

**VESSEL FRAME SURVEY 2001  
ANTIGUA – BARBUDA**

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## INTRODUCTION

Fisheries data including information on fishers, vessels, catch and effort, and biological data on fishery resources are stored in two database programs present at the Fisheries Division. The Trip Interview Program (TIP) captures data pertaining to catch and effort and biological data while the Licensing and Registration System (LRS) captures baseline socio-economic data on fishers as well as technological features of the fishing fleet. Both programs were supplied under the CARICOM Fisheries Resource Assessment and Management Program, a joint project between the Canadian International Development Agency and member countries of the Caribbean Community.

TIP and LRS are used in conjunction to calculate certain basic fisheries statistics, such as the mean catch per unit effort by vessel length class, which may be used with appropriate “raising factors” to estimate annual fisheries production or landings. In terms of fisheries management and development, these values are important for the analysis of trends within the sector, policy development and the determination of fisheries contribution to the economy (i.e., fisheries share of the Gross Domestic Product).

At the end of 2001 there were 555 fishing vessels registered in Antigua and 72 in Barbuda, accounting for 881 registered fishers in Antigua and 106 in Barbuda (Figures 1 and 2). The registration process was initiated in 1995, however most vessels and fishers were not captured in the early years. Vessels were located at approximately 25 landing sites around Antigua and 5 in Barbuda (Figures 3 and 4).

While a database of fishers and vessels is an important component of any effective fisheries management system, keeping track of the changes with respect to these elements is just as essential. This is particularly important in the context of Antigua – Barbuda, since the sector acts as a “safety-net” for other economic activity. In other words, when there is a downturn in other sectors (e.g., tourism and construction) individuals may re-enter or increase their activity in the fisheries sector. Hence, estimation of annual landings can be problematic due to the variability in the number of active fishing vessels.

It is within the context of this background that a vessel frame survey of landing sites was conducted. The main objectives were to:

- Quantify the total number of fishing vessels
- Quantify the number of vessels actively engaged in commercial and recreational fishing (charters that provided sport-fishing services were considered as commercial since the venture is ultimately profit-seeking)
- Update the “raising factors” used to determine annual fisheries landings (e.g., no. of active fishing vessels)
- Estimate the number of active fishers based on the survey
- Determine the present technological features of the fleet and update existing database (LRS)

- Identify trends in fleet composition and vessel and fisher distribution over the past decade
- Determine compliance with Section 11 (1) of the Fisheries Act, 1983 (i.e., the mandatory licensing of all fishing vessels)

- Vessel status (active or inactive; commercial or recreational)
- Colour
- Primary gear

## METHODOLOGY

The survey was conducted from January to March 2001. Surveyors were all fisheries personnel that are directly responsible for inspecting and licensing fishing vessels or directly involved in the registration of fishers and vessels. Surveyors were instructed to record all fishing vessels at landing sites regardless of their status (whether active or inactive).

Data compiled on vessels included:

- Name
- Registration number
- Size class
- Vessel type
- Hull material
- Engine type
- Engine power

The basic form utilised by surveyors is included in the Annex. Figures 5 to 10 identify the main types of fishing vessels.

Note that the vessel status and primary gear used was determined primarily by direct observation by surveyors. In cases where the surveyor had no direct knowledge of the vessel, status and primary gear used was determined using any one of the following methods:

- Interview of vessel owner or secondary source (e.g., crew, other fishers at the landing site)
- Examination of the vessel for signs of activity (e.g., presence of fishing gear)
- Inspection of licensing and catch and effort records for 2001

In order to identify trends in fleet composition and vessel and fisher distribution, comparison were made with the 1992 Boat and Fishermen Census conducted by Mr. George Looby (Fisheries Officer). Comparisons were limited to Antigua due to the fact that Barbuda was not captured in the 1992 census.

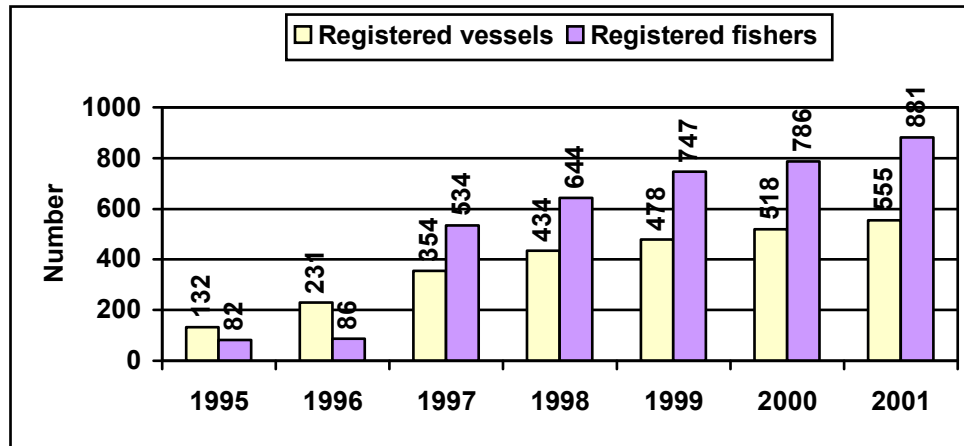


Figure 1. Number of registered vessels and fishers at year-end in Antigua.

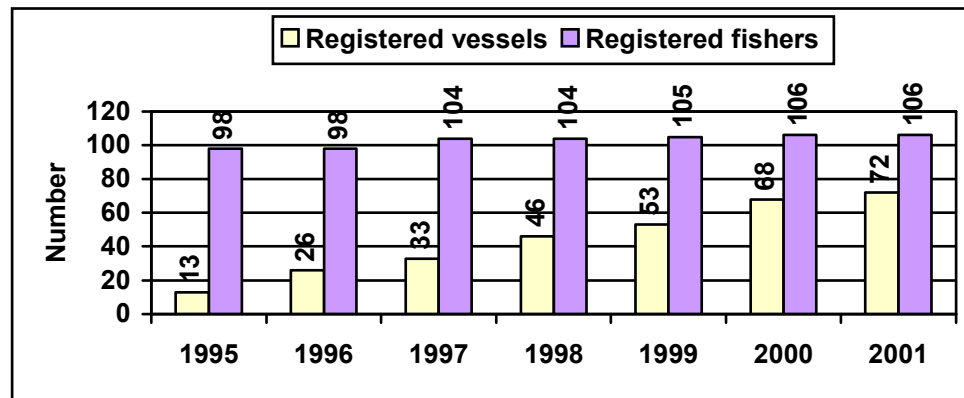


Figure 2. Number of registered vessels and fishers at year-end in Barbuda.

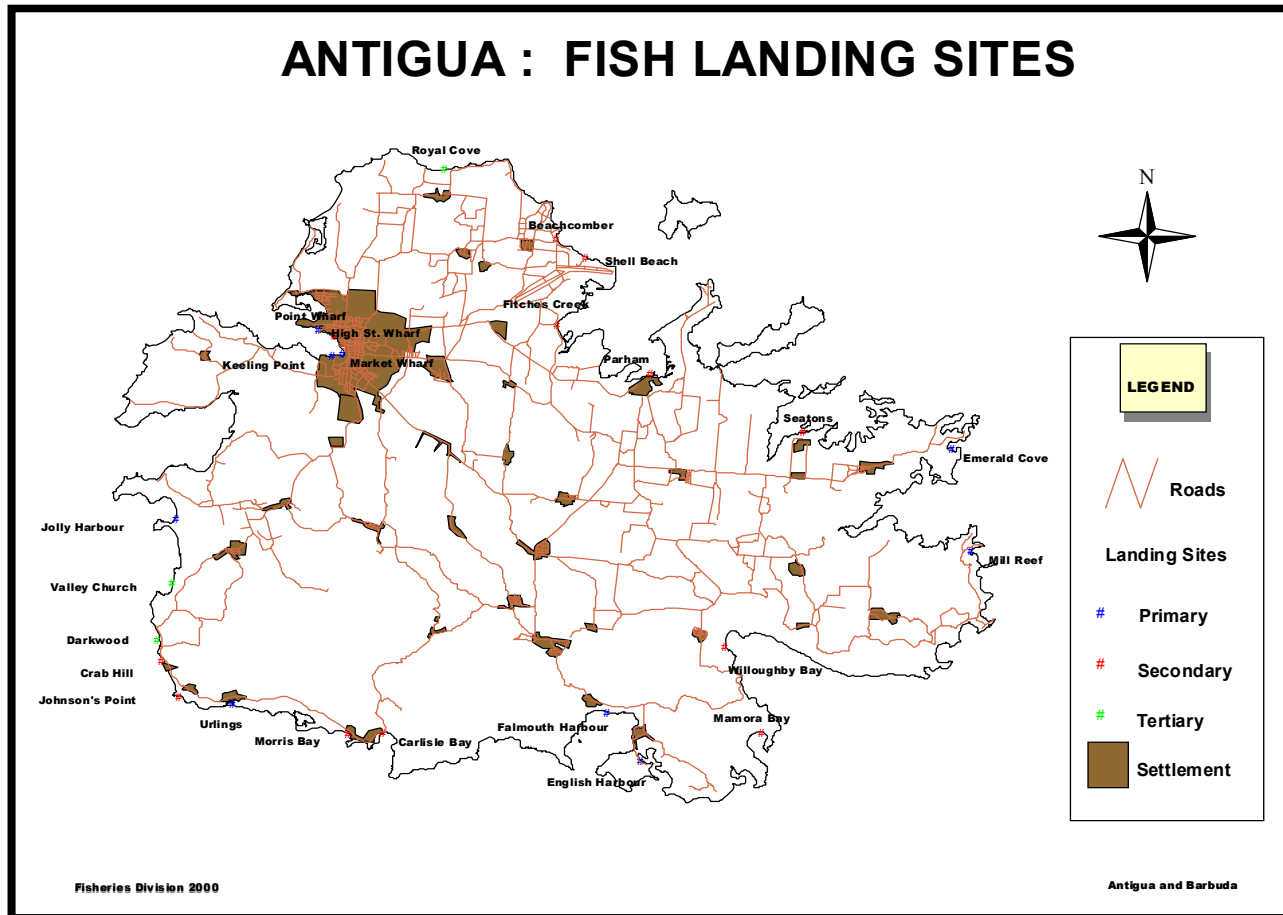


Figure 3. Fish landing sites in Antigua.

