Maldives Grouper Fishery Management Plan

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Foreword

Praise be to Allah, the Creator of the oceans, marine life and other blessings upon the earth. Prayers and peace be upon our Prophet, Muhammad, who taught us the righteous way to make use of these blessings.

The oceans, lagoons and reefs are national heritages that are inextricably linked to our culture, tradition, and the Maldivian identity. The Maldives fisheries are heavily dependent on this heritage. Hence it is our utmost responsibility to ensure that they are faithfully passed down to our future generations. The Ministry is committed to working towards achieving this goal, and to implement the government's policies on the expansion of the blue economy agenda. To this end, we have compiled this plan to steer our efforts towards maximising long-term benefits of marine resources to Maldivians.

Since the time of our forefathers, the fishery sector has been a major pillar of our economy, upon which our incomes, our livelihoods and our sustenance are dependent. Therefore, the measures included in these fisheries management plans are geared towards the sustainable development and management of these fisheries resources. These legally recognised fisheries management plans mark a watershed moment in the history of marine resource management in the Maldives.

Fisheries resources are common goods, of which all Maldivians hold a share. These plans have been developed based on principles of the Precautionary Approach, Ecosystem-Based Management, Sustainable Development and Equity, with due regard to the various and variety of interactions within an ecosystem and to ensuring timely and cost-effective measures are taken to safeguard ecosystems and prevent irreparable damage to them. This process has been informed by meaningful suggestions and constructive feedback from various stakeholders including fishers, others engaged directly and indirectly within the fisheries sector as well as civil society organisations working towards natural resource management, conservation, and protection.

The fisheries management plans will be the primary basis for guiding the authorities as well as stakeholders in the sustainable management of the fisheries sector in the Maldives. These plans comprise of developmental goals and objectives for each fishery, measures and actions to achieve them, the roles and responsibilities of stakeholder agencies in the implementation of these measures and an implementation timeline for the measures. It is my sincere hope that these plans contribute towards realising the vision set forth by the Fisheries Act of the Maldives.

Zaha Waheed

Minister of Fisheries, Marine Resources
and Agriculture

Abbreviations

FIS	Fisheries Information System
IGO	Intergovernmental Organisation
IUCN	International Union for Conservation of Nature
LGA	Local Government Authority
MCS	Monitoring,Control and Surveillance
ME	Ministry of Environment
MFDA	Maldives Food and Drug Authority
MIRA	Maldives Inland Revenue Authority
MMRI	Maldives Marine Research Institute
MNDF-CG	Maldives National Defence Force,Coast Guard
MoE	Ministry of Education
MoED	Ministry of Economic Development
MoFMRA	Ministry of Fisheries,Marine Resources and Agriculture
MoT	Ministry of Tourism
MPS	Maldives Police Services
NBS	National Bureau of Statistics
RFBs	Regional Fisheries Bodies
SDFC	SME Development Finance Corporation
SWIOFC	Southwest Indian Ocean Fisheries Commission
UCSB	University of California,Santa Barbara

Chapter 1

Preamble

1.1 Introduction and Title

This Plan is made pursuant to Article 18 of the Act No. 2019/14 (Fisheries Act of the Maldives) and provides for the management of the fishery stated in Section 17 (a) (6) of the Act. The plan will be the primary basis for guiding the authorities as well as stakeholders in the sustainable development of the grouper fishery and trade in the Maldives. This Management Plan shall be cited as "Maldives Grouper Fishery Management Plan".

1.2 Overall Purpose

The overall purpose of the management plan is to:

(a) Manage all activities that may impact grouper stocks and ensure long-term benefits to the people of Maldives through the responsible management of the fishery; and

(b) Guide the authorities and stakeholders in the sustainable development of the grouper fishery and trade in the Maldives.

1.3 Scope and Application

1.3.1 Species and Activities

This Plan shall apply to all species belonging to the subfamily Epinephelinae (family Serranidae, order Perciformes), which are listed in Annex 2 of this plan, as well as all other non-target species which are caught in the grouper fishery.

This Plan shall apply to all activities carried out in the Maldives that may impact the grouper resources, including but not limited to fishing, fishing related activities, aquaculture, processing, trading and exporting of groupers from the Maldives. The Plan also applies to all parties, vessels, processing and export facilities or places engaged in or otherwise connected with any activity within the scope of this Plan.

1.4 Guiding Principles

1.4.1 Precautionary Approach: Timely and cost-effective measures shall be taken to safeguard ecosystems and prevent irreparable damage to them despite the lack of full scientific certainty.

1.4.2 Ecosystem-based management: The various and variety of interactions within an ecosystem, including anthropogenic elements, shall be recognised as opposed to accounting for matters, species, or ecosystem services in isolation.

1.4.3 Universal Responsibility: Local policies governing marine resource management shall be in harmony with global efforts to protect, conserve and manage biodiversity.

1.4.4 Sustainable Development: In developing the fishery, the needs of the present shall be met without compromising the ability of the future generations to benefit from the resource.

1.4.5 Equity: Resources shall be acknowledged as shared common good, and benefits obtained from the utilisation of resources shall be shared in a fair and just manner among all through the application of transparency, legitimacy, accountability and decentralisation.

1.4.6 Participatory Approach: All stakeholders, particularly those who are directly affected by a policy or a measure, shall be engaged in the decision-making process to ensure inclusivity and consensus-oriented outcomes.

1.5 Interpretation

Unless stated otherwise, words or expressions used in this Plan have been given the meanings specified in Annex 1: Glossary.

1.6 Entry into Force

This Plan shall come into force upon its publication in the Government Gazette.

Chapter 2

Biology, Behaviour and Habitat

2.1 Introduction

Groupers are a diverse group of economically significant fish, generally classified as belonging to various genera of the subfamily Epinephelinae (family Serranidae, order Perciformes). Most groupers of commercial groupers are found within the genera Epinephelus and Cephalopholis. There are approximate 160 recorded species of groupers in 16 genera (Zhuang et al. 2013) of which, 41 species are recorded in the Maldives.

2.2 Habitat

Groupers are wide spread and distributed across the globe (Sadovy de Mitcheson et al. 2013), however habitat specifications do vary dependant on species and life cycle stage, amongst other factors. In general, juvenile groupers may typically be found in near shore habitats such as seagrass beds, coral clumps, and other nursery habitats. Mature groupers commonly inhabit the bottom of tropical and subtropical marine habitats and are especially strongly associated with stony environments and coral reefs (Frisch et al. 2016), at depths of 0 to 200 m, occasionally up to 500 m (Shapiro et al. 1993).

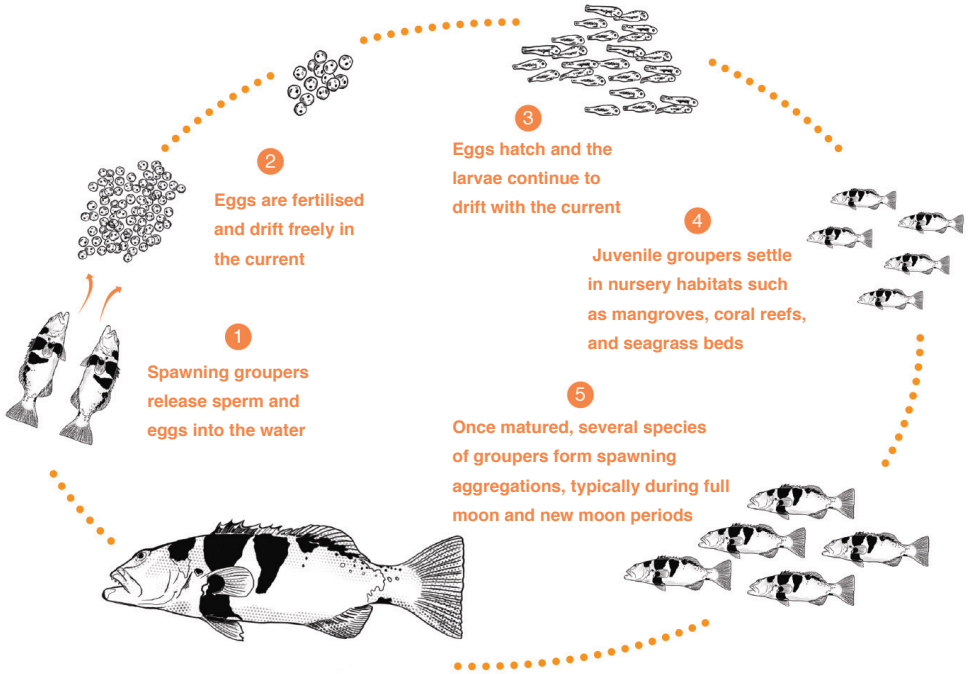
2.3 Reproductive Biology and Key Behavioural and Physiological Traits

Groupers exhibit a diverse array of reproductive systems and behaviours, however many share common traits. While some grouper species are gonochoristic, most groupers are monandric protogynous hermaphrodites, that is, they mature as females and have the ability to transform into males, before or after sexual maturity and dependant on sex ratio at spawning aggregations, amongst other factors (Shapiro et al. 1993; Frisch et al. 2016).

The majority of groupers are K-selected species that are long lived and slow growing and reach sexual maturity comparatively late, however, species belonging to the genus Plectropomus are noted to be relatively faster growing, with shorter lifespans and higher natural mortality, compared to most other grouper species. Their size ranges and size at maturity are subject to both interspecific and intraspecific variations (Morris et al. 2000; Frisch et al. 2016).

