

# SEYCHELLES FISHING AUTHORITY TECHNICAL REPORT

## REPORT ON THE SPINY LOBSTER FISHERY Lobster Survey Report 2020



# **LOBSTER SURVEY REPORT 2020**



©Roger Swains ton  
Source: anima.net.au/ image ID: IB0418  
*Species: Panulirus ornatus*

**SFA Fisheries Research Section**



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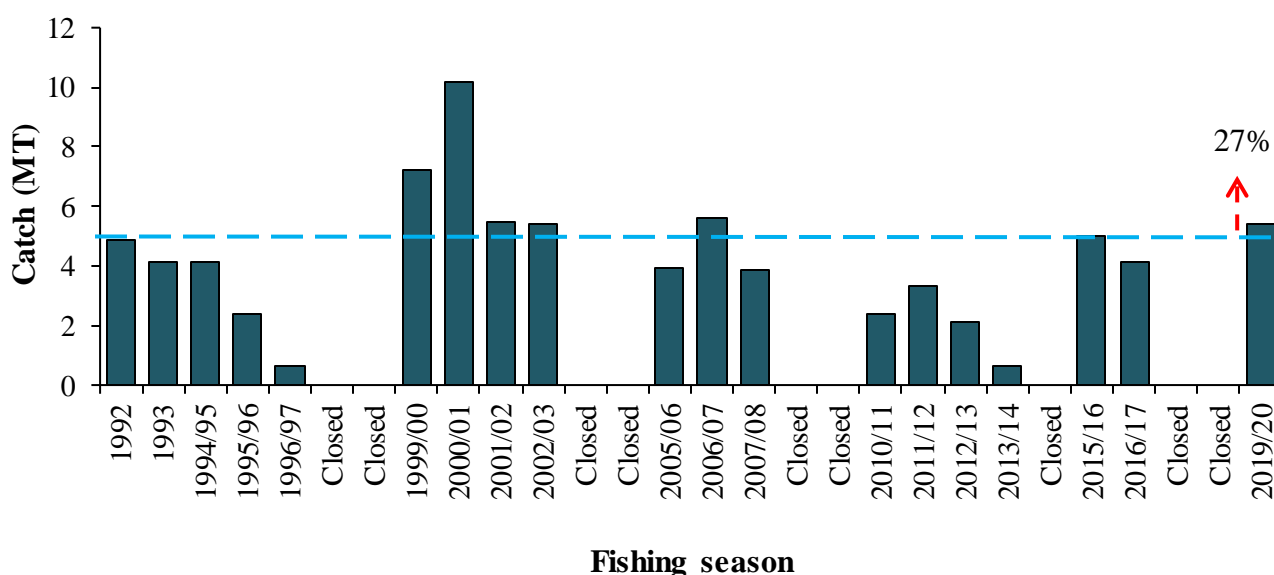
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## 1. Introduction.

The spiny lobster fishery has been conventionally managed by seasonal closures and limited access (license-limited) regulations implemented by the Seychelles Fishing Authority. These regulations have been in force to limit fishers primarily targeting coastal and shallow water stocks, where abundance is limited and easily accessible. In the past, assessments of fisheries dependent data have shown several significant declines in the coastal stocks when too many licenses are allocated or when the fishery remains open for 3 to 4 consecutive seasons. Consequently, the stock status is determined by assessing both fisheries dependent and independent (surveys) data. Results obtained are provided to managers with advice on whether the fishery should be opened or remain closed.

The 2019-2020 lobster fishing season was opened after remaining closed for two consecutive seasons (2017-2018, 2018-2019, **Figure 1**). In October 2020, as part of the Participatory Lobster Monitoring Programme (PLMP) a fisheries independent survey was carried out to assess stock status at 20 sites around Mahé. The aim of this paper is to present the results of the PLMP survey and to present information on several stock indicators based on the combined data collected from the survey and the 2019-2020 fishing season.

Moreover, it provides several recommendations and advice to managers on both fishery and survey to decision making on whether the 2020-2021 fishing season should be opened or remain closed.

