

HOW MUCH DO COMMERCIAL AND RECREATIONAL FISHERMEN KNOW
ABOUT MARINE DEBRIS AND ENTANGLEMENT? PHASE 1

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ABSTRACT

Education is assumed to be a cost-effective method to encourage shoreside disposal of plastics and other garbage. To test this assumption, a demonstration project is under way at four sites to develop, test, and evaluate marine debris education as a technique for changing the waste management practices of commercial fishermen and recreational boaters. The project is structured in three phases: 1) a baseline survey of commercial fishermen and recreational boaters on their garbage disposal practices and perceptions of the problems of marine debris and entanglement; 2) a targeted marine debris education program for the survey groups at three of the four sites; and 3) a survey of the same groups used in phase 1 on their garbage disposal practices and perceptions of the problems of marine debris after the education program. The project sites are: Bayou La Batre, Alabama; Martin County, Florida; Hampton, Virginia; and Taylor County, Florida. Phase 1 of the project was completed in the spring of 1989. Commercial fishermen and recreational boaters at the four sites were asked questions in six areas: 1) current garbage disposal practices, 2) experiences with plastic marine debris, 3) opinion on the problems caused by plastic marine debris, 4) knowledge of laws on at-sea garbage disposal, 5) opinion on ways to encourage shoreside disposal of plastic garbage, and 6) background information. Results of the phase 1 survey revealed the garbage disposal practices of those surveyed as well as their opinions on and experiences with plastic marine debris.

INTRODUCTION

Annex V of the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73/78) went into effect 31 December 1988. The MARPOL Annex V, formally entitled "Regulations for the Prevention of Pollution by Garbage from Ships," prohibits at-sea dumping of plastics and specifies the distance from shore that all other materials may be dumped. This means overboard disposal of most garbage is no longer an option.

Enforcement of MARPOL Annex V will be difficult because of competing priorities and limited resources of the Federal enforcement agencies. The success of MARPOL Annex V will depend in part on voluntary compliance.

Education is expected to be a key factor in gaining voluntary compliance with MARPOL Annex V. Education is also assumed to be a cost-effective way of encouraging shoreside disposal of plastics and other debris. To test this assumption, a demonstration project is under way to develop, test, and evaluate a marine debris education project for commercial fishermen and recreational boaters. The project is sponsored by a Saltonsall-Kennedy grant from the U.S. National Marine Fisheries Service. This paper outlines the overall structure of the project. Results of a survey of commercial fishermen and recreational boaters at four sites taken before a targeted marine debris education program are also presented.

METHODOLOGY

The project is structured in three phases: 1) a baseline survey of commercial fishermen and recreational boaters on their garbage disposal practices and perceptions of the problems of marine debris and entanglement; 2) a targeted marine debris education program for the survey groups at three of the four sites; and 3) a survey of the same groups used in phase 1 on their garbage disposal practices and perceptions of the problems of marine debris after the education program (Fig. 1). Phase 1, the initial survey, was conducted in the spring of 1989. Phase 2, the marine debris education program, will be conducted from the spring through the summer of 1989. The second and final survey, Phase 3 of the project, will be conducted in the fall of 1989.

The project is being conducted using four sites: Bayou La Batre, Alabama; Martin County, Florida; Hampton, Virginia; and Taylor County, Florida. Taylor County will serve as the control site. Commercial fishermen and recreational boaters in Taylor County will receive no marine debris education as part of this project, but will be surveyed twice. This approach was taken because some of the education activities cannot be restricted to the survey sample.

These sites were selected after consultation with state natural resource agencies. Other factors considered in the selection process included distance from other known marine debris education projects, prior involvement of the state with the marine debris issue, the ability of the state to provide comprehensive lists of commercial fishermen and recreational boaters, the number of commercial fishermen and recreational boaters, and the opportunity to coordinate marine debris education activities with local events or projects. In Martin County, for example, marine debris education activities will be tied to a fishing tournament.

