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PATTERNS OF PREHISTORIC FISHING IN THE WEST INDIES

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ABSTRACT: The fish faunal assemblages from a series of prehistoric caribbean sites are compared in order to see wether or not different strategies existed in order to crop the resource. The analysis evidences that reef fishes, in particular parrotfishes (Scaridae) and groupers (Serranidae), were indeed an important but by no means the only fishing resource exploited since, in some samples, reef species are less important than some locally abundant species. Clearly, the prehistoric fishermen were competent, using a variety of fishing techniques, in order to optimize their cropping efforts.

KEYWORDS: FISH, WEST INDIES, PREHISTORY, FISHING

RESUMEN: Se comparan las ictiocenosis de una serie de yacimientos caribeños a fin de evidenciar la existencia de diferentes estrategias pesqueras en diferentes zonas. El análisis demuestra que los peces recifales, en especial las viejas (Scaridae) y meros (Serranidae), son un recurso importante aunque no el único dado que, en algunos casos, estas especies se sitúan por debajo de otras localmente importantes. Claramente, el pescador caribeño era un profesional competente que utilizaba una gama de estrategias en diferentes situaciones a fín de optimizar su esfuerzo recolector.

PALABRAS CLAVE: PECES, CARIBE, PREHISTORIA, PESCA

INTRODUCTION

The fish faunal assemblages from prehistoric West Indian sites all contain reef species and among these species the parrotfishes (Scaridae) are the most abundant. The first impression is of a fishing economy centered on the exploitation of the coral reef ecosystem. However, with a closer look at these fish assemblages, a number of different patterns of exploitation emerge. The implications of these differences to a reconstruction of prehistoric West Indian fishing practices are important in revealing the adaptability of the early colonists to this island archipelago.

The faunal samples are all associated with people who produced ceramics and occupied the Islands of the Caribbean from the time of Christ to the era of Spanish exploration (Rouse, 1989). These prehistoric colonists migrated from northeastern South America. In so doing, they had to adapt hunting, fishing, and gathering practices from one of hunting an abundant mainland fauna and fishing in a large river delta, the Orinoco, to hunting on islands with scarce terrestrial animal resources and fishing and gathering in maritime waters. The faunal samples reveal some aspects of this adaptation required by these colonizing efforts.

MATERIALS

The faunal samples come from 24 sites in the Caribbean ranging from sites on the large islands such as Jamaica to small ones such as Samana Cay and from the northern Bahaman Island of San Salvador to the southern Lesser Antillian Island of Barbados (Figure 1 and Table 1). The samples varied in size from only 71 fish bones to as many as 6956 with an average sample size of 1311 fish bones. The recovery technique employed in securing the samples also differed and this may be the greatest cause of bias among the samples.

