Survey of Redfish Bay and Nine-Mile Hole Anglers to Assess Attitudes and Opinions Towards Boating Restrictions Intended to Conserve Seagrass Beds

by
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and
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Management Data Series
No. 252
2008

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ABSTRACT

Voluntary and mandatory boating restrictions for Redfish Bay and Nine-Mile Hole were enacted by Texas Parks & Wildlife Commission in 2000. Users of these areas intercepted at creel surveys were sent follow-up questionnaires to assess their attitudes and opinions towards these voluntary and mandatory boating restrictions. A total of 254 questionnaires were sent out and 196 returned for an effective response rate of 77%. Most (97%) reported seeing bottom scarring of seagrass. Almost two-thirds (65%) supported the voluntary prop-up zones in the Redfish Bay area. Slightly less than half (45%) supported the mandatory no-run zone for the Nine-Mile Hole area. When determining management approaches to seagrass protection, anglers gave the highest priority to "increase education efforts and monitor situation." The majority of anglers agreed that "boating through shallow bays, estuaries or grass flats has a significant negative impact on these environments" (56%) in addition, 52% agreed that "boating through shallow bays, estuaries, or grass flats should be restricted in some way." More anglers disagreed (46%) that "TPWD should temporarily close certain bays, estuaries or grass flats when they may be susceptible to damage" than agreed (37%). A large percentage of anglers (44%) felt that "most boaters they saw were in compliance with the "prop-up" or "no-run zone" regulations in effect for the area. The large majority of anglers strongly agreed with the following statements: "Seagrass coverage in bays is important" (66%), "seagrasses are important to water quality" (61%), and "seagrasses provide important nursery areas" (70%). Additional, information regarding characteristics, participation, preferences, and other variables pertaining to anglers was collected.

INTRODUCTION

Seagrass beds provide vital habitat for recreationally and commercially important fish and shellfish in the bays and estuaries along the Texas coast. Their rhizomes help stabilize sediments while their leaves provide a substrate for epiphytic algae that provides food for marine life. Light requirements restrict seagrass growth to shallow areas, which subjects them to damage by boat propellers as boaters cross these shallow flats. The seagrass beds in Redfish Bay and Nine-Mile Hole (Figure 1) are two areas that undergo extensive propeller scarring.

The Redfish Bay area is bordered by Rockport, Aransas Pass, Port Ingleside, and Port Aransas, and contains an estimated 14,000 acres of seagrass (Pulich et al. 1997) (Figure 1). Redfish Bay is the northernmost area in Texas where all five species of seagrass can be found.

Nine-Mile Hole is located in the Laguna Madre, one of the longest hypersaline lagoons in the world (>190 km) (Morton et al. 2001). The area contains mostly shoal grass (Halodule beaudettei).

Concern over damage from propeller scarring in the Redfish Bay and Nine-Mile Hole areas lead to the establishment of boating restrictions enacted by Texas Parks and Wildlife Commission in October of 2000. Three voluntary "prop-up" zones were established in Redfish Bay and a mandatory "no-run" zone was established in Nine-Mile Hole.

A survey was conducted to assess angler's attitudes and opinions towards these new boating regulations. This information would provide guidance to the Texas Parks and Wildlife Department (TPWD) in its future seagrass management efforts.

The objectives of this research were to 1) establish rates of participation and species preferences for Redfish Bay and Nine-Mile Hole anglers, 2) gauge angler support for, and preference of, various management options to conserve seagrass beds, and 3) determine angler attitudes towards seagrass habitat.

MATERIALS AND METHODS

Sample Frame

From November 2000 through June 2001, names and addresses of 254 anglers were obtained from an ongoing creel survey (Green and Campbell 2005). Creel surveys were conducted on randomly selected days, stratified by day type (weekday/weekend) and season (high use 15 May - 20 November, low use 21 November - 14 May). Boat access sites are selected at random but selection is weighted according to mean trailer counts obtained from roving counts from the three previous years.

All anglers intercepted at boat ramps near Redfish Bay and Nine-Mile Hole were shown maps of the study area and asked if they fished there. In addition, they were given background information and a description of the survey process (Appendix A) Individuals that indicated they had fished in the study area were asked to provide their names, addresses and phone numbers for a follow-up mail survey. A follow-up questionnaire was the preferred approach for this project as it provided a more comprehensive interview than could be completed through on-site interviews.

