



# Official Gazette

No. 13

XLV

No. 13

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Published by Authority

Thursday 6th February 2020

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## GOVERNMENT NOTICES

The following Government Notice is published by Order of the President.

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No. 68 of 2020

### **FISHERIES ACT, 2014**

*(Act 20 of 2014)*

Pursuant to section 5(7) of the Fisheries Act, the Minister responsible for fisheries hereby publish the Mahé Plateau trap and line fishery co-management plan.

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### ***Mahé Plateau trap and line fishery co-management plan***

January 2020

Seychelles Fishing Authority



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## **Mahé Plateau trap and line fishery Co-management Plan**

### **Executive summary**

The Mahé Plateau supports a demersal artisanal fishery that is critically important in providing local food security and economic development in Seychelles. The main species targeted by the hand line fishery are snappers, groupers and emperors whereas the trap fishery targets rabbitfish, parrotfish and emperors. However, over recent years fishers have raised concerns over decreasing catch rates and sizes of target species, and this has been supported by risk and stock assessments. These assessment results demonstrated multiple lines of evidence that overfishing on some of the major plateau fishery species is likely to be occurring and that management intervention is an urgent need. Sustainable resource management is also consistent with the vision of the Seychelles Government.

Consistent with world's best practice the development of this plan followed principles of the Ecosystem Approach to Fisheries Management (EAFM), also a requirement of the Seychelles Government's *Fisheries Act 2014*. The development of the plan also heavily involved stakeholder consultation and input.

This plan document presents the elements of the management plan for the Mahé plateau artisanal trap and line fishery. These elements are: 1. Objectives of the management plan, 2. Issues facing the fishery, 3. How the plan will be implemented, 4. Management strategies and regulations, 5. The Performance Measurement System, 6. Monitoring, Control and Surveillance (details included in a separate plan document), and 7. a plan review process.

Central to the plan are management strategies and regulations that were developed to address fishery issues identified and prioritized by stakeholders, and evolved based on stakeholder feedback during the consultation process. The plan describes the intent of each management strategy/regulation and their rationale, and highlights aspects relevant to their successful implementation. It will be implemented in two phases over 24 months to ensure key measures can be introduced immediately, while other measures can be given the requisite time for their comprehensive development prior to implementation.

The development of this fisheries management plan was initiated in 2007 and significantly developed in 2015 under the framework of a project between the Government of Seychelles (GOS) and the United Nations Development Programme (UNDP), and funded by a Global Environment Facility (GEF) grant. It was approved by Cabinet in 2017 for implementation of its two phases. Cabinet also approved the establishment of a Co-management Plan Implementation Committee that would address the concerns raised by stakeholders and fully involve them in the implementation of the plan. The Co-management Plan Implementation Committee was set up in January 2019 and the concerns of stakeholders addressed and resolved at its second meeting in March 2019. It is now gazetted for implementation.

### **1. Purpose of the plan**

Fish are of fundamental importance to the social and economic wellbeing of the inhabitants of the Seychelles. There is growing concern over the drop in total catch in some of the primary fishery areas, a drop in the average size of fish caught, and a need to venture further to new fishing areas, placing economic strain on commercial fishing ventures. Fishers, processors, research scientists and fisheries managers have voiced their concern over the state of the resource and have urged intervention to ensure the long-term sustainability of the resource.

There is currently no specific Management Plan for the artisanal demersal trap and hand line fishery or the recreational fishery, although some management measures have been introduced (mainly over the last 30 years) to monitor/control the development of the sector while maintaining sustainability of the resources, and have been included in the deliberations around the formulation of this document.

This document presents the Mahé plateau trap and line fishery co-management plan (hereafter referred to as “the Plan”) developed based on views and feedback from

stakeholders of the Mahé plateau fishery. This document describes the key objectives of the Plan, identifies key issues and how the Plan addresses these using various management strategies, and how the performance of the Plan will be assessed.

### **Co-management**

Co-management is a partnership arrangement between government and the local community of resource users and other resource stakeholders to share the responsibility and authority for management of a resource (FAO, 2008-2015). Management of the resource is therefore a shared responsibility among the stakeholders that can be negotiated and delegated (FRDC, 2008). The *Fisheries Act 2014* also provides for the management of fisheries in Seychelles using co-management arrangements. Stakeholders participated at the very beginning and sought input at each step in the formulation of this management plan. With continued engagement, this will pave the way in the future for fisheries management on the plateau to adopt a full co-management model whereby fishers and other stakeholders may be involved in or have joint responsibility for aspects of management such as surveillance, monitoring and data collection, data analyses and review phases. A key strategy in ensuring a co-management model is realised is the appointment of stakeholder representatives on the steering committee assigned to oversee the further development and implementation of the Plan.