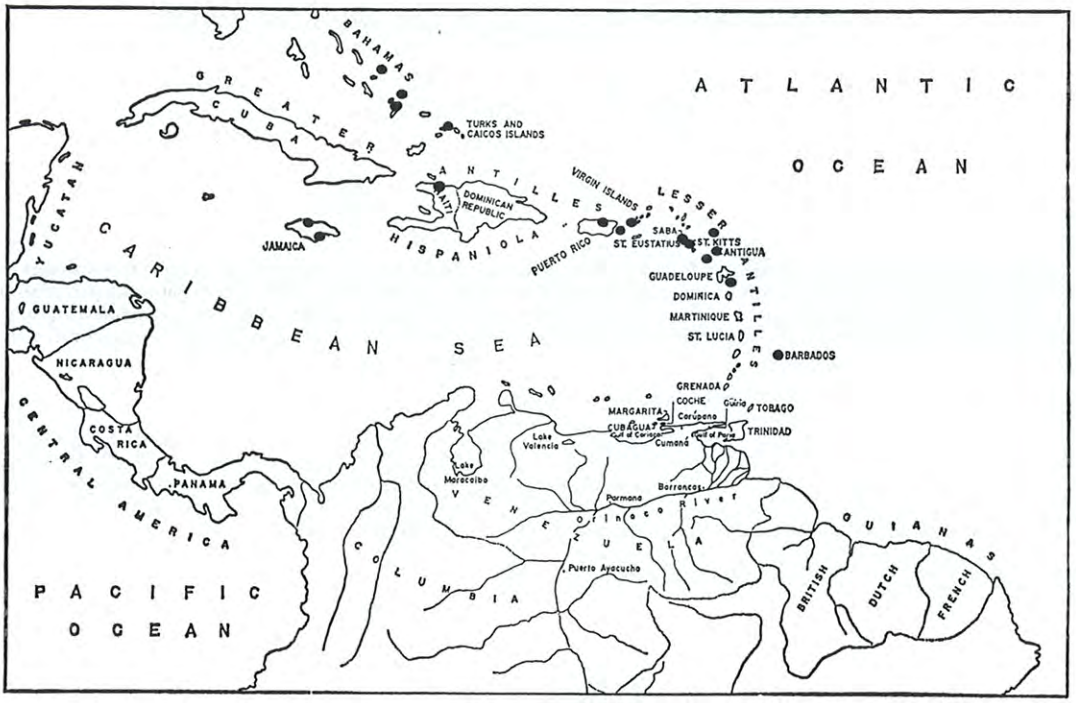

FIGURE 1. Map of the West Indies with site locations marked with a dot.

The samples from the sites of Palmetto Grove, White Marl, Bengal, Rio Nuevo, Mill Reef, Taliserond, and Sugar Factory were all excavated during a time before we realized the importance of using fine gauge screens to sieve faunal samples. Undoubtedly, remains of smaller organisms are missing or under-represented in these coarsely sieved samples. They are included here because the patterns of reef fish exploitation, particularly the parrotfishes (Scaridae), surgeonfishes (Acanthuridae), and grouper (Serranidae), are of primary concern in this analysis. Adult individuals in these three groups are medium sized to large and their remains are recovered by all sieving strategies. The remains of juveniles of these three groups and species such as flyingfishes (Exocetidae), herrings (Clupeidae) and other small inshore species would only be recovered by fine gauge screen sieving strategies.

METHODS

Only the fish component of the faunal samples is considered here. This is not to ignore the importance of the terrestrial vertebrate and the invertebrate fauna in the prehistoric economies but rather to concentrate on the fishing aspect of the economy.

A search for patterns in the fish faunal assemblage began by a comparison of the three most abundantly represented fishes, based on numbers of identified specimens and minimum numbers of individuals, in the West Indian faunal samples. Parrotfishes (Scaridae) are the most abundantly

represented in thirteen of the twenty-four samples. Grouper (Serranidae) are either of primary or secondary importance in eleven of the twenty-four samples. Surgeonfishes (Acanthuridae) are among the three most important fishes in six sites. Nine sites lack one or another of these species and are eliminated from this particular analysis.

ISLAND	SITE NAME	EXCAVATOR	REFERENCE
BAHAMAS			
San Salvador	Palmetto Grove	C. Hoffman	Wing 1969
San Salvador	Long Bay	C. Hoffman	incomplete
Samana Cay	SM 2	N. Hoffman	Wing ms.
Samana Cay	SM 7	C. Hoffman	Wing ms.
Crooked Island	CK 8 and CK 14	W. Keegan	Wing ms.
Pine Cay	PI 1	W. Keegan	Keegan 1986
Middle Caicos	MC 6 and MC 12	S. Sullivan	Wing & Scudder 1983
GREATER ANTILLES			
Jamaica	White Marl	R. Vanderwal	Wing 1972
Jamaica	Rio Nuevo & Bengal	F. Osbourne	Wing 1972
Haiti	En Bas Saline	K. Deagan	incomplete
Puerto Rico	Maisabel	P. Siegal	de France 1988
Puerto Rico	El Bronce	L. Robinson	Reitz 1984
Vieques Island	Sorce	L. Chanlatte	Narganes 1982
VIRGIN ISLANDS			
St. Thomas	Krum Bay	E. Lundberg	Reitz 1982
LESSER ANTILLES			
St. Eustatius	Golden Rock	A. Versteeg	van der Klift 1985
St. Kitts	Sugar Factory	C. Goodwin	Wing & Scudder 1980
Barbuda	Indiantown Tr.	D. Watters	Watters *et al.* 1984
Montserrat	Trant's	D. Watters	Steadman *et al.* 1984
Antigua	Mill Reef	C. Hoffman	Wing *et al.* 1968
Marie Galante	Taliseronde	D. Emond	incomplete
Barbados	Silver Sands	P. Drewett	incomplete

TABLE 1. List of sites examined for this review of fishing patterns.