While they do not exhibit schooling behaviour, and some groupers are non-aggregating, the majority of groupers form spawning aggregations of varying sizes depending on the species, with some species exhibiting high aggregation site fidelity (Robinson et al. 2008; Hamilton et al. 2012). These aggregations are strongly connected to the lunar cycle and typically occur during new or full moon periods (Domeier and Colin 1997; Hamilton et al. 2012; Frisch et al. 2016). This spawning activity may last from a few days to a week and at times may be spread over several (Coleman et al. 1999; Sadovy de Mitcheson and Colin 2012).

During these mating events, female groupers release eggs which are fertilised by the sperm released by male groupers. Once fertilised eggs hatch, they form larvae which float along with the currents, before becoming juveniles that inhabit shallow habitats. Mature groupers move to deeper waters and corals reefs. Most of these naturally rare species typically spend the majority of their adult lives solitarily (Craig et al. 1993; Heemstra et al. 2002).



- **Figure 1:** Life Cycle of a Grouper

2.4 Ecological Niche and Significance

Groupers form a variety of associations and relationships with other species, filling an important ecological niche where they occur. These include feeding associations, transferring of energy along the food chain and symbiotic relationships. For example, groupers are sometimes known to form interspecific feeding associations with eels and octopuses to hunt their prey (Bshary et al. 2006). Grouper species are also associated with a number of parasites; these include isopods, larval tapeworms, nematodes, trematodes, and cestodes. Consequently, some groupers frequently visit wrasse cleaning stations to help clear parasites (Frisch et al. 2016).

While groupers are top predators in coral reef ecosystems, the majority of species are not fast or long-distance swimmers, but rather ambush predators, that use their powerful jaws and gills to create suction and draw prey into their mouths (Craig et al. 1993). They do not have teeth but the teeth plates located in the pharynx are used to mash the prey. Mature groupers' diets are composed of fish and invertebrates, including large crustaceans and cephalopods. Juvenile groupers feed on crustaceans such as crab and shrimp (Jory and Iverson 1989; Dierking et al. 2009; Frisch et al. 2016).

Groupers themselves have few natural predators, including some sharks, barracudas and eels (Jory and Iverson 1989). Some predators, in particular megafauna, are also known to specifically target spawning aggregations (Harley et al. 2001; Sadovy de Mitcheson and Colin 2012).

Groupers are important species that play critical roles in ensuring the health and resilience of ecosystems. The extirpation of grouper species and grouper spawning aggregations from an area could not only impact species which are directly linked to groupers across the food web, but can lead to cascading effects throughout the wider ecosystem (Sadovy de Mitcheson and Domeier 2005). Aggregation fishing has been a known and documented cause of stock decline in other parts of the world. For example, aggregation fishing, in particular targeting aggregations of camouflage grouper and squaretail grouper, in Palau resulted in rapid depletion of the stocks and consequently, exporting them became unviable (Sadovy de Mitcheson et al. 2013)

Alongside aggregation fishing, the various behavioural and biological idiosyncrasies of epinephelines make them both easy targets for fishers and highly susceptible to overfishing (Sadovy de Mitcheson et al. 2013; Bejarano Chavarro et al. 2014). Research indicates 13% of all grouper species are threatened, as per the IUCN Red List criteria (Sadovy de Mitcheson et al. 2020). In the face of unprecedented climate change and it's adverse effects, from ocean warming to coral bleaching to regime shifts compounded by large scale environmental change (IPCC 2019; Rogers et al. 2020), it has become imperative that measures are taken to reduce overexploitation and ensure the health of both grouper populations and their ecosystems.

Chapter 3

Overview of the Fishery

3.1 Grouper Species Commonly Landed in the Maldives

Annex 2 of this plan contains a non-exhaustive list of grouper species commonly landed in the commercial grouper fishery in the Maldives, identified through various data sources, including catch sampling by MMRI from 2018-2020. The data indicates that the top 10 most commonly landed species account for over 90% of all landings, with *Cephalopholis argus* (22%), Aethaloperca rogaa (20%), *Anyperodon leucogrammicus* (10%) and *Variola louti* (9%) being the most commonly landed species. Despite the preference of fishers for species of high value, the catch proportion has varied over the years, suggesting an underlying change in abundance (Marine Research Centre 2011). While not commonly landed, it has also been noted recently that several deep-water species have been recorded in the recreational fishery, which uses jigging to target deeper water species.

3.2 Fishery

3.2.1 Development of the fishery and trade

A targeted grouper fishery did not exist in the Maldives prior to the inception of the export-based grouper fishery in the early 1990s. Before that, groupers that were locally consumed were mostly caught within the general reef fishery. However, the fishery has since rapidly expanded due to the demand

from East and Southeast Asian markets. The grouper fishery in the Maldives at the present, is a specialised fishery which mostly caters to the export industry. High demand and market prices led to an increasing interest in the fishery, and fishing for these high valued species was extended to all areas of Maldives, with exporters establishing their collection points in different atolls.

Due to a number of challenges in exporting groupers via air freight during the early years of the grouper trade, the largest grouper exporting company at the time worked together with a foreign importing company to make grouper export feasible. They utilised live fish carriers to buy catch from key grouper fishing islands and export the fish directly via sea. Live groupers were exported in this manner from 2002 to 2009. During this time, on average, 4 shipments were exported per year, with brown marbled grouper and squaretail coral grouper being exported in the highest numbers.

With the developments in air freight technology, as live grouper exports via air freight increased, the use of live fish carriers for grouper export ceased. Subsequently, fish purchasing from Maldivian exporting companies also increased. Exporter-owned collector vessels now make rounds to collect the catch from fishermen, typically twice a week. Exporters have also established cages where fishers can sell their catch, in a few areas. Some fishers who operate from smaller vessels or dinghies, many of whom do not actively engage in the grouper fishery as their sole income generating activity, have their own smaller cages to hold their catch until collector vessels arrive. Fishermen also supply fish directly to resorts and tourism markets. Data on the resort and local market driven grouper fishery and trade is less well documented compared to the export-oriented fishery and trade.

3.2.2 Fishing method

The grouper fishing method has undergone significant evolution over the years. While in the early years, fishers stayed on board and used weighted handlines to target groupers, fishers now use snorkelling equipment and

enter the water to catch groupers using Visually Aided Handlines. When the snorkelling fishers, who are typically spread out across the stretch of any given reef, spot a grouper, a baited line is sunk to attract it, and the harvested groupers are collected in floating baskets tethered to the fisher. A recently trending method, similar to a flying gaff, is also being used in the grouper fishery, to target large aggregating groupers such as *Epinephelus fuscoguttatus* and *Plectropomus areolatus*. The gear is mostly used at the aggregation sites at night during the aggregation periods. Groupers are spotted by free diving and using flashlights. Once spotted, fishers hook the grouper using the gaff and slowly ascends with it. Aggregation fishing has become a common practice over time (Marine Research Centre 2011).

Grouper fishing was previously restricted to the atolls in which fishers lived, however with the expansion of the fishery and the mechanization and development of the fleet, inter-atoll fishing and longer fishing trips have become the norm for full time grouper fishers. This also allows fishers better access to productive fishing grounds.

3.2.3 Socio-economic aspects

Information received from the island councils showed that in 2018, a total of 146 vessels and 730 fishers were engaged in grouper fishing. The data also showed that grouper fishers were distributed across 31 islands, in 13 atolls. However, according to data received from the local councils and information collected via sampling trips made by MMRI, the majority of the stakeholders were from 6 islands; F.Bilehdhoo, F.Feeali, F.Nilandhoo, R.Dhuvaafaru, M.Dhiggaru and B.Fulhadhoo.

A quick assessment of the socio-economic status of the grouper fishery and trade reveals a number of issues that require coordinated effort from all stakeholders, in order to ensure the sustainable development of this sub-sector. Once critical issue is conflicts that arise from the usage of reef resources by multiple stakeholder groups. Conflicts between the tourism sector and the reef associated fisheries sectors is notable in this regard and

require effective and permanent solutions. The boundary areas of tourist resorts being uncertain and the limits of such boundaries differing from case to case has been a cause for confusion. There is much work being done in this regard to make this information readily available to fishers through maps and other means. Additionally, as the tourism sector continued to expand, several islands and lagoons have been taken or set aside for tourism activities, resulting in the substantial loss of important historical fishing grounds.