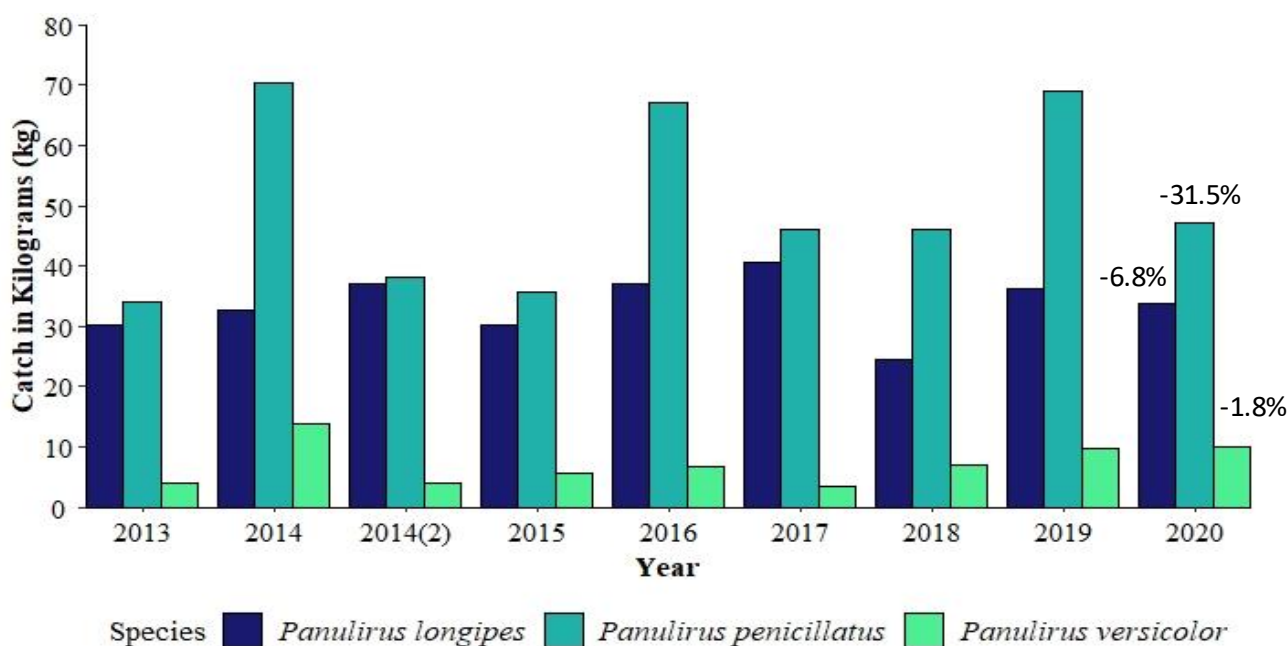


**Figure 1.** Overview of the catches from the lobster fishery from 1992 to 2020.

## 2. Fisheries independent survey (PLMP survey).

### 2.1. Total catch.

The total catch of lobsters for the 20 sites surveyed is shown in **Figure 2**. In 2020, 90.9 kg of lobsters were caught as opposed to 114.8 kg in 2019 representing a 20.8% decrease. The catch composition consisted of three species notably *Panulirus longipes*, *P. penicillatus* and *P. versicolor*. *P. penicillatus* remains the dominant species with a total of 47.2 kg, followed by *P. longipes* 33.9 kg and *P. versicolor* 9.8 kg. Compared to 2019, this represent a decline of 31.5%, 6.8% and 1.8% respectively (**Figure 2**).