## **2. Rationale**

The Ecosystem Approach to Fisheries (EAF) has been developed by FAO in response to the need to implement management, in a practical manner consistent with the principles of sustainable development (WCED, 1987), the Convention on Biological Diversity (CBD) and, more recently, the Code of Conduct for Fisheries (FAO, 1995). EAF is consistent with all these principles and has been adopted by COFI, at its 25<sup>th</sup> session in 2003, as the appropriate framework for the management of fisheries. Consequently, it deals with all the ecological consequences of fishing and it recognises the social and economic implications of fishing and its management arrangements. It also assists in understanding how these activities interact and can affect the other. Finally, it provides decisions on necessary institutional arrangements and processes (related to research, development and enforcement of management measures and monitoring of fishing activities) required to ensure the sustainable management of these fisheries.

The requirement for Fisheries Management Plans consistent with the ecosystem approach has been recognised in the *Seychelles Fisheries Act 2014*. The ecosystem approach provides a strong guide to help plan, coordinate and prioritise current and proposed activities. There is broad agreement that management intervention is required in the Mahé plateau demersal fishery.

## **3. Legislative/policy framework**

The *Fisheries Act 2014* under Part II s5 makes for the development of management plans and management measures, and requires those plans to be kept under review. The Act specifies provisions that fisheries management plans may contain; of note are the biological, ecological and socio-economic objectives for the fishery; the management strategy for the fishery including biological, ecological and socioeconomic indicators and reference points; management measures by which the objectives and strategy are to be attained, including harvest control rules; licensing measures; the role of stakeholders in decision making relating to the management plan; performance criteria and timeframes for assessing the performance of management measures in meeting fishery objectives; processes for reviewing the plan and provision for entering into co-management arrangements with stakeholders. Specifically, the Act allows for management regulations relating to closed seasons, closed waters or areas, species of fish to be regulated, authorized gear, size and other characteristics of fish, limits on catch or effort; and the requirement of fishers to supply information deemed necessary under the management plan. The Plan has been developed to be consistent with the provisions of the Fisheries Act.

The Plan reflects the Ecosystem Approach to Fisheries Management (EAFM) and allows for a full co-management framework to be adopted in the future. In following the EAFM, the Plan aims to ensure fisheries development proceeds while addressing the needs of society and without jeopardizing the benefits of marine resources to future generations. The implementation of the Plan is the responsibility of the Ministry for Fisheries and Agriculture (MFA) through its executive arm the Seychelles Fishing Authority (SFA).

#### 4. Development of the plan

Development of the Plan followed the principles of an Ecosystem Approach to Fisheries Management (EAFM), which is now regarded as world's best practice for fisheries management and explicitly incorporates ecological, social, economic and governance aspects of the fishery. The EAFM also places greater emphasis than traditional fisheries management on stakeholder consultation. This paves the way for the evolution of the Plan to a full co-management model in the future. Full details of the development of the Plan, including all levels of consultation, are given in a separate management plan report.

#### 5. Scope of the plan

The scope includes those fishing activities that involve licensed artisanal fishers as well as sport and recreational fishers with the fishing gears listed below. It includes the target reef areas, and their associated catch of fish, including demersal species and some semi-pelagic species. The area of the Plan encompasses the entire Mahé Plateau and its deepwater slopes as described in Zone 1 of the Fisheries Act and Regulations 1991 and revised in 2010 (Table 1, Figure 1). The Plan encompasses an area where fishing by foreign vessels is prohibited.

**Table 1:** Scope of the fishery for management purposes.

NB. Gears such as spearfishing and gillnetting are covered under other legal instruments.

Category	Details
Fishery	Artisanal and recreational fisheries targeting demersal and semi-pelagic fish on the Mahé plateau
Fishers	Artisanal (licensed commercial), recreational (including sportfishers), charter (hire craft)
Gears	Handline, rod and reel, dropline, bottom-set long line, trap
Main target species	Snappers ( <i>Lutjanidae</i> ), Groupers ( <i>Serranidae</i> ), Jobfish ( <i>Aprion</i> , <i>Pristipomoides</i> and <i>Aphareus spp.</i> ), Emperors ( <i>Lethrinidae</i> ), Trevallies ( <i>Carangidae</i> ), Sharks ( <i>Carcharhinidae</i> ), Rabbitfish, ( <i>Siganidae</i> ), Parrotfish ( <i>Scaridae</i> ), Goatfish ( <i>Mullidae</i> )
Area of application	Zone 1: Comprising an area around Mahe Island and Seychelles Bank with the boundary running as follows: From Point 1 (Latitude 5°22.0'S and Longitude 57°23.0'E) to Point 2 (Latitude 3°40.0'S and Longitude 56°06.9'E) to Point 3 (Latitude 3°30.0'S and Longitude 55°11.0'E) to Point 4 (Latitude 3°55.0' S and Longitude 54°23.0'E) to Point 5 (Latitude 4°44.0'S and Longitude 53°47.0'E) to point 6 (Latitude 5°38.0'S and Longitude 56°08.0'E) to point 7 (Latitude 6°34.04'S and Longitude 56°02.0'E) to Point 8 (Latitude 6°34.0'S and Longitude 56°23.0'E) and back to Point 1, the Point of commencement

