Annual Report on the Status of the Artisanal Seine Net Fishery of Rodrigues 2007

E. R. Hardman, F. E. I. Blais, M. S. Desiré, J. S. J. Raffin, S. Perrine and S. Meunier

Shoals Rodrigues, Pointe Monier, Rodrigues

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Summary

As a continuation of a monitoring programme started in 2002, catch assessments were made by Shoals Rodrigues staff during the seine net open season between 1st March and 30th September 2007. Seine net teams from Port Sud Est, Pointe L'Aigle, Baie du Nord and Pointe Corail were followed during the course of a fishing day. The time and position of each haul was recorded and all fish caught were transferred to the survey boat where the species and total length of each individual was determined.

12,997 individuals were landed, with a total weight of 3,916 kg. The catches comprised of 66 fish species. The most important species within the catch was the Goatfish (Rouget), *Mulloidichthys flavolineatus*. Rabbitfish (Cordonnier) *Siganus sutor*, Trevally (Carangue) *Caranx melampygus*, Emperor (Capitaine) *Lethrinus nebulosus*, Convict Surgeonfish (Lorsan) *Acanthurus triostegus* and Mojarra (Breton) *Gerres longirostris* were also important components of seine net catches. Comparisons with catch statistics from 2002 -2007 show that for the first year, *S. sutor* was not the most important species in terms of numbers and was replaced by *M. flavolineatus*. There was also a change in species composition of the catch with previously unimportant species such as *Rhinecanthus aculeatus*, *Sphyraena jello*, *Scarus* spp. and *Fistularia commersonii* becoming important in 2007.

The mean length of a fishing day was 6 hours 15 minutes at sea, with the net deployed for 27% of the total time on average. An average fishing day comprised 10 hauls (net deployments), of which 41% did not result in the capture of any fish. An average haul landed 14.9 kg of fish (40 individuals). Combining the catches for individual hauls gives an average landing of 151 kg (499 individuals) per fishing day. Taking account of the number of fishers and the duration of the fishing day gives a catch per unit effort (CPUE) of 1.1 kg/man-hour on average, which rises to 4.0 kg/man-hour if only the time during which the net was actually in the water is considered. For all fishing teams combined, the number and weight of fish caught per haul and per day decreased between 2006 and 2007, however the CPUE remained constant between probably due to shorter fishing days and the net being submerged for a lower percentage of time.

Length-frequency was calculated for the 10 most frequently caught species. Comparisons with data from previous years indicate that the modal range in fact increased for *Siganus sutor, Caranx melampygus, Lethrinus nebulosus* and *Acanthurus triostegus* between 2006 and 2007, however it decreased for *Mulloidichthys flavolineatus and Gerres longirostris*. The modal range was below the published length of maturity (obtained from FishBase) for 5 species and the data suggest that serious recruitment overfishing is occurring for *C. melampygus, L. nebulosus* and *A. triostegus*. A similar situation is occurring for growth overfishing, with the modal range of the same 5 fish species falling below the length at maximum yield. Determination of mortality rates indicates that fishing mortality is higher than natural mortality for 7 of the 10 species. This is particularly severe for *C. melampygus*, *L. mahsena*, *Chlorurus sordidus* and *Lethrinus harak*.

Although the seine net fishery appears to be operating with only a limited degree of success closing the fishery is likely to only displace the fishing effort and habitat damage from one gear to another. It seems therefore that the development of marine reserves with effective enforcement will provide the most effective management of the seine net fishery in Rodrigues.

Acknowledgements

This work was funded by the U.K. Department for Environment, Food and Rural Affairs (DEFRA) Darwin Initiative and the North of England Zoological Society. The authors would like to thank Sylvio Perrine of the Fisheries Research and Training Unit for background information about the fishery, and Dr Alasdair Edwards of Newcastle University, UK, for assistance with data analysis. Thank you also to the volunteers who helped out measuring fish: Lauren Taylor, Christopher Felicité, Natacha Felicité, Liliana Ally, Fabio Allas, Miguel Anthony, Trevor, Bernard, Robert and others. *Shoals Rodrigues* would also like to acknowledge the co-operation of the Rodrigues Regional Assembly, the Ministry of Fisheries and the Mauritius Oceanography Institute in the undertaking of this work.

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1 Introduction

This report forms part of a continuing assessment of the artisanal seine net fishery in Rodrigues. Reference should also be made to Lynch *et al*. (2003) (2004) (2005) and Hardman *et al.* (2006) (2007) for further details of the results from previous years.

The seine net fishery is of great socio-economic importance to Rodrigues. Seine net fishing is undertaken by teams of fishers, usually with between 15 and 30 men using four to eight boats Fishers use a semi-circular net and herd fish into the net by walking towards it beating the water with poles. Eight seine net licenses were in place in 2007, with teams operating from Baie du Nord, Bengelique, Pointe Corail, Port Sud Est, Pointe L'Aigle and Pointe Coton.

64 people in 2006 were licensed seine net fishers, out of a total of 2,024 registered fishers, which represents 3% of total fisher population. However, seine net landings make a significant contribution to total catch, totalling 266 tonnes in 2006 (42% of the catch of lagoon fish) (S. Perrine, *pers. comm*.).

Reports suggest that fishing activities within the lagoon are impacting heavily on fish stocks and seine net catches decreased from 264 tonnes in 1994 to 157 tonnes in 1997 (FRTU, 2004). During 1997 a net buy-back scheme was introduced to reduce pressure on the lagoon. As a result the number of seine net fishers decreased by more than 75% and catches increased to 278 tonnes by 2004; catches however have decreased again in recent years. The seine net fishery also has a number of management measures in place, including a closed season (30th September to 1st March), 5 closed areas where seine net fishing is permanently prohibited, a minimum mesh size of 9 cm and minimum catch sizes for different fish species.

2 Methods

Catch assessments were undertaken by following a seine net team during the course of a fishing day. The GPS position and time of each haul were noted and all of the fish caught were transferred to the survey boat, where the species and total length of each individual was determined. The weight of each individual was estimated using calculated or published length-weight relationships. In addition, a selection of fish were returned to the laboratory where they were weighed and measurements made of total length, fork length, standard length, body depth and girth; gonads were also removed and weighed.

Surveys were carried out on 26 fishing days between 2nd March and 19th September 2007 and involved large net teams from Port Sud Est, Pointe L'Aigle, Baie du Nord and Pointe Corail.

3 Results

3.1 Fishing grounds

Sites close to the fringing reef and major channels and within coral areas were frequently targeted by the seine net teams. Habitats within the fishing grounds included consolidated limestone reef flat areas, seagrass/algae beds, sandy areas interspersed with coral blocks, coral patch reefs, reef edge corals and areas of dense coral. The sites fished by the seine net teams followed during the study are shown in Figure 1.

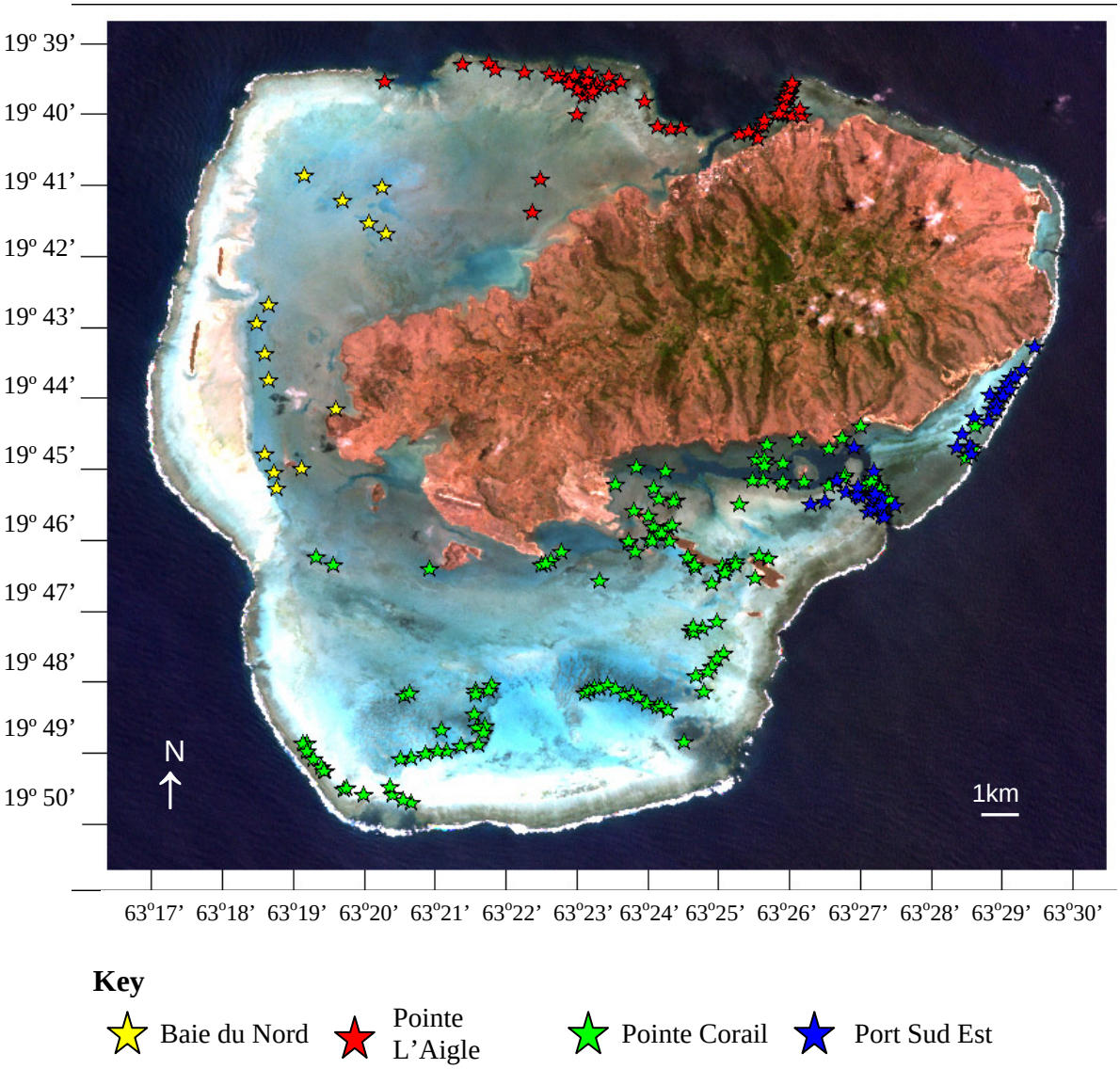


Figure 1. The sites of hauls taking by the 4 fishing teams in 2007.

3.2 Catch Data

3.21 Relative Importance of Different Species within the Catch

12,997 individuals were landed, with a total weight of 3,916 kg. The catches comprised of 66 fish species. The most important species within the catch in terms of numbers was the Goatfish (Rouget) *Mulloidichthys flavolineatus*, which accounted for 37% of the total number of individuals. In terms of weight, the Rabbitfish (cordonnier) *Siganus sutor*, was the most important species accounting for 28% of the total weight landed. Trevally (Carangue) *Caranx melampygus*, Emperor (Capitaine) *Lethrinus nebulosus*, Convict Surgeonfish (Lorsan) *Acanthurus triostegus* and Mojarra (Breton) *Gerres longirostris*, were also important components of seine net catches. The 15 most common species caught, with the number of individuals and total weight landed are given in Table 1.

Table 1. The 15 most frequently caught species in the seine net fishery, with number of individuals and total weight landed.

Fish species	Number of individuals	% of total catch	Total weight (kg)	% of total catch
Mulloidichthys flavolineatus	4,843	37.3	770.0	19.7
Siganus sutor	3,121	24.0	1,079.7	27.6
Caranx melampygus	1,307	10.1	341.6	8.7
Lethrinus nebulosus	940	7.2	294.3	7.5
Acanthurus triostegus	561	4.3	80.5	2.1
Gerres longirostris	538	4.1	165.3	4.2
Rhinecanthus aculeatus	234	1.8	45.8	1.2
Valamugil seheli	177	1.4	402.1	10.3
Chlorurus sordidus	164	1.3	34.2	0.9
Lethrinus harak	119	0.9	63.3	1.6
Sphyraena jello	96	0.7	50.2	1.3
Scarus spp	93	0.7	29.7	0.8
Caranx papuensis	70	0.5	90.7	2.3
Mulloidichthys vanicolensis	59	0.5	9.6	0.2
Parupeneus barberinus	59	0.5	14.1	0.4

Comparisons with catch statistics from 2002 - 2007 show that there has been a change in the species composition of the catch over the 6 year period (Table 2). The Rabbitfish, *Siganus sutor*, fell from the most important species in every year to rank 2 in 2007 and the Goatfish, *Mulloidichthys flavolineatus*, increased from rank 4 to rank 1. Species which had previously been important fell in rank, for example, the Surgeonfish, *Acanthurus triostegus*, decreased from rank 2 in 2006 to rank 5 in 2007 and the Mojarra, *Gerres longirostris*, fell from rank 3 in 2006 to rank 6. In contrast, *Rhinecanthus aculeatus* rose from rank 30 in 2006 to rank 7, *Sphyraena jello* increased from rank 22 in 2006 to rank 11; *Scarus* spp increased from rank 34 to 12 and *Mulloidichthys vanicolensis* rose from rank 36 in 2006 to rank 14 in 2007. Considering the relative importance of different species in terms of weight landed, it can be seen that *S. sutor* remained the most important species (Table 3). *Valamugil seheli* increased from rank 8 in 2006 to rank 3 in 2007 and *Caranx papuensis* increased from rank 18 to 7. *Fistularia commersonii* increased from rank 45 to rank 10, *S. jello* increased from rank 21 to rank 12, *R. aculeatus* increased from rank 34 to rank 14 and *Crenimugil crenilabis* increased from rank 43 in 2005 to rank 15 in 2007. Previously important species such as *G. longirostris* fell from rank 2 in 2006 to rank 6 in 2007; *A. triostegus* fell from rank 5 to 9 and *Siganus argenteus* fell from rank 8 to rank 22. *Monodactylus argeneteus*, which was placed at rank 5 in 2006 was not caught at all during 2007.

Table 2. The importance of different species in terms of rank within the total catch by number of individuals landed for the 15 most common species in 2002 - 2006.

Species	Rank					
	2007	**2006**	**2005**	**2004**	**2003**	**2002**
Mulloidichthys flavolineatus	1	4	2	7	2	2
Siganus sutor	2	1	1	1	1	1
Caranx melampygus	3	6	6	3	7	5
Lethrinus nebulosus	4	7	3	2	4	3
Acanthurus triostegus	5	2	4	5	9	7
Gerres longirostris	6	3	5	4	3	4
Rhinecanthus aculeatus	7	30	22	26	21	11
Valamugil seheli	8	10	7	6	10	18
Chlorurus sordidus	9	9	12	9	12	-
Lethrinus harak	10	18	15	21	24	19
Sphyraena jello	11	22	21	15	14	-
Scarus spp	12	34	26	-	26	10
Caranx papuensis	13	14	16	43	32	24
Mulloidichthys vanicolensis	14	36	24	10	5	9
Parupeneus barberinus	14	27	20	20	18	13
Naso unicornis	14	19	8	11	16	6
Acanthurus spp	15	12	9	12	29	-
Fistularia commersonii	16	52	38	35	40	14
Scarus ghobban	19	31	13	12	19	19
Lethrinus mahsena	20	11	17	14	38	27
Siganus argenteus	22	8	14	19	6	8
Upeneus vittatus	34	39	11	8	15	-
Mugil cephalus	35	16	10	38	11	17
Monodactylus argenteus	-	5	50	-	41	-
Acanthurus nigrofuscus	-	13	68	-	-	-
Sphyraena flavicauda	-	15	-	-	-	-
Chanos chanos	-	23	-	53	20	12
Myripristis murdjan	-	-	-	-	8	-
Valamugil robustus	-	-	-	-	13	-

Table 3. The relative importance of different species within the total catch by weight landed, giving the ranking and the percentage of the total catch for the 15 most common species from 2002 - 2006.

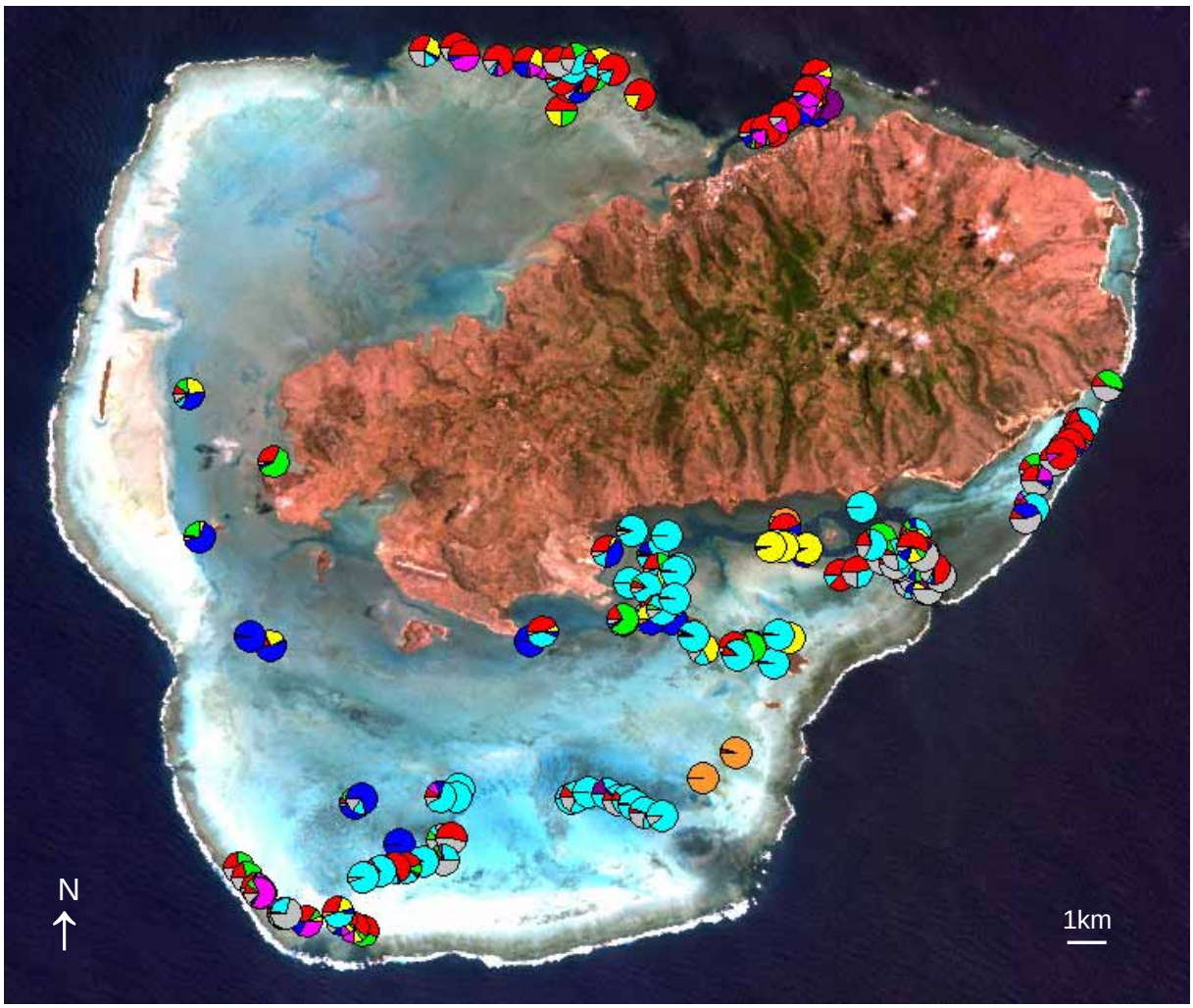
Species	Rank					
	2007	**2006**	**2005**	**2004**	**2003**	**2002**
Siganus sutor	1	1	1	2	1	1
Mulloidichthys flavolineatus	2	3	5	10	4	7
Valamugil seheli	3	8	2	3	3	12
Caranx melampygus	4	6	8	4	6	4
Lethrinus nebulosus	5	7	4	1	2	5
Gerres longirostris	6	2	7	5	5	6
Caranx papuensis	7	18	12	25	13	11
Naso unicornis	8	12	3	8	15	2
Acanthurus triostegus	9	5	11	12	18	13
Fistularia commersonii	10	45	40	44	33	17
Lethrinus harak	11	15	15	18	22	25
Sphyraena jello	12	21	19	13	14	-
Acanthurus spp	13	9	6	11	23	-
Rhinecanthus aculeatus	14	34	30	40	32	20
Crenimugil crenilabis	15	-	43	62	26	-
Chlorurus sordidus	16	13	14	9	17	-
Scarus spp	17	33	36	-	27	8
Scarus ghobban	18	17	10	6	19	18
Parupeneus barberinus	21	28	24	32	24	15
Mulloidichthys vanicolensis	23	40	31	14	7	10
Naso tuberosus	29	16	16	-	37	14
Upeneus vittatus	31	41	13	7	20	-
Hipposcarus harid	33	58	35	15	30	-
Albula glossodonta	35	10	42	-	-	-
Siganus argenteus	37	20	21	29	8	9
Mugil cephalus	42	19	9	39	11	16
Monodactylus argenteus	-	4	53	-	45	-
Rhabdosargus sarba	-	11	25	30	-	-
Chanos chanos	-	14	-	24	16	3
Kyphosus cinerascens	-	-	17	46	12	27
Myripristis murdjan	-	-	-	-	10	-
Valamugil robustus	-	-	-	-	9	-

The regularity with which these species occurred in individual hauls was also considered, and the results are given in Table 4. *Siganus sutor* remains the most important species being caught on 88% of fishing days and in 48% of the hauls. *Mulloidichthys flavolineatus*, *Caranx melampygus* and Lethrinus nebulosus were also important being caught on 77% of the fishing days and in 39%, 32% and 26% of the hauls respectively. In contrast, *Valamugil seheli* was only caught on 27% of the fishing days and in 3% of the hauls.