Observed patterns are illustrated by the use of log difference diagrams (Figures 2-5 and Table 2). The fish fauna from the site of Indiantown identified by Elizabeth Reitz (Watters *et al.*, 1984) was used as a sample against which to compare all other samples. This choice was an arbitrary decision and undoubtedly other patterns would be revealed if other groups of fishes and other samples were used.

GROUP	SITE NAME	TOTAL NISP	TOTAL MNI	1st TAXON	1st NISP	1st MNI	2nd TAXON	2nd NISP	2nd MNI	3rd TAXON	3rd NISP	3rd MNI
0	Indiantown	2350	122	Scaridae	370	51	*Acanthurus*	98	43	Serranidae	49	8
1	Mill Reef	-	1294	Scaridae	-	574	*Acanthurus*	-	255	*Epinephelus*	-	62
1	Samana Cay 2	509	80	Scaridae	455	49	*Acanthurus*	23	11	Serranidae	11	7
1	MC 12	1148	120	Scaridae	365	70	*Albula*	21	10	*Haemulon*	22	7
1	Palmetto Grove	3118	563	Scaridae	2433	347	Balistidae	70	53	Serranidae	314	50
2	EBS 6752	647	77	Scaridae	199	20	*Haemulon*	139	8	Serranidae	76	6
2	CK 14	1056	177	Scaridae	437	65	Serranidae	210	27	*Acanthurus*	222	19
2	CK 8	71	14	Scaridae	28	3	Serranidae	8	3	*Acanthurus*	8	2
2	Sugar Factory	-	199	Scombridae	-	84	Serranidae	-	52	Scaridae	-	14
2	Rio Nuevo	-	458	Serranidae	-	94	Scaridae	165	21	*Thunnus*	-	50
2	Golden Rock	4306	419	*Trachurus*	1519	187	Serranidae	929	65	*Caranx*	105	34
3	Silver Sands	1230	91	*Acanthurus*	233	28	Scaridae	165	21	*Hirundichthys*	124	3
3	MC 6	6956	114	*Albula*	2201	37	*Lutjanus*	198	12	*Haemulon*	167	10
3	Maisabel	916	62	Carangidae	-	5	Clupeidae	-	4	Balistidae	-	3
3	White Marl	-	246	*Centropomus*	-	40	shark	-	33	*Mugil*	-	22
3	Pine Cay	1096	94	Scaridae	86	23	*Lutjanus*	158	19	*Haemulon*	53	10
4	El Bronce	114	64	Eleotridae	63	23	Scaridae	7	6	*Lutjanus*	5	4
4	Taliseronde	281	35	Scaridae	173	16	*Balistes*	28	5	Serranidae	30	3
4	Samana Cay 7	287	25	Scaridae	77	13	Scombridae	198	4	Clupeidae	4	2
4	Long Bay	399	-	Scaridae	358	-	Serranidae	26	-	Labridae	7	-
4	Krum bay	648	123	Scaridae	422	66	Serranidae	56	16	Lutjanidae	60	15
4	Trant's	282	17	Serranidae	40	7	*Lutjanus*	5	3	*Euthynnus*	7	1
4	Bengal	-	98	Serranidae	-	36	*Lutjanus*	-	10	*Haemulon*	-	10
4	Sorce	439	207	Serranidae	277	67	*Lutjanus*	72	36	Labridae	57	28

TABLE 2. Caribbean fish faunal samples. The three most important fish groups. Number of identified specimens (NISP) and minimum number of individuals per taxonomic unit (species, genus or family, and for shark in general).