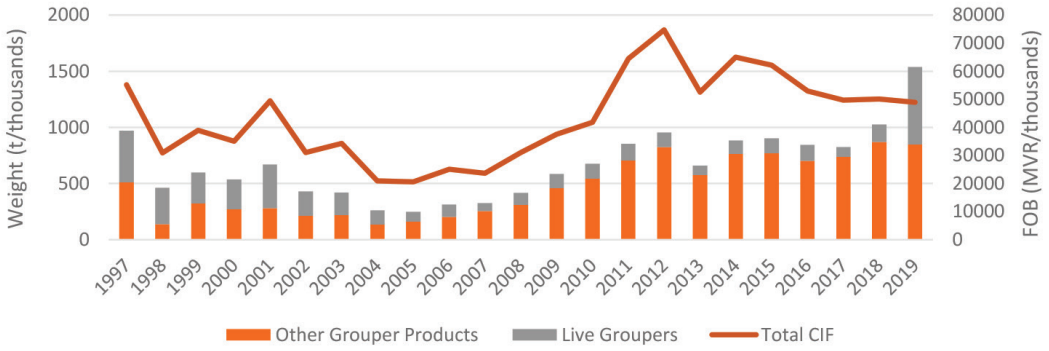
Fishers have also noted unsustainable development projects and natural disasters as prime reasons for habitat loss, resulting in decreased number of viable fishing grounds. In particular, fishers have noted mass coral bleaching events as a critical factor, with a multitude of adverse impacts on the fishery. Fishers have also raised concerns with regards to the declaration of Marine Protected Areas (MPAs). While the benefits garnered from the establishment of cohesive MPA networks, including the spill over effect, has been well document and widely accepted across the world (Tupper 2007; Goñi et al. 2008) fishers have noted the importance of a thorough and inclusive consultation processes prior to the declaration of such MPAs.

3.3 Export

Over the course of the past 5 years, as identified through data available from Maldives Customs Service, there have been a total of 12 grouper exporters, with 7 main export companies accounting for majority of the exports. The main exporting companies have cage systems established in 8 areas across the Maldives, with most of them concentrated around the Malé area. These cages cover approximately 10,000 square feet in total. The total revenue generated (FOB) from these grouper export operations has fluctuated across the years.

Groupers are most commonly exported as fresh, chilled or live fish. However, there have been a few recorded exports of salted and dried groupers, as well. The main market for fresh and chilled groupers has been East-Asia, with Taiwan, Thailand and Hong Kong being the most prominenet importers. Contrastingly, 97% of all live grouper exports are exported to Hong Kong.

Export quantity averaged 869t from 2011 to 2018, with the percentage of live exports fluctuating between 10-17%. While the trend from 2003 onwards shows a consistent increase in export of fresh and chilled grouper, the exports in 2019 show a remarkable deviation from this trend, with total exports being 1538t and live exports accounting for 44% of the total exports.



- **Graph 1:** Grouper exports from Maldives, 1997-2019

Export based data is officially maintained solely by the MCS*, documenting quantities and values declared at the time of export. This data is received by the Maldives Customs Service at the time of export and is shared with the Ministry digitally. In addition, proforma data, which is for the most part segregated by species and weight, is also maintained at the Ministry. As discussed previously, export data indicates a decline in higher value live exports (Marine Research Centre 2011), with other grouper products, which mostly consists of fresh and chilled groupers, taking prominence. It is hypothesized that this pattern indicates a decline in catches higher value species.

Chapter 4

Previous Management Measures

4.1 The First Grouper Fishery Management Plan

Documentation of efforts to sustainably manage the grouper fishery in the Maldives through research and generating awareness amongst stakeholders can be dated back to as far as the 1990s. One notable publication produced through this work was the "Review of Grouper Fishery of the Maldives with Additional Notes on the Faafu Atoll Fishery", published in 2005 (Adam and Sattar 2005). The review proposed potential management measures to better govern the grouper fishery in Faafu Atoll, including the establishment of two MPAs within the atoll and measures to sustainably manage the natural resources of Faafu Atoll, as a whole.

The efforts to manage the grouper fishery culminated in the development of a grouper management plan in 2011, which established agreed steps to ensure that the fishery is biologically sustainable and that people who depend on the grouper fishery for their livelihood continue to benefit from the resource. The management plan, which was based on findings from substantial research carried out across the years, covered a variety of issues surrounding the grouper fishery and recommended a set of theoretical size limits for 24 species, through the application of the Precautionary Approach. It also proposed the closure of five grouper aggregation sites, the first of their kind in the history

of fisheries management in the Maldives. While the management plan was developed after extensive consultation and research, it did not have any legal standing and thus, Regulation No. 2013/R-41 (Regulation on Grouper Fishing and Exporting Groupers from the Maldives) was developed to enforce the measures recommended within the management plan.

4.2 Regulation on Grouper Fishing and Exporting Groupers from the Maldives

Measures under the Regulation No. 2013/R-41 (Regulation on Grouper Fishing and Exporting Groupers from the Maldives) included requiring grouper fishing vessels that trade with exporters to acquire a fishing license. Licensing requirements were also extended to grouper holding and processing facilities, including vessels and cages. The regulation also set forth the minimum quality requirements of grouper exports from the country and required each grouper shipment to be accompanied by a catch certificate. Furthermore, offences and penalties were outlined, together with the MCS framework that would be established alongside the implementation of the regulation. The regulation also established a Fishery Management Advisory Board for the grouper fishery, also the first of its kind in the country.

The two most important measures implemented through the regulation were, however, the protected grouper spawning aggregation sites and legal harvest and export size limits, as per the recommendations in the management plan. The minimum, and for some species maximum, legal sizes were set to protect the juveniles and allow them to contribute to the spawning population. Due to unavailability of biological information such as length at maturity from local grouper populations, the proposed minimum harvest sizes based on theoretical length at maturity (half the maximum length reported in literature) as reported in the 2005 review (Adam and Sattar 2005). However, after extensive consultations with stakeholders, and concerns raised by fishers in particular, the initially proposed sizes were revised, and considerably lower sizes were adopted and the amended regulation was re-published in the Government Gazette as 2014/R-376.

4.3 Data Collection and Recording

Catch data on groupers has been collected through various data collection schemes implemented over the years. The grouper fishery reporting system established in 2001 enabled vessels engaging in the grouper fishery to send catch data to the Ministry on a monthly basis via the island offices. With the introduction of the formal Grouper Fishery Logbook in 2010, the data reporting mechanism switched to this logbook. The logbook was designed to capture information on the main species caught within the grouper fishery, as well as their total catch and the associated effort. The data that is obtained through these logbooks is recorded and maintained by the Statistics Section of the Ministry (Anderson et al. 2003).

Additionally, the Fisheries Information System, *Keyolhu*, developed by the Ministry has also played an instrumental role in the maintenance of data from the grouper fishery. In addition to management of fishery related data, the system also enables the issuance of licenses to grouper fishing vessels and grouper processing facilities. It also records and stores purchase reports and helps issue catch certificates to accompany grouper shipments which are prepared for export.

4.4 Research Conducted to Determine Length at Maturity

In order to review and revise the size limits established under Regulation No. 2014/R-376 (Regulation on Grouper Fishing and Exporting Groupers from the Maldives), MMRI has conducted extensive research to determine size at first maturity (L50) for key grouper species. The maturity studies conducted by MMRI were supported by the Sustainable Fisheries Resources Development Project (SFRDP), with data contributed by Blue Marine Foundation on two species. This research focussed on four commercially important and highly exploited species: *E. fuscoguttatus, E. polyphekadeon, P. areolatus* and *P. pessuliferus.*

Chapter 5

Objectives and Strategies of this Plan

This management plan comprises of objectives, strategies, and actions that would contribute towards achieving the overall purpose.

The five specific objectives are;

(1) Ensure that all activities associated with the harvest and trade of groupers are carried out through the application of principles of sustainability, ecosystem-based management and the Precautionary Approach;
(2) Prioritise evidence-based policymaking through the collection of biological, ecological, and socio-economic data on the grouper fishery and associated resources;
(3) Implement Monitoring, Control and Surveillance (MCS) measures and strengthen data collection and data reporting mechanisms for the grouper fishery and trade;
(4) Ensure equitable benefits to all Maldivians and improve their livelihoods through decentralised development of the grouper fishery and trade; and
(5) Increase education and awareness on grouper fishery and resources amongst stakeholders and the general public.

Strategies and actions developed to achieve these objectives are summarised in Table 1

Table 1: Breakdown of each objective, by strategies, actions, time frame and responsible parties.

Objective 1	Ensure that all activities associated with the harvest and trade of groupers are carried out through the application of principles of sustainability, ecosystem-based management, and the Precautionary Approach		
Strategy	**Action**	**Time frame**	**Responsible parties**
1.1 Ensure the protection of the reproductive capacity of the grouper stock by conserving existing and potential spawning stock.	1.1.1 Establish, maintain and manage new and existing protected grouper spawning aggregation sites to provide a form of protection to mature spawning populations.	Within one year of implementation of this Plan	o MoFMRA o MMRI o Local Councils
	1.1.2 Coordinate with stakeholder agencies to consider ecologically significant areas for groupers, including spawning aggregation sites, in the declaration of MPAs.	Immediate	o MoFMRA o ME o MMRI o Local Councils
	1.1.3 Establish legal harvest size limits for key grouper species to reduce fishing pressure on immature fish.	Within one year of implementation of this Plan	o MoFMRA o MMRI o MCS*
	1.1.4 Where necessary, establish input and output control measures to control fishing levels.	Long-term (5 - 10 years)	o MoFMRA o MMRI o MCS*
	1.1.5 Dependant on fishery related and environmental factors, enact export and/or harvest bans for grouper species under threat of extinction.	Medium-term (3 – 5 years)	o MoFMRA o MMRI o MCS*
	1.1.6 Cap fishing effort by limiting number of fishing licenses to reduce fishing pressure on the wild stock.	Medium-term (3 – 5 years)	o MoFMRA o MMRI
1.2 Promote the use of environmentally friendly gears and techniques in the grouper fishery	1.2.1 Implement and enforce the restriction on the use of any fishing method or gear prohibited Act No. 2019/14 (Fisheries Act of the Maldives) and its pursuant regulations.	Immediate	o MoFMRA o MPS o MNDF-CG