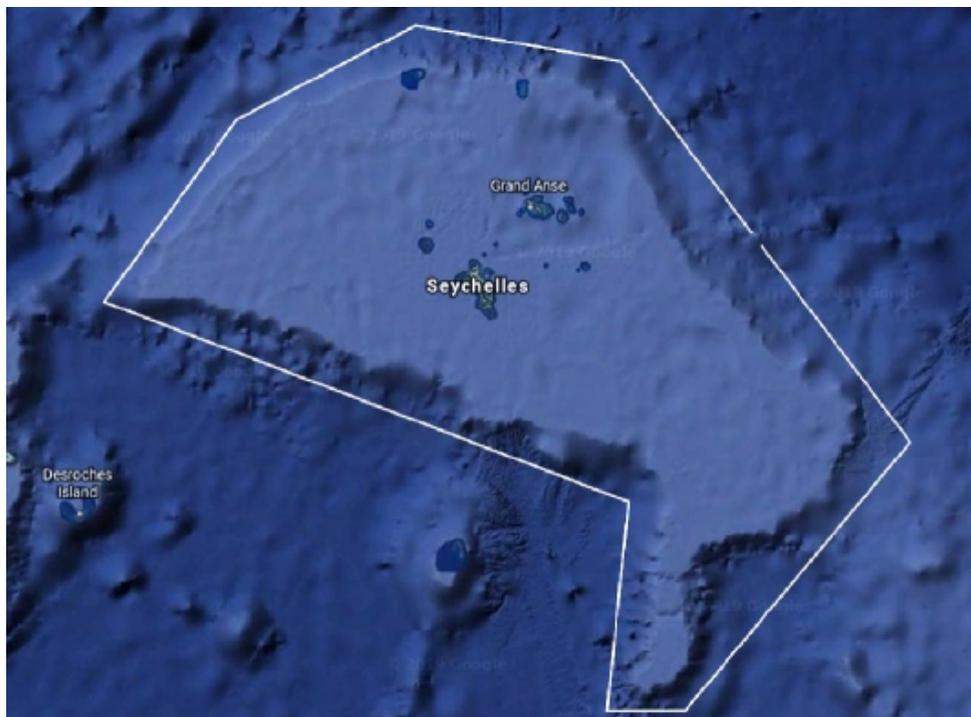
## 6. Stakeholder engagement

### Key stakeholders

Key stakeholders in the fishery includes: all fishers (commercial, recreational, sport fishers, hire craft operators), NGOs, government agencies and departments, Government officials, restaurateurs, processors, boating and seafood retail businesses.

### Engagement strategy

Effective stakeholder engagement was key to the development of the Plan and will be the key to its ultimate success as long as there is the commitment to continue this engagement for the future monitoring and further development of the Plan. The establishment of a plan Implementation Committee, recommended as part of the future implementation of the Plan, will be a critical first step to achieving this in conjunction with a comprehensive communication and extension strategy to be developed as part of the Plan.



**Figure 1.** The area of application of the co-management plan. Extracted from Google Earth with a KML file of the longitude and latitude coordinates of Zone 1.

## 7. Fishery background

### Fishery characteristics

The artisanal fishery in Seychelles operates predominantly on the Mahé Plateau. The Mahé Plateau is a steep-sided plateau approximately 40,000 km<sup>2</sup> in area that rises rapidly from around 1000m. The area of the plateau is made up predominantly of subsurface granite and coral outcrops forming banks with a maximum depth between 50 and 65 m. The relatively large area of the shallow banks and plateau in Seychelles provides the main fishing grounds for an important artisanal demersal fishery.

The artisanal fishery in Seychelles is a multispecies fishery comprised of demersal, reef-associated and pelagic fish species. The artisanal fishery is characterized by a variety of vessels and gear types. The handline fishery is by far the most important fishery by catch, accounting for more than 73% of total fish landings. The trap fishery is the second most

dominant fishery, primarily occurring in near-shore habitats around the 3 main granitic islands of Mahé, Praslin and La Digue. The trap fishery accounts for 15% of total landings. In the last 20 years however, the inshore trap fishery has moved further offshore, up to a distance of 30km from the granitic islands. Of concern is the percentage of juvenile fish in the catch as a result of the relatively small size of the mesh (40mm stretched). Another concern for sustainability is the heavy seasonal fishing pressure apparently on spawning aggregations of some species by trap and line (see Baseline Report for details). Beach seine and gillnets are used mainly to target small pelagic such as mackerels, sardines, *Decapterus* spp and fusiliers.

