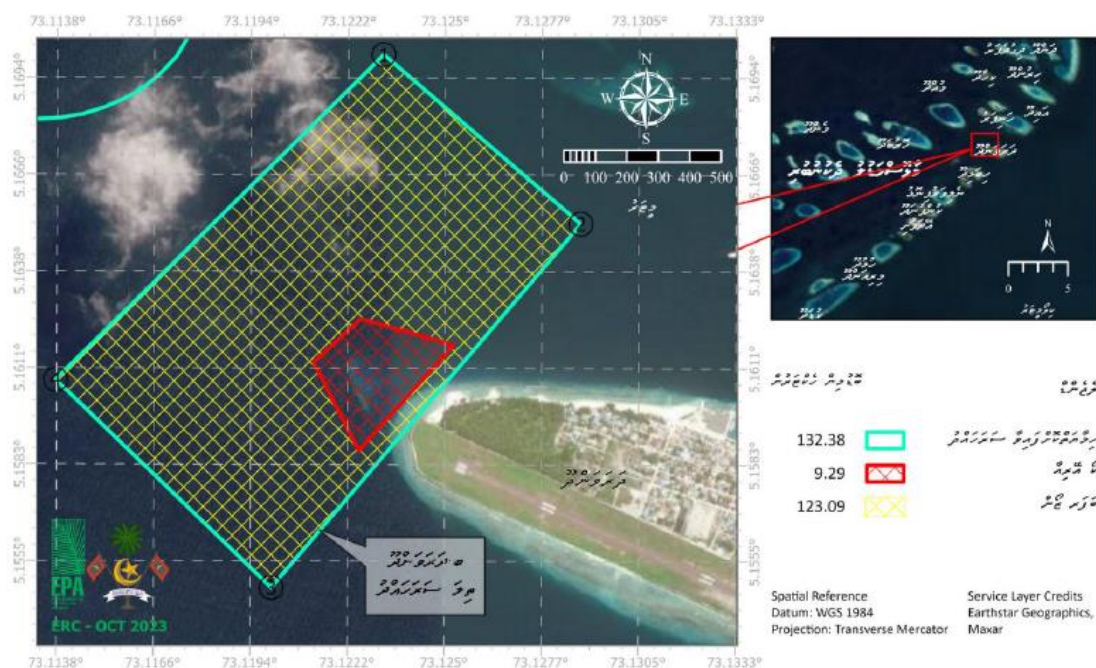


Figure 2: Dharavandhoo Thila MPA Boundary Map

The protected area consists of a submerged reef system characterized by significant bathymetric features including a sandy plateau at 15 meters depth, four manta ray cleaning stations, and

extensive soft and black coral gardens. The site experiences dynamic oceanographic conditions, with strong east-to-west and west-to-east currents that influence both marine life distribution and user activities. The MPA is situated near Dharavandhoo Island (*Figure 2*), making it easily accessible to local dive operators, tourism establishments, and traditional fishermen.

2.2 Physical Features

Dharavandhoo Thila is characterized by distinct physical features that contribute to its ecological significance and attraction as a premier dive site in Baa Atoll. These features create a complex marine environment that supports various ecological functions and user activities, from diving tourism to traditional fishing practices. The details are included in 2.4 of this section.

The underwater topography of Dharavandhoo Thila consists of a distinctive submerged reef system featuring a sandy plateau at 15 meters depth.

Dharavandhoo Thila experiences dynamic oceanographic conditions characterized by strong bidirectional currents flowing east-to-west and west-to-east. These current patterns play a crucial role in shaping both marine life distribution and diving activities within the protected area. The strength and predictability of these currents have established the site as particularly suitable for experienced divers. During the southwest monsoon season, these current patterns create especially favorable conditions for manta ray sightings, enhancing the site's value for marine tourism.

The water conditions at Dharavandhoo Thila present a dynamic environment that influences the site's ecological characteristics. Local dive operators, during stakeholder consultations conducted in September 2024, reported observations of coral bleaching, particularly in upper reef sections. Despite these impacts, the area maintains remarkably high biodiversity and continues to support rich fish populations. The water conditions vary seasonally, affecting visibility and marine life aggregations throughout the year.

2.3 Biological Features:

Dharavandhoo Thila supports a rich marine ecosystem characterized by high biodiversity and significant ecological functions. The biological features of this protected area demonstrate its importance as both a habitat for diverse marine species and a critical site for species interactions within Baa Atoll.

This reef structure provides an ideal foundation for extensive soft coral communities that thrive throughout the area. One of the most notable features of the site is the presence of black coral gardens, which contribute significantly to the habitat diversity. The reef system also incorporates four identified cleaning stations that serve as essential habitat features for manta rays, highlighting the site's importance for marine megafauna.

The protected area encompasses a diverse array of marine habitats, featuring a rich mosaic of soft and hard coral communities that create complex ecosystem structures. The sandy bottom areas provide distinct habitat zones that support various marine species, including rare species

like long fin gobies. The site's black coral gardens represent a particularly valuable habitat type, while dedicated cleaning station environments foster essential symbiotic relationships between species. Additionally, the area serves as a critical nursery ground, providing protection zones for juvenile fish species and contributing to the overall biodiversity of Baa Atoll.

Coral Communities

The protected area hosts diverse coral communities, with particularly notable soft coral formations throughout the reef system. While some areas show signs of bleaching, especially in the upper sections, the overall coral ecosystem maintains its vitality and continues to support abundant marine life. One of the most distinctive ecological features of the site is the presence of black coral gardens (Antipatharia), which contribute significantly to the habitat diversity and provide specialized habitat niches for various marine species. Black coral is legally protected in the Maldives under the Environment Protection and Preservation Act and harvesting is strictly prohibited nationwide, making these gardens particularly valuable from a conservation perspective. The presence of these protected black coral colonies adds to the site's ecological significance and enhances its priority for conservation management.

Fish Populations

The site serves as a crucial habitat for both resident and transient fish species. The reef supports a rich diversity of fish populations, including both commercially important species and those of conservation significance. Notably, the area functions as an important aggregation site for bait fish, particularly blue sprat (*Hondeli*), attracting both fishermen and marine predators. The presence of juvenile fish in protected areas of the reef highlights its vital role as a nursery habitat, contributing to the sustainability of fish populations in the broader region.

Marine Megafauna

Dharavandhoo Thila is particularly notable for its marine megafauna populations. The site features four manta ray cleaning stations, with regular sightings of 2-3 mantas during favorable current conditions, especially in the southwest monsoon season. Other significant megafauna observed in the area include various ray species, sharks, and hawksbill turtles. These species utilize the site for crucial behaviors such as cleaning, feeding, and resting.

Marine Species

The protected area hosts several species of particular interest, including:

- Manta rays (*Mobula alfredi*) at dedicated cleaning stations (*Figure 2*).
- Hawksbill turtles (*Eretmochelys imbricata*)
- Green turtles (*Chelonia mydas*)
- Various shark species, including blacktip reef sharks (*Carcharhinus melanopterus*) and whitetip reef sharks (*Triaenodon obesus*)
- Bigeye tuna (*Thunnus obesus*)
- Guitarfish (*Rhinobatos rhinobatos*) (a rare species observation)
- Ocean sunfish (*Mola mola*) (occasional sightings)
- Long fin gobies (*Valenciennesia longipinnis*) in the sandy plateau area
- Anemone fish (*Amphiprion nigripes*) in dedicated habitat zones
- Mackerel Tuna or Kawakawa (*Euthynnus affinis*, locally known as Latti)
- Rainbow Runners (*Elagatis bipinnulata*)

- Blue Sprat (*Spratelloides delicatulus*, locally known as Hondeli) bait fish aggregations

Invertebrate Life

The protected area supports a variety of invertebrate species that contribute to its overall biodiversity. Notably, lobsters are regularly observed, particularly during night dives. These invertebrate populations play important roles in the reef ecosystem and add to the site's value for both conservation and diving tourism.

Ecological Interactions

The site demonstrates significant ecological interactions that contribute to its biological importance. The presence of cleaning stations facilitates crucial symbiotic relationships between different species. The aggregation of bait fish attracts larger predatory species, creating a dynamic food web. The combination of diverse habitat types, from sandy plateaus to coral gardens, supports various ecological niches and enables complex species interactions that maintain the site's high biodiversity.

2.4 Current Resource Use

The current use of Dharavandhoo Thila MPA encompasses various activities ranging from tourism and fishing to vessel traffic, reflecting its significance as both a natural resource and an economic asset. Detail resource use maps are included in *Figure 3*.

Tourism Activities

Dharavandhoo Thila has established itself as one of the top five dive sites in the region, supporting a diverse range of tourism-related activities. Local dive centers, including Dharavandhoo Divers which has been operating since 2014, conduct regular diving excursions alongside nearby resorts such as Royal Island Resort, Reethi Beach Resort, and Dusit Thani. The site caters to various diving experiences, from regular day dives to specialized night diving sessions popular among underwater photographers. The area is particularly renowned for manta ray observations during favorable conditions, and specialty dives focusing on unique marine life such as long fin gobies and black coral gardens.

Fishing Activities

The protected area supports a range of fishing practices that are integral to local community livelihoods. Local fishermen employ both traditional methods and modern techniques such as deep drop jigging, alongside shore casting activities. Bait fishing, particularly targeting blue sprat (Hondeli), is practiced in the area, though often limited by strong currents. Regular catches include commercially important species such as mackerel tuna (Latti) and rainbow runner, along with other reef-associated species. These fishing activities represent an important economic activity for the local community, though they need to be balanced with conservation objectives.

Vessel Traffic

Dharavandhoo Thila- Current Resource Use

Legend

- Anchoring
- Core Protection Zone
- Dharavandhoo
- Dharavandhoo Airport
- Dive Vessels
- Diving/Snorkeling
- Fishing
- Vessel Traffic

Vessel Traffic

Fishing

Dive Vessels

Diving/Snorkeling

Fishing Anchoring

Fishing

Dharavandhoo

Dharavandhoo Airport

2000 ft

Google Earth

Image © 2025 Airbus

2.5 Seasonal Patterns

Manta ray presence at Dharavandhoo Thila follows a predictable seasonal pattern, with peak sightings during the southwest monsoon season (May- November). During this period, typically 2-3 manta rays can be observed at the site's four cleaning stations when current conditions are favorable. This seasonality is particularly notable as it differs from the primary manta season in other parts of Baa Atoll, such as Hanifaru Bay, where operators focus their activities during the May to November period.

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differs from other protected areas in the region, potentially offering opportunities for more distributed tourism pressure across the atoll's protected areas throughout the year.

User Statistics

Based on stakeholder data, the current usage patterns is shown in Table 2 below:

Usage Category	Recorded Statistics	Source
Regular Dive Operations		
Daily Dive Boats	Approximately 2 boats per day	Fishermen Consultation
Resort Visit Frequency	1 visit per week (year-round)	Dusit Thani Maldives
Marine Life Sightings		
Manta Ray Occurrence	2-3 individuals during favorable conditions	Stakeholder Consultations
Tourism Operators		
Active Dive Centers	4 centers	Dharavandhoo Council
Registered Guesthouses	15 establishments	Dharavandhoo Council
Regular Resort Users	3 resorts (Royal Island Resort, Reethi Beach Resort, Dusit Thani)	Resort Consultation
Vessel Traffic		
Types of Vessels	<ul style="list-style-type: none"> - Diving boats - Fishing vessels - Speedboats - Resort vessels - Liveaboards 	Combined Stakeholder Input
Fishing Activities		
Local Fishing Vessel Frequency	Inconsistent usage - estimated 1-2 vessels per week during favorable conditions	Fishermen Consultation
Main Target Species	Mackerel Tuna (Latti), Rainbow Runners	Fishermen Consultation
Bait Fishing Operations	Limited due to strong currents - primarily focused on Blue Sprat (Hondeli)	Fishermen Consultation

Table 2: Current User statistics

Note: The statistics presented are based on stakeholder consultations and may not represent comprehensive usage data. A systematic monitoring program would be needed to collect more detailed user statistics. Fishing activity data is particularly limited due to the small number of fisheries representatives at consultations and the variable nature of fishing operations in the area.

3. Key Values

3.1 Ecological Values

The ecological values of Dharavandhoo Thila MPA are characterized by its exceptional habitat diversity, critical species habitats, and ecological connectivity that contribute to the broader marine environment of Baa Atoll UNESCO Biosphere Reserve.

Regionally important manta ray cleaning stations

The site's most distinctive ecological value is the presence of four specialized manta ray cleaning stations, where reef manta rays (*Mobula alfredi*) regularly aggregate. These stations support critical symbiotic relationships between manta rays and cleaner fish species, with consistent sightings of 2-3 individuals during favorable current conditions, particularly during the southwest monsoon season. This predictable presence of mantas makes the site an important component of regional manta ray conservation efforts within the Baa Atoll Biosphere Reserve, complementing other aggregation sites like Hanifaru Bay.

Locally significant black coral gardens and diverse coral communities

The protected area features unique black coral (*Antipathes* spp.) gardens alongside extensive soft coral communities, creating complex three-dimensional habitat structures at various depths. The reef systems support diverse coral species including branching *Acropora* colonies in upper reef sections and massive *Porites* formations in deeper areas. This vertical zonation and habitat complexity create numerous ecological niches supporting the site's high biodiversity and providing essential shelter, feeding, and reproduction areas for various marine species.

Critical habitat for vulnerable and endangered species

The MPA provides essential habitat for multiple IUCN Red List species, making it important for international conservation efforts. These include:

- Reef manta rays (*Mobula alfredi*) - Vulnerable
- Bigeye tuna (*Thunnus obesus*) - Vulnerable
- Guitar sharks (*Rhinobatos* spp.) - Critically Endangered
- Hawksbill turtles (*Eretmochelys imbricata*) - Critically Endangered
- Green turtles (*Chelonia mydas*) - Endangered
- Ocean sunfish (*Mola mola*) - Vulnerable

Beyond these charismatic species, the area serves as a vital nursery ground for juvenile fish species, contributing to the sustainability of fish populations throughout Baa Atoll. The interconnected nature of the site's habitats—from cleaning stations to black coral gardens to sandy plateaus—creates an ecosystem mosaic that supports different life stages of numerous marine species.

Ecological connectivity and ecosystem services

Dharavandhoo Thila's ecological value is enhanced by its connectivity to surrounding marine ecosystems. The site's connection to the house reef provides important ecological corridors for species movement, supporting both resident and transient species. This connectivity contributes to the resilience of marine populations across the broader seascape and maintains ecological processes essential for healthy marine ecosystems. The area provides important ecosystem services including:

- Feeding grounds for various marine species
- Spawning and nursery areas for fish populations
- Critical cleaning services for marine megafauna
- Support for food web dynamics through bait fish aggregations
- Habitat for commercially important species

3.2 Economic Value

Dharavandhoo Thila MPA demonstrates significant economic value at the local and regional scale through multiple sectors, primarily tourism and fisheries.