# FISH LANDING SITES: BARBUDA

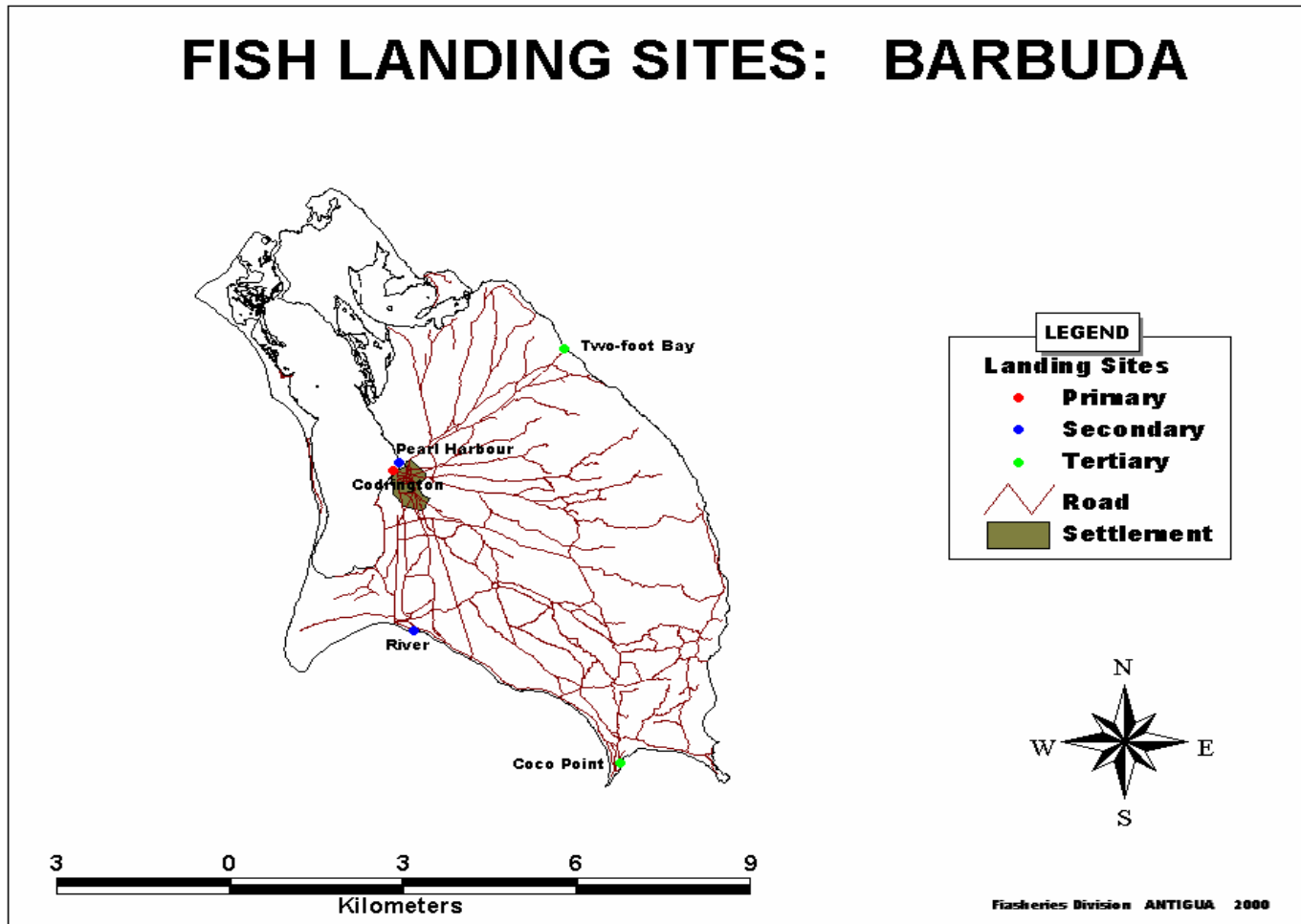


Figure 4. Fish landing sites in Barbuda.



Photo: P. James

Figure 5. Traditional wooden open boat (foreground) and modern fibreglass launch (background).



Photo: P. James

Figure 7. Modern fibreglass open boat (pirogu).



Photo: P. James

Figure 6. Wooden open boat (dory) with cabin.



Photo: P. James

Figure 8. Traditional wooden launch with winch and trap hauler.



Figure 9. Traditional wooden sloop.



Figure 10. Modern sport-fishing fiberglass launch.

## RESULTS AND DISCUSSION

### Vessel Activity and Distribution

Tables 1 and 2 provide a summary of the vessels encountered at each landing site. Of the 371 vessels surveyed, 77.9% (289) were active, accounting for 46.1% of the total number of registered fishing vessels in Antigua and Barbuda (627 at the end of 2001).

Vessels that were inactive fell into one of the following categories:

- Vessels that were damaged (in some cases sunken) by one of the major hurricanes over the past decade
- Vessels that were in the process of being repaired or serviced
- Vessels that were dry-docked for an extended period (over a year)
- Vessels that were seaworthy but inactive for no apparent reason

The low level of fishing activity may be attributed to the numerous hurricanes experienced over the past decade. Another factor include the level of activity in the tourism and construction industry. Survey was conducted during the tourism season when a number of part-time fishers would have been more active in that sector. The multi-source approach to income generation may be seen as one way of minimising the risk associated with fishing operations.

Figures 11 and 12 summarise the distribution of active fishing vessels by vessel type and landing site. For Antigua, open boats accounted for 53.0% of the active fleet; open boats with cabin, 20.6%; launch, 24.3%; sloop, 1.2%; and other 0.8%. In terms of distribution of the 247 active vessels, Point Wharf, Keeling Point, Market Wharf, Falmouth Harbour and Jolly Harbour were the five most active landing sites.

Of the 45 vessels surveyed in Barbuda, 93.3% (42) were actively fishing. The higher level of fishing activity, relative to Antigua (75.8%), highlights the importance of the fisheries sector to the Barbudan economy. For Barbuda, open boats were the dominant design, accounting for 95.2% of the active fleet. Codrington Wharf and Pearl Harbour were the two major landing sites; 83.8% of all active vessels were based at these two sites.

TABLE 1. Summary of the distribution and activity of fishing vessels in Antigua (January – March 2001).

Site	Vessel Type					Total	No of Vessel Active		Total Active	Comments
	Open	Open/cabin	Launch	Sloop	Other		Commercial	Recreational		
BC	5	2	2	0	0	9	7	0	7	
CB	10	0	0	0	0	10	6	0	6	
CH	1	0	0	0	0	1	1	0	1	
CM	4	0	2	0	0	6	5	0	5	Marina changed ownership
DB	1	0	1	0	1	3	1	0	1	1 active sport-fishing charter (launch)
DR	5	0	0	0	0	5	5	0	5	
DU	2	0	0	0	0	2	2	0	2	Not an official landing site
EH	2	3	4	0	0	9	8	0	8	1 active sport-fishing charter (launch)
FC	2	2	0	0	0	4	1	0	1	
FH	6	2	14	0	0	22	16	6	22	5 active sport-fishing charters (launches)
FI	2	0	0	0	0	2	2	0	2	
GN	2	1	0	0	0	3	2	0	2	
HW	2	1	3	0	0	6	5	0	5	
JP	0	1	0	0	0	1	?	?	?	Vessel reported missing during survey
JH	8	3	11	0	1	23	17	3	20	User conflict (fishers versus marina owner)
KP	16	16	4	0	1	37	27	0	27	27% of the vessels inactive
MA	3	0	0	0	0	3	3	0	3	
MB	5	3	0	0	0	8	4	0	4	
MR	4	0	1	0	0	5	4	0	4	
MW	10	8	7	1	0	26	26	0	26	
PH	12	0	1	0	0	13	10	1	11	Site earmarked for fisheries development
PW	20	11	18	3	1	53	35	0	35	66% of the vessels inactive
RB	0	1	0	0	0	1	1	0	1	
SH	8	1	5	0	1	15	9	0	9	Recreational vessels stored at site (Pitch)
ST	6	2	0	0	0	8	7	1	8	
UL	17	7	2	0	0	26	13	0	13	50% of vessels inactive
VC	1	0	0	0	0	1	0	0	0	Site inactive (fishers displaced to JH)
WB	6	0	0	0	0	6	6	0	6	
WL	14	1	3	0	0	18	13	0	13	
Total	174	65	78	4	5	326	236	11	247	

TABLE 2. Summary of the distribution and activity of fishing vessels in Barbuda (January – March 2001).

Site <sup>1</sup>	Vessel Type					Total	No of Vessel Active		Total Active	Comments
	Open	Open/cabin	Launch	Sloop	Other		Commercial	Recreational		
CP	1	0	0	0	1	2	2	0	2	
CW	21	1	1	0	0	23	22	0	22	Single launch is inactive
PL	14	0	0	0	0	14	13	0	13	
RV	5	1	0	0	0	6	5	0	5	
TB	0	0	0	0	0	0	0	0	0	Site inactive
Total	41	2	1	0	1	45	42	0	42	

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Site Codes Antigua: BC=Beach Comber; CB=Carlisle Bay; CH=Crab Hill; CM=Crabbs Marina; DB=Dickenson Bay; DR=Dredge Bay; DU=Dutchman Bay; EH=English Harbour; FC=Fitches Creek; FH=Falmouth Harbour; FI=Five Islands; GN=Gaynors; HW=High St. Wharf; JP=Johnson Pt; JH=Jolly Harbour; KP=Keeling Pt; MA=Mamora Bay; MB=Morris Bay; MR=Mill Reef; MW=Market Wharf; PH=Parham Harbour; PW=Point Wharf; RB=Royal Bay; SH=Shell Beach; ST=Seatons; UL=Urlings; VC=Valley Church; WB=Willoughby Bay; WL=Willikies.

Site Codes Barbuda: CP=Coco Point; CW=Codrington Wharf; PL=Pearl Harbour; RV=River; TB=Two Foot Bay.