Table 4. The frequency of occurrence of common species, in terms of the number of days on which the species was caught, the number sets in which the species was caught and the percentage of the total number of sets this represents.

Rank	Species	% of days caught	Number of sets present in	% of total number of sets
1	*Mulloidichthys flavolineatus*	77	102	39
2	*Siganus sutor*	88	127	48
3	*Caranx melampygus*	77	84	32
4	*Lethrinus nebulosus*	77	69	26
5	*Acanthurus triostegus*	62	47	18
6	*Gerres longirostris*	62	54	21
7	*Rhinecanthus aculeatus*	50	34	13
8	*Valamugil seheli*	27	9	3
9	*Chlorurus sordidus*	50	41	16
10	*Lethrinus harak*	50	23	9
11	*Sphyraena jello*	23	10	4
12	*Scarus* spp	15	8	3
13	*Caranx papuensis*	35	19	7
14	*Mulloidichthys vanicolensis*	23	7	3
14	*Parupeneus barberinus*	54	23	9
14	*Naso unicornis*	31	9	3
15	*Acanthurus* spp	27	15	6
	No fish	12	97	37

Figure 2 shows the dominant fish species in each haul during 2006. *Siganus sutor* was particularly common on the reef flat areas in both the north and south-east; *Acanthurus triostegus* was also common in reef flat areas. *Mulloidichthys flavolineatus* tended to dominate hauls in the south on both the lagoon patch reefs and inshore sandy areas. *Caranx melampygus*, *Gerres longirostris* and *Valamugil seheli* were common in sandy lagoon areas in the south.



Key

Siganus sutor	*Gerres longirostris*
Lethrinus nebulosus	*Mulloidichthys flavolineatus*
Caranx melampygus	*Valamugil seheli*
Acanthurus triostegus	*Naso unicornis*
Other	

Figure 2. The dominant fish species caught during each of the hauls.

3.22 Summary Statistics for Net Hauls and Fishing Days

As shown in Table 5 the mean length of a fishing day was 6 hours 15 minutes at sea, with the net deployed for 27% of the total time on average. The team at Pointe Corail tended to fish for the longest (with a mean of 6 hours 54 minutes), whereas the Port Sud Est team was only at sea for an average of just under 5 hours. Net deployments accounted for the lowest proportion of the total day at Pointe L'Aigle (20%) and the greatest proportion at Baie du Nord (43%).

Table 5. The mean and range for the total time at sea, total time the net was submerged, and the percentage of the total fishing day during which the net was deployed for each fishing team.

	Total time of fishing day (hh:mm)		Total time net submerged per day (hh:mm)		% time net in water per day	
Fishing Team	**Mean**	**Range**	**Mean**	**Range**	**Mean**	**Range**
Baie du Nord	6:22	4:45 – 8:00	2:45	2:02 – 3:28	43.1	42.7 – 43.4
Pointe Corail	6:54	5:20 – 9:00	2:04	0:47 – 2:51	30.0	14.6 – 40.4
Pointe L'Aigle	6:26	2:55 – 9:50	1:13	0:03 – 2:19	19.8	1.3 – 31.3
Port Sud Est	4:52	4:25 – 5:40	1:20	0:56 – 2:07	27.7	18.2 – 47.1
All Teams	6:15	2:55 – 9:50	1:41	0:03 – 3:28	27.3	1.3 – 47.1

An average fishing day comprised 10 hauls (net deployments), of which 41% did not result in the capture of any fish. The team at Pointe Corail achieved the largest numbers of hauls, with the team at Baie du Nord achieving the least. The teams at Pointe Corail and Port Sud Est had the lowest proportion of hauls in which no fish at all were caught (30%), whereas at Baie du Nord 83% of hauls on average had no fish and on one day all hauls resulted in no fish. An average haul landed 14.9 kg of fish (50 individuals). The Baie du Nord team achieved the largest catch in terms of mean number of individuals (78 fish) and weight (24.4 kg) per haul. Pointe L'Aigle was the least successful team in terms of numbers of individuals (40 individuals) and Port Sud Est was the least successful in terms of weight (14.2 kg) per haul.

Table 6. Haul statistics for each fishing team, showing the number of sets per day, number of nil hauls (in which no fish were caught) per day and the numbers of individuals and total weight (kg) per haul.

	Number of hauls per day		Number of nil hauls per day		% nil hauls		Number of individuals per haul		Weight (kg) per haul	
Fishing Team	**Mean**	**Range**	**Mean**	**Range**	**Mean**	**Range**	**Mean**	**Range**	**Mean**	**Range**
Baie du Nord	7	5 - 9	6	5 - 6	83.3	67 - 100	78	0 – 700	24.4	0 – 201
Pointe Corail	14	11 - 18	4	0 - 10	29.9	0 – 77	53	0 - 370	14.6	0 - 233
Pointe L'Aigle	8	1 - 15	4	1 - 8	54.0	13 - 100	40	0 – 227	14.3	0 – 79.0
Port Sud Est	8	5 - 9	2	0 - 5	29.5	0 - 56	45	0 – 207	14.2	0 – 83.1
All Teams	10	1 - 18	4	0 - 10	41.3	0 - 100	50	0 – 700	14.9	0 – 233

Combining the catches for individual hauls gives an average landing of 151 kg (499 individuals) per fishing day. Pointe Corail recorded the highest average catch in terms of numbers, landing 716 individuals and weight with an average landing of 198 kg (Table 7). Pointe L'Aigle and Port Sud Est had the lowest average catch with 326 and 255 individuals and a weight of 116 kg and 111 kg respectively. Both teams also returned without any catch at all on 1 fishing day. Taking account of the number of fishers and the duration of the fishing day gives a catch per unit effort (CPUE) of 1.1 kg/man-hour on average, which rises to 4.0 kg/man-hour if only the time during which the net was actually in the water is considered. The CPUE based on total time at sea was highest for Pointe Corail and lowest for Pointe L'Aigle and the CPUE based on the time the net was actually in the water was highest for Pointe Corail and lowest for Baie du Nord.

Table 7. Statistics for each fishing team, giving the number of individuals and total weight (kg) per fishing day and the catch per unit effort (CPUE) in kg/man-hour based on total time at sea and time of actual net deployment.

Fishing Team	Total number of individuals per day		Total weight (kg) per day		Catch per Unit Effort (kg/man-hour)	
	Mean	Range	Mean	Range	Total time at sea	Time net deployed
Baie du Nord	547	0 - 1093	170.6	0 - 341	0.9	2.1
Pointe Corail	716	87 - 1004	197.8	100 – 360	1.3	4.7
Pointe L'Aigle	326	0 - 1397	115.9	0 - 439	0.8	3.3
Port Sud Est	355	133 - 754	110.9	48 - 211	1.2	4.2
All Teams	499	0 - 1093	150.5	0 - 439	1.1	4.0

Comparisons with data from 2002 – 2007 show that the proportion of hauls which resulted in no fish at all increased from 27% in 2006 to 41% in 2007 (Table 8). There was a decline in the number of individuals caught per haul from 87 in 2003 to 40 in 2007 and the number of fish caught per day also decreased from 655 in 2006 to 499 in 2007. There was a decrease in the average weight of hauls from 17.8 kg in 2006 to 14.9kg in 2007; weight of the catch per day also fell from 176 kg in 2006 to 151kg in 2007. Catch per unit effort decreased from 2.1 kg/man-hour in 2003 to 1.1 kg/man-hour in 2007 and from 7.1 kg/man-hour in 2002 to 4.0 kg/man-hour in 2007 when only the time the net is submerged is considered, however there was a slight increase between 2006 and 2007.

Table 8. Average haul and fishing day statistics for all fishing teams, showing the percentage of nil hauls (in which no fish were caught) per day and the numbers of individuals and total weight (kg) per haul for 2002 - 2007.

	20007	2006	2005	2004	2003	2002
% nil hauls	41	27	32	24	17	5
Number of fish per haul	40	66	49	51	87	72
Weight (kg) per haul	14.9	17.8	19.6	25.1	29.4	26.6
Number of fish per day	499	655	452	491	712	347
Weight (kg) per day	150.5	175.5	180.2	241.4	240.3	131.0
CPUE total time at sea (kg/man-hour)	1.1	1.2	1.2	1.7	2.1	1.0
CPUE time net submerged (kg/man-hour)	4.0	3.8	4.3	5.4	6.9	7.1

3.3 Length Frequency

For the 10 most commonly caught fish species, the length frequency was calculated based on total length (in cm) (Figures 3 – 12). This allowed the modal range (i.e. the size class into which most individuals fell) to be determined for the different species (Table 9).

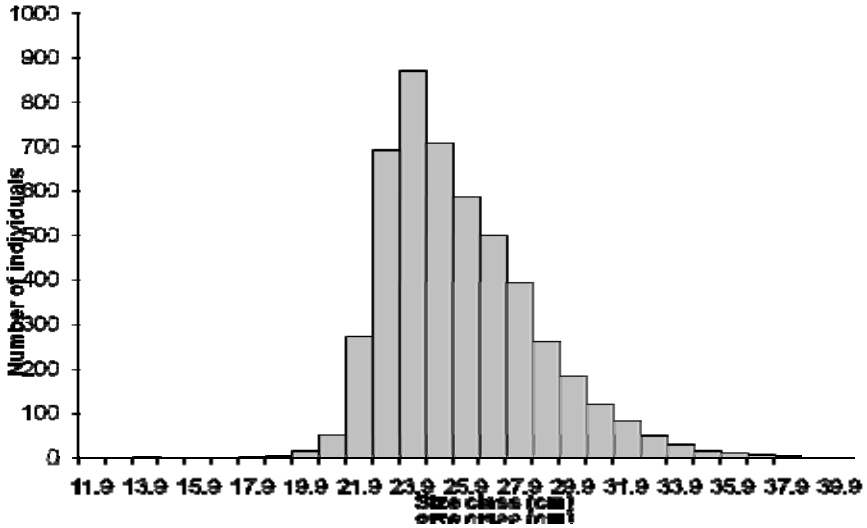


Figure 3. Length-frequency histogram for *Mulloidichthys flavolineatus* individuals caught by the seine net fishery.

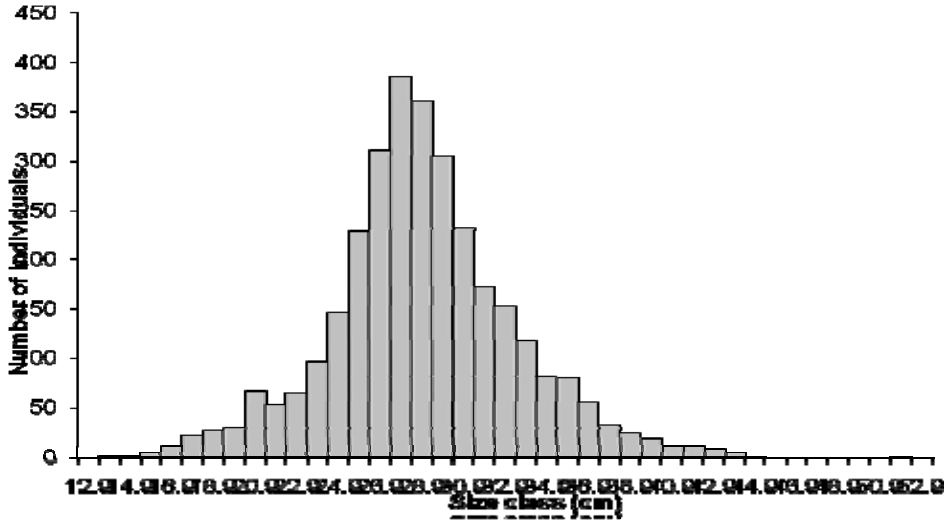


Figure 4. Length-frequency histogram for *Siganus sutor* individuals caught by the seine net fishery.

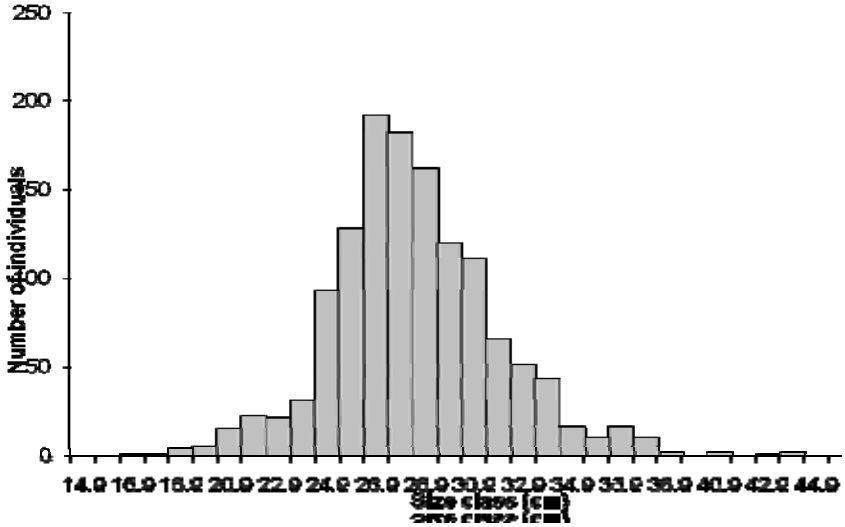


Figure 5. Length-frequency histogram for *Caranx melampygus* individuals caught by the seine net fishery.

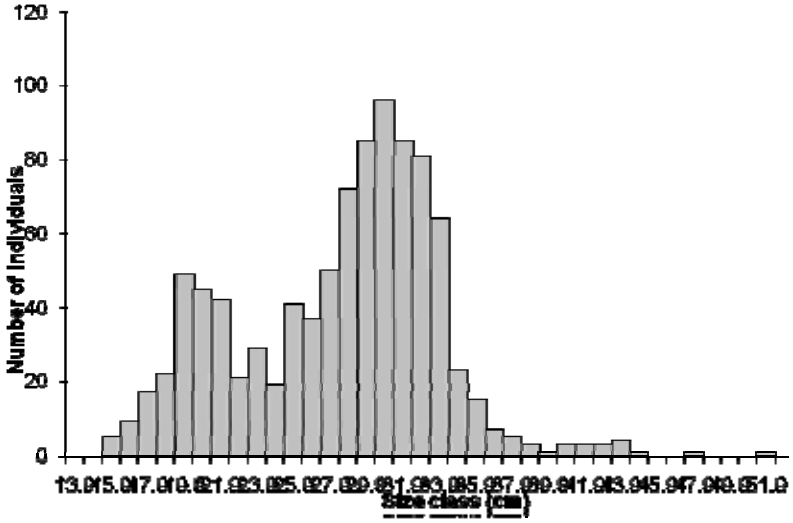


Figure 6. Length-frequency histogram for *Lethrinus nebulosus* individuals caught by the seine net fishery.

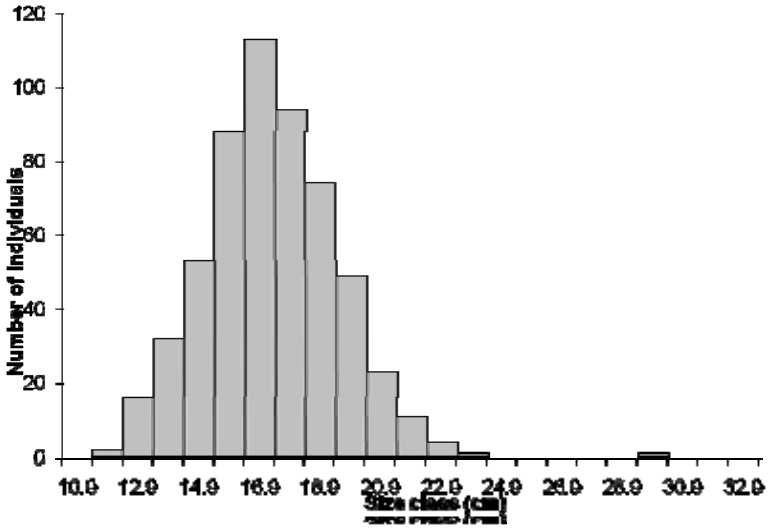


Figure 7. Length-frequency histogram for *Acanthurus triostegus* individuals caught by the seine net fishery.

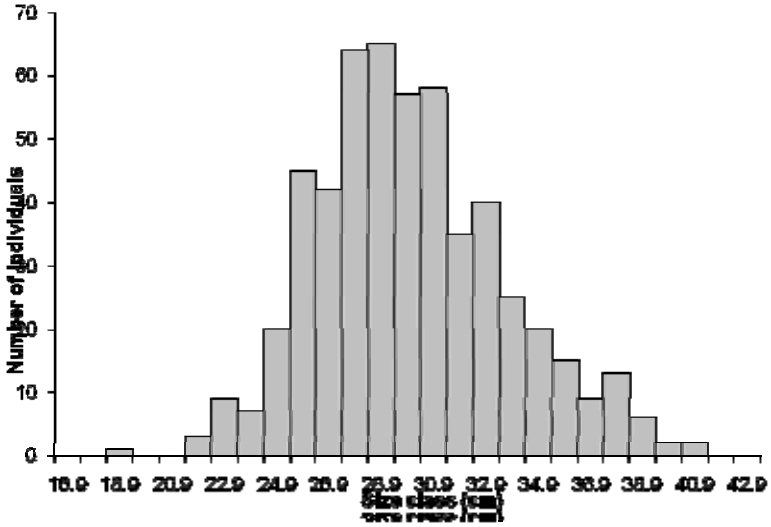


Figure 8. Length-frequency histogram for *Gerres longirostris* individuals caught by the seine net fishery.

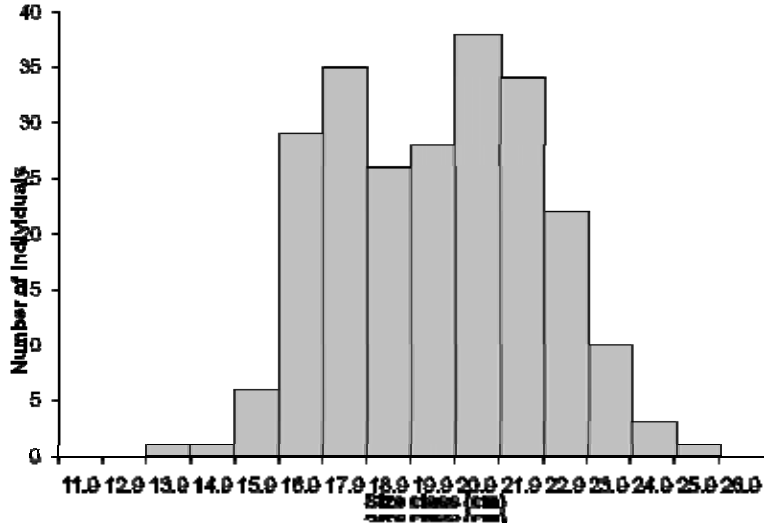


Figure 9. Length-frequency histogram for *Rhinecanthus aculeatus* individuals caught by the seine net fishery.

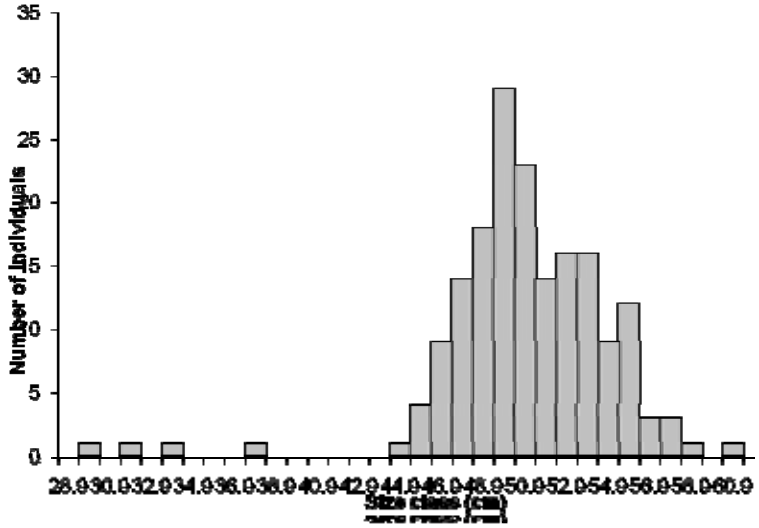


Figure 10. Length-frequency histogram for *Valamugil seheli* individuals caught by the seine net fishery.

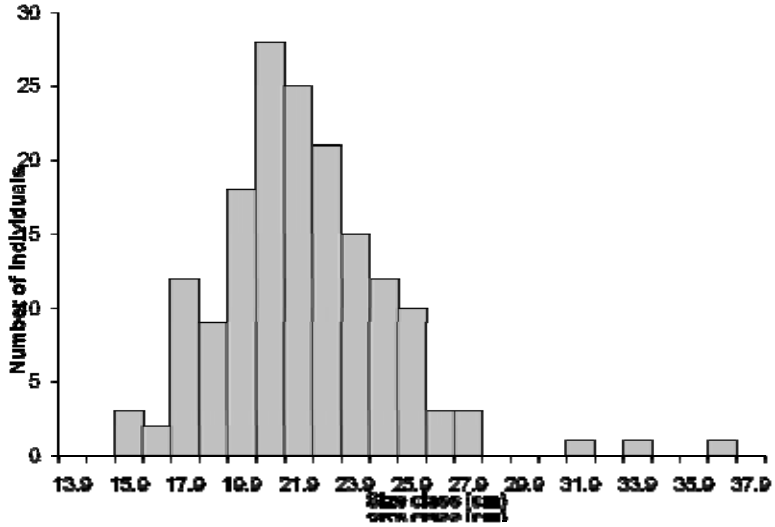


Figure 11. Length-frequency histogram for *Chlorurus sordidus* individuals caught by the seine net fishery.