Survey Instrument and Methodology

A seven-page mail questionnaire was developed to collect information on anglers' attitudes and opinions towards boating restrictions to conserve seagrass beds (Appendix A). Other information collected includes angler fishing and boating practices, and other issues pertinent to fishery management in Texas.

Mail survey procedures recommended by Salant and Dillman (1994) were used. Specifically, individuals received a letter briefly describing the project and its purpose (Appendix A). A week later, another letter and the questionnaire were mailed (Appendix A). A post card reminder was mailed one week later (Appendix A). A final mailing to individuals that had not responded to the earlier mailings was done three weeks after the initial mailing of the questionnaire.

Between March and August of 2001, 254 questionnaires were distributed to Redfish Bay and Nine-Mile Hole anglers. Following the methods described above, 196 anglers responded (77%).

As only 38 respondents indicated they fished Nine-Mile Hole in the last year, and only 4 respondents exclusively fished Nine-Mile Hole, sample sizes were insufficient to compare results between Redfish Bay and Nine-Mile Hole anglers.

RESULTS

Angler Characteristics

Redfish Bay and Nine-Mile Hole anglers were predominantly non-Hispanic white (95%) and predominantly male (96%). Average age was 52 years. Only 5% of all anglers were of Spanish/Hispanic or Latino heritage. Approximately one-third (35%) of anglers were members of a fishing club or organization with a majority belonging to the Coastal Conservation Association

Most anglers (74%) made use of newspaper columns and articles to obtain saltwater fishing information. Approximately one-third of anglers utilized the Texas Parks & Wildlife Magazine (39%) and the TPWD website (31%) for information. Fewer

anglers used TPWD offices/personnel (23%) and radio shows (115) to get fishing information.

Angler Participation

Redfish Bay and Nine-Mile Hole anglers averaged 60 days fishing in Texas during the previous year, with the majority of those days (47) fishing in saltwater bays from a motorized boat (Figure 2). Anglers spent an average of 34 days fishing in Redfish Bay and 11 days fishing in the voluntary "prop-up" zones. Anglers spent fewer days (4) fishing in Nine-Mile Hole and the mandatory "no-run" zone.

Of the Redfish Bay and Nine-Mile Hole anglers who indicated they fished in saltwater bays in Texas, the most (62%) fished most often in Aransas Bay, followed by Corpus Christi Bay (22%). Fewer anglers indicated the upper Laguna Madre (8%), lower Laguna Madre (4%), San Antonio Bay (2%), and Galveston Bay (2%). No anglers indicated fishing in Sabine Lake or Matagorda Bay.

Approximately one-third of anglers had fished with a saltwater fishing guide within the past two years. These users spent an average of 3 days with a guide primarily targeting red drum (Sciaenops ocellatus) and spotted seatrout (Cynoscion nebulosus). The majority (70%) used live bait during this trip, primarily Atlantic croaker (Micropogonias undulatus) and shrimp. Only 18% caught what they considered to be a trophy fish on their trip.

Angler Satisfaction

Most anglers (86%) were moderately to extremely satisfied with saltwater fishing in Texas (Figure 3). Only 14% were not at all or only slightly satisfied.

Angler Preferences

The most preferred species among Redfish Bay and Nine-Mile Hole anglers was red drum with over 64% indicating red drum as their first choice and 32% as their second choice (Table 1). The second most preferred species was the drum family (includes those respondents who did not list a specific species of drum) listed by 18% as their first choice and by 33% as their second choice. Spotted seatrout was the third most sought after species with 16% indicating it as their first choice and 17% as their second choice.

When asked what length was considered a trophy fish for their most preferred species, red drum anglers indicated a mean length of 32 inches. Respondents who cited spotted seatrout as their preferred choice indicated a mean length of 28 inches.

