Species Composition, Abundance and Catch Rates of Fish Caught on the Formigas Bank, Jamaica

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Fishers, who fish on the Formigas Bank, approached the Fisheries Division, regarding the status of the fishable resource on the Bank. Their main concern was the reduction in catch, and suggested that as a management strategy the Division should close the Bank for at least one year. The Division with assistance from CARICOM Fisheries Resource Assessment and Management program embarked on a data collection programme to gather information on species composition, abundance and catch rates by gear type. The results were compared with data from Alice Shoal, Morant Bank and Discovery Bay. There were significant difference in the catch rates and species composition and abundance by gear type. Although, the overall catch rate by gear type is lower that other areas, complete closure of the area might not be necessary.

KEY WORDS: Abundance, catch rates, species composition

INTRODUCTION

The Jamaica Fisheries Division (FD) began catch and effort data collection on Formigas Bank from January to October 1996, in response to a request from the fishermen. They felt the bank was over-exploited due to a reduction in catch rate of reef fish and suggested that as a management strategy the FD should close the bank for at least one year. The Division therefore saw it necessary to study the bank, first by looking at catch and effort data from the area.

The Formigas Bank

The bank is approximately 40 km NE from Manchioneal, Portland (landing site the data was collected) (Figure 1). The bank comprises mainly of three bottom types; rock (SE), seagrass (NW) and sand in the middle. Not much is known about the area.

METHODS

Approximately 130 fishermen fish on the bank, the main fishers are from Manchioneal (50% of the fishers). Fishermen travels, via motorized 8.4m fibreglass boats, four (4) hours to the bank and spend approximately six (6) hours fishing. They will return to the landing site by 2:00pm where they are meet twice per month by the data collectors from the Fisheries Division. Boat captains are questioned about the days activities, information includes, gear

types, hours fishing, number of gears used, species weight and price (ex-vessel) prices are recorded.

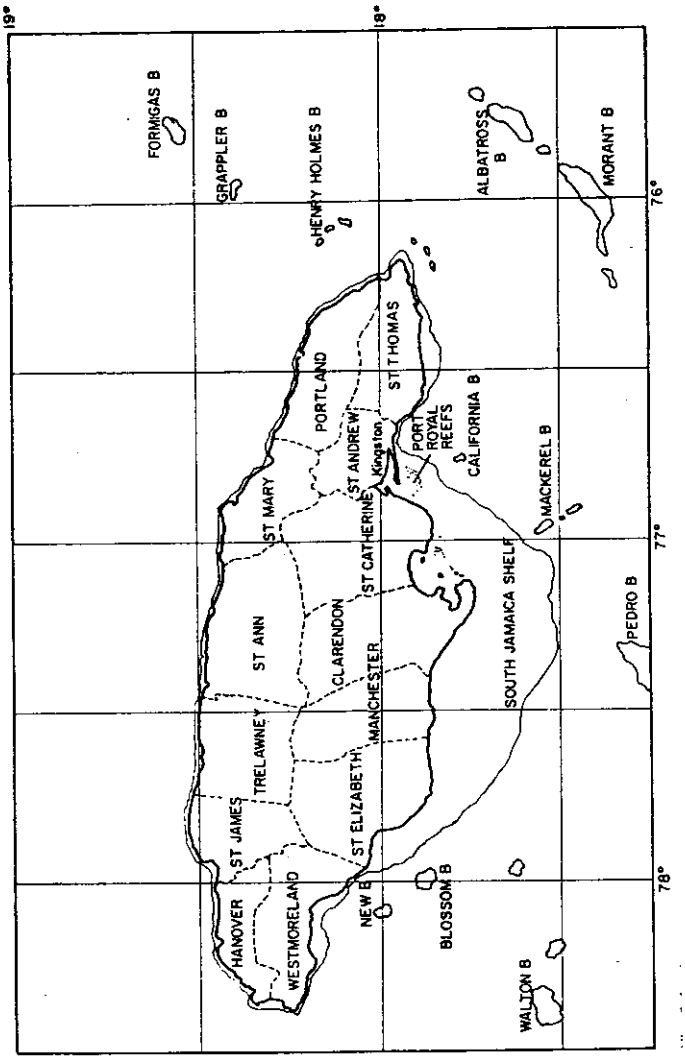

Figure 1. Map of Jamaica showing extent of shelf areas and position of proximal oceanic bank (Source Munro, 1983).

RESULTS AND DISCUSSION

Species Composition and Abundance

The main gear types used on the bank were fish pots (66%), 3.18cm (1.25") maximum diameter, speargun (28%), trolling (3%) and dropline (2%) (Appendix 1). Dropline (vertical line with 20 – 30 hooks) and trolling are not methods of choice on the bank, these methods requires fishers to use large quantities of gas. A total of 48 species (15 family groups) are landed from the bank. Pots contributed the highest number of species (41 species); speargun, 10 species; trolling, 5 species and dropline, 3 species (Appendix 1). The most dominant family group, in terms of weight, was the Parrotfishes (39%). The next most dominant family group are Squirrelfishes (19%), followed by Surgeonfish (11%), Groupers (10%) and Triggerfishes (6%) (Table 1). Lobster is the targetted species by spearfishers contibuting 86% of the total weight followed by Barracuda (6%) and Parrotfishes (3%). Barracuda (31%) were caught mainly by trolling, followed by Jacks and Dolphinfishes (25% each) and Mackerel (19%). Groupers (67%) and Snappers (33%) are the only families caught by dropline.

Species composition on the Formigas bank is relatively low compared to other areas (Table 2.)