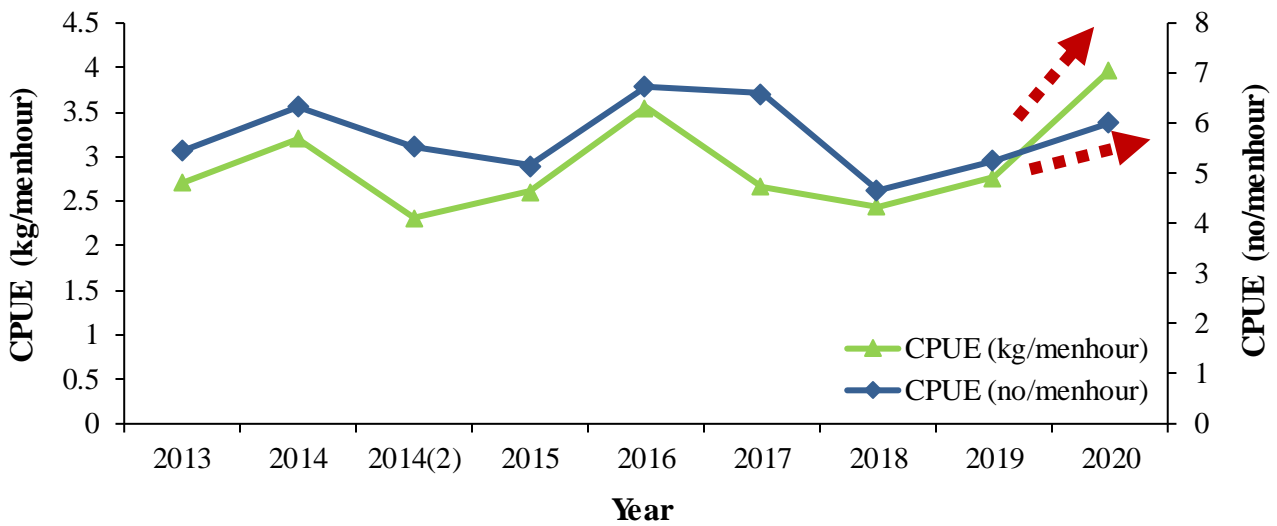
**Figure 2.** Total catch by species in kilograms for the twenty survey sites from 2013 to 2020.

## 3. Abundance and biomass indicators.

### 3.1. All lobsters caught.

The average catch per unit effort (CPUE) in kg/menhour and no/menhour\* from 2013 to 2020 can be observed in **Figure 3**. In 2016, the CPUE increased by 35% (kg/menhour) and 30% (no/menhour) compared to 2015. A 25% decline was observed in the CPUE in kg/menhour whilst the CPUE in no/menhour remained relatively stable in 2017. Further declines in CPUE were observed in 2018. In 2019 a 13% increase for both measures of CPUE was recorded. Similarly, in 2020, both measures of CPUE showed an increasing trend of 7.6% (kg/menhour) and 14.6% (no/menhour).

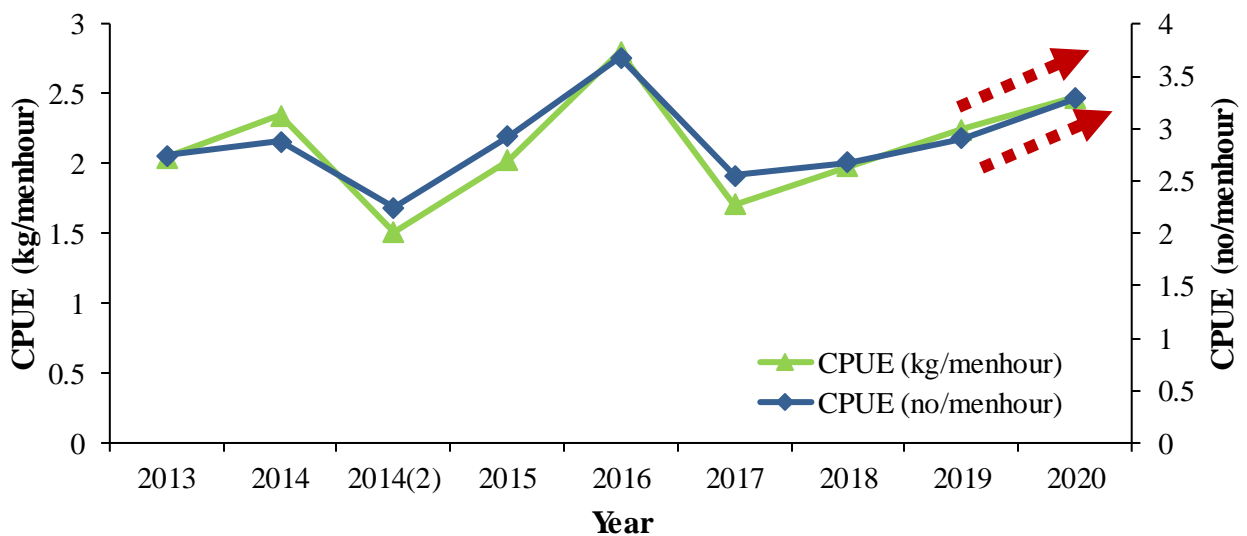
\* menhour = transect time per site multiply by number of men (2) snorkelling.



