SEYCHELLES FISHING AUTHORITY
TECHNICAL REPORT

REPORT ON THE SPINY LOBSTER FISHERY

Summary of Fishing Activity for the 2016-2017 season

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SFA Fisheries Research Section

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1. Introduction

The Seychelles artisanal spiny lobster fishery targets shallow water lobster stocks around the main granitic islands. The main species of lobsters caught are Homard Grosse Tete (*Panulirus penicillatus*), Homard Rouge (*P. longipes)*, Homard Vert (*P. versicolor*) and Porcellene (*P. ornatus*). The spiny lobster fishery in Seychelles is a licensed and seasonally-managed fishery with fishers applying for licences prior to the opening of the season, which typically last 3 months in duration. The current management regulations in place for the spiny lobster fishery are:

I.   Restrictions on the number of licenses

II.   Seasonal restrictions (the fishery is typically opened for a 3 month period)

III.   Minimum size (75 mm carapace length for all species)

IV.   Prohibition to retain berried females

The fishery was opened from the 1st of December 2016 to the 28th of February 2017. A compliance bond of SCR5000 was maintained to ensure that licence holders submitted their logbooks at the end of the fishing season. A total of sixteen fishing licences were on offer to fishermen. A total of 15 fishermen applied and was subsequently issued a licence, of which 9 was from Mahe, 4 from Praslin and 2 from La Digue. In comparison, for the 2015/2016 season, a total of 12 licences were issued to fishermen.

This report presents analyses of fisheries-dependent data collected for the spiny lobster fishery during the 2016/2017 fishing season. It also compares the stock indicators, namely the size structure of lobsters and the harvest rate between the 2015/2016 and 2016/2017 fishing season.

2. Sampling methodology and analysis

During the 2016/2017 season data was collected from fishermen operating on Mahé, Praslin and La Digue through two main sources:

a) **Catch and Effort log**: Each licensed fishermen was given a logbook to record information on their fishing activities. Information collected included information on catch, effort and fishing location.

b) **Sampled Catch and Effort log**: SFA technicians sampled the landed catch directly whenever possible. Information on the species caught, weight and length measures were collected. Interviews were also conducted to determine total effort and fishing location.

The total catch of lobsters caught for the season was derived from the sum of the weight of lobsters from the sampled catch and effort log and the raised calculated weight of lobsters from the catch and effort log for each species. The raised weight was calculated from the

average estimated weight multiplied by the number of lobsters caught for each species. The average weight for each species was derived from the total number and weight of lobsters sampled from the sampled catch and effort log recorded by the technicians.

The total effort was based on the total number of fishing trips (number of sites visited per day) undertaken. The catch per unit effort (CPUE) was calculated from the total catch in kg and the total effort. The catch, effort and CPUE and species composition was estimated for the main fishing location groupings.

The length frequency distributions of males and females of the different species of lobsters sampled in 2016/2017 was compared with distributions of lobsters sampled in the previous season using univariate analysis of variance (ANOVA) or Kruskal-Wallis non-parametric tests. Assumptions of the ANOVA model were checked by examining the residual plots for normality of error terms and homogeneity of variances. In addition, homogeneity of variances was checked by running the Fligner-Killeen test. A significance level of $\alpha=0.05$ was used throughout the analysis.

