

Ocean Country Partnership Programme

Guraidhoo Kandulhi Marine Protected Area

Conservation Action Plan 2025-2035



Submitted by Island Wetlands

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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:

Guraidhoo Kanduolhi was designated as a Protected Area under the Environment Protection and Preservation Act (4/93) on 27th September 1995 and the area was rezoned as a Category VI Species/Habitat Management Area in September 3, 2020. Covering approximately 352 hectares, it encompasses critical manta ray cleaning stations, diverse coral reef systems, and pelagic habitats that support significant marine biodiversity.

The site's exceptional ecological value centers on two key features: it hosts one of South Malé Atoll's most important reef manta ray (*Mobula alfredi*) aggregation sites, with regular sightings of 4-10 individuals during peak season (April-November), and supports a diverse coral reef ecosystem that provides critical habitat for several vulnerable and endangered species. The reef system, characterized by complex underwater caves and extensive Acropora formations, serves as habitat for globally threatened species including whitetip reef sharks (*Triaenodon obesus*), grey reef sharks (*Carcharhinus amblyrhynchos*), and the critically endangered bowmouth guitarfish (*Rhina ancylostomus*).

However, these values face significant threats. Growing tourism pressure, evidenced by up to twelve safari vessels operating simultaneously during peak seasons, leads to overcrowding and potential disturbance to marine life. High-speed vessel traffic poses direct risks to marine megafauna and disrupts natural behaviors at cleaning stations. Physical damage to reefs from anchoring, coupled with sedimentation from adjacent coastal development activities, threatens coral reef health. Local stakeholders have reported a concerning decline in manta ray sightings over the past decade, highlighting the urgent need for coordinated management action.

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. The plan establishes two distinct management zones: a Conservation Zone covering 40% of the MPA, which encompasses critical manta ray cleaning stations and essential marine habitats along the western reef system where strict protection measures apply, and a General Use Zone where sustainable tourism and traditional activities are permitted under specific guidelines. 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 to provide a comprehensive framework for protected area management.

The vision for Guraidhoo Kanduolhi is:

"To develop an effectively managed Guraidhoo Kanduolhi that ensures the conservation of manta rays and marine biodiversity while promoting sustainable tourism practices and supporting local community benefits through science-based adaptive management."

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 the marine biodiversity of Guraidhoo Kanduolhi Marine Protected Area, with focus on protecting manta ray cleaning stations, diverse coral reef ecosystems, and habitats for vulnerable species, while enabling sustainable tourism that benefits local communities through science-based management.

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

Objective 2: By December 2027, implement a formalized integrated management framework that transitions from voluntary codes of conduct to enforceable regulations while ensuring local governance and sustainable resource use.

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 2030 local communities are gaining socio-economic benefits through a sustainable tourism management system.

Objective 5: By 2030, stakeholders and local communities are actively engaged in marine conservation efforts.

Objective 6: By 2034, understanding of the site's ecological, economic and social values is enhanced to inform adaptive management.

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).
- **Implementation Level:** Daily operations and enforcement by Guraidhoo Council through the PA Management Unit.
- **Support Level:** Local coordination and stakeholder engagement by Gulhi and Maafushi Councils and a PA Management Advisory Committee.

The plan proposes eight strategic areas, including zoning schemes for management with activity protocols, a daily 10-boat limit, and 1.5-hour duration restrictions. Infrastructure priorities include installing six mooring buoys and implementing a 5mph speed restriction system. Visitor management incorporates a flexible fee structure, offering two options: an annual contribution for operators or an entrance fee per visitor. Specific protocols are proposed for local dive operators, resort diver operators and safari vessels to ensure compliance and equitable contribution to the management of the protected area.

Key infrastructure needs addressed in the plan include installing mooring buoys to protect coral reefs and facilitate effective vessel management. The plan also outlines the resources required for enforcement and monitoring to ensure successful implementation. Furthermore, it establishes a code of conduct and strategic objectives for the short- and long-term management of the Guraidhoo Kandulhi MPA. Operating under the regulatory framework of the Environment Protection and Preservation Act (4/93) and the Protected Areas Regulation (2018/R-78), the plan aligns with national policies and international conservation commitments for a coordinated approach to marine resource management

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 (April-November). Financing mechanisms rely on visitor fees and potential Green Fund allocations.

Stakeholder engagement through the Advisory Committee 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.

1. Introduction

Guraidhoo Kandulhi represents a critical marine ecosystem in the Maldives, serving as an essential habitat for manta rays and supporting a thriving marine tourism industry. Designated as a Protected Area in 27th September 1995 under the Environment Protection and Preservation Act (4/93), this site is located in South Malé Atoll. The site was initially designated as a single geographic point but underwent spatial rezoning expanding the area to 352-hectare, in September 2020 to better protect its key values and manage increasing use pressure.

The MPA is currently designated as a Category VI Species/Habitat Management Area, primarily aiming to protect significant coral reef systems, manta ray cleaning stations, and marine habitats that support both biodiversity conservation and sustainable tourism activities. The site is particularly notable for its regular manta ray aggregations, with 4-10 individuals commonly observed during the peak season (April-November), and its diverse coral reef ecosystems that provide critical habitat for several vulnerable and endangered species. The area has been a cornerstone of local tourism development, particularly benefiting the communities of Guraidhoo, Maafushi, and Gulhi through dive tourism and excursion operations.

In recent years, increasing pressures on this marine ecosystem have become evident. Local stakeholders, particularly from Guraidhoo and Maafushi, have reported a significant decline in manta ray sightings over the past decade. This decline, coupled with impacts from coastal development projects and growing tourism activities, highlights the urgent need for structured management measures. The designation of this area as a protected area under the Environment Protection and Preservation Act (4/93) marks a vital step toward ensuring its long-term conservation while maintaining socio-economic benefits for local communities.

This Conservation Action Plan aims to establish a comprehensive framework to protect and sustainably manage the Guraidhoo Kandulhi Marine Protected Area (MPA). It seeks to balance the preservation of critical marine habitats, particularly manta ray cleaning stations, with sustainable tourism activities. The plan includes guidelines for visitor management, such as standardized visit durations and speed control measures, to minimize impacts on marine megafauna.

The development of the Guraidhoo Kandulhi 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 action plan, which includes specific action plans, monitoring protocols, and implementation frameworks.

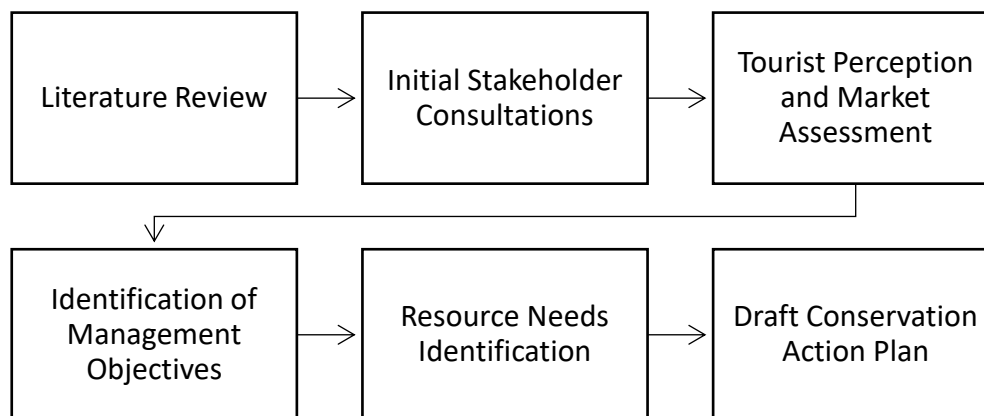


Figure 1: Process of development of Conservation Action Plan

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 meetings identified critical concerns such as overcrowding during peak tourist seasons (May-December), vessel speeding, damage to coral reefs, declining manta ray sightings, and sedimentation impacts from nearby development projects. Key outcomes included agreement on implementing a management system with designated zones for diving and snorkeling marked by six buoys at manta point, visitor limitations (10 boats per day with 1.5-hour maximum stays), a proposed \$5 visitor fee, speed limits of 5 miles per hour in sensitive areas, and potential drone monitoring for enforcement. Stakeholders from resorts expressed willingness to financially support the MPA's management through a seasonal fee structure, while local councils committed to providing vessels for monitoring and spot checks.

Ten- year Conservation Action Plan (2025-2035)

This ten-year Conservation Action Plan (2025-2035) divides the Guraidhoo Kandulhi MPA into two management zones with different protection levels and permitted activities. The Conservation Zone, covering 40% of the MPA along the western reef system, encompasses critical manta ray cleaning stations and essential marine habitats. This zone aligns with Category VI (Species/Habitat Management Area) of the Protected Areas Regulation, focusing on actively managing and protecting the natural environment to ensure the survival and health of specific species, particularly manta rays, by actively caring for the areas where they live while enabling controlled tourism activities. The General Use Zone, also designated as Category VI, allows for sustainable tourism activities and traditional uses while maintaining environmental protection.

2. Description of the Site:

2.1. Location and Boundaries

The Guraidhoo Kanduoilhi MPA, located within the South Malé Atoll administrative region, was designated as an MPA under Environment Protection and Preservation Act 4/93, on September 27, 1995. Initially designated as a single geographic point, the protected area underwent a spatial rezoning process on September 3, 2020 through decree (IUL)438-/ENV/438/2020/150. The rezoning redefined its management zones and established the current boundary defined by the following coordinates:

Point	Latitude (N)	Longitude (E)
1	3.895369°	73.447917°
2	3.900767°	73.451286°
3	3.897257°	73.462754°
4	3.896226°	73.462473°
5	3.894387°	73.470021°
6	3.898501°	73.473986°
7	3.89595°	73.481495°
8	3.880967°	73.476624°
9	3.883256°	73.467034°
10	3.887145°	73.46786°
11	3.88858°	73.467649°
12	3.889745°	73.466486°
13	3.890608°	73.46437°
14	3.890035°	73.461899°
15	3.890661°	73.460409°
16	3.891467°	73.459812°
17	3.895369°	73.447917°

Table 1: Guraidhoo Kanduoilhi MPA - GPS Coordinates

The MPA encompasses a total area of 352 hectares. Geographically positioned at the southern periphery of Guraidhoo Island, the MPA holds a strategically significant location within the greater Malé Atoll complex, due to its proximity to major tourism hubs and population centers.