Premium dive tourism destination

The area serves as one of the top five dive sites in Baa Atoll, attracting both high-end resorts and local tourism operations. Premium resorts including Royal Island Resort, Dusit Thani Maldives, and Reethi Beach Resort regularly utilize the site for their guests, while local operations include Dharavandhoo Divers (operating since 2014) and 15 registered guesthouses on Dharavandhoo Island. The site offers diverse diving experiences, from night diving opportunities for macrophotography to manta ray observations at the cleaning stations, with guests describing the reef experience as "like an aquarium."

The predictable presence of charismatic megafauna, particularly manta rays during favorable conditions, allows operators to offer specialized marine wildlife experiences that command premium rates. This consistent wildlife viewing opportunity, combined with the site's exceptional coral formations including black coral gardens, creates substantial tourism value throughout the year.

Support for local livelihoods through sustainable fisheries

The fisheries sector represents another significant economic component of Dharavandhoo Thila. The area supports both traditional and modern fishing methods, including deep drop jigging and shore casting. Commercially important species such as Mackerel Tuna (*Euthynnus affinis*, locally known as Latti) and Rainbow Runner (*Elagatis bipinnulata*) are regularly caught here. The area also serves as a potential bait fishing ground for Blue Sprat (*Spratelloides delicatulus*, locally known as Hondeli), though strong currents can limit this activity.

Importantly, the site functions as a fish nursery area, contributing to the sustainability of local fish stocks and long-term economic viability of the fishing industry in Baa Atoll. This nursery function creates potential spillover benefits for fishing activities in surrounding areas, enhancing the overall economic productivity of regional fisheries.

Local business opportunities and employment

The protected area generates substantial local business opportunities through the tourism value chain. The presence of four active dive centers and fifteen registered guesthouses on Dharavandhoo Island demonstrates the area's contribution to local tourism development. This tourism activity creates employment opportunities for local residents across various skill levels, from dive guides and boat captains to hospitality staff and service providers. The year-round nature of tourism activities, though varying in intensity with seasons, provides relatively stable income opportunities that enhance economic resilience in the community.

3.3 Social Values

Dharavandhoo Thila holds significant social value for various stakeholder groups, particularly the local community of Dharavandhoo Island and the broader tourism sector in Baa Atoll.

Preservation of traditional fishing practices and knowledge

The protected area plays a vital role in supporting cultural heritage through the maintenance of traditional fishing practices. For the fishing community, the area serves as a traditional fishing ground where various fishing techniques are practiced, including both traditional methods and modern adaptations like deep drop jigging. This continuation of traditional resource use contributes to cultural identity and knowledge transmission between generations within the fishing community. Local fishermen's intimate knowledge of the area, including seasonal patterns, current dynamics, and marine life behavior, represents valuable traditional ecological knowledge that enhances management effectiveness.

Recreational and educational resource for local communities

The MPA serves as a recreational resource for local communities, providing opportunities for snorkeling, diving, and marine wildlife observation that strengthen community connections to their marine environment. The site offers experiential learning opportunities for local schools and youth groups, facilitating environmental education through direct engagement with marine ecosystems. The presence of easily observable ecological relationships, such as manta cleaning stations, makes complex marine ecology concepts accessible and tangible for various audiences, enhancing environmental awareness and stewardship.

Scientific research and knowledge generation

Dharavandhoo Thila offers valuable opportunities for scientific research on manta ray behavior, coral reef ecology, and marine protected area management. The regular aggregation of mantas at cleaning stations provides a setting for long-term population monitoring and behavioral studies. The diverse coral communities, including black coral gardens, offer research opportunities related to coral ecology and resilience. As tourism pressure increases throughout the Maldives, the site also presents opportunities to study sustainable tourism management approaches that balance conservation with economic development. Research conducted within the protected area contributes to both local management decisions and broader scientific understanding of tropical marine ecosystems.

4. Identification of Constraints, Opportunities, and Threats

4.1 Constraints

The management of Dharavandhoo Thila MPA faces several significant constraints that affect both its conservation effectiveness and sustainable use. A primary challenge is the conflict between different user groups, particularly between fishing activities and diving operations. Historical incidents, such as the 2016 case where fishing nets were deployed during dive operations, highlight the risks associated with uncoordinated use of the area. The high vessel traffic through the protected area presents another major constraint, with stakeholders expressing serious concerns about navigation safety and the potential impacts on both marine life and diving activities. The absence of speed controls and marker buoys, coupled with doubts about the long-term sustainability of such infrastructure due to rough conditions and maintenance requirements, further complicates vessel management.

Financial sustainability represents another significant constraint. Resort stakeholders have expressed skepticism about the feasibility of implementing entry fees, noting that the presence of alternative dive sites could lead to reduced visitation if fees are introduced. The Dharavandhoo Island Council has expressed a strong preference for local governance autonomy, advocating for direct management of conservation revenues rather than integration with the existing Baa Atoll Conservation Fund framework. This emphasis on community-led financial stewardship presents both challenges and opportunities in developing sustainable financing mechanisms that respect local priorities while ensuring adequate resource allocation for conservation activities. This is further complicated by concerns raised by the National Boating Association of Maldives about the financial burden of managing what they perceive as a low-traffic area, particularly given the existing green tax obligations of tourism operators. A significant threat stems from inadequate management systems and low awareness of the MPA's protected status. Two tourism stakeholders were unaware that Dharavandhoo Thila was a protected area, indicating a communication gap.

The site's strong currents, while beneficial for marine life aggregations, can limit certain activities such as bait fishing, and require careful management of diving operations. The current lack of systematic monitoring and enforcement capacity presents additional challenges for effectively managing these environmental impacts and ensuring compliance with future regulations.

Governance constraints are particularly notable, with various stakeholders expressing different and sometimes conflicting views about management approaches. The Dharavandhoo Island Council's emphasis on local governance and preference for localized management approaches is an important aspect of community empowerment. However, it may present challenges when aligning the site's management with broader atoll-level conservation initiatives. The lack of awareness about the area's protected status among some stakeholders, as revealed during consultations, indicates challenges in communication and stakeholder engagement that need to be addressed for effective management implementation.

4.2 Threats

The threats to Daravandhoo Thila MPA can be categorized into natural and anthropogenic sources, each presenting distinct challenges for management and requiring different mitigation approaches.

Natural Threats:

The natural threats to Dharavandhoo Thila MPA primarily stem from environmental and climatic factors.

Coral Bleaching: Climate change represents the most significant natural threat to the protected area's ecosystem health and functionality. Rising sea temperatures increase the risk of coral bleaching events, potentially compromising the structural integrity of reef systems that support manta ray cleaning stations and other critical habitats. Changes in ocean chemistry through acidification may affect coral growth and skeleton formation, particularly impacting branching *Acropora* species that dominate the upper reef zones. While bleaching is a natural response to environmental stress, its frequency and severity are exacerbated by cumulative impacts from local anthropogenic pressures including physical damage from anchoring, sedimentation, and tourism activities, potentially reducing coral resilience to thermal stress.

Anthropogenic Threats:

Vessel Traffic Impacts

Dharavandhoo Thila MPA faces significant challenges from intensive vessel traffic, particularly from high-speed boats, which emerged as a primary concern across all stakeholder groups. Multiple stakeholders, including dive operators, fishermen, and the local council, highlighted the dangers posed by speedboats to both marine life and divers. The specific threats include:

- **Physical collision risks:** Fast-moving vessels create direct collision hazards for surface-active marine life, particularly around the manta ray cleaning stations.
- **Behavioral disturbance:** The traffic is particularly concerning around the manta ray cleaning stations, where boat disturbance can disrupt these critical biological interactions. The noise and physical presence of vessels may cause mantas to abandon cleaning activities, affecting their health and behavior patterns.
- **Underwater noise pollution:** Engine noise and propeller cavitation create acoustic disturbance that can interfere with marine life communication and natural behavior patterns. The cumulative effect of multiple vessels operating simultaneously creates zones of constant acoustic disturbance.

The threat is amplified by the area's popularity with nearby resorts and dive operators, leading to regular boat traffic throughout the diving season. Stakeholders from three major resorts (Royal Island Resort, Dusit Thani Maldives, and Reethi Beach Resort) and local dive operators confirmed regular use of the site, suggesting consistent vessel presence year-round with intensification during peak tourist seasons.

Disturbance to marine species from tourism activities: During peak seasons, multiple vessels operate simultaneously in relatively confined areas, leading to significant site congestion. This overcrowding is particularly pronounced at popular dive sites and manta ray cleaning stations, where vessels compete for limited space. The concentration of activities in these areas leads to

increased underwater traffic and potential disturbance to marine life, particularly during critical periods such as manta ray cleaning activities.

Inappropriate visitor behavior represents a persistent threat to the area's marine life. Stakeholders from dive centers and resorts have reported instances of tourists attempting to chase or touch manta rays, particularly during snorkeling activities at cleaning stations. These behaviors not only stress the animals but can also disrupt their natural cleaning patterns, potentially causing mantas to abandon these critical ecological interaction sites. The problem is often exacerbated by inadequate pre-activity briefings from some dive guides, who may fail to properly communicate protected area regulations or the importance of maintaining appropriate distances from marine life.

Physical damage to marine habitats: The issue of anchor damage presents an ongoing threat to Dharavandhoo Thila's reef ecosystem. In the absence of a comprehensive mooring buoy system, vessels often resort to anchoring, particularly during peak visitation periods. Even when attempting to anchor in sandy areas, anchors can drag across reef structures, causing physical damage to coral formations. Dive operators have specifically reported observing direct damage to coral structures from anchoring activities.

This impact is particularly concerning around the four manta ray cleaning stations and black coral gardens, where repeated anchoring activities can lead to cumulative damage to the very features that make the area ecologically significant and attractive for tourism. The presence of unique and fragile black coral formations increases the potential severity of anchor damage, as these slow-growing species are particularly vulnerable to physical disturbance and have limited recovery capacity.

Unsustainable fishing practices: The MPA faces pressure from various fishing activities, including traditional methods, modern techniques, and bait fishing. Of particular concern is fishing pressure near juvenile areas, which stakeholders identified as threatening the sustainability of fish populations. Fishing lines have been reported to cause coral damage, and there have been incidents of fishing bait nets being dropped during dives, as noted in a 2016 incident. Stakeholders suggested implementing fishing restrictions or bans near key areas to protect juvenile fish and support species recovery.

Sedimentation from adjacent coastal development: Coastal development activities in the vicinity of the MPA present a complex threat to marine ecosystem health. The reclamation work associated with Dharavandhoo airport development has been identified as a significant source of sedimentation, which temporarily affected water quality and potentially smothered coral communities. While these impacts were short-term and the sedimentation events have subsided, they demonstrate the vulnerability of the MPA to external activities. These infrastructure developments, though occurring outside the protected area boundaries, can significantly impact the health of the MPA through increased turbidity, reduced light penetration, and sediment deposition on coral structures. Future coastal development projects near Dharavandhoo Island may pose similar threats if not properly managed with appropriate sediment control measures.

4.3. Threat Prioritization Matrix:

The threat prioritization for Dharavandhoo Thila MPA was developed through a systematic, evidence-based process involving multiple stakeholders and experts. Initial threat identification was conducted through comprehensive literature review of existing reports and research, analysis of available monitoring data, and extensive stakeholder consultations with local councils, dive

operators, and resort representatives. Marine biologists and protected area managers provided additional expert input to ensure all potential threats were identified and properly characterized.

Each identified threat was then assessed using two key criteria: likelihood and consequence. Likelihood was evaluated based on historical data and current trends, using a five-point scale ranging from rare (may occur once in 5+ years) to almost certain (expected to occur multiple times per year). Consequence was evaluated based on the severity of impact if the threat occurs, ranging from insignificant (minimal impact requiring no specific response) to catastrophic (long-term, possibly irreversible damage to key values). Existing management measures were considered when determining both likelihood and consequence, as these may reduce either the probability or severity of impacts.

Likelihood Rating

Rating	Description	Frequency
Almost Certain	Expected to occur regularly under normal circumstances	Multiple times per year
Likely	Will probably occur in most circumstances	Annually
Possible	Might occur at some time	Every 2-3 years
Unlikely	Could occur but not expected	Every 3-5 years
Rare	May occur only in exceptional circumstances	Once in 5+ years

Table 3: Likelihood Rating Criteria

Consequence Rating

Rating	Description	Impact
Catastrophic	<ul style="list-style-type: none"> - Permanent or long-term damage to key values - Full ecosystem recovery unlikely - Major intervention required - Serious long-term impact on MPA objectives 	Severe, possibly irreversible impact on manta populations or reef ecosystem
Major	<ul style="list-style-type: none"> - Significant impact on environmental values - Recovery in 5-10 years - Significant intervention required - Significant impact on MPA objectives 	Significant decline in manta sightings or coral cover
Moderate	<ul style="list-style-type: none"> - Moderate impact on environmental values - Recovery in 2-5 years - Some intervention required - Moderate impact on MPA objectives 	Temporary disruption to manta behavior or localized reef damage
Minor	<ul style="list-style-type: none"> - Minor impact on environmental values - Recovery in 1-2 years - Minimal intervention required - Minor impact on MPA objectives 	Brief disturbance to wildlife or minor coral damage
Insignificant	<ul style="list-style-type: none"> - Negligible impact on environmental values - Rapid recovery without intervention - No impact on MPA objectives 	No measurable impact on key species or habitats

Table 4: Consequence Rating Criteria

Likelihood					Consequence
Rare	Unlikely	Possible	Likely	Almost certain	
			<ul style="list-style-type: none"> Physical damage to marine habitats Sedimentation from adjacent coastal development 	<ul style="list-style-type: none"> Coral Bleaching 	
			<ul style="list-style-type: none"> Vessel traffic impact. <ul style="list-style-type: none"> Underwater noise pollution Physical collision risks Behavioral disturbance 	<ul style="list-style-type: none"> Damage to coral due to Anchoring Speeding Disturbance to marine species from tourism activities Overcrowding 	
		<ul style="list-style-type: none"> Lack of awareness about MPA status 			
		<ul style="list-style-type: none"> Unsustainable Fishing 	<ul style="list-style-type: none"> Night Diving Impacts Fishing pressure 		
					Insignificant

- Low risk
- Medium risk
- High risk
- Very high risk

Management Considerations

The diverse patterns of resource use at Dharavandhoo Thila have highlighted several critical management needs that must be addressed for sustainable long-term use. Stakeholders have identified the necessity for infrastructure improvements such as the installation of buoys for vessel management and speed control, alongside measures to prevent coral damage from anchoring. The regulation of fishing activities near juvenile and nursery areas requires careful consideration, as does the development of systems to manage diving activities. Additionally, stakeholders have discussed the potential implementation of a fee structure for commercial operators, though this remains a point of debate among various user groups. These management considerations reflect the complex balance required between facilitating continued resource use and ensuring the site's ecological preservation.