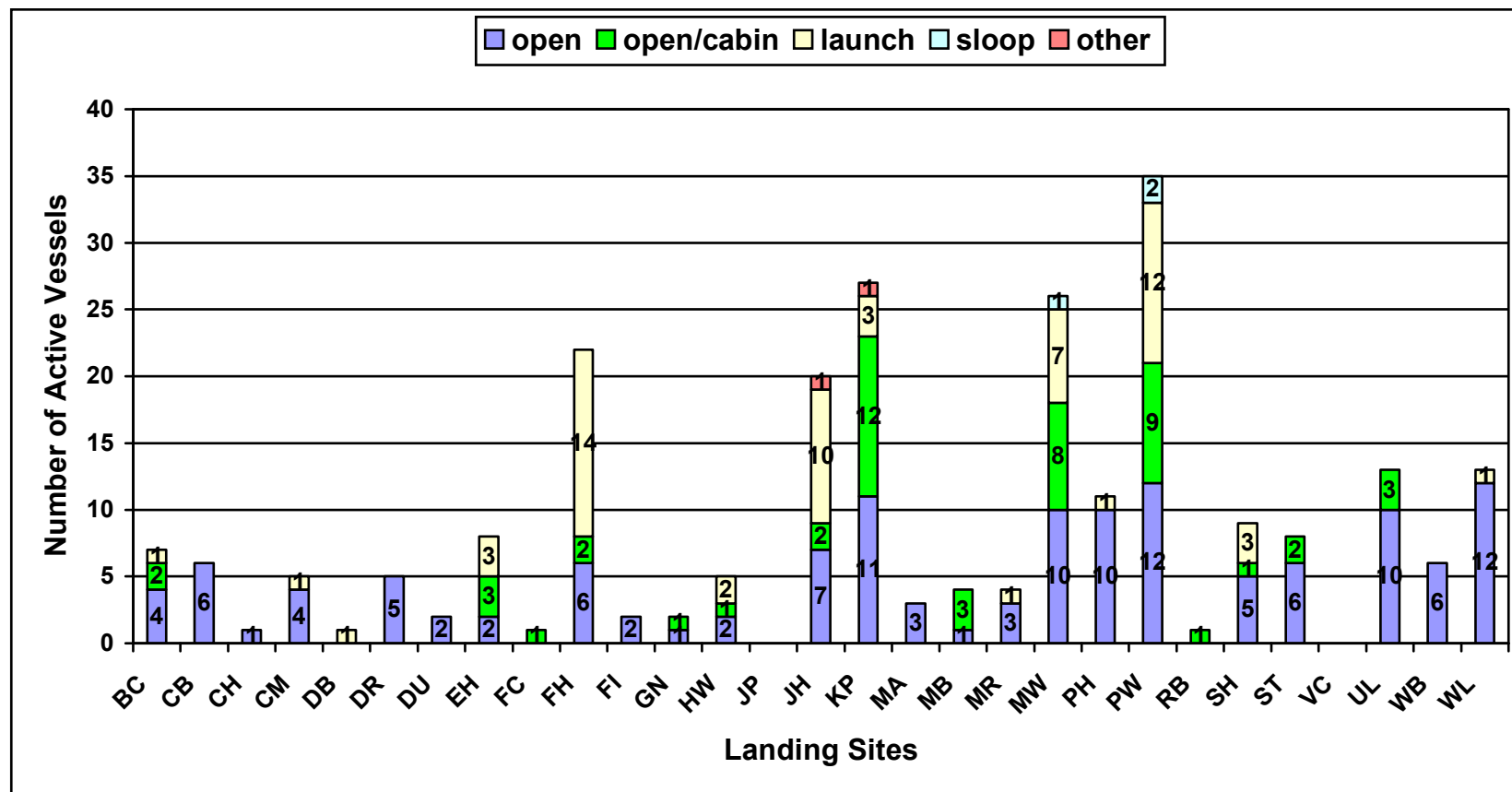


Figure 11. Distribution of active fishing vessels in Antigua in 2001 by vessel type.<sup>2</sup>

<sup>2</sup> BC=Beach Comber; CB=Carlisle Bay; CH=Crab Hill; CM=Crabbs Marina; DB=Dickenson Bay; DR=Dredge Bay; DU=Dutchman Bay; EH=English Harbour; FC=Fitches Creek; FH=Falmouth Harbour; FI=Five Islands; GN=Gaynors; HW=High St. Wharf; JP=Johnson Pt; JH=Jolly Harbour; KP=Keeling Pt; MA=Mamora Bay; MB=Morris Bay; MR=Mill Reef; MW=Market Wharf; PH=Parham Harbour; PW=Point Wharf; RB=Royal Bay; SH=Shell Beach; ST=Seatons; UL=Urlings; VC=Valley Church; WB=Willoughby Bay; WL=Willikies.

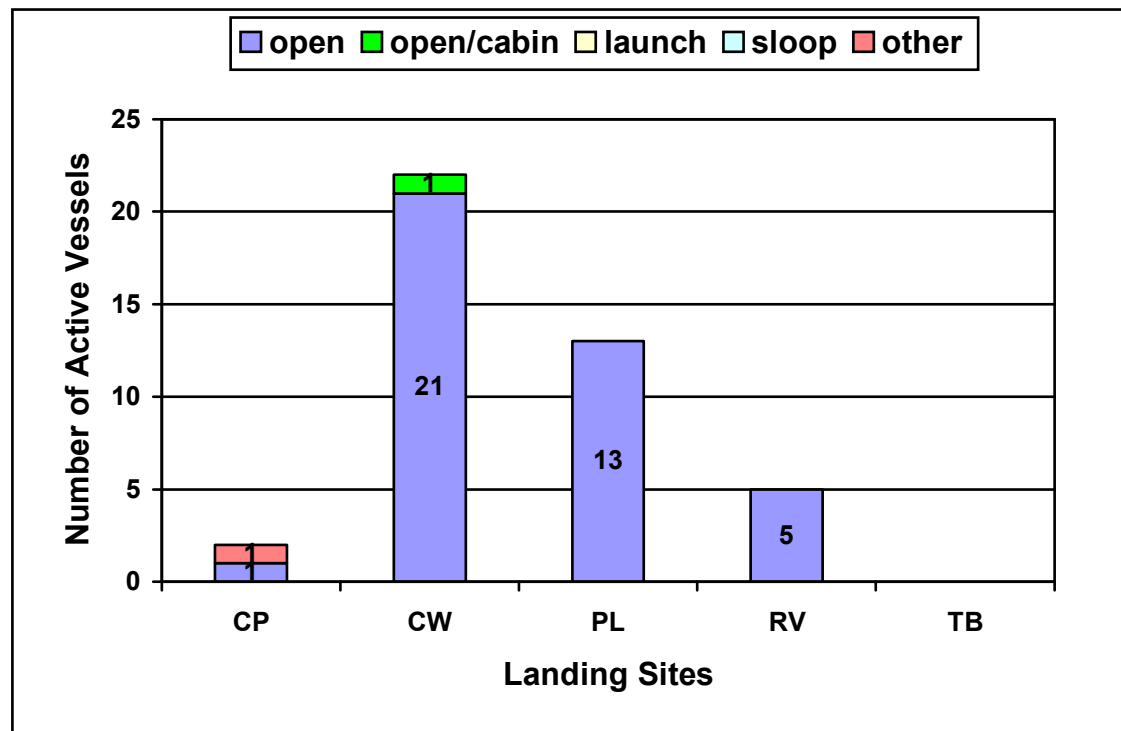


Figure 12. Distribution of active fishing vessels in Barbuda in 2001 by vessel type.<sup>3</sup>

<sup>3</sup> CP=Coco Point; CW=Codrington Wharf; PL=Pearl Harbour; RV=River; TB=Two Foot Bay.

## Trends in Vessel Activity and Distribution

Figure 13 summarises the distribution of active fishing vessels in Antigua for the 1992 census. Of the vessels surveyed in 1992, 286 were determined to be active as opposed to 247 in 2001. As mentioned earlier, the low level of fishing activity may be attributed to the damage done to vessels by the numerous hurricanes experienced over the past decade (Tropical Storm Iris and Hurricane Luis in 1995; Hurricane Georges in 1998; and Hurricane Jose and Lenny in 1999).

Table 3 summaries the two hurricanes that have impacted significantly on the level of activity and the number of active vessels. Since the 1992 census, a total of 42 vessels have been destroyed or lost at sea due to hurricanes. This accounts for 6.7% of the registered vessels in Antigua and Barbuda (end of 2001). The present status of all vessels that were severely damaged by hurricanes is unknown. While the recent frame survey have identified a number of derelict fishing vessels, those that were the result of severe damage by hurricanes could not be differentiated. Factors such as the state of deterioration of the vessel, and the absence of registration number, hindered the identification process.

TABLE 3. Summary of damage done to fishing vessels by Hurricane Luis and Georges.

	Hurricane Luis (1995)	Hurricane Georges (1998)
Vessels destroyed	34	1
Vessels lost at sea	6	1
Vessels severely damaged	79	18
Estimated cost	EC\$1,961,630	EC\$150,000

Figure 14 compares the distribution of active fishing vessels in 2001 relative to 1992. It should be noted that sites surveyed in 2001 were pooled where necessary to enable comparisons with the 1992 census. In general, there was a decrease in the number of active fishing vessels at most landing sites in 2001. The exceptions were Willoughby Bay, Jolly Harbour, Shell Beach and Willikies. At Jolly Harbour, there was a 4-fold increase in the number of active fishing vessels due in part to the displacement of fishers from Valley Church following the construction of the Jolly Harbour Marina. The new facilities also attracted a number of recreational sport-fishers thereby contributing to the total number of active vessels. New marina facilities at Shell Beach also produced similar results.