The fishery is characterized by over 50 landing sites. Except for Port Victoria and Belombre on Mahé, all landing sites have very limited and rudimentary shore-based facilities.

The sport and the recreational sectors also target demersal species. The sport fishery is a relatively small sector made up of licensed super ski boats primarily taking tourists out for big game fishing for species such as wahoo, dolphin fish, sailfish, tunas and marlins. The main gear type used is trolling, however, some handline fishing for demersal species are also conducted. Its contribution to the coastal livelihood is relatively unknown as there are few data collected for this fishery. Similarly, the monitoring of the recreational fishery is challenging since anyone can fish for leisure or as a hobby in the Seychelles. Fishing is considered as a fundamental right of every Seychellois citizen and therefore there is currently no restriction on access (i.e. no licenses required for recreational fishing). Moreover, because recreational fishers are mostly active during weekends, most of the landings are not currently recorded in the SFA catch statistics.

### **Key species**

The fishery is a multi-species fishery and many species are harvested. The line catch consists predominantly of demersal species such as snappers (*Lutjanus* spp.) including green jobfish (*Aprionvirescens*), groupers (*Epinephelus* spp.), emperors (*Lethrinus* spp.), semi-pelagic *Carangoides* spp., and bonito (*Euthynnus affinis*) while the trap catch is predominantly Rabbitfish (*Siganus* spp.), Parrotfish (*Scarus* spp.) and Goatfish (*Parupeneus* spp.). From 2002-2010, the average annual artisanal demersal catch was 3989 metric tonnes of which the three major species groups landed were: Trevally (*Carangoides* spp.; 25.8 %), bourzwa (*Lutjanussebae*; 20.0 %), Zobgris (*Aprionvirescens*; 15.66 %). Other species taken were: Emperors (5.96 %), Groupers (4.5 %) and Bonito (2.18 %). The full demersal species list for which regulations in the Plan apply is given in Appendix 1.

### **Ecological characteristics**

The biological productivity supporting fisheries varies spatially and temporally. Although the impacts of climate change on terrestrial and marine ecosystems have yet to be adequately assessed in Seychelles, the 1998 coral bleaching event clearly demonstrated its ability to cause major habitat perturbations, with potential to cause changes in fish diversity and abundance and severe socio-economic impacts.

Habitat perturbation can also be directly caused by human actions. In Seychelles, there is an extreme scarcity of land for development purposes. As a consequence, major land reclamation works have been carried out since the early 1980's on Mahé and Praslin to provide much needed land for infrastructure. These reclamations have had significant impacts on coral reefs and the productivity of the coastal zone. Tourism development along the coastal fringe through reclamation has directly impacted fisher access to the sea.

### **Economic characteristics**

It is estimated that the fishing sector, including ancillary activities, generates both directly and indirectly around 6,000 jobs, amounting to about 17% of total formal employment. In terms of income generation, for 2008 the National Statistics Bureau

(NSB) estimated the “direct” contribution of fisheries activities to the total Gross Domestic Product (GDP). This method of calculating GDP was applied to previous years' data and it showed that since 2004, the percentage of fisheries contribution to the total GDP has been increasing from 6.4% at current market prices to 7.7% in 2008 (NSB report, May 2010). It is believed that should all fisheries related activities be taken into account, the annual true contribution to GDP would be between 15 and 20%. Although the industrialized fishing sector is more lucrative, the artisanal fishery represents significant local importance through food security and income generation.

Official figures from the Central Bank of Seychelles indicate that from 2008 to 2010 gross earnings from fisheries and fisheries related activities surpassed gross earnings from tourism. This further highlights the economic importance of the fisheries sector and its role in the development of the country.

The economic viability and the social background of fisheries have an important impact on sustainable use and response to management. At present, socio-economic information is not well integrated in fisheries monitoring even though fisheries specific socio-economic surveys are conducted from time to time. A reliable and efficient economic and socio-economic data management and dissemination system is crucial not only for fisheries management purposes, but for effective monitoring of the performance of the sector.

The number of fishers employed full-time in the artisanal demersal fishing sector in 2011 was estimated to be 1,100. Recent estimates (2014) also indicate that full-time demersal fishers represent 62% of the total number of fishers in the artisanal fishery sector and account for approximately 80% of total fish landings. There are also estimated to be approximately 375 sport and recreational fishers (Nageon de Lestang, 2011).