The survey groups were selected from mailing lists of recreational boat registrations and commercial fishing licenses maintained by state agencies. The goal was to obtain 100 completed surveys at each site for both commercial fishermen and recreational boaters. For each site, an initial sample of 300 individuals with registered motorboats used for pleasure was selected

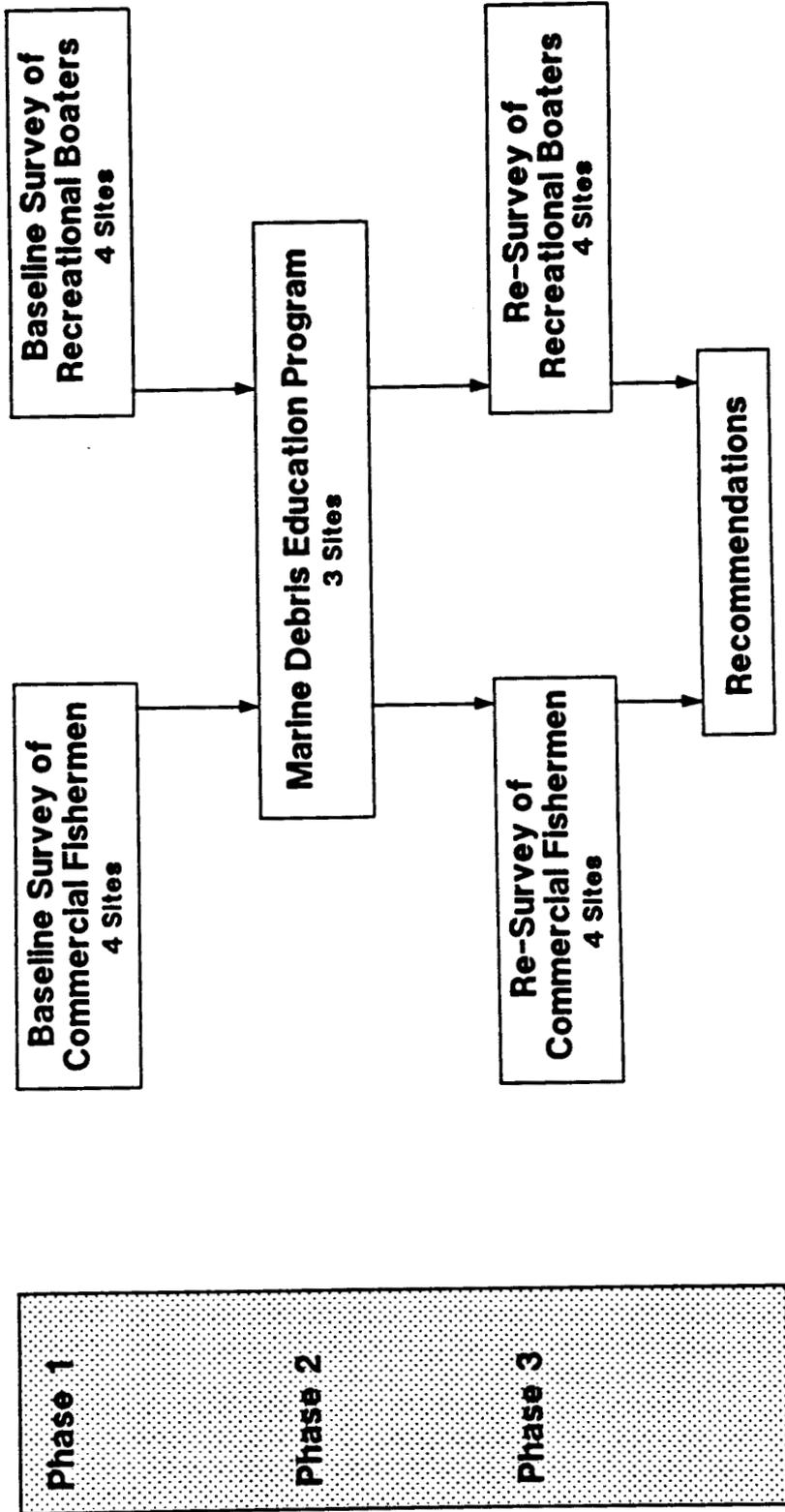


Figure 1.--Overview of project methodology.