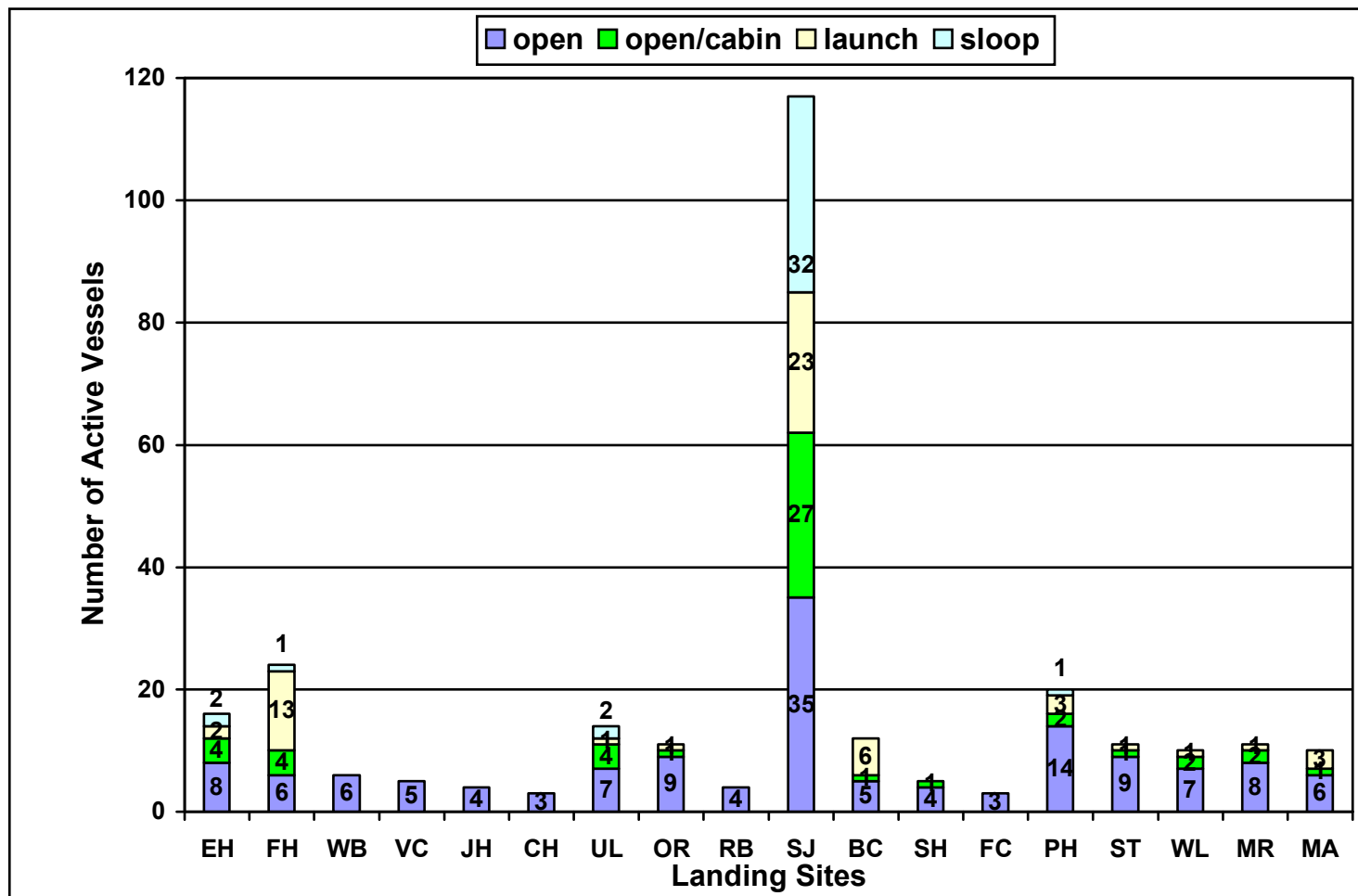


Figure 13. Distribution of active fishing vessels in Antigua in 1992 by vessel type.<sup>4</sup>

<sup>4</sup> EH=English Harbour; FH=Falmouth Harbour; WB=Willoughby Bay; VC=Valley Church; JH=Jolly Harbour; CH=Crab Hill; UL=Urlings; OR=Old Road (beaches of Carlisle Bay and Morris Bay); RB=Royal Bay; SJ=St. John's; BC=Beach Comber; SH=Shell Beach; FC=Fitches Creek; PH=Parham Harbour; ST=Seatons; WL=Willikies; MR=Mill Reef; MA=Mamora Bay.

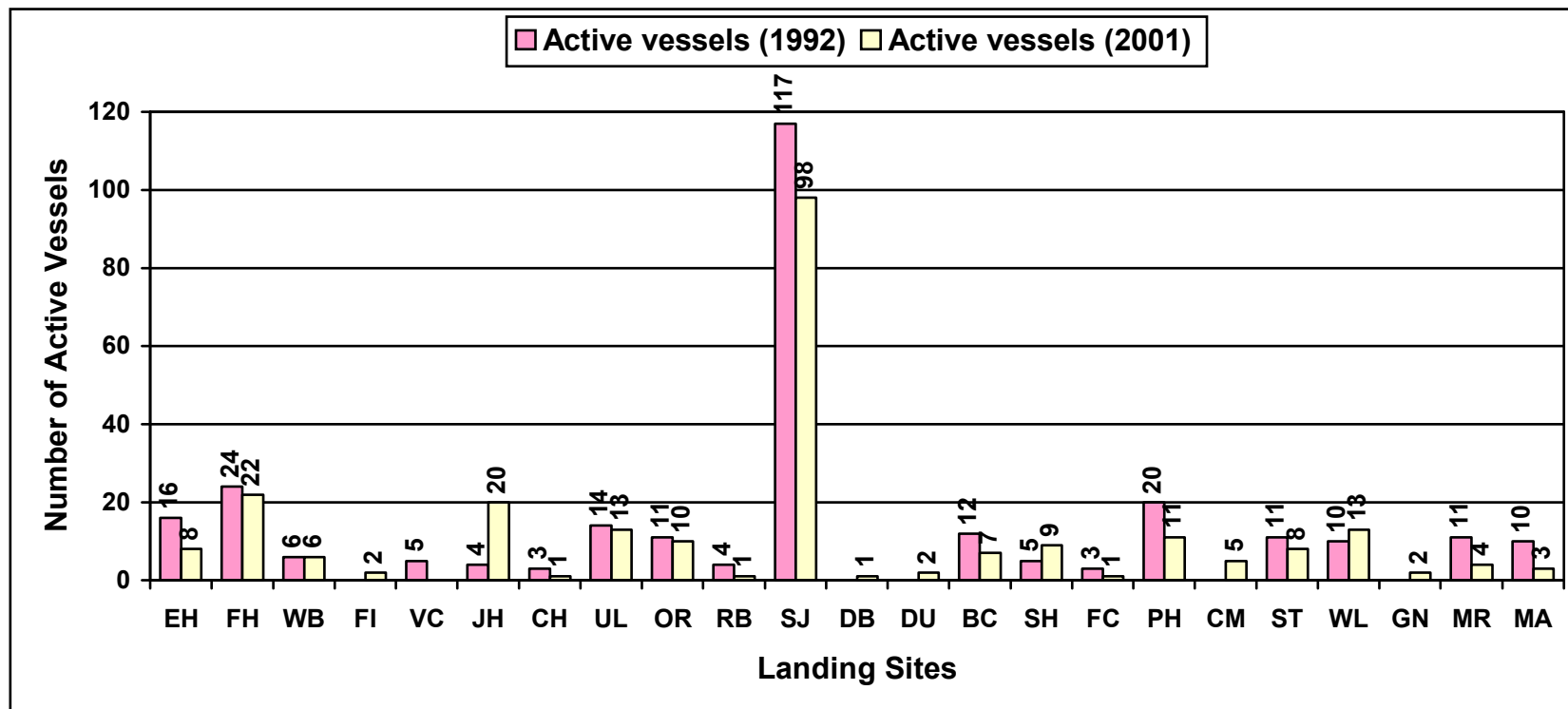


Figure 14. Distribution of active fishing vessels in Antigua in 1992 and 2001.<sup>5</sup>

<sup>5</sup> EH=English Harbour; FH=Falmouth Harbour; WB=Willoughby Bay; FI=Five Island; VC=Valley Church; JH=Jolly Harbour; CH=Crab Hill; UL=Urlings; OR=Old Road (beaches of Carlisle Bay and Morris Bay); RB=Royal Bay; SJ=St. John's (sites of Dredge Bay, High St. Wharf, Keeling Point, Market Wharf and Point Wharf); DB=Dickenson Bay; DU=Dutchman Bay; BC=Beach Comber; SH=Shell Beach; FC=Fitches Creek; PH=Parham Harbour; CM=Crabbs Marina; ST=Seatons; WL=Willikies; GN=Gaynors; MR=Mill Reef; MA=Mamora Bay.

## Trends in Fleet Composition

Figures 15 and 16 summarise the changes in the fleet composition since 1992. Based on the 2001 Frame Survey, the proportion of wooden sloops has decreased significantly from 13.3% to 1.2%. This drastic reduction is due mainly to the replacement of these traditional fishing vessels by modern fibreglass launches. In a few cases, the wooden sloops were converted to traditional launches by removal of the single mast to increase the stability of the vessel. It should be noted that sloops were originally used to transport cargo between the Antilles as far back as the 1950s. With respect to the open boats and open boats with cabin, only marginal increases were recorded (50.0 to 53.0% and 17.5 to 20.6% respectively).

## Technological Features of the Fleet

Figures 17 and 18 summarise the size distribution of the fleet on both islands in 2001. In Antigua, most vessels were in the class of less than 21ft (49.0%) while in Barbuda the majority of vessels were in the class of 21 to 30ft (64.3%). These two classes accounted for 83.4% of the fleet in Antigua and 97.6% of the fleet in Barbuda.

As mentioned earlier, open boats were the dominant design feature on both islands. In Antigua, open boats accounted for 53.0% of the fleet (Figure 16) while in Barbuda, 95.2% (Figure 19). With respect to the larger classes of vessels (>30ft), the

launch was the dominant design, replacing the traditional sloop with its central mast and high bow. In the 1950s and 60s, these two features aided fishers on their long journey to areas such as Saba Bank and Nevis Bank.

Figures 20 and 21 summarise the composition of the fleet by hull material. Relative to Antigua, Barbuda has the most modernised fleet. The traditional wooden open boats and open boats with cabin have been replaced by modern fibreglass pirogues (Figure 7) imported primarily from Trinidad.

In Antigua, 53.0% of the hulls are constructed of fibreglass while 39.3% are constructed of wood. In recent times, some fishers have modernised the traditional wooden design through the application of a layer of fibre-reinforced plastic to the hull (about 6% of the fleet). If the modernisation process continues along the present trend in Antigua, it is expected that the popularity of wooden vessels will decrease in favour of the fibreglass design. This will also influence the size distribution of the smaller classes of vessels, since most of the vessels imported from Trinidad tend to range from 22 to 29ft. Hence the 21-30ft size class is expected to become the dominant category (as in the case of Barbuda).

Corresponding with the popularity of open boats and open boats with cabin and their size distribution, the two-stroke outboard gasoline engine was the dominant engine type on both islands (67.6% in Antigua and 97.6% in Barbuda). For the larger classes of vessels (>30ft), inboard diesel engines were preferred.