	1.2.2 Prohibit the use of SCUBA gear and gaffs in association with lights to target groupers.	Within one year of implementation of this Plan	o MoFMRA o MPS o MNDF-CG
	1.2.3 Prohibit spearfishing and the use of gaffs to target grouper spawning aggregations.	Immediate	o MoFMRA o MPS o MNDF-CG
1.3 Maintain a leading role in regional fishery bodies (RFBs) and relevant Intergovernmental Organisations (IGOs) in management and conservation of groupers	1.3.1 Actively participate in the scientific and management processes of SWIOFC and other relevant regional and international bodies.	Immediate	o MoFMRA o MMRI
1.4 Reduce pressure on the wild stock through the introduction and promotion of grouper aquaculture	1.4.1 Construct and operate a multispecies hatchery and demonstration farms to facilitate aquaculture operations.	Long-term (5–10 years)	o MMRI o MoFMRA
	1.4.2 Assist in the establishment of pilot and commercial grouper grow-out farms in island lagoons to provide alternative livelihoods for grouper fishers.	Medium-term (3 – 5 years)	o MMRI o MoFMRA
Objective 2 | Prioritise evidence-based policymaking through the collection of biological, ecological, and socio-economic data on the grouper fishery and associated resources			
Strategy	**Action**	**Time frame**	**Responsible parties**
2.1 Improve data collection on biological, ecological, and socio-economic aspects of grouper fishery to support evidence-based policymaking	2.1.1 Prioritise and carry out research on identification and validation of additional spawning aggregation sites	Medium-term (3 – 5 years)	o MMRI
	2.1.2 Implement nationwide biological studies, size sampling, maturity studies and monitoring programmes for groupers	Immediate	o MMRI

	2.1.3 Gather geographical information on fishing grounds using fishery data and field surveys in order to study the spatio-temporal exploitation patterns in grouper fishery	Immediate	o MMRI o MoFMRA
	2.1.4 Conduct grouper tagging studies at grouper aggregation sites to collect data on movement, growth, habitat range and the connectivity between grouper populations, both inter-atoll and intra-atoll.	Short-term (1 – 3 years)	o MMRI
	2.1.5 Regularly monitor protected grouper spawning aggregation sites to gauge their effectiveness.	Medium-term (3 – 5 years)	o MMRI
	2.1.6 Conduct series of surveys to identify and understand the socio-economic aspects of grouper fishery in the Maldives	Immediate	o MoFMRA o Local Councils
Objective 3 | Implement Monitoring, Control and Surveillance (MCS) measures and strengthen data collection and data reporting mechanisms for the grouper fishery and trade.			
Strategy	**Action**	**Time frame**	**Responsible parties**
3.1 Establish an effectively controlled and monitored trade flow	3.1.1 Strengthen the existing licensing arrangements for commercial grouper fishing vessels	Immediate	o MoFMRA o Local Councils
	3.1.2 Strengthen the existing licensing arrangements for grouper processing facilities	Immediate	o MoFMRA o MFDA
	3.1.3 Establish licensing arrangements to monitor operations of third-parties (resellers) trading grouper species to exporters or resorts.	Within one year of implementation of this Plan	o MoFMRA o Local Councils

	3.1.4 Establish registration arrangements in Fisheries Information System (FIS) – *Keyolhu*, for those engaged in grouper fishery and trade	Within one year of implementation of this Plan	o MoFMRA o MCS*
3.2 Establish an efficient documentation scheme for grouper fishery	3.2.1 Maintain the existing mechanism to collect catch and effort data from harvesters through fishery logbooks, and conduct awareness programmes to ensure that data submitted by fishers are complete and accurate	Immediate	o MoFMRA o Local Councils
	3.2.2 Strengthen and implement the system through which grouper processors maintain and submit purchase records to the Ministry	Immediate	o MoFMRA
	3.2.3 Require any third-parties (resellers) trading grouper species to exporters or resorts to maintain and submit transaction log records to the Ministry	Within one year of implementation of this Plan	o MoFMRA o MoT o MoED
	3.2.4 Strengthen and implement the system through which export companies maintain and submit purchase records to the Ministry	Immediate	o MoFMRA
	3.2.5 Maintain and manage existing catch certification mechanism to ensure all grouper export consignments are accompanied by a catch certificate.	Immediate	o MoFMRA o MCS*
3.3 Establish an effective monitoring and enforcement system to ensure effective compliance with regulations related to grouper fishery and trade	3.3.1 Work with other government agencies to monitor export of groupers and grouper products.	Immediate	o MoFMRA o MCS* o MFDA o MIRA

	3.3.2 Conduct trainings in species identification for Maldives Customs Service officials and other inspectors.	Immediate	o MoFMRA o MMRI o MCS*
	3.3.3 Ensure those engaged in the grouper fishery and trade are compliant with relevant regulations, with the assistance of fisheries rangers.	Immediate	o MoFMRA o Local Councils
	3.3.4 Conduct spot checks at grouper processing facilities, ports and the airports to ensure compliance with relevant requirements and regulations.	Immediate	o MoFMRA o MCS* o MMRI
	3.3.5 Expand existing Vessel Monitoring System (VMS) to incorporate all licensed commercial grouper fishing vessels.	Long-term (5 - 10 years)	o MoFMRA o MNDF-CG o MPS
Objective 4 | Ensure equitable benefits to all Maldivians and improve their livelihoods through decentralised development of the grouper fishery and trade.			
Strategy	**Action**	**Time frame**	**Responsible parties**
4.1 Increase profitability for grouper fishing communities	4.1.1 Promote aquaculture to provide an alternative livelihood for grouper fishers and facilitate their engagement in the aquaculture sector	Immediate	o MoFMRA o MMRI
	4.1.2 Facilitate and encourage fishers' participation in existing benefits schemes that are targeted for fishers.	Immediate	o MoFMRA o MCS*
4.2 Promote grouper fishery and products and foster new market opportunities to increase economic benefits	4.2.1 Provide support for the establishment of cooperatives to expand and diversify the production of value-added fish products within grouper fishing communities, through facilitating access to loans and financing mechanisms.	Medium-term (3 – 5 years)	o MoFMRA o Local Councils o SDFC

	4.2.2 Facilitate market access to new markets to maximise economic returns to grouper fishers and exporters.	Long-term (5 - 10 years)	o MoFMRA o MoED
4.3 Identify and engage stakeholders to ensure that policy decisions are made through a participatory approach	4.3.1 Establish, maintain and update a fishers' registry, *Masveringe Dhaftharu*, to understand fishing community dependence on grouper resources	Immediate	o MoFMRA o Local Councils
	4.3.2 Engage with stakeholders and take their views into account in the implementation of management measures	Immediate	o MoFMRA o Local Councils
	4.3.3 Work in close liaison with key grouper fishing communities and traders	Immediate	o MoFMRA o Local Councils
Objective 5 | Increase education and awareness on grouper fishery and resources amongst stakeholders and the general public.			
Strategy	**Action**	**Time frame**	**Responsible parties**
5.1 Promote awareness and understanding of the grouper fishery and its contribution to the Maldives economy	5.1.1 Based on data availability, compile and disseminate information on: • status of the resource; • status of the fishery; • trade and exports; and • revenue to Maldives	Short-term (1 – 3 years)	o MMRI o MoFMRA o MoED o MIRA o MCS* o NBS
	5.1.2 Prepare and disseminate information on best practices in grouper fishery, including methods on safe release of groupers that do not fit within the stipulated size limits.	Short-term (1 – 3 years)	o MoFMRA o MMRI
	5.1.3 Educate fishers, traders, processors, exporters and enforcement officers about new and existing regulations via workshops, trainings and awareness campaigns.	Short-term (1 – 3 years)	o MoFMRA o MMRI o MCS* o MPS o MNDF-CG

	5.1.4 Develop awareness campaigns for school children and the general public on the important role groupers play in marine ecosystems.	Short-term (1 – 3 years)	o Ministry o MMRI o MoE
5.1 Promote appreciation for the marine environment and resources through public engagement in citizen science programmes	5.2.2 Implement a citizen science monitoring programme to collect and record photographic and observational data on grouper fishery resources	Medium-term (3 – 5 years)	o MMRI

Chapter 6

Management Measures Under This Plan

The grouper fishery and trade remain lucrative economic activities for Maldivians, with groupers continuing to be the second most exported species group from Maldives over several years, in terms of the proportion of revenue generated from marine exports. As discussed in Section 2, groupers also play a fundamental role in supporting the health and productivity of ecosystems. It is therefore critical that timely management measures and best practices are introduced through legislative instruments, to ensure that this important resource is sustainably managed to the benefit of the stakeholders and future generations. The measures that will be implemented to achieve the objectives and strategies of this Plan are summarised below

6.1 Establishment of an Advisory Committee

An advisory committee will be established to advise the Ministry on management of grouper stock, fishery and trade. The committee will also give recommendations to the Ministry on research and sustainable development of this fishery. The meetings of the committee will be convened at least once per year.