3. Results

3.1 Catch, effort and catch per unit effort

The estimated total catch for the 2016/2017 season was 4.12 t. In comparison, the total catch for the 2015/2016 season was 4.99 t (Fig. 1). This represents a slight decline of 17% in the total catches. The snorkelling technique was the most common method used to catch lobsters, accounting for 98% of the total catches. Traps were the other technique used.
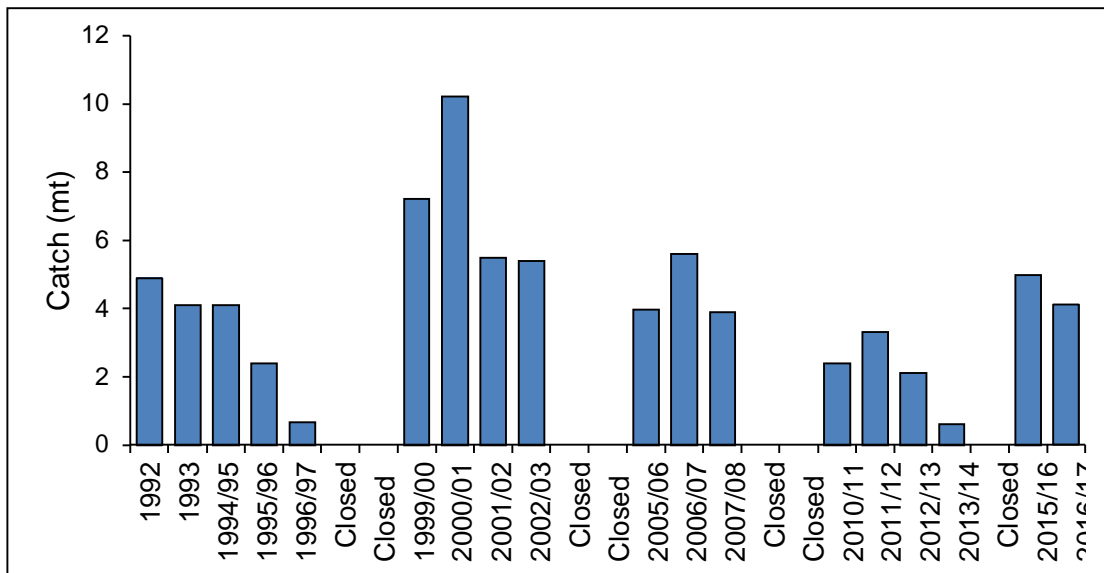

Figure 1. Historical seasonal catch (metric tonnes, t) of spiny lobsters from 1992 to 2017.

Fishing was concentrated mainly around Mahé, with an estimated landed catch of 2.81 t, accounting for 68% of the total catch. This was followed by Fregate/Récif with a total estimated catch of 690 kg and 253 kg from North Island, accounting for 17% and 6% of the total catch respectively. Other minor fishing sites included Praslin and Praslin Ridge where a total of 55 kg and 120 kg of lobsters were caught respectively (Fig. 2).
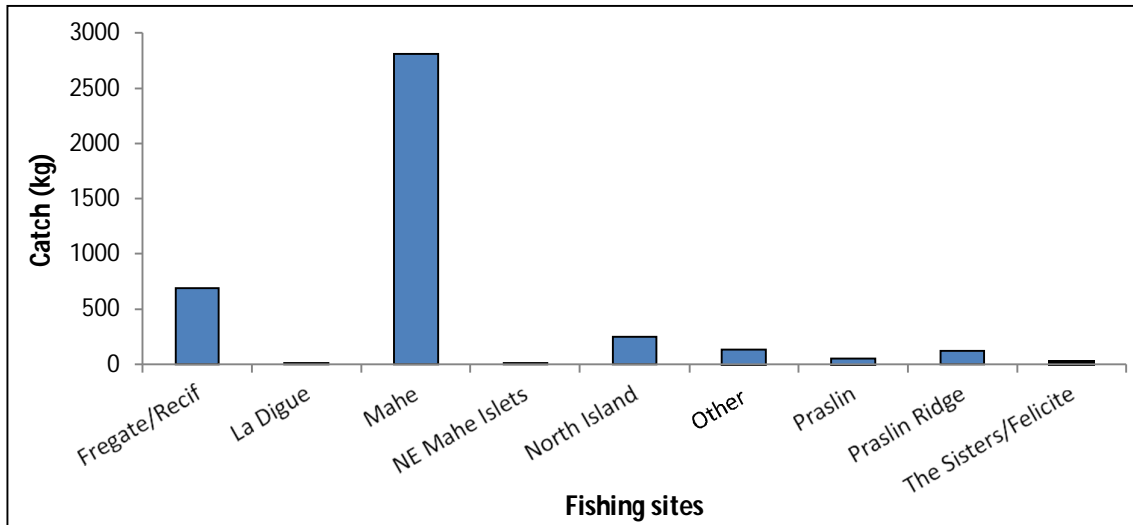

Figure 1. Catches (kg) by major fishing location for the 2016/2017 fishing season.