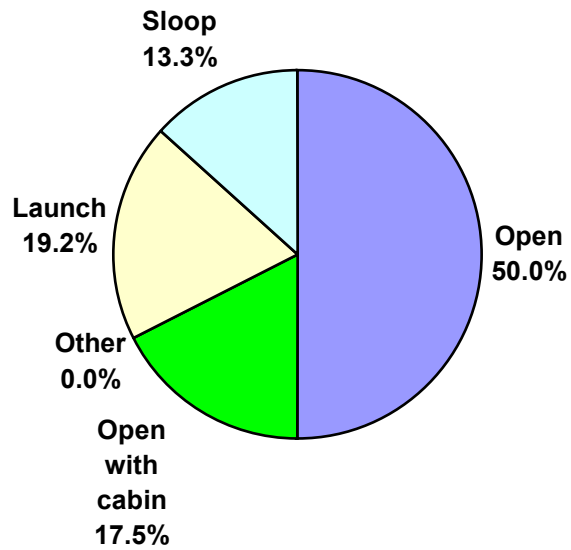


Figure 15. Composition of the active fishing fleet of Antigua in 1992 (N = 286).

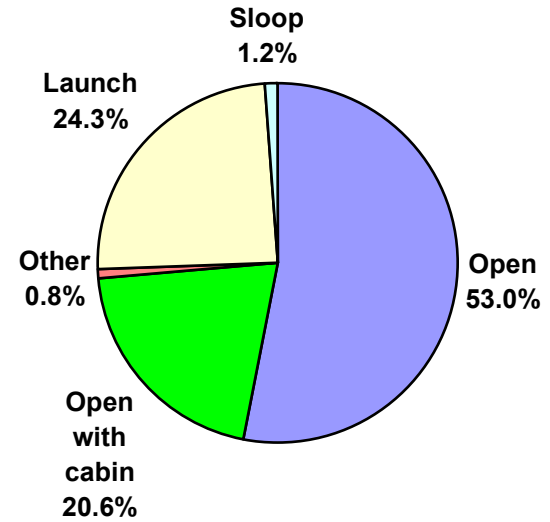


Figure 16. Composition of the active fishing fleet of Antigua in 2001 (N = 247).

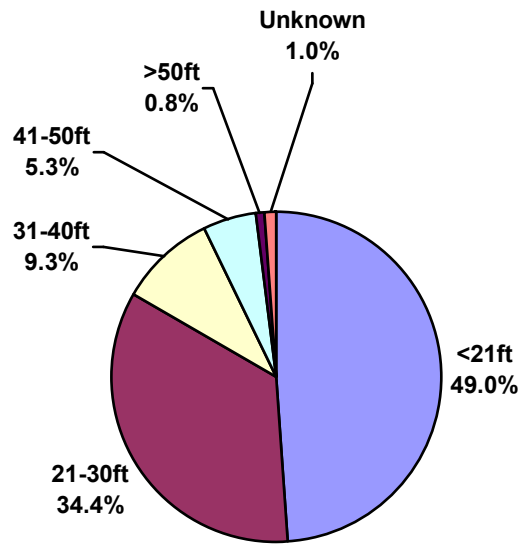


Figure 17. Size distribution of the active fishing fleet in Antigua in 2001 (N = 247).

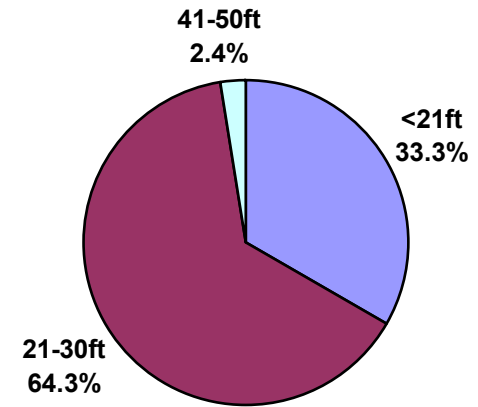


Figure 18. Size distribution of the active fishing fleet in Barbuda in 2001 (N = 42).

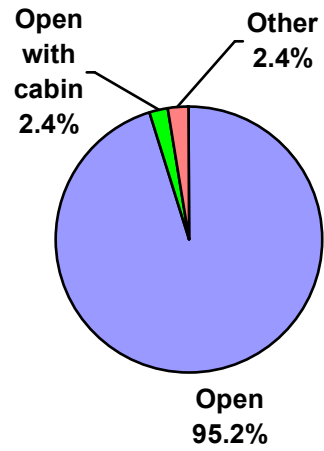


Figure 19. Composition of the active fishing fleet of Barbuda in 2001 (N = 42).

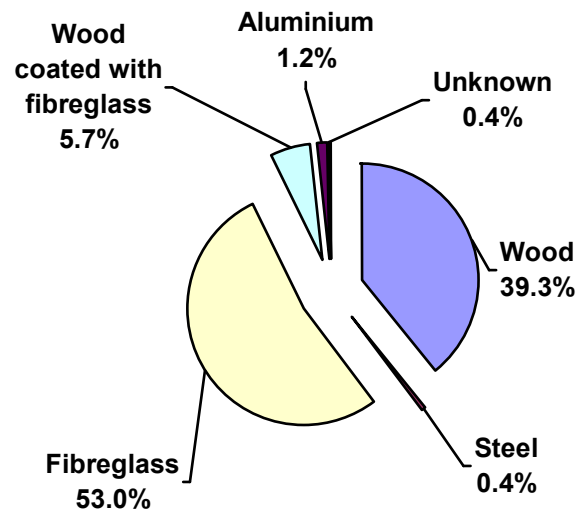


Figure 20. Composition of the active fishing fleet of Antigua by hull material in 2001 (N = 247).

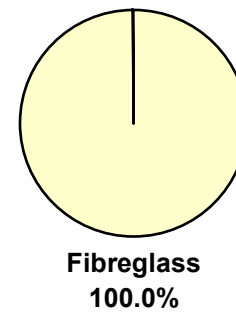


Figure 21. Composition of the active fishing fleet of Barbuda by hull material in 2001 (N = 42).

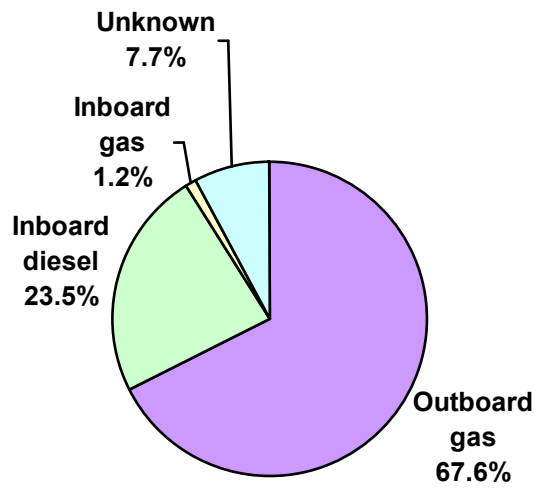


Figure 22. Composition of the active fishing fleet of Antigua by engine type in 2001 (N = 247).

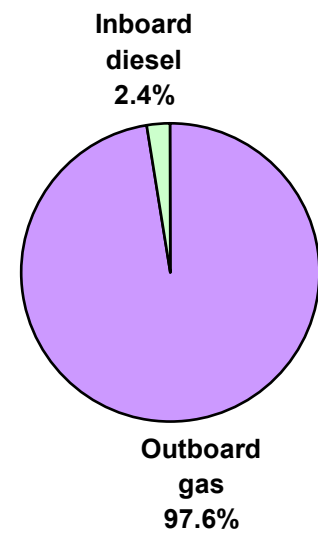


Figure 23. Composition of the active fishing fleet of Barbuda by engine type in 2001 (N = 42).

## Technological Features of Vessel Types

Tables 4 to 9 summarise the technological features of the various vessel types. In general, open boats were less than 30 feet, predominantly of fibreglass construction and powered by two-stroke outboard engines. The mean engine power was about 46 hp. Open boats with cabin were predominantly of wood construction, ranging from 21 to 30 feet and powered by outboard engines with mean engine power of 63 hp. In general, launches and sloops were greater than 30 feet and powered by inboard diesel engines. Mean engine power for the sloops was 160 hp while that for launches was 268 hp.

TABLE 4. Percentage distribution by size class for the various types of vessels actively fishing in Antigua in 2001 (N = Number of vessels).

Size class	Open N=131 (%)	Open/ Cabin N=51 (%)	Launch N=60 (%)	Sloop N=3 (%)	Other N=2 (%)
<21ft	76.3	39.2	1.7	0.0	0.0
21-30ft	22.9	58.8	38.3	0.0	100.0
31-40ft	0.0	0.0	35.0	66.7	0.0
41-50ft	0.0	0.0	21.7	0.0	0.0
>50ft	0.0	0.0	1.7	33.3	0.0
Unknown	0.8	2.0	1.7	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0

TABLE 5. Percentage distribution by size class for the various types of vessels actively fishing in Barbuda in 2001 (N = Number of vessels).

Size class	Open N=40 (%)	Open/ Cabin N=1 (%)	Other N=1 (%)
<21ft	35.0	0.0	0.0
21-30ft	65.0	100.0	0.0
31-40ft	0.0	0.0	0.0
41-50ft	0.0	0.0	100.0
>50ft	0.0	0.0	0.0
Unknown	0.0	2.0	0.0
Total	100.0	100.0	100.0

TABLE 6. Percentage distribution by hull material type for the various types of vessels actively fishing in Antigua in 2001 (N = Number of vessels).

Hull material	Open N=131 (%)	Open/ Cabin N=51 (%)	Launch N=60 (%)	Sloop N=3 (%)	Other N=2 (%)
Wood	38.9	62.7	18.3	100.0	0.0
Fibreglass	52.7	29.4	75.0	0.0	100.0
Wood/Fibreglass	5.3	7.8	5.0	0.0	0.0
Steel	0.0	0.0	1.7	0.0	0.0
Aluminium	2.3	0.0	0.0	0.0	0.0
Unknown	0.8	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0

TABLE 7. Percentage distribution by hull material type for the various types of vessels actively fishing in Barbuda in 2001 (N = Number of vessels).

Hull material	Open N=40 (%)	Open/ Cabin N=1 (%)	Other N=1 (%)
Wood	0.0	0.0	0.0
Fibreglass	100.0	100.0	100.0
Wood/Fibreglass	0.0	0.0	0.0
Steel	0.0	0.0	0.0
Aluminium	0.0	0.0	0.0
Unknown	0.0	0.0	0.0
Total	100.0	100.0	100.0

TABLE 8. Percentage distribution by engine type and mean engine power for the various types of vessels actively fishing in Antigua in 2001.