The committee will comprise of the following members:

(a) Chairperson (a representative of the Ministry);
(b) A representative from the MMRI ;

(c) 3 representatives of grouper fishers;
(d) 2 representatives of grouper exporters;
(e) A representative from the Ministry of Environment;
(f) A representative from the Ministry of Economic Development;
(g) A representative from the Ministry of Tourism;
(h) A representative from the Local Government Authority;
(i) A representative from the Maldives Customs Service;
(j) A representative from the Maldives Police Service;
(k) A representative from a relevant locally registered NGO; and
(l) A scientist conducting research on groupers and the grouper fishery.

A public announcement will be made by the Ministry, calling for Expression of Interest for the following Committee positions:

- Representatives of grouper fishers;
- Representatives of grouper exporters; and
- Representative from a relevant locally registered NGO.

The responsibilities of the Committee will include:

(a) Reviewing technical and other reports pertaining to the grouper fishery;
(b) Advising the Ministry on implementation of relevant regional and international management measures on a national scale;
(c) Monitoring the implementation of this Plan and providing advice to the Ministry on an annual basis;
(d) Advising the Ministry on management measures in response to the outcomes and recommendations from the technical reports and stakeholder workshops and consultations; and
(e) Advising the Ministry on the implementation, monitoring and review of this Plan.

6.2 Licensing

One of the overarching aims of establishing a licensing mechanism is to identify parties that are engaged in the fishery and those who are economically dependent on the fishery resources. Such a mechanism also supports the collection and management of fisheries data. Furthermore, the licensing mechanism plays a crucial role in providing the Ministry with information that contributes towards the development of the fisheries sector and the extension of essential services to fishers.

In addition, a licensing mechanism also allows for the formal recognition of stakeholders engaged in the fishery and trade, which in turn facilitates the Ministry to safeguard their rights and ensure their social and economic security. Maintaining records of the fishing fleet and crew members, as well as information on fish processing facilities, through a licensing system assures the international community that the Maldivian fisheries are effectively and responsibly managed. Such records also serve as an important basis for planning and implementing fishery development projects.

In light of these considerations, the following parties operating within the grouper fishery and trade will be required to acquire a license:

(a) All commercial fishing vessels
(b) All processing facilities
(c) All third-parties (resellers) trading grouper species to licensed processing facilities, exporters or resorts, unless stated otherwise in another management plan.

The general process of application for and issuance of licenses, their renewal and revocation as well as conditions of the licenses will be set forth in the relevant regulations. The Ministry will establish, maintain and update a database of licensed parties.

6.3 Data collection and Management

Collection and management of comprehensive catch and effort data and maintenance of fisheries statistics is an important measure that contributes towards assessing changes in the abundance of fish stocks in response to fishing. It also plays a critical role in ensuring that stocks are fished at sustainable levels and that future generations continue to benefit from these resources. The fundamental tool used for this purpose is the fishery logbooks, in which catch composition, fuel usage, fishing grounds and other trip details, for each fishing trip, are recorded and submitted by the licensed vessels. Other vital information collected on the fisheries sector include details on processing and trade of fish and fishery products.

In consideration of the aforementioned factors, an integrated data collection system will be established and used to collect the following information:

- Logbook / fishery data from licensed fishing vessels;
- Purchase reports from licensed grouper processors / processing facilities;
- Purchase reports from licensed third-party traders; and
- Purchase reports from parties exporting groupers and grouper products.

6.4 Legal Size Requirements

Groupers exhibit a host of special biological characteristics and behaviours; most are long lived, slow growing species that reach sexual maturity comparatively late and many are monandric protogynous hermaphrodites, meaning they mature as females and can transform into males. Traits such as these make groupers particularly vulnerable to unsustainable fishing practices and overexploitation. The establishment of catch size limits is crucial to reduce the impacts of fishing and ensure juvenile groupers are given the opportunity to contribute to the spawning population.

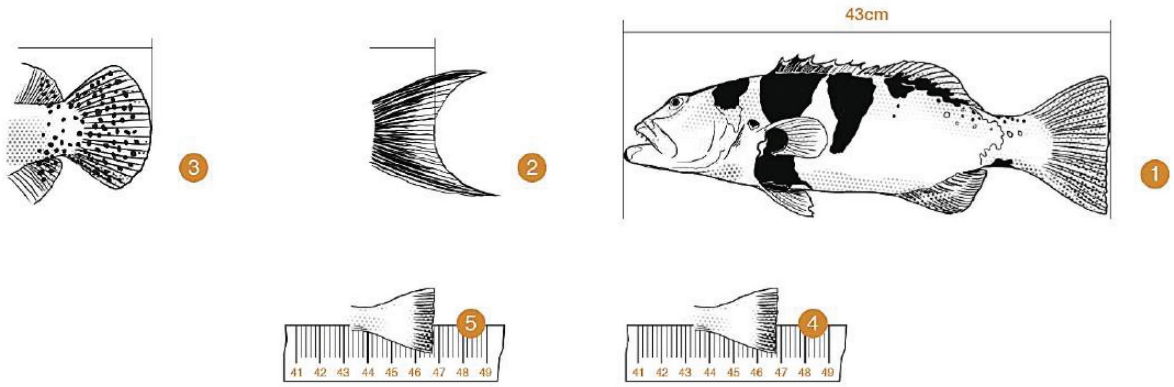
The current research from MMRI shows that as much as 70% of the groupers currently being caught are undersized or have not reached size of maturity

and 90% of the most targeted grouper species are caught immature. The future of grouper fishermen's livelihoods in the Maldives is entirely dependent on a healthy and thriving wild grouper stock. The establishment of size limits is therefore also not only important to safeguard the health of the grouper populations, but also to ensure that Maldivians continue to benefit from these resources in the long-term.

Harvest and export size limits will be established for the following grouper species. It will be prohibited to harvest, retain on-board, store on-board, tranship, transport to a landing facility or land, trade, retain in a processing facility and process any grouper species in contravention of legal size requirements applicable to that species

Table 2: Legal size requirements for grouper species

Scientific Name	Common Name (English)	Local Name	Harvest / Export Length (cm)
Aethaloperca rogaa	Red mouth grouper	Ginimas faana	>20
Anyperodon leucogrammicus	Slender grouper	Boalhajehi faana	>25
Cephalopholis argus	Peacock hind	Mas faana	>20
Cephalopholis aurantia	Golden hind	Ran Faana	>20
Cephalopholis leopardus	Leopard hind	Raiy Thiki Faana	>20
Cephalopholis miniata	Coral hind	Koveli faana	>20
Cephalopholis sexmaculata	Sixblotch hind	Landaa faana	>20
Cephalopholis sonnerati	Tomato hind	Veli faana	>20
Cephalopholis spiloparaea	Strawberry hind	Naaringu Faana	>20
Cephalopholis urodeta	Darkfin hind	Kanfaiy Kalhu Faana	>20
Epinephelus coeruleopunctatus	White-spotted grouper	Hudhulah faana	>25
Epinephelus fasciatus	Blacktip grouper	Raiygalhi faana	>25
Epinephelus flavocaeruleus	Blue and Yellow grouper	Dhon-noo faana	>30
Epinephelus fuscoguttatus	Brown-marbled grouper	Kas faana	>60
Epinephelus macrospilos	Snubnose grouper	Fijjehi faana	>25
Epinephelus ongus	White streaked grouper	Kirulhi faana	>20
Epinephelus polyphekadion	Camouflage grouper	Kula faana	>40
Epinephelus spilotoceps	Four-saddle grouper	Asdhaanu faana	>20
Plectropomus areolatus	Squaretail coral grouper	Thijjehi faana	>40
Plectropomus laevis	Black-saddled coral grouper	Kula olhu faana	>25
Plectropomus pessuliferus	Roving coral grouper	Dhon olhu faana	>42
Variola louti	Yellow edged lyretail	Kan'du haa	>22
Variola albimarginata	White edged lyretail	Kan'du raiyhaa	>22