A total of 230 fishing trips were recorded compared to 219 trips in 2015/2016. In terms of location, fishing effort was highly concentrated around Mahé, with a total of 179 trips, followed by Fregate/Récif with 24 trips (Fig. 3).
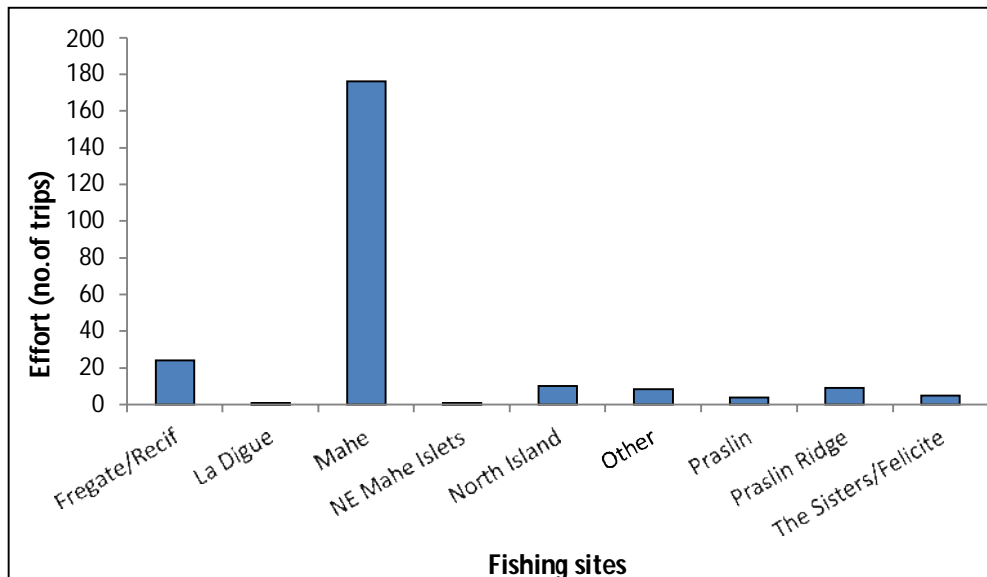

Figure 3. Fishing effort (no. of trips) by major fishing location for the 2016/2017 fishing season.

The estimated CPUE for the 2016/2017 season was 17.3 kg/trip. This represents a decrease of 24% compared to the 2015/2016 season when the CPUE was 22.8 kg/trip (Fig. 4).
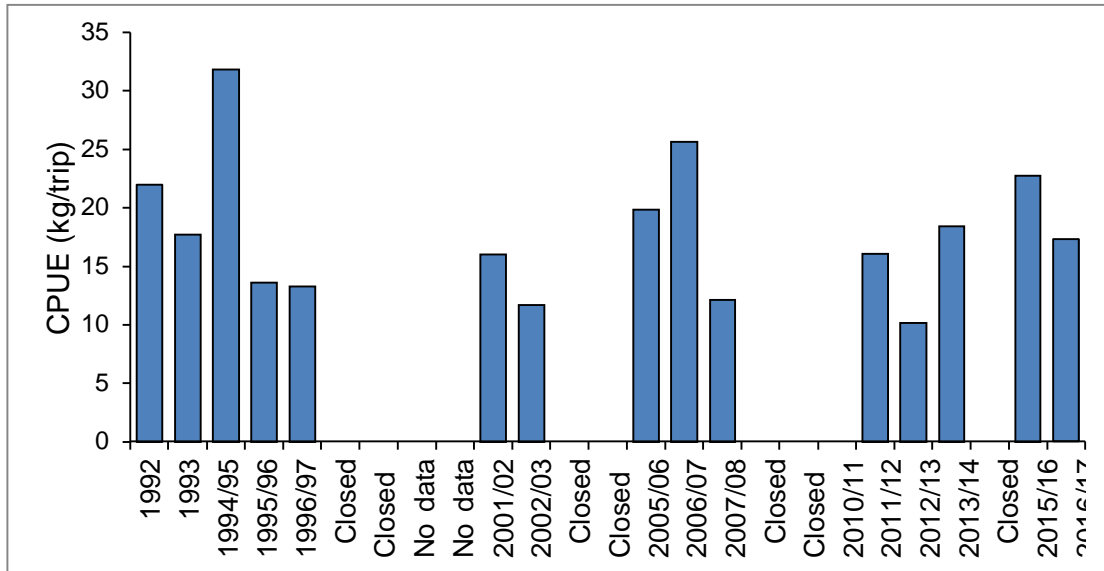