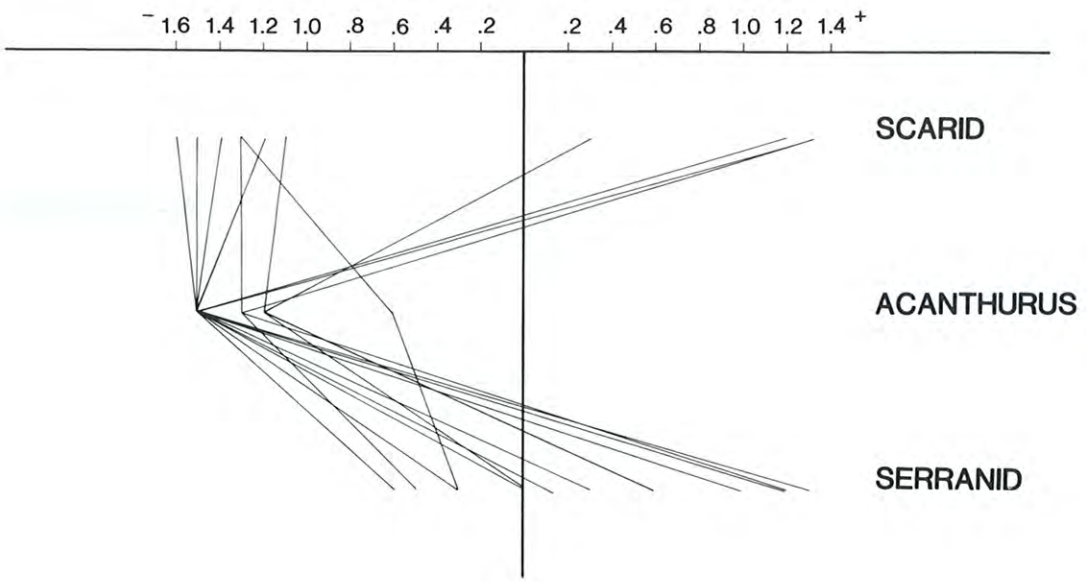

FIGURE 2. Log difference diagram of the relative abundance of parrotfishes, surgeonfishes, and grouper in the fish faunal samples from all of the sites.

RESULTS

Three clear patterns of fish exploitation emerge in respect to the relative abundances of these three fish groups. They are: 1) samples with a predominance of parrotfishes (Figure 3); 2) samples with a predominance of groupers (Figure 4); 3) samples in which reef fishes are secondary in importance to locally abundant species (Figure 5).

Those sites with a predominance of parrotfishes have a majority of reef fishes in their faunas (Figure 3). At Mill Reef on Antigua the three reef fishes used in this analysis constitute 69 percent of the fish fauna (Wing *et al.*, 1968), at Palmetto Grove on San Salvador they constitute 77 percent (Wing, 1969), at Samana Cay 2 they constitute 84 percent (Wing ms.), and at MC-12 on Middle Caicos they constitute 66 percent (Wing & Scudder, 1983) all based on minimum numbers of individuals. In addition to the three reef fishes chosen as a basis of analysis, such typical reef fishes as wrasses (Labridae), triggerfishes (Balistidae), and squirrelfishes (Holocentridae) are represented. It should be remembered that two of these samples, Mill Reef and Palmetto Grove, were coarsely sieved and it is conceivable that some small sized but key species were lost.

In the samples where groupers predominate some species other than reef species are also abundant (Figure 4). At the Sugar Factory Site on St. Kitts and Rio Nuevo on the north coast of Jamaica tuna fish are abundantly represented in addition to the grouper (Wing & Scudder, 1980). At Golden Rock on St. Eustatius the small schooling bumper (*Trachurus lathami*) are abundantly represented in addition to the predominant groupers (van der Klift, 1985).