4.4. Opportunities

Despite these challenges, the protected area offers several significant opportunities for enhanced management and sustainable use.

Local Support: Strong support from Dharavandhoo Island Council provides a robust foundation for effective local management implementation. The Council, with their experience in protected area management through involvement in Baa Atoll UNESCO Biosphere Reserve and proximity to Hanifaru Bay MPA, brings valuable institutional knowledge to the management process. The Council's strong stance on local governance and their willingness to provide vessels for monitoring activities demonstrates their commitment to effective MPA management. Their insistence on overseeing implementation indicates a strong sense of local ownership and responsibility for conservation outcomes.

Established Tourism Market: Dharavandhoo Thila enjoys recognition as one of the top five dive sites in the region, supported by a well-established tourism infrastructure. Multiple high-end resorts, including Royal Island Resort, Dusit Thani Maldives, and Reethi Beach Resort, regularly utilize the site, indicating strong market demand. The presence of 15 registered guesthouses and four active dive centers on Dharavandhoo Island provides a solid foundation for local tourism development. The site's unique features, particularly the four manta ray cleaning stations and opportunities for specialized activities like night diving and macrophotography, create potential for premium tourism experiences. While stakeholders expressed mixed views on entry fees, some operators suggested implementing a one-time annual fee for dive centers, presenting a potential sustainable financing mechanism for management activities.

Biodiversity and Conservation Value: The MPA hosts significant biodiversity, offering opportunities for conservation and research initiatives. The presence of endangered species including manta rays, bigeye tuna, guitar sharks, and various turtle species makes it an important site for marine conservation. The existence of black coral gardens and the area's role as a fish nursery provide opportunities for targeted conservation programs. Regular sightings of 2-3

mantas during good currents, particularly at the cleaning stations, enhance the site's value for both conservation and tourism. The reported coral bleaching also presents opportunities for coral restoration projects and climate change impact studies.

Close Proximity to Dharavandhoo: The MPA's location near Dharavandhoo Island creates significant advantages for management effectiveness. This proximity enables quick response times for monitoring and enforcement activities while reducing operational costs. The close distance allows dive operators to maintain regular visits to the site, with some reporting multiple weekly trips. This geographical advantage also facilitates community engagement in management activities, as demonstrated by the active participation of local dive centers and fishing communities in stakeholder consultations. The proximity to Hanifaru Bay provides additional opportunities for coordinated management approaches and shared learning experiences.

Technology and Management Innovation: Stakeholder discussions highlighted opportunities for incorporating technological advances to enhance management efficiency. The potential for digital monitoring systems could address current challenges while reducing operational costs. The suggestion of establishing a ranger post on shore, combined with modern monitoring techniques, could create an effective oversight system. The willingness of local tourism operators to support monitoring efforts provides opportunities for developing collaborative management approaches that leverage both traditional knowledge and modern technology.

Educational and Awareness Development: The MPA presents significant opportunities for environmental education and awareness programs. The site's rich biodiversity, established dive operations, and multiple user groups provide a platform for comprehensive marine environmental education. The presence of both traditional fishermen and modern tourism operators offers opportunities for developing inclusive awareness programs that address various stakeholder needs while promoting sustainable resource use. The site's role within the broader Baa Atoll UNESCO Biosphere Reserve adds value to educational initiatives and creates opportunities for integrated conservation messaging.

Baa Atoll Biosphere Reserve Institutional Support: The established presence and experience of the Baa Atoll Biosphere Reserve office presents a significant opportunity for Dharavandhoo Thila MPA management. Their existing outreach programs and conservation activities within the atoll provide a strong institutional framework that can be leveraged for the MPA's management. The Biosphere Reserve's experience with Hanifaru Bay MPA management offers valuable lessons and established protocols that could be adapted for Dharavandhoo Thila.

The presence of the Biosphere Reserve office also provides opportunities for integrating Dharavandhoo Thila MPA into broader atoll-wide conservation initiatives. Their existing networks and partnerships with resorts, local councils, and environmental organizations could facilitate knowledge sharing and resource mobilization. The office's experience in managing visitor experiences, implementing conservation measures, and coordinating with multiple stakeholders could significantly benefit the development of management systems for Dharavandhoo Thila. Additionally, their established role in environmental education and awareness programs could support capacity building efforts among local stakeholders and enhance public understanding of the MPA's importance.

The Biosphere Reserve's international UNESCO designation also offers opportunities for raising the profile of Dharavandhoo Thila MPA and potentially accessing additional resources and technical support. Their experience with sustainable financing mechanisms, particularly through the Baa Atoll Conservation Fund, provides insights for developing appropriate funding models,

even though stakeholders have indicated a preference for local management of any revenue generated from the MPA.

5. Governance

5.1 Management structure

The Dharavandhoo Thila MPA will be managed under a co-management regime with clearly defined roles and responsibilities:.

National Level Management

The primary management authority for Dharavandhoo Thila MPA operates through a dual leadership structure at the national level, with distinct yet complementary roles assigned to the Ministry of Tourism and Environment (MoTE) and the Environmental Protection Agency (EPA). The MoTE serves as the principal policy-making body, responsible for developing comprehensive strategies and providing high-level oversight of the MPA's operations. In this capacity, MoTE plays a crucial role in securing and managing sustainable financing mechanisms for the protected area, including allocation of government resources and coordination of external funding opportunities. The Ministry also facilitates coordination among various national stakeholders, ensuring alignment between the Marine Protected Area's management objectives and broader national environmental and development goals.

Working in tandem with MoTE, the EPA functions as the primary regulatory authority for the MPA. The EPA provides essential technical guidance on conservation practices, monitoring protocols, and environmental management standards. Their expertise informs the development and implementation of specific management measures, ensuring these align with national environmental regulations and international best practices. The EPA also plays a vital role in enforcement support, working closely with local management units to develop and implement compliance mechanisms, investigate environmental violations, and ensure the effective application of penalties when necessary. This dual authority structure ensures both policy-level direction and practical regulatory oversight, creating a robust framework for the MPA's management and protection.

Through this arrangement, both institutions collaborate to provide comprehensive management support while maintaining clear lines of authority and responsibility. Their combined expertise and resources ensure that the MPA receives necessary guidance and support at the national level while maintaining operational efficiency through local implementation mechanisms. This structure has been specifically designed to address the management challenges identified through stakeholder consultations, particularly the need for strong national-level support in policy development and enforcement while enabling effective local-level implementation.

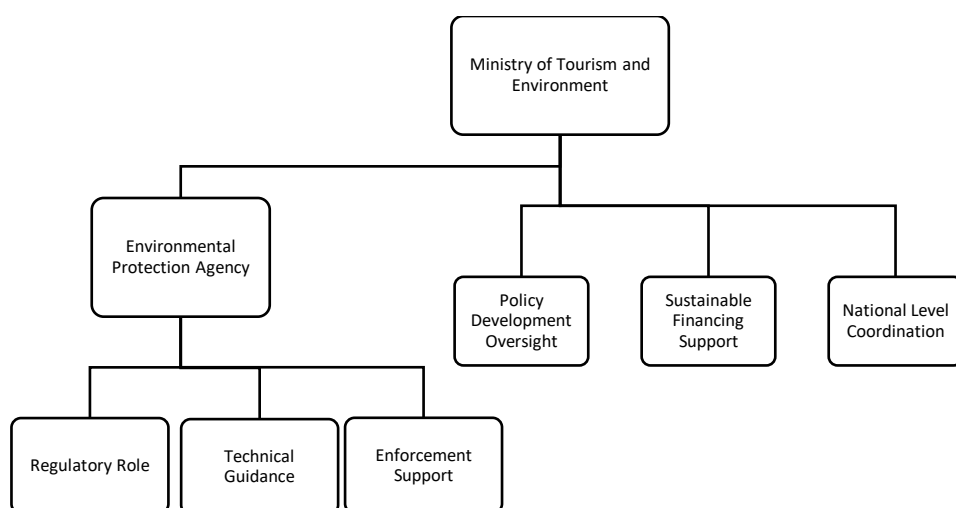


Figure 5: National Level Functions

Atoll Level Management:

The Baa Atoll Biosphere Reserve Office serves as a critical intermediary body between national authorities and local implementation (*Figure 6*). As Dharavandhoo Thila is situated within the UNESCO Biosphere Reserve, the Biosphere Reserve Office provides specialized technical support for management activities aligned with Biosphere Reserve principles and requirements. Their responsibilities include:

- Providing technical guidance on best practices for protected area management within the Biosphere Reserve context
- Conducting monthly monitoring spot checks to assess management effectiveness, compliance and knowledge exchange.
- Training local MPA rangers in specialized monitoring techniques and conservation practices
- Facilitating coordination between the MPA and other protected areas within the Biosphere Reserve
- Supporting outreach and education activities relating to the broader Biosphere Reserve framework
- Contributing to adaptive management approaches based on scientific monitoring and research.

Local Level Management

The implementation structure for Dharavandhoo Thila MPA operates through a hierarchical system with Dharavandhoo Council serving as the primary implementing authority, a role they have strongly advocated for during stakeholder consultations. Within the council, a dedicated MPA Management Unit would be established as the central operational body responsible for daily management activities. This unit would oversee four key operational functions: vessel traffic and

visitor management, resource monitoring and conservation, enforcement of regulations, and revenue management. Through these functions, the unit would ensure comprehensive oversight of all MPA activities while maintaining necessary monitoring systems and coordinating with various stakeholders, particularly focusing on the management of diving activities and vessel movements around sensitive areas such as manta cleaning stations.

The MPA Resource User Working Group forms the second pillar of the implementation structure, bringing together representatives from the active dive centers, fifteen registered guesthouses, and the local fishing community. This committee serves three primary functions: providing operational guidance based on user experience, particularly regarding diving activities and fishing practices; facilitating conflict resolution between different user groups, especially concerning vessel traffic and fishing zones; and offering recommendations for adaptive management approaches. The committee's membership encompasses tourism operators including resort representatives who regularly utilize the site, local dive centers that conduct multiple weekly visits, and the fishing community who maintain traditional resource use in the area. This diverse representation ensures that management decisions consider multiple perspectives while maintaining focus on conservation objectives.

Resource User Working Group Members:

- 1 representative from local dive centers of Dharavandhoo
- 1 representative from resort dive operations within MPA.
- 1 representative from local fishing community within MPA
- 1 representative from local guesthouse operating in Dharavandhoo
- 1 representative from Dharavandhoo Council
- 1 representative from MPA Management Unit

Selection Criteria:

1. Must be actively operating in the protected area
2. Minimum 2 years of experience in respective sector
3. Commitment to attend bi annual meetings

Term Length:

1. 2-year terms with possibility of renewal
2. Staggered appointments to ensure continuity

Meeting Requirements:

1. Bi annual regular meetings
2. Emergency meetings as needed
3. Minimum 75% attendance required to maintain membership

This three-tiered implementation structure creates an effective framework for managing Dharavandhoo Thila MPA through clear lines of authority, collaborative monitoring mechanisms, and inclusive decision-making processes. The system emphasizes local governance while maintaining necessary stakeholder engagement. By centralizing authority with the Dharavandhoo Council while establishing clear roles for stakeholder groups, the structure ensures both operational efficiency and strong community involvement in the MPA's management. This approach addresses the key concerns raised during stakeholder consultations regarding local control, revenue management, and the integration of various user group interests in management decisions. The Council's direct oversight of revenue collection and allocation, combined with their authority to coordinate monitoring and enforcement activities, provides a strong foundation for effective local management of the MPA..

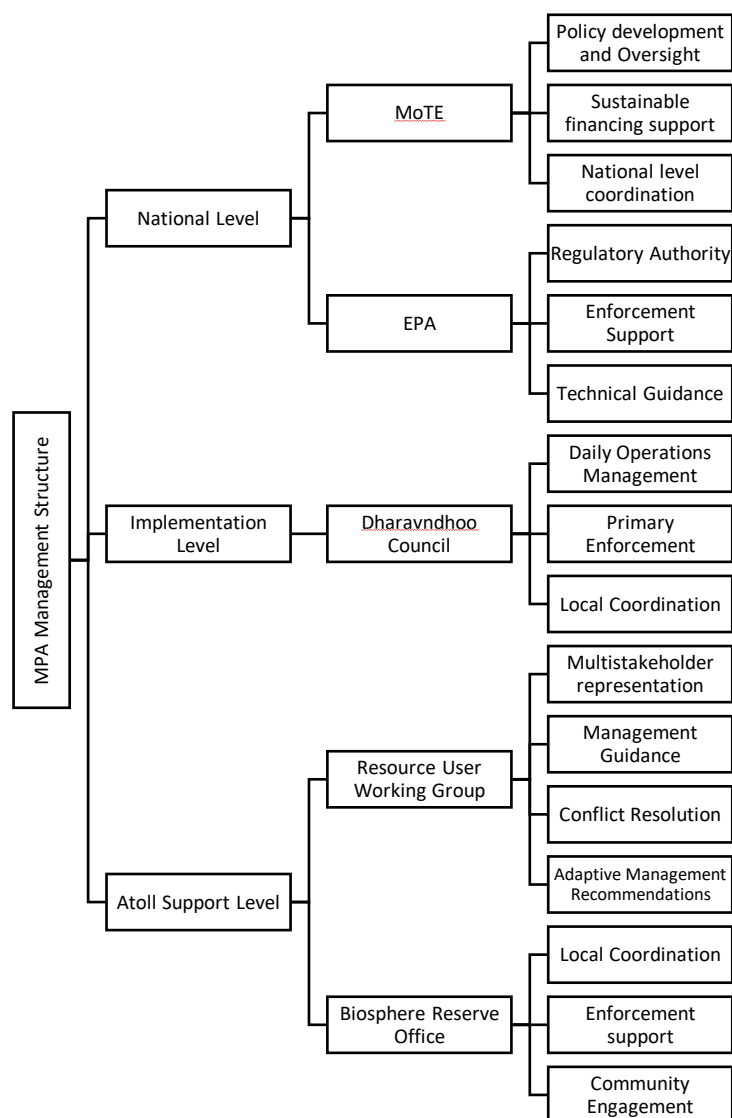


Figure 5: Governance Structure and Functions at local level

5.2 Roles and Responsibilities

The effective management of Dharavandhoo Thila MPA requires clear delineation of roles and responsibilities across multiple governance levels, from national authorities to local implementing bodies. The management structure reflects the strong preference for local governance expressed during stakeholder consultations while maintaining necessary oversight and technical support from national authorities. This framework has been specifically designed to address key challenges identified through stakeholder consultations, including vessel traffic management, protection of manta ray cleaning stations, sustainable tourism operations, and traditional resource use. Each entity within the management structure has been assigned specific roles that complement one another, creating a cohesive system that supports both conservation objectives and sustainable use of the Marine Protected Area. The following matrix outlines the primary roles and key responsibilities of each management entity, establishing clear accountability and operational guidelines for all aspects of the Marine Protected Area's management.