using a systematic sampling technique. Surveys returned because of incorrect addresses were replaced with new names drawn using the same sampling technique. An additional sample of up to 150 names was drawn after initial survey returns indicated that fewer than 100 completed surveys would be received. All individuals on the commercial fishing license lists at each site were included in the survey. The number of commercial fishing licenses at the four sites ranged from about 200 to 330. Over 400 surveys were completed and returned--161 (16% of the potential respondents) from commercial fishermen and 257 (20% of the potential respondents) from recreational boaters. The number of completed commercial fishermen surveys ranged from 8% from Bayou La Batre to 21% from Martin County. For recreational boaters, the range was from 7% from Bayou La Batre to 27% from Hampton. None of the sites reached the goal of 100 completed survey forms, although 97 recreational boater surveys from Hampton were completed and returned. The description of the survey responses which follows represents the answers of those responding to the survey only and should not be generalized to a larger population. Unless otherwise noted, the following description of the responses combines the responses from all four sites.

DESCRIPTION OF RESPONDENTS

Commercial Fishermen

About one-quarter of the commercial fishermen responding to the survey were between 30 and 39 years of age. Another quarter of the respondents were 60 years or older. The percentage of income from commercial fishing in 1988 ranged from 0 to 100%, with the average being about 41%. The types of gears used in 1988 in order of percentage of use were as follows: rod and reel (42%), gillnet (38%), traps and pots (26%), tongs (24%), trawl (12%), dredge (4%), and longline (4%). Rod and reel were used at all sites, but most often in Martin County and Taylor County. Gillnets were also used at all sites, but most often in Hampton and Taylor Counties. Surf fishermen and spear fishermen were represented among the respondents from Martin County. Most of the commercial fishermen responding to the survey typically make day trips. However, one or more of the respondents at each of the four sites make longer trips. Some of the trips last up to 14 days at a time. About 28% of the respondents are members of a commercial fishermen's association. Only about 13% of them had participated in an organized beach cleanup in the past 3 years.

Recreational Boaters

The age distribution among the recreational boaters responding to the survey was evenly divided among three groups: 40 to 49 years, 50 to 59 years, and 60 and older. About one-quarter of the respondents fell into each group. About 40% of the respondents fish on every boat trip they make. Only 5% of the respondents never fish from their boats. About 8% of the respondents are members of fishing clubs, and about 11% had participated in an organized beach cleanup within the past 3 years.

CURRENT GARBAGE DISPOSAL PRACTICES

Commercial Fishermen

About 95% of the respondents have one or more trash receptacles on their vessels. The most prevalent types are buckets (52%) and plastic garbage bags (36%). Other receptacles used include trash cans, paper bags, and fish boxes. Only two respondents (1.3%) have compactors and one (0.6%) has an incinerator on board. Over half of the respondents said they consider what plastic items are taken on board which will need to be thrown away. Over 80% of the respondents said they have picked up plastic trash from the ocean, bay, or sound and returned it to shore for disposal. Plastic trash is generally disposed of at home (50%), at the dock or marina (27%), or at the fishhouse (20%). Fewer than 3% of the respondents admitted to disposing of plastic trash in the ocean, bay, or sound. Unwanted gear is generally disposed of at home (54%), at the dock or marina (23%), and at the fishhouse (10%). Fewer than 2% of the respondents admitted to disposing of their fishing gear in the ocean, bay, or sound. Unwanted gear is also left at city and county garbage dumps and landfills, or in dumpsters away from a dock or marina.

Recreational Boaters

Like the commercial fishermen, most recreational boaters responding to the survey have one or more trash receptacles on board their boats. The most common trash receptacles among the respondents are plastic garbage bags (51%) and buckets (43%). Among the other types of receptacles used for trash are coolers and dry and live wells. Over 56% of the respondents said they consider what plastic items will need to be thrown away when deciding what to take on board. About 75% of the respondents have picked up plastic trash from the ocean, bay, or sound and returned it to shore for disposal. Plastic trash from day trips is generally disposed of at home (73%) or at the dock or marina (23%). Fewer than 1% of the respondents said they throw plastics into the ocean, bay, or sound. On overnight trips or longer trips, the respondents generally dispose of their plastic trash at the dock or marina (56%) or at home (38%).