Anglers were asked to indicate their level of support for a variety of seagrass conservation measures (Figure 4). Two of the six management options were favored by more than half of all anglers: 65% supported "the voluntary 'prop-up' zones in the Redfish Bay area" and 55% supported "designating other areas along the coast as voluntary 'prop-up' zones. Only 45% supported the "mandatory 'no-run' zone for the Nine-Mile Hole area in the Laguna Madre." The least supported management scenario was "designating other areas along the coast as kayak or paddle trails" (31%). No one management scenario was opposed by a majority of anglers.

The questionnaire noted several options the TPWD could implement to protect seagrass habitat. Anglers were provided with a hypothetical situation in which resource managers determined that bottom scarring/prop scarring was a problem where they fished most often. Anglers were then asked to evaluate a set of management options that could be implemented to protect seagrasses in shallow water habitats and rank them from highest (1) to lowest (5) based on their preferences (Figure 5). The highest ranking was given to "increase education efforts and monitor situation" (75% ranked 1 or 2). This was the only option in which more than 50% of all anglers gave a ranking of 1 or 2. The second most preferred option was to "increase law enforcement and issue citation", with 46% of anglers ranking this as a 1 or 2. The least preferred management option was to "close entire area for a year or two as necessary" with only 11% ranking this as a 1 or 2.

Angler Feedback

Anglers were prompted to recall their fishing trip on the day they were interviewed by TPWD staff at the boat ramp. They were then asked to respond to a series of questions that would describe their feelings about that particular fishing trip to Redfish Bay or the Nine-Mile Hole area (Figures 6 & 7). More than 85% said they "thoroughly enjoyed their fishing trip to the area" though half (50%) disagreed with the statement "I caught more fish than expected on this trip" and only 4% indicated they caught what they considered to be a trophy fish during the trip. Anglers felt that catch rates have decreased in the area with 75% indicating "they caught fewer fish on this trip than in previous years." Though anglers feel that the number of fish being caught has decreased, the majority would "like to fish other places like this one" (63%).

Some anglers (44%) felt that most boaters they saw were in compliance with the "prop-up" or "no-run" zone regulations in effect for the area they were fishing. Most anglers (77%) indicated they understood the "prop-up" and/or "no-run" zone regulations in the area.

Respondents were asked to what extent they agreed or disagreed with various fish population and seagrass habitat statements. While the majority of respondents were neutral when asked about whether or not shark populations were increasing (66%) and if Atlantic croaker (Micropogonias undulatus) populations were increasing (64%), over half (53%) agreed that red drum populations were increasing (Table 2). Anglers were split when asked if spotted seatrout populations were increasing; 35% agreed while 41%

disagreed. Almost half (48%) disagreed that flounder (Paralichthys lethostigma) populations are increasing with 37% indicating neutral. Almost half (48%) were neutral when asked if black drum (Pogonias cromis) populations were increasing.

The majority of respondents strongly agreed with the following statements: "seagrass coverage in bays is important" (66%), "seagrasses are important to water quality" (61%), and "seagrasses provide important nursery areas" (70%) (Table 3). None strongly disagreed with those statements, and only 0.5% disagreed with them. Anglers were split when asked if "seagrasses recover quickly from propeller scarring" and "seagrass acreage is increasing" (Table 3).

Most (62%) agreed that "the quality of their fishing experience can be enhanced by less noise from other recreationists" (Table 4). When asked if "the voluntary 'prop-up' zone at Redfish Bay has enhanced the quality of their fishing experience by reducing noise and conflicts with other anglers" more disagreed (45%) than agreed (25%). When asked if the "mandatory 'no-run' zone in Nine-Mile Hole has enhanced the quality of their fishing experience by reducing noise and conflicts with other anglers", the majority of respondents were neutral (67%), with 14% in agreement and 20% in disagreement (Table 4).

Most respondents were either neutral (46%) or in disagreement (45%) when asked if "the voluntary 'prop-up' zone at Redfish Bay has increased the populations of red drum and spotted seatrout" (Table 5). Results were similar (70% neutral) when asked if "the mandatory no run zone in Nine-Mile Hole has increased the populations of red drum and spotted seatrout" (Table 5).