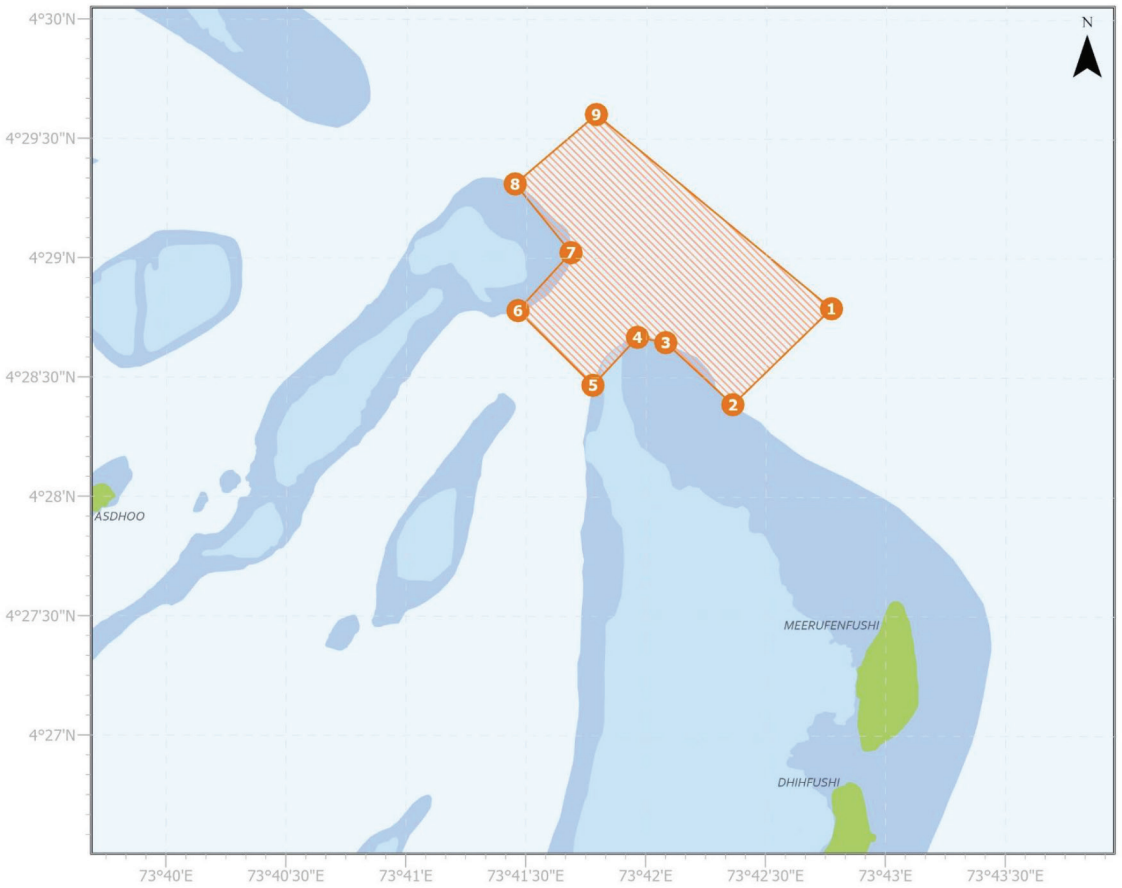


- **Figure 2:** How to measure the length of a grouper

6.5 Protected Grouper Spawning Aggregation Sites

Most groupers form spawning aggregations, with some species exhibiting high site fidelity, which makes these aggregations predictable and easy to target. Research shows that groupers are highly vulnerable to aggregation fishing, and it has been recorded to have severe impacts on grouper stocks. The conservation of these aggregation sites is a crucial step towards protecting the reproductive capacity of the grouper stock. Therefore, the protection status for the 5 sites which were previously protected under Regulation No. 2013/R-41 (Regulation on Grouper Fishing and Exporting Groupers from the Maldives) will be extended for a further 10 years. As per the management interventions in these MPAs , they will be considered IUCN Management Category IV (Habitat/Species Management Area) sites.

(a) Dhiffushi Kanduolhi - K. Atoll



LEGEND

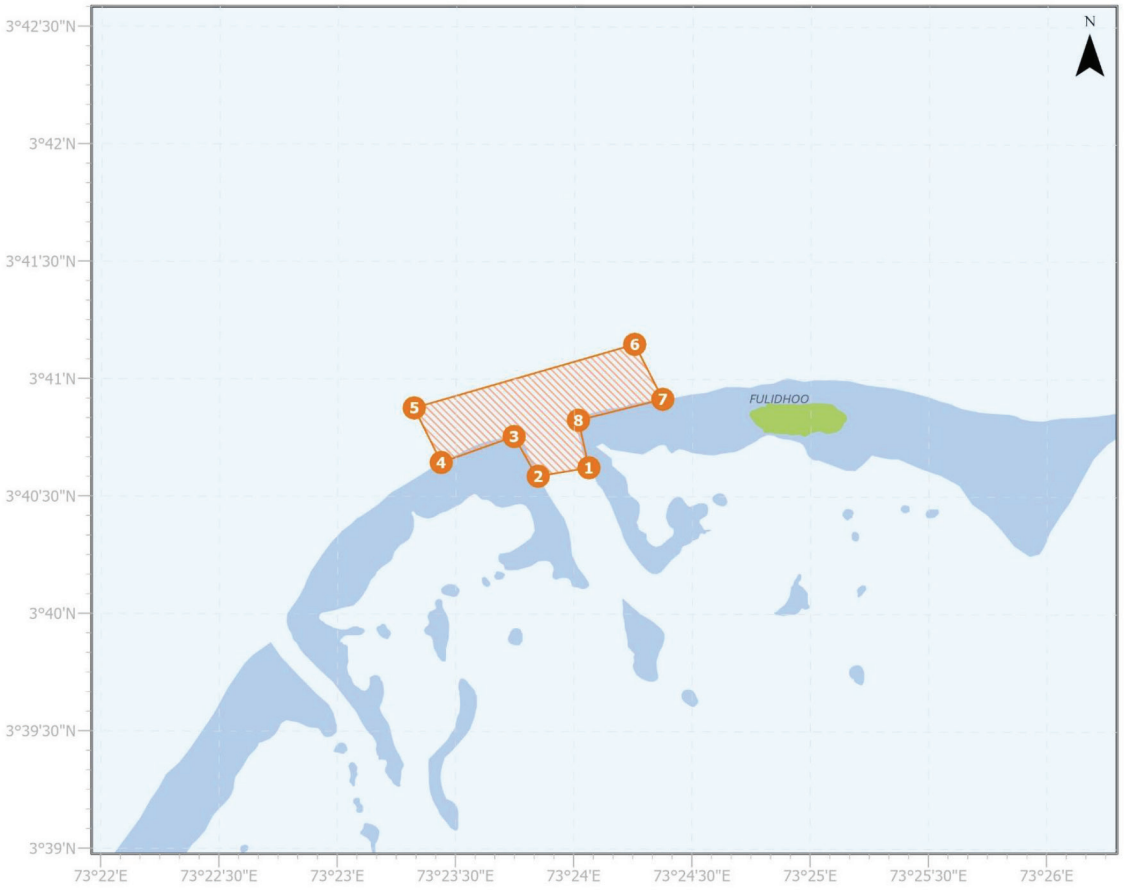
- Grouper MPAs
- Islands
- Lagoons
- Reefs

Name	Latitude	Longitude
1	04° 28' 47.449 N	73° 42' 46.289 E
2	04° 28' 23.279 N	73° 42' 21.650 E
3	04° 28' 38.849 N	73° 42' 04.839 E
4	04° 28' 40.180 N	73° 41' 57.760 E
5	04° 28' 28.099 N	73° 41' 46.640 E
6	04° 28' 46.848 N	73° 41' 27.847 E
7	04° 29' 01.430 N	73° 41' 41.079 E
8	04° 29' 18.690 N	73° 41' 27.089 E
9	04° 29' 36.179 N	73° 41' 47.379 E

2 km

WGS 1984 UTM 43N

(b) Boamas Kandu – V. Atoll



LEGEND

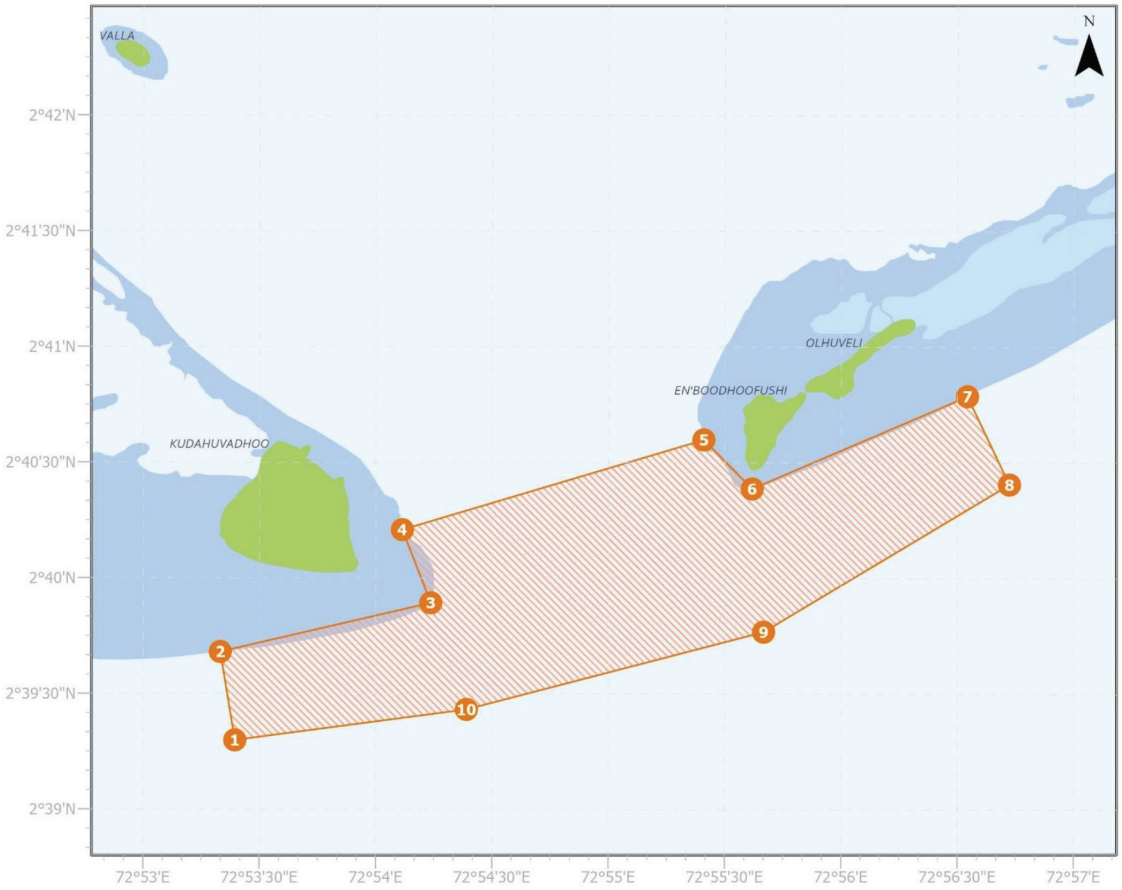
- Grouper MPAs
- Islands
- Lagoons
- Reefs