Figure 4. Seasonal CPUE (kg/trip) for open seasons of the lobster fishery between 1992 and 2017. Due to unavailable data for 2 open seasons and underreporting for 2010/2011 season, the CPUE was not calculated.

In terms of fishing locations, the highest CPUEs were recorded at Fregate/Récif and North Island with catch rates of 28.8 kg/trip and 25.4 kg/trip respectively. Mahe recorded a catch rate of 16 kg/trip. The catch rates at the other sites ranged between 5.6 kg/trip and 17.4 kg/trip (Fig. 5).
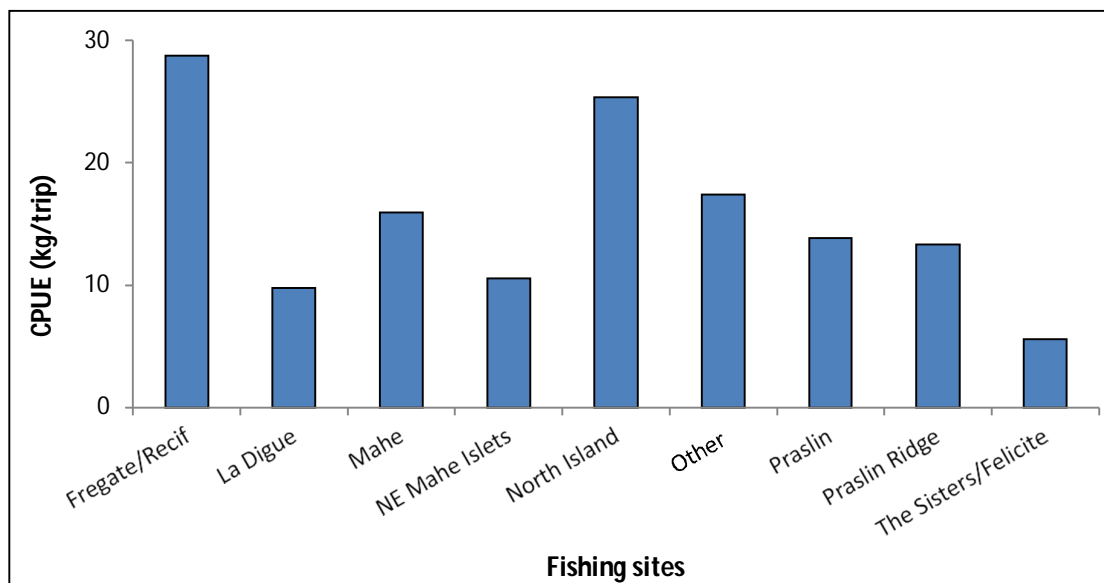

Figure 5. Catch per unit effort (CPUE) (kg/trip) for the 2016/2017 season at the major fishing locations.

3.2 Species composition by location

Catches of the main targeted species during this season was dominated by *P. penicillatus*. A total of 3.2 t of *P. penicillatus* was caught compared to 4.14 t caught in 2015/2016. The second most dominant species in the catch was *P. longipes.* A total of 797 kg of this species was caught compared to 803 kg in 2015/2016. *P. versicolor* and *P. ornatus* were the rarest species caught, comprising of only 118 kg and 3.6 kg of the total catch respectively.