Engine type	Open N=131 (%)	Open/ Cabin N=51 (%)	Launch N=60 (%)	Sloop N=3 (%)	Other N=2 (%)
Outboard gas	87.8	82.4	15.0	0.0	50.0
Inboard diesel	0.0	13.7	80.0	100.0	0.0
Inboard gas	0.0	2.0	3.3	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0
Unknown	12.2	2.0	1.7	0.0	50.0
Total	100.0	100.0	100.0	100.0	100.0
Mean hp	46.5	63.1	268.3	160.0	450.0

TABLE 9. Percentage distribution by engine type and mean engine power for the various types of vessels actively fishing in Barbuda in 2001.

Engine type	Open N=40 (%)	Open/ Cabin N=1 (%)	Other N=1 (%)
Outboard gas	100.0	100.0	0.0
Inboard diesel	0.0	0.0	100.0
Inboard gas	0.0	0.0	0.0
Other	0.0	0.0	0.0
Unknown	0.0	0.0	0.0
Total	100.0	100.0	100.0
Mean hp	46.1	150.0	?

## Composition of the Fleet by Primary Gear

Figures 24 and 25 summarise the composition of the fishing fleet by primary gear. It should be noted that the sector is a multi-gear fishery with certain seasonal variation in gear use (e.g., trap fishers in Antigua may switch to hand line during the red hind season, which runs from late-November to mid-February). On both islands, traps remain the dominant gear used by fishing vessels, ranging from 51 to 60% of the fleet.

In Barbuda, traps are specially designed to target the caribbean spiny lobster, *Panulirus argus*, the species that supports its principal fishery. The species is also targeted using SCUBA or by free diving in shallow areas. In recent times, SCUBA has become more common and its use is expected to increase past its present level of 20%.

Unlike Barbuda, Antigua has a vibrant reef fishery and to a lesser extent a small pelagic fishery. The former (mainly snappers, groupers, grunts and parrotfish) are targeted primarily by trap, hand line and gill net while the latter (wahoo, dolphinfish, and barracudas) are caught by troll line. In recent times, fishers have used vertical long lines to target the deep-water snappers (about 2%). SCUBA is used to target both the spiny lobster and queen conch in Antigua. Individuals that free dive tended to target reef fish using spear gun, despite the prohibition placed on the gear.

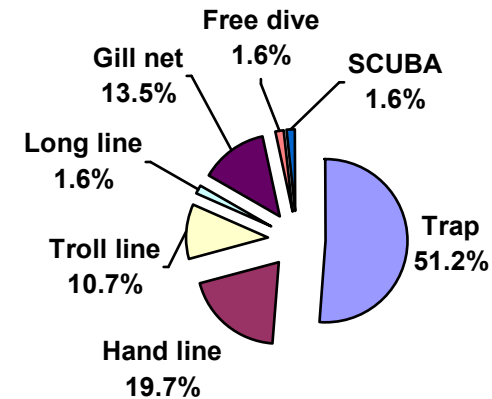


Figure 24. Composition of the active fishing fleet in Antigua by primary gear in 2001 (N=247).

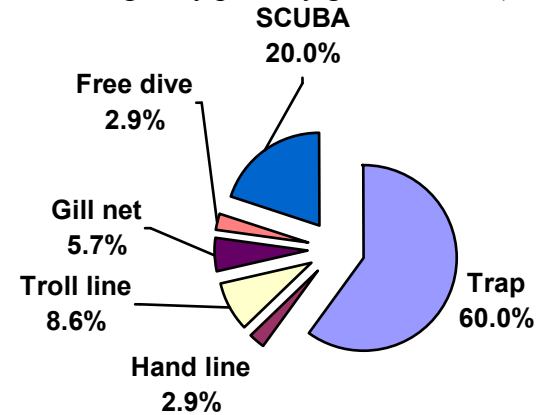


Figure 25. Composition of the active fishing fleet in Barbuda by primary gear in 2001 (N=42).

## **Distribution of Gear by Landing Site**

Figures 26 and 27 summarise the distribution of gear by landing site. In Antigua, traps were the dominant gear at most landing sites. The main exceptions were Falmouth Harbour, Parham, Willikies and Dredge Bay. Catamaran Marina in Falmouth was predominantly a sport-fishing site, hence trolling was the dominant method. For Willikies and Dredge Bay, hand line was the preferred gear. While for Parham, gill net was dominant. In Barbuda, SCUBA was second only to traps in terms of primary gear used, due to the importance of the lobster fishery.

## **Gear Distribution by Vessel Size and Vessel Type**

Tables 10 to 13 summarise the gear distribution by size class and vessel type. In Antigua, gill netting and diving was limited to vessels less than 31 feet, while trapping remained fairly constant and dominant across all size classes. In general, the use of hand line decreased with progressive size class, while troll line use was greatest in the 31 to 40 feet category. For Barbuda, the use of traps and SCUBA remained fairly constant across the various classes.

In terms of vessel types, gill netting and diving was conducted mainly from open boats, while trapping was not limited to any

vessel type. Traps were the dominant gear, particularly aboard traditional sloops.

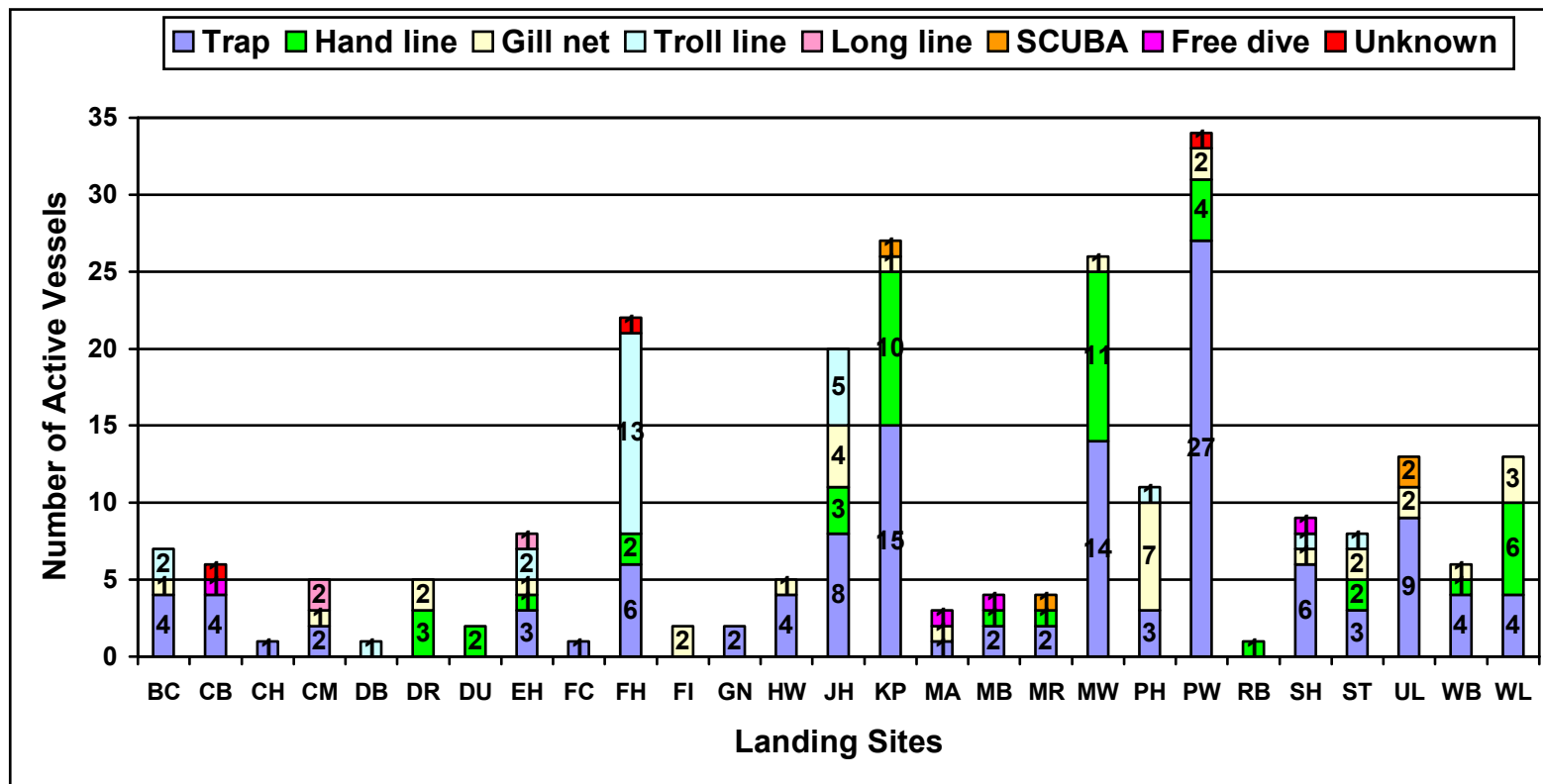


Figure 26. Distribution of active fishing vessels in Antigua in 2001 by primary gear type.<sup>6</sup>

<sup>6</sup> BC=Beach Comber; CB=Carlisle Bay; CH=Crab Hill; CM=Crabbs Marina; DB=Dickenson Bay; DR=Dredge Bay; DU=Dutchman Bay; EH=English Harbour; FC=Fitches Creek; FH=Falmouth Harbour; FI=Five Islands; GN=Gaynors; HW=High St. Wharf; JH=Jolly Harbour; KP=Keeling Pt; MA=Mamora Bay; MB=Morris Bay; MR=Mill Reef; MW=Market Wharf; PH=Parham Harbour; PW=Point Wharf; RB=Royal Bay; SH=Shell Beach; ST=Seatons; UL=Urlings; VC=Valley Church; WB=Willoughby Bay; WL=Willikies.