EXPERIENCE WITH PLASTIC MARINE DEBRIS

Commercial Fishermen

The respondents were asked first to identify which of six problems caused by plastic marine debris they had seen or experienced. They were then asked to identify the one they considered to be the most important among the six. Figure 2 summarizes the experience of the respondents with plastic marine debris. More than 95% of the commercial fishermen said they have seen plastic trash floating in the ocean, bay, or sound. This was also identified by the commercial fishermen as the most important problem among the six. About 75% of the respondents said they have seen plastic trash floating near the dock. Many of the respondents have had personal experience with plastic marine debris. Over 45% have had their vessel's propeller caught in plastic. Over 30% have had their gear caught or fouled by

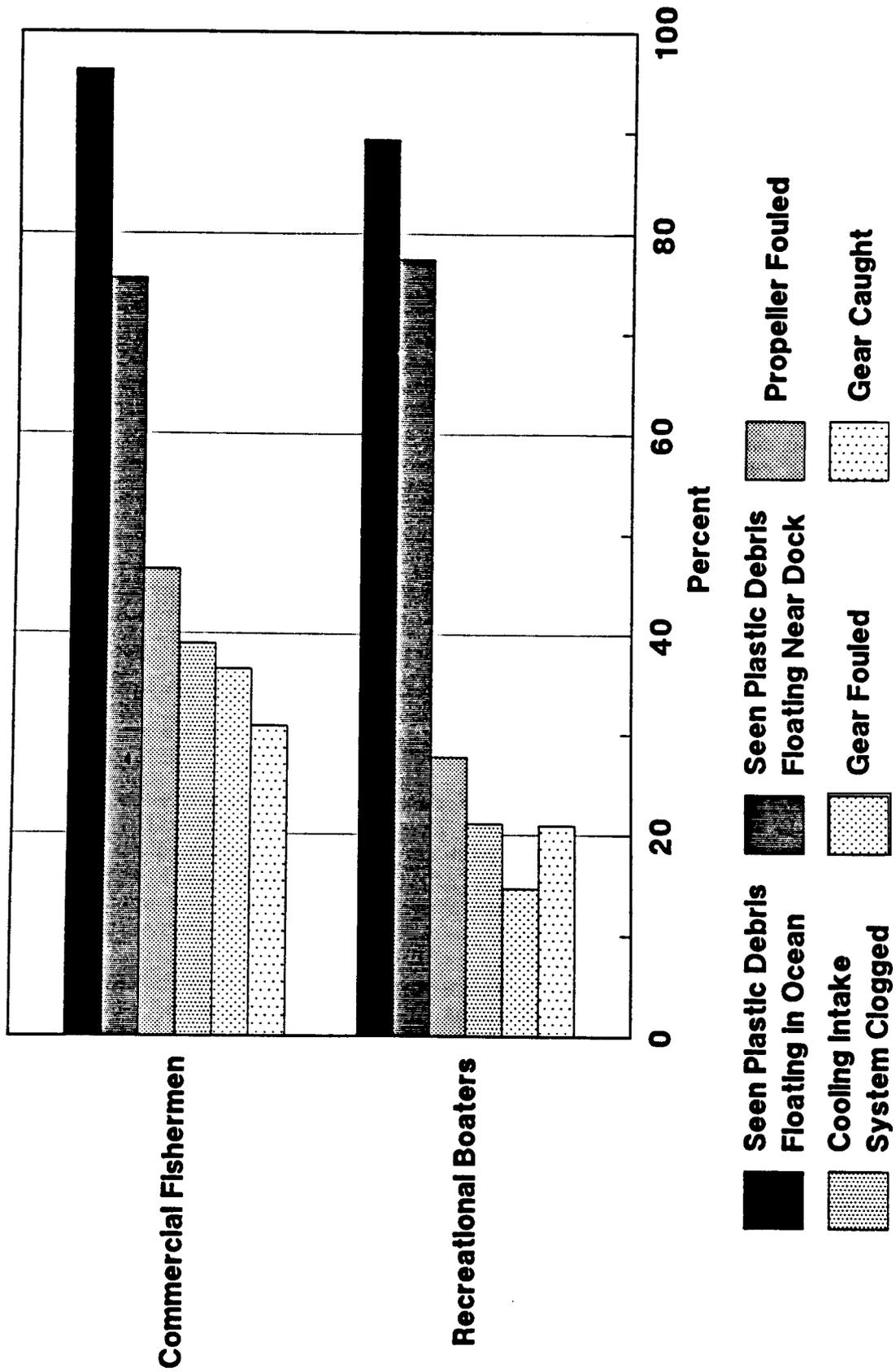


Figure 2. -- Experience with plastic marine debris (based on percent of responses to the question).

plastic debris. Almost 40% have had their boat's cooling intake systems clogged by plastic debris.