**Figure 3.** Average catch per unit effort at survey sites in kilogram/menhour and numbers/menhour for all lobsters caught from 2013 to 2020. Red arrow highlights increasing trends.

### 3.2. Legal sized lobsters (>7.5 cm Carapace Length).

The average CPUE for legal sized lobsters caught varied over the survey periods. From the second survey in 2014 to 2016, an increasing trend can be observed in both measures of CPUE (**Figure 4**). In 2017, a decline of 39% (kg/menhour) and 31% (no/menhour) was observed in both measures of CPUE compared to 2016. However, 2018 CPUE data for legal sized lobsters presented an increase of 16% (kg/menhour) and 5% (no/menhour) in comparison to 2017. Further increases in CPUE was observed in 2019. A 13.2% and 8.4% increase for kg/menhour and no/menhour respectively, was recorded in 2020.

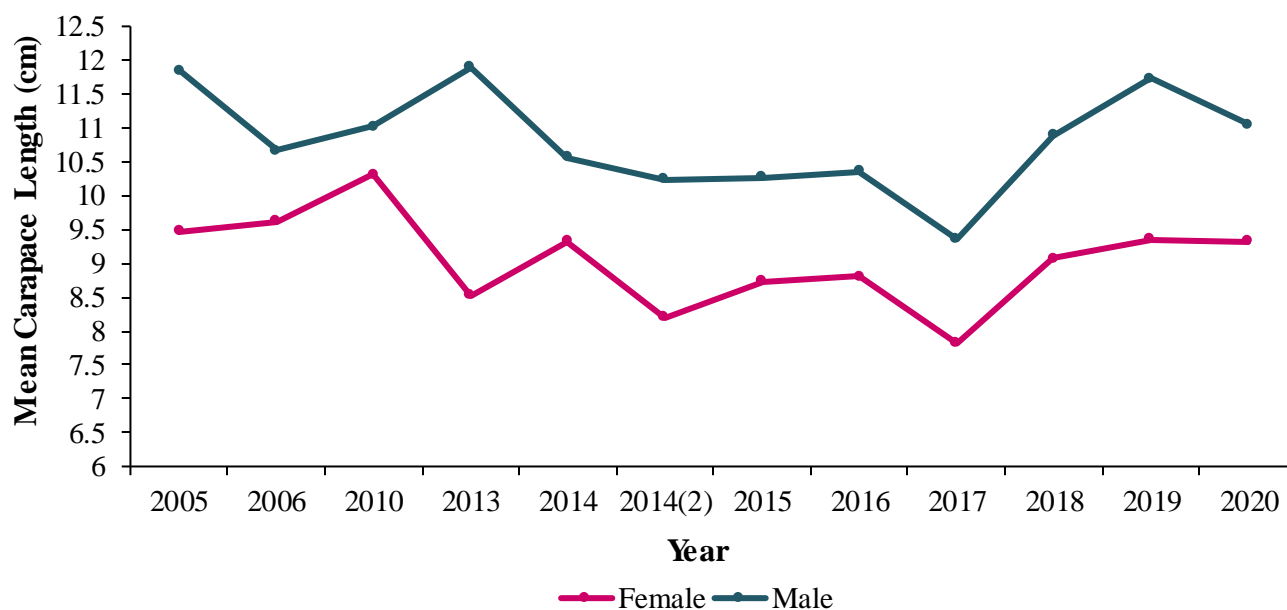


**Figure 4.** Average catch per unit effort for legal sized lobsters caught from 2013 to 2020. Red arrow highlights increasing trend.