By fishing location, *P. penicillatus* was the main species caught around most of the fishing locations. However, *P. longipes* was the most dominant species caught on Praslin, The Sisters/Felicite and NE Mahe Islets (Fig. 6).
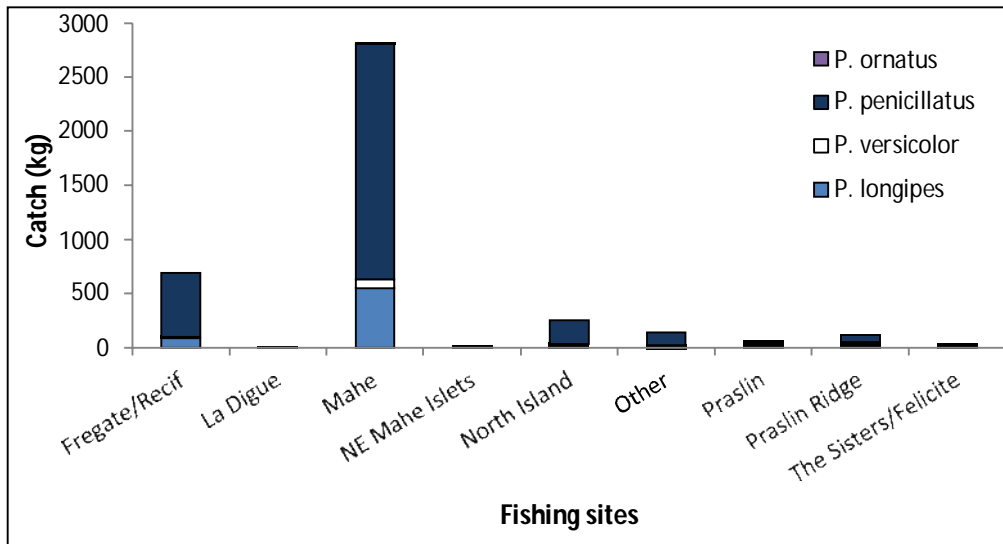

Figure 6. Species compositions of spiny lobster catch from the main fishing locations during the 2016/2017 fishing season.

3.3 Size frequency distributions

A total of 3697 spiny lobsters were sampled for length (carapace length) and sex during the 2016/2017 season compared to 5049 in 2015/2016 (Table 1). This represents a sampling coverage of about 68% of fishing activities for the 2016/2017 season. In contrast, in 2015/2016 the sampling coverage was 86%. Similarly to previous seasons, males dominated females in the samples with a ratio of 1.41.

Table 1. Size frequency sample sizes by species for the last 2 open season.

Season	Species	F	M	Total
	P. penicillatus	1616	2300	3916
2015/2016	*P. longipeds*	382	714	1096
	P. versicolor	16	17	33
	P.ornatus	2	1	3
	P. penicillatus	1140	1527	2667
2016/2017	*P. longipeds*	373	604	977
	P. versicolor	20	31	51
	P.ornatus	1	1	2