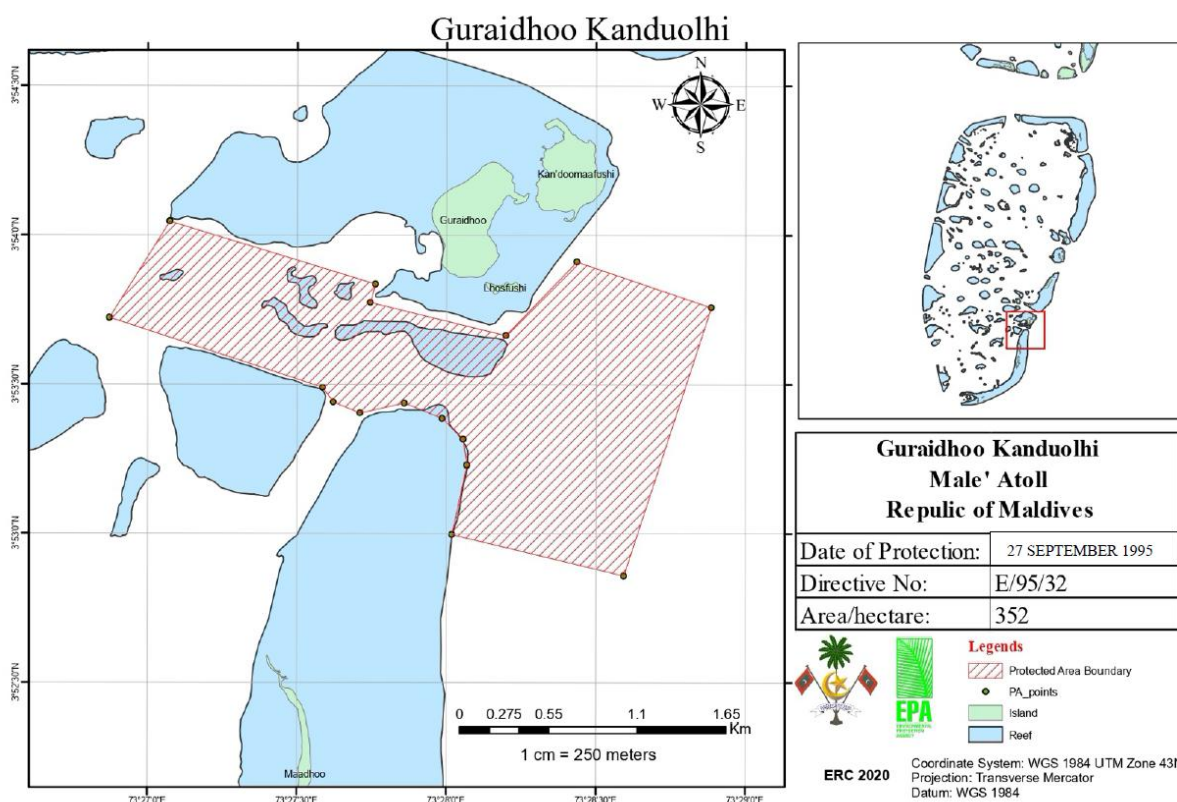


Figure 2: Guraidhoo Kandulhi MPA Boundary Map (Source: Decree number (IUL)438-/ENV/438/2020/150)

The MPA's location is particularly noteworthy due to its position at the interface of North and South Male' Atolls, making it readily accessible to tourism operations from both administrative regions. This geographical advantage facilitates access from multiple tourism hubs, including local islands with established guesthouse tourism (such as Maafushi, Guraidhoo, and Gulhi), as well as numerous luxury resorts distributed throughout both atolls. The site's accessibility is enhanced by its position relative to major navigation channels and its proximity to Male' International Airport, the primary gateway for international tourism in the Maldives.

2.2. Physical Features:

The Guraidhoo Kandulhi MPA features a diverse underwater topography ranging from 10 to 30 meters in depth, characterized by distinctive underwater caves, complex reef formations, and deep channels. The manta ray cleaning stations, situated at depths of 4 - 5 meters, are formed by specific reef formations where unique current patterns create optimal conditions for marine life aggregation. The area experiences strong current flows, especially during tidal changes, which influence marine life behavior and create nutrient-rich environments. These varying physical features, from shallow cleaning stations to deep channels and cave systems, create a mosaic of marine habitats supporting diverse ecological communities.

2.3. Biological Features:

Manta Ray Populations and Behavior

The Guraidhoo Kandulhi MPA serves as a critical habitat for manta rays, with regular sightings of 4-10 individuals during the peak season from April to November. These magnificent creatures visit the area's cleaning stations where cleaner fish maintain their health by removing parasites and dead tissue. Stakeholder observations indicate historical patterns of manta ray presence, though recent years have shown some decline in sighting frequency. The manta rays' behavior is closely tied to tidal movements and current patterns, with outgoing currents particularly favorable for manta ray activity.

Coral Reef Ecosystems

Guraidhoo Kandulhi's coral reef ecosystem exhibits remarkable diversity across its varying depths and zones, characterized by both hard and soft coral communities that create complex three-dimensional habitats. The reef system predominately features branching *Acropora* species, particularly *Acropora muricata*, which form extensive thickets in the upper reef zones between 10-15 meters. These branching coral formations provide essential shelter for numerous reef-associated fish species, including damselfish (Pomacentridae) and fusiliers (Caesionidae).

The reef system's ecological significance is enhanced by the presence of specialized habitat zones, including cave formations and cleaning stations. These areas support distinct coral communities adapted to lower light conditions and stronger current flows, including encrusting species of *Leptastrea* and *Agaricia*. The cleaning stations, crucial for manta ray aggregations, feature specific coral formations that provide habitat for cleaner fish species.

Protected Species and Marine Biodiversity

Beyond manta rays and coral communities, the MPA supports a rich diversity of marine life. Local dive operators report regular sightings of various reef fish species, with the site serving as a crucial habitat for both juvenile and adult fish populations. The channel areas, influenced by strong tidal movements, create nutrient-rich environments that attract planktivorous species, forming the foundation of a complex food web. This biodiversity is not just a measure of species numbers but represents intricate ecological relationships that have evolved over time, including the crucial symbiotic relationships between cleaner fish and manta rays at cleaning stations.

The MPA serves as a critical habitat for numerous protected and endangered species. Key species include:

- Reef Manta Rays (*Mobula alfredi*): Regular aggregations of 4-10 individuals during the peak season (April-November), utilizing cleaning stations
- Whitetip Reef Sharks (*Triaenodon obesus*): Commonly observed around reef areas and cave systems
- Hammerhead Sharks (Sphyrnidae): Periodic visitors to deeper areas
- Grey Reef Sharks (*Carcharhinus amblyrhynchos*): Frequent inhabitants of reef slopes
- Napoleon Wrasse (*Cheilinus undulatus*): Protected species found throughout reef areas
- Bowmouth Guitarfish (*Rhina ancylostomus*): Rare but significant species
- Sea turtles and dolphins: Regular visitors throughout the protected area

2.4. Current Resource Use

Guraidhoo Kanduoilhi MPA experiences significant resource use primarily centered around marine tourism activities. Based on stakeholder consultations with dive operators from Maafushi, Gulhi, and Guraidhoo islands, the MPA supports a robust tourism industry with well-defined seasonal patterns and user groups.



Figure 3: Resource Use zones

Tourism Activities

Dive centers from three primary locations operate within the Guraidhoo Kanduoilhi MPA. Maafushi, being the largest tourism hub with over 90 guesthouses and multiple water sports facilities, hosts approximately 8-10 dive centers actively conducting tours in the area. These centers collectively serve both local guesthouse tourists and day visitors from nearby resorts. Gulhi contributes two dive centers to the operation pool, each typically handling groups of 4-6 divers per trip, primarily serving their local guesthouse visitors and resort guests. Additionally, Guraidhoo-based operators regularly utilize the MPA for diving and manta ray watching excursions, catering to their growing local tourism market.

Safari vessels form another significant user group, with 12 or more vessels visiting the area during peak seasons, creating additional pressure on the marine environment. These liveaboard vessels typically operate on 7–10-day itineraries throughout South Male' Atoll, with Guraidhoo Kanduoilhi being a key attraction on their routes. The combination of local dive operations and safari vessels results in significant tourism activity, particularly during the manta season from April to November.

Seasonal Patterns

Guraidhoo Kandulhi experiences distinct seasonal usage patterns, primarily dictated by manta ray presence. The peak season runs from April to November, coinciding with the southwest monsoon when manta rays are most frequently observed at cleaning stations. During this period, dive operators report running daily excursions, with each operator conducting multiple trips. Tourism activities are particularly intensive during the manta season, with operators from Maafushi alone running 3-4 boats daily, each carrying 20-30 tourists. The off-season sees reduced activity, though daily regular diving operations continue year-round.

User Statistics

Based on stakeholder data, the current (year 2024) usage patterns show:

Daily Vessel Traffic:	3-4 boats per operator during peak season
Average Group Size:	20-30 tourists per boat
Dive Group Size:	4-6 divers per guided group
Safari Vessel Presence:	12+ vessels during peak season
Visit Duration:	Currently unregulated but typically lasting several hours
Manta Sightings:	4-10 mantas during successful trips in season
Operating Hours:	Daylight hours only, with no night diving due to strong currents

Table 2: User statistics (Year 2024)

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 Activities:

The MPA and surrounding waters support fishing activities alongside tourism uses. One dhoni vessel from Guraidhoo community regularly fishes in adjacent areas, targeting reef fish and occasional pelagic species for local resorts and markets. Recreational fishing is carried out by local guesthouses and resorts, which organize regular sunset and night fishing excursions for guests, typically accommodating 2-3 fishing trips per week during peak tourist season. Recreational fishing activity increases on weekends and public holidays when approximately 3-5 vessels carrying residents from Male' and neighboring islands visit the area. These visitors typically use small vessels and traditional handline methods during early morning or late afternoon hours, especially in calm weather conditions.

Vessel Traffic:

The MPA experiences regular vessel traffic as it intersects with key transportation routes. Public ferry services between Male' and southern atolls traverse the area daily, and cargo vessels frequently pass-through adjacent channels. A designated shipping lane runs along the eastern boundary of the MPA, used by both commercial vessels and local transport dhonis.

Other Uses:

Significant coastal infrastructure development on adjacent islands has implications for the MPA. Recent coastal modification projects, includes the harbor expansion and land reclamation project at Guraidhoo island, and ongoing seasonal beach replenishment works in Kandooma resort at the vicinity of the MPA. Local communities, particularly from Guraidhoo, use the area for recreational purposes including swimming and snorkeling along the reef edges. These activities are primarily concentrated in the shallower western sections of the MPA during calm weather periods.

3. Key Values

3.1. Ecological Values:

The ecological values of Guraidhoo Kandulhi MPA are characterized by its exceptional marine biodiversity, critical species habitats, and complex ecosystem functions that contribute to the broader marine environment of the Maldives. The protected area's ecological significance is particularly evident in its role as a marine megafauna aggregation site and its diverse coral reef ecosystems.

Locally significant reef manta ray aggregations

The area serves as one of several critical habitats for reef manta rays (*Mobula alfredi*) within the Male' Atoll region. The presence of specialized cleaning stations at depths of 3.7-4.6 meters creates optimal conditions for manta ray aggregations, with regular sightings of 4-10 individuals during the southwest monsoon season from April to November. While the site's manta ray populations and sighting frequencies are relatively low compared to nationally significant aggregation sites like Hanifaru Bay in Baa Atoll, its protection remains crucial as part of the broader network of manta ray habitats in the Maldives. The cleaning stations represent complex ecological relationships between manta rays and cleaner fish species, and as reef manta rays are a protected species in the Maldives, preserving all their habitats is vital for maintaining population connectivity throughout the archipelago. The predictable presence of mantas at this site, particularly during the southwest monsoon, makes it a vital component of regional manta ray conservation efforts.

Critical habitats for vulnerable and endangered species

The protected area's underwater cave systems and reef formations provide crucial habitats for multiple shark species, including resident populations of whitetip reef sharks (*Triaenodon obesus*) and grey reef sharks (*Carcharhinus amblyrhynchos*), both listed as Vulnerable on the IUCN Red List. The periodic presence of hammerhead sharks (Sphyrnidae) also classified as Vulnerable, in deeper waters adds to the area's value as a shark habitat. Additionally, the regular occurrence of other threatened species such as the Endangered Napoleon wrasse (*Cheilinus undulatus*) and the Critically Endangered bow mouth guitarfish (*Rhina ancylostomus*) underscores the site's significant role in protecting globally threatened marine species. The presence of these IUCN Red List species highlights the MPA's importance in contributing to international conservation efforts and protecting critical habitats for endangered marine biodiversity.