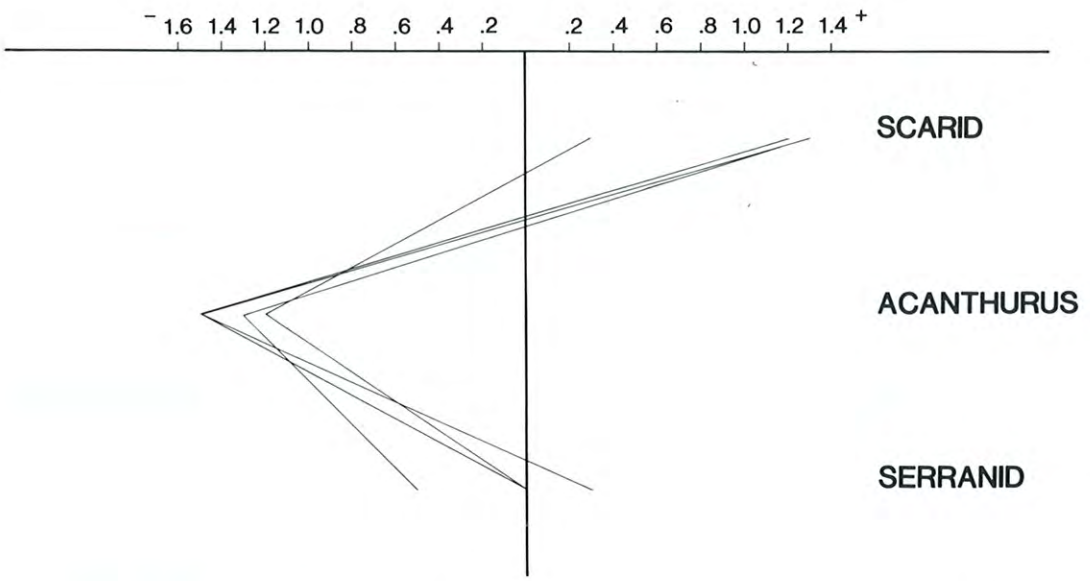

FIGURE 3. Log difference diagram of the relative abundance of parrotfishes, surgeonfishes, and grouper in the fish faunal samples from those sites in which parrotfishes predominate.

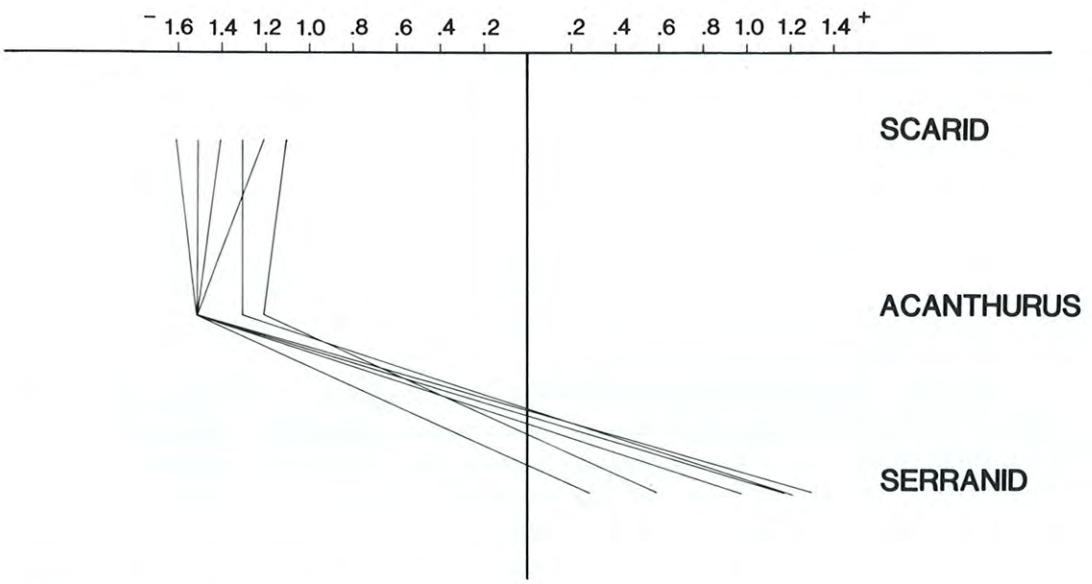

FIGURE 4. Log difference diagram of the relative abundance of parrotfishes, surgeonfishes, and grouper in the fish faunal samples from those sites in which grouper predominate.

In those sites where reef fishes are present but are of secondary importance, a variety of local fishes predominate in the samples (Figure 5). For example, at MC-6 on the southern coast of Middle Caicos bonefish (*Albula vulpes*) are most abundant (Wing & Scudder, 1983), at White Marl near Kingston, Jamaica snook (*Centropomus* sp.) are most abundant, and Maisabel on the north coast of Puerto Rico jack (Carangidae) and herring (Clupeidae) are most abundant (de France, 1988).