Note: M=males, F=females

The relative size frequency distributions of males and females *P. penicillatus* sampled over the last 2 fishing season are shown in Figure 7. The length frequency distribution is similar between the two seasons. Moreover, the average size of both males and females was similar between the two seasons. The average size of females was 9.1 cm whilst that of males was 11.1 cm.
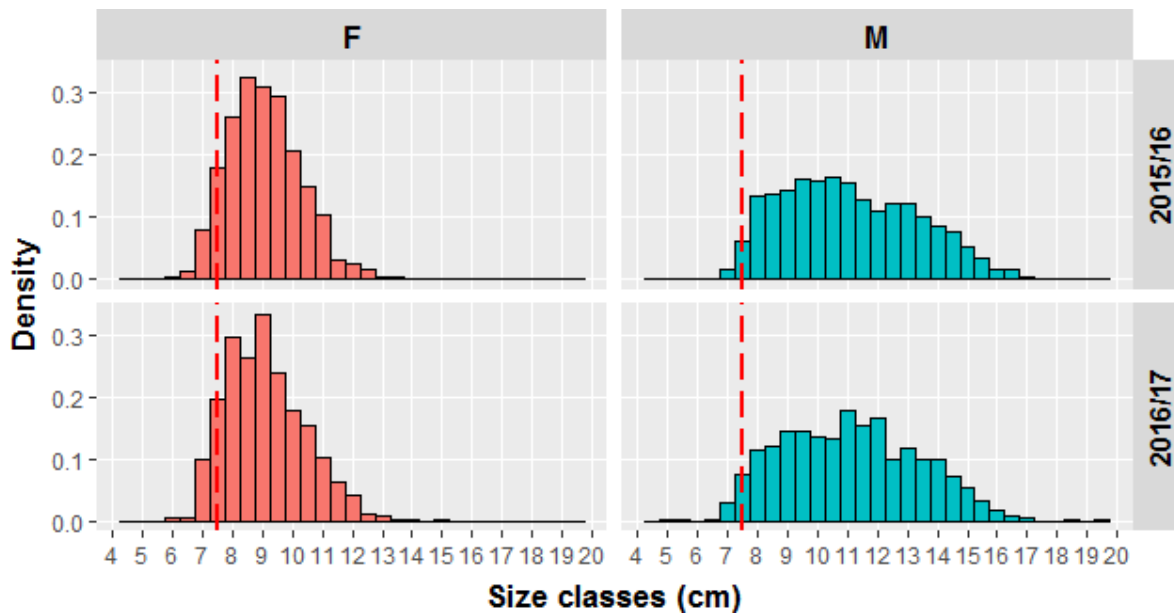

Figure 7. Size frequency distribution of males and females *P. penicillatus* over the last 2 open seasons.

The relative size frequency distributions of males and females *P. longipes* sampled are shown in Figure 8. A similar pattern can be observed between the two seasons. The average size of both males and females sampled in 2016/2017 increased slightly[1]. During the 2015/2016 season the average size of males and females was 8.4 cm and 7.6 cm, respectively. In contrast, during the 2016/2017 season the average size of males and females was 8.5 cm and 7.7 cm, respectively. Similarly to previous seasons, a high proportion of females sampled were below the minimum size limit. During the 2016/2017 season 40% of females were undersized whilst in 2015/2016 the proportion was 44%.
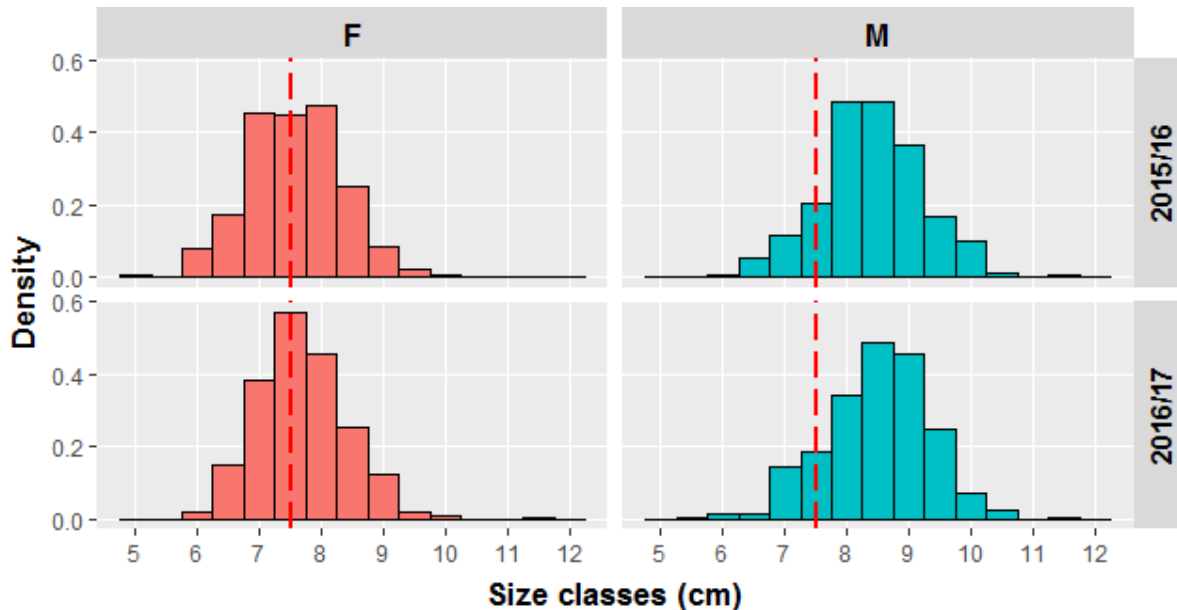