Diverse and complex coral reef ecosystems

The coral reef ecosystems within the protected area exhibit remarkable diversity and structural complexity. The reefs feature extensive formations of branching *Acropora* species in shallow zones, massive *Porites* colonies in mid-reef areas, and specialized deep-water coral communities extending to 30 meters depth. This vertical zonation of coral communities creates diverse microhabitats supporting numerous fish species, invertebrates, and other marine organisms. The reef system's structure and health are fundamental to maintaining the area's ecological functions, including feeding grounds, nursery areas, and shelter for various marine species.

The protected area's position within the broader marine ecosystem of South Male' Atoll enhances its ecological value through connectivity with surrounding reef systems. The deep channels and strong current patterns facilitate larval dispersal, nutrient circulation, and species movement, contributing to the resilience and productivity of the marine ecosystem. This ecological connectivity is crucial for maintaining genetic diversity and population stability of marine species across the atoll system.

These ecological values are intrinsically linked to the area's capacity to provide ecosystem services, including supporting fisheries through spillover effects, maintaining water quality, contributing to coastal protection, and sustaining tourism activities through its diverse marine life and healthy reef systems.

3.2. Economic Value:

The economic value of Guraidhoo Kandulhi MPA manifests primarily through its significant contribution to the local tourism economy and the diverse business opportunities it generates for surrounding communities. The protected area has become a cornerstone of marine tourism operations in South Male' Atoll, generating substantial revenue streams through various tourism activities and associated services. Guraidhoo Kandulhi is currently home to 78 registered guesthouses across 3 islands with 25 in Guraidhoo, 10 in Gulhi and 45 in Maafushi. Additionally, 11 resorts are operational near the MPA.

Locally important revenue from tourism activities:

The area's tourism revenue is primarily driven by dive and excursion operations, with multiple established dive centers conducting daily tours during peak seasons. Each dive center typically operates 3-4 boats daily, carrying 20-30 tourists per vessel during the manta season from April to November. This intensive tourism activity generates direct revenue through diving fees, equipment rentals, and guide services. The tour fee for excursions and diving ranges from \$45 to \$55 per person, with a minimum group size of 4 and a maximum of 10. Night fishing packages range from \$40 to \$50 per person, with a minimum group size of 4 and a maximum of 10. Safari vessels, numbering 12 or more during peak seasons, contribute additional revenue through various excursion packages. The consistent presence of charismatic marine species, particularly manta rays, enables operators to charge premium rates for specialized marine encounters, enhancing the economic value of each tour.

Local business opportunities extend well beyond direct tourism operations, creating a multiplier effect throughout the local economy. The protected area's accessibility from Maafushi, Guraidhoo, and Gulhi islands has catalyzed the development of supporting businesses in these communities. Local guesthouses have flourished, particularly in Maafushi, where the proximity to the protected area serves as a key attraction for budget tourists. Related businesses such as restaurants, souvenir shops, and water sports centers have emerged to cater to the growing tourist market. Local transportation services, including speedboat transfers and traditional dhoni vessels, benefit from regular tourist movements to and from the protected area.

The protected area also supports employment opportunities across various skill levels, from dive masters and boat captains to hospitality staff and tour guides. Local dive centers provide training and certification programs, creating pathways for youth employment in the marine tourism sector. The year-round nature of tourism activities, though seasonal in intensity, provides stable income opportunities for local communities, contributing to economic resilience in the region.

3.3. Social Values

The social values of Guraidhoo Kandulhi MPA extend beyond its ecological significance, encompassing crucial recreational, educational, and research benefits that contribute to both local community development and broader scientific understanding.

Essential recreational resource for the local community:

The MPA serves as a vital recreational resource for multiple user groups, primarily supporting nature-based tourism activities. Local communities from Guraidhoo, Maafushi, and Gulhi islands

utilize the area for recreational diving and snorkeling, fostering a connection with their marine heritage. Tourism operators (resorts, liveaboards, diver and excursion centers) conduct regular excursions to observe manta rays and explore underwater caves, providing economic opportunities while promoting environmental appreciation. The site's accessibility and diverse marine features make it particularly valuable for both beginner and experienced divers, contributing to its significance as a recreational asset in South Male' Atoll.

Enhancement of local and national knowledge of the marine environment

Guraidhoo Kandulhi functions as a natural laboratory for marine environmental education, offering unique opportunities for experiential learning. Local dive centers utilize the area for environmental awareness programs, conducting briefings about marine life behavior and conservation needs. The presence of easily observable marine megafauna, particularly manta rays, provides exceptional opportunities for public education about marine conservation. The site demonstrates clear examples of ecological relationships, such as cleaning stations and reef interactions, making complex marine ecology concepts tangible for visitors. This educational value extends to local schools and communities, fostering environmental stewardship among younger generations.

The MPA holds substantial research value, particularly for understanding manta ray behavior, coral reef ecology, and marine tourism management. The regular aggregation of manta rays at cleaning stations provides opportunities for long-term population monitoring and behavioral studies. The reef system offers valuable insights into coral resilience and adaptation, especially in the context of increasing environmental pressures. The area's long history of tourism use makes it an important case study for understanding the impacts and management of marine tourism activities. Research conducted within the protected area will contribute 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 Guraidhoo Kandulhi MPA faces several operational and institutional constraints that affect its effective implementation. The primary constraint is the limited baseline data about marine megafauna populations, particularly regarding manta ray abundance and behavior patterns. This knowledge gap hampers the development of evidence-based management strategies and makes it challenging to measure management effectiveness over time.

Infrastructure limitations present another significant constraint. The absence of permanent mooring buoys forces vessels to anchor in designated areas, potentially impacting marine habitats and creating congestion during peak seasons. Additionally, the lack of established monitoring

stations and surveillance equipment restricts the ability to effectively track visitor activities and ensure compliance with regulations.

Lack of financial sustainability represents a third major constraint. The current absence of a structured fee collection system and limited allocation from government sources restricts the implementation of comprehensive management measures. This financial limitation affects the ability to maintain infrastructure, conduct regular monitoring, and employ adequate enforcement personnel.

4.2. Threats

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

Natural Threats:

Coral Bleaching: Climate change represents the most significant natural threat to the MPA'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.

Change in weather patterns: Seasonal weather patterns, particularly during the southwest monsoon, can create challenging conditions that affect both marine life behavior and tourism operations. Strong currents and rough seas may alter manta ray aggregation patterns and impact their use of cleaning stations. These conditions can also increase sedimentation through natural processes, temporarily affecting water clarity and coral health.

Natural predation and competition within marine ecosystems, while part of normal ecological processes, can stress certain populations, particularly when combined with anthropogenic pressures. This includes crown-of-thorns starfish outbreaks that may affect coral communities and natural predator-prey relationships that influence fish populations targeted by recreational fishing.

Anthropogenic Threats:

Vessel Traffic Impacts: The MPA faces significant challenges from intensive vessel traffic, with speeding vessels emerging as a primary concern based on stakeholder consultations. Regular ferry services operating between Male' and Guraidhoo island frequently traverse the MPA at high speeds, creating immediate risks to marine megafauna, particularly during their surface activities. Tourist vessels, eager to maximize their time at dive sites, often maintain high speeds while moving between locations, especially after receiving reports of manta ray sightings. Additionally, vessels using the channel as a transit route contribute to the overall traffic volume, often maintaining speeds unsuitable for a protected area with significant marine life.

The wake generated by these high-speed vessels creates a secondary impact on the marine ecosystem. At manta ray cleaning stations, which typically occur at depths of 3.7-4.6 meters, vessel wake can generate underwater turbulence that disrupts the delicate interaction between manta rays and cleaner fish. Local dive operators have observed instances where manta rays

abandon cleaning stations following disturbance from passing vessels, potentially affecting their health and behavior patterns. This disruption is particularly problematic during peak manta season from April to November, when consistent access to cleaning stations is crucial for the species.

The increasing vessel traffic also generates significant underwater noise pollution, introducing a new dimension of disturbance to the marine environment. Engine noise and propeller cavitation create acoustic disturbance that can interfere with marine life communication and natural behavior patterns. This is particularly concerning for species such as dolphin that rely on acoustic cues for navigation, feeding, or social interaction. The cumulative effect of multiple vessels operating simultaneously amplifies this impact, potentially creating zones of constant acoustic disturbance within the protected area.

Disturbance to marine species from tourism activities: The convergence of tourism activities within the protected area creates multiple pressure points on the marine ecosystem. During peak seasons, the simultaneous presence of up to twelve safari vessels in relatively confined areas leads to significant site congestion. This overcrowding is particularly pronounced at popular dive sites and manta ray observation areas, where multiple vessels compete for limited mooring or anchoring space. The concentration of activities in these areas can lead 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 have reported numerous instances of tourists attempting to chase or touch manta rays, particularly during snorkeling activities. These behaviors not only stress the animals but can also disrupt their natural feeding and cleaning patterns. 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 the reef ecosystem. In the absence of a comprehensive mooring buoy system, vessels often resort to anchoring, particularly during peak times. Even when attempting to anchor in sandy areas, anchors can drag across reef structures, causing physical damage to coral formations. This impact is particularly concerning around popular dive sites and cleaning stations, where repeated anchoring activities can lead to cumulative damage to the very features that make the area attractive for tourism.

Underwater Noise Pollution: Underwater noise pollution has emerged as a significant threat within Guraidhoo Kandulhi MPA. The primary sources include engine noise and propeller cavitation from the high volume of vessel traffic - combining daily ferry services, up to 12 safari vessels during peak season, and multiple daily tourism boats. This constant vessel movement creates a near-continuous acoustic disturbance throughout the MPA, with particular intensity during peak tourism hours. The vessel noise can mask the natural sounds marine life use for critical behaviors such as navigation, feeding, and communication. Of particular concern is the potential disruption to manta ray behavior at cleaning stations, where excessive noise may interfere with their ability to detect and respond to environmental cues necessary for these vital cleaning interactions. The consistent nature of vessel traffic makes this noise disturbance almost certain to occur daily, with major consequences for marine life behavior and ecosystem functioning.

Sedimentation from adjacent coastal development: Coastal development activities in the vicinity of the MPA present a complex threat to marine ecosystem health. The recent reclamation of Guraidhoo island and beach replenishment projects undertaken by nearby resorts have been identified as a significant source of sedimentation, affecting water quality and potentially smothering coral communities. These infrastructure developments, while occurring outside the protected area boundaries, impacts the health of MPA significantly.

Further, the coastal developmental activities add to the pollution through sedimentation. Furthermore, coastal development activities, such as land reclamation and beach replenishment projects, contribute to environmental degradation by increasing sedimentation and runoff. These activities can result in the smothering of coral reefs, reduced water clarity, and disrupted marine habitats, further exacerbating pollution levels in the MPA. The influx of sediments can lead to harmful effects on marine life, particularly filter-feeding organisms and coral species that rely on clear water for photosynthesis and healthy growth. The cumulative impact of coastal development, along with the associated pollution, poses a significant threat to the long-term ecological health and biodiversity of the protected area.