Name	Latitude	Longitude
1	03° 40' 37.400 N	73° 24' 03.719 E
2	03° 40' 35.214 N	73° 23' 50.839 E
3	03° 40' 45.356 N	73° 23' 44.723 E
4	03° 40' 38.678 N	73° 23' 26.240 E
5	03° 40' 52.619 N	73° 23' 19.359 E
6	03° 41' 08.949 N	73° 24' 15.279 E
7	03° 40' 54.925 N	73° 24' 22.431 E
8	03° 40' 49.531 N	73° 24' 01.035 E

2 km

WGS 1984 UTM 43N

(c) Kudahuvadhoo Kanduolhi



LEGEND

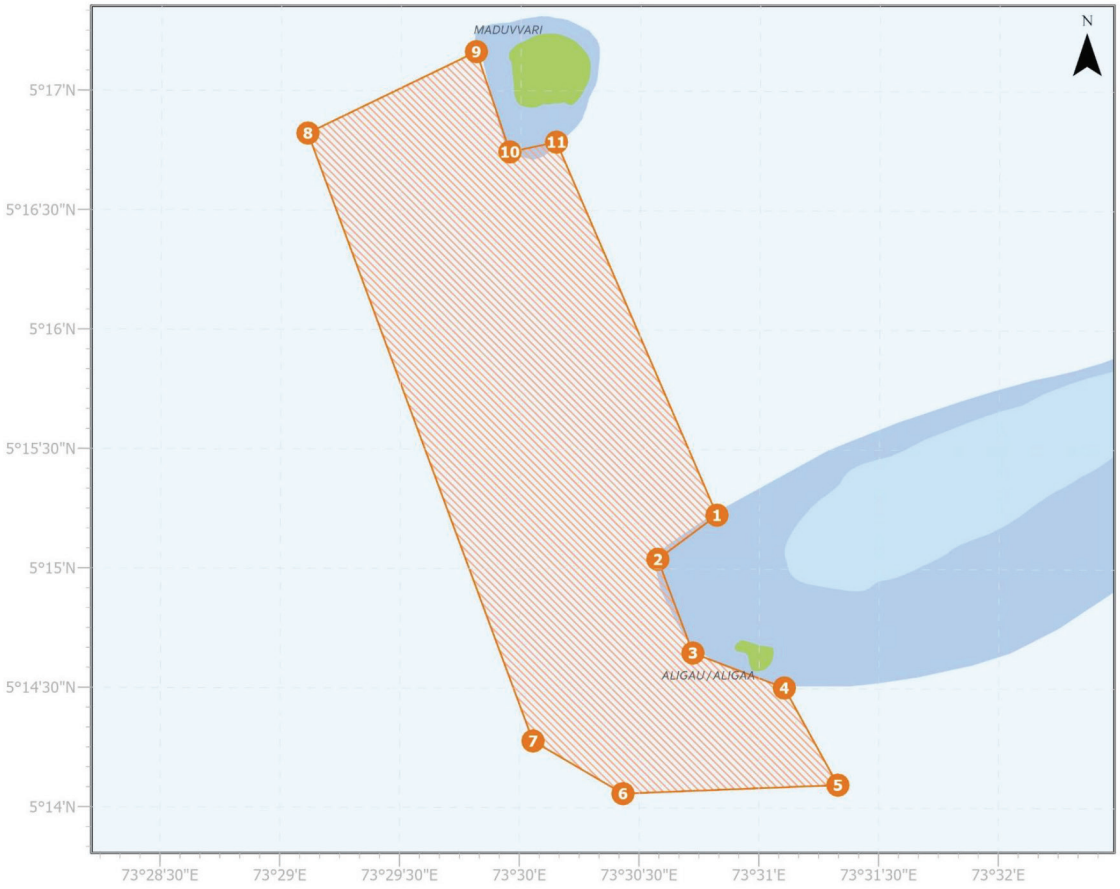
- Grouper MPAs
- Islands
- Lagoons
- Reefs

Name	Latitude	Longitude
1	02° 39' 17.930 N	72° 53' 23.679 E
2	02° 39' 40.855 N	72° 53' 19.903 E
3	02° 39' 53.575 N	72° 54' 14.188 E
4	02° 40' 12.524 N	72° 54' 06.812 E
5	02° 40' 35.930 N	72° 55' 24.561 E
6	02° 40' 23.227 N	72° 55' 37.042 E
7	02° 40' 47.229 N	72° 56' 32.539 E
8	02° 40' 24.350 N	72° 56' 43.379 E
9	02° 39' 46.090 N	72° 55' 40.029 E
10	02° 39' 25.921 N	72° 54' 23.394 E

2 km

WGS 1984 UTM 43N

(d) Aligaa Kanduolhi



LEGEND

- Grouper MPAs
- Islands
- Lagoons
- Reefs

Name	Latitude	Longitude
1	05° 15' 13.569 N	73° 30' 49.340 E
2	05° 15' 02.459 N	73° 30' 34.549 E
3	05° 14' 38.929 N	73° 30' 43.390 E
4	05° 14' 30.210 N	73° 31' 06.319 E
5	05° 14' 05.830 N	73° 31' 19.779 E
6	05° 14' 03.570 N	73° 30' 25.959 E
7	05° 14' 16.749 N	73° 30' 03.380 E
8	05° 16' 49.299 N	73° 29' 06.640 E
9	05° 17' 09.849 N	73° 29' 48.800 E
10	05° 16' 44.680 N	73° 29' 57.260 E
11	05° 16' 47.169 N	73° 30' 08.920 E

2 km

WGS 1984 UTM 43N

(e) Bodu and Kuda Kanduolhi – M. Atoll

LEGEND

- Grouper MPAs
- Islands
- Lagoons
- Reefs

Name	Latitude	Longitude
1	02° 55' 00.120 N	73° 35' 39.120 E
2	02° 55' 02.051 N	73° 35' 06.359 E
3	02° 55' 30.705 N	73° 35' 14.118 E
4	02° 55' 38.797 N	73° 35' 11.448 E
5	02° 55' 41.795 N	73° 35' 00.875 E
6	02° 56' 44.520 N	73° 35' 41.280 E
7	02° 56' 31.423 N	73° 35' 53.420 E
8	02° 56' 56.351 N	73° 36' 18.199 E
9	02° 56' 38.040 N	73° 36' 45.000 E
10	02° 55' 28.920 N	73° 35' 47.040 E

2 km

WGS 1984 UTM 43N

It will be prohibited to conduct any of the following activities within the bounds of the protected grouper spawning aggregation sites, at all times:

(a) Any form of fishing barring trolling (vadhaadhuhvun);
(b) Anchoring;
(c) Mining for or removal of sand, coral and stone;
(d) Introduction of any new species;
(e) Fish feeding; and
(f) Aquaculture.

And it will be prohibited to conduct any of the following activities within the bounds of the protected grouper spawning aggregation sites, during the aggregation period (from the 23rd of every lunar month to the 3rd of the following month):

(a) Diving and snorkelling;
(b) Water sports activities that utilise motorised crafts; and
(c) Use of light to attract fish for any purpose;

6.6 Harvesting Restrictions

As discussed elsewhere, most groupers are K-selected species, meaning they are long lived and slow growing and reach sexual maturity comparatively late. Many species are also monandric protogynous hermaphrodites; maturing as females and transforming into males during or prior to forming spawning aggregations. Due to these particular characteristics that groupers exhibit, they are highly vulnerable to overfishing. Targeting groupers using gears such as spear guns has been known to especially impact grouper populations. A study (Frisch et al. 2012) conducted on abundance and size structure of both target and non-target species in a multi-use conservation park zone within the Great Barrier Reef Marine Park showed that within three years of spearfishing being allowed in the area, a 54% reduction in abundance and a 27% reduction in average size of the main target species, coral groupers (Plectropomus species) was observed. Aside from impacts on the size and abundance of

target and non-target species, spear fishing can also severely disrupt marine food chains, cause direct and indirect impacts to sub-tidal reef community structure, and affect the health of the ecosystem, at large. These impacts are most severely felt by species such as groupers and herbivorous species, which are typically k-selected species with slow growth, longer life expectancy and low reproductive potential. The loss of these species can ultimately lead to widespread ecosystem level changes such as reduction in productivity and shifts in the trophic structure (Gillett and Moy 2006).

Additionally, the use of SCUBA gear in fishing has also been identified as having a significant impact on fish populations. SCUBA gear allows fishers spend longer periods of time underwater, thereby increasing their efficiency and catch and inevitably leading to overfishing and stock depletion. For example, research conducted in American Samoa during 1994, showed the rapid change from subsistence-based, snorkel spearfishing to commercial SCUBA spearfishing resulted in parrotfish catches increasing 15-fold. Following a ban on the practice, recent surveys of American Samoa's coral reefs revealed that populations of key reef species are in a stable state and parrotfish populations are showing signs of recovery (Lindfield et al. 2014). In light of these considerations, and in order to protect the reproductive capacity of the grouper stocks, use of the following gears and methods in the grouper fishery will be prohibited.