Figure 8. Size frequency distribution of males and females *P. longipes* over the last 2 open seasons.

4. Discussion

Following the closure of the fishery in 2014/2015, the 2015/2016 and 2016/2017 lobster fishing season was opened for a period of three months. The total catch of 4.12 t in 2016/2017 is higher than catches over the past four seasons between 2010/2011 and 2013/2014, however, compared to the last season, a decline of 17% in the catch can be observed. In addition, the CPUE, which is a measure of the relative abundance of lobsters, decreased by 24% compared to last season.

The average size of male and female *P. penicillatus* was stable between the two fishing season. In contrast, Males and females *P. longipes* were significantly larger in 2016/2017 compared to 2015/2016. However, the differences in size were quite small. A very important point of concern in the size composition of the catch is the high proportions of undersize

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[1] ANOVA test Males: $F_{(1,1315)}=4.329$ $p<0.05$, Females: $F_{(1,753)}=3.856$ $p<0.05$

female *P. longipes* lobsters that are recorded in the catch sampled over the last four fishing season (2012/2013= 41%, 2013/2014= 50% and 2015/2016= 44% and 2016/2017= 40%).

This clearly indicates that the current minimum size of 7.5 cm is not being respected with regards to this species, in particular for females. The minimum size of capture is an important regulation since it allows smaller individuals the chance to reproduce before being recruited into the fishery. The extraction of large proportions of undersize lobsters can potentially have negative impacts on the reproductive potential of this species in the future. Monitoring, control and surveillance efforts should increase in order to ensure that fishers are complying with the current regulation.

The Research Section implemented a sampling programme during the lobster season, however, the sampling coverage declined by 18% compared to the previous season. The decline in sampling coverage is due to the fact that some fishers often go out fishing without informing SFA if they will be going out or not. In addition, due to the limited number of staff, it is difficult to set up an effective sampling programme to cover the fishing activities on Praslin and La Digue.

It is worth noting that during the 2016/2017 fishing season, many fishers complained about unfavorable weather conditions which affected their fishing activities during this period. However, a few fishers often take the risks to go out fishing during the bad weather. Such risks often lead to low catches which contributes to the decline in CPUE.

Overall, data collected during the 2016/2017 season indicates that there was a decrease in the relative abundance of lobsters. The data collected in conjunction with information collected from fisheries independent surveys carried out from 2013 to 2017 will be used to further assess the status of the lobster stocks and determine the status of the fishery. Such information and assessments will be useful for managers to decide whether the fishery should be open/remain close for the 2017/2018 season.

5. References

Govinden, R. & Hollanda, S. (2013). The Seychelles Lobster Fishery, Fishery & Stock Status: 2010-2013. SFA Technical Report.

Mees, C. C. (1992). Procedures for monitoring catch, effort and biological parameters from Seychelles Lobster Fishery. SFA, September 1992.

Robinson, J., Dorizo, J. & Assan, C. (2009). The Seychelles Lobster Fishery, Fishery & Stock Status: 2005-2008. SFA Technical Report.

SFA Research Section (2014). Report on the spiny lobster fishery: Summary of Fishing activity for the 2013-2014 season. SFA Technical Report.