Marine litter and Chemical Pollution: Environmental degradation through pollution and resource exploitation poses ongoing threats to the MPA's integrity. Marine debris from vessels and nearby islands contributes to declining water quality and poses risks to marine life through entanglement or ingestion. The increasing vessel traffic brings associated risks of chemical pollution from boat operations, particularly during peak tourism seasons. A significant concern is the direct discharge of untreated sewage from Guraidhoo Island into the sea. With Guraidhoo's growing population and increasing tourism development, the volume of raw sewage discharge has increased, potentially affecting water quality within the MPA, particularly during certain tidal conditions.

Limited Selective Overfishing: While general fishing pressure within the MPA remains significantly low, there exists a potential threat of selective overfishing targeting certain high-value reef species for commercial markets. This targeted reef fishery primarily focuses on groupers (Serranidae), snappers (Lutjanidae), and emperors (Lethrinidae), which are sought after for resort supply chains and export markets. However, the threat remains relatively contained due to the small scale of local fishing operations, with only 1-2 dhoni vessels from Guraidhoo community regularly fishing adjacent areas. The limited number of vessels, combined with the predominantly traditional fishing methods employed, has prevented widespread overfishing impacts across the ecosystem. Nevertheless, monitoring of these specific high-value species remains important, as their ecological roles as predators in the reef ecosystem can have disproportionate effects on overall reef health and resilience if their populations decline significantly.

4.3. Threat prioritization matrix

The threat prioritization for Guraidhoo Kandulhi 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 (*Figure 4*). 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	- 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	- 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	- 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	- 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	- 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		
			• Coastal Development impacts. •	• Coral Bleaching	Catastrophic	

		Noise Pollution	- Vessel traffic impact. - Inappropriate visitor behavior. - Ocean Acidification	- Marine litter and Pollution - Anchoring - Speeding - Tourism Pressure	Major	
		- Change in weather patterns - Selective Overfishing			Moderate	
					Minor	
					Insignificant	

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

Figure 4:Threat Prioritization Matrix

Coral bleaching represents the most critical threat to Guraidhoo Kandulhi MPA (Figure 4). Historical data from the Maldives shows major bleaching events occurred in 1998, 2010, and 2016, with the 2016 event causing widespread coral mortality across many reefs. Within the MPA, the shallow reef areas, particularly those supporting cleaning stations at 3.7-4.6m depth, are most vulnerable to bleaching due to elevated sea temperatures and increased UV exposure. The branching *Acropora* communities that dominate these areas are especially susceptible to thermal stress, making them highly vulnerable to future bleaching events.

Vessel Traffic Impacts represent one of the most significant and frequent threats to the MPA. This threat occurs daily through regular ferry services between Male'- Guraidhoo, combined with up to 12 safari vessels during peak season and multiple daily tourism boats. The severity is particularly evident at manta ray cleaning stations, where documented cases show manta rays abandoning cleaning activities due to vessel disturbance. The impact is especially concerning at cleaning stations located at 3.7-4.6m depth, where vessel wake creates underwater turbulence that disrupts the delicate interaction between manta rays and cleaner fish. The continuous nature and widespread extent of this threat make it almost certain to occur, with major consequences for the MPA's key values.

Tourism Pressure manifests through intense site use, particularly during peak seasons when up to 12 safari vessels operate simultaneously within the MPA. Each local operator runs 3-4 boats

daily, carrying 20-30 tourists per vessel, leading to significant site congestion. This pressure affects the entire MPA but is particularly concentrated at cleaning stations and popular dive sites. The high frequency and intensity of tourism activities make this threat almost certain to occur, with major consequences including increased underwater traffic and documented disturbance to marine life.

Physical Damage to Marine Habitats primarily occurs through anchoring activities in the absence of a proper mooring system. Regular anchoring, particularly around popular dive sites and cleaning stations, has led to documented coral damage. The cumulative nature of this impact is especially concerning as it affects reef structures that support critical manta ray habitat. This threat is likely to continue occurring with major consequences until proper mooring infrastructure is installed.

Sedimentation from Coastal Development has become an increasing concern, particularly following recent reclamation of Guraidhoo island and beach replenishment projects. The impact extends beyond the immediate construction areas, affecting water quality and coral communities across the MPA. The severity of this threat lies in its potential to smother coral communities and reduce water clarity, which is crucial for cleaner fish activity at manta ray stations. The likelihood of this threat is considered likely with major consequences as coastal development continues in the region.

Marine Litter and Pollution presents a persistent threat throughout the MPA, with regular occurrence of debris from vessels and nearby islands. This widespread threat poses risks to marine life through entanglement or ingestion and contributes to overall habitat degradation. The ubiquitous nature of this threat makes it almost certain to occur, with major consequences for both ecosystem health and the aesthetic value of the MPA.

4.4. Opportunities

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

Local Support: Strong support from local councils, particularly the Guraidhoo Council, provides a solid foundation for effective local management implementation. During stakeholder consultations, the Guraidhoo Council has offered to provide a vessel to support monitoring activities, representing a potential cost-effective solution to surveillance needs. This commitment from the council demonstrates their willingness to actively participate in the MPA's management. Furthermore, Maafushi (tourism operators and Council), the closest and most frequent resource user of the area, has shown strong support for the management of the MPA. Gulhi Council and the community has expressed their willingness to collaborate in conservation efforts, contributing to the broader goals of sustainable resource use and protection. Additionally, the involvement of local dive centers in monitoring activities presents opportunities for community-based conservation initiatives

Close Proximity of MPA to Guraidhoo: The close proximity of the MPA to Guraidhoo presents a valuable opportunity for effective management and community engagement. Being located just adjacent to the island, the MPA allows the Guraidhoo Council and local community to play an active and hands-on role in its day-to-day management. This geographical advantage facilitates

quicker response times for monitoring, enforcement, and addressing any arising issues within the protected area.

Additionally, the proximity fosters a sense of stewardship among the Guraidhoo community, as they directly benefit from the ecological health of the MPA through improved fisheries, coastal protection, and the potential for eco-tourism ventures. It also reduces logistical challenges, such as transportation costs for surveillance or stakeholder activities, making the implementation of management actions more cost-effective and sustainable.

Established Tourism Market: The South Malé Atoll hosts a thriving tourism industry and well-established tourism markets, making it a prime location for implementing sustainable financing mechanisms. One significant opportunity lies in the willingness of operators to contribute through entrance fees, which could serve as a consistent revenue source for the management of the MPA. During stakeholder consultations, some operators proposed a fee structure of \$5 per visitor (Appendix G), a model that could generate substantial revenue to support key management activities, such as monitoring, enforcement, and habitat restoration.

Additionally, tourism stakeholders including tour operators, dive schools, resorts, and safari vessels have proposed alternative approaches to the fee system, suggesting they could make seasonal or annual operator contributions rather than collecting per-visitor fees. These models, if carefully designed in consultation with stakeholders, could ensure that the financial contributions align with the economic realities of the operators while fostering a shared responsibility for the conservation and sustainable use of the MPA. The diversity of these proposals underscores the strong interest from the tourism sector in actively supporting the long-term management of the protected area.

Technology: Technological advancement offers opportunities for improved monitoring and enforcement. The potential implementation of digital monitoring systems and drone surveillance could enhance management effectiveness while reducing operational costs.

5. Governance

5.1. Management structure:

The MPA will be managed under a co-management regime with clearly defined roles and responsibilities. The Governance structure is included in Figure 5. Based on the legal and institutional functions a three-tiered implementation structure is proposed for the management purposed for the management of Guraidhoo Kandulhi MPA.

Tier 1: National level management: Include Ministry of Tourism and Environment and EPA

Tier 2: Implementational Level: Include the MPA management Unit located within the Guraidhoo Council

Tier 3 Supporting Level: Include advisory committee and supporting councils (Gulhi and Maafushi)

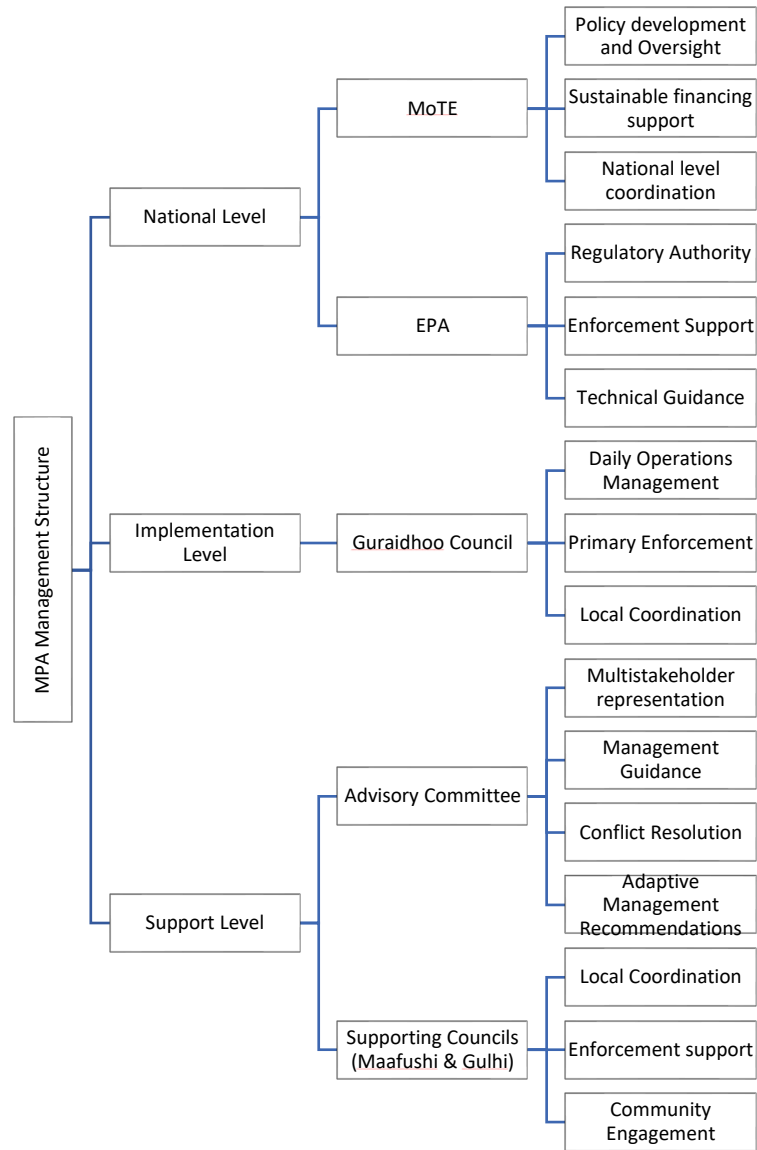


Figure 5: Overall management structure for Guraidhoo Kandulhi MP

National Level Management

The primary management authority for Guraidhoo Kandulhi 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) (*Figure 6*). 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 MoTE also facilitates coordination among various national stakeholders, ensuring alignment between the MPA'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.