An overwhelming majority of anglers (97%) indicated they had seen scarring of seagrasses during their fishing or boating experience. The awareness of this scarring could be the reason most anglers agreed that "boating through shallow bays, estuaries, or grass flats has a significant negative impact on these environments" (56%) and that "boating through shallow bays, estuaries, or grass flats should be restricted in some way" (52%) (Table 6). However, more anglers disagreed (46%) that "TPWD should temporarily close certain bays, estuaries, or grass flats when they may be susceptible to damage" than agreed (37%). Similarly, more anglers disagreed (45%) than agreed (37%) that "TPWD should restrict boating and fishing access to certain areas to improve the quality of the fishing experience" (Table 6).

DISCUSSION

Results from this survey provide input from anglers on their perception of the effectiveness of the measures, as the voluntary and mandatory measures had been in place for over a year. Based on the results, more respondents disagreed (45%) than agreed (25%) that the voluntary "prop-up" zone in Redfish Bay had enhanced the quality of their fishing trip while more anglers were neutral (67%) when asked the same question about the mandatory measures in Nine-Mile Hole. This could be a result of the lack of

compliance with voluntary measures in Redfish Bay as less than half of anglers (44%) felt that most boaters they saw while fishing were in compliance with the measures in place. It's possible that more anglers fishing Nine-Mile Hole were neutral when asked the same question because fewer anglers actually fish the Nine-Mile Hole thus less chance for contact with other anglers: anglers spent an average of 34 days fishing in Redfish Bay versus only 4 days fishing in Nine-Mile Hole. In addition, anglers were mostly neutral or in disagreement when asked if the voluntary and mandatory measures had increased the populations of red drum or spotted seatrout. Although anglers did not see immediate improvements with the voluntary and mandatory measures, they still supported voluntary measures over mandatory of the six management scenarios listed. Interestingly, fewer anglers supported designating other areas along the coast as paddling trails than mandatory "no-run" zones, which implies anglers would rather close an area entirely than allow special privileges to certain groups.

Over 95% of the respondents reported they had seen bottom scarring of seagrasses. These results coincide with findings from a study conducted in 1997 which estimated up to 98%of Estes Flats, located within Redfish Bay, affected by propeller scarring (Dunton and Schoenberg 2001). In addition to the obvious direct impacts propeller scarring has on seagrass, some indirect effects such as different seagrass types recovering a scared area should also be examined. Pulich et al. (1997) showed a 13% decrease in turtle grass (Thalassia testudinum) and a 72% increase in shoal grass beds indicating possible overall ecological changes. These results can not be directly linked to seagrass scar recovery succession, but suggest this may be a factor.

Protecting the habitat that helps maintain sustainable fish and shellfish populations is a management priority, as the local coastal economy depends on stable recreational and commercial fishing industries. It was estimated (Wellman and Noble 1997) that sport-boat fishing alone generated $83 million dollars for the Corpus Christi, Aransas, and Upper Laguna Madre community between 1996 and 1997. Seagrasses are also affected by natural disturbances such as hurricanes, floods, and algal blooms which can all negatively impact the growth and development of these aquatic plants, but only human induced impacts such as dredging, nutrient loading, and propeller scarring can be regulated.

Overall, anglers would rather see TPWD increase education efforts instead of increasing law enforcement or closing down an area seasonally or as necessary. Continued outreach throughout the five-year period would help increase awareness of the importance of seagrasses as well as the impacts of propeller scarring. As indicated in the survey results, newspaper columns and magazine articles would be a good venue to promote awareness of seagrasses and its ecological functions in promoting healthy bays and estuaries. Some clarification of the lasting impacts of propeller scarring and the status of seagrass acreage should also be addressed through community outreach and education as anglers were undecided when asked questions related to these topics.

Conducting a similar survey within the same five-year time-frame, along with a thorough review of the voluntary as well as mandatory measures, will be necessary to determine their effectiveness and provide suggestions to the TPWD commissioners for future management decisions. Ultimately, determining what management option best protects the resource while still providing opportunity for recreational as well as commercial fishermen is TPWD's main objective.

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Table 1. Preferred species among Redfish Bay and Nine-Mile Hole anglers.