Authority/Entity	Primary Role	Key Responsibilities
Ministry of Tourism and Environment (MoTE)	National Policy Authority	<ol style="list-style-type: none"> 1. Develop and oversee implementation of national policies related to MPA. 2. Secure and manage sustainable financing mechanisms. 3. Coordinate with other national agencies and international partners. 4. Review and approve annual work plans and budgets. 5. Monitor overall management effectiveness. Provide capacity building and training support
Environmental Protection Agency (EPA)	Regulatory Authority	<ol style="list-style-type: none"> 1. Enforce environmental regulations and protected area rules. 2. Provide technical guidance on conservation practices 3. Review and approve research permits 4. Investigate environmental violations 5. Monitor environmental parameters 6. Issue penalties for non-compliance 7. Develop monitoring protocols and standards. 8. Provide enforcement training and capacity building 9. Handle major violations requiring national-level intervention 10. Issue penalties for serious infractions 11. Conduct periodic enforcement audits
Baa Atoll Biosphere Reserve Office	Supporting Implementation Authority	<ol style="list-style-type: none"> 1. Providing technical guidance on best practices for protected area management within the Biosphere Reserve context. 2. Conducting monthly monitoring spot checks to assess management effectiveness and compliance. 3. Training local MPA rangers in specialized monitoring techniques and conservation practices.

		<ol style="list-style-type: none"> Facilitating coordination between the MPA and other protected areas within the Biosphere Reserve. Supporting outreach and education activities relating to the broader Biosphere Reserve framework. Contributing to adaptive management approaches based on scientific monitoring and research.
Dharavandhoo Council	Lead Implementation Authority	<ol style="list-style-type: none"> Host and support the MPA Management Unit Oversee daily operations and management Coordinate with supporting councils Manage local staffing and resources Maintain infrastructure and facilities Handle revenue collection and financial management Report to national authorities Coordinate emergency response
MPA Management Unit	Operational Authority	<ol style="list-style-type: none"> Implement day-to-day enforcement activities Monitor compliance with regulations Issue initial warnings for minor violations Document and report infractions to EPA Maintain enforcement records Conduct regular patrols
Resource User Working Group	Advisory Function	<ol style="list-style-type: none"> Provide management recommendations Mediate stakeholder conflicts. Advise on adaptive management strategies Provide technical input on management issues Represent stakeholder interests Support community outreach efforts

Figure 6: Authority roles and responsibility

5.3 Key Regulations and Policies

The management of Dharavandhoo Thila is governed primarily by the Environment Protection and Preservation Act (4/93) and the Protected Areas Regulation (2018/R-78), which provide the legal framework for protected area management in the Maldives. Within this framework, a new site-specific regulation for Dharavandhoo Thila will be enacted under the EPPA based on the guidelines and standards set forth in this conservation plan. This regulation will formalize all management measures, including zoning schemes, permitted activities, visitor limitations, and enforcement protocols. conservation plan.

Codes of Conduct

During the grace period, strict but voluntary codes of conduct will be introduced for all user groups, including fishers, tourism operators, and researchers, to promote responsible activities while protecting the marine ecosystem. These guidelines will be developed through stakeholder consultations and refined based on monitoring data and feedback.

- **Visitor Guidelines:**
 - Maintain appropriate distances from marine life to prevent disturbances.
 - Strictly prohibit touching, chasing, or feeding marine species.
 - Regulate the use of artificial lighting to minimize disruption to natural behaviors.
 - Require thorough pre-dive briefings from dive operators to ensure adherence to regulations.
 - Suspend all diving and snorkeling activities during poor weather or low visibility for safety and ecosystem protection.
- **Diver and Dive Operator Responsibilities:**
 - Display proper dive flags when visitors are in the water to reduce boat traffic risks.
 - Adhere to a maximum daily carrying capacity of six boats within the MPA, with each vessel limited to a two-hour stay.
 - Follow designated dive paths to minimize coral disturbance.
 - Ensure responsible waste management and prohibit any disposal of materials into the ocean.
- **Boating and Anchoring Regulations:**
 - Enforce a speed restriction of 5 knots in designated zones to protect marine life.
 - Prohibit anchoring on reefs; vessels must use designated mooring buoys to prevent coral damage.
 - Establish marked boundaries and navigation guidelines to reduce environmental impact.
- **Fishing and Resource Use:**
 - Establish sustainable fishing zones while strictly prohibiting destructive practices.
 - Implement no-take zones to protect critical habitats.
 - Develop responsible harvesting guidelines for bait fishing.
- **Monitoring and Research Activities:**
 - Introduce citizen science initiatives with trained dive guides to monitor the area and educate visitors.
 - Encourage research and monitoring activities aligned with conservation goals.
 - Set guidelines for underwater photography, commercial filming, and drone use to minimize disruptions.

Management Guidelines

The management guidelines for Dharavandhoo Thila MPA provide detailed operational protocols for both management authorities and users. These guidelines have been developed based on stakeholder input, particularly incorporating the practical experience of dive operators, resort representatives, and local fishermen, while maintaining alignment with national conservation objectives.

- a) Visitor Management and Fee Guideline
- b) Prohibited and Allowed Activities
- c) Photography and Videography Guidelines
- d) Non-compliance and Enforcement
- e) Vessel Regulation
- f) General Guideline for Permit

Note: The enforcement measures and penalties are implemented within the existing framework of the Protected Areas Regulation (2018/R-78) and do not require new legislation. The guidelines provide specific implementation procedures for the regulations already established by national law.

The MPA CAP will focus on establishing effective conservation protocols, sustainable resource use, and structured visitor management. Stakeholder collaboration, including the Dharavandhoo Island Council, local fishermen, and dive operators, will be central to shaping the regulatory framework.

During the grace period, a ranger hotline number will be established to facilitate reporting and compliance monitoring. Additionally, daily, and monthly visitor and resource use data including vessel numbers will be collected and maintained by the Protected Area Management Unit established within the Dharavandhoo Island Council. The three-year grace period will allow for data collection and stakeholder engagement before transitioning into a regulated framework with visitor fees dedicated to conservation efforts.

During this phase, mooring buoys will be installed to prevent anchor damage, and sustainable fishing practices will be encouraged through zoning guidelines. Group size limits, speed restrictions, and research monitoring will also be tested and refined.

At the end of the three-year period, the voluntary codes of conduct will be transitioned into a mandatory regulatory framework or management guidelines as annexure to protected area regulation, ensuring long-term compliance with best practices for conservation, tourism, and fisheries management. The Dharavndhoo Thila MPA will serve as a model site, demonstrating how adaptive management and community engagement can support marine conservation in the Maldives.

6. Boundary and Zonation

A zoning plan for Dharavandhoo Marine Protected Area has been identified and is being recommended to establish distinct management zones to balance conservation priorities with sustainable tourism activities. The zoning scheme incorporates critical habitat protection while allowing for regulated tourism and recreational uses..

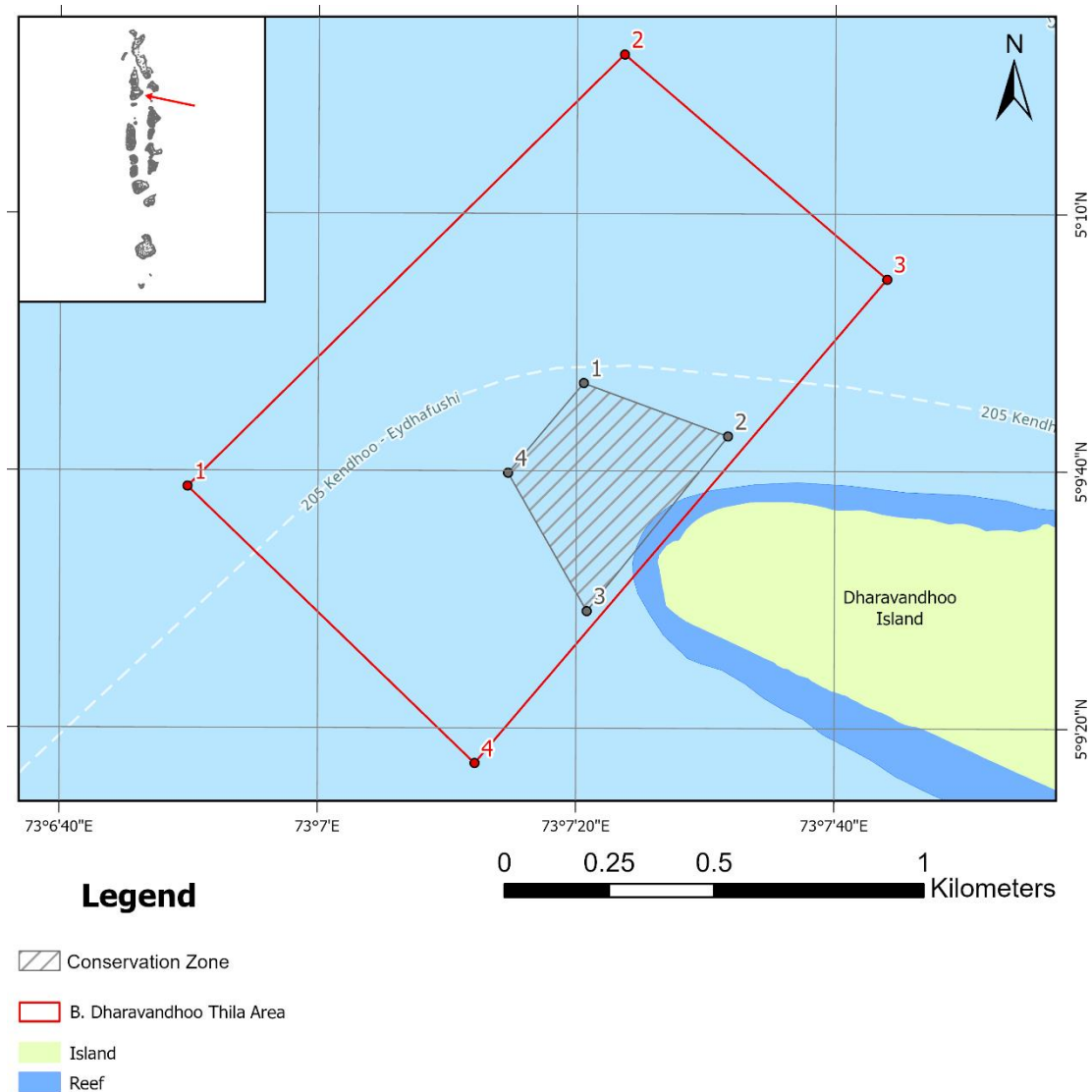


Figure 7: Management Zonation

6.1 Zone Descriptions and Coordinates

Core Area (20% of the MPA)

Through the Conservation Action Plan, a Core Area is being recommended, which is clearly demarcated by the grey boundary line (*Figure 8*) and would be the core area of the MPA. The Core Area includes the actual Thila area, where protection measures are required. The GPS coordinates are given below:

Point	Longitude	Latitude
1	73.12237	5.163003
2	73.12548	5.161861
3	73.12245	5.158082
4	73.12075	5.161063

The main thila reef system forms the centerpiece of the protected area, featuring extensive coral reef ecosystems that support diverse marine life. The zone encompasses several marine biodiversity hotspots that are crucial for the area's ecological balance and marine species survival.

Permitted Activities

The core, represented by the striped region, is subject to stricter management measures to protect sensitive habitats such as coral reefs and marine species. Within this zone, only regulated activities are permitted, including:

- **Snorkeling and Diving:** These activities are allowed but must adhere to strict guidelines to prevent damage to the coral reef and marine life. Divers and snorkelers will be properly briefed by dive guides.
- **Photography and Videography:** Visitors and researchers are allowed to capture images and videos for educational, scientific, and promotional purposes, provided they follow responsible practices that do not disturb the ecosystem.
- **Permitted Research:** Scientific research activities focusing on marine biodiversity, ecosystem health, and conservation efforts are permitted with prior authorization, ensuring minimal disturbance to the habitat.

Vessels may use the 4 designated mooring points (Mooring 1-4) to prevent anchor damage to the reef system.

Prohibited Activities

To ensure the preservation of the marine ecosystem, the following activities are strictly prohibited within the Management Zone:

- **Fishing:** All types of fishing activities are banned to safeguard marine biodiversity and maintain ecological balance.
- **Anchoring:** Anchoring is not allowed, except at designated mooring points, to prevent damage to the coral reef and seafloor habitat.
- **Unguided Activities:** Independent or unguided exploration within the core area is prohibited to ensure compliance with conservation guidelines and minimize human impact.
- **Speed Restrictions:** Vessels must operate at speeds below 5 knots to reduce disturbances to marine life and ensure the safety of divers and snorkelers.
- **Unregulated Tourism:** Any unauthorized tourism-related activities are not permitted to prevent environmental degradation and overcrowding.
- **Resource Extraction:** Activities such as coral harvesting, sand mining, and any form of resource extraction are strictly forbidden to preserve the area's natural integrity.

Maximum speed:

- 5 knots at all times
- No exceptions except for emergency response

Access Restrictions

Access to the zone is limited to authorized vessels that have obtained special permits. The maximum capacity is four (4) vessels at any given time at the mooring points. Each dive session is limited to 2 hours to manage impact on the marine environment. Operators must book in advance to ensure organized access and compliance with capacity limits. The daily vessel limit is strictly aligned with the mooring capacity to prevent overuse.

Buffer Zone

The area within the red boundary, excluding the striped core area, is designated as the Buffer Zone of the Dharavndhoo Thila Marine Protected Area (MPA). This zone is managed with special conservation efforts to protect marine life and habitats while allowing sustainable use. It serves as a buffer around the core protection zone, offering controlled access to marine attractions while minimizing environmental impact on sensitive areas.

The General Use Zone supports traditional and recreational activities that align with conservation goals, ensuring a balance between ecosystem preservation and community needs. Strategically positioned transit corridors facilitate organized vessel movement, and supporting marine habitats complement the core protected area's ecological integrity.

Permitted Activities:

- **Sustainable Fishing:** Fishing is permitted exclusively for local residents holding valid permits, supporting traditional livelihoods while maintaining sustainable resource management. Only hand line fishing and bait fishing will be allowed, with restrictions on the use of nets and traps to prevent habitat degradation.
- **Guided Diving and Snorkeling:** These activities are allowed under professional supervision to ensure safety and environmental protection.
- **Vessel Transit:** Safe passage through this zone is permitted, ensuring minimal disruption to marine life.
- **Scientific Research:** Research activities are allowed with the necessary permits to support conservation efforts and sustainable use practices.
- **Mooring Access:** Vessels can access mooring points via designated pathways to reduce environmental impact.