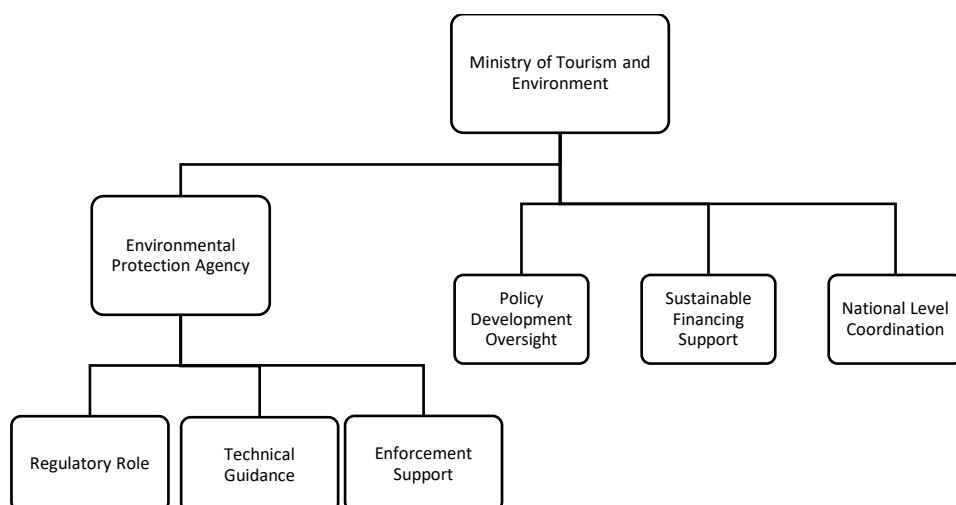


Figure 6: National Level Functions

Local Level Management

The implementation structure for Guraidhoo Kandulhi MPA operates through a clearly defined hierarchical system with Guraidhoo Council serving as the primary implementing authority (*Figure 7*). Within the council, a dedicated Protected Area (PA) Management Unit will be established as the central operational body responsible for daily management activities. This unit oversees four key operational functions: visitor management, resource monitoring, enforcement, and facility maintenance. Through these functions, the unit ensures comprehensive oversight of all park activities while maintaining necessary infrastructure and monitoring systems. The unit also serves as the primary coordinator for local stakeholder engagement and operational activities, ensuring smooth communication between various management partners.

Supporting this central authority are two key partner councils - Gulhi Council and Maafushi Council. These supporting councils play vital roles in extending the MPA management reach through three essential functions: local coordination within their respective jurisdictions, enforcement support for park regulations, and community engagement activities. This tripartite council structure ensures comprehensive coverage of the MPA's area while maintaining strong connections with local communities and stakeholders across all three islands. The supporting councils' involvement is particularly crucial for enforcement activities, as they help monitor compliance with park regulations and support the implementation of management measures across the broader geographic area.

The PA Management Advisory Committee forms the third pillar of the implementation structure, bringing together diverse stakeholder perspectives to inform management decisions. The committee's membership encompasses representatives from key stakeholder groups, including Guraidhoo, Gulhi dive centers, tourism businesses, local communities, and environmental experts. This diverse representation ensures that management decisions consider multiple perspectives and interests. The committee serves three primary functions: providing management guidance based on stakeholder expertise, facilitating conflict and dispute resolution among various user groups, and offering recommendations for adaptive management approaches. Through these functions, the committee helps ensure that management strategies remain responsive to changing conditions and stakeholder needs while maintaining focus on the park's conservation objectives.

This three-tiered implementation structure creates an effective framework for managing the MPA through clear lines of authority, collaborative enforcement mechanisms, and inclusive decision-making processes. The system allows for efficient daily operations while maintaining strong community involvement and adaptive management capabilities. By distributing responsibilities across multiple entities while maintaining clear hierarchical relationships, the structure ensures both operational efficiency and broad stakeholder engagement in the MPA management.

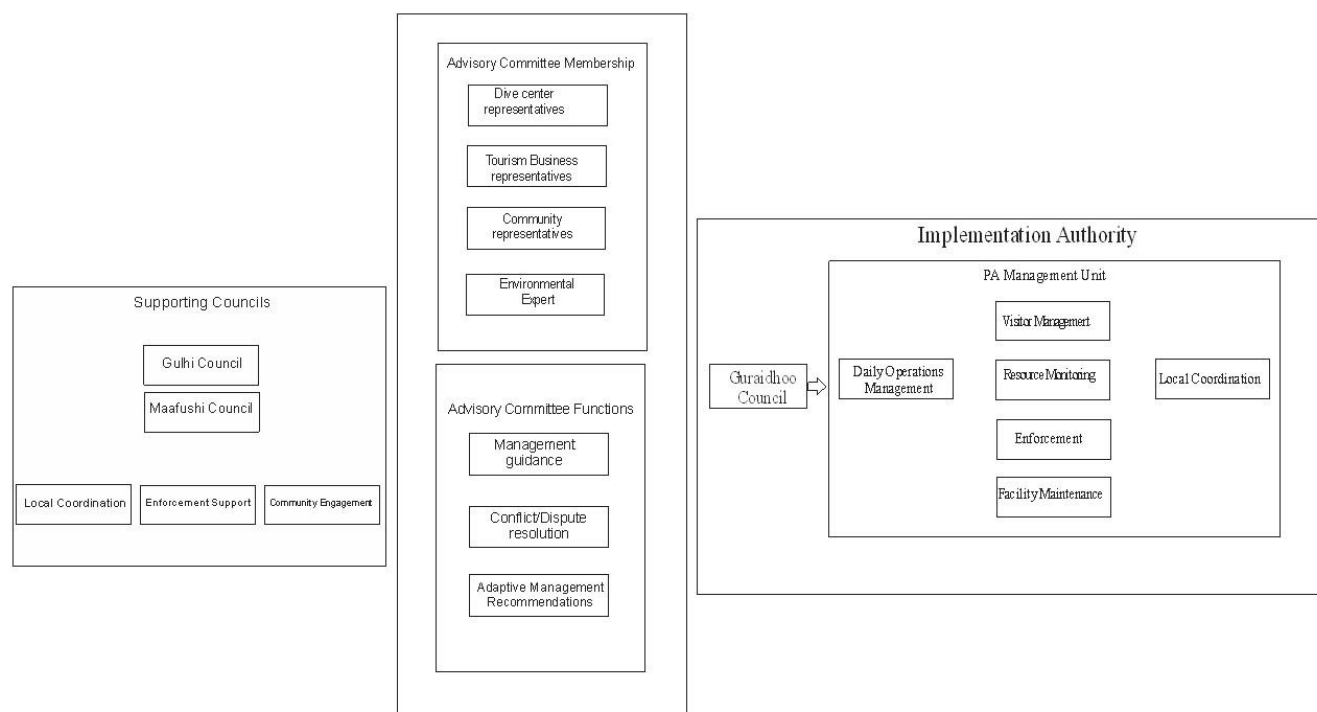


Figure 7: Governance Structure and Functions at local level

Roles and Responsibilities:

The effective management of Guraidhoo Kandulhi MPA requires clear delineation of roles and responsibilities across multiple governance levels, from national authorities to local implementing bodies. The management structure incorporates a systematic distribution of authority and responsibilities, ensuring comprehensive oversight while maintaining operational efficiency. This framework has been carefully designed to address the specific challenges identified through stakeholder consultations, particularly the need for coordinated enforcement, sustainable tourism management, and effective conservation measures. 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 (Figure 8) 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	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.

		6. Provide capacity building and training support. 7. Provide compliance and enforcement support through rangers.
Environmental Protection Agency (EPA)	Regulatory Authority	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 compliance and enforcement support through rangers.
Guraidhoo Council	Lead Implementation Authority	1. Host and support the PA Management Unit 2. Oversee daily operations and management 3. Coordinate with supporting councils 4. Manage local staffing and resources 5. Maintain infrastructure and facilities 6. Handle revenue collection and financial management 7. Report to national authorities 8. Coordinate emergency response
Supporting Councils (Gulhi and Maafushi)	Local Support Authority	1. Provide enforcement support in respective jurisdictions 2. Coordinate with local stakeholders 3. Facilitate community engagement activities 4. Support monitoring and surveillance 5. Assist in emergency response 6. Contribute to management planning 7. Support public awareness programs
PA Management Unit	Operational Authority	1. Implement day-to-day management activities 2. Monitor visitor activities and enforce regulations 3. Maintain mooring buoys and infrastructure 4. Collect usage fees and manage permits 5. Conduct regular patrols and inspections 6. Maintain monitoring databases 7. Prepare regular reports and updates 8. Coordinate with tour operators and dive centers

Advisory Committee	Advisory Authority	1. Provide management recommendations 2. Review management effectiveness 3. Mediate stakeholder conflicts. 4. Advise on adaptive management strategies 5. Review annual work plans and budgets 6. Provide technical input on management issues 7. Represent stakeholder interests 8. Support community outreach efforts
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Figure 8: Authority roles and responsibility

5.2. Key Regulations and Policies

The management of Guraidhoo Kandulhi MPA 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 Guraidhoo Kandulhi will be enacted under the EPA 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.

5.3. Management Guidelines

The management guidelines for Guraidhoo Kandulhi 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.

1. Visitor Management and Fee Guidelines
2. Prohibited and Allowed Activities
3. Photography and Videography Guidelines
4. Non-compliance and Enforcement
5. Vessel Regulation
6. 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.

6. Boundary and Zonation

The Conservation Action Plan proposes a zoning plan for Guraidhoo Kandulhi MPA, 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 9*).