In any reef fisheries, decreases in the abundance or biomass of piscivorous or carnivorous species have proven to be the most readily detectable effects of fishing pressure (Jennings and Polunin 1996). The abundance of herbivores (Sacridae and Acanthuridae) and carnivores (Serranidae) comprises the four most dominant family groups on the Formigas Bank, this suggests that the bank is over exploited.

Catch Rates

Fish Pot — During this period of this activity, no pot fishing occurred in January, August and September, by Manchioneal fishers. January was due to poor weather conditions while in August fishers found a new bank approximately 15 miles from the landing site, thus August and September was spent fishing on the new bank. Of the remaining seven (7) months, the mean catch rate was 2.08 kg/trap/haul.

By species mean catch rate for Redband Parrotfish and Holocentrus ascencionis is the same 0.38 kg/trap/haul. The most dominant family group in terms of catch rates were Scaridae, followed by Holocentridae, Acanthuridae and Serranidae (Table 3).

Table 1. Ranking of family by gear

Rank	POT		SPEARGUN		TROLLING		DROPLINE	
	Family Name	%wt	Family Name	%wt	Family Name	%wt	Family Name	%wt
1	Scaridae	39	Palinuridae	86	Sphyraenidae	31	Serranidae	67
2	Holocentridae	19	Sphyraenidae	6	Carangidae	25	Lutjanidae	33
3	Acanthuridae	11	Scaridae	3	Coryphaenidae	25		
4	Serranidae	10	Lutjanidae	2	Scombridae	19		
5	Palinuridae	6	Haemulidae	1.3				
6	Balistidae	6	Balistidae	1.2				
7	Carangidae	3	Holocentridae	0.7				
8	Coryphaenidae	2						
9	Haemulidae	1.9						
10	Pomocanthidae	1.5						
11	Mullidae	0.7						

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Table 3. Ranking of family group by catch rates

Rank	Pot		Spearfishing		Trolling		Dropline	
	Family Name	kg/th	Family Name	kg/dh	Family Name	kg/lh	Family Name	kg/lh
	OVERALL	**2.08**	**OVERALL**	**4.34**	**OVERALL**	**1.72**	**OVERALL**	**1.57**
1	Scaridae	0.70	Palinuridae	3.67	Scombridae	0.76	Serranidae	1.05
2	Holocentridae	0.32	Sphyraenidae	0.36	Sphyraenidae	0.33	Lutjanidae	0.52
3	Acanthuridae	0.17	Scaridae	0.10	Carangidae	0.09		
4	Serranidae	0.17	Lutjanidae	0.08	Coryphaenidae	0.07		
5	Palinuridae	0.13	Balistidae	0.07				
6	Balistidae	0.12	Haemulidae	0.04				
7	Carangidae	0.06	Holocentridae	0.02				
8	Coryphaenidae	0.04						
9	Haemulidae	0.04						
10	Pomocanthidae	0.03						

KEY: th – trap haul; dh – dive hour; lh – line hour.

Table 2. Number of species by gear.

Fishing Ground	# Species in Pot	# Species on Line	Source
Alice Shoal	77	23	Fisheries Division, 1986
Morant Bank	51	-	Pears, 1996
Formigas Bank	48	8	Present Study

Formigas bank is less exploited than Discovery Bay (north shelf), however, Morant Cay has a higher catch rate by family group (Table 4).

Table 4. Pot catch rate (kg/trap/haul) by family group.

Family	Formigas	Morant Cay	Discovery Bay
Scaridae	0.70	0.96	0.36
Holocentridae	0.32	0.37	0.08
Acanturidae	0.17	0.34	0.11
Serranidae	0.17	0.21	0.06

The catch rates are low when compared with other areas (Table 5), although very similar to Morant Cay.

Table 5. Pot catch rate comparison

Catch rates (kg/trap/haul)	Fishing Ground	Soak (days)	Source
21.00	Jamaica (offshore)	2	Munro, 1983
8.17	Alice Shoal	2	Fisheries Division, 1996
2.96	Morant Cay	3.2	Pears, 1996
2.60	Jamaica (inshore)	16	Munro, 1983
2.08	Formigas Bank	3	Present Study

Spearfishing

Mean catch rate is 4.34 kg/dive hours, this is higher than pots. Lobster has the highest catch rate 3.67 kg/dive hours. (Table 3).

Trolling

The main species caught are King Mackerel (0.63 kg/line hrs.), Wahoo (0.38 kg/line hrs.) and Barracuda (0.43 kg/line hrs.), the mean catch is 1.72 kg/line hrs. Catch rate on Formigas is similar to Alice Shoal (Table 6).

Table 6. Line catch rate comparison

Catch Rate (kg/line/hour)	Fishing Ground	Source
2.30	Morant Cay (SE)	Kawaguahi, 1974
2.00	Pedro Bank	Munro, 1983
1.72	Formigas Bank	Present Study
1.59	Alice Shoal	Fisheries Division, 1996

Dropline

Mean catch rate is 1.57 kg/line hours or 0.036 kg/hook hours.

CONCLUSION

Although the data suggests that Formigas Bank is as exploited as Morant Cay (offshore) and Discovery Bay (inshore), closing this bank will also justify closing the other areas as well. Although, fishers from Manchioneal area would like the Bank to be closed, experience tells us that, economic pressures will force fishers to violate this regulation. The alternative would be for the Fisheries Division to properly manage the area, by using specific management strategies in association with assistance from fishers who uses the area. Management options could include:

i) Increase mesh size of pots, from 3.18cm to 3.82cm..
ii) Investigating a new gear technology ie. Use of long-line fishing .
iii) Control of the number of fishermen on the bank.
iv) Monitor the bank for poachers.
v) Co-management

Administration of the above management options could best be achieved by co-management. With the efforts of the fishers, stakeholders, Fisheries Division and a NGO, monitoring activities on the Bank could be accomplished.

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