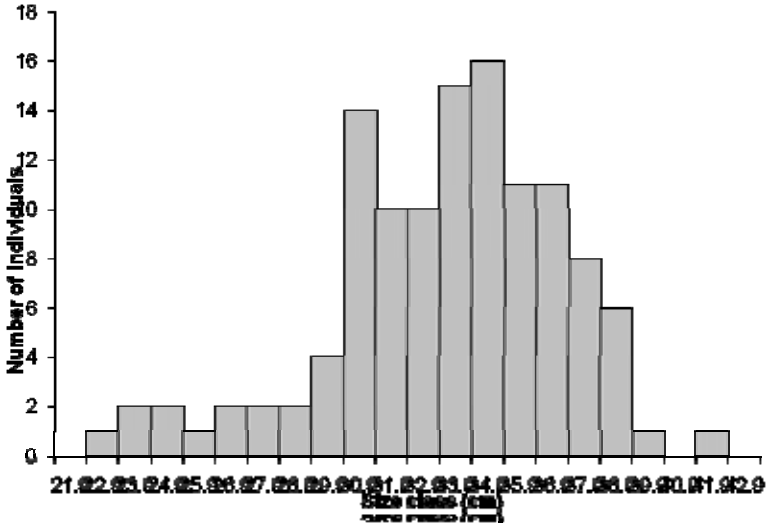


Figure 12. Length-frequency histogram for *Lethrinus harak* individuals caught by the seine net fishery.

If the modal range of fish caught is compared to the length of that species at maturity (obtained from FishBase, 2005) it can be seen that the modal range is below the length of maturity for 5 of the 10 most frequently caught fish (Table 9). The data suggest that serious recruitment overfishing is occurring for *Caranx melampygus*, *Lethrinus nebulosus* and *Acanthurus triostegus*, with juveniles accounting for >80% of the individuals landed for each species.

Table 9. The modal range from length-frequency analysis (cm), the length at maturity (cm) and the percentage of individuals caught below the length at maturity for the 10 most commonly caught species.

Species	**Modal range (cm)**	**Length at maturity (cm)**	**% caught before maturity**
Mulloidichthys flavolineatus	23 – 23.9	24.0	39
Siganus sutor	27 – 27.9	28.0	47
Caranx melampygus	26 – 26.9	51.3	100
Lethrinus nebulosus	30 – 30.9	34.3	94
Acanthurus triostegus	16 – 16.9	18.5	81
Gerres longirostris	29 – 29.9	23.8	4
Rhinecanthus aculeatus	20 – 20.9	16.8	16
Valamugil seheli	49 – 49.9	34.1	2
Chlorurus sordidus	20 – 20.9	18.2	14
Lethrinus harak	34 – 34.9	29.3	13

A similar situation occurs for growth overfishing, with the modal range of the same 5 fish species falling below the length at maximum yield (Table 10). This is particularly true for *Siganus sutor, Caranx melampygus, Lethrinus nebulosus* and *Acanthurus triostegus* of which over 80% of fish caught were below the length for maximum yield.

Table 10. The modal range from length-frequency analysis (cm), the length at maximum yield (cm) and the percentage of individuals caught below the length of maximum yield for the 10 most commonly caught species.

Species	Modal range (cm)	Length at maximum yield (cm)	% caught below maximum yield
Mulloidichthys flavolineatus	23 – 23.9	26.9	76
Siganus sutor	27 – 27.9	32.3	84
Caranx melampygus	26 – 26.9	63.2	100
Lethrinus nebulosus	30 – 30.9	39.7	98
Acanthurus triostegus	16 – 16.9	19.4	91
Gerres longirostris	29 – 29.9	25.9	16
Rhinecanthus aculeatus	20 – 20.9	17.3	25
Valamugil seheli	49 – 49.9	39.4	2
Chlorurus sordidus	20 – 20.9	20.2	40
Lethrinus harak	34 – 34.9	33.1	52

If the modal range is compared for 6 fish species caught in 2002 – 2007 it can be seen that for *Mulloidichthys flavolineatus*, the modal range has declined from 27.0 – 27.9 in 2006 to 23.0 – 23.9 in 2007 and it has declined from 29.0 – 29.9 to 28.0 – 28.9 for *Gerres longirostris* (Table 11). The modal range of the remaining 4 species has however increased between 2006 and 2007.

Table 11. The modal range from length-frequency analysis (cm) for 6 fish species caught in 2002 - 2007.

Species	2007	2006	2005	2004	2003	2002
Siganus sutor	27.0 – 27.9	19.0 – 19.9	31.0 – 31.9	28.0 – 28.9	20.1 – 22.0	24.1 – 26.0
Mulloidichthys flavolineatus	23.0 – 23.9	27.0 – 27.9	27.0 – 27.9	28.0 – 28.9	26.1 – 28.0	28.1 – 32.0
Gerres longirostris	28.0 – 28.9	29.0 – 29.9	27.0 – 28.9	28.0 – 28.9	28.1 – 30.0	28.1 – 30.0
Lethrinus nebulosus	30.0 – 30.9	21.0 – 21.9	32.0 – 32.9	28.0 – 28.9	20.1 – 22.0	30.1 – 32.0
Caranx melampygus	26.0 – 26.9	20.0 – 20.9	20.0 – 20.9	33.0 – 33.9	20.1 – 22.9	36.1 – 38.0
Acanthurus triostegus	16.0 – 16.9	14.0 – 14.9	15.0 – 15.9	15.0 – 15.9	14.1 – 16.0	14.1 – 16.0

3.4 Mortality rates

Mortality rates of 9 of the most frequently caught fish species were calculated by looking at the rate of decline in numbers with size. Lengths were converted to relative age using the Von Bertalanffy parameters K, t_o and $L\infty$ (obtained from FishBase, 2005) and total mortality (Z) calculated using the equation:

$$Log_e(N_{t2}) = log_e(N_{t1}) - Z \times (t_2 - t_1)$$

Natural mortality (M) was obtained from FishBase (2005) and fishing mortality (F) could therefore be calculated using the equation:

$$F = Z - M$$

The results, which are shown in Figures 13 - 22 and Table 12, indicate that fishing mortality is higher than natural mortality for 7 of the 10 species, suggesting that overfishing is occurring. Overfishing is particularly severe for *Caranx melampygus*, *Lethrinus nebulosus*, *Chlorurus sordidus* and *Lethrinus harak* with fishing mortality rates 13-times, 9-times and 4-times higher than natural mortality rates, respectively.

Table 12. Total (Z), natural (M) and fishing (F) mortality rates for 10 fish species.

	Total Mortality (Z)	Natural Mortality (M) (from FishBase)	Fishing Mortality (F)
Mulloidichthys flavolineatus	0.70	1.14	-0.44
Siganus sutor	3.15	1.06	2.09
Caranx melampygus	5.74	0.41	5.33
Lethrinus nebulosus	4.19	0.40	3.79
Acanthurus triostegus	3.68	0.82	2.86
Gerres longirostris	1.13	0.64	0.49
Rhinecanthus aculeatus	3.27	0.85	2.42
Valamugil seheli	0.55	0.37	0.18
Chlorurus sordidus	4.56	0.93	3.63
Lethrinus harak	2.61	0.56	2.05

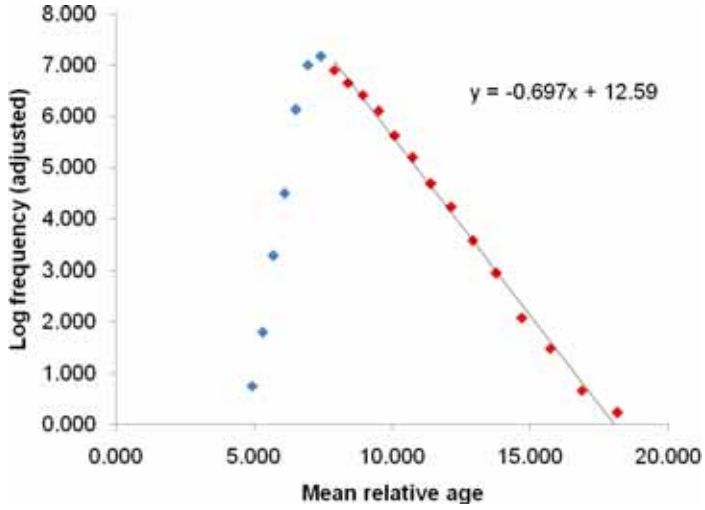


Figure 13. Total mortality rate (Z) assessment for *Mulloidichthys flavolineatus*, where Z is the slope of the regression line.

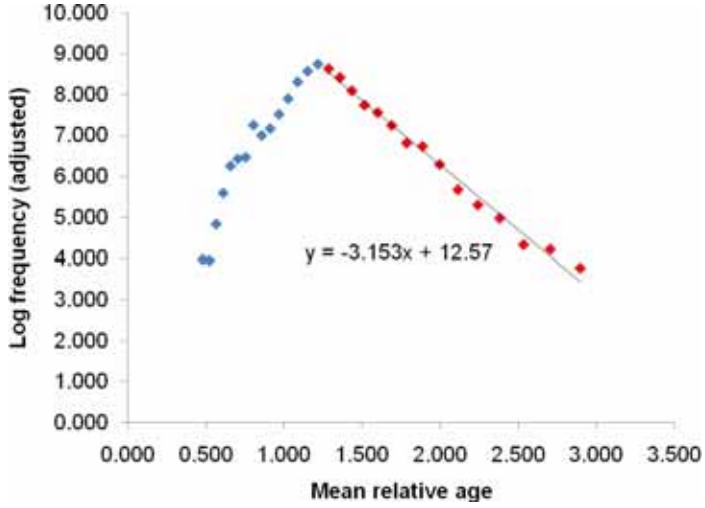


Figure 14. Total mortality rate (Z) assessment for *Siganus sutor*, where Z is the slope of the regression line.

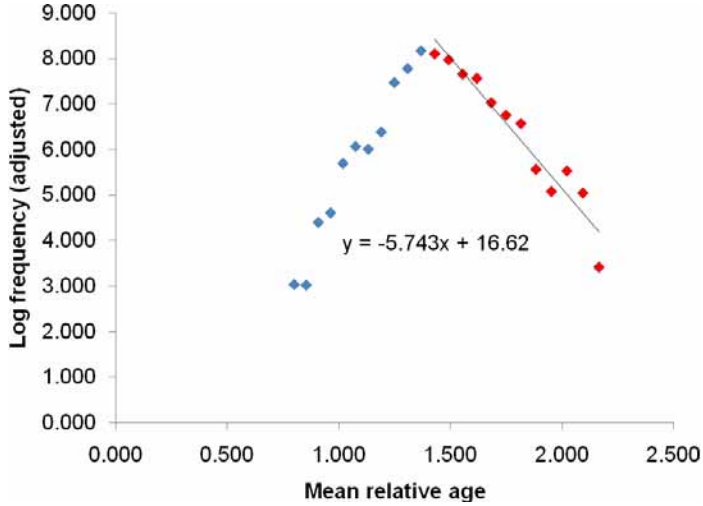


Figure 15. Total mortality rate (Z) assessment for *Caranx melampygus*, where Z is the slope of the regression line.

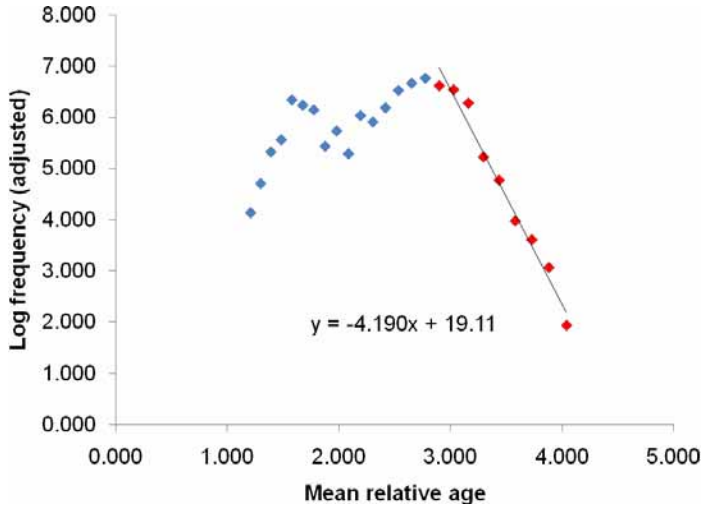


Figure 16. Total mortality rate (Z) assessment for *Lethrinus nebulosus*, where Z is the slope of the regression line.

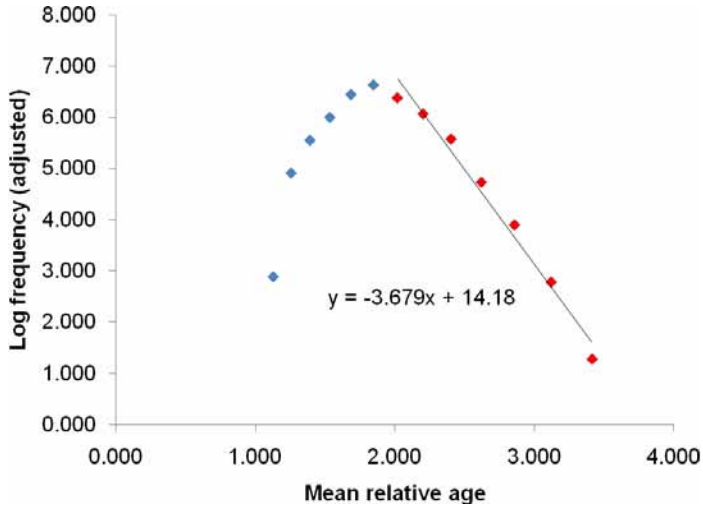


Figure 17. Total mortality rate (Z) assessment *Acanthurus triostegus*, where Z is the slope of the regression line.

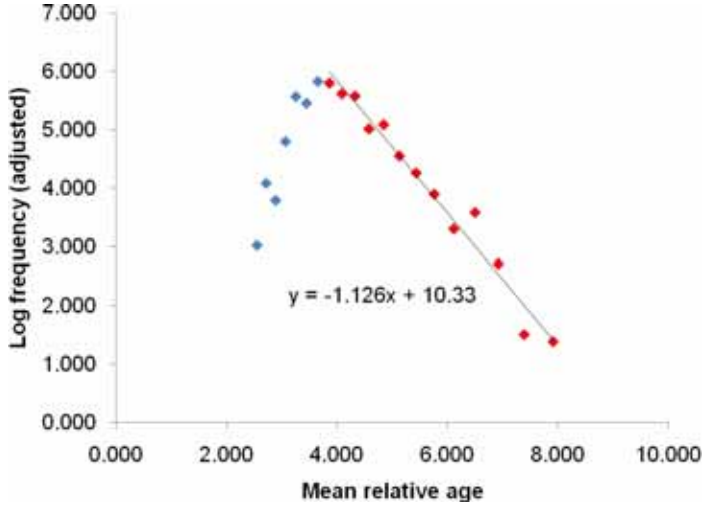


Figure 18. Total mortality rate (Z) assessment for *Gerres longirostris*, where Z is the slope of the regression line.

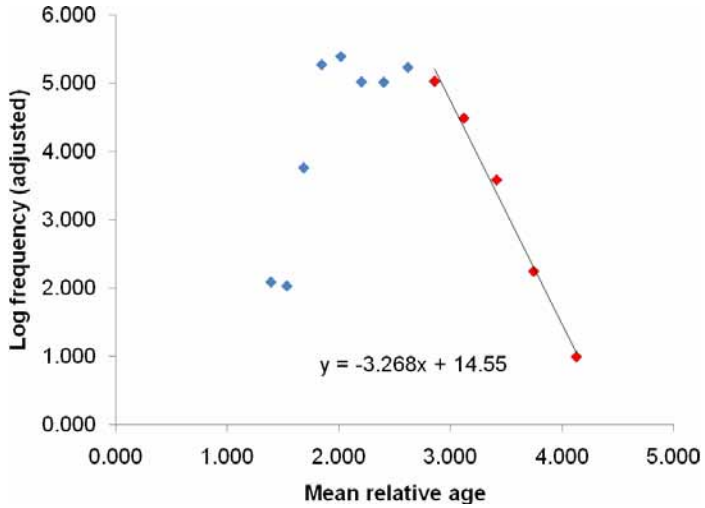


Figure 19. Total mortality rate (Z) assessment for *Rhinecanthus aculeatus*, where Z is the slope of the regression line.

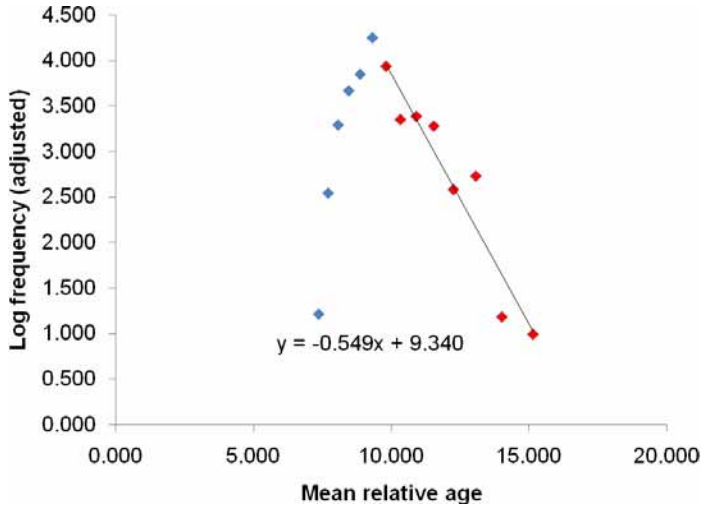


Figure 20. Total mortality rate (Z) assessment for *Valamugil seheli*, where Z is the slope of the regression line.

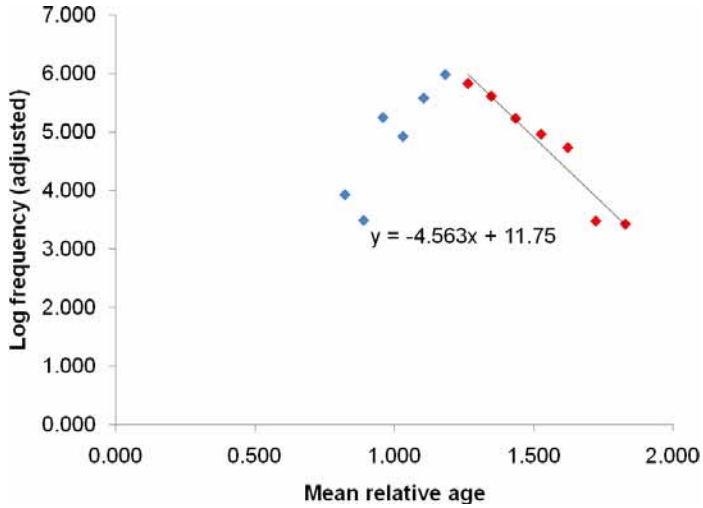


Figure 21. Total mortality rate (Z) assessment for *Chlorurus sordidus*, where Z is the slope of the regression line.

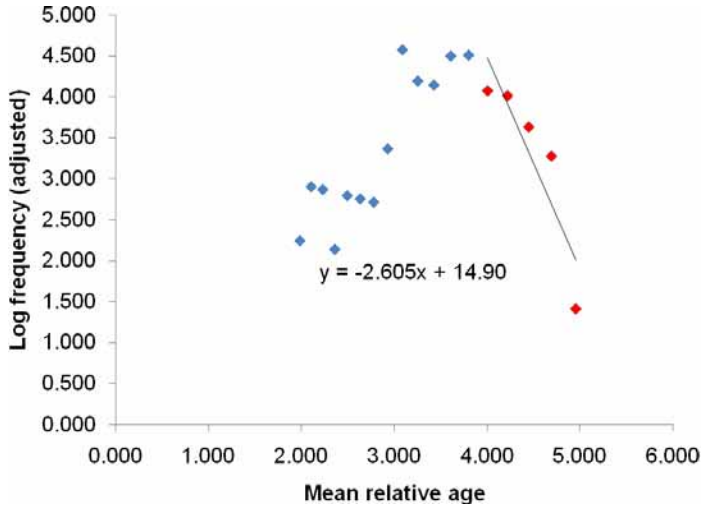


Figure 22. Total mortality rate (Z) assessment for *Lethrinus harak*, where Z is the slope of the regression line.

3.5 Length-weight Relationships

Catch data collected in the field involves measurement of the total length (TL) of individual specimens, as there are practical constraints on obtaining weight data. Equations describing the length-weight relationship are then used to determine the weight of each individual. The length-weight relationship (based on TL) was updated for 3 species in Rodrigues using data collected in 2003 - 2007. The a and b values for each relationship are given in Table 13 and Figures 23 - 25.

Table 13. The a and b values calculated for the length-weight relationship for 14 species.

Species	a	b
Siganus sutor	0.012	3.030
Gerres longirostris	0.010	3.028
Caranx melampygus	0.009	3.059

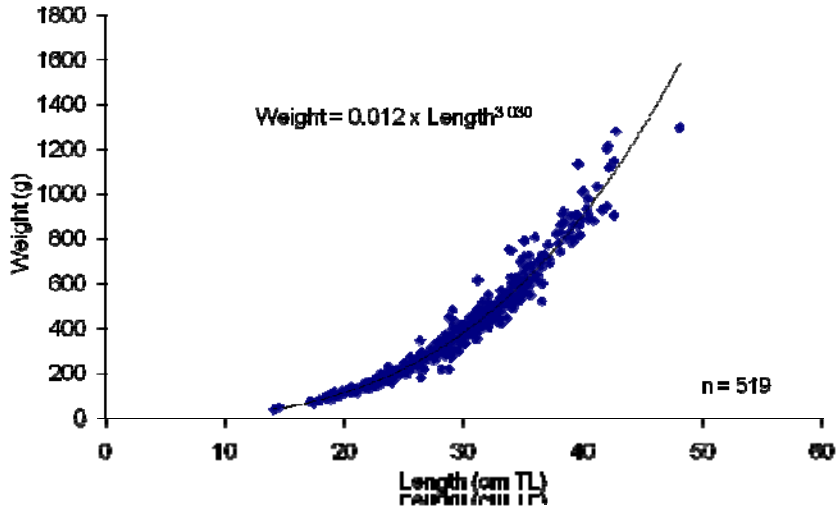


Figure 23. The relationship between length (cm) and weight (g) for *Siganus sutor*.