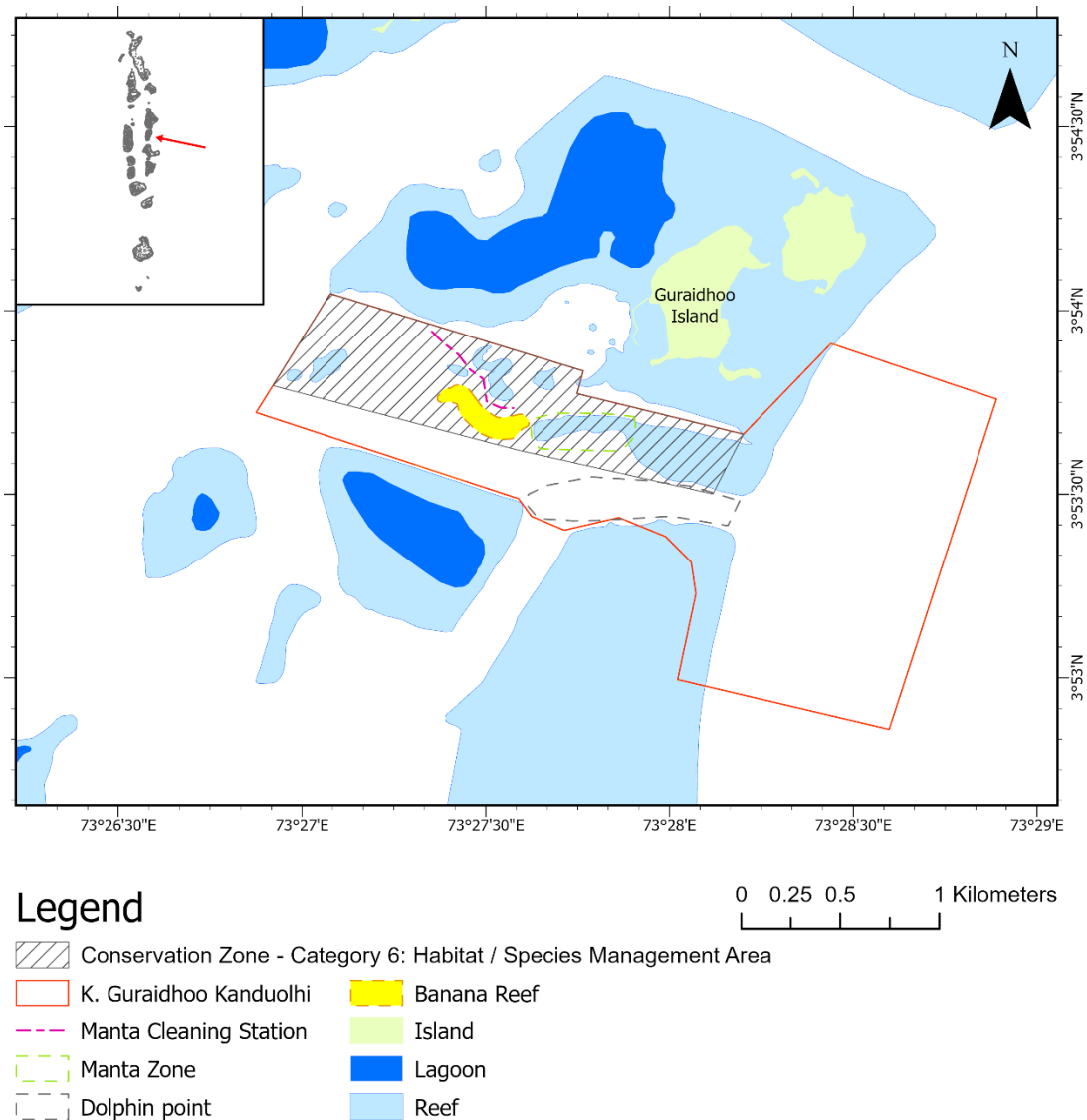


Figure 9: Management Zonation

6.1. Zone Descriptions and Coordinates

1. Conservation Zone/ Category 6: Habitat/Species management area (40% of the MPA)

The Conservation Zone encompasses the primary manta ray cleaning stations and essential marine habitats along the western reef system. The GPS coordinates of the conservation zone is given below:

Point	Longitude (E)	Latitude (N)
1	73.451286	3.900767
2	73.462754	3.897257
3	73.462473	3.896226
4	73.470021	3.894387
5	73.468629	3.891676
6	73.459846	3.89365
7	73.448677	3.896587

Figure 10: GPS Coordinates (Conservation Zone)

This zone extends along the reef edge, covering approximately 40% of the protected area. The zone includes the designated manta ray cleaning station and Banana Reef, which serves as a critical habitat for various marine species. This area requires the highest level of protection due to its ecological significance.

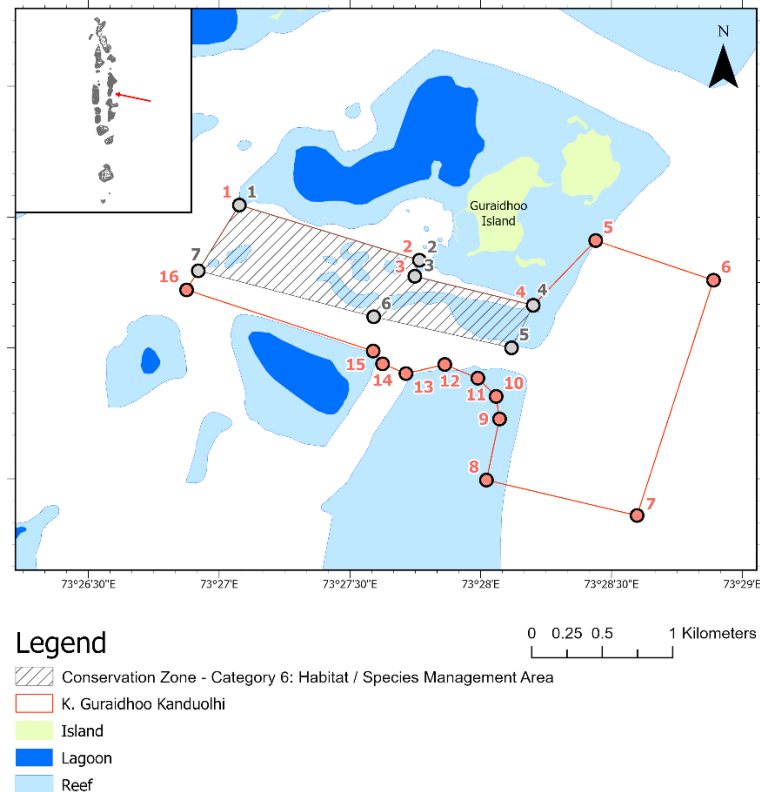


Figure 11: Conservation zone (marked with stripped lines)

Category	Details
Key Features	- Manta ray cleaning stations
	- Key coral reefs (e.g., Banana Reef)
	- Underwater caves and complex reef formations
Permitted Activities	- Scientific Research (with proper permits)
	- Authorized Monitoring Activities
	- Guided Manta Ray Observation (with special permits ¹)
Prohibited Activities	- Anchoring (except in designated areas)
	- Unguided Activities (e.g., unauthorized tours)
	- Vessel Speeds Above 5 Knots
	- Resource Extraction (e.g., fishing, coral collection)
	- Tourism Activities (unregulated)
Access Restrictions	- Only authorized vessels with special permits allowed
	- Maximum of two vessels at cleaning stations at any given time
	- 1.5-hour time limit per visit
	- Advance booking required for operators
	- Daily vessel limit of 10

2. General Use Zone/ Category 6: Habitat/Species management area

This zone includes areas of the MPA with less stringent protection measures, enabling sustainable traditional and recreational uses that align with conservation objectives. It features established dive sites, wildlife viewing areas, and designated zones for sustainable fishing using traditional methods. The zone is strategically positioned to provide access to marine attractions while minimizing impact on sensitive areas.

Category	Details
Key Features	- Less sensitive areas but still important for local livelihoods
	- Migration corridors for marine species
	- Popular dive sites
	- Support for traditional uses like small-scale fishing
Permitted Activities	- Sustainable Fishing (limited to traditional methods)
	- Guided Diving and Snorkeling (with certified guides)
	- Guided Excursions (with operator permits)
	- Tourism (with regulation on visitor numbers and impact)
	- Vessel Transit (through marked navigation channels)
	- Research (focused on ecological impact assessment)
Prohibited Activities	- Overfishing
	- Unsustainable Fishing Practices
	- Anchoring in coral areas
	- Vessel Speed Above 10 Knots
	- Invasive Species Introduction.

¹ Authorized activities in both zones may require permits issued by the EPA and PA Management Unit. Details of permit requirements, application processes, and criteria are provided in:

Appendix G for tourism activities and fees

Appendix H: General Guideline for Permit

Appendix I for photography/videography activities

Appendix J for research activities

Access Restrictions	- Visitor numbers and vessel traffic to be monitored
	- No anchoring in sensitive coral areas
	- Re
	- Sustainable use practices to be strictly enforced

Summary of Permitted Activities by Zone

Activity	Conservation Zone	General Use Zone
Diving	Guided only (with permit)	Regulated
Snorkeling	Guided only (with permit)	Regulated
Wildlife Observation	Guided only (with permit)	Yes
Fishing	Prohibited	Sustainable (with permit)
Anchoring	Prohibited	Not on coral reef (with permit)
Research	Allowed (with permit)	Allowed (with permit)

6.2. Permitted Activities by Zone

Diving Activities

In the Conservation Zone, diving is permitted only with licensed operators who have obtained necessary permits from the PA Management Unit (detailed in Appendix A). All dives must be guided by certified professionals who have completed the PA's environmental awareness training. In the General Use Zone, diving operations are regulated through a code of conduct (Appendix H) that establishes specific requirements including maximum group sizes of 8 divers per guide, minimum experience levels for certain sites, and mandatory pre-dive briefings.

Snorkeling Activities

Snorkeling in the Conservation Zone requires guided tours with permitted operators only. These operators must follow strict protocols outlined in the operational guidelines (Appendix H), including maintaining appropriate group sizes and ensuring proper briefing of participants. In the General Use Zone, snorkeling activities are regulated through the same code of conduct as diving operations, with specific provisions for surface activities and wildlife interaction protocols.

Wildlife Observation

Wildlife observation in the Conservation Zone is strictly controlled through a permit system and must be conducted with authorized guides who have specific training in marine megafauna interaction protocols. The General Use Zone allows wildlife observation activities but operators must still adhere to the protected area's wildlife interaction guidelines detailed in Appendix H, particularly regarding approach distances and observation durations.

Fishing Activities

Fishing is completely prohibited within the Conservation Zone to protect critical habitats and species. In the General Use Zone, sustainable fishing is permitted but requires specific permits from the PA Management Unit. Only traditional hook-and-line methods are allowed, with strict

regulations on gear types and catch limits as detailed in Appendix H. Commercial fishing activities are not permitted in either zone.

Anchoring Regulations

Anchoring is strictly prohibited in the Conservation Zone to protect sensitive marine habitats, particularly coral reefs and cleaning stations. Within the General Use Zone, anchoring is permitted only in designated sandy areas marked by buoys. The mooring and anchoring guidelines (Appendix H) provide detailed maps of these areas and specific protocols for vessel securing procedures to prevent any damage to marine habitats.

Research Activities

Research activities are permitted in both zones but require proper permits obtained through a two-step process: initial approval from the PA Management Unit followed by final authorization from the Environmental Protection Agency. Research protocols, permit application procedures, and reporting requirements are comprehensively detailed in Appendix J. All research activities must align with the protected area's research priorities and contribute to its conservation objectives.

7. Vision

7.1. Long-term Vision:

The vision for Guraidhoo Kandulhi MPA is *"to develop an effectively managed Guraidhoo Kandulhi that ensures the conservation of manta rays and marine biodiversity while promoting sustainable tourism practices and supporting local community benefits through science-based adaptive management."*

7.2. Guiding Principles:

The management of Guraidhoo Kandulhi MPA is guided by four fundamental principles that shape all decisions and actions within the protected area:

The Precautionary Principle forms the foundation of our management approach. In situations where potential threats to marine ecosystems are identified but scientific understanding may be incomplete, management actions will err on the side of conservation. This principle is particularly crucial for protecting manta ray populations and their critical habitats, where the full implications of disturbance may not be immediately apparent.

Ecosystem-Based Management recognizes the interconnected nature of marine systems. Management decisions consider not only individual species but also the complex relationships between different marine organisms, their habitats, and human activities. This holistic approach ensures that protecting manta ray cleaning stations, for example, includes consideration of the reef ecosystem that supports cleaner fish populations.

Adaptive Management enables responsive and flexible protection strategies based on monitoring results and emerging challenges. This principle acknowledges that marine ecosystems are dynamic and that management approaches must evolve based on scientific evidence and stakeholder feedback. Regular assessment of management effectiveness allows for continuous improvement and refinement of conservation strategies.

Community-Centered Conservation recognizes that successful marine protection depends on meaningful engagement with local communities and stakeholders. This principle ensures that management decisions balance conservation objectives with sustainable resource use, particularly concerning tourism operations and traditional fishing practices. It emphasizes the importance of local knowledge and community participation in protected area governance.

Climate Change Aware Management incorporates climate change considerations into all aspects of protected area planning and operations. This principle ensures that management strategies account for current and projected climate impacts on marine ecosystems, particularly coral reefs and species distributions. It guides the development of climate-resilient conservation measures and adaptation strategies to protect the MPA's key values in a changing environment.

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.