About 94% of the respondents said they think plastic trash in the ocean, bay, or sound can kill marine animals, create safety hazards for mariners, and wash ashore as beach litter. Personal experience was cited most frequently as the basis for their opinion.

Recreational Boaters

Figure 2 also summarizes the experience of the recreational boaters with plastic marine debris. About 90% of the respondents said they have seen plastic trash floating in the ocean, bay, or sound. This was also cited most frequently as the most important problem. The recreational boaters responding to the survey have also had personal experience with plastic marine debris, but not to the extent of the commercial fishermen. About 28% of the respondents have had their boat's propeller caught in plastic debris. Between 15 and 20% have had their gear caught or fouled by plastic debris. About 21% of the respondents said that their boat's cooling intake systems have been clogged by plastic marine debris.

Almost all of the respondents (97%) said they think that plastic trash in the ocean, bay, or sound can kill marine animals, create safety hazards for mariners, and wash ashore as beach litter. Like the commercial fishermen, personal experience was cited most frequently as the basis of the respondents' opinion.

KNOWLEDGE OF LAWS ON AT-SEA GARBAGE DISPOSAL

Commercial Fishermen

Just over half (51%) of the commercial fishermen said they know there is a Federal law which prohibits disposal of plastics from vessels and restricts the other types of garbage that may be dumped into the ocean, bays, or sounds. The remainder of the respondents were evenly split between those who were unsure and those who did not know about such a law. Word of mouth was cited most frequently as the source of information on this law, followed by magazine articles, television, and newspapers. Among the sources of information on the law specified by the respondents were training by offshore oil and gas companies for their workers and tickets received from the U.S. Coast Guard or marine patrol. Only 5% of the respondents said they have heard of MARPOL Annex V.

Recreational Boaters

Thirty-eight percent of the respondents said they know there is a Federal law which prohibits disposal of plastic trash from boats and limits the dumping of other types of garbage into the ocean, bays, and sounds. About 33% of the respondents were unsure whether there is such a law, and 30% did not know about the law. Like the commercial fishermen, word of mouth was cited most frequently as the source of the respondents' information. This was followed by television, newspapers, and magazine articles.