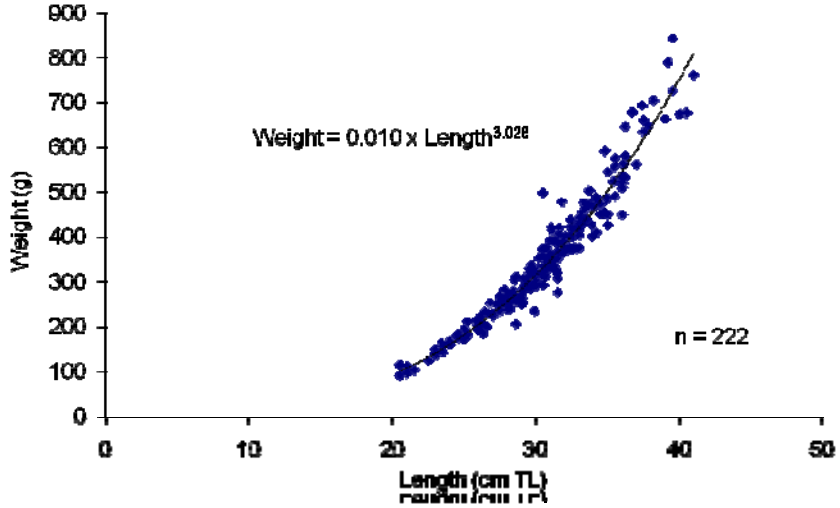


Figure 24. The relationship between length (cm) and weight (g) for *Gerres longirostris*.

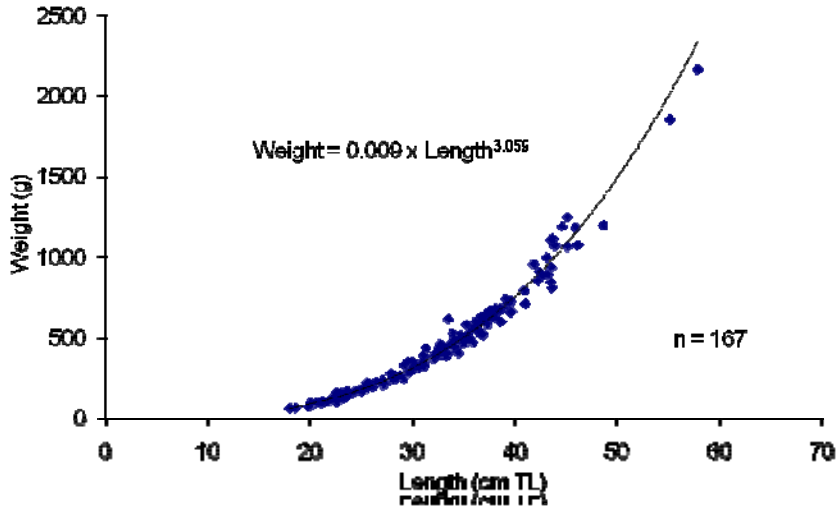


Figure 25. The relationship between length (cm) and weight (g) for *Caranx melampygus*

3.6 Maturity

The Gonadosomatic Index (GSI) was calculated as weight of gonads/body weight *100 for samples of *Siganus sutor* collected in 2004, 2006 and 2007. The data show that an increase in GSI for females first occurred at 28cm (the published length at maturity), with low GSI values being observed beyond 41.5cm (Figure 41). For males, the GSI starts to increase later, at around 31.1cm, with peak GSI values first being observed at 35.7cm. Comparison of mean monthly GSI values shows that the GSI is significantly higher during June and August, than during the remaining months (Kruskall-Wallis, H = 33.93, df = 6, p<0.001).

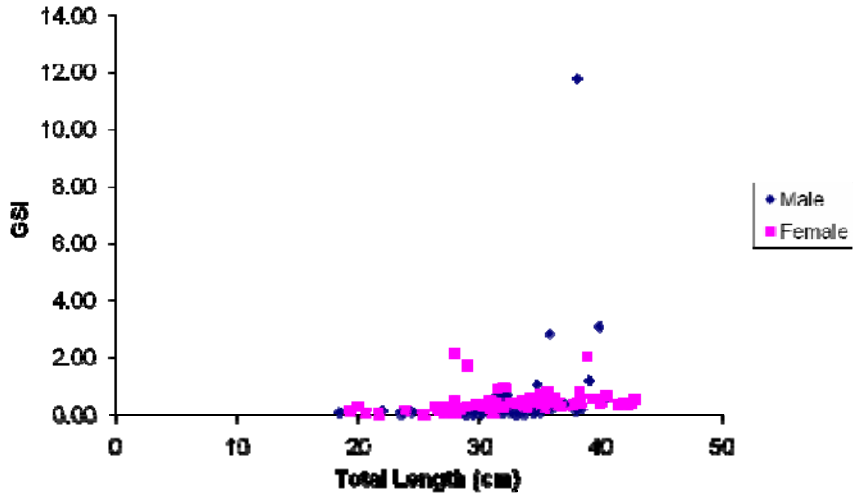


Figure 26. The Gonadosomatic Index (GSI) for male and female specimens of *Siganus sutor* based on data from 2004 and 2007.

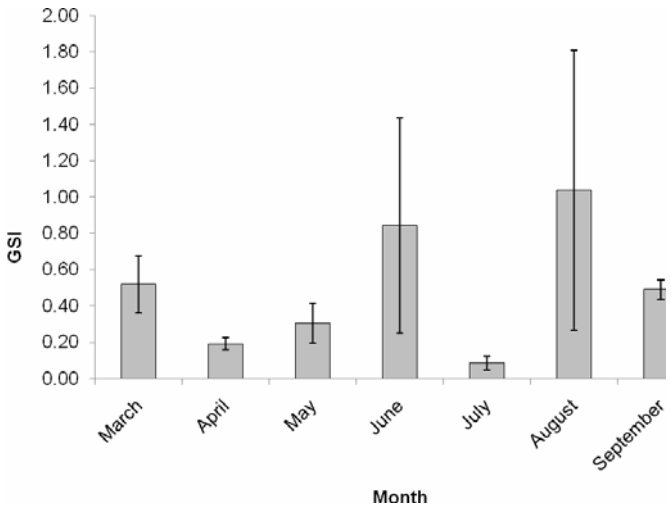


Figure 27. The mean monthly Gonadosomatic Index (GSI) ± SE for specimens of *Siganus sutor* based on data from 2004 and 2007.

4. Discussion and Management Issues

The seine net fishery appears to be operating with only a limited degree of success. Individual hauls generally returned small catches, amounting to a total of 151 kg per day on average. 41% of net deployments caught no fish and this was particularly true for the Baie du Nord team for whom 83% of net deployments on average caught no fish. The Catch per Unit Effort (CPUE) was highest for the team from Pointe Corail and lowest for the team from Pointe L'Aigle (total time) and Baie du Nord (time net submerged). The Port Sud Est team was the smallest with the least number of fishers and also had the shortest average fishing day; the Pointe L'Aigle team deployed their net for the lowest percentage of the fishing day. The teams from Pointe L'Aigle and Port Sud Est were the most unsuccessful teams, landing the lowest number and weight of fish per haul and per day; however Baie du Nord had the lowest CPUE. In contrast, the team from Pointe Corail landed the most individuals and weight per day and had the highest CPUE. For all fishing teams combined, the number and weight of fish caught both per haul and per day decreased between 2005 and 2006 (Hardman *et al.*, 2006). The CPUE based on total fishing team however, remained stable and there was a slight increase in CPUE based on the time the net was actually in the water, probably due to shorter fishing days and the net being submerged for a lower percentage of time (27% in 2007 compared to 33% in 2006).

The fishery is highly multi-species, in that 66 species were found in the catches. However, 61% of the individuals landed were from only 2 species: the Goatfish (Rouget), *Mulloidichthys flavolineatus*, which accounted for 37% of the total number of individuals and the Rabbitfish (Cordonnier), *Siganus sutor*, which accounted for 24% of individuals. These together with a further six species, *Caranx melampygus*, *Lethrinus nebulosus*, *Acanthurus triostegus*, *Gerres longirostris*, *Rhinecanthus aculeatus* and *Valamugil seheli* accounted for over 90% of the fish landed. Therefore, the fishery is clearly dominated by a small number of species, which are principally herbivores or carnivores which feed on small benthic invertebrates; only a single piscivore is included in the list. The lack of predators indicates some imbalance within the ecosystem, especially when taking into account that historically these species accounted for a much larger proportion of the catch (Pearson, 1988). The species composition of the catch remained fairly constant between 2002 and 2005 (Hardman *et al.*, 2006; Lynch *et al.*, 2003; 2004; 2005), however the catch compositions changed in 2006 and 2007. In 2007, for the first year, *Siganus sutor* was not the most important species in terms of numbers and was overtaken by *Mulloidichthys flavolineatus*. Traditionally important

species such as *Caranx melampygus*, *Lethrinus nebulosus* and *Valamugil seheli* showed a come-back in 2007 increasing in importance, where as *Acanthurus triostegus* and *Gerres longirostris* declined. Previously unimportant species such as the Triggerfish, *Rhinecanthus aculeatus*, the Barracuda, *Sphyraena jello*, *Scarus* spp. *and Fistularia commersonii* however became important components of the catch in 2007, suggesting that the fish populations within the lagoon are changing, a further indication of overfishing.

Length-frequency data suggests that overfishing of the most frequently caught species is occurring. Serious recruitment overfishing is occurring for *Caranx melampygus*, *Lethrinus nebulosus* and *Acanthurus triostegus* with juveniles accounting for over 80% of the individuals landed. Growth overfishing also appears to be affecting these species as well as *Siganus sutor* as over 80% of individuals caught were below the length for maximum yield. There was however an increase in the modal length of these species between 2006 and 2007. Despite this, calculations of mortality rates suggest that mortality due to fishing is higher than natural mortality for 7 out of the 10 species assessed and is particularly severe for *C. melampygus, L. nebulosus, Chlorurus sordidus* and *L. harak*.

Significant recruitment overfishing results in a decline of the size of the spawning stock, so the size of the fish population cannot be sustained and catches will fall. Landing fish that are too small also means that the fishery is not providing its maximum yield. If individuals were caught at greater length then much larger returns would be achieved for the same number of fish, as a small increase in length equates to a large increase in biomass due to the power relationship between length and weight. The establishment of marine reserves in Rodrigues will therefore allow fish stocks to recover, thus enhancing the ecosystem as a whole. In response to the decline in fish stocks the Co-ordinating Committee for Fisheries and Marine Resources (led by the Rodrigues Regional Assembly) has now delimited four reserve areas in the northern lagoon (Figure 42). The location of the reserves was decided in collaboration with the major stakeholders including the fishers, of whom 86% were in support. The reserves will result in the loss of fishing areas by Baie du Nord and Pointe L'Aigle teams, however these teams recognise the need to protect fish stocks.

The Government of Mauritius has proposed to ban the seine net fishery, however this is likely to only displace the fishing effort and habitat damage from one gear to another. Most seine net fishers are involved in other fisheries (line, trap or harpoon) during the closed season so if seine net fishing is banned the number of fishers in other sectors is likely to increase. It seems therefore that the development of effective marine reserves which are properly enforced will provide the most effective management of the seine net fishery.

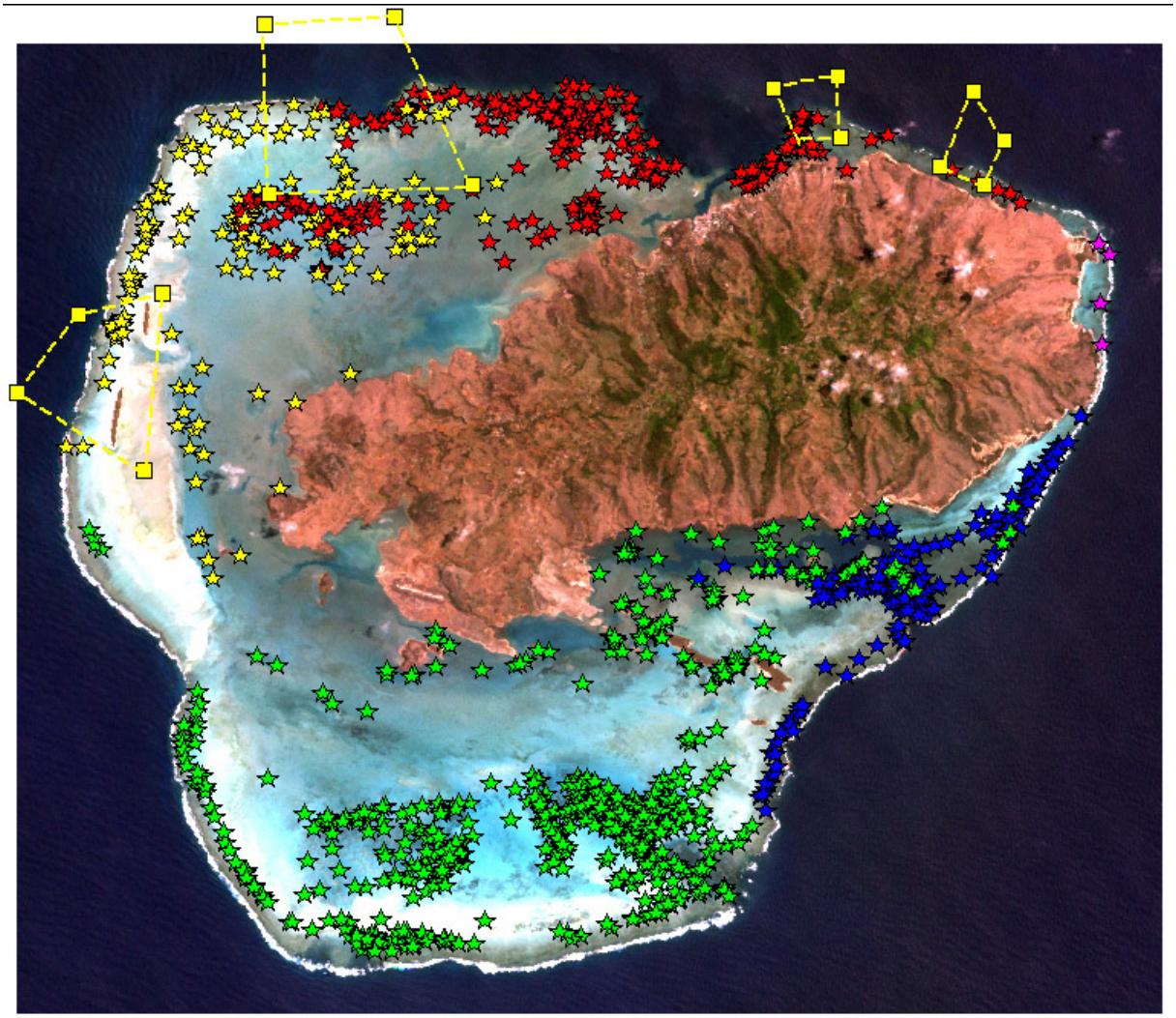


Figure 28. The position of the 4 marine reserves in the northern lagoon and the fishing sites in 2002 - 2007.

5 Conclusions

The daily catch in terms of numbers and weight of fish per haul and per day decreased between 2006 and 2007 although the Catch per Unit Effort remained stable. On average 41% of hauls resulted in no fish being caught and this rose to 83% for the team at Baie du Nord.

The Goatfish (Rouget) *Mulloidichthys flavolineatus* and the Rabbitfish (Cordonnier), *Siganus sutor* were the dominant species in the fishery account for 37% and 24% of the total number of individuals, respectively. Eight species made up over 90% of the total catch and these were predominantly herbivores and benthic carnivores. The lack of larger predators suggests that the ecosystem is degraded.

Serious recruitment overfishing appears to be occurring for *Caranx melampygus, Lethrinus nebulosus* and *Acanthurus triostegus,* with over 80% of fish being caught before they reach maturity. Growth overfishing is also occurring for the same species as well as *Siganus sutor* with over 80% of fish caught before they reach the length of maximum yield. Mortality due to fishing is greater than natural mortality for 7 of the 10 species assessed and is particularly severe for *C. melampygus, L. nebulosus, Chlorurus sordidus* and *L. harak.*

6 Recommendations for Further Research

- Monitoring of length-frequency data should continue and expand to determine trends over time.
- More biological data, particularly gonad weights, should be collected, and for a greater number of species, to permit better understanding of local populations.
- Fish tagging studies should be undertaken in order to understand fish migratory patterns.

7 References

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8 Appendices

Table A1. The number of individuals for each different species caught by the seine net fishery.

Fish Species	No. of individuals	% of total individuals	Weight (kg)	% of total weight
Mulloidichthys flavolineatus	4,843	37.3	770.0	19.7
Siganus sutor	3,121	24.0	1,079.7	27.6
Caranx melampygus	1,307	10.1	341.6	8.7
Lethrinus nebulosus	940	7.2	294.3	7.5
Acanthurus triostegus	561	4.3	80.5	2.1
Gerres longirostris	538	4.1	165.3	4.2
Rhinecanthus aculeatus	234	1.8	45.8	1.2
Valamugil seheli	177	1.4	402.1	10.3
Chlorurus sordidus	164	1.3	34.2	0.9
Lethrinus harak	119	0.9	63.3	1.6
Sphyraena jello	96	0.7	50.2	1.3
Scarus spp	93	0.7	29.7	0.8
Caranx papuensis	70	0.5	90.7	2.3
Mulloidichthys vanicolensis	59	0.5	9.6	0.2
Parupeneus barberinus	59	0.5	14.1	0.4
Naso unicornis	59	0.5	89.6	2.3
Acanthurus spp	50	0.4	48.1	1.2
Fistularia commersonii	43	0.3	71.1	1.8
Scarus psittacus	42	0.3	9.0	0.2
Anampses caeruleopunctatus	42	0.3	10.1	0.3
Parupeneus ciliatus	39	0.3	7.5	0.2
Ctenochaetus striatus	31	0.2	2.0	0.1
Scarus ghobban	31	0.2	25.8	0.7
Lethrinus mahsena	29	0.2	5.4	0.1
Cheilinus trilobatus	27	0.2	18.1	0.5
Siganus argenteus	25	0.2	2.8	0.1
Siganus luridus	19	0.1	3.6	0.1
Upeneus vittatus	17	0.1	6.3	0.2
Acanthurus mata	13	0.1	0.8	<0.1
Hipposcarus harid	12	0.1	6.1	0.2
Tylosaurus crocodilus	10	0.1	25.3	0.6
Lethrinus xanthochilus	10	0.1	6.8	0.2
Coris aygula	9	0.1	2.4	0.1
Sphyraena obtusata	9	0.1	6.2	0.2
Lethrinus rubrioperculus	9	0.1	7.1	0.2
Crenimugil crenilabis	8	0.1	41.0	1.0
Parupeneus trifasciatus	8	0.1	1.2	<0.1
Gnathodentex aureolineatus	8	0.1	1.9	<0.1
Scomberoides lysan	6	<0.1	7.8	0.2
Cheilinus chlorourus	5	<0.1	0.7	<0.1
Hemiramphus far	5	<0.1	0.7	<0.1
Thalassoma trilobatum	4	<0.1	0.9	<0.1
Chaetodon auriga	4	<0.1	0.3	<0.1
Leptoscarus vaigiensis	4	<0.1	1.1	<0.1
Rhinecanthus rectangulus	3	<0.1	0.5	<0.1
Cheilio inermis	3	<0.1	0.7	<0.1
Lethrinus olivaceus	3	<0.1	1.0	<0.1
Hemigymnus fasciatus	3	<0.1	0.7	<0.1
Diodon spp	3	<0.1	8.4	0.2
Parupeneus rubescens	3	<0.1	0.7	<0.1
Naso tuberosus	2	<0.1	7.0	0.2
Albula glossodonta	2	<0.1	3.8	0.1
Chaetodon xanthocephalus	2	<0.1	0.6	<0.1

Scarus rubriolaceus	2	<0.1	0.6	<0.1
Novaculichthys taeniourus	1	<0.1	0.3	<0.1
Thalassoma hardwicke	1	<0.1	0.2	<0.1
Aluterus scriptus	1	<0.1	0.2	<0.1
Zebrasoma veliferum	1	<0.1	0.1	<0.1
Aprion virescens	1	<0.1	6.2	0.2
Cantherines dumerilii	1	<0.1	0.1	<0.1
Gnathodentex speciosus	1	<0.1	0.4	<0.1
Parupeneus cyclostomus	1	<0.1	0.1	<0.1
Parupeneus macronema	1	<0.1	0.2	<0.1
Hologymnosus longibes	1	<0.1	0.5	<0.1
Mugil cephalus	1	<0.1	1.4	<0.1
Sphyraena barracuda	1	<0.1	1.5	<0.1
TOTAL	**12,997**		**3,915.7**	

Table A2. Length frequency distribution for different species caught by the seine net fishery.