Protected Species populations maintained: Beyond manta rays, the area aims to conserve populations of other protected species, including whitetip reef sharks (*Triaenodon obesus*), grey reef sharks (*Carcharhinus amblyrhynchos*), sea turtle and Napoleon wrasse (*Cheilinus undulatus*). This target includes protecting their habitats and minimizing disturbance to their natural behaviors.

Water 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.

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 Guraidhoo Kandulhi MPA have been developed through stakeholder consultation and analysis of current challenges. Each objective includes specific timelines, measurable indicators, and clearly defined outcomes to ensure effective implementation and evaluation of management efforts.

8.1. Governance Objective:

Objective 1: By December 2027, establish a co-managed governance lead by the Guraidhoo 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 Guraidhoo 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 a formalized integrated management framework that transitions from voluntary codes of conduct to enforceable regulations while ensuring local governance and sustainable resource use.

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 2027
- 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 Objective:

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.

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.
- Conduct vulnerability assessments for key species and habitats.
- Organize biannual community-led beach and underwater cleanup campaigns
- 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.

- At least 50% reduction in solid waste collected in MPA.

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 Objective:

Objective 4: By 2030 local communities are gaining socio-economic benefits through a sustainable tourism management system.

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 2030, stakeholders and local communities are actively engaged in marine conservation efforts.

Timeline: Medium Term (By December 2030)

Measures:

- Formation of a MPA Advisory Committee
- 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 2034, understanding of the site's ecological, economic and social values is enhanced to inform 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 Guraidhoo Kandulhi 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. Conservation Strategies/Action Plans

The Guraidhoo Kandulhi MPAs Conservation Action Plan establishes an integrated framework for implementing six core management objectives over 2025-2035. The strategic framework prioritizes essential infrastructure development in 2027, progressing systematically through management systems implementation (2027), marine ecosystem conservation (2029), sustainable tourism management (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 in protected area management.

The implementation framework begins with the establishment of critical infrastructure, including the installation of six GPS-coordinated mooring systems, speed restriction zones with digital monitoring capabilities, and an integrated land-based surveillance station. This foundation supports subsequent management strategies, particularly marine ecosystem conservation measures focused on manta ray populations and coral reef systems, where success is measured through standardized ecological assessment methodologies and quantitative performance metrics. Tourism management strategies incorporate carrying capacity controls and digital monitoring systems, targeting an 85% visitor satisfaction rate while maintaining ecological integrity.

The action plan employs evidence-based implementation protocols, integrating real-time monitoring systems, standardized data collection methodologies, and adaptive management mechanisms. Success indicators are defined through measurable parameters, including infrastructure functionality metrics (>95% operational uptime), management effectiveness indicators (80% protocol compliance), and ecological monitoring parameters (statistically significant improvement in key species abundance). This technical approach enables systematic evaluation of management effectiveness and facilitates adaptive responses based on quantitative assessment of implementation outcomes.

9.1. 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 Guraidhoo Island Council, with essential infrastructure and protocols for protected area management.t.	Formation of a Protected Area Management Unit within Guraidhoo Island Council																																											Official establishment of the unit, documented operational guidelines and assigned staff roles	MoTE (Lead), Guraidhoo 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																																									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				

10. Compliance and Enforcement

The effective management of Guraidhoo Kandulhi 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 D.

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) (*Figure 11*). This conservation action plan proposes vessel speed restrictions of 5 knots within designated zones, a maximum daily capacity of ten vessels, and standardized 1.5-hour time limits for site visits. These regulations extend to specific activities within the MPA:

Vessel Operations: All vessels must register with the PA Management Unit and obtain necessary permits before accessing the area. Vessels must use designated mooring buoys or anchoring zones, maintain specified distances from marine life, and comply with speed restrictions in designated zones. Ferry services and regular transport vessels must follow designated transit lanes through the protected area.

Tourism Activities: Tour operators must employ certified guides who have completed the required training programs. All visitor activities must adhere to established guidelines² for marine life interactions, particularly regarding manta ray observations. Operators must conduct standardized briefings before all activities and maintain specific guest-to-guide ratios for in-water activities.

Adaptive Management: Compliance measures remain flexible and proportional to actual site usage, ensuring long-term ecological integrity while supporting responsible tourism and stakeholder participation.

² Authorized activities in both zones may require permits issued by the EPA and PA Management Unit. Details of permit requirements, application processes, and criteria are provided in:

Appendix I for tourism activities and fees
Appendix J: General Guideline for Permit
Appendix K for photography/videography activities
Appendix L for research activities

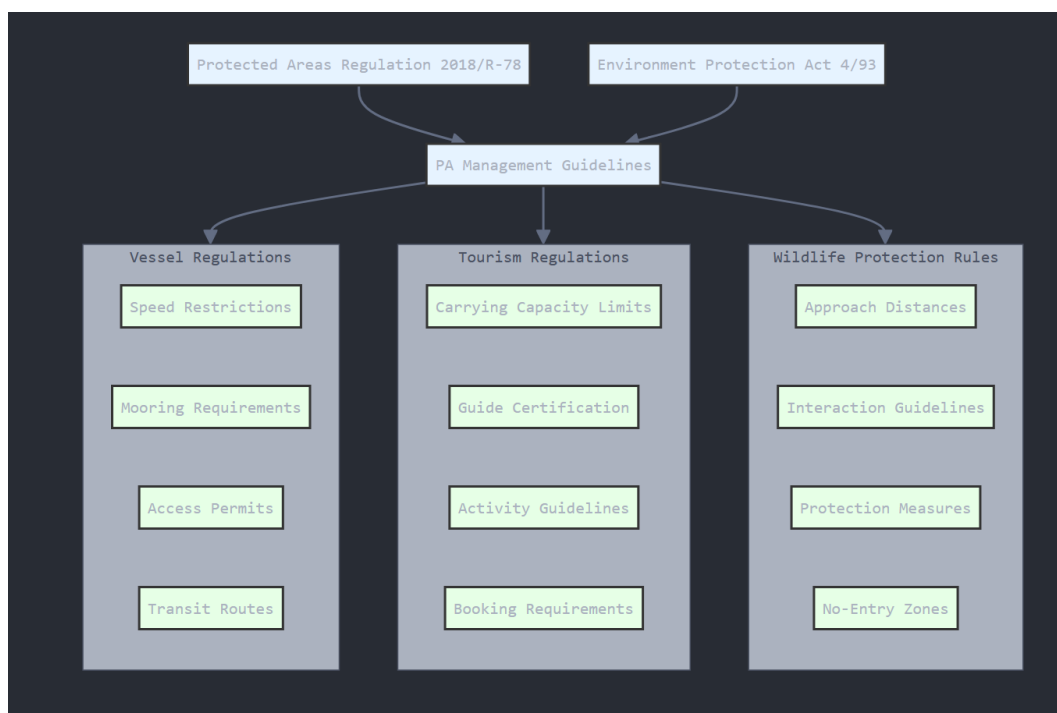


Figure 12: Rules implemented in Guraidhoo Kandulhi MPA

10.2. Enforcement Mechanisms

The regulation on management of Guraidhoo Kandulhi MPA will serve as legal foundation governing all enforcement operations within the MPA. Enforcement follows a multi-tiered approach integrating systematic monitoring, active stakeholder participation, and proportional responses to violations.

The MPA Management Unit established under Guraidhoo Council serves as the primary local enforcement body, with trained local rangers conducting routine compliance monitoring. The national rangers under the Ministry of Tourism and Environment and EPA 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 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 (6 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
- 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 will result in written warnings. 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 Guraidhoo Kandulhi 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 detail monitoring plan is given in table 5.

Ecological Monitoring

The ecological monitoring program for Guraidhoo Kandulhi 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.

Tourism Impact Monitoring

The tourism monitoring program for Guraidhoo Kandulhi 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.

Socio-Economic Monitoring

The socio-economic monitoring program will track broader community impacts and benefits from the MPA. This includes regular assessment of:

- Environmental education effectiveness through knowledge surveys of local schools and community participants
- Stakeholder engagement levels using participation metrics and satisfaction surveys
- Economic benefits to local communities, measuring tourism revenue distribution, employment generation, and local business development
- Cultural values preservation and traditional knowledge integration in MPA management
- Community perception and support for conservation efforts through periodic focus groups and interviews

11.1. 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.

The evaluation process incorporates stakeholder feedback through regular consultations with local councils, tour operators, and community representatives.

11.2. Reporting Requirements

The reporting framework ensures regular communication of monitoring results to relevant authorities and stakeholders. The PA Management Unit maintains responsibility for coordinating all reporting activities.

- **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
 - Revenue and Financial Transparency:
 - Annual report on the use of funds
 - Detailed breakdown of revenue sourcesExpenditure allocation across conservation, management, and community development initiatives
- **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: PA Management Unit Environmental Officer Trained rangers Partners: Marine biologists	Monthly 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: PA Management Unit Monitoring team Partners: Marine biologists Research partners	Quarterly health reports Annual reef assessment

	Environmental Parameters	Water temperature Visibility Sedimentation rates Water quality metrics	Biannual	Data loggers Water sampling Sediment traps Visual assessment	Lead: PA Management Unit Environmental Officer	Weekly data logs Monthly analysis reports
Tourism Impact Monitoring	Visitor Management	Daily vessel numbers Duration of visits Carrying capacity compliance Activity patterns Guide performance	Monthly	Digital tracking system Site inspections Activity logs Guide assessments	Lead: PA Management Unit Rangers Partners: Tour operators	Daily operation logs Monthly compliance reports
	Visitor Experience	Satisfaction ratings Complaint incidents Service quality Value perception	Annually	Visitor surveys Feedback forms Operator interviews Online reviews	Lead: PA Management Unit Partners: Tour operators	Quarterly satisfaction reports Annual tourism assessment
	User Conflicts	Incident reports Resource use conflicts Resolution outcomes Stakeholder feedback	Ongoing	Incident reporting Stakeholder meetings Conflict resolution logs	Lead: PA Management Unit Partners: Local councils	Monthly incident reports Quarterly conflict analysis

Management Effectiveness	Operational Performance	Infrastructure condition Staff performance Protocol compliance Revenue generation Enforcement effectiveness	Annually	Performance reviews Financial audits Compliance checks METT assessments (every 5 years)	PA Management Unit Community liaison Partners: External evaluators	Monthly performance reports Ten-year effectiveness evaluation
	Stakeholder Engagement	Meeting attendance Program participation Community feedback Partnership effectiveness Local benefits	Quarterly	• Meeting records Engagement surveys Partnership reviews	Local councils	Quarterly engagement reports
	Conservation Outcomes	Target achievement Threat reduction Ecosystem improvements Management adaptations	Annually	Impact assessments Target reviews Outcome evaluation Adaptation planning	PA Management Unit Environmental Officer Partners: Advisory Committee Research partners	Annual conservation report Management recommendations

Table 6: Monitoring Plan

12. Appendices

This chapter cover a range of critical areas, including spatial management through boundary and zonation maps, governance frameworks, resource monitoring schedules, compliance mechanisms, and operational guidelines. Additionally, tools for capacity building, visitor management, research, and reporting are included to promote transparency, accountability, and sustainable management practices.

12.1.Appendix A: PA 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.