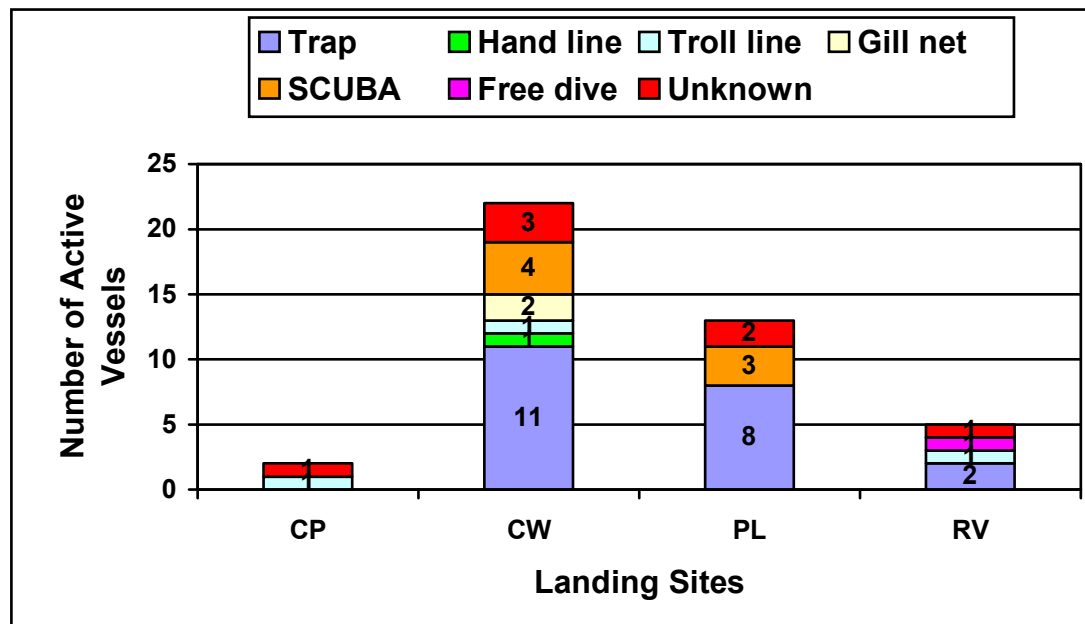


Figure 27. Distribution of active fishing vessels in Barbuda in 2001 by primary gear type.<sup>7</sup>

<sup>7</sup> CP=Coco Point; CW=Codrington Wharf; PL=Pearl Harbour; RV=River.

TABLE 10. Percentage distribution by gear type for the various classes of vessels actively fishing in Antigua in 2001 (n = No. of vessels sampled).

Gear type	<21ft n=122 (%)	21-30ft n=86 (%)	31-40ft n=24 (%)	41-50ft n=11 (%)	>50ft n=1 (%)
Trap	48.4	55.8	50.0	45.5	100.0
Hand line	23.0	20.9	4.2	9.1	0.0
Troll line	1.6	11.7	41.6	36.3	0.0
Long line	0.0	2.3	4.2	9.1	0.0
Gill net	22.1	7.0	0.0	0.0	0.0
Free dive	1.6	2.3	0.0	0.0	0.0
SCUBA	3.3	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0

TABLE 11. Percentage distribution by gear type for the various classes of vessels actively fishing in Barbuda in 2001 (n = No. of vessels sampled).

Gear type	<21ft n=10 (%)	21-30ft n=24 (%)	41-50ft n=1 (%)
Trap	60.0	62.5	0.0
Hand line	0.0	4.2	0.0
Troll line	10.0	4.2	100.0
Gill net	0.0	8.3	0.0
Free dive	10.0	0.0	0.0
SCUBA	20.0	20.8	0.0
Total	100.0	100.0	100.0

TABLE 12. Percentage distribution by gear type for the various types of vessels actively fishing in Antigua in 2001 (n = No. of vessels sampled).

Gear type	Open n=128 (%)	Open/ Cabin n=51 (%)	Launch n=60 (%)	Sloop n=3 (%)	Other n=2 (%)
Trap	45.3	64.7	51.6	100.0	0.0
Hand line	21.1	31.3	6.7	0.0	50.0
Troll line	2.3	2.0	35.0	0.0	50.0
Long line	0.8	0.0	5.0	0.0	0.0
Gill net	24.2	2.0	1.7	0.0	0.0
Free dive	3.2	0.0	0.0	0.0	0.0
SCUBA	3.1	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0

TABLE 13. Percentage distribution by gear type for the various types of vessels actively fishing in Barbuda in 2001 (n = No. of vessels sampled).

Gear type	Open n=33 (%)	Open/ Cabin n=1 (%)	Other n=1 (%)
Trap	60.6	100.0	0.0
Hand line	3.0	0.0	0.0
Troll line	6.1	0.0	100.0
Gill net	6.1	0.0	0.0
Free dive	3.0	0.0	0.0
SCUBA	21.2	0.0	0.0
Total	100.0	100.0	100.0

## Distribution of Active Fishers

Figures 28 and 29 summarise the distribution of active fishers in Antigua and Barbuda in 2001. Estimates of the number of active fishers were based on the mean crew size by vessel size class obtained from the LRS database. Crew size for each vessel size class is summarised in table 14.

In Antigua, it was estimated that a total of 626 individuals were actively fishing. This accounted for 71% of the registered fishers in Antigua (881). For Barbuda, the level of fishing activity was much greater. A total of 104 individuals were estimated as actively fishing. This accounted for 98% of the registered fishers (106 individuals).

TABLE 14. Mean crew size by vessel size class for Antigua and Barbuda (2001).

Vessel size class	Mean crew size (from LRS database)
<21ft	2.4
21-30ft	2.5
31-40ft	3.0
41-50ft	3.1
>50ft	2.3

## Trends in Fishers Distribution

Figure 30 compares the distribution of active fishers in 2001 relative to 1992. In terms of total numbers there was no significant difference between the two years; in 1992 there were 627 individuals, while in 2001 there were 626 individuals. From 1992 to 2001, there was an 18% decrease in the number of fishers operating from landing sites in St. John's city, while the number of fishers operating from sport-fishing sites (Jolly Harbour, Falmouth Harbour, and Shell Beach) increased significantly. For example, Jolly Harbour increased by 271%, Falmouth Harbour by 36% and Shell Beach by 156%. The rural sites, in general, also had a decrease in the level of fishing activity. This suggests that the growth in the sport-fishing sector (both commercial and recreational) is responsible for maintaining the level of fishing activity to 1992 levels.

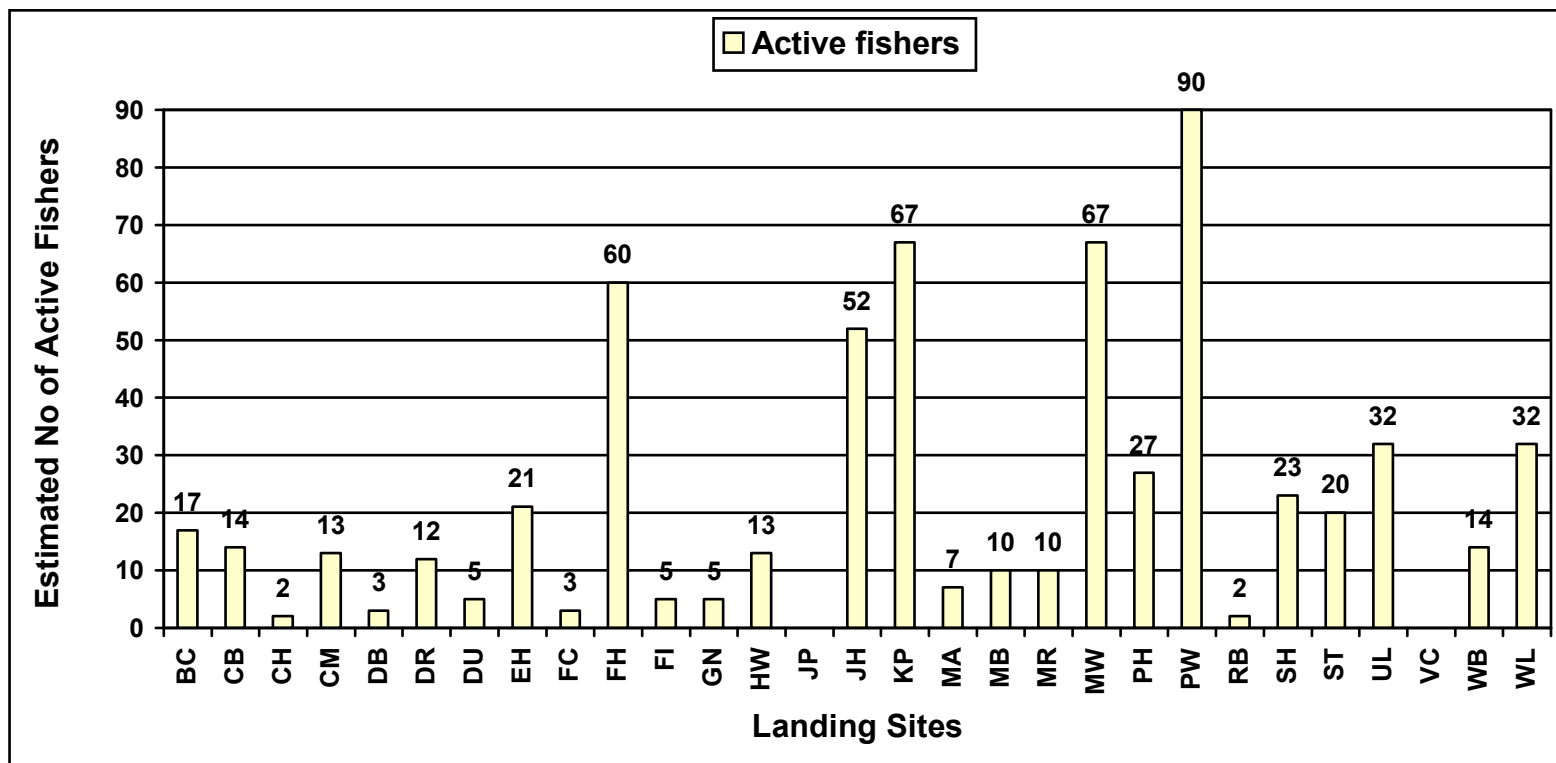


Figure 28. Distribution of active fishers in Antigua in 2001.<sup>8</sup>

<sup>8</sup> BC=Beach Comber; CB=Carlisle Bay; CH=Crab Hill; CM=Crabbs Marina; DB=Dickenson Bay; DR=Dredge Bay; DU=Dutchman Bay; EH=English Harbour; FC=Fitches Creek; FH=Falmouth Harbour; FI=Five Islands; GN=Gaynors; HW=High St. Wharf; JP=Johnson Pt; JH=Jolly Harbour; KP=Keeling Pt; MA=Mamora Bay; MB=Morris Bay; MR=Mill Reef; MW=Market Wharf; PH=Parham Harbour; PW=Point Wharf; RB=Royal Bay; SH=Shell Beach; ST=Seatons; UL=Urlings; VC=Valley Church; WB=Willoughby Bay; WL=Willikies.