Artisanal fisheries catches have remained fairly stable since comprehensive monitoring began in 1985, averaging 4,568 metric tonnes per annum; however, over the period 2008 to 2010 catches dropped significantly by 45%. Piracy and the rising cost of fishing operations are factors that may have contributed to this decline in artisanal fisheries catches over the past 3 years. However, recent risk and stock assessment results demonstrate multiple lines of evidence that overfishing on some of the major plateau fishery species is likely to be occurring and that management intervention is an urgent need (Gutierrez, 2015).

### **Existing regulations**

Prior to this management plan there were a number of fisheries management regulations in force. As such these are not included in this Plan however, they are noted here:

The use of explosives, poisons and noxious substances is prohibited in taking fish.

The use of a speargun in the taking of fish is prohibited.

Taking of marine mammals is prohibited.

Setting a fish aggregating device is prohibited unless authorized.

A licence is required to undertake commercial fishing for the purposes of selling fish.

A licence is required for charter (hire craft) vessels used for the purposes of taking paying customers fishing.

Minimum trap mesh size

Prohibition of the use of large pelagic net

The development of a Praslin co-management plan preceded the development of this plan and thereby served as a pilot plan development exercise.

## 8. Plan objectives

### Overarching goal

The overarching goal of the Plan is:

*A sustainable demersal fishery that delivers best possible ecological, economic and social benefits for the Seychelles through effective, **TRANSPARENT** and participatory management.*

### Broad objectives

There are four key components of the overarching goal and each comprise a separate broad objective of the plan:

#### **Ecological:**

*To ensure ecological sustainability of the fishery resource and maintain healthy ecosystems that the fishery depends on.*

#### **Economic:**

*To optimise and sustain the economic benefits from the fishery.*

#### **Social:**

*To optimise and sustain the social benefits, and promote cultural values, for the Seychelles.*

#### **Governance:**

*To ensure management processes are transparent, accountable and participatory; and management measures are simple, effective and equitable.*

## 9. Fishery issues

Based on stakeholder workshops on Mahé and Praslin during November 2014, over 180 individual fishery issues (or variations of issues) were identified. The purpose of identifying the issues in the fishery was to try and address as many as possible in the Plan while making sure that the most important issues are given highest priority. It is not possible to address every single perceived issue as this would make the Plan too large, complex and ineffective. Therefore, stakeholders were also asked to prioritise the issues during workshop breakout group sessions to enable efforts to focus on the highest priority issues first. Many of the issues raised were variations of the same or similar issues, and although all are documented (see the management plan *report*), and because there were so many, for simplification we consolidated the many issues into several key *Issue themes* and grouped them according the respective categories of the Plan that they belonged (Ecological, Social, Economic, Governance). These are listed in priority order in the management plan report. The development of strategies for the Plan subsequently focused on ensuring that high priority issues were addressed.

## 10. Implementation and Governance

Implementation of the plan will be carried out over two phases separated by approximately 2 years. This will be necessary given this is the first management plan for the fishery and will involve some changes that are confronting and challenging for fishers. Further, some of the management strategies require significant development and

information gathering prior to implementation. Each management strategy is consistent with the overall goal of the plan and fit within the plan's broad objectives. They also address the highest priority issues in the fishery as identified by stakeholders. Stakeholders also identified each management strategy. The effectiveness of each strategy will need to be assessed against the plans objectives and operational objectives under the Performance Measurement System (see below) on an ongoing future basis as more data and information is accumulated. In reviewing the plans effectiveness alternative management measures should be considered as deemed necessary as new issues arise and/or if current issues are not being addressed effectively.

To oversee the implementation of the Plan and future review events, an **Implementation Committee** has been established with agreed rules of procedure. It will meet regularly to discuss progress and suggest changes to the plan, as appropriate. The composition of the Implementation Committee comprises of a cross-section of representative fishery stakeholders (ensuring the fishing industry including charter operators is well represented) and that are considered either as primary or secondary stakeholders. Primary stakeholders are those that benefit directly from or are adversely affected by actions of the management plan. They may be wholly dependent on the fishery resource or related services for their well-being and have few other options when faced with change. Secondary stakeholders are those other people and institutions with a stake or interest in the resources, services or area being considered. The Implementation Committee has 14 voting members split equally between primary and secondary stakeholders. It also allows the inclusion of other primary and secondary stakeholders as observers who can participate in the deliberations of the Implementation Committee but without vote. Consequently a number of other organisations form an integral part of the process, including the Seychelles Tourism Board, the Department of Environment (DOE), the Seychelles National Park Authority (SNPA), the Seychelles Port Authority and the Seychelles Maritime Safety Administration (SMSA). Other important organizations are Seychelles Licensing Authority, the Coast Guard, the Police, and the Attorney General's Office, as well as NGO's.