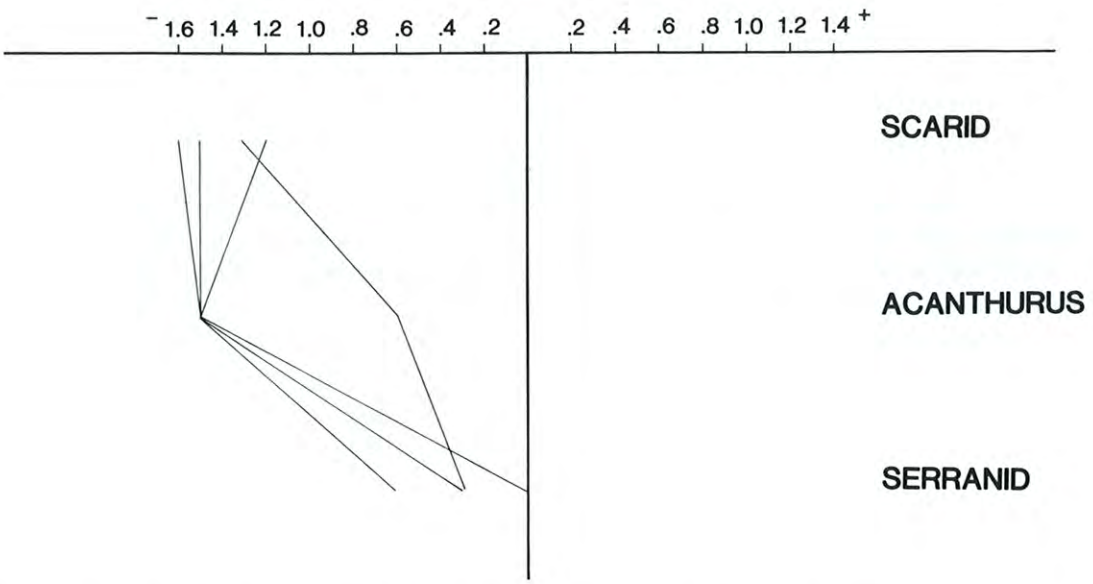

FIGURE 5. Log difference diagram of the relative abundance of parrotfishes, surgeonfishes, and grouper in the fish faunal samples from those sites in which reef fishes are of secondary importance.

CONCLUSIONS

Clearly, reef fishes were a vital resource to the early West Indian fisherman. Many of these species would have been most effectively caught with traps as they are today. Traps regulate the size of the individuals caught by excluding fishes too large to enter the trap and allowing the smallest fishes to escape through the holes in the fabric of the trap. Uniformity in the sizes of the individuals of many represented reef species would further support the hypothesized use of traps. This can only be validly tested in samples that have been recovered with the use of fine gauge sieves. Some reef species, such as the groupers, can also be caught with a hook and line. In this case the size of the fish caught would be somewhat regulated by the size of the hook. Finally, reef species may be caught with spears. Speared fishes would probably vary most in size. A study of the estimated sizes of fishes represented in the faunal samples is now underway.

The faunal samples in which grouper predominate also include other important species. In two of these sites, the Sugar Factory Pier site in St. Kitts and the Rio Nuevo site on the northern coast of Jamaica, the key species group accompanying a grouper dominant reef assemblage is tuna fishes (Scombridae, tribe Tunnini). The tunas are seasonally abundant close to shore in St. Kitts. It is possible that these two fishes, the grouper and the tuna, were caught with hook and line and the only difference in the fishing strategy being whether the hook was weighted to catch the grouper in the deep rocky reef or not wieghted to catch the pelagic tunas swimming in the upper water layers.

The Golden Rock site, St. Eustatius, has faunal sample in which grouper predominates and scad (*Trachurus lathami*) is an important complement to the assemblage. Scad are small schooling fishes that are caught in nets close to shore by St. Eustatians today.

The third pattern of fish exploitation is one in which reef fishes are less important than some locally abundant species. Two examples are of particular interest because they provide a time depth to a specialized fishing strategy that continues with great economic importance to the present day. They are the apparent importance of bonefish fishing (*Albula vulpes*) represented at MC 6 located on the southern coast of Middle Caicos and flyingfish (*Hirundichthys affinis*) and tuna (Scombridae) at Silver Sands in Barbados. Today bonefish are caught with hook and line by the sportsfisherman. Bonefish come up into the shallow water to feed and, when the water receeds, they could be entrapped with nets or wiers in the shallow tidal channels. The flyingfish are present in Barbadian waters between December and July. Today, they are caught with gillnets at a distance of at least three miles and up to ten miles from shore. Tuna feed on flyingfishes and could be caught at the same time.

The main conclusions to be drawn from these varied patterns of fish exploitation are that reef fishes were, indeed, important and in many cases a primary resouce but they were by no means the only resource exploited. The prehistoric fisherman of the Caribbean was clearly competent, used a variety of fishing techniques, and exploited regionally or locally abundant resources.

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