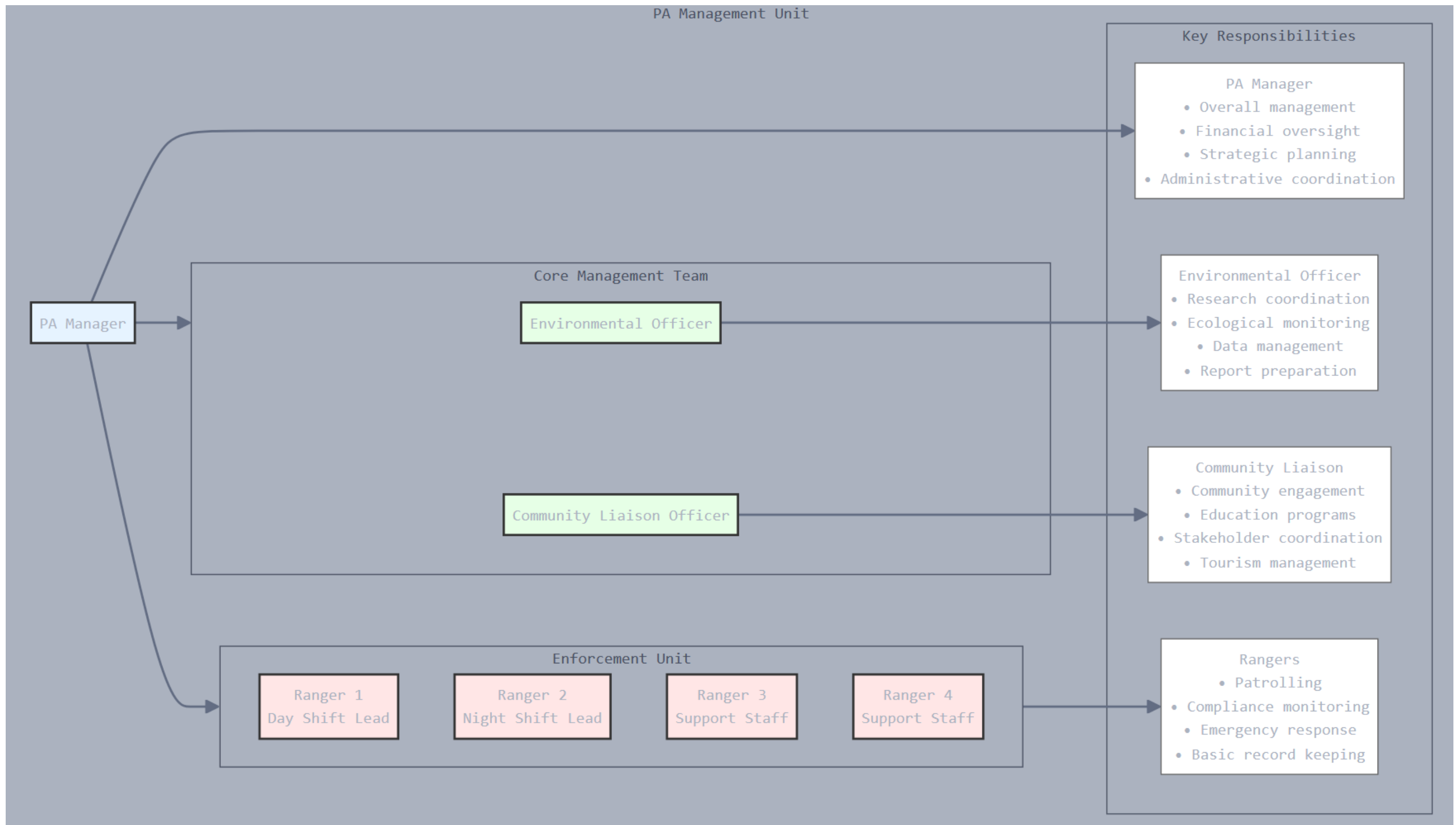
4. Research and Conservation Functions

- 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 Guraidhoo Kandulhi 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.

Position	Core Training Requirements	Specialized Training	Refresher Requirements
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 Radio communication	Vessel operation Patrol techniques Incident reporting Safety and rescue operations	Quarterly refresher on: Emergency procedures First aid Law enforcement Safety protocols

	Use and maintenance of surveillance equipment (e.g., drones)		
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: Guraidhoo Kandulhi 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				
Wildlife Watching				
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				

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 Guraidhoo Kandulhi Management Unit established within the Guraidhoo 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	Immediate	Rangers	Incident log entry
	Digital monitoring			
	Report from stakeholders			
2. Assessment	Evaluate severity	Within 1 hour	Environmental Officer	Assessment form
	Classify violation			
	Determine response			
3. Response	Issue warning	Within 2 hours	PA Management Unit	Action report
	Enforce regulations			
	Contact authorities if needed			

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

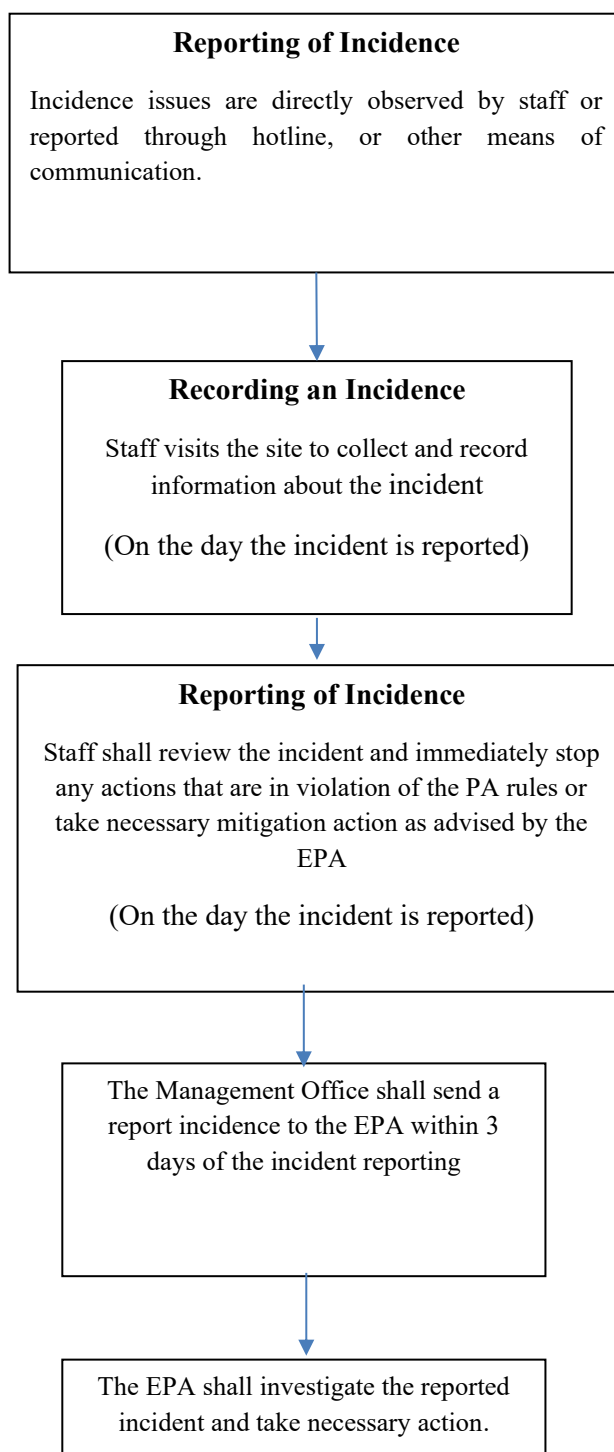
Reporting Requirements

Report Type	Content	Frequency	Distribution
Incident Reports	Date/time Location Violation type Actions taken	Per incident	PA 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 Photo documentation	All seasons	Environmental Officer Research partners	Comprehensive 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
Seawater Analysis	Laboratory testing	All seasons	External laboratory	Water quality 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	✓*	✓*	✓*
	✓*	✓*	

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12.7. Appendix G: Fee Guidelines

The fee structure for Guraidhoo Kandulhi Marine Protected Area has been developed to ensure sustainable financing for effective management while maintaining equitable access for different user groups. This framework provides two primary mechanisms for revenue generation: annual operator contributions for commercial users and a visitor fee system for individual users. The fee structure reflects both the operational costs of protected area management and the necessity to generate sustainable revenue for conservation activities.

The fee guidelines incorporate differentiated rates that recognize various user categories, including commercial operators, international visitors, and local communities. This tiered approach ensures that access fees remain appropriate to different user groups while supporting the protected area's financial sustainability. Special consideration has been given to educational and research activities, with specific provisions to encourage scientific study and environmental education.

Revenue generated through these fee mechanisms directly supports critical management activities including infrastructure maintenance, monitoring programs, and community engagement initiatives. The framework includes clear payment terms, exemptions for specific activities, and transparent revenue allocation to ensure effective implementation and stakeholder understanding.

Option 1: Annual Operator Contributions

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	12,000	Unlimited access within carrying capacity limits Use of mooring buoys Marketing through PA platforms
Local Tour Operators	3,000	Unlimited access within carrying capacity limits Use of visitor facilities Marketing support

Option 2: Monthly Operator Contribution

Operator Type	Annual Fee (USD)	Includes
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Safari Vessels	500	Unlimited access within carrying capacity limits. Use of mooring buoys Marketing through PA platforms
Resort Dive Centers	1,000	Unlimited access within carrying capacity limits Use of mooring buoys Marketing through PA platforms
Local Tour Operators	300	Unlimited access within carrying capacity limits Use of visitor facilities Marketing support

Option 3: Daily Visitor Fees

Operator Type	Annual Fee (USD)
Safari Vessels	7
Resort Dive Centers	5
Local Tour Operators	5
Local Visitors	2

Activity-Specific Fees

Activity	Fee (USD)	Duration
Photography (Commercial)	1000	Per day
Research Activities	100	Per week
Educational Field Trips	Free	Pre-arranged

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.
- Annual reviews of the financial allocation will be conducted to assess spending effectiveness. If a particular sector requires less funding in a given period, funds may be redistributed to areas with pressing needs, ensuring adaptive and transparent financial management.
- To ensure accountability, an Annual Financial Report will be published detailing the allocation and expenditure of protected area revenues. This report will include:
 - A breakdown of funds disbursed to each category
 - A summary of key conservation, infrastructure, and community initiatives supported
 - Any reallocation decisions made during the year and their justifications
 - Future financial projections and priority areas for funding

Annual financial reviews and reallocations will be done under the advisement of Advisory Committee.

12.8. Appendix H General Guideline 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.

12.9. Appendix I: Photography/Videography Guidelines

Commercial Photography/Videography Permits

- Commercial photography and videography activities require a specific permit from the PA 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 PA Management Unit.
- Credit line "Filmed at Guraidhoo Kandulhi Marine Protected Area" required.
- PA 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	• Research proposals must be submitted to the PA Management Unit at least 30 days prior to intended start date • Applications must include: ○ 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	Research teams must: • Submit monthly progress reports • Provide final research report • Share raw data with PA Management Unit • Acknowledge the protected area in publications • Present findings to local stakeholders
Research Priorities	Priority will be given to research focusing on: • Manta ray population dynamics • Coral reef resilience • Climate change impacts • Sustainable tourism practices • Socio-economic impacts • Marine ecosystem connectivity
Operational Guidelines	Researchers must: • Follow all protected area regulations • Use designated mooring buoys • Minimize impact on marine life • Coordinate activities with PA management • Report any incidents or unusual observations • Maintain research logs
Prohibited Activities	• 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: • 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.