Prohibited Activities:

- **Unauthorized Fishing:** Fishing without a valid permit is strictly prohibited to prevent overexploitation of marine resources.
- **Destructive Fishing Methods:** Practices that harm marine habitats, are strictly forbidden, even for permit holders. Destructive fishing methods, including bottom trawling, gillnets, drift nets, spear fishing and fish traps are strictly prohibited. Any practices causing significant bycatch, habitat destruction, or physical damage to coral reefs and seagrass beds are not permitted.
- **Anchoring in Sensitive Areas:** Anchoring is not allowed outside designated mooring points to protect coral reefs and seabed ecosystems.
- **Speed Limits:** Vessels must not exceed 10 knots within the zone, and speeds must be reduced to 5 knots when:
 - Within 100 meters of dive boats.
 - During divers active in the two zones.
- **Vessel navigation:** Vessel transit is allowed. Vessel transit is permitted within general use zone area, with a maximum speed of 15 knots to minimize environmental impact. During the three-year grace period, vessels navigating through the Marine Protected Area (MPA) must adhere to this speed limit. Once active monitoring begins, navigation will be restricted except in emergencies.
- **Marine Pollution:** Any activity that contributes to pollution, such as waste discharge, is strictly prohibited.
- **Unregulated Tourism:** Unauthorized tourism activities are not permitted to ensure environmental sustainability and avoid overcrowding.

Summary of Permitted Activities by Zone

Activity	Habitat Management Zone	General Use Zone
Diving	Guided only (with permit)	Regulated
Snorkeling	Guided only (with permit)	Regulated
Fishing	Prohibited	Sustainable (with permit)
Anchoring	Prohibited	In designated areas
Research	Allowed (with permit)	Allowed (with permit)
Photo/Videography	Allowed	Allowed
Navigation	Allowed in emergencies	Allowed in first 3 years (15 knots limit)

7. Vision

7.1 Long-term Vision

The vision for Dharavandhoo Thila MPA is

"To establish Dharavandhoo Thila as a locally governed marine protected area that preserves its diverse marine ecosystems and endangered species while sustaining traditional fishing practices and responsible tourism through effective community-based management within the Baa Atoll Biosphere Reserve framework."

7.2 Guiding Principles

The conservation action plan for Dharavandhoo Thila focuses on addressing potential challenges arising from the extensive resource use of the MPA and the need to conserve and protect critical habitats within the MPA. The plan aims to safeguard critical marine habitats, such as the mantata cleaning stations, black coral gardens, coral-covered thilas and fish nurseries, while fostering sustainable tourism practices.

The management of Dharavandhoo Thila Marine Protected Area is built on the following guiding principles:

Precautionary Principle: Management decisions prioritize conservation in cases where potential threats to marine ecosystems are identified, even if scientific understanding is incomplete. This approach ensures that sensitive ecosystems, including coral reefs and species-specific habitats, are protected proactively to prevent irreversible damage.

Ecosystem-Based Management: Decisions are made with a holistic view of marine ecosystems, accounting for interactions between species, habitats, and human activities. For example, protecting coral reefs is integral to sustaining fish populations, as the reefs provide essential habitat for cleaner fish and other marine organisms critical to the ecosystem.

Adaptive Management: Management approaches are flexible and responsive, evolving based on monitoring data, scientific advancements, and stakeholder input. Regular evaluations ensure that conservation strategies remain effective and can adapt to emerging challenges, such as climate change impacts and changing patterns of marine resource use.

Community-Centered Conservation: The success of Dharavandhoo Thila's conservation efforts depends on meaningful engagement with local communities and stakeholders, ensuring that management decisions balance ecological protection with sustainable resource use while promoting equity, so that vulnerable or low-income groups are not disproportionately impacted and the benefits of conservation, including eco-tourism opportunities, are fairly distributed across the community.

Climate Change Awareness: Recognizing climate change as a significant and overarching threat, management strategies align with the National PCA Management Framework to ensure resilience in marine ecosystems. Conservation actions prioritize mitigating climate-related stressors such as coral bleaching, and sea-level rise.

7.3 Conservation Targets

The protected area focuses on specific conservation targets that represent its core ecological values and management priorities:

Populations of reef manta rays are maintained: The primary conservation target is maintaining healthy populations of reef manta rays (*Mobula alfredi*) and protecting their critical habitats. This includes preserving the integrity of cleaning stations, ensuring undisturbed access to feeding areas, and maintaining water quality conditions that support manta ray aggregations.

Live coral cover is maintained: The coral reef system, particularly areas supporting cleaning stations, represents a crucial conservation target. This includes maintaining coral cover, promoting reef resilience, and ensuring the survival of key species that contribute to ecosystem function. Special attention is given to protecting branching *Acropora* communities and massive *Porites* colonies that provide essential habitat structure. The diverse coral ecosystem, particularly the distinctive black coral gardens and soft coral communities, represents a crucial conservation target. This includes maintaining coral cover and diversity, promoting reef resilience against bleaching impacts, and ensuring the survival of key coral species that provide essential habitat structure.

Manta Cleaning stations preserved and protected: The four identified manta ray cleaning stations represent a key conservation target due to their critical ecological function. This includes maintaining the physical integrity of these stations, protecting the cleaner fish populations that service visiting megafauna, ensuring appropriate distance between observers and cleaning activities, and preventing disruption of the symbiotic cleaning processes essential to manta ray health and behavior patterns.

Protected Species Population maintained: The area aims to conserve critical habitats for multiple endangered species including manta rays, bigeye tuna, guitar sharks, hawksbill turtles, green turtles, and *Mola mola*. This target includes protecting their feeding grounds, resting areas, and movement corridors while minimizing disturbance to their natural behaviors. Particular emphasis is placed on maintaining habitat features that support regular visitation by these species.

Habitat quality maintained: Maintaining environmental conditions that support marine life represents another critical target. This includes preserving water quality, protecting current patterns that facilitate species movement, and maintaining the connectivity between different habitat types within the protected area.

Fish Nursery maintained: Protecting the site's role as a fish nursery represents another vital conservation target. This includes preserving juvenile fish habitats, maintaining bait fish aggregation areas, and ensuring conditions that support fish recruitment. Special attention is given to protecting areas that serve as refugia for juvenile fish and maintaining habitat features that support different life stages of commercially and ecologically important species.

Human and Wildlife Interaction regulated: The conservation target focuses on establishing and maintaining a robust framework for regulating human interactions with marine wildlife, ensuring minimal disturbance to natural ecosystems, species behaviors, and critical marine habitats while providing sustainable opportunities for responsible wildlife observation and research.

8. Management Objectives

The management objectives for Dharavandhoo Thila Marine Protected Area have been developed through extensive stakeholder consultation and analysis of current challenges. Each objective includes specific timelines and clearly defined outcomes to ensure effective implementation and evaluation of management efforts. The action plan in chapter 9 gives the activities, indicators, detailed timeline with responsible authority.

8.1 Governance Objectives

Objective 1: By December 2027, establish a co-managed governance lead by the Dharavandhoo Island Council, with essential infrastructure and protocols for protected area management.

Timeline: Short-term (By December 2027)

Measures:

- Formation of a Protected Area Management Unit within Dharavndhoo Island Council
- Development and voluntary adoption of codes of conduct for different user groups (fishers, tourism operators, visitors, and researchers)
- Installation of mooring buoys and navigation markers
- Establishment of a ranger hotline and compliance monitoring protocols
- Establishment of a monitoring and reporting system for visitor and resource use data
- Capacity-building programs for MPA management staff and stakeholders

Indicators:

- At least 80% of user groups voluntarily adopting the code of conduct by the end of the grace period
- At least 70% reduction in reported violations of voluntary guidelines by the end of the grace period
- At least two annual stakeholder meetings held for governance review

Expected Outcomes:

A locally led governance structure that ensures adaptive management, stakeholder participation, and the transition from voluntary guidelines to enforceable regulations by the end of the grace period.

Objective 2: By December 2027, implement formalized integrated management framework that aligns with both local governance priorities and Baa Atoll Biosphere Reserve requirements.

Timeline: Medium Term (By December 2027).

Measures:

- Development of formalized regulations or management guidelines under the Environment Protection and Preservation Act or Protected Areas Regulation (2018/R-78)
- Establishment of a sustainable financing mechanism (e.g., visitor fees) to support conservation efforts
- Regular stakeholder coordination meetings and integration of local and atoll authorities in decision-making

Indicators:

- Full transition from voluntary guidelines to enforceable regulations by 2028
- At least 50% of operational costs covered through sustainable financing mechanisms
- At least 90% of reported compliance cases resolved through local governance structures

Expected Outcomes:

A fully operational governance system with clear regulatory measures and financing mechanisms that ensure long-term conservation and sustainable use of marine resources.

8.2 Ecological Objectives

Objective 3: By December 2029, enhance the health of Dharavndhoo Thila’s marine ecosystems, with focus on manta cleaning stations through, habitat protection measures, voluntary compliance strategies, and structured monitoring.

Timeline: Medium Term (By December 2029)

Measures:

- Conduct baseline habitat assessments and biannual ecological monitoring
- Establishment of no-take zones and sustainable fishing zones
- Reduction in observed anthropogenic impacts on coral reefs and manta cleaning stations.
- Implementation of visitor guidelines to minimize disturbances.
- Introduction of citizen science initiatives for ecosystem monitoring.

Indicators:

- At least 20% reduction in coral damage from anthropogenic impacts by 2028
- At least 50% of tour operators actively participating in voluntary monitoring programs
- No-take zones showing measurable increases in fish biomass and coral cover by first five years of implantation of CAP.

Expected Outcomes:

Improved ecosystem health through data-driven conservation efforts, leading to formalized habitat protection and species management strategies by the end of the first five years.

8.3 Socio-Economic Objectives

Objective 4: By December 2030, develop and implement a sustainable tourism management system that aligns with conservation objectives while supporting local economic benefits.

Timeline: Medium Term (By December 2030)

Measures:

- Establishment of designated snorkeling, diving, and vessel anchoring zones
- Development of visitor guidelines promoting responsible behavior
- Implementation of a locally managed fee system for conservation funding
- Training programs for local tour guides and dive operators
- Enforcement of boat speed limits (5 knots in designated areas)

Indicators:

- At least 80% of visitors and operators complying with responsible tourism guidelines
- At least 70% of visitor fees reinvested into conservation and community initiatives
- At least 60% of trained local guides actively involved in tourism activities

Expected Outcomes:

A responsible tourism framework that enhances visitor experience while minimizing ecological impacts, transitioning from voluntary adherence to regulatory enforcement.

Objective 5: By December 2030 Develop a strategic stakeholder engagement system to support marine conservation efforts through targeted capacity building and community involvement.

Timeline: Medium Term (By December 2030)

Measures:

- Formation of a resource user working group
- Development and execution of two annual capacity-building programs for local fishers, tour operators, and conservation groups
- Regular public consultation meetings for feedback and policy refinement
- Monitoring and evaluation of training impact on community involvement

Indicators:

- At least 50% of stakeholders participating in advisory committee meetings annually
- At least 50% of trained stakeholders demonstrating improved compliance with conservation measures
- Increased stakeholder-led initiatives supporting conservation efforts

Expected Outcomes:

A community-driven MPA with strong stakeholder participation, fostering a sense of ownership and compliance with conservation regulations.

8.4 Research and Monitoring Objective

Objective 6: By December 2034, establish a comprehensive research and monitoring program that integrates community participation and provides data for adaptive management.

Timeline: Long Term (By December 2034)

Measures:

- Development of a standardized research framework
- Biannual biodiversity surveys and habitat assessments
- Annual reporting of ecological and visitor impact data
- Collaboration with dive centers (citizen science), academic institutions, and research organizations
- Integration of monitoring data into decision-making processes

Indicators:

- At least two peer-reviewed studies published using Dharavndhoo Thila data by 2034
- At least 80% of key ecological indicators (e.g., coral cover, manta ray abundance, fish biomass) monitored consistently over five years
- Increased local participation in citizen science programs

Expected Outcomes:

A data-driven management system that informs policy decisions, ensures ecosystem resilience, and transitions from voluntary monitoring to a structured research framework supporting long-term conservation.

9. Management Strategies and Action Plans

Dharavandhoo Thila MPA's management strategies and action plans establish an integrated framework for implementing six core management objectives over 2025-2035. The strategic framework prioritizes establishing essential infrastructure and local governance under Dharavandhoo Island Council leadership by December 2027, followed by integrated management implementation (2027), marine habitat conservation (2029), sustainable tourism development (2030), stakeholder engagement (2030), and comprehensive research programs (2034). Each strategy incorporates specific technical parameters, quantifiable success indicators, and defined implementation protocols designed to achieve measurable outcomes.

The implementation framework begins with critical infrastructure development, including the installation of 4 permanent mooring buoys, establishment of a watch station in Dharavandhoo with digital monitoring capabilities (including drone systems), and procurement of a monitoring vessel. This foundation supports the creation of a MPA Management Unit with defined roles and standard operating procedures. The plan emphasizes local governance through emergency response protocols and a multi-stakeholder advisory committee. Success will be measured through infrastructure functionality metrics, including completion of monthly maintenance logs and 85% reporting compliance.

The action plan employs evidence-based implementation protocols that integrate local knowledge with scientific monitoring systems, standardized data collection methodologies, and adaptive management mechanisms. Success indicators are defined through measurable parameters, including infrastructure functionality metrics (operational marker buoys and monitoring systems), management effectiveness indicators (compliance with vessel and fishing regulations), and ecological monitoring parameters (stability or improvement in coral health and endangered species presence). This approach enables systematic evaluation of management effectiveness while maintaining flexibility to accommodate local governance needs and traditional use patterns.

The framework particularly emphasizes the role of the Dharavandhoo Island Council in implementation oversight, ensuring that management measures align with local priorities while meeting broader conservation objectives within the Baa Atoll Biosphere Reserve context. The Ministry of Tourism and Environment (MoTE) leads implementation across all objectives, working in partnership with the MPA Management Unit, Dharavandhoo Council, resort dive schools, the Maldives Marine Research Institute (MMRI), and other stakeholders to ensure coordinated and effective management of the protected area.