a. Mulloidichthys flavolineatus

Size class (cm)	Frequency
13 - 13.9	1
14 - 14.9	0
15 - 15.9	0
16 - 16.9	0
17 - 17.9	1
18 - 18.9	3
19 - 19.9	14
20 - 20.9	50
21 - 21.9	272
22 - 22.9	691
23 - 23.9	870
24 - 24.9	708
25 - 25.9	587
26 - 26.9	499
27 - 27.9	392
28 - 28.9	261
29 - 29.9	183
30 - 30.9	119
31 - 31.9	83
32 - 32.9	47
33 - 33.9	28
34 - 34.9	13
35 - 35.9	8
36 - 36.9	4
37 - 37.9	3

b. Siganus sutor

Size class (cm)	Frequency
13 - 13.9	2
14 - 14.9	2
15 - 15.9	5
16 - 16.9	11
17 - 17.9	22
18 - 18.9	27
19 - 19.9	29
20 - 20.9	66
21 - 21.9	53
22 - 22.9	65
23 - 23.9	96
24 - 24.9	146
25 - 25.9	229
26 - 26.9	311
27 - 27.9	385
28 - 28.9	361
29 - 29.9	305
30 - 30.9	232
31 - 31.9	172
32 - 32.9	152
33 - 33.9	117
34 - 34.9	81
35 - 35.9	80
36 - 36.9	55
37 - 37.9	32
38 - 38.9	24
39 - 39.9	19
40 - 40.9	11
41 - 41.9	11
42 - 42.9	8
43 - 43.9	5
44 - 44.9	1
45 - 45.9	0
46 - 46.9	0
47 - 47.9	0
48 - 48.9	0
49 - 49.9	0
50 - 50.9	0
51 - 51.9	1

c. Caranx melampygus

Size class (cm)	Frequency
16 - 16.9	1
17 - 17.9	1
18 - 18.9	4
19 - 19.9	5
20 - 20.9	15
21 - 21.9	22
22 - 22.9	21
23 - 23.9	31
24 - 24.9	93
25 - 25.9	128
26 - 26.9	192
27 - 27.9	182
28 - 28.9	162
29 - 29.9	120
30 - 30.9	111
31 - 31.9	66
32 - 32.9	51
33 - 33.9	43
34 - 34.9	16
35 - 35.9	10
36 - 36.9	16
37 - 37.9	10
38 - 38.9	2
39 - 39.9	0
40 - 40.9	2
41 - 41.9	0
42 - 42.9	1
43 - 43.9	2

d. Lethrinus nebulosus

Size class (cm)	Frequency
15.9	5
16.9	9
17.9	17
18.9	22
19.9	49
20.9	45
21.9	42
22.9	21
23.9	29
24.9	19
25.9	41
26.9	37
27.9	50
28.9	72
29.9	85
30.9	96
31.9	85
32.9	81
33.9	64
34.9	23
35.9	15
36.9	7
37.9	5
38.9	3
39.9	1
40.9	3
41.9	3
42.9	3
43.9	4
44.9	1
45.9	0
46.9	0
47.9	1
48.9	0
49.9	0
50.9	0
51.9	1

e. Acanthurus triostegus

Size class (cm)	Frequency
11 – 11.9	2
12 – 12.9	16
13 – 13.9	32
14 – 14.9	53
15 – 15.9	88
16 - 16.9	113
17 - 17.9	94
18 - 18.9	74
19 - 19.9	49
20 - 20.9	23
21 - 21.9	11
22 - 22.9	4
23 - 23.9	1
24 - 24.9	0
25 - 25.9	0
26 - 26.9	0
27 - 27.9	0
28 - 28.9	0
29 - 29.9	1

f. Gerres longirostris

Size class (cm)	Frequency
18 - 18.9	1
19 - 19.9	0
20 - 20.9	0
21 - 21.9	3
22 - 22.9	9
23 - 23.9	7
24 - 24.9	20
25 - 25.9	45
26 - 26.9	42
27 - 27.9	64
28 - 28.9	65
29 - 29.9	57
30 - 30.9	58
31 - 31.9	35
32 - 32.9	40
33 - 33.9	25
34 - 34.9	20
35 - 35.9	15
36 - 36.9	9
37 - 37.9	13
38 - 38.9	6
39 - 39.9	2
40 - 40.9	2

g. Rhinecanthus aculeatus

Size class (cm)	Frequency
13 - 13.9	1
14 - 14.9	1
15 - 15.9	6
16 - 16.9	29
17 - 17.9	35
18 - 18.9	26
19 - 19.9	28
20 - 20.9	38
21 - 21.9	34
22 - 22.9	22
23 - 23.9	10
24 - 24.9	3
25 - 25.9	1

h. Valamugil seheli

Size class (cm)	Frequency
29 - 29.9	1
30 - 30.9	0
31 - 31.9	1
32 - 32.9	0
33 - 33.9	1
34 - 34.9	0
35 - 35.9	0
36 - 36.9	0
37 - 37.9	1
38 - 38.9	0
39 - 39.9	0
40 - 40.9	0
41 - 41.9	0
42 - 42.9	0
43 - 43.9	0
44 - 44.9	1
45 - 45.9	4
46 - 46.9	9
47 - 47.9	14
48 - 48.9	18
49 - 49.9	29
50 - 50.9	23
51 - 51.9	14
52 - 52.9	16
53 - 53.9	16
54 - 54.9	9
55 - 55.9	12
56 - 56.9	3
57 - 57.9	3
58 - 58.9	1
59 - 59.9	0
60 - 60.9	1

i. Chlorurus sordidus

Size class (cm)	Frequency
15 – 15.9	3
16 – 16.9	2
17 - 17.9	12
18 - 18.9	9
19 - 19.9	18
20 - 20.9	28
21 - 21.9	25
22 - 22.9	21
23 - 23.9	15
24 - 24.9	12
25 - 25.9	10
26 - 26.9	3
27 - 27.9	3
28 - 28.9	0
29 - 29.9	0
30 - 30.9	0
31 - 31.9	1
32 - 32.9	0
33 - 33.9	1
34 - 34.9	0
35 - 35.9	0
36 - 36.9	1

j. Lethrinus harak

Size class (cm)	Frequency
22 – 22.9	1
23 – 23.9	2
24 - 24.9	2
25 - 25.9	1
26 - 26.9	2
27 - 27.9	2
28 - 28.9	2
29 - 29.9	4
30 - 30.9	14
31 - 31.9	10
32 - 32.9	10
33 - 33.9	15
34 - 34.9	16
35 - 35.9	11
36 - 36.9	11
37 - 37.9	8
38 - 38.9	6
39 - 39.9	1
40 - 40.9	0
41 - 41.9	1

Table A3. Total length (cm) and weight (g) values for different species caught by the seine net fishery.

a. Siganus sutor

Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)
17.9	81.1	24.4	201.1	28.0	322.2	30.8	392.4	33.1	570.3	23.9	192.9
18.8	104.1	24.4	190.7	28.0	320.0	30.9	442.9	33.2	517.4	28.7	217.3
19.1	91.2	24.5	193.0	28.0	288.0	30.9	427.6	33.3	504.0	20.5	131.6
19.5	107.9	24.5	193.8	28.0	331.6	31.0	379.0	33.4	524.0	28.1	218.0
20	110.9	24.5	193.0	28.0	337.2	31.0	426.6	33.5	507.0	34.6	524.4
20.1	119.2	24.6	212.5	28.0	323.5	31.0	432.0	33.5	507.0	25.1	192.5
20.5	118.2	24.6	196.2	28.2	321.5	31.0	353.0	33.6	553.0	26.3	234.6
20.5	120.4	24.9	233.6	28.2	321.5	31.0	354.3	33.7	562.5	26.5	264.4
20.7	125.9	25.0	222.0	28.3	290.0	31.0	397.4	33.9	630.6	25.0	207.0
20.7	115.8	25.0	215.0	28.4	278.1	31.0	418.5	34.0	496.8	26.5	253.5
20.8	114.4	25.0	219.0	28.4	303.0	31.0	456.1	34.0	491.0	25.6	241.2
20.8	131.4	25.0	235.0	28.5	350.3	31.0	417.8	34.0	545.6	36.4	715.5
21.0	130.0	25.0	246.8	28.7	300.5	31.0	379.0	34.0	521.0	23.0	157.6
21.0	111.1	25.0	247.6	28.9	273.9	31.0	426.6	34.1	495.8	24.0	204.0
21.0	125.3	25.0	222.0	28.9	374.6	31.0	432.0	34.2	630.0	35.5	551.4
21.0	130.0	25.0	215.0	28.9	273.9	31.0	353.0	34.2	523.8	27.1	289.5
21.3	136.2	25.0	219.0	29.0	294.0	31.0	354.3	34.3	540.5	31.8	477.6
21.5	138.3	25.0	235.0	29.0	342.0	31.1	465.4	34.5	575.3	22.7	146.4
21.6	150.5	25.4	234.6	29.0	346.8	31.2	397.1	34.6	605.0	22.7	143.8
21.6	134.1	25.5	235.0	29.0	359.3	31.3	472.0	34.6	562.5	23.7	166.7
21.7	145.7	25.5	236.5	29.0	310.9	31.4	428.6	34.8	602.8	21.9	134.2
21.7	133.6	25.5	235.0	29.0	481.1	31.4	447.1	34.8	543.0	26.3	273.9
21.8	130.28	25.5	236.5	29.0	442.4	31.5	448.3	35.0	583.6	42.5	906.4
22.1	153.4	25.6	243.0	29.0	377.5	31.5	425.8	35.0	567.0	41.9	945.2
22.1	142.11	25.6	244.1	29.0	351.4	31.5	482.5	35.1	627.4	27.5	296.5
22.4	172.2	25.6	226.1	29.0	294.0	31.5	461.4	35.4	592.5	23.0	198.3
22.5	140.5	26.0	225.0	29.0	342.0	31.6	450.0	35.8	643.3	28.5	325.9
22.5	170.7	26.0	259.0	29.0	346.8	31.9	424.2	36.0	618.0	34.0	539.1
22.6	159.8	26.0	251.0	29.1	343.3	32.0	404.0	36.1	638.9	38.0	744.5
22.6	159.7	26.0	225.0	29.5	393.2	32.0	462.0	36.1	638.9	36.4	671.5
22.6	159.8	26.0	259.0	29.5	394.9	32.0	424.2	36.5	692.1	26.4	220.7
22.7	180.3	26.0	251.0	29.5	339.8	32.0	517.0	36.5	727.3	23.9	158.6
22.7	144.2	26.3	253.7	29.5	393.2	32.0	469.3	37.1	691.0	23.5	170.3
22.9	169.8	26.4	293.3	29.5	394.9	32.0	404.0	38.5	802.3	27.0	283.3
22.9	171.2	26.5	271.0	29.7	336.3	32.1	450.5	39.0	862.4	22.0	160.8
22.9	150.35	26.5	264.6	30.0	368.0	32.1	505.5	39.0	783.0	28.0	314.0
23.2	157.3	26.6	265.4	30.0	419.0	32.3	489.0	39.3	803.5	28.2	351.0
23.5	167.0	26.6	219.1	30.0	333.8	32.3	480.0	39.7	818.5	26.6	274.9
23.5	171.0	26.6	260.5	30.0	372.8	32.4	452.2	40.2	936.5	26.3	347.4
23.5	178.6	26.6	286.0	30.0	382.8	32.4	489.7	41.6	936.0	40.3	912.8
23.5	167.0	26.7	262.4	30.0	332.7	32.4	496.1	25.5	238.4	36.5	522.8
23.5	171.0	27.1	283.3	30.0	379.4	32.5	508.3	27.1	282.5	38.8	829.5
23.7	165.8	27.4	261.0	30.0	368.0	32.5	440.0	24.3	195.8	30.2	386.8
23.8	189.9	27.4	261.0	30.0	419.0	32.5	490.6	40.8	881.1	27.6	333.7
23.9	191.0	27.5	272.0	30.0	333.8	32.5	471.7	23.5	202.2	28.3	313.1
23.9	191.0	27.5	302.5	30.3	381.7	32.7	512.5	27.9	313.0	27.8	303.0
24.0	193.0	27.5	272.0	30.3	372.7	32.8	481.6	29.5	296.3	26.4	254.8
24.0	182.0	27.7	279.4	30.3	381.7	32.8	481.5	23.8	199.7	26.4	280.0
24.0	212.8	27.7	279.4	30.4	417.5	32.8	484.3	26.1	244.9	26.2	278.8
24.0	168.1	28.0	320.0	30.5	372.5	32.9	448.1	22.2	131.8	35.0	650.7
24.0	186.5	28.0	288.0	30.5	389.5	33.0	440.9	29.6	336.6	33.0	533.4
24.0	193.0	28.0	331.6	30.5	372.5	33.0	476.7	26.5	268.0	32.5	460.4
24.0	182.0	28.0	337.2	30.6	379.6	33.0	440.9	28.4	334.1	30.3	376.4
24.2	186.8	28.0	323.5	30.8	392.4	33.1	519.0	26.0	245.8	31.6	452.7

Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)
29.7	378.2	48.0	1298.6	30.0	371.0	31.7	442.6	34.7	698.3	19.6	101.5
31.0	444.2	33.3	550.0	30.5	405.6	31.5	446.1	31.5	520.4	18.4	92.0
31.5	431.9	37.1	709.7	28.7	449.2	30.0	403.9	20.6	126.1	20.9	122.9
28.5	357.9	29.8	419.7	27.0	279.2	29.6	413.9	21.9	145.0	20.9	130.8
27.5	303.8	41.1	1036.1	31.4	469.2	29.0	359.8	21.7	152.4	18.4	88.9
28.8	312.4	39.9	1012.9	30.4	443.2	30.9	470.3	19.8	121.6	17.2	72.5
28.3	330.9	31.0	448.3	25.4	241.2	33.8	517.0	21.7	142.5	33.5	526.9
27.2	309.8	41.9	1203.3	39.5	860.0	29.0	395.6	23.9	192.7	32.2	482.3
23.3	191.5	34.0	583.8	39.1	862.2	21.0	133.2	23.2	174.6	31.7	476.1
27.9	307.8	32.5	489.2	42.0	1218.4	36.5	715.2	22.6	169.9	32.0	549.4
26.6	262.9	28.5	323.3	38.1	828.1	34.0	602.1	19.3	96.3	33.0	520.1
26.4	254.9	30.5	451.2	38.3	867.5	38.2	911.2	20.4	134.7	36.7	729.0
25.4	228.9	30.0	398.0	40.4	890.0	36.1	700.8	21.7	143.1	31.8	468.9
24.3	199.8	34.5	603.5	39.3	901.8	37.7	824.2	24.2	211.2	35.6	672.1
24.0	181.2	37.0	774.7	34.5	598.6	31.1	616.0	19.9	115.6	35.6	682.8
35.0	594.2	38.0	863.7	38.3	880.0	30.9	475.0	23.6	189.8	32.0	516.7
35.0	622.5	34.5	586.4	36.5	601.9	38.9	903.0	22.8	179.2	32.3	441.3
25.5	272.1	32.0	491.4	35.0	720.0	33.7	754.5	17.1	73.6	34.2	506.8
31.0	449.2	31.5	480.2	40.3	980.0	35.0	793.2	19.5	107.2	32.0	411.0
18.5	94.5	30.6	378.8	35.4	601.6	19.1	117.8	42.5	1149.6	33.0	501.4
25.0	214.5	35.7	621.3	39.4	909.9	33.9	750.0	34.4	629.4	27.6	263.8
26.8	282.5	27.9	313.0	22.5	158.4	35.4	725.0	28.2	307.9	23.7	179.4
32.5	509.5	32.9	442.9	36.1	632.0	32.4	490.0	23.5	189.4	18.8	87.7
39.5	1136.5	29.1	361.6	27.6	301.5	27.9	350.0	19.1	100.8	24.40	214.00
39.8	888.0	26.3	259.4	27.4	288.0	28.0	325.0	14.5	47.4	20.90	130.80
31.8	459.0	18.4	94.9	23.2	171.5	26.4	180.0	41.5	930.0	31.20	491.60
30.00	361.00	39.00	801.00	42.10	1120.20	34.50	624.50	31.60	515.30	27.00	283.00
29.50	310.80	32.00	492.70	33.00	535.90	29.60	343.00	26.50	290.00	28.40	372.30
33.00	422.70	35.00	553.00	29.00	409.50	21.50	138.80	20.60	136.80	29.70	362.70
31.00	362.30	26.40	247.80	35.60	684.50	33.60	534.70	17.40	67.00	38.30	925.50
31.50	401.90	28.00	288.40	23.60	228.50	37.90	781.10	14.10	38.70	42.70	1283.40
27.70	297.60	25.30	209.70	26.80	262.80	40.00	1014.00	35.90	810.50	35.10	670.40
27.60	309.40	29.90	366.60	33.50	445.70						

b. Gerres longirostris

Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)
20.5	114.0	26.8	252.7	29.0	278.7	30.6	326.5	31.9	387.7	37.8	648.8
20.5	90.9	27.0	222.9	29.0	270.2	30.7	373.1	32.0	371.8	33.9	400.9
21.0	95.4	27.3	249.4	29.0	255.0	30.7	344.0	32.0	401.2	35.0	449.5
21.0	97.2	27.5	256.4	29.1	307.0	30.7	376.6	32.0	368.5	31.4	324.2
21.0	111.1	27.5	256.4	29.2	290.7	30.8	343.2	32.3	402.4	30.5	293.4
21.5	102.8	27.5	248.4	29.4	309.0	30.8	344.8	32.3	376.5	34.2	488.6
22.5	123.8	27.8	283.0	29.4	297.9	31.0	361.1	32.4	423.4	27.8	254.3
23.0	135.4	28.0	248.0	29.5	321.0	31.0	353.9	32.4	438.8	29.5	294.2
23.0	149.4	28.0	248.0	29.5	294.7	31.0	393.3	32.5	370.8	33.7	502.9
23.0	138.8	28.0	237.5	29.5	287.9	31.0	359.6	32.5	370.8	31.1	390.6
23.5	160.0	28.0	276.3	29.5	329.3	31.1	348.9	32.7	376.0	30.0	322.0
23.5	160.0	28.0	270.0	29.7	323.7	31.1	421.2	33.0	429.2	32.9	420.0
23.5	143.1	28.2	254.3	29.7	338.2	31.1	415.5	33.0	403.4	29.8	315.5
24.0	168.6	28.2	239.4	29.8	321.2	31.2	347.5	33.0	418.4	27.9	260.8
24.6	175.0	28.3	274.1	29.9	315.9	31.2	392.1	33.2	455.5	27.9	257.2
24.6	179.2	28.4	280.0	29.9	293.8	31.2	350.0	33.3	477.0	33.0	375.2
25.0	194.5	28.5	258.0	29.9	234.8	31.2	334.3	33.4	439.1	31.5	276.1
25.2	211.2	28.5	258.0	30.0	301.5	31.4	390.6	33.5	439.7	30.5	316.6
25.2	180.7	28.5	255.7	30.0	291.9	31.5	321.1	33.7	473.0	29.6	284.0
25.8	211.3	28.5	270.5	30.2	353.4	31.5	366.5	34.0	467.2	31.5	307.6

Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)
26.0	192.0	28.5	262.6	30.5	373.7	31.5	352.5	34.2	482.6	41.0	761.5
26.0	192.0	28.5	264.8	30.5	373.7	31.6	406.4	34.7	455.8	36.0	508.9
26.0	208.4	28.6	312.2	30.5	320.8	31.6	420.8	34.9	486.3	30.6	310.9
26.2	206.4	28.6	206.1	30.5	333.0	31.7	364.9	35.0	485.5	36.0	535.5
26.3	183.8	29.0	279.2	30.5	355.5	31.8	478.2	35.5	490.3	34.5	450.4
26.5	200.9	29.0	254.6	30.5	308.9	31.9	369.8	36.0	449.7	33.9	426.9
26.7	228.9	29.0	262.9	30.5	498.6	31.9	365.1	36.7	678.9	34.5	473.3
32.8	372.6	35.0	545.2	36.2	646.3	32.5	416.4	26.2	206.3	31.7	404.3
34.2	409.7	23.0	141.7	34.8	591.7	26.4	232.9	23.4	163.4	40.0	674.4
29.0	250.3	24.0	158.3	35.4	524.2	29.8	328.2	36.2	531.6	39.0	664.0
39.5	726.6	24.0	164.8	35.5	575.6	27.5	268.3	31.5	385.0	37.5	634.3
32.5	398.3	33.3	427.8	32.5	416.2	26.1	222.6	32.0	401.0	37.0	561.9
26.5	199.9	36.1	561.6	36.0	530.8	28.5	304.5	29.6	322.0	40.5	677.0
33.5	465.6	32.2	370.4	35.0	426.8	31.0	330.0	30.0	293.1	37.4	694.2
29.0	251.0	35.5	557.8	34.8	453.1	33.0	442.6	38.2	705.0	39.5	843.8
29.1	280.0	27.0	228.8	36.2	581.1	36.0	522.3	37.5	661.0	39.2	790.0
28.0	247.7	25.0	171.6	24.5	180.6	26.0	200.3	24.0	168.9	27.5	235.1

c. Caranx melampygus

Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)	Total length (cm)	Weight (g)
18.0	66.2	23.9	155.4	33.0	436.5	35.4	528.6	43.1	895.8	57.7	2166.9
18.5	67.5	25.0	173.8	33.0	436.5	33.5	456.4	42.1	857.5	29.9	354.8
19.8	77.3	25.0	169.4	33.2	385.0	33.0	439.8	42.3	910.7	22.8	142.8
19.9	84.1	25.3	186.4	33.7	453.9	24.3	169.2	33.3	403.8	22.5	154.3
20.0	91.2	25.4	196.2	33.8	530.7	32.0	392.8	36.5	525.9	33.0	427.8
20.5	99.6	25.5	224.3	34.0	487.5	36.9	616.7	35.5	490.0	36.7	611.9
21.0	97.6	25.5	194.8	34.0	470.1	38.5	602.1	35.8	474.8	22.5	161.1
21.1	111.7	27.0	221.2	34.0	448.2	40.9	713.6	38.0	657.8	20.0	98.8
21.2	101.8	27.0	210.1	34.0	448.8	38.0	624.4	43.5	813.8	36.7	612.2
21.7	109.6	27.8	280.0	34.4	409.0	37.8	629.6	55.0	1856.8	32.3	412.9
21.7	109.4	27.9	246.9	34.6	522.5	36.8	519.5	31.0	323.2	30.9	350.1
22.0	121.4	27.9	246.9	34.7	493.4	34.9	487.4	27.2	212.9	25.7	207.5
22.0	117.6	28.3	246.7	34.9	464.6	34.9	472.6	33.4	617.9	23.7	162.9
22.5	145.1	28.7	268.5	35.0	485.3	38.0	662.5	28.0	266.7	27.0	239.5
22.5	126.3	29.1	332.9	35.0	485.3	39.5	731.1	29.9	315.6	26.4	228.8
22.5	117.5	29.5	355.0	35.0	510.3	38.5	687.0	45.8	1186.5	24.7	174.5
22.5	111.1	29.7	291.9	35.2	583.7	37.5	649.5	43.8	1073.1	27.0	225.5
22.5	101.5	30.2	322.4	36.5	629.9	34.0	445.1	41.7	959.8	23.5	168.4
22.7	131.1	31.0	393.6	37.1	651.2	30.5	315.7	36.3	589.1	23.5	168.1
23.0	161	31.2	440.1	37.2	625.4	34.5	503.3	43.6	1116.8	38.4	670.0
23.0	122.6	32.0	370.3	37.5	636.1	27.0	225.7	44.5	1193.1	36.9	635.0
23.2	142.1	32.2	407.2	37.5	672.7	26.0	194.1	37.2	584.4	37.6	622.3
23.2	124.6	32.5	441.8	38.0	685.9	36.8	529.8	35.7	553.6	37.9	640.2
23.5	162.2	32.5	445.2	39.0	744.3	39.5	661.1	36.4	546.8	43.5	939.7
23.6	164.6	32.6	464.5	40.8	796.7	42.6	887.9	43.4	1109.4	46.0	1078.7
23.7	155.7	32.7	413.4	45.0	1068.5	43.4	847.4	39.2	722.1	48.5	1200.9
36.0	575.0	45.0	1250.0	43.0	1000.0	29.0	250.0	36.0	600.0	32.5	400.0
31.0	328.7	23.5	144.1	29.5	283.9	29.5	283.9	25.5	190.0		

Table A5. Details of the individual hauls sampled in the study.