The Implementation Committee serves as a representative body of key stakeholders in the co-managed fishery. The Committee will report on and make recommendations to the Minister responsible for Fisheries in relation to the implementation of the co-management plan. The extent of responsibilities will encompass issues relating to day-to-day management, education and awareness and enforcement. It will meet at least every 3 months, and make publicly available an update on progress of implementation (e.g. posted on the SFA website).

The Committee will also report on and make recommendations in relation to the performance of the fishery in terms of meeting its objectives under the Performance Monitoring System (PMS), report on compliance, updates on the status of fish stocks, changes to regulations, and the performance of the education awareness strategies. The Committee will have responsibility for ensuring that relevant information and reports on the fishery are made publically available. The SFA will provide administrative support to the Implementation Committee and provide reports on the PMS, fish stock status, fishery compliance as required.

## **11. Management strategies and regulations**

Several management strategies and regulations follow. These were decided following extensive consultation with stakeholders during the preparation of the co-management plan document in 2015. The Implementation Committee will oversee the implementation of these previously agreed strategies and regulations and may request changes to their order, or the detail of their implementation as it may consider appropriate, in keeping with the broad objectives of the co-management plan. It may also consider additional strategies or regulations that contribute towards the fulfilment of the co-management plan's broad objectives.

***Phase 1*****Management Strategies*****1. Develop and implement a stakeholder communication strategy.*****Intent of strategy**

The intent of this strategy is to ensure that all fishery stakeholders are informed about matters relating to management of the fishery. This will help to ensure that stakeholders understand the basis for decisions, and are informed enough to actively participate in providing input into future management decision-making processes. Additionally, the communication strategy should ensure that stakeholders have the necessary information to comply with management regulations.

***2. SFA employ a full-time liaison officer(s).*****Intent of strategy**

To have an SFA staff member dedicated to support the development and implementation of the stakeholder communication strategy, and to provide clear lines of communication between stakeholders and government on fishery-related issues. It is also the intent that this position would play a key role in helping to facilitate the development of relevant management strategies scheduled for phase 2 of the Plan, and other similar activities, since consultation will be key to this task.

**Management Regulations*****1. Implement a minimum landing size limit for Bourzwa (*Lutjanussebae*) of 32 cm (fork length).*****Intent of strategy**

That all Bourzwa caught by any fisher that are less than 32 cm Fork Length (FL) must be released back into the water. Bourzwa refers to the emperor red snapper, *Lutjanussebae*. This is an interim management measure with the acknowledgement that the limit of 32 cm FL is unlikely to satisfy the principle behind this strategy and that it will be adjusted accordingly in Phase 2 of the Plan based on scientific data, co-jointly collected by SFA scientists and fishers, for local populations of emperor red snapper (bourzwa).

**2. Implement a minimum landing size limit for green jobfish (Zobgris) of 32 cm (fork length)**

Intent of strategy

That all Zobgriscaught that are less than 32 cm Fork Length (FL) must be released back into the water. Zobgris refers to the green jobfish, *Aprionvirescens*. This is introduced with acknowledgement that the limit of 32 cm FL is unlikely to satisfy the principle behind this strategy behind this strategy, and that it will be adjusted accordingly in Phase 2 of the Plan based on scientific data, co-jointly collected by SFA's scientists and fishers, for local populations of Zobgris.

**3. Implement A bag limit (per person/per day) that applies to recreational fishers (including fishers on sportfishing/charter vessels) for: Bourzwa = five (5); Zobgris = five (5)**

Intent of strategy

Uncontrolled fishing effort leads to overfishing and in the Seychelles demersal fishery there is significant evidence that key fish stocks have declined and are continuing to do so. There is a need to limit targeting on key species by all sectors, especially those species considered at risk due to historical high levels of fishing effort and/or their particular biological characteristics.

**4. Implement a combined demersal species bag limit for recreational fishers of 20 fish per person per day**

Intent of strategy

There is a need to limit the take of all demersal species and this responsibility needs to be shared among all sectors. This strategy is to limit the daily catch of recreational fishers to reduce potential impact through a limit on the number of fish an individual can catch per day.

**5. Implement a maximum limit of 25 active traps per licensed (commercial) fishing vessel.**

Intent of strategy

There is a need to limit the capacity for future effort increases in the trap fishery and also to remove any latent effort currently existing in this sector of the fishery.

**6. *Implement a maximum limit of two (2) traps per vessel for recreational fishers***

Intent of strategy

There is a need to limit the capacity for future effort increases in the recreational sector while also allowing recreational fishers the opportunity to use traditional methods to catch fish for subsistence.

**7. *Implement a bag limit of 20 demersal fish species per semi-industrial fishing vessel***

Intent of strategy

Semi-industrial vessels are generally defined as large vessels with reasonably sophisticated technological capabilities that target tunas or swordfish using longlines. The intent is to remove the capacity for large semi-industrial vessels to target large quantities of demersal fish on the plateau and for them to refocus their fishing effort on pelagic species off the plateau.