1.1. Action Plan

Objective	Key actions	Timeline																																Success Indicators	Responsible party											
		2025			2026				2027				2028				2029				2030				2031				2032				2033				2034				2035					
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1			Q2	Q3	Q4								
Objective 1: By December 2027, establish a co-managed governance lead by the Dharavandhoo Island Council, with essential infrastructure and protocols for protected area management.	Formation of a Protected Area Management Unit within Dharavndhoo Island Council																																											Official establishment of the unit, documented operational guidelines and assigned staff roles	MoTE (Lead), Dharavandhoo Council (Partner), MPA Management Unit (Partner)	
	Development and voluntary adoption of codes of conduct for different user groups (fishers, tourism operators, visitors, and researchers)																																									High compliance rate (>80%) among target groups, awareness programs conducted, and feedback from stakeholders indicating understanding and adherence				
	Installation of mooring buoys, navigation markers and watch tower																																									Buoys and markers installed at identified locations, reduction in anchoring-related reef damage				
	Establishment of a ranger hotline and compliance monitoring protocols																																									Hotline operational with a response log, enforcement reports indicating increased compliance and reduced violations				
	Establishment of a monitoring and reporting system for visitor and resource use data																																													Regular reports published on visitor trends and resource use, improved enforcement strategies

[illegible]

manta cleaning stations through, habitat protection measures, voluntary compliance strategies, and structured monitoring.	Establishment of no-take zones and sustainable fishing zones																																					No-take zones demarcated and enforced, fish biomass and biodiversity indicators showing positive trends	Resort Dive Schools (Partner), MMRI (Partner)
	Reduction in observed anthropogenic impacts on coral reefs and manta cleaning stations																																				Decrease in coral damage incidents, improved reef health indicators (coral cover, fish abundance)		
	Implementation of visitor guidelines to minimize disturbances																																				High compliance among visitors, reduction in reef disturbance incidents		
	Introduction of citizen science initiatives for ecosystem monitoring																																				Participation rates in citizen science programs, increased local engagement in reef monitoring		
Objective 4: By December 2030, develop and implement a sustainable tourism management system that aligns with conservation objectives while supporting local economic benefits.	Establishment of designated snorkeling, diving, and vessel anchoring zones																																					Zones clearly marked and adhered to, reduced anchoring in sensitive areas	MoTE (Lead), MPA Management Unit (Partner), Resource User Working Group (Partner), Dharavandhoo Council (Partner) Baa Atoll BR Office (Partner)
	Development of visitor guidelines promoting responsible behavior																																				Guidelines published and distributed, increased awareness and compliance from tourists		
	Implementation of a locally managed fee system for conservation funding																																				Fee system operational, revenue reports showing financial sustainability		

[illegible]

10. Compliance and Enforcement

The effective management of Dharavandhoo Thila MPA requires a comprehensive compliance and enforcement framework that ensures adherence to established rules while maintaining positive relationships with stakeholders. This framework outlines specific regulations, enforcement mechanisms, penalties for violations, and monitoring protocols designed to protect the area's ecological values while supporting sustainable use. The compliance and enforcement protocols are included in Appendix F..

10.1 Rules and Regulations

The protected area operates under specific regulations derived from the Environment Protection and Preservation Act (4/93) and the Protected Areas Regulation (2018/R-78). Core regulations include vessel speed restrictions of 5 knots within the Core Area, a maximum capacity of four (4) vessels at any given time within the protected area, and standardized 2-hour time limits for site visits. These regulations extend to specific activities within the protected area:

Key Regulations:

- **Vessel Operations:** Vessels must register with the MPA Management Unit and obtain permits. A 5-knot speed limit applies within designated zones to protect marine life. To prevent overcrowding and reduce environmental impact over time, a maximum of six vessels is allowed within the protected area at any given time. Mooring buoys and designated anchoring zones must be used to prevent coral damage.
- **Tourism Activities:** Tour operators must implement sustainable tourism practices, employ certified guides, and follow strict guidelines for diving and snorkeling to minimize ecological impact. Pre-activity briefings are required, and visitor compliance is monitored.
- **Fisheries Resource Use:** Fishing within the MPA will be regulated to balance traditional fishing practices with conservation goals. Sustainable fishing zones will be established, with restrictions on gear types and catch limits to protect critical habitats and fish populations. No-take zones will be designated to safeguard breeding and nursery areas, ensuring long-term fish stock viability. Fishers will be engaged through capacity-building programs and alternative livelihood initiatives to promote sustainable resource use.
- **Adaptive Management:** Compliance measures remain flexible and proportional to actual site usage, ensuring long-term ecological integrity while supporting responsible tourism and stakeholder participation.

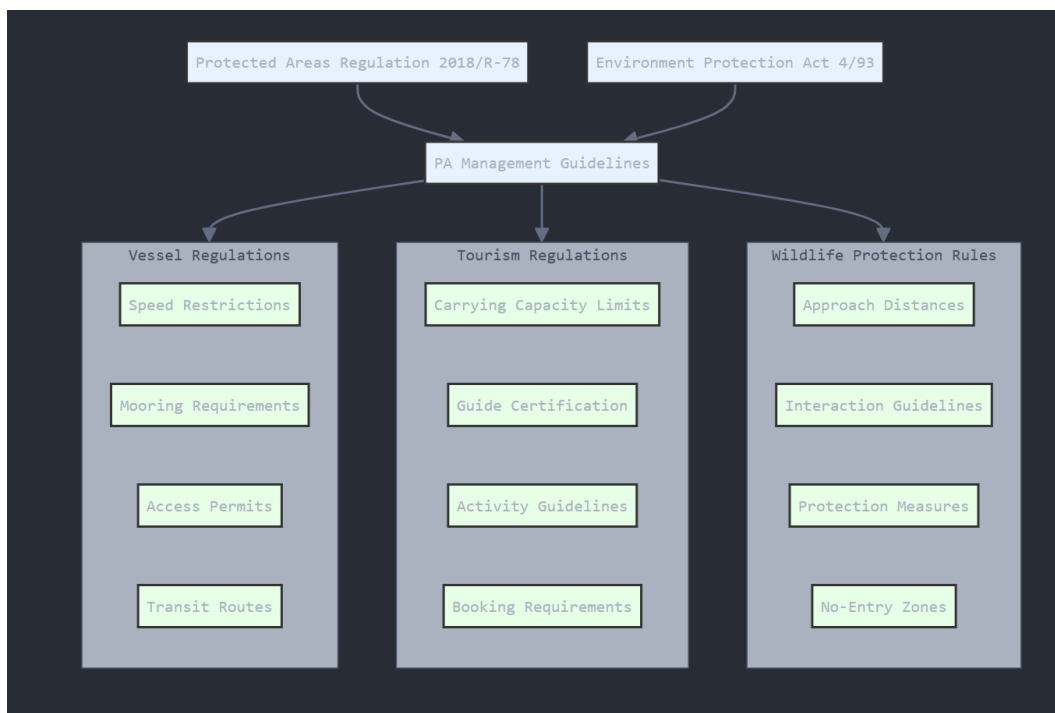


Figure 9: Rules implemented in Dharavndhoo Thila MPA

At the end of the grace period, codes of conduct will be transitioned into formal regulations or guidelines under the Environment Protection and Preservation Act or the Protected Areas Regulation to ensure enforceable conservation measures.

10.2 Enforcement Mechanisms

The regulation on management of Dharavandhoo Thila MPA serves as the legal foundation governing all enforcement operations within the protected area. Enforcement follows a multi-tiered approach integrating systematic monitoring, active stakeholder participation, and proportional responses to violations.

The MPA Management Unit established under Dharavandhoo Council serves as the primary local enforcement body, with trained local rangers conducting routine compliance monitoring. The Baa Atoll Biosphere Reserve Office provides supplementary enforcement support through monthly spot checks and assists with capacity building by training local rangers in specialized monitoring techniques for the MPA. This collaborative enforcement approach ensures consistent oversight while building local management capacity aligned with broader Biosphere Reserve conservation objectives.

Integrated Enforcement Mechanisms

These local operations receive critical support from Ministry/EPA rangers who bring specialized expertise and authority to enforcement activities through three integrated mechanisms:

Digital Monitoring System

- Real-time tracking of vessel movements
- Automated verification of speed restriction compliance (5 knots in designated areas)
- Comprehensive documentation of site usage patterns for carrying capacity management
- Maximum capacity enforcement (4 vessels at any given time)
- Monitoring of time limits (2 hours per vessel)

Strategic Patrol System

- Scheduled ranger patrols creating visible enforcement presence
- On-site verification of regulatory compliance
- Immediate response capabilities for reported violations
- Integration of both local and BR rangers
- Surprise inspections during peak periods to deter infractions

Community-Based Monitoring

- 24-hour operational hotline for reporting violations or emergencies
- Rapid response to developing situations
- Stakeholder participation in protected area oversight
- Community awareness programs promoting voluntary compliance
- Engagement of local fishermen and tourism operators in monitoring activities

Enforcement Approach and Strategy

- Proactive monitoring focusing on high-risk areas and activities
- Education and outreach initiatives including stakeholder engagement and visitor briefings
- Graduated response system for violations:
 - Verbal warnings for minor first-time infractions
 - Written warnings with mandatory additional training for repeated minor violations
 - Proportionate and consistent fines for serious violations
 - Permit suspension or revocation for severe or persistent non-compliance

10.3 Penalty Framework

Violations of protected area regulations incur penalties according to a graduated system that reflects the severity and frequency of infractions. First-time minor violations typically result in written warnings and mandatory additional training. Repeated or serious violations may lead to monetary fines, suspension of access privileges, or revocation of operating permits.

The penalty framework establishes clear consequences for specific violations:

- Speed limit violations: Fines ranging from MVR 5,000 to MVR 15,000
- Unauthorized anchoring: Fines of MVR 10,000 plus compensation for any damage
- Exceeding capacity limits: MVR 5,000 per excess vessel
- Operating without proper permits: MVR 25,000 and immediate cessation of activities
- Wildlife harassment: Fines from MVR 10,000 to MVR 50,000 based on severity

10.4 Monitoring Protocols

Systematic monitoring ensures consistent enforcement and provides data for evaluating management effectiveness. The monitoring system includes several key components:

Daily monitoring activities focus on vessel compliance, visitor numbers, and adherence to operational guidelines. This includes regular checks of mooring buoy usage, vessel speeds, and activity patterns at key sites. Technology-based monitoring through the digital management system provides continuous data on vessel movements and site usage.

Monthly assessments evaluate patterns of compliance, identify recurring issues, and assess the effectiveness of enforcement measures. These assessments inform adaptive management responses and help identify needs for additional enforcement resources or modified regulations.

Quarterly reviews analyze enforcement data to identify trends, assess the effectiveness of current measures, and recommend adjustments to the enforcement framework. These reviews incorporate stakeholder feedback and consider both compliance levels and the impact of enforcement measures on protected area users.

11. Monitoring and Evaluation

The monitoring and evaluation framework for Dharavndhoo Thila MPA ensures systematic assessment of ecological health, tourism operations, and management effectiveness. This comprehensive approach enables evidence-based decision-making and adaptive management responses. The monitoring plan is included in table 5..

11.1 Ecological Monitoring

The ecological monitoring program for Dharavandhoo Thila is designed to track the health of key marine habitats, with an emphasis on manta cleaning stations, manta ray populations coral communities, fish nurseries and reef habitat in line with the Ten-Year Action Plan. The program is structured around the following key actions:

- **Baseline Habitat Assessments:** The MPA Management Unit, in collaboration with resort dive schools, EPA, MMRI, and MoTE, will complete baseline habitat assessments in 2030. These assessments will measure coral cover, fish populations, and the presence of endangered species, establishing critical reference points for future monitoring.
- **Regular Habitat Monitoring:** Annual surveys, focusing on coral health, fish abundance, and water quality, will be conducted by the MPA Management Unit, MoTE, and EPA. These surveys will inform the ongoing management of the MPA and help evaluate the effectiveness of conservation actions.
- **Visitor Guidelines and Impact Mitigation:** The MPA Management Unit will develop and enforce visitor guidelines by 2028 to minimize human impact on sensitive habitats, including coral reefs.
- **No-Take Zones and Protection Areas:** As per the action plan's objectives, habitat management zones will be established by 2028, at the end of the grace period, based on the scientific data from the baseline assessments and ongoing monitoring.

11.2 Tourism Impact Monitoring

The tourism monitoring program for Dharavandhoo Thila will track operational compliance and the effects of tourism on the marine environment, aligning with the integrated management framework outlined in Objective 2 and 3 of the Ten-Year Action Plan. Key actions include:

- **Tourism Monitoring System:** In 2027, the MPA Management Unit will establish a structured tourism monitoring framework to track visitor numbers, vessel activity, and interaction patterns. Monitoring will be integrated into the overall ecological and socio-economic assessments, ensuring adherence to carrying capacity limits.
- **Stakeholder Coordination:** Quarterly coordination meetings will be held with tourism operators and other stakeholders to address potential conflicts between different user groups, such as diving, fishing, and tourism activities.
- **Training for Guides:** In 2029, the MPA Management Unit will implement training programs for local guides, focusing on sustainable tourism practices and marine conservation principles. Certification programs will be introduced to ensure adherence to environmental guidelines.

11.3 Management Effectiveness Evaluation

To assess the effectiveness of MPA management, an evaluation will be conducted every five years using the Protected Area Management Effectiveness Tracking Tool (METT). The assessment will incorporate both quantitative data and qualitative feedback from stakeholders, including local councils, tour operators, and community members. Key performance indicators include:

- **Infrastructure Maintenance and Functionality:** Monitoring the effectiveness of infrastructure, such as mooring systems and the watch station.
- **Revenue Generation and Financial Sustainability:** Evaluation of the locally-managed fee system and the creation of a sustainable financing mechanism, including eco-tourism revenue.
- **Stakeholder Engagement and Satisfaction:** Regular consultations with stakeholders to assess satisfaction levels and the effectiveness of the advisory committee.
- **Conservation Targets:** Progress toward achieving habitat protection and biodiversity conservation goals.

11.4 Reporting Requirements

The reporting framework for Dhravandhoo Thila will ensure that monitoring results are communicated to relevant authorities and stakeholders in a timely and transparent manner, in line with the Ten-Year Action Plan. Reports will be prepared as follows:

- **Monthly Reports:**
 - Visitor statistics and compliance with carrying capacity
 - Infrastructure maintenance status
 - Incident reports and enforcement actions
 - Wildlife sightings and ecological observations
- **Quarterly Reports:**
 - Tourism impact assessments
 - Ecological monitoring data (coral health, fish populations)
 - Stakeholder engagement activities
 - Financial performance and budget tracking
- **Annual Reports:**
 - Comprehensive ecological assessments
 - Progress on conservation and management goals
 - Stakeholder satisfaction analysis
 - Adaptation recommendations based on monitoring outcomes
- **Every 5 Years:**
 - Management effectiveness evaluation

Reports will be submitted to the Ministry of Tourism and Environment and the Environmental Protection Agency (EPA) according to established deadlines. Key findings will also be shared with stakeholders through meetings and digital platforms.