Fishing base: Pointe l'Aigle Date: 02/03/2007 No. fishers: 22 No. boats: 7 Fishing day: 08h 00 min

Haul time: 06 min Long: 63.39521° Lat: -19.66083°

Species		No.	Weight (kg)
Siganus	*sutor*	76	22.1
Lethrinus	*nebulosus*	22	9.5
Caranx	*melampygus*	21	7.1
Lethrinus	*harak*	18	8.5
Acanthurus	*triostegus*	7	0.9
Gerres	*longirostris*	3	1.0
Scarus	*ghobban*	1	0.4
	Total	***148***	***49.3***

Haul time: 08 min Long: 63.39421° Lat: -19.65996°

Siganus	*sutor*	162	43.6
Mulloidichthys	*flavolineatus*	1	0.3
Gerres	*longirostris*	1	0.2
	Total	***164***	***44.1***

Haul time: 09 min Long: 63.39385° Lat: -19.66106°

Siganus	*sutor*	74	20.8
Caranx	*melampygus*	16	4.8
Gerres	*longirostris*	2	0.9
Lethrinus	*nebulosus*	2	0.7
Acanthurus	*triostegus*	1	0.2
Lethrinus	*harak*	1	0.5
	Total	***96***	***27.9***

Haul time: 10 min Long: 63.38594° Lat: -19.65823°

Siganus	*sutor*	101	34.2
Acanthurus	*triostegus*	31	3.5
Gerres	*longirostris*	21	6.4
Lethrinus	*harak*	20	9.3
Caranx	*melampygus*	14	4.0
Lethrinus	*rubrioperculat*	1	0.6
	Total	***188***	***57.9***

Haul time: 17 min Long: 63° Lat: -19°

Siganus	*sutor*	171	47.6
Rhinecanthus	*aculeatus*	2	0.6
	Total	***173***	***48.3***

Haul time: 08 min Long: 63.38956° Lat: -19.65906°

Species		No.	Weight (kg)
Siganus	*sutor*	90	29.5
Acanthurus	*triostegus*	29	5.2
Lethrinus	*harak*	13	6.3
Caranx	*melampygus*	10	3.8
Lethrinus	*nebulosus*	3	1.1
Diodon	*spp*	3	8.4
Tylosurus	*crocodilus*	1	2.3
Lethrinus	*rubrioperculat*	1	0.3
	Total	***150***	***56.9***

Haul time: 09 min Long: 63.39101° Lat: -19.66288°

Siganus	*sutor*	51	14.8
	Total	***51***	***14.8***

Haul time: 09 min Long: 63.39249° Lat: -19.66280°

Siganus	*sutor*	226	78.8
Caranx	*melampygus*	8	3.6
Lethrinus	*nebulosus*	4	1.1
Siganus	*sutor*	2	0.6
Naso	*unicornis*	2	1.3
Scarus	*rubroviolaceus*	2	0.6
Naso	*tuberosus*	1	3.9
Caranx	*melampygus*	1	0.2
	Total	***246***	***90.1***

Haul time: 10 min Long: 63.38953° Lat: -19.66741°

Siganus	*sutor*	2	0.6
Lethrinus	*nebulosus*	1	0.2
Gerres	*longirostris*	1	0.3
	Total	***4***	***1.1***

Haul time: 12 min Long: 63° Lat: -19°

Siganus	*sutor*	177	49.0
	Total	***177***	***49.0***

Fishing base: Port Sud Est Date: 09/03/2007 No. fishers: 22 No. boats: 7 Fishing day: 05h 00 min

Haul time: 05 min Long: 63.45895° Lat: -19.75968°

Species		No.	Weight (kg)
Caranx	*melampygus*	11	3.6
Acanthurus	*triostegus*	3	0.4
Lethrinus	*harak*	2	1.1
Rhinecanthus	*aculeatus*	1	0.2
Lethrinus	*nebulosus*	1	0.2
	Total	***18***	***5.5***

Haul time: 10 min Long: 63.45533° Lat: -19.75638°

Mulloidichthys	*flavolineatus*	67	13.8
Rhinecanthus	*aculeatus*	21	4.1
Caranx	*melampygus*	8	1.9
Chlorurus	*sordidus*	2	0.4
Siganus	*sutor*	2	1.1
Cheilio	*inermis*	1	0.2
	Total	***101***	***21.5***

Haul time: 10 min Long: 63.44415° Lat: -19.75884°

Species		No.	Weight (kg)
Siganus	*sutor*	36	17.5
Mulloidichthys	*flavolineatus*	5	1.0
Rhinecanthus	*aculeatus*	1	0.2
	Total	***42***	***18.6***

Haul time: 10 min Long: 63.44766° Lat: -19.75823°

Siganus	*sutor*	14	4.3
Rhinecanthus	*aculeatus*	8	1.5
Mulloidichthys	*flavolineatus*	8	1.6
	Total	***30***	***7.4***

Haul time: 10 min Long: 63.45581° Lat: -19.75711°

Siganus	*sutor*	67	25.4
Mulloidichthys	*flavolineatus*	27	5.6
Rhinecanthus	*aculeatus*	9	2.1
Acanthurus	*triostegus*	6	1.0

Haul time: 10 min Long: 63.45593° Lat: -19.75725°			
Rhinecanthus	*aculeatus*	13	2.5
Acanthurus	*triostegus*	9	1.4
Caranx	*melampygus*	4	0.9
Siganus	*sutor*	1	0.3
Chlorurus	*sordidus*	1	0.2
Lethrinus	*harak*	1	0.2
Mulloidichthys	*flavolineatus*	1	0.3
	Total	***30***	***5.9***

Haul time: 10 min Long: 63.46094° Lat: -19.76171°			
Caranx	*papuensis*	6	24.4
	Total	***6***	***24.4***

Chlorurus	*sordidus*	2	0.5
Caranx	*melampygus*	1	0.2
	Total	***112***	***34.9***

Haul time: 10 min Long: 63.45803° Lat: -19.76061°			
Siganus	*sutor*	46	23.0
Mulloidichthys	*flavolineatus*	36	6.5
Rhinecanthus	*aculeatus*	22	4.0
Caranx	*melampygus*	5	1.1
	Total	***109***	***34.7***

Haul time: 20 min Long: 63.45248° Lat: -19.75603°			
Mulloidichthys	*flavolineatus*	31	5.9
Rhinecanthus	*aculeatus*	27	5.0
Caranx	*melampygus*	6	1.3
Cheilio	*inermis*	1	0.2
Siganus	*sutor*	1	1.2
Gerres	*longirostris*	1	0.2
	Total	***67***	***13.8***

Fishing base: Pointe Corail Date: 14/03/2007 No. fishers: 28 No. boats: 9 Fishing day: 07h 30 min

Haul time: 10 min Long: 63.32583° Lat: -19.81668°			
Species		**No.**	**Weight (kg)**
Lethrinus	*nebulosus*	27	12.2
Siganus	*sutor*	14	6.1
Mulloidichthys	*flavolineatus*	4	1.3
Acanthurus	*spp*	3	2.9
Caranx	*melampygus*	3	0.7
Mulloidichthys	*vanicolensis*	2	0.3
Rhinecanthus	*aculeatus*	2	0.4
Hemiramphus	*far*	1	0.1
Lethrinus	*mahsena*	1	0.3
Acanthurus	*triostegus*	1	0.1
	Total	***58***	***24.2***

Haul time: 10 min Long: 63.32995° Lat: -19.82151°			
Acanthurus	*triostegus*	83	11.2
Siganus	*sutor*	11	3.3
Lethrinus	*nebulosus*	11	3.7
Chlorurus	*sordidus*	6	1.4
Caranx	*melampygus*	4	0.7
Acanthurus	*spp*	2	3.4
Chaetodon	*xanthocephalu*	2	0.6
Rhinecanthus	*aculeatus*	2	0.4
Coris	*aygula*	2	0.6
Lethrinus	*harak*	1	0.6
Parupeneus	*trifasciatus*	1	0.2
Mulloidichthys	*flavolineatus*	1	0.3
Parupeneus	*ciliatus*	1	0.2
Hemigymnus	*fasciatus*	1	0.2
Gnathodentex	*aureolineatus*	1	0.2
	Total	***129***	***27.2***

Haul time: 15 min Long: 63.32721° Lat: -19.81864°			
Lethrinus	*nebulosus*	31	11.7
Siganus	*sutor*	25	8.3
Acanthurus	*triostegus*	18	2.1
Caranx	*melampygus*	9	1.9
Rhinecanthus	*aculeatus*	6	1.3
Coris	*aygula*	5	1.5

Haul time: 10 min Long: 63.32924° Lat: -19.82053°			
Species		**No.**	**Weight (kg)**
Acanthurus	*triostegus*	28	3.3
Siganus	*sutor*	13	4.4
Acanthurus	*spp*	5	4.3
Scarus	*spp*	4	1.8
Lethrinus	*nebulosus*	2	0.7
Mulloidichthys	*flavolineatus*	2	0.6
Chlorurus	*sordidus*	2	0.4
Anampses	*caeruleopuncta*	2	0.4
Lethrinus	*harak*	2	1.3
Rhinecanthus	*aculeatus*	1	0.2
Gerres	*longirostris*	1	0.2
	Total	***62***	***17.5***

Haul time: 10 min Long: 63.32996° Lat: -19.82153°			
Lethrinus	*nebulosus*	46	21.6
Siganus	*sutor*	21	7.4
Mulloidichthys	*flavolineatus*	9	2.6
Parupeneus	*barberinus*	4	1.0
Caranx	*melampygus*	3	0.6
Coris	*aygula*	1	0.2
Acanthurus	*triostegus*	1	0.2
	Total	***85***	***33.5***

Haul time: 10 min Long: 63.33451° Lat: -19.82571°			
Acanthurus	*triostegus*	57	6.3
Chlorurus	*sordidus*	12	2.6
Siganus	*sutor*	4	1.1
Caranx	*melampygus*	2	0.2
Lethrinus	*mahsena*	1	0.2
Lethrinus	*nebulosus*	1	1.1
Mulloidichthys	*flavolineatus*	1	0.3
Naso	*unicornis*	1	0.2
Rhinecanthus	*aculeatus*	1	0.3
Coris	*aygula*	1	0.1
Gerres	*longirostris*	1	0.3
Acanthurus	*spp*	1	0.5
	Total	***83***	***13.1***

Anampses	*caeruleopuncta*	4	0.7
Acanthurus	*spp*	4	2.3
Scarus	*spp*	3	1.7
Parupeneus	*trifasciatus*	3	0.5
Mulloidichthys	*vanicolensis*	2	0.6
Chlorurus	*sordidus*	2	0.8
Gnathodentex	*aureolineatus*	2	0.6
Hemigymnus	*fasciatus*	2	0.5
Lethrinus	*mahsena*	1	0.2
Parupeneus	*barberinus*	1	0.3
Lethrinus	*rubrioperculat*	1	0.6
Cheilio	*inermis*	1	0.2
Mulloidichthys	*flavolineatus*	1	0.2
	Total	***121***	***36.0***

Haul time: 15 min Long: 63.32806° Lat: -19.77115°

Caranx	*melampygus*	156	38.1
Caranx	*papuensis*	1	0.4
Gerres	*longirostris*	1	0.2
Chlorurus	*sordidus*	1	0.2
	Total	***159***	***38.9***

Haul time: 05 min Long: 63.33203° Lat: -19.77301°

Caranx	*melampygus*	79	19.6
Gerres	*longirostris*	38	15.1
Siganus	*sutor*	27	12.1
Acanthurus	*triostegus*	3	0.4
Chlorurus	*sordidus*	2	0.5
Caranx	*papuensis*	1	1.1
Lethrinus	*nebulosus*	1	0.5
	Total	***151***	***49.2***

Fishing base: Pointe Corail Date: 15/03/2007 No. fishers: 18 No. boats: 6 Fishing day: 5h 45min

Haul time: 08 min Long: 63.35734° Lat: -19.81194°

Species		**No.**	**Weight (kg)**
Caranx	*melampygus*	6	2.5
	Total	***6***	***2.5***

Haul time: 10 min Long: 63.34523° Lat: -19.82521°

Mulloidichthys	*flavolineatus*	7	1.4
Siganus	*sutor*	5	2.4
Gerres	*longirostris*	3	0.7
Caranx	*melampygus*	1	0.3
Valamugil	*seheli*	1	1.6
	Total	***17***	***6.4***

Haul time: 10 min Long: 63.34603° Lat: -19.82695°

Siganus	*sutor*	211	67.3
Scarus	*spp*	52	16.1
Acanthurus	*triostegus*	30	4.6
Caranx	*melampygus*	21	5.1
Gerres	*longirostris*	21	5.2
Acanthurus	*spp*	9	13.0
Lethrinus	*nebulosus*	8	2.8
Parupeneus	*barberinus*	2	0.3
Lethrinus	*rubrioperculat*	2	2.3
Mulloidichthys	*flavolineatus*	2	0.5
Hipposcarus	*harid*	1	0.2
Parupeneus	*trifasciatus*	1	0.1
Scarus	*psittacus*	1	0.2
Scomberoides	*lysan*	1	1.8
Naso	*unicornis*	1	0.6
	Total	***363***	***120.2***

Haul time: 13 min Long: 63.33501° Lat: -19.82555°

Scarus	*spp*	25	6.2
Mulloidichthys	*flavolineatus*	17	3.9
Acanthurus	*spp*	9	5.1
Rhinecanthus	*aculeatus*	4	1.2
Parupeneus	*barberinus*	2	0.5
Parupeneus	*trifasciatus*	2	0.3
Lethrinus	*nebulosus*	1	0.4
Hologymnosus	*longibes*	1	0.5
Scarus	*ghobban*	1	0.2

Haul time: 09 min Long: 63.35038° Lat: -19.82903°

Species		**No.**	**Weight (kg)**
Siganus	*sutor*	45	14.9
Caranx	*melampygus*	11	2.8
Fistularia	*commersonii*	9	6.2
Parupeneus	*barberinus*	4	0.5
Scarus	*psittacus*	4	0.6
Lethrinus	*nebulosus*	2	0.6
Lethrinus	*rubrioperculat*	1	1.1
Acanthurus	*triostegus*	1	0.1
Siganus	*argenteus*	1	0.2
	Total	***78***	***26.9***

Haul time: 11 min Long: 63.33924° Lat: -19.82711°

Acanthurus	*triostegus*	49	5.4
Caranx	*melampygus*	25	5.4
Lethrinus	*nebulosus*	11	3.7
	Total	***85***	***14.5***

Haul time: 11 min Long: 63.34831° Lat: -19.82839°

Siganus	*sutor*	83	28.1
Acanthurus	*triostegus*	24	2.6
Gerres	*longirostris*	14	3.3
Lethrinus	*nebulosus*	8	2.4
Mulloidichthys	*flavolineatus*	4	1.2
Caranx	*melampygus*	4	0.9
Fistularia	*commersonii*	3	2.0
	Total	***140***	***40.4***

Haul time: 11 min Long: 63° Lat: -19°

Siganus	*sutor*	56	17.6
Gerres	*longirostris*	7	1.7
	Total	***63***	***19.3***

Haul time: 13 min Long: 63.34994° Lat: -19.80308°

Caranx	*melampygus*	5	1.3
Mulloidichthys	*flavolineatus*	1	0.2
Scomberoides	*lysan*	1	0.8
	Total	***7***	***2.3***

Haul time: 16 min Long: 63.34866° Lat: -19.80391°

Caranx	*melampygus*	55	15.6
Lethrinus	*nebulosus*	11	2.6

Lethrinus	*harak*	1	0.6	*Gerres*	*longirostris*	10	3.2
	Total	***63***	***18.9***	*Siganus*	*sutor*	4	2.4
				Mulloidichthys	*flavolineatus*	3	0.5
					Total	***83***	***24.3***

Fishing base: Pointe l'Aigle Date: 22/03/2007 No. fishers: 20 No. boats: 7 Fishing day: 08h 50 min

Haul time: min Long: 63.43765° Lat: -19.66751°

Species		**No.**	**Weight (kg)**
Gerres	*longirostris*	32	7.2
Acanthurus	*triostegus*	17	3.8
Siganus	*sutor*	12	3.6
Caranx	*melampygus*	6	2.1
Parupeneus	*barberinus*	3	1.1
Lethrinus	*harak*	1	0.6
Cheilinus	*trilobatus*	1	0.3
Rhinecanthus	*aculeatus*	1	0.2
	Total	***73***	***19.0***

Haul time: 08 min Long: 63.44003° Lat: -19.66755°

Caranx	*melampygus*	54	12.7
Siganus	*sutor*	9	2.7
Sphyraena	*jello*	7	3.3
Mulloidichthys	*flavolineatus*	1	0.2
	Total	***71***	***18.8***

Haul time: 09 min Long: 63.43768° Lat: -19.66694°

Siganus	*sutor*	8	5.2
Naso	*unicornis*	7	9.0
Caranx	*melampygus*	5	1.8
Gerres	*longirostris*	1	0.3
	Total	***21***	***16.3***

Haul time: 07 min Long: 63.43126° Lat: -19.67164°

Species		**No.**	**Weight (kg)**
Siganus	*sutor*	94	53.9
Lethrinus	*harak*	12	7.4
Caranx	*melampygus*	4	1.4
Gerres	*longirostris*	3	0.7
Rhinecanthus	*aculeatus*	2	0.4
Acanthurus	*triostegus*	1	0.2
	Total	***116***	***63.9***

Haul time: 07 min Long: 63.44170° Lat: -19.66624°

Naso	*unicornis*	33	57.6
Siganus	*sutor*	10	6.1
Hipposcarus	*harid*	3	4.4
Caranx	*melampygus*	1	0.8
Lethrinus	*nebulosus*	1	1.0
Aprion	*virescens*	1	6.2
	Total	***49***	***76.0***

Haul time: 11 min Long: 63.43945° Lat: -19.66211°

Gerres	*longirostris*	27	6.7
Acanthurus	*triostegus*	15	3.1
Siganus	*sutor*	14	4.8
Caranx	*melampygus*	7	1.9
Parupeneus	*barberinus*	3	1.0
Rhinecanthus	*aculeatus*	1	0.3
Anampses	*caeruleopuncta*	1	0.3
Lethrinus	*harak*	1	0.6
	Total	***69***	***18.6***

Fishing base: Baie du Nord Date: 23/03/2007 No. fishers: 23 No. boats: 7 Fishing day: 8h 00min

Haul time: 13 min Long: 63.31595° Lat: -19.72338°

Species		**No.**	**Weight (kg)**
Caranx	*melampygus*	68	15.6
Gerres	*longirostris*	53	12.6
Lethrinus	*nebulosus*	29	11.1
Siganus	*sutor*	21	6.8
Mulloidichthys	*flavolineatus*	15	4.2
Tylosurus	*crocodilus*	8	22.4
Upeneus	*vittatus*	7	3.0
Parupeneus	*barberinus*	5	1.3
Sphyraena	*jello*	1	0.7
Valamugil	*seheli*	1	2.2
	Total	208	79.8

Haul time: 15 min Long: 63.33275° Lat: -19.73653°

Species		**No.**	**Weight (kg)**
Lethrinus	*nebulosus*	106	34.1
Siganus	*sutor*	61	22.5
Caranx	*melampygus*	10	2.0
Parupeneus	*barberinus*	5	1.3
Caranx	*papuensis*	2	0.6
Upeneus	*vittatus*	1	0.4
	Total	185	61.0

Haul time: 43 min Long: 63.31791° Lat: -19.75148°

Caranx	*melampygus*	449	114.6
Lethrinus	*nebulosus*	180	64.0
Caranx	*papuensis*	30	11.6
Gerres	*longirostris*	28	6.2
Siganus	*sutor*	10	3.2
Upeneus	*vittatus*	2	0.7
Mulloidichthys	*flavolineatus*	1	0.2
	Total	700	200.5

Fishing base: Port Sud Est Date: 13/04/2007 No. fishers: 12 No. boats: 4 Fishing day: 4h 40min

Haul time: 08 min Long: 63.49126° Lat: -19.72923°

Haul time: 09 min Long: 63.49694° Lat: -19.73419°

Species		No.	Weight (kg)
Siganus	*sutor*	4	1.6
Mulloidichthys	*flavolineatus*	3	0.9
Acanthurus	*triostegus*	1	0.2
Scarus	*psittacus*	1	0.2
Cheilinus	*trilobatus*	1	1.4
Lethrinus	*nebulosus*	1	0.4
Lethrinus	*mahsena*	1	0.2
	Total	***12***	***4.9***
Haul time: 13 min Long: 63.49694° Lat: -19.72189°			
Lethrinus	*nebulosus*	26	9.2
Cheilinus	*trilobatus*	8	2.2
Siganus	*sutor*	8	3.1
Anampses	*caeruleopuncta*	7	2.0
Lethrinus	*mahsena*	4	0.7
Scarus	*ghobban*	3	0.8
Parupeneus	*barberinus*	3	0.5
Rhinecanthus	*aculeatus*	2	0.5
Scarus	*psittacus*	2	0.4
Acanthurus	*triostegus*	1	0.2
	Total	***64***	***19.6***