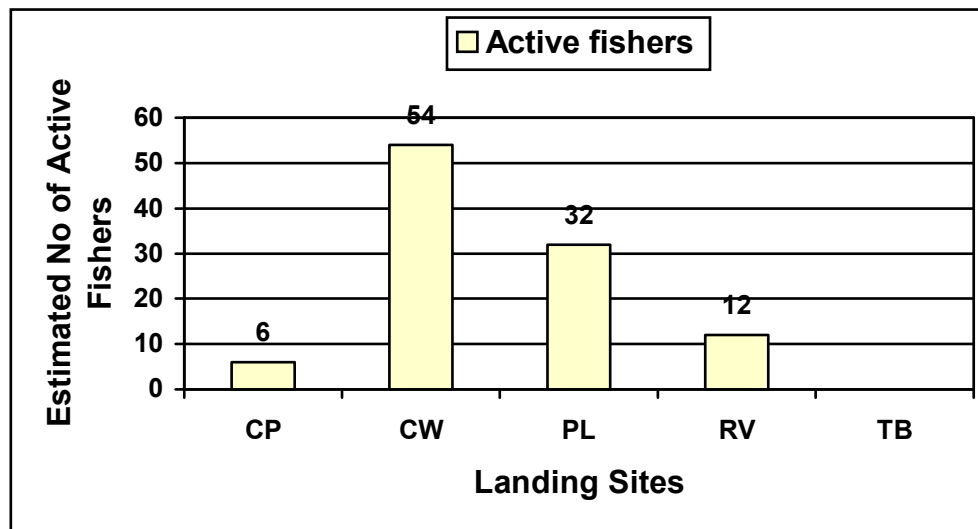


Figure 29. Distribution of active fishers in Barbuda in 2001.<sup>9</sup>

<sup>9</sup> CP=Coco Point; CW=Codrington Wharf; PL=Pearl Harbour; RV=River; TB=Two Foot Bay.

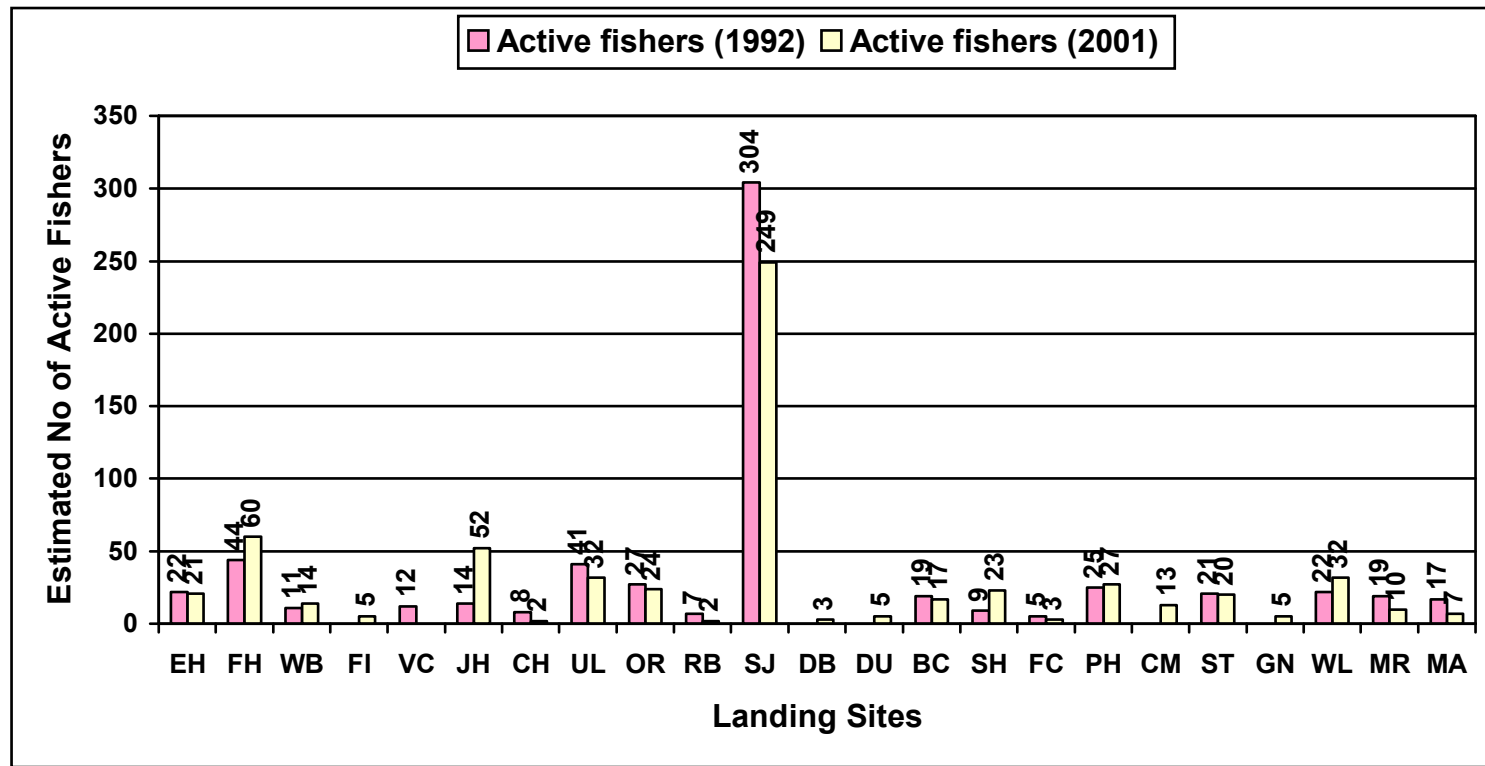


Figure 30. Distribution of active fishers in Antigua in 1992 and 2001.<sup>10</sup>

<sup>10</sup> EH=English Harbour; FH=Falmouth Harbour; WB=Willoughby Bay; FI=Five Island; VC=Valley Church; JH=Jolly Harbour; CH=Crab Hill; UL=Urlings; OR=Old Road (beaches of Carlisle Bay and Morris Bay); RB=Royal Bay; SJ=St. John's (sites of Dredge Bay, High St. Wharf, Keeling Point, Market Wharf and Point Wharf); DB=Dickenson Bay; DU=Dutchman Bay; BC=Beach Comber; SH=Shell Beach; FC=Fitches Creek; PH=Parham Harbour; CM=Crabbs Marina; ST=Seatons; WL=Willikies; GN=Gaynors; MR=Mill Reef; MA=Mamora Bay.

## Level of Non-compliance with respect to Licensing

Section 11(1) of the Fisheries Act of 1983 states, “No local fishing vessel shall be used for fishing or related activities in Antigua and Barbuda waters without a valid license issued under this section in respect of that vessel”. Table 15 summarises the level of non-compliance with respect to licensing of fishing vessels. At the end of 2001, 150 vessels were licensed in Antigua and 17 in Barbuda. This accounted for 60.7% of the active vessels in Antigua and 40.5% for those in Barbuda (non-compliance rates of 39.3% and 59.5% respectively). In terms of estimated loss revenue, this was equated to EC\$9,250 for Antigua and EC\$2,370 for Barbuda. The loss revenue accounted for 30% of the revenue that could have been collected for Antigua and 55% of the forecasted revenue for Barbuda.

With respect to vessel markings, 17.4% of the active vessels in Antigua were unmarked. For Barbuda, the level was more than twice that of Antigua (38.1%). While the bearing of identification marks is one of the general conditions for local licensing of fishing vessels (Section 15(b) of the Fisheries Regulations of 1990), the present regulations do not address vessels that are not licensed. Hence, there is no requirement for fishing vessels to bear the identification marks at all times. Possibly the regulations need to be upgraded to link the condition of bearing identification marks to the precursor of the licensing process, that is, the registration or recording of vessels entering the fisheries. It should be noted that the

Fisheries Act does not speak to the recording or registering of local fishing vessels. By linking the bearing of identification marks to the recording or registration process, fishing vessels could be required to be properly identified at all times. This would assist enforcement and enable better tracking of vessel activity.

TABLE 15. Level of non-compliance for 2001 with respect to licensing of fishing vessels in Antigua and Barbuda.

	ANTIGUA	BARBUDA
No. of registered vessels	555	72
Estimated active vessels	247	42
No. of vessels licensed	150	17
No. of unmarked active vessels	43	16
Rate of non-compliance (licensing)	39.3%	59.5%
Percentage of active vessels unmarked	17.4%	38.1%
Forecasted revenue estimated from licensing of all active vessels plus communication tax where applicable	EC\$31,115	EC\$4,345
License and communication tax collected (EC\$5 per foot plus EC\$25 where applicable)	EC\$21,865	EC\$1,975
Estimated loss revenue	EC\$9,250	EC\$2,370

## CONCLUSION

Coming out of this frame survey a number of key issues were raised concerning the management of the fisheries.

These included the need for more timely and in-depth frame surveys to properly monitor the changes in the fisheries. This is best highlighted by the disparity between the total number of registered vessels (627), the total number of licensed vessels (167), and the total number of active fishing vessels (289). As a guide, an in-depth frame survey should be conducted at least every five years. Because of the impact tourism and construction can have on the level of activity in the fisheries sector, a count of the number of active vessels should be conducted each year. This would ensure a more accurate “raising factor” for estimating annual production. Presently, the number of licensed vessels is not a “good indicator” of the level of fishing activity.

In order to properly monitor the long-term impact of storms on the level of fishing activity, recovery or follow-up surveys need to be an integral part of the damage assessment programme. This should at a minimum include the monitoring of damaged vessels.

Another issue that was raised was the level of non-compliance with respect to licensing. In Antigua, 39% of the active vessels were not licensed while in Barbuda the level was much higher (59%). If these figures are an indication of fishers attitude towards “responsible fishing”, then one has to wonder about the level of compliance with respect to other management

measures, such as, close seasons, size and gear restrictions. This also raises the issue of the effectiveness of enforcement and management strategies. Possibly, the time has come for us to move away from the traditional “top-down approach” towards fisheries management and move towards a more “participatory approach” where stakeholders are more actively involved in “co managing” the sector. To achieve this, the necessary legislations need to be upgraded to allow for greater participation of stakeholders in decision-making and management process. This is paramount given the limitations of the Fisheries Division with respect manpower, technical support and financing.

## ANNEX

### List of Surveyors

#### Fisheries Division: Antigua

Mr. Steve Archibald

Mr. George Looby

Mr. Hilroy Simon

Ms. Verlyn George

Mr. Ian Horsford

#### Fisheries Division: Barbuda

Mr. Alexander DeSuza

Mr. Orlando Morris

Mr. John Webber