Monitoring Component	Parameters	Indicators	Frequency	Methods	Responsible Parties	Reporting Requirements
Ecological Monitoring	Marine Megafauna	Manta ray abundance at cleaning stations Abundance of keystone species and protected species such as sharks, Napoleon wrasse, turtle. Megafauna Behavioral patterns Megafauna Population demographics Megafauna Disturbance incidents	Quarterly	Visual surveys Photo identification Behavioral sampling Incident logging	Lead: MPA Management Unit Environmental Officer Trained rangers Partners: Marine biologists BR Office	Quarterly summary reports Quarterly trend analysis. Annual population assessment
	Coral Reef Health	Live coral cover percentage Species diversity Disease prevalence Physical damage assessment Reef fish abundance	Annual	Line intercept transects Photo quadrats Fish census Health assessment surveys	Lead: MPA Management Unit Monitoring team Partners: Marine biologists Research partners BR Office	Quarterly health reports Annual reef assessment

	Environmental Parameters	<ul style="list-style-type: none"> • Water temperature Visibility Sedimentation rates Water quality metrics 	Daily/Weekly	Data loggers Water sampling Sediment traps Visual assessment	Lead: MPA Management Unit Environmental Officer BR Office	Weekly data logs Monthly analysis reports
Tourism Impact Monitoring	Visitor Management	Daily vessel numbers Duration of visits Carrying capacity compliance Activity patterns Guide performance	Daily	<ul style="list-style-type: none"> • Digital tracking system Site inspections Activity logs Guide assessments 	Lead: MPA Management Unit Rangers Partners: Tour operators BR Office	Daily operation logs Monthly compliance reports
	Visitor Experience	<ul style="list-style-type: none"> • Satisfaction ratings Complaint incidents Service quality Value perception 	Quarterly	Visitor surveys Feedback forms Operator interviews Online reviews	Lead: MPA Management Unit Partners: Tour operators BR Office	Quarterly satisfaction reports Annual tourism assessment
	User Conflicts	<ul style="list-style-type: none"> • Incident reports Resource use conflicts Resolution outcomes Stakeholder feedback 	Ongoing	Incident reporting Stakeholder meetings Conflict resolution logs	Lead: MPA Management Unit Partners: Local councils BR Office	Monthly incident reports Quarterly conflict analysis

Management Effectiveness	Operational Performance	<ul style="list-style-type: none"> • Infrastructure condition Staff performance Protocol compliance Revenue generation Enforcement effectiveness 	Monthly	Performance reviews Financial audits Compliance checks METT assessments (every 5 years)	MPA Management Unit Community liaison Partners: External evaluators	Monthly performance reports Five-year effectiveness evaluation
	Stakeholder Engagement	<ul style="list-style-type: none"> • Meeting attendance Program participation Community feedback Partnership effectiveness Local benefits 	Quarterly	<ul style="list-style-type: none"> • Meeting records Engagement surveys Partnership reviews 	Local council BR Office	Quarterly engagement reports
	Conservation Outcomes	<ul style="list-style-type: none"> • Target achievement Threat reduction Ecosystem improvements Management adaptations 	Annually	Impact assessments Target reviews Outcome evaluation Adaptation planning	MPA Management Unit Environmental Officer Partners: Advisory Committee Research partners	Annual conservation report Management recommendations

Figure 10 Monitoring Plan

12. Appendices

12.1 Appendix A: MPA Management Unit Functions

1. Administration and Oversight Functions

- The PA Management Unit oversees comprehensive daily operations and management of the protected area, implementing standardized procedures for all administrative activities.
- The unit handles all financial management aspects including budget planning, revenue collection, expense tracking, and financial reporting to relevant authorities.
- Staff supervision responsibilities include scheduling, performance monitoring, training coordination, and maintaining proper staffing levels for all operational needs.
- Infrastructure and equipment maintenance involves regular inspections, coordinating repairs, maintaining inventory, and ensuring all facilities remain operational.
- The unit manages all permit and license systems, maintaining detailed documentation and ensuring compliance with regulatory requirements.

2. Monitoring and Enforcement Functions

- Implementation of comprehensive digital vessel monitoring systems to track and manage vessel movements within the protected area.
- Coordination of regular patrol schedules covering all zones of the protected area, with specific focus on critical habitat areas.
- Enforcement of speed restrictions, carrying capacity limits, and other regulations through both physical and digital monitoring systems.
- Collection and analysis of compliance data to inform enforcement strategies and identify areas requiring additional management attention.
- Maintenance and operation of all surveillance equipment including drones, vessel tracking systems, and monitoring stations.

3. Tourism Management Functions

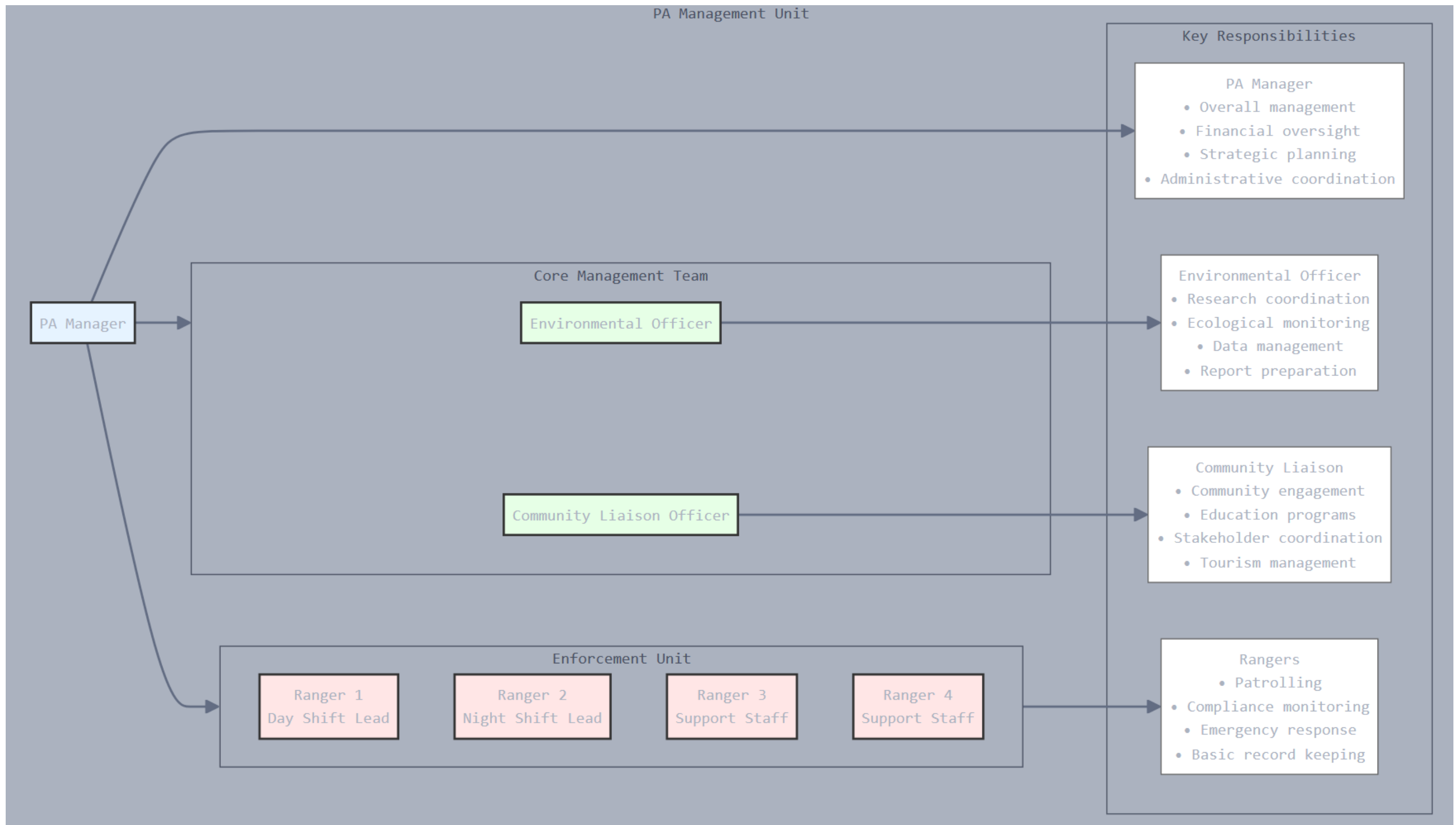
- Management of visitor access through digital booking systems and coordination with tour operators to ensure compliance with carrying capacity limits.
- Operation of the mooring buoy reservation system, including maintenance scheduling and usage monitoring.
- Implementation of fee collection systems and management of revenue from tourism activities within the protected area.
- Coordination of guide certification programs and oversight of tourism activity standards within the protected area.
- Development and implementation of visitor satisfaction monitoring programs to maintain service quality standards.

4. Research and Conservation Functions

- Implementation of standardized ecological monitoring protocols focusing on key species and habitat health indicators.
- Collection and management of scientific data regarding manta ray populations, coral reef health, and water quality parameters.
- Coordination with research partners and management of research permit systems to facilitate scientific studies.
- Maintenance of comprehensive scientific databases and preparation of regular monitoring reports.
- Development and implementation of habitat restoration and species conservation programs based on monitoring results.

5. Community Engagement Functions

- Coordination of stakeholder consultation processes and implementation of regular community feedback mechanisms.
- Development and delivery of environmental education programs for local schools and community groups.
- Implementation of capacity building programs focusing on marine tourism operations and conservation monitoring.
- Support for local business development initiatives related to sustainable tourism operations.
- Management of traditional use activities and implementation of conflict resolution procedures when needed



12.2 Appendix B: Training Requirements

The training requirements for Dharavandhoo Thila Marine Protected Area's management unit establish a comprehensive framework to ensure effective protected area management through systematic capacity building and skill development. This framework addresses the specific needs of each position while maintaining standardized baseline requirements across all staff members. The training program integrates theoretical knowledge with practical applications, focusing on both technical competencies and soft skills required for effective protected area management.

The training framework is designed to be adaptive and responsive to emerging management needs while maintaining consistent core competencies. Each position within the management unit requires specific technical skills and certifications, complemented by regular refresher courses and updates to ensure currency of knowledge and capabilities. The program emphasizes hands-on learning experiences, incorporating both formal training sessions and practical field applications.

Required Certifications:

- First Aid and CPR for all staff
- Vessel operation license for rangers
- Dive certification for Environmental Officer
- Guide certification for Community Liaison Officer

Training Partners:

- Maldives Marine Research Institute
- Environmental Protection Agency
- Environment Management and Tourism Training Institutes (MNU)
- Emergency Response Organizations (Red Crescent, MNDF)
- Local dive schools.
- Baa Atoll BR Office

Position	Core Training Requirements	Specialized Training	Refresher Requirements
Protected Area Manager/Environmental Officer	Protected area management fundamentals Ecological monitoring methods Data collection and analysis Scientific report writing GIS and mapping	Manta ray monitoring protocols Coral reef assessment techniques Water quality monitoring Research methodology Database management	Annual refresher on: Monitoring protocols Data analysis methods Latest conservation techniques
Community Liaison Officer	Stakeholder engagement methods Communication techniques Education program development Project management Tourism management	Guide training certification Community development Conflict resolution Environmental education Tourism product development	Biannual refresher on: Stakeholder engagement Communication skills Tourism management
Rangers	Basic marine biology Law enforcement procedures First aid and emergency response Navigation skills	Vessel operation Patrol techniques Incident reporting	Quarterly refresher on: Emergency procedures First aid Law enforcement

	Radio communication Use and maintenance of surveillance equipment (e.g., drones)	Safety and rescue operations	Safety protocols
All Staff	Protected area regulations Basic computer skills Health and safety Standard operating procedures Emergency protocols	Team building Basic equipment maintenance Digital reporting systems Environmental awareness	Annual refresher on: PA regulations Emergency procedures

12.3 Appendix C: Reporting Templates

Monitoring Report Template:

1. General Information

Date: [Month/Year]

Report Prepared By: [Name/Position]

Location: Dharavandhoo Thila Marine Protected Area

2. Visitor Statistics Table

Visitor Category	Daily Count	Weekly Total	Monthly Total	Notes
International Tourists				
Domestic Visitors				
Research Groups				
Educational Groups				
Total Visitors				

3. Activity Monitoring Table

Activity Type	Number of Operations	Number of Participants	Revenue Generated	Incidents
Diving				
Snorkeling				
Fishing				
Research Activities				
Photography				

4. Ecological Monitoring Table

Parameter	Location	Observation	Status	Action Required
Manta Ray Sightings				
Coral Health				
Water Quality				
Protected Species				
Environmental Threats				

5. Infrastructure Status Table

Infrastructure Type	Condition Rating	Maintenance Required	Action Taken	Next Inspection Due
Mooring Buoys				
Zone Markers				
Monitoring Equipment				
Visitor Facilities				
Safety Equipment				
Watch Tower				

6. Incident Report Table

Date	Time	Location	Incident Type	Description	Action Taken	Follow-up Required

7. Research Activity Table

Research Project	Principal Investigator	Start Date	End Date	Progress Status	Key Findings	Challenges

Condition Rating Key:

- Excellent (5): Fully functional, no issues
- Good (4): Minor wear, fully operational
- Fair (3): Showing wear, needs attention
- Poor (2): Significant issues, needs immediate attention
- Critical (1): Non-functional, requires replacement

12.4 Appendix D: Non-compliance Monitoring Guidelines

The following provides guidelines for PA management unit to attend to any incidences of non-compliances or violations of the PA rules.

1. The Dharavndhoo Thila Management Unit established within the Dharavandhoo Council (Management Unit) will be the primary party responsible for attending to reported incidences of non-compliance and violation of PA rules.
2. The Management Unit has the right to attend to such issues and resolve these in a peaceful manner.
3. Reports of the incident shall be received through direct observation by the Management Unit staff or through reports either by phone, letter, email or other means of communication.
4. Management Unit Staff shall attend the site and gather information on the day an incident is reported. Any violations of PA rules should immediately be stopped, or necessary mitigation action should be taken as advised by the EPA.
5. A report of the incident should be sent to the EPA within 5 days of the incident being reported.
6. The EPA will investigate the incident and take necessary action.
7. The Management Unit shall maintain a log of all reported incidences and compile a list of incidences in the monthly PA management report.
8. The EPA shall maintain a register of reported incidences and actions taken.