#### 4. Length based indicators.

##### 4.1. *P. penicillatus.*

The average sizes of *P. penicillatus* caught during the surveys are shown in **Figure 5**. A decrease in the average carapace size, by about 1 cm, can be observed for both males and females between the year 2016 and 2017. However, in 2018 females and males showed an increased average carapace size of 1.3 cm and 1.5 cm respectively. Further increase in the average carapace size of both females (0.3 cm) and males (0.8 cm) was observed in 2019. In 2020, the average carapace size shows a decrease in males (0.7 cm), whilst that of females remains relatively stable (**Figure 5**).

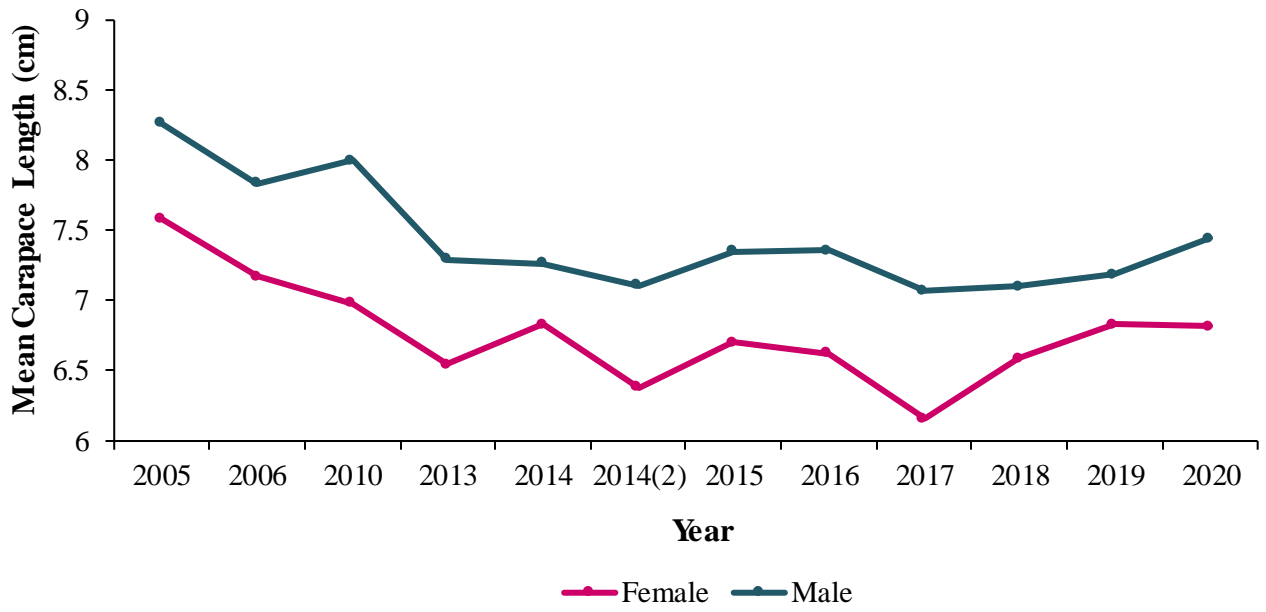


**Figure 5.** Average carapace sizes of *P. penicillatus* caught during the surveys between sexes from 2013 to 2020.

##### 4.2. *P. longipes.*

Similarly, a decreasing trend was observed in the average carapace size of *P. longipes* surveyed between 2016 and 2017. However, the magnitude of the decline is minute compared to *P. penicillatus*. The average carapace size of males decreased by 0.3 cm and females decreased by 0.5 cm. In 2018, the average carapace size of males remained stable whilst that of females increased by 0.4 cm. The average carapace size increased by 0.2 cm for males and by 0.4 cm for females in 2019. In 2020, the average carapace size shows an increase in males (0.3 cm), whilst that of females remains relatively stable (**Figure 6**).