**8. *No trap is to be left in the sea overnight on listed rabbit fish (Kordonnyen) spawning sites from September to April inclusive.***

Intent of strategy

Spawning aggregations make fish easy to target at a sensitive time in their life cycle. Globally the practice of fishing fish spawning aggregations has often led to overfishing and stock collapses.

The intent of the strategy is to ensure there are no traps left in the water during night hours on the nominated Kordonnyen spawning sites during the spawning months.

**9. *Implement a maximum limit of 6 traps per boat per day for 7 days spanning the full moon (3 days prior and 3 days post) on listed Kordonnyen spawning sites from September to April inclusive.***

Intent of strategy

The intent is to constrain the capacity for targeting spawning aggregations of kordonnyen (rabbitfish). The spawning sites this applies to are listed in Appendix 2. Each site is to be named and identified by GPS co-ordinates and the strategy will apply to the area represented by a 100m radius from the co-ordinates.

## Phase 2

### Management Strategies

#### ***1. Develop and implement a fisheries licensing framework***

##### Intent of strategy

This strategy is intended to provide a framework that facilitates greater control and monitoring of fishing effort that will enable future effort reductions to occur to reduce the threat of overfishing. The intent is for a framework that is developed in consultation with fishers. It should explicitly define their fishing operation, the permissible activities and conditions of that operation in accordance with the Plan and existing fisheries regulations.

#### ***2. Develop and implement a revised incentive scheme for commercial fishermen***

##### Intent of strategy

The intent of this strategy is to provide incentives to fishers for adhering to the licensing system. The current incentive scheme provides discounted fuel and may or may not be part of a revised scheme. The intent is also that the old scheme be reviewed to introduce a revised version that is equitable and effective with meaningful incentives under a rights-based licensing system.

#### ***3. SFA to develop a framework to facilitate the ongoing capacity of the fishing industry to engage with SFA on management issues***

##### Intent of strategy

The intent is for SFA to provide resources to develop clear and simple communication channels for the fishing industry in dealing with government. This may involve SFA to assist and empower industry (commercial fishers primarily) to become a more professional and cohesive group that will provide the mechanism to communicate with SFA (and other stakeholders) more effectively and efficiently. In doing so, it is envisaged that the commercial artisanal fishing sector will have a stronger voice and a more professional reputation in the community.

**4. Introduce offset provisions to compensate ecosystem impacts affecting the fishery**

Intent of strategy

The intent of this strategy is that the fishing industry is adequately and fairly compensated where there are environmental impacts from coastal developments and/or reclamations. This would require the development of an adequate regulatory framework to ensure mechanisms are in place for this to occur.

**Management Regulations**

**1. Introduce minimum landing size limits consistent with  $L_m50$  (Fork Length) and base on scientific data for the following species:**

**Bourzwa**, *Lutjanussebae*; **Zobgris**, *Aprionvirescens*; **Karang plat**, *Carangoidesfulvoguttatus*; **Karangbalo**, *Carangoidesgymnostethus*; **Vyey plat**, *Epinephelusmultinotatus*; **Varavara**, *Lutjanusbohar*; **Bordmar**, *Lutjanussanguineus*; **Makonde**, *Epinepheluschlorostigma*.

Intent of strategy

The intent of the strategy is to allow key species identified at-risk, the opportunity to breed before they can be caught and kept. Of the listed species, all fish caught that are below the MSL (once determined) must be released back in the water. The species are:

**2. Schooners and whalers shall not carry on board more than 2 traps**

Intent of strategy

There is a need to limit the capacity for future effort increases in the trap fishery and also to remove any latent effort currently existing in this sector of the fishery.

**3. Implement a recreational demersal species bag limits for high-risk species**

Intent of strategy

There is a need to limit targeting on key species by all sectors, especially those species considered at risk due to historical high levels of fishing effort and/or their particular biological characteristics. This strategy ensures the responsibility of limiting catches is also shared among the recreational sector.

## **Review biennial review and record of revisions**

It is recommended that the PMS is reviewed biennially to ensure that the performance measures and reference points are valid and reflect any changes to the type and quality of fisheries data available for analysis. All revisions and changes to the PMS should be clearly documented and made publicly available as soon as practical.

A detailed Performance Measurement System including Decision Control Rules is available in a separate stand-alone document.

## **12. Monitoring, Control and Surveillance**

Protocols for Monitoring, Control and Surveillance (MCS) were developed in conjunction with the Plan and are available as a separate stand-alone document.