Incident Classification Matrix

Violation Category	Description	Severity Level	Immediate Action Required
Critical	Wildlife harassment	High	Immediate cessation of activity
	Coral damage		Documentation
	Protected species capture		Report to EPA immediately.
	Operating in no-entry zones		
Major	Speed violations	Medium-High	Issue warning
	Unauthorized anchoring		Document incident
	Exceeding capacity limits		Report to EPA within 24 hours.
	Operating without permits		
Minor	Improper vessel operation	Low	Issue warning
	Minor rule infractions Documentation issues		Record incident Monthly reporting

Response Protocol

Step	Action	Timeline	Responsible Party	Documentation Required
1. Detection	Direct observation Digital monitoring Report from stakeholders	Immediate	Rangers	Incident log entry
2. Assessment	Evaluate severity Classify violation Determine response	Within 1 hour	Environmental Officer	Assessment form
3. Response	Issue warning Enforce regulations Contact authorities if needed	Within 2 hours	MPA Management Unit	Action report
4. Documentation	Complete incident report Collect evidence Record witness statements	Within 24 hours	Rangers	Full incident report
5. Follow-up	Monitor compliance Review effectiveness Update procedures if needed	Within 7 days	Management Unit	Follow-up report

Monitoring Equipment Requirements

Equipment Type	Purpose	Maintenance Schedule	Data Storage
Surveillance Cameras	Activity monitoring	Weekly checks	30 days
Patrol Vessel Equipment	Enforcement operations	Daily checks	Continuous
Documentation Tools	Evidence collection	Per use	Permanent

Reporting Requirements

Report Type	Content	Frequency	Distribution
Incident Reports	Date/time Location Violation type Actions taken	Per incident	MPA Management unit EPA Council
Patrol Reports	Areas covered Observations Issues noted	Daily	PA Management
Compliance Summary	Violation statistics Trends Recommendations	Monthly	All stakeholders
Enforcement Review	Effectiveness analysis Resource needs Policy updates	Quarterly	Advisory Committee

Evidence Collection Guidelines

Type of Evidence	Collection Method	Storage Requirements	Retention Period
Photo/Video	Digital documentation	Secure server backup	5 years
Written Statements	Standard forms	Physical and digital	5 years
Equipment Records	Maintenance logs	Filing system	3 years

Note: All monitoring activities must comply with legal requirements and protected area regulations. Regular training updates required for monitoring staff.

12. 5 Appendix E: Ecological Monitoring Schedule

Daily Monitoring Parameters

Parameter	Method	Location	Staff Responsible	Data Recording
Water Temperature	Digital thermometer readings	Cleaning stations Reef zones Channel areas	Rangers	Digital log sheet
Weather Conditions	Visual observation	All zones	Rangers	Weather log
Manta Ray Presence	Visual surveys	Cleaning stations	Environmental Officer	Sighting sheet
Vessel Activity	Digital tracking	All zones	Rangers	Vessel log

Weekly Monitoring Parameters

Parameter	Method	Location	Staff Responsible	Equipment Required
Water Quality	pH testing Turbidity measurement Salinity testing	Cleaning stations Channel areas Reef zones	Environmental Officer	Water quality meter Secchi disk Sample bottles
Coral Health	Visual surveys	Designated reef sites	Environmental Officer	Underwater camera Survey slates
Marine Megafauna	Timed swims Photo identification	Channel areas Reef zones	Environmental Officer	Camera GPS unit

Monthly Monitoring Parameters

Parameter	Method	Timing	Staff Required	Output
Benthic Cover	Line intercept transects Photo quadrats	First week	Environmental Officer Research partners	Percentage cover data Photo documentation
Fish Surveys	Belt transects Timed swims	Second week	Environmental Officer Research partners	Species abundance Size class data
Manta Population	Photo identification Behavior monitoring	Continuous	Environmental Officer Research partners	Population estimates Behavior patterns

Quarterly Monitoring Parameters

Parameter	Method	Season	Staff Required	Deliverables
Reef Health Assessment	• REEF Check protocol	All seasons	Environmental Officer	Comprehensive report

	Photo documentation		Research partners	
Seawater Analysis	Laboratory testing	All seasons	External laboratory	Water quality report
Habitat Mapping	Drone surveys underwater mapping	NE & SW monsoon	Environmental Officer Research partners	Updated habitat maps

Annual Monitoring Requirements

Assessment	Timing	Method	Partners	Outputs
Coral Reef Assessment	January	Line Intercept Photo quadrats	Research institutions	Annual reef health report
Manta Population Census	June	Photo identification	Manta research partners	Population status report
Ecosystem Health Review	December	Comprehensive survey	External experts	Management effectiveness report

Equipment Maintenance Schedule

Equipment	Maintenance Frequency	Calibration Requirements	Responsible Staff
Water Quality Meters	Weekly	Monthly	Environmental Officer
Survey Equipment	Monthly	Quarterly	Environmental Officer
Cameras	After each use	Annually	Rangers
GPS Units	Monthly	Bi-annually	Rangers

*Notes:

- All monitoring activities subject to weather conditions
- Data to be entered into central database within 24 hours
- Quality control checks required for all data entry
- Immediate reporting required for any unusual observations*

12. 6 Appendix F: Activities Allowed and Prohibited

Note: All permitted activities must comply with protected area regulations and may be subject to temporary restrictions based on environmental conditions or management requirements.

✗ = Prohibited ✓ = Permitted with standard regulations ✓* = Permitted with special authorization

Activity Category	Core Zone	Tourism Zone	Permitted With Authorization*
General Activities			
Any activities causing harm to marine ecosystem	✗	✗	
Littering	✗	✗	
Introduction of alien species	✗	✗	
Feeding marine life	✗	✗	
Night lighting to attract marine life	✗	✗	
Resource Extraction			
Mining activities	✗	✗	
Sand mining	✗	✗	
Coral mining	✗	✗	
Dredging	✗	✗	
Development Activities			
Infrastructure development	✗	✗	
Reclamation	✗	✗	
Aquaculture/mariculture	✗	✗	
Installation of mooring buoys	✗	✗	✓*
Maritime Activities			
Anchoring	✗	✗	
Vessel speed above 5 knots	✗	✓	
Tourism Activities			
Recreational diving	✓*	✓	✓*
Snorkeling	✓*	✓	✓*
Wildlife watching	✓*	✓	✓*
Photography/videography	✓*	✓	✓*
Research Activities			
Scientific research	✓*	✓*	✓*
Monitoring activities	✓*	✓*	✓*
Equipment installation	✓*	✓*	✓*

Activities marked with (✓) require special permits and must comply with specific conditions:

12.7 Appendix G: Fee Guidelines

The fee structure for Dharavndhoo Thila Marine Protected Area operates as a dual system, with separate mechanisms for commercial operators and individual visitors. Both fee systems operate concurrently as follows:

1. Annual Operator Fees (voluntary)
2. Monthly Operator Fee (voluntary)

3. Individual Visitor Entry Fees (Applicable to all visitors except those entering with annual permit holders)

All fees are listed in Maldivian Rufiyaa (MVR) with US Dollar (USD) equivalents shown in parentheses for reference. The official MVR amount shall be considered binding.

Annual Operator Fees:

Operator Type	Annual Fee (USD)	Includes
Safari Vessels	\$5,000	- Unlimited access within carrying capacity limits
		- Use of mooring buoys
		- Marketing through PA platforms
Resort Dive Centers	\$ 10,000	- Unlimited access within carrying capacity limits
		- Use of mooring buoys
		- Marketing through PA platforms
Local Tour Operators	\$ 2,000	- Unlimited access within carrying capacity limits
		- Use of visitor facilities
		- Marketing support
Photography/Videography Business	MVR 1,000 (\$780)	- Commercial photography rights
		- Marketing through PA platforms

Individual Visitor Entry Fees:

Visitor Category	Fee per Visit MVR (USD)
International Tourists	\$ 5
Maldivian Nationals	\$ 2
Children (under 12)	Free
Research/Educational Groups	50% discount

Activity-Specific Fees:

Activity	Fee MVR (USD)	Duration
Diving	\$5	Per dive
Snorkeling	\$5	Per session
Photography (Commercial)	\$50	Per day
Research Activities	Free	Pre-arranged
Educational Field Trips	Free	Pre-arranged

Note:

1. Commercial operators must pay annual fees regardless of visitor entry fees.
2. Visitors entering with annual permit holders are exempt from individual entry fees.

3. *All fees are reviewed annually and may be adjusted based on management requirements.*
4. *Exchange rates will be updated quarterly based on official MMA rates*
5. *For multi-day access, weekly passes are available at a 20% discount from daily rate.*

Fee Exemptions

- Government monitoring activities
- Emergency response operations
- Local school educational visits
- Conservation research (with approved permits)
- Traditional non-commercial activities

Payment Terms

Annual Operator Fees:

- Annual operator fees must be paid in advance of the operational year to maintain valid permits for protected area access.
- Operators have the flexibility to pay their annual fees through quarterly installments to manage cash flow more effectively.
- The management offers a 10% discount on the total annual fee for operators who complete their full payment before the start of the operational year.
- A late payment penalty of 5% will be applied to any payments received after the designated due dates to ensure timely compliance with payment schedules.

Visitor Fees:

- All visitor fees must be paid and validated before entering the protected area to ensure proper access control and visitor management.
- The protected area offers convenient digital payment options through an online portal and mobile payment systems to facilitate easy transactions for visitors.
- Groups consisting of ten or more persons qualify for a 10% discount on the standard entry fees, making the protected area more accessible for organized tours and educational groups.
- Season passes are available offering cost-effective access options for regular users of the protected area, with passes available in various durations to suit different visitation patterns.

Revenue Allocation

Revenue generated from protected area fees will be allocated as follows:

- The largest portion, comprising 40% of total revenue, will be directed towards conservation programs including ecological monitoring, species protection initiatives, and habitat restoration projects.
- Infrastructure maintenance will receive 25% of the revenue, ensuring proper upkeep of mooring buoys, monitoring stations, and other essential facilities within the protected area.
- Community development initiatives will be supported through 20% of the revenue, focusing on capacity building, local business development, and educational programs that benefit surrounding communities.
- The remaining 15% will be utilized for administrative costs, covering operational expenses, staff salaries, and basic management requirements necessary for effective protected area governance.

12.8 Appendix H: Vessel Regulation

Regulation Category	Parameter	Limit/Requirement
Capacity Limits	Total MPA Vessels	Maximum 8 vessels simultaneously
	Core Area	Maximum 4 vessels
	Buffer Zone (at Mooring)	Maximum 4 vessels
	Cross-zone Total	No more than 8 vessels total
Time Restrictions	Stay Duration	Maximum 2 hours per vessel
	Vessel Interval	Minimum 30 minutes between arrivals/departures
	Operating Hours	6:00 AM to 6:00 PM
Vessel Size	Length	Maximum 30 meters
	Draft	Maximum 3 meters
Access Priority	Regular Access	First-come, first-served basis
	Commercial Operators	Advance booking required
	Emergency Vessels	Exempt from capacity limits

12.9 Appendix I: Photography/Videography Guidelines

Commercial Photography/Videography Permits

- Commercial photography and videography activities require a specific permit from the MPA Management Unit.
- Permit applications must be submitted at least 14 working days prior to the planned activity.
- Permits are valid for the duration specified in the application, with maximum duration of one month.
- Commercial activities include but are not limited to advertising, film production, professional portfolios, and social media content creation for commercial purposes.

Application Requirements

- Completed permit application form
- Detailed description of planned activities and equipment to be used
- Proposed shooting schedule and locations within the protected area
- Number of crew members involved
- Proof of liability insurance
- Equipment inventory including drone registration if applicable

Fee Structure

Activity Type	Duration	Rate (USD)
Standard Commercial Photography/Videography		
Daily Rate	1 day	50
Weekly Rate	7 days	250
Monthly Rate	30 days	800
Additional Services		
Drone Usage	Per day	100
Underwater Filming	Per day	75
Additional Crew Member (>5 persons)	Per person/day	25
Special Permits		
Night Photography	Per session	150
Special Access Areas	Per day	200
Extended Hours	Per hour	50

Notes: Rates are subject to annual review and may be adjusted based on management requirements.

- All fees must be paid in advance
- Permits are non-transferable
- Cancellation fee of 25% applies if cancelled within 48 hours
- Special permits subject to management approval
- Additional fees may apply for specialized equipment use
- Group discounts available for long-term projects

Operational Guidelines

- Photography/videography activities must not interfere with wildlife behavior or habitat
- Minimum distance of 3 meters must be maintained from coral reefs during underwater photography
- Use of artificial lights limited to hand-held devices only
- No flash photography permitted during manta ray observations
- Drone operations restricted to designated zones and times
- All activities must be conducted during daylight hours (6:00 AM to 6:00 PM)

Prohibited Activities

- Use of tripods or equipment stands on coral reefs.
- Touching or manipulating marine life for photo opportunities.
- Use of baiting or feeding to attract marine life.
- Moving or removing any natural objects for staging.

- Operating drones within 50 meters of manta ray cleaning stations.
- Night photography without special permission.

Special Conditions

- Special permits required for night photography/videography.
- Additional restrictions may apply during peak tourist seasons.
- Weather-dependent activities may be suspended without notice.
- Compliance with general protected area regulations required.

Content Sharing Requirements

- Copies of final content must be shared with MPA Management Unit.
- Credit line "Filmed at Dharavndhoo Thila Marine Protected Area" and Baa Atoll Biosphere Reserve required.
- MPA Management Unit reserves right to use content for promotional purposes.
- Acknowledgment of protected area status in commercial uses.

Note: Violation of these guidelines may result in immediate permit revocation and denial of future permits. All fees are non-refundable unless activities are cancelled due to management decisions.

12.10 Appendix J: Research Guidelines

Application Process	<ul style="list-style-type: none"> • Research proposals must be submitted to the MPA Management Unit at least 30 days prior to intended start date • Applications must include: <ul style="list-style-type: none"> ○ Detailed research methodology ○ Project timeline ○ Equipment list ○ Team composition and qualifications ○ Expected outcomes and deliverables ○ Data management plan • All research activities require final approval from EPA
Research Requirements	<p>Research teams must:</p> <ul style="list-style-type: none"> • Submit monthly progress reports • Provide final research report • Share raw data with MPA Management Unit • Acknowledge the protected area in publications • Present findings to local stakeholders
Research Priorities	<p>Priority will be given to research focusing on:</p> <ul style="list-style-type: none"> • Manta ray population dynamics • Coral reef resilience • Climate change impacts • Sustainable tourism practices • Socio-economic impacts • Marine ecosystem connectivity
Operational Guidelines	<p>Researchers must:</p> <ul style="list-style-type: none"> • Follow all protected area regulations • Use designated mooring buoys

	<ul style="list-style-type: none"> • Minimize impact on marine life • Coordinate activities with PA management • Report any incidents or unusual observations • Maintain research logs
Prohibited Activities	<ul style="list-style-type: none"> • Collection of specimens without specific permits • Destructive sampling methods • Interference with tourism operations • Night operations without special permission • Use of unauthorized equipment • Unauthorized drone usage
Data Sharing Requirements	Submit: <ul style="list-style-type: none"> • Raw data in specified format • GIS files if applicable • Photo documentation • Research reports • Copies of publications • Monitoring protocols used

Note: All research activities must comply with national research guidelines and protected area regulations. Permits may be revoked for non-compliance with these guidelines.

12.11 Appendix K General Guideline for Permit:

- Tourism permits are issued by the PA Management Unit following review of operator credentials and proposed activities.
- Research permits require initial approval from the PA Management Unit and final authorization from EPA.
- Applications must be submitted at least:
 - 14 days in advance for tourism activities
 - 14 days for photography/videography
 - 30 days for research activities
- Full permit requirements and application procedures are detailed in the relevant appendices below.