**Figure 6.** Average carapace sizes of *P. longipes* caught during the surveys between sexes from 2013 to 2020.

## 5. Lobster stock status indicators

**Table 1.** Summary output for lobster survey 2020.

Fishery independent indicators	2019 Survey	2020 Survey	Comments
Catch (compared to long-term average)	1167 kg	90.9 kg	Catch in both years are higher than the long-term average of 86 kg ( <b>Figure 2</b> ).
Catch (compared to previous survey)	44.3% increase	20.8% decrease	Catch decreased in 2020 survey compared to 2019 survey ( <b>Figure 2</b> ).
CPUE Kg/menhour (all lobsters compared to previous survey)	13% increase	7.6% increase	CPUE increased slightly for all lobster caught between 2019 and 2020 surveys. However, the increase was not statistically significant ( <b>Figure 3</b> ).
CPUE Kg/menhour (legal size lobsters compared to previous survey)	13.4% increase	10% increase	CPUE increased slightly for all lobster caught between 2019 and 2020 surveys. However, the increase was not statistically significant ( <b>Figure 3</b> ).
CPUE No/menhour (all lobsters compared to previous survey)	13% increase	14.6% increase	CPUE increased slightly for all lobster caught between 2019 and 2020 surveys. However, the increase was not statistically significant ( <b>Figure 4</b> ).
CPUE No/menhour (legal size lobsters compared to previous survey)	8.4% increase	13.2% increase	CPUE increased slightly for all lobster caught between 2019 and 2020 surveys. However, the increase was not statistically significant ( <b>Figure 4</b> ).
Mean size <i>P. penicillatus</i> M (compared to previous survey)	7.7% increase	5.7% decrease	Male decreased in size between 2020 and 2019 surveys. However, the decrease was not statistically significant ( <b>Figure 5</b> ).
Mean size <i>P. penicillatus</i> F (compared to previous survey)	3.1% increase	0.4% decrease	Female decreased in size between 2020 and 2019 surveys. However, the decrease was not statistically significant ( <b>Figure 5</b> ).
Mean size <i>P. longipes</i> M (compared to previous survey)	1.1% increase	3.6% increase	Male increase in size between 2020 and 2019 surveys. However, the increase was not statistically significant ( <b>Figure 6</b> ).
Mean size <i>P. longipes</i> F (compared to previous survey)	3.7% increase	0.2% decrease	Female decreased in size between 2020 and 2019 surveys. However, the decrease was not statistically significant ( <b>Figure 6</b> ).

<b>key</b>	 Indicator shows negative trend or comparison	 Indicator shows positive trend or comparison	 Indicator shows a stable trend
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**Table 2.** Summary output for lobster fishing season 2019/2020.