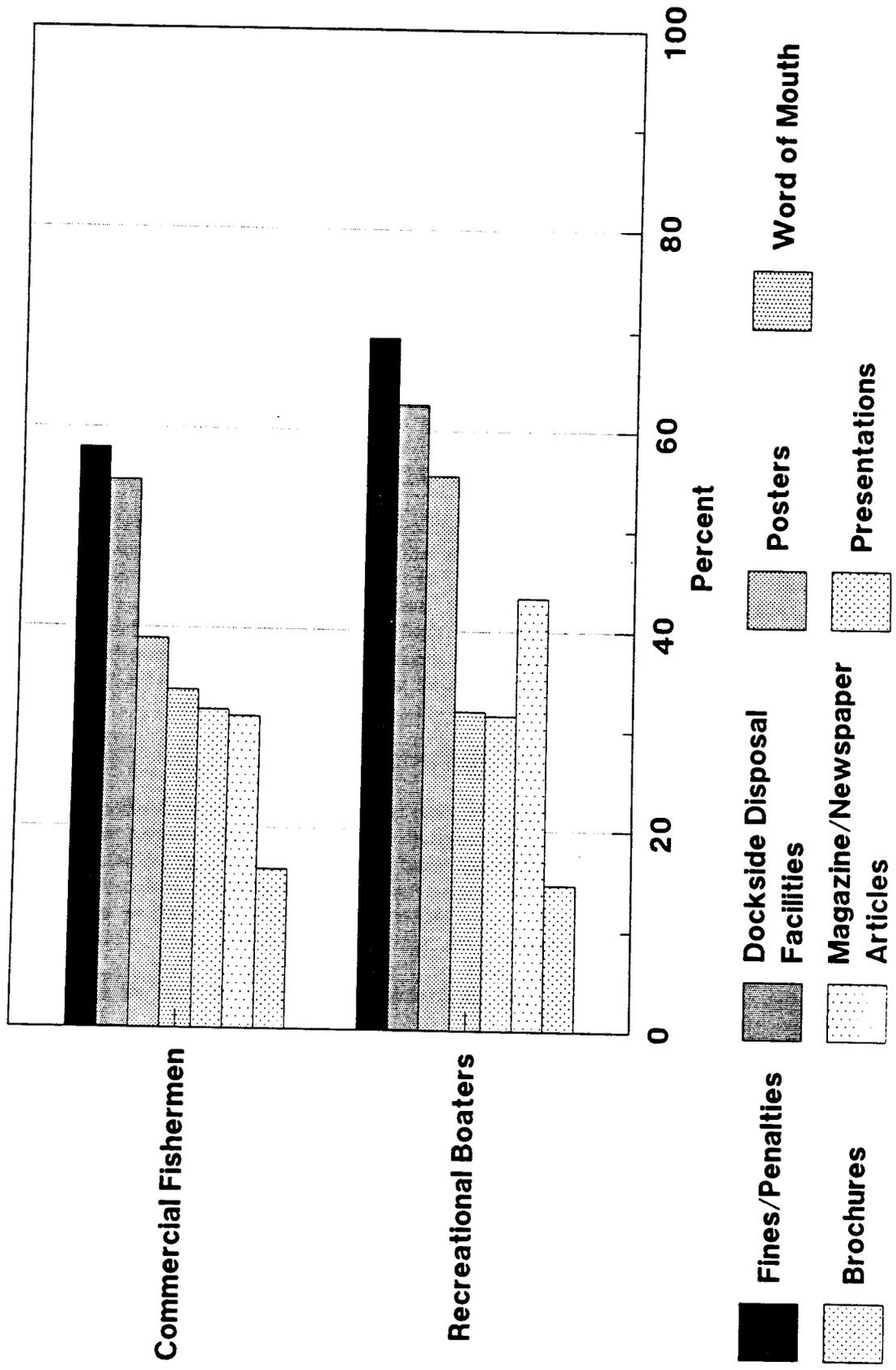


Figure 3.--Best ways to encourage shoreside disposal (based on percent of responses to the question).

The Coast Guard, marine patrol, and training by offshore oil and gas companies were also cited as sources of information on this law. Only 3% of the respondents said they have heard of MARPOL Annex V.

OPINION ON THE BEST WAYS TO ENCOURAGE SHORESIDE DISPOSAL OF PLASTIC TRASH

Commercial Fishermen

Commercial fishermen were asked which of seven techniques are the best ways to encourage commercial fishermen to return their plastic trash to shore for disposal. A summary of their responses is shown in Figure 3. Dockside disposal facilities and fines were the most frequent responses. There was some support for each of the techniques. Among the suggestions from the respondents were reminders on the marine radio channel, incorporation of information on proper garbage disposal into the licensing procedure, and use of advertisements and stickers.

Recreational Boaters

Figure 3 summarizes the responses of recreational boaters on which of seven techniques are the best ways to encourage recreational boaters to return their plastic trash to shore for disposal. Like the commercial fishermen, there was some support for each of the techniques, but dockside disposal facilities and fines were cited most often. The recreational boaters also suggested the following techniques: television advertisements and programs, educational material sent with license renewals, information broadcast on the marine weather channel, and peer pressure.

RESULTS

The results of this survey provide a baseline of knowledge on the garbage disposal practices of commercial fishermen and recreational boaters at four sites, and on their opinions and experiences with plastic marine debris. The results indicate that the problem of marine debris is not new to those responding to the survey. Further, the results show there are responsible commercial fishermen and recreational boaters. From the many comments written in the margins and on the backs of the survey form, it is also evident that many of the respondents think the source of marine debris is a group other than their own.