A risk assessment and risk management approach was used to inform the development of the MCS Protocol. The methodology used is current best practice, follows ISO31000 guidelines and has been adopted by many national and international fisheries agencies and organizations (e.g. FAO, Indian Ocean Commission, Australian Fisheries Management Authority) (International Standard 2009; AFMA 2013). In an environment where there are finite surveillance, enforcement and monitoring resources, the formal risk assessment approach provides a transparent and accountable process for prioritising allocation of resources. The risk assessment process involves 5 steps; these steps include establishing the context of the risk environment; identifying the full spectrum of possible risks in the implementation of the Plan; analysing the risks; evaluating the risk assessment results; and treating the risks by identifying specific monitoring or surveillance/enforcement actions.

Key stakeholders in the fishery: commercial fishers, fisher associations, Fishing Boat Owners Association (FBOA), sports fishing/charter operators, recreational fishers, NGO's, Government Agencies (e.g. SFA and the Coastguard) were engaged in, or had the opportunity to contribute to the risk assessment and prioritization process.

The risks assessed in the MCS protocol were derived from the management regulations outlined in the Plan and an additional 12 regulations from the *Fisheries Act 2014* relevant to the Mahé Plateau region that were identified by stakeholders.

The MCS protocol is composed of 2 phases, which are consistent with the 2-phased approach for the implementation of the Plan. From the regulations identified in the Fisheries Act and that proposed in phase 1 of the Plan, 25 risks were identified for analysis. 16 of the 25 identified risks were classified as 'HIGH' risk or greater. In phase 2, 32 risks were identified of which 22 were classified as 'HIGH' risk or greater.

## **13. Performance measurement system**

The Performance Measurement System (PMS) objectively measures the fishery performance against a number of operational objectives that include ecological, economic, social, and governance dimensions. A PMS serves to promote transparency in fisheries management by measuring and publically reporting on the fishery's performance. The PMS consists of operational objectives, performance indicators, target and/or limit reference points, and decision control rules. In developing the PMS, consideration was given to the availability of data on the fishery, resources available to conduct the PMS analyses and report outcomes to stakeholders. The PMS also needs to be kept relevant by periodically reviewing the operational objectives and updating Performance indicators and reference points as new fisheries data becomes available.

### **Selection of Operational Objectives**

Results of a Productivity Susceptibility Analysis (PSA), stock assessments on key species in the fishery (Gutierrez 2015) and issues raised by stakeholders informed the setting of the operational objectives for the Mahé Plateau demersal fishery PMS. The

assessments identified consistent trends in declining CPUE for a number of key species over the last 10 years; operational objectives relate to the rebuilding of declining stocks of these species (Gutierrez 2015). Ecological operational objectives are limited to target species in the fishery due to data and information constraints on any by-catch (species discarded), impacts of fishery on ecosystem and status of fishery habitats. Refer to the PMS summary below for a full list of operational objectives.

### **Selection of Performance Indicators**

The PMS is constrained in the type of indicators that can be used due to the fishery being relatively data poor. Empirical indicators are used such as trends in CPUE, size structure of catch relative to estimated  $L_{50}$  and changes in species composition of catches for which data are currently being collected (Gutierrez 2015). Relative changes in standardized CPUE are used as a proxy for biomass (stock size), however these are used with high levels of caution given the likelihood of hyperstability in a number of key species in the fishery. Proxies for fishing mortality include relative changes in mean size of landed catch and measures of fishing effort.

For several operational objectives the PMS provides multiple Performance Indicators and reference points, relating to different aspects of the stock and fishing mortality. This is advantageous in data poor fisheries where there are uncertainties in stock status. It provides for the use of a 'weight of evidence' approach that considers all sources of available information in determining stock status (Ziegler et al 2006).

Specific Surveillance and Enforcement resources have been directed at risks rated 'HIG' and greater. Risk factors rated 'MODERATE/HIGH' and less, are included in general surveillance and enforcement activities. A costed Implementation plan is provided to deliver the MCS Protocol. This covers surveillance/enforcement, monitoring/data collection, and education and awareness related actions.

## **14. Plan review process**

The process of reviewing the Plan is an essential component post-implementation to:

- Ensure that the Plan is achieving its stated objectives.
- Identify emerging issues that may need to be incorporated into the Plan.
- Review new data/information and incorporate as necessary into the Plan.
- Modify the Plan as necessary based on the above.

The Plan shall be reviewed *biennially* as a balance between limiting resources required to conduct a review and the likely timeframes for meaningful change to be experienced in the fishery and the Plan strategies. An essential component of the review process will be the application of the Plans Performance Measurement System (PMS). This process will involve collating and analysing relevant information and so will require the necessary personnel and time (see action plan). The *Implementation Committee* will be responsible for overseeing each subsequent review of the Plan and the associated process. The outcomes of any review process shall be documented, advertised and made publicly available.

**Dated this 31st day of January, 2020.**

**CHARLES BASTIENNE  
MINISTER OF FISHERIES  
AND AGRICULTURE**