Fishery dependent indicators	2016/2017 Season	2019/2020 Season	Comments
Catch (compared to long-term average)	4120 kg	5421 kg	Catch were higher in 2019/2020 fishing seasons compared to the long-term average (4250 kg), but lower in 2016/2017 (SFA, 2020*; <b>Figure 1</b> ).
Catch (compared to previous season)	17.4% decrease	31.6% increase	Catch increase was observed with a 31.6% difference between 2019/2020 and 2016/2017 fishing season (SFA, 2020; <b>Figure 1</b> ).
Effort (compared to previous season)	5% increase	14% decrease	Effort (no. of fishing trips) declined by 14% difference between 2019/2020 and 2016/2017 fishing season (SFA, 2020; <b>Figure 3</b> ).
CPUE (all gears compared to long-term average)	6.5% decrease	49.5% increase	CPUE increased significantly from the long-term mean = 18.49 kg/trip (SFA, 2020; <b>Figure 7</b> ).
CPUE (all gears compared to previous season)	24% decreased	59.9% increase	CPUE increased significantly during the 2019/2020 fishing season compared to the 2016/2017 fishing season (SFA, 2020; <b>Figure 7</b> ).
CPUE (snorkelling <sup>†</sup> ) (compared to previous season)	24.2% decrease	69.7% increase	Snorkelling as a fishing method increased significantly in 2019/2020 fishing season. (SFA, 2020).
Mean size <i>P. penicillatus</i> M (compared to previous season)	0.3% increase	4.6% increase	Male were significantly larger in size during the 2019/2020 than in 2016/2017 fishing season (SFA, 2020; <b>Figure 11</b> ).
Mean size <i>P. penicillatus</i> F (compared to previous season)	0.2% increase	0.02% decrease	Decrease in size of females caught in the 2019/2020 compared to 2016/2017 (SFA, 2020; <b>Figure 11</b> ).
Mean size <i>P. longipes</i> M (compared to previous season)	1.1% increase	3.7% increase	Increase in male size observed in the two past fishing season, 2016/2017 and 2019/2020. However, males were significantly larger in 2019/2020 (SFA, 2020; <b>Figure 13</b> ).
Mean size <i>P. longipes</i> F (compared to previous season)	1.4% increase	2.9% increase	Average size of females sampled in 2019/2020 was significantly larger than those in 2016/2017 (SFA, 2020; <b>Figure 13</b> ).

<b>key</b>	<span style="background-color: red; color: black;">■</span> Indicator shows negative trend or comparison	<span style="background-color: green; color: black;">■</span> Indicator shows positive trend or comparison	<span style="background-color: yellow; color: black;">■</span> Indicator shows a stable trend
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\* Seychelles Fishing Authority [SFA], 2020. Report on the spiny lobster fishery: Summary of Fishing activity for the 2019-2020 season. Seychelles: Seychelles Fishing Authority, pp. 1-21. SFA/R&D/083.

<sup>†</sup> Scuba diving was the second method use in 2019/2020 however no comparison was made with previous fishing season (2016/2017) because snorkelling was the only fishing method used.

## 6. Conclusion.

Despite a decrease in the overall catch of lobsters in the 2020 PLMP survey, the CPUE data indicates an increase in the relative abundance and biomass of all lobsters caught. In addition, an increasing trend was also observed in the relative abundance and biomass of legal-size lobsters (more than 7.5 cm carapace length). Similarly, the CPUE data from the fishery also points to an increase in the relative abundance of lobsters. This is a positive sign that the lobster stock is in a healthy state.

In terms of size indicators, a slight decrease was observed in the average size of males *P. penicillatus*, however this decrease is not statistically significant when compared with lobster average size in 2019 PLMP survey. The average size of females *P. penicillatus* and *P. longipes* (F and M) were relatively stable. The size indicators from the fishery indicates significant increases in the average size of *P. penicillatus* (M) and *P. longipes* (F and M).

## 7. Recommendations.

Based on the analysis of the fisheries dependent and independent information collected, the Research Section proposes the following recommendations with regards to the lobster fishery:

- **It is recommended that the fishery be opened for a three-month period for the 2020-2021 season to maintain a similar level of fishing effort as the previous season.**
- **It is recommended that the number of licences be capped at 16 (10 licenses allocated for Mahé residents, 4 for Praslin and 2 for La Digue) to maintain the fishing effort at similar levels to the previous season.**
- **It is strongly recommended that a compliance bond of SCR 5000 is maintained to ensure that licensees return their logbook and receipt books at the end of the fishing season.**
- **It is recommended that the annual PLMP survey is carried out in 2021 to continuously evaluate and monitor the status of lobster stock.**
- **It is recommended that monitoring, control and surveillance is strengthened to discourage illegal fishing activities during opened and closed fishing season.**
- **It is recommended that an education and awareness campaign is set up to educate the public on the regulations of this fishery.**

## **8. Reference list.**

Seychelles Fishing Authority [SFA]., 2020. Report on the spiny lobster fishery: Summary of Fishing activity for the 2019-2020 season. Seychelles: Seychelles Fishing Authority, pp. 1-21. SFA/R&D/083.