Species		No.	Weight (kg)
Mulloidichthys	*flavolineatus*	3	0.4
Rhinecanthus	*aculeatus*	2	0.6
Cheilinus	*trilobatus*	2	3.0
Siganus	*sutor*	2	0.6
Lethrinus	*mahsena*	1	0.2
	Total	***10***	***4.9***
Haul time: 11 min Long: 63.49010° Lat: -19.73209°			
Lethrinus	*nebulosus*	21	7.5
Siganus	*sutor*	17	5.7
Acanthurus	*spp*	2	2.6
Anampses	*caeruleopuncta*	2	0.6
Mulloidichthys	*vanicolensis*	2	0.4
Caranx	*melampygus*	1	0.2
Cheilinus	*trilobatus*	1	1.1
Acanthurus	*triostegus*	1	0.2
	Total	***47***	***18.3***

Fishing base: Pointe Corail Date: 18/04/2007 No. fishers: 24 No. boats: 8 Fishing day: 05h 30 min

Haul time: 03 min Long: 63.40745° Lat: -19.75511°

Species		No.	Weight (kg)
Mulloidichthys	*flavolineatus*	141	18.9
Caranx	*melampygus*	22	6.8
Lethrinus	*nebulosus*	4	0.8
Siganus	*sutor*	3	1.0
Gerres	*longirostris*	3	1.0
Caranx	*papuensis*	1	1.3
Parupeneus	*barberinus*	1	0.3
	Total	***175***	***30.1***

Haul time: 06 min Long: 63.43430° Lat: -19.77146°

Gerres	*longirostris*	8	2.2
Scomberoides	*lysan*	1	1.9
	Total	***9***	***4.1***

Haul time: 07 min Long: 63.40786° Lat: -19.76533°

Mulloidichthys	*flavolineatus*	8	1.1
Siganus	*sutor*	1	0.2
	Total	***9***	***1.3***

Haul time: 22 min Long: 63.43343° Lat: -19.74861°

Valamugil	*seheli*	89	185.6
Crenimugil	*crenilabis*	8	41.0
Gerres	*longirostris*	7	2.2
Albula	*glossodonta*	2	3.8
	Total	***106***	***232.6***

Haul time: 03 min Long: 63.43125° Lat: -19.77628°

Species		No.	Weight (kg)
Mulloidichthys	*flavolineatus*	367	54.0
Caranx	*melampygus*	2	0.2
Caranx	*papuensis*	1	0.6
	Total	***370***	***54.8***

Haul time: 03 min Long: 63.43203° Lat: -19.77081°

Mulloidichthys	*flavolineatus*	92	19.4
Caranx	*melampygus*	1	0.2
	Total	***93***	***19.6***

Haul time: 06 min Long: 63.40656° Lat: -19.76721°

Mulloidichthys	*flavolineatus*	10	1.6
Siganus	*sutor*	1	0.2
	Total	***11***	***1.8***

Haul time: 10 min Long: 63.43755° Lat: -19.75426°

Gerres	*longirostris*	31	9.9
Caranx	*melampygus*	12	4.5
Mulloidichthys	*flavolineatus*	2	0.4
Lethrinus	*nebulosus*	1	0.4
	Total	***46***	***15.3***

Fishing base: Pointe Corail Date: 19/04/2007 No. fishers: 16 No. boats: 5 Fishing day: 8h 50min

Haul time: 05 min Long: 63.40848° Lat: -19.75773°

Species		No.	Weight (kg)
Lethrinus	*nebulosus*	11	2.7
Siganus	*sutor*	7	1.9
Gerres	*longirostris*	5	1.2
Mulloidichthys	*flavolineatus*	5	0.8
Lethrinus	*harak*	1	0.3

Haul time: 05 min Long: 63.41106° Lat: -19.76756°

Caranx	*melampygus*	15	1.9
Gerres	*longirostris*	4	1.0
Mulloidichthys	*flavolineatus*	3	0.6
	Total	***22***	***3.5***

Haul time: 07 min Long: 63.41741° Lat: -19.77358°

Gerres	*longirostris*	4	0.6

	Total	***29***	***6.9***
Haul time: 10 min Long: 63.42433° Lat: -19.77403°			
Mulloidichthys	*flavolineatus*	11	1.8
Gerres	*longirostris*	6	1.3
	Total	***17***	***3.1***
Haul time: 07 min Long: 63.42650° Lat: -19.77321°			
Lethrinus	*nebulosus*	13	6.2
Siganus	*sutor*	4	1.6
Mulloidichthys	*flavolineatus*	3	0.5
	Total	***20***	***8.3***
Haul time: 10 min Long: 63° Lat: -19°			
Mulloidichthys	*flavolineatus*	176	26.3
Gerres	*longirostris*	8	2.1
Lethrinus	*nebulosus*	5	1.9
Siganus	*sutor*	5	2.6
Parupeneus	*barberinus*	3	0.7
Valamugil	*seheli*	1	3.6
Scarus	*ghobban*	1	0.3
Caranx	*melampygus*	1	0.3
	Total	***200***	***37.8***

Upeneus	*vittatus*	1	0.5
Mulloidichthys	*flavolineatus*	1	0.2
	Total	***6***	***1.2***
Haul time: 05 min Long: 63.42660° Lat: -19.77298°			
Mulloidichthys	*flavolineatus*	17	3.0
Lethrinus	*nebulosus*	8	3.4
Siganus	*sutor*	1	0.5
	Total	***26***	***6.8***
Haul time: 10 min Long: 63.42361° Lat: -19.77335°			
Mulloidichthys	*flavolineatus*	6	1.4
Siganus	*sutor*	5	1.4
Scarus	*ghobban*	1	0.3
Lethrinus	*nebulosus*	1	0.2
	Total	***13***	***3.4***
Haul time: 12 min Long: 63.44861° Lat: -19.74571°			
Mulloidichthys	*flavolineatus*	353	53.0
	Total	***353***	***53.0***

Fishing base: Port Sud Est Date: 24/05/2007 No. fishers: 14 No. boats: 4 Fishing day: 5h 00min

Haul time: 08 min Long: 63.45918° Lat: -19.75096°

Species		**No.**	**Weight (kg)**
Mulloidichthys	*flavolineatus*	3	0.9
Scarus	*psittacus*	2	0.7
Parupeneus	*barberinus*	1	0.3
Siganus	*sutor*	1	0.6
Scarus	*ghobban*	1	0.2
Caranx	*melampygus*	1	0.4
Lethrinus	*nebulosus*	1	0.4
Thalassoma	*trilobatum*	1	0.4
	Total	***11***	***3.9***

Haul time: 11 min Long: 63.46405° Lat: -19.75925°

Lethrinus	*harak*	22	13.4
Siganus	*sutor*	11	5.2
Caranx	*papuensis*	4	8.6
	Total	***37***	***27.2***

Haul time: 13 min Long: 63.45885° Lat: -19.75594°

Mulloidichthys	*flavolineatus*	23	5.9
Scarus	*psittacus*	15	2.8
Rhinecanthus	*aculeatus*	15	2.7
Siganus	*sutor*	10	4.8
Lethrinus	*nebulosus*	4	0.4
	Total	***67***	***16.6***

Haul time: 09 min Long: 63.45920° Lat: -19.75756°

Species		**No.**	**Weight (kg)**
Mulloidichthys	*flavolineatus*	14	4.1
Acanthurus	*triostegus*	5	0.9
Scarus	*psittacus*	5	1.1
Lethrinus	*nebulosus*	1	0.1
Siganus	*sutor*	1	0.5
	Total	***26***	***6.6***

Haul time: 09 min Long: 63.46151° Lat: -19.76184°

Acanthurus	*triostegus*	16	2.1
Scarus	*psittacus*	12	3.0
Rhinecanthus	*aculeatus*	7	1.0
Caranx	*melampygus*	5	1.9
Gerres	*longirostris*	5	1.7
Chaetodon	*auriga*	4	0.3
Thalassoma	*trilobatum*	2	0.4
Novaculichthys	*taeniourus*	1	0.3
Cheilinus	*trilobatus*	1	0.3
Mulloidichthys	*flavolineatus*	1	0.4
Cantherines	*dumerilii*	1	0.1
Anampses	*caeruleopuncta*	1	0.2
	Total	***56***	***11.7***

Haul time: 17 min Long: 63.45893° Lat: -19.75741°

Caranx	*papuensis*	5	15.5
Gerres	*longirostris*	2	0.8
Caranx	*melampygus*	1	0.6
	Total	***8***	***17.0***

Fishing base: Pointe l'Aigle Date: 29/05/2007 No. fishers: 20 No. boats: 6 Fishing day: 9h 50min

Haul time: 01 min Long: 63.43655° Lat: -19.66736°

Species		**No.**	**Weight (kg)**
Siganus	*sutor*	5	2.3
Caranx	*melampygus*	4	1.2
Acanthurus	*triostegus*	3	0.5

Haul time: 05 min Long: 63.42958° Lat: -19.67134°

Species		**No.**	**Weight (kg)**
Siganus	*sutor*	39	15.1
Acanthurus	*triostegus*	11	3.0
Caranx	*melampygus*	3	1.3

Chlorurus	*sordidus*	1	0.4
	Total	***13***	***4.4***
Haul time: 08 min	Long: 63.42751°	Lat: -19.67193°	
Siganus	*sutor*	29	12.2
Caranx	*melampygus*	4	1.4
Lethrinus	*nebulosus*	2	0.2
Acanthurus	*triostegus*	1	0.1
Rhinecanthus	*aculeatus*	1	0.2
Chlorurus	*sordidus*	1	0.3
Cheilinus	*trilobatus*	1	0.7
	Total	***39***	***15.2***
Haul time: 10 min	*Long: 63.43908°*	*Lat: -19.66253°*	
Siganus	*sutor*	3	1.3
Caranx	*melampygus*	1	0.4
Lethrinus	*nebulosus*	1	0.4
	Total	***5***	***2.1***

Lethrinus	*nebulosus*	2	0.2
	Total	***55***	***19.7***
Haul time: 09 min	Long: 63.43971°	Lat: -19.66040°	
Siganus	*sutor*	35	18.1
Acanthurus	*triostegus*	24	3.9
Caranx	*melampygus*	11	4.7
Gerres	*longirostris*	10	3.8
Cheilinus	*trilobatus*	1	0.2
	Total	***81***	***30.8***
Haul time: 10 min	Long: 63.43786°	Lat: -19.66560°	
Siganus	*sutor*	13	5.7
Caranx	*melampygus*	10	3.5
Acanthurus	*triostegus*	3	0.5
Lethrinus	*nebulosus*	2	0.8
Gerres	*longirostris*	2	0.6
	Total	***30***	***11.1***

Fishing base: Pointe Corail Date: 06/06/2007 No. fishers: 23 No. boats: 9 Fishing day: 7h 50min

Haul time: 06 min	Long: 63.40150°	Lat: -19.76793°	
Species		***No.***	***Weight (kg)***
Mulloidichthys	*flavolineatus*	6	0.8
Lethrinus	*nebulosus*	3	1.0
Siganus	*sutor*	3	1.3
Parupeneus	*ciliatus*	1	0.2
	Total	***13***	***3.2***
Haul time: 08 min	Long: 63.42401°	Lat: -19.77491°	
Mulloidichthys	*flavolineatus*	69	10.1
Siganus	*sutor*	7	1.4
Lethrinus	*nebulosus*	1	0.1
Gerres	*longirostris*	1	0.2
	Total	***78***	***11.8***
Haul time: 10 min	Long: 63.40689°	Lat: -19.76758°	
Caranx	*melampygus*	6	1.0
Gerres	*longirostris*	5	1.3
Valamugil	*seheli*	1	0.8
	Total	***12***	***3.1***
Haul time: 10 min	Long: 63.41546°	Lat: -19.77121°	
Mulloidichthys	*flavolineatus*	243	37.1
Caranx	*melampygus*	12	1.3
Gerres	*longirostris*	6	1.5
Siganus	*sutor*	1	0.1
Valamugil	*seheli*	1	0.6
Lethrinus	*xanthochilus*	1	0.2
Sphyraena	*jello*	1	0.3
Lethrinus	*nebulosus*	1	0.2
Upeneus	*vittatus*	1	0.1
	Total	***267***	***41.4***
Haul time: 10 min	Long: 63.45949°	Lat: -19.75721°	
Lethrinus	*nebulosus*	15	6.7
Caranx	*papuensis*	4	5.0
Siganus	*sutor*	3	1.8
Caranx	*melampygus*	2	0.9
	Total	***24***	***14.5***
Haul time: 15 min	Long: 63.46058°	Lat: -19.67133°	
Siganus	*sutor*	16	7.3
Lethrinus	*harak*	6	3.3
Chlorurus	*sordidus*	5	1.0
Caranx	*melampygus*	4	1.7
	Total	***31***	***13.3***

Haul time: 07 min	Long: 63.45708°	Lat: -19.75460°	
Species		***No.***	***Weight (kg)***
Lethrinus	*nebulosus*	27	11.8
Caranx	*papuensis*	1	3.7
Cheilinus	*trilobatus*	1	0.2
Siganus	*sutor*	1	0.3
Gerres	*longirostris*	1	0.6
	Total	***31***	***16.6***
Haul time: 08 min	Long: 63.43343°	Lat: -19.74988°	
Siganus	*sutor*	27	11.4
Sphyraena	*jello*	26	16.8
Caranx	*melampygus*	6	2.7
	Total	***59***	***30.9***
Haul time: 10 min	Long: 63.40856°	Lat: -19.76573°	
Mulloidichthys	*flavolineatus*	13	1.9
Siganus	*sutor*	3	0.4
Siganus	*argenteus*	1	0.1
Lethrinus	*rubrioperculat*	1	0.2
	Total	***18***	***2.6***
Haul time: 10 min	Long: 63.45243°	Lat: -19.75186°	
Lethrinus	*nebulosus*	17	6.3
Gerres	*longirostris*	4	2.4
Caranx	*melampygus*	1	0.4
Siganus	*sutor*	1	0.6
	Total	***23***	***9.8***
Haul time: 10 min	Long: 63.45886°	Lat: -19.75278°	
Gerres	*longirostris*	2	0.6
Lethrinus	*nebulosus*	2	0.6
Caranx	*papuensis*	1	0.5
Lethrinus	*rubrioperculat*	1	2.0
Lethrinus	*harak*	1	0.6
	Total	***7***	***4.2***
Haul time: 10 min	Long: 63.45949°	Lat: -19.75721°	
Lethrinus	*nebulosus*	15	6.7
Caranx	*papuensis*	4	5.0
Siganus	*sutor*	3	1.8
Caranx	*melampygus*	2	0.9
	Total	***24***	***14.5***
Haul time: 10 min	Long: 63.46226°	Lat: -19.75760°	
Siganus	*sutor*	4	1.4
Lethrinus	*harak*	1	0.7
	Total	***5***	***2.1***

Fishing base: Pointe Corail Date: 08/06/2007 No. fishers: 18 No. boats: 7 Fishing day: 05h 20 min

Haul time: min Long: 63.39825° Lat: -19.75429°

Species		No.	Weight (kg)
Caranx	*melampygus*	23	2.8
Siganus	*sutor*	18	2.3
Mulloidichthys	*flavolineatus*	10	2.0
Gerres	*longirostris*	3	0.7
Parupeneus	*ciliatus*	2	0.3
Scarus	*ghobban*	1	0.2
Caranx	*papuensis*	1	1.6
	Total	***58***	***9.8***

Haul time: 05 min Long: 63.41018° Lat: -19.75110°

Mulloidichthys	*flavolineatus*	59	8.3
	Total	***59***	***8.3***

Haul time: 05 min Long: 63.41193° Lat: -19.75831°

Mulloidichthys	*flavolineatus*	130	17.2
Caranx	*melampygus*	1	0.1
Siganus	*sutor*	1	0.1
	Total	***132***	***17.4***

Haul time: 06 min Long: 63.41068° Lat: -19.76449°

Mulloidichthys	*flavolineatus*	66	9.8
	Total	***66***	***9.8***

Haul time: 07 min Long: 63.40263° Lat: -19.76044°

Mulloidichthys	*flavolineatus*	33	5.0
	Total	***33***	***5.0***

Haul time: 08 min Long: 63.41263° Lat: -19.75789°

Mulloidichthys	*flavolineatus*	152	21.3
Lethrinus	*nebulosus*	29	2.4
Siganus	*sutor*	18	3.4
Scarus	*ghobban*	4	1.1
Siganus	*argenteus*	2	0.2
Gerres	*longirostris*	2	0.3
Parupeneus	*ciliatus*	1	0.1
Leptoscarus	*vaigiensis*	1	0.4
	Total	***209***	***29.2***

Haul time: 04 min Long: 63.40329° Lat: -19.75021°

Species		No.	Weight (kg)
Mulloidichthys	*flavolineatus*	245	32.9
Sphyraena	*jello*	11	4.4
Parupeneus	*ciliatus*	5	0.9
Gerres	*longirostris*	4	0.9
Siganus	*sutor*	3	0.5
Lethrinus	*nebulosus*	2	0.3
Scarus	*ghobban*	1	0.3
Caranx	*papuensis*	1	7.7
Siganus	*argenteus*	1	0.1
Caranx	*melampygus*	1	0.1
	Total	***274***	***48.1***

Haul time: 06 min Long: 63.40601° Lat: -19.76159°

Mulloidichthys	*flavolineatus*	44	5.9
Siganus	*sutor*	4	0.4
Lethrinus	*nebulosus*	3	0.2
Scarus	*ghobban*	2	0.5
Parupeneus	*ciliatus*	2	0.3
	Total	***55***	***7.3***

Haul time: 06 min Long: 63.41263° Lat: -19.75789°

Mulloidichthys	*flavolineatus*	96	13.6
Siganus	*sutor*	11	1.6
Parupeneus	*ciliatus*	5	0.7
Lethrinus	*nebulosus*	5	0.3
Scarus	*ghobban*	1	0.3
	Total	***118***	***16.5***

Fishing base: Pointe l'Aigle Date: 20/06/2007 No. fishers: 19 No. boats: 6 Fishing day: 8h 30min

Haul time: 05 min Long: 63.40508° Lat: -19.66433°

Species		No.	Weight (kg)
Siganus	*sutor*	16	5.8
Gerres	*longirostris*	4	1.6
	Total	***20***	***7.4***

Haul time: 06 min Long: 63.39149° Lat: -19.65929°

Mulloidichthys	*flavolineatus*	106	21.6
Siganus	*sutor*	3	0.8
Leptoscarus	*vaigiensis*	1	0.1
Chlorurus	*sordidus*	1	0.2
Acanthurus	*triostegus*	1	0.2
	Total	***112***	***22.9***

Haul time: 12 min Long: 63.39676° Lat: -19.65824°

Gerres	*longirostris*	16	6.4
Siganus	*sutor*	4	1.8
Mulloidichthys	*flavolineatus*	4	1.2
Rhinecanthus	*aculeatus*	1	0.1
Hipposcarus	*harid*	1	0.2
	Total	***26***	***9.7***

Haul time: 05 min Long: 63.38871° Lat: -19.65796°

Species		No.	Weight (kg)
Chlorurus	*sordidus*	8	3.1
Siganus	*sutor*	6	2.6
	Total	***14***	***5.7***

Haul time: 07 min Long: 63.39218° Lat: -19.65731°

Mulloidichthys	*flavolineatus*	2	0.5
Lethrinus	*nebulosus*	1	0.5
Lethrinus	*harak*	1	0.5
Siganus	*sutor*	1	0.3
	Total	***5***	***1.8***

Haul time: 10 min Long: 63.38931° Lat: -19.66139°

Siganus	*sutor*	46	9.8
Mulloidichthys	*flavolineatus*	4	1.0
Scarus	*ghobban*	1	0.3
Aluterus	*scriptus*	1	0.2
	Total	***52***	***11.3***

Haul time: 15 min Long: 63.39973° Lat: -19.65951°

Siganus	*sutor*	26	9.2
Mulloidichthys	*flavolineatus*	5	1.3

Chlorurus	*sordidus*	2	0.4
	Total	***33***	***10.8***

Fishing base: Port Sud Est Date: 18/07/2007 No. fishers: 25 No. boats: 7 Fishing day: 4h 25min

Haul time: 07 min Long: 63.48184° Lat: -19.74508°

Species		**No.**	**Weight (kg)**
Ctenochaetus	*striatus*	31	2.0
Mulloidichthys	*flavolineatus*	6	1.6
Acanthurus	*triostegus*	4	0.6
Siganus	*sutor*	3	0.9
Chlorurus	*sordidus*	2	0.3
Rhinecanthus	*rectangulus*	1	0.1
Lethrinus	*mahsena*	1	0.1
Siganus	*argenteus*	1	0.1
	Total	***49***	***5.7***

Haul time: 09 min Long: 63.48861° Lat: -19.73378°

Siganus	*sutor*	33	15.4
Siganus	*luridus*	16	3.2
Mulloidichthys	*flavolineatus*	7	1.4
Lethrinus	*xanthochilus*	5	2.1
Lethrinus	*mahsena*	5	1.1
Rhinecanthus	*aculeatus*	5	1.0
Siganus	*argenteus*	1	0.2
Parupeneus	*macronema*	1	0.2
Chlorurus	*sordidus*	1	0.2
	Total	***74***	***24.8***