(a) Using SCUBA gear or any similar underwater breathing apparatus to target grouper species;
(b) Use of gaffs in association with lights to fish for groupers; and
(c) Spearfishing and the use of gaffs to target grouper spawning aggregations

6.7 Catch Certification

Catch certification is an essential instrument that helps prevent, deter and eliminate Illegal, Unreported and Unregulated (IUU) fishing. Through such a scheme, the catch is certified to have been made in accordance with applicable laws, regulations and international conservation and management measures, fully assuring consumers that the fish traded in the Maldives are sourced from a sustainably and responsibly managed fishery.

The catch certification scheme established for the grouper fishery by the Ministry will be maintained and all grouper exporters will be required to submit an approved catch certificate with all consignments of grouper products. Details of the fishing vessel, date of catch as well as information on the processing facility will also be collected through the scheme. This will help to track the flow of the product through the supply chain, ensuring product traceability at all stages, from 'hook to plate'.

6.8 Precautionary Measures

The Precautionary Approach promotes the application of timely and cost-effective measures to safeguard ecosystems and prevent irreparable damage to them, despite the lack of full scientific certainty. This approach falls within the purview of international best practices for sustainable management of natural resources (UNCED, 1982). In this regard, additional measures that are not stated in this Plan may be taken to protect and manage grouper stocks. These measures may include but are not limited to the following:

(a) Protecting additional grouper spawning aggregation sites within Maldives;
(b) Prohibiting the capture, processing or export of a specific species of grouper;
(c) Revising the currently established harvest and export size limits and introducing new size limits for other species of grouper;
(d) Implementing a catch / export quota for groupers; and
(e) Impose other restrictions on activities that may affect grouper stocks.

Chapter 7

Implementation of this Plan

The Ministry is responsible for the implementation of each objective in this management plan, by strategies and actions, as outlined and in coordination with the relevant agencies. The Ministry shall also formulate a regulation, under the Fisheries Act of the Maldives, to implement and enforce all grouper fishery management measures stated in this Plan. The Maldives Marine Research Institute shall formulate and implement a plan of action to undertake all research activities that the institute is responsible for under this Plan.

Chapter 8

Reviewing the Management Plan

This Plan will be reviewed and revised every 4 (four) years. The Ministry will ensure the engagement of grouper fishing communities, licence holders, processors, exporters, civil society and other stakeholders in the review process. Where there is an immediate need to revise any part(s) or measures of this Plan, the Ministry shall carry out such revisions in consultation with the Committee.

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Annex 1: Glossary

(a) Aquaculture	Culture, propagation, keeping and raising of captive or hatchery bred aquatic living resources on the Territory and in the maritime zones of the Maldives.
(b) Commercial Fishing	Fishing or Harvesting for the purpose of obtaining a financial benefit
(c) Enforcement Officer	Any officer designated pursuant to Section 57 of the Act No. 2019/14 (Fisheries Act of the Maldives) to enforce regulations made under the Act.
(d) Fisheries Ranger	Persons who are appointed for and by the Ministry under Section 58 of the Act No. 2019/14 (Fisheries Act of the Maldives).
(e) Fishing / Harvesting	(1) Searching for the purpose of catching, taking, killing and harvesting of fish; (2) Attempting to search for, catch, take, kill or harvest fish; (3) Engaging in any other activity that results in the searching, catching, taking, killing or harvesting of fish; (4) Placing or searching or retaking of any fish aggregating device or equipment including "radio beacons"; (5) Undertaking any operation at sea or on an island in preparation for any activity mentioned in subsections (3) ,(2) ,(1) or (4).
(f) Fishing Vessels	Any type of vessel, ship or any other thing which is used for fishing, which has been prepared for fishing, or which is usually used for fishing or related activities.
(g) Logbook	Any instruments provided to record data on fishing trips, including catch and effort data, submitted electronically or via any other medium determined by the Ministry

(h) Management Plans	Plans made with regard to fisheries planning, management and development pursuant to Chapter Three of the Act No. 2019/14 (Fisheries Act of the Maldives).
(i) Master / Captain	Person holding the most responsible position at any given time on-board a fishing vessel
(j) Minister	The minister responsible for fisheries, including aquaculture.
(k) Ministry	The ministry responsible for fisheries, including aquaculture.
(l) Precautionary Measures	In the absence of complete information based on scientific research or where a matter has not been proved, measures adopted to manage the natural resources in a sustainable manner considering the possibility of an adverse outcome if such measures are not taken.
(m) Processing	Activities undertaken to package, pack or bring any change to fish in order to preserve fish for a long period.
(n) Processing Facilities	Lands, buildings, or such other places on or in which: (1) fish or aquaculture products are cleaned, packaged, dried, salted, chilled, frozen or otherwise processed for sale in and outside the Maldives; or (2) fish or aquaculture products are stored for the purposes of packaging, canning, drying, cleaning, salting, chilling, freezing or otherwise for processing for sale in and outside the Maldives.
(a) Reseller	Any third-parties trading fish to exporters or resorts as middlemen, but do not engage in the harvesting process.

(p) Spear Gun	Any gear or tool that shoots a sharp and pointed projectile using a trigger mechanism that involves the use of a rubber sling, compressed air or a chemical to target fish.
(q) Trolling	Fishing using long nylon wires with lures and a hook, set out from the side of the boat and trailed behind the boat. Sometimes the lines are deployed with floaters attached.
(r) Fisheries Information System - *Keyolhu*	A web-enabled fishery information system designed to upload record catch data and issue permits and licenses to fishery and fishery related activities.

Annex 2: List of Recorded Grouper Species in the Maldives

Scientific Name	Common Name	Local Name	IUCN Red List Status
Aethaloperca rogaa	Red mouth grouper	Ginimas faana	Least Concern
Anyperodon leucogrammicus	Slender grouper	Boalhajehi faana	Least Concern
Cephalopholis argus	Peacock hind	Mas faana	Least Concern
Cephalopholis aurantia	Golden hind	Ran faana	Least Concern
Cephalopholis boenak	Chocolate hind	-	Least Concern
Cephalopholis leopardus	Leopard hind	Raiy thiki faana	Least Concern
Cephalopholis miniata	Coral hind	Koveli faana	Least Concern
Cephalopholis nigripinnis	Blackfin grouper	-	Least Concern
Cephalopholis polleni	Harlequin hind	-	Least Concern
Cephalopholis sexmaculata	Sixblotch hind	Landaa faana	Least Concern
Cephalopholis sonnerati	Tomato hind	Veli faana	Least Concern
Cephalopholis spiloparaea	Strawberry hind	Naaringu faana	Least Concern
Cephalopholis urodeta	Darkfin find	Kanfaiy kalhu faana	Least Concern
Epinephelus areolatus	Areolate grouper	Thijjehi faana	Least Concern
Epinephelus chlorostigma	Brownspotted grouper	Kulhandhuru faana	Least Concern
Epinephelus coeruleopunctatus	Whitespotted grouper	Hudhulah faana	Least Concern
Epinephelus fasciatus	Blacktip grouper	Raiygalhi faana	Least Concern
Epinephelus flavocaeruleus	Blue-and-yellow grouper	Dhon-noo faana	Least Concern
Epinephelus fuscoguttatus	Brown-marbled grouper	Kas faana	Vulnerable
Epinephelus lanceolatus	Giant grouper	Mudu faana	Data deficient
Epinephelus longispinis	Longspine grouper	Kooru faana	Least Concern
Epinephelus macrospilos	Snubnose grouper	Fijjehi faana	Least Concern
Epinephelus melanostigma	Blackspot grouper	-	Least Concern
Epinephelus merra	Honeycomb grouper	Lah faana	Least Concern
Epinephelus miliaris	Netfin grouper	Kurehi faana	Least Concern
Epinephelus morrhua	Comet grouper	Dhunthari faana	Least Concern
Epinephelus multinotatus	White-blotched grouper	Baafothi faana	Least Concern
Epinephelus ongus	White-streaked grouper	Kirulhi faana	Least Concern
Epinephelus poecilonotus	Dotdash grouper	-	Least Concern
Epinephelus polyphekadion	Camouflage grouper	Kula faana	Vulnerable
Epinephelus retouti	Red-tipped grouper	Dhon faana	Least Concern
Epinephelus spilotoceps	Foursaddle grouper	Asdhaanu faana	Least Concern

Epinephelus tauvina	Greasy grouper	Londhi faana	Least Concern
Epinephelus undulosus	Wavy-lined grouper	-	Least Concern
Gracila albomarginata	Masked grouper	Boakuda faana	Least Concern
Hyporthodus octofasciatus	Eight-bar grouper	Kalhu faana	Least Concern
Plectropomus areolatus	Squaretail coral grouper	Olhu faana	Least Concern
Plectropomus laevis	Blacksaddled coral grouper	Kula olhu faana	Least Concern
Plectropomus pessuliferus	Roving coral grouper	Dhon olhu faana	Least Concern
Variola albimarginata	White-edged lyretail	Kan'du raiyhaa	Least Concern
Variola louti	Yellow-edged lyretail	Kan'du haa	Least Concern

Ministry of Fisheries, Marine Resources & Agriculture

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