Haul time: 07 min Long: 63.48281° Lat: -19.73836°

Species		**No.**	**Weight (kg)**
Lethrinus	*nebulosus*	28	11.7
Mulloidichthys	*vanicolensis*	26	5.3
Siganus	*sutor*	12	5.4
Lethrinus	*mahsena*	9	2.2
Chlorurus	*sordidus*	8	1.1
Siganus	*argenteus*	6	0.7
Anampses	*caeruleopuncta*	3	0.5
Siganus	*luridus*	3	0.4
Parupeneus	*rubescens*	2	0.6
Leptoscarus	*vaigiensis*	1	0.1
Rhinecanthus	*rectangulus*	1	0.2
Fistularia	*commersonii*	1	0.1
Mulloidichthys	*flavolineatus*	1	0.2
Parupeneus	*cyclostomus*	1	0.1
Tylosurus	*crocodilus*	1	0.7
Thalassoma	*trilobatum*	1	0.2
	Total	***104***	***29.3***

Haul time: 13 min Long: 63.48669° Lat: -19.73643°

Chlorurus	*sordidus*	17	3.1
Rhinecanthus	*aculeatus*	12	2.8
Anampses	*caeruleopuncta*	9	2.1
Siganus	*sutor*	9	1.3
Cheilinus	*trilobatus*	3	2.7
Mulloidichthys	*flavolineatus*	3	0.7
Parupeneus	*barberinus*	1	0.5
Lethrinus	*xanthochilus*	1	0.1
Caranx	*papuensis*	1	0.1
Lethrinus	*rubrioperculat*	1	0.1
	Total	***57***	***13.6***

Fishing base: Port Sud Est Date: 19/07/2007 No. fishers: 19 No. boats: 4 Fishing day: 4h 30min

Haul time: 10 min Long: 63.45546° Lat: -19.82151°

Species		**No.**	**Weight (kg)**
Mulloidichthys	*flavolineatus*	68	16.4
Fistularia	*commersonii*	14	59.2
Lethrinus	*nebulosus*	13	1.2
Siganus	*sutor*	10	2.2
Parupeneus	*ciliatus*	8	1.7
Chlorurus	*sordidus*	6	1.3
Rhinecanthus	*aculeatus*	4	0.8
Parupeneus	*barberinus*	1	0.1
Thalassoma	*hardwicke*	1	0.2
	Total	***125***	***83.1***

Haul time: 13 min Long: 63° Lat: -19°

Mulloidichthys	*flavolineatus*	92	19.2
Siganus	*sutor*	17	1.9
Rhinecanthus	*aculeatus*	9	1.7
Fistularia	*commersonii*	6	1.6
Parupeneus	*ciliatus*	2	0.5
Chlorurus	*sordidus*	2	0.4

Haul time: 12 min Long: 63.45503° Lat: -19.75673°

Species		**No.**	**Weight (kg)**
Mulloidichthys	*flavolineatus*	74	14.0
Chlorurus	*sordidus*	23	3.5
Rhinecanthus	*aculeatus*	20	3.4
Siganus	*sutor*	9	1.2
Lethrinus	*nebulosus*	7	0.8
Acanthurus	*triostegus*	6	1.0
Parupeneus	*barberinus*	5	0.4
Lethrinus	*mahsena*	3	0.2
Leptoscarus	*vaigiensis*	1	0.4
Parupeneus	*ciliatus*	1	0.2
Fistularia	*commersonii*	1	0.0
	Total	***150***	***25.3***

Haul time: 14 min Long: 63° Lat: -19°

Mulloidichthys	*flavolineatus*	39	9.1
	Total	***39***	***9.1***

Haul time: 15 min Long: 63.45046° Lat: -19.75311°

Mulloidichthys	*flavolineatus*	123	31.5

Scomberoides	*lysan*	1	1.7
Lethrinus	*mahsena*	1	0.1
Lethrinus	*nebulosus*	1	0.1
	Total	***131***	***27.1***

Haul time: 35 min Long: 63° Lat: -19°

Mulloidichthys	*flavolineatus*	91	18.5
Rhinecanthus	*aculeatus*	8	1.3
Fistularia	*commersonii*	2	0.3
Chlorurus	*sordidus*	1	0.3
	Total	***102***	***20.4***

Siganus	*sutor*	42	6.4
Rhinecanthus	*aculeatus*	14	2.9
Parupeneus	*ciliatus*	11	2.1
Lethrinus	*nebulosus*	7	0.8
Fistularia	*commersonii*	7	1.6
Chlorurus	*sordidus*	2	0.4
Parupeneus	*barberinus*	1	0.1
	Total	***207***	***45.8***

Fishing base: Port Sud Est Date: 17/08/2007 No. fishers: 22 No. boats: 6 Fishing day: 5h 40min

Haul time: 06 min Long: 63.48803° Lat: -19.73528°

Species		**No.**	**Weight (kg)**
Siganus	*sutor*	9	5.1
Cheilinus	*trilobatus*	5	4.7
Rhinecanthus	*aculeatus*	2	0.5
Anampses	*caeruleopuncta*	2	0.4
Lethrinus	*harak*	1	0.8
Scarus	*ghobban*	1	0.6
Acanthurus	*triostegus*	1	0.2
Chlorurus	*sordidus*	1	0.2
	Total	***22***	***12.6***

Haul time: 07 min Long: 63.49114° Lat: -19.73173°

Siganus	*sutor*	35	17.3
Chlorurus	*sordidus*	8	1.4
Acanthurus	*triostegus*	7	0.5
Naso	*unicornis*	4	1.2
Anampses	*caeruleopuncta*	4	1.1
Lethrinus	*nebulosus*	3	2.6
Cheilinus	*trilobatus*	1	0.5
	Total	***62***	***24.7***

Haul time: 06 min Long: 63.48940° Lat: -19.73341°

Species		**No.**	**Weight (kg)**
Siganus	*sutor*	20	12.1
Rhinecanthus	*aculeatus*	7	1.2
Anampses	*caeruleopuncta*	6	1.4
Caranx	*melampygus*	2	0.7
Scarus	*ghobban*	1	8.8
	Total	***36***	***24.3***

Haul time: 06 min Long: 63.49228° Lat: -19.72913°

Mulloidichthys	*flavolineatus*	65	11.0
Siganus	*sutor*	20	5.9
Mulloidichthys	*vanicolensis*	20	2.1
Chlorurus	*sordidus*	10	1.6
Anampses	*caeruleopuncta*	1	0.3
Mugil	*cephalus*	1	1.4
Parupeneus	*trifasciatus*	1	0.1
Parupeneus	*barberinus*	1	0.1
	Total	***119***	***22.4***

Fishing base: Pointe l'Aigle Date: 01/08/2007 No. fishers: 19 No. boats: 6 Fishing day: 3h 27min

Haul time: 06 min Long: 63.36233° Lat: -19.65568°

Species		**No.**	**Weight (kg)**
Siganus	*sutor*	9	4.0
Gerres	*longirostris*	7	2.1
Mulloidichthys	*flavolineatus*	4	0.7
Chlorurus	*sordidus*	3	0.7
Lethrinus	*harak*	2	1.1
Scarus	*ghobban*	1	0.8
Caranx	*melampygus*	1	0.4
Parupeneus	*barberinus*	1	0.4
	Total	***28***	***10.2***

Haul time: 10 min Long: 63.37028° Lat: -19.65674°

Siganus	*sutor*	7	1.9
Acanthurus	*triostegus*	6	0.7
Caranx	*melampygus*	1	0.1
	Total	***14***	***2.7***

Haul time: 11 min Long: 63.38288° Lat: -19.65783°

Siganus	*sutor*	10	4.4
Gerres	*longirostris*	7	2.8
Caranx	*melampygus*	6	2.2
Acanthurus	*triostegus*	4	0.5
Acanthurus	*spp*	1	0.5

Haul time: 07 min Long: 63.37704° Lat: -19.65753°

Species		**No.**	**Weight (kg)**
Siganus	*sutor*	25	12.5
Acanthurus	*triostegus*	3	0.3
Scarus	*ghobban*	3	4.9
Chlorurus	*sordidus*	2	0.5
Caranx	*melampygus*	2	0.7
Mulloidichthys	*flavolineatus*	2	0.4
	Total	***37***	***19.3***

Haul time: 11 min Long: 63.36858° Lat: -19.65524°

Siganus	*sutor*	24	10.2
Lethrinus	*nebulosus*	9	4.6
Chlorurus	*sordidus*	6	1.4
Acanthurus	*triostegus*	4	0.3
Gerres	*longirostris*	4	1.3
Lethrinus	*nebulosus*	3	1.5
Caranx	*melampygus*	2	0.7
Scarus	*spp*	2	0.8
Parupeneus	*barberinus*	2	0.8
Acanthurus	*spp*	1	0.4
Lethrinus	*xanthochilus*	1	0.5
	Total	***58***	***22.5***

Naso	*unicornis*	1	0.9
	Total	***29***	***11.3***

Fishing base: Pointe l'Aigle Date: 16/08/2007 No. fishers: 20 No. boats: 7 Fishing day: 6h 00min

Haul time: 05 min Long: 63.43800° Lat: -19.66381°

Species		**No.**	**Weight (kg)**
Siganus	*sutor*	42	17.0
Acanthurus	*triostegus*	18	3.1
Siganus	*argenteus*	5	0.4
Caranx	*melampygus*	4	0.8
Lethrinus	*harak*	1	0.8
	Total	***70***	***22.1***

Haul time: 10 min Long: 63.43353° Lat: -19.66866°

Species		**No.**	**Weight (kg)**
Siganus	*sutor*	61	25.4
Acanthurus	*triostegus*	15	3.1
Chlorurus	*sordidus*	4	1.0
Siganus	*argenteus*	3	0.3
Acanthurus	*spp*	2	3.6
Scarus	*ghobban*	1	0.3
Rhinecanthus	*rectangulus*	1	0.2
	Total	***87***	***33.9***

Fishing base: Pointe Corail Date: 22/08/2007 No. fishers: 16 No. boats: 6 Fishing day: 6h 45min

Haul time: 15 min Long: 63.40584° Lat: -19.80576°

Species		**No.**	**Weight (kg)**
Mulloidichthys	*flavolineatus*	61	6.9
Sphyraena	*jello*	20	9.8
Siganus	*sutor*	3	1.4
Chlorurus	*sordidus*	1	0.1
	Total	***85***	***18.3***

Haul time: 05 min Long: 63.40251° Lat: -19.80324°

Mulloidichthys	*flavolineatus*	9	1.5
Siganus	*sutor*	1	0.7
	Total	***10***	***2.2***

Haul time: 07 min Long: 63.40913° Lat: -19.80635°

Mulloidichthys	*flavolineatus*	23	3.6
Chlorurus	*sordidus*	1	0.3
Hipposcarus	*harid*	1	0.2
Sphyraena	*barracuda*	1	1.5
	Total	***26***	***5.6***

Haul time: 10 min Long: 63.40056° Lat: -19.80339°

Mulloidichthys	*flavolineatus*	12	1.7
Hipposcarus	*harid*	3	0.5
Chlorurus	*sordidus*	3	1.0
Siganus	*sutor*	2	0.7
Caranx	*melampygus*	1	0.4
Scarus	*ghobban*	1	0.5
Sphyraena	*jello*	1	0.4
	Total	***23***	***5.2***

Haul time: 05 min Long: 63.39465° Lat: -19.80181°

Species		**No.**	**Weight (kg)**
Mulloidichthys	*flavolineatus*	289	43.0
	Total	***289***	***43.0***

Haul time: 05 min Long: 63.39836° Lat: -19.80216°

Mulloidichthys	*flavolineatus*	4	0.6
Naso	*unicornis*	1	2.7
	Total	***5***	***3.2***

Haul time: 05 min Long: 63.40348° Lat: -19.80423°

Mulloidichthys	*flavolineatus*	284	35.1
Sphyraena	*jello*	6	1.7
Caranx	*melampygus*	1	0.1
	Total	***291***	***36.9***

Haul time: 10 min Long: 63.39121° Lat: -19.80308°

Mulloidichthys	*flavolineatus*	27	5.6
	Total	***27***	***5.6***

Haul time: 10 min Long: 63.39211° Lat: -19.80261°

Mulloidichthys	*flavolineatus*	10	1.5
Siganus	*sutor*	2	0.8
Hipposcarus	*harid*	1	0.2
Parupeneus	*barberinus*	1	0.5
Acanthurus	*spp*	1	1.0
	Total	***15***	***4.0***

Fishing base: Pointe Corail Date: 23/08/2007 No. fishers: 16 No. boats: 5 Fishing day: 5h 45min

Haul time: 10 min Long: 63.38318° Lat: -19.77206°

Species		**No.**	**Weight (kg)**
Caranx	*melampygus*	3	0.6
	Total	***3***	***0.6***

Haul time: 21 min Long: 63.42378° Lat: -19.79393°

Valamugil	*seheli*	80	204.5
Siganus	*sutor*	2	0.3
Gerres	*longirostris*	1	0.3
	Total	***83***	***205.0***

Haul time: 13 min Long: 63.41740° Lat: -19.79899°

Species		**No.**	**Weight (kg)**
Valamugil	*seheli*	1	2.5
	Total	***1***	***2.5***

Fishing base: Pointe Corail Date: 19/09/2007 No. fishers: 10 No. boats: 28 Fishing day: 9h 00min

Haul time: 05 min Long: 63.40918° Lat: -19.76574°

Haul time: 10 min Long: 63.38551° Lat: -19.77006°

Species		No.	Weight (kg)
Mulloidichthys	*flavolineatus*	15	2.1
Lethrinus	*olivaceus*	1	0.2
Parupeneus	*rubescens*	1	0.2
Lethrinus	*nebulosus*	1	0.1
	Total	***18***	***2.6***
Haul time: 15 min Long: 63.40141° Lat: -19.76756°			
Lethrinus	*nebulosus*	136	16.5
Siganus	*sutor*	34	7.3
Mulloidichthys	*flavolineatus*	6	1.0
Caranx	*melampygus*	5	0.9
Upeneus	*vittatus*	4	1.5
Caranx	*papuensis*	4	1.4
Lethrinus	*olivaceus*	2	0.8
Hipposcarus	*harid*	1	0.1
Gnathodentex	*aureolineatus*	1	0.6
Lethrinus	*mahsena*	1	0.1
Gnathodentex	*speciosus*	1	0.4
	Total	***195***	***30.4***
Haul time: 10 min Long: 63.46068° Lat: -19.75538°			
Sphyraena	*jello*	20	11.3
Naso	*unicornis*	9	16.2
Parupeneus	*barberinus*	8	1.5
Caranx	*melampygus*	7	3.8
Acanthurus	*spp*	7	5.5
Siganus	*sutor*	5	2.4
Cheilinus	*chlorourus*	5	0.7
Lethrinus	*nebulosus*	1	0.2
	Total	***62***	***41.5***
Haul time: 05 min Long: 63.48310° Lat: -19.74039°			
Siganus	*sutor*	11	4.3
Acanthurus	*triostegus*	8	1.8
Chlorurus	*sordidus*	6	0.9
Mulloidichthys	*vanicolensis*	5	0.7
Caranx	*melampygus*	2	0.6
Siganus	*argenteus*	2	0.3
Lethrinus	*nebulosus*	1	0.2
Cheilinus	*trilobatus*	1	0.8
Scarus	*ghobban*	1	0.1
Gnathodentex	*aureolineatus*	1	0.2
Mulloidichthys	*flavolineatus*	1	0.3
	Total	***39***	***10.3***
Haul time: 15 min Long: 63.46295° Lat: -19.75764°			
Siganus	*sutor*	20	7.7
Scarus	*spp*	2	2.0
Acanthurus	*spp*	2	2.5
Lethrinus	*harak*	1	0.4
Mulloidichthys	*flavolineatus*	1	0.4
Caranx	*melampygus*	1	0.6
	Total	***27***	***13.6***
Haul time: 15 min Long: 63.43769° Lat: -19.75358°			
Gerres	*longirostris*	41	15.6
Caranx	*papuensis*	3	3.4
	Total	***44***	***19.0***

Species		No.	Weight (kg)
Siganus	*sutor*	8	0.8
Mulloidichthys	*flavolineatus*	7	1.1
Scarus	*ghobban*	1	0.3
Gerres	*longirostris*	1	0.2
Caranx	*melampygus*	1	0.1
	Total	***18***	***2.4***
Haul time: 05 min Long: 63.43061° Lat: -19.75338°			
Gerres	*longirostris*	18	6.4
Caranx	*melampygus*	1	0.5
	Total	***19***	***6.9***
Haul time: 05 min Long: 63.45841° Lat: -19.75348°			
Siganus	*sutor*	57	24.9
Gerres	*longirostris*	15	7.2
Caranx	*melampygus*	12	4.4
Lethrinus	*nebulosus*	8	3.6
Sphyraena	*jello*	3	1.6
Lethrinus	*xanthochilus*	2	3.8
Caranx	*papuensis*	2	1.9
Mulloidichthys	*flavolineatus*	1	0.2
Parupeneus	*barberinus*	1	0.6
Acanthurus	*spp*	1	0.5
	Total	***102***	***48.5***
Haul time: 05 min Long: 63.41181° Lat: -19.76369°			
Mulloidichthys	*flavolineatus*	256	35.3
Hemiramphus	*far*	4	0.6
Siganus	*sutor*	2	0.2
Valamugil	*seheli*	2	0.8
Caranx	*melampygus*	2	0.3
Upeneus	*vittatus*	1	0.2
Scomberoides	*lysan*	1	0.3
	Total	***268***	***37.7***
Haul time: 10 min Long: 63.48096° Lat: -19.74784°			
Caranx	*melampygus*	4	1.4
Scarus	*spp*	3	0.6
Scarus	*ghobban*	2	4.2
Siganus	*sutor*	1	0.4
Naso	*tuberosus*	1	3.1
	Total	***11***	***9.9***
Haul time: 13 min Long: 63.48248° Lat: -19.74590°			
Mulloidichthys	*flavolineatus*	9	3.0
Scarus	*spp*	2	0.5
Siganus	*sutor*	2	1.0
Siganus	*argenteus*	1	0.2
	Total	***14***	***4.6***
Haul time: 15 min Long: 63.43325° Lat: -19.75338°			
Gerres	*longirostris*	32	12.1
Scomberoides	*lysan*	1	1.2
Caranx	*papuensis*	1	1.3
	Total	***34***	***14.6***

Fishing base: Pointe Corail Date: 20/09/2007 No. fishers: 30 No. boats: 11 Fishing day: 6h 50min

Haul time: 04 min Long: 63.35013° Lat: -19.81836°

Haul time: 08 min Long: 63.35860° Lat: -19.81678°

Species		No.	Weight (kg)
Mulloidichthys	*flavolineatus*	16	2.6
Chlorurus	*sordidus*	1	0.2
	Total	***17***	***2.8***
Haul time: 08 min Long: 63.36199° Lat: -19.81553°			
Mulloidichthys	*flavolineatus*	12	1.9
Siganus	*sutor*	1	0.4
Gnathodentex	*aureolineatus*	1	0.1
	Total	***14***	***2.5***
Haul time: 10 min Long: 63.35381° Lat: -19.81729°			
Mulloidichthys	*flavolineatus*	15	2.3
Siganus	*sutor*	3	0.9
Chlorurus	*sordidus*	1	0.2
Acanthurus	*mata*	1	0.1
Gnathodentex	*aureolineatus*	1	0.0
	Total	***21***	***3.5***
Haul time: 10 min Long: 63.36863° Lat: -19.80263°			
Mulloidichthys	*flavolineatus*	204	24.1
Siganus	*sutor*	11	1.6
Lethrinus	*nebulosus*	3	0.4
Mulloidichthys	*vanicolensis*	2	0.2
Acanthurus	*triostegus*	1	0.1
Siganus	*argenteus*	1	0.1
Chlorurus	*sordidus*	1	0.3
	Total	***223***	***26.7***
Haul time: 11 min Long: 63.35656° Lat: -19.81675°			
Siganus	*sutor*	32	15.1
Mulloidichthys	*flavolineatus*	10	2.0
Chlorurus	*sordidus*	4	1.1
Caranx	*melampygus*	1	0.2
	Total	47	18.4
Haul time: 11 min Long: 63.36754° Lat: -19.81078°			
Siganus	*sutor*	6	0.8
Acanthurus	*mata*	5	0.4
	Total	***11***	***1.2***

Species		No.	Weight (kg)
Siganus	*sutor*	24	5.2
Mulloidichth	*flavolineatus*	19	3.6
Lethrinus	*nebulosus*	5	0.7
Caranx	*melampygus*	1	0.1
Chlorurus	*sordidus*	1	0.3
Acanthurus	*triostegus*	1	0.1
	Total	***51***	***10.1***
Haul time: 08 min Long: 63.36916° Lat: -19.80121°			
Mulloidichth	*flavolineatus*	184	22.9
Siganus	*sutor*	3	0.4
Caranx	*melampygus*	3	0.4
Lethrinus	*nebulosus*	1	0.1
	Total	***191***	***24.0***
Haul time: 10 min Long: 63.36596° Lat: -19.81516°			
Acanthurus	*mata*	7	0.3
Mulloidichth	*flavolineatus*	6	0.7
Siganus	*sutor*	3	0.5
Acanthurus	*triostegus*	1	0.1
Zebrasoma	*veliferum*	1	0.1
Lethrinus	*nebulosus*	1	0.1
Chlorurus	*sordidus*	1	0.1
Rhinecanthus	*aculeatus*	1	0.2
Gnathodente	*aureolineatus*	1	0.1
	Total	***22***	***2.2***
Haul time: 11 min Long: 63.36560° Lat: -19.80268°			
Mulloidichth	*flavolineatus*	6	1.0
Siganus	*sutor*	1	0.6
Acanthurus	*triostegus*	1	0.2
Caranx	*melampygus*	1	0.1
Hipposcarus	*harid*	1	0.2
	Total	***10***	***2.1***
Haul time: 15 min Long: 63.36571° Lat: -19.81121°			
Sphyraena	*obtusata*	9	6.2
Mulloidichth	*flavolineatus*	1	0.1
Lethrinus	*nebulosus*	1	0.7
	Total	***11***	***7.0***