Species	First Choice (%) N=193	Second Choice (%) N=189	Third Choice (%) N=161
Red drum	64.8	32.4	5.0
Drum family	18.1	33.4	15.5
Spotted seatrout	16.1	16.5	2.5
Flounder	0.5	10.7	51.6
Black drum	0.0	4.8	11.2
Red snapper	0.0	1.1	1.2
King mackerel	0.0	0.0	3.8
Sheepshead	0.5	0.0	5.0
Bass	0.0	0.5	0.0
Gafftopsail catfish	0.0	0.5	0.6
Tuna	0.0	0.0	0.6
Snapper	0.0	0.0	0.6
Blue marlin	0.0	0.0	0.6
Sand seatrout	0.0	0.0	0.6
Cobia	0.0	0.0	0.6
Tarpon	0.0	0.0	0.6

Table 2. Distribution (%) of Redfish Bay and Nine-Mile Hole anglers by the extent they disagree/agree on the status of fish populations

Statement	Strongly Disagree	Disagree	Neutral	Slightly Agree	Strongly Agree
Red drum populations are increasing	11.5	18.9	16.8	34.6	18.3
Spotted seatrout populations are increasing	13.1	28.3	24.1	26.7	7.9
Flounder populations are increasing	18.0	30.2	37.0	11.6	3.2
Shark populations are increasing	8.8	12.6	65.9	8.2	4.4
Atlantic croaker populations are increasing	14.2	12.6	63.9	6.0	3.3
Black drum populations are increasing	4.3	14.1	47.6	28.7	5.4

Table 3. Distribution (%) of Redfish Bay and Nine-Mile Hole anglers by the extent they disagree/agree with statements about seagrass habitat.

Statement	Strongly Disagree	Disagree	Neutral	Slightly Agree	Strongly Agree
Seagrasses recover quickly from propeller scarring	11.0	29.8	24.6	20.4	14.1
Seagrass coverage in bays is important	0.0	0.5	8.3	25.8	65.5
Seagrasses are important to water quality	0.0	0.5	9.3	29.4	60.8
Seagrasses provide important nursery areas	0.0	0.5	6.2	23.2	70.1
Seagrass acreage is increasing	4.2	23.3	42.5	17.6	12.4

Table 4. Distribution (%) of Redfish Bay and Nine-Mile Hole anglers by the extent they disagree/agree with factors that affect their fishing experience.

Statement	Strongly Disagree	Disagree	Neutral	Slightly Agree	Strongly Agree
The quality of my fishing experience can be enhanced by less noise from other recreationists	9.8	11.9	16.1	25.9	36.3
The voluntary "prop-up" zone at Redfish Bay has enhanced the quality of my fishing experience by reducing noise and conflicts with other anglers	18.7	25.9	30.1	14.0	11.4
The mandatory "no-run" zone in Nine-Mile Hole has enhanced the quality of my fishing experience by reducing noise and conflicts with other anglers	10.4	9.3	66.5	7.1	6.6

Table 5. Distribution of Redfish Bay and Nine-Mile Hole anglers by opinions about the fisheries in Redfish Bay and Nine-Mile Hole.

Statement	Strongly Disagree	Disagree	Neutral	Slightly Agree	Strongly Agree
The voluntary "prop-up" zone at Redfish Bay has increased the populations of red drum and spotted seatrout	18.0	26.5	45.5	5.8	4.2
The mandatory "no-run" zone in Nine-Mile Hole has increased the populations of red drum and spotted seatrout	12.9	9.0	70.2	5.6	2.3

Table 6. Distribution (%) of Redfish Bay and Nine-Mile Hole anglers by the extent they disagree/agree on boating impacts in and enactment of regulations to manage shallow water areas.

Statement	Strongly Disagree	Disagree	Neutral	Slightly Agree	Strongly Agree
Boating through shallow bays, estuaries or grass flats has a significant negative impact on these environments	11.9	19.6	12.4	33.5	22.7
Boating through shallow bays, estuaries, or grass flats should be restricted in some way	13.7	18.9	15.9	26.8	24.7
TPWD should temporarily close certain bays, estuaries, or grass flats when they become susceptible to damage	22.7	23.2	17.0	22.7	14.4
TPWD should restrict boating and fishing access to certain areas to improve the quality of the fishing experience	23.7	21.6	17.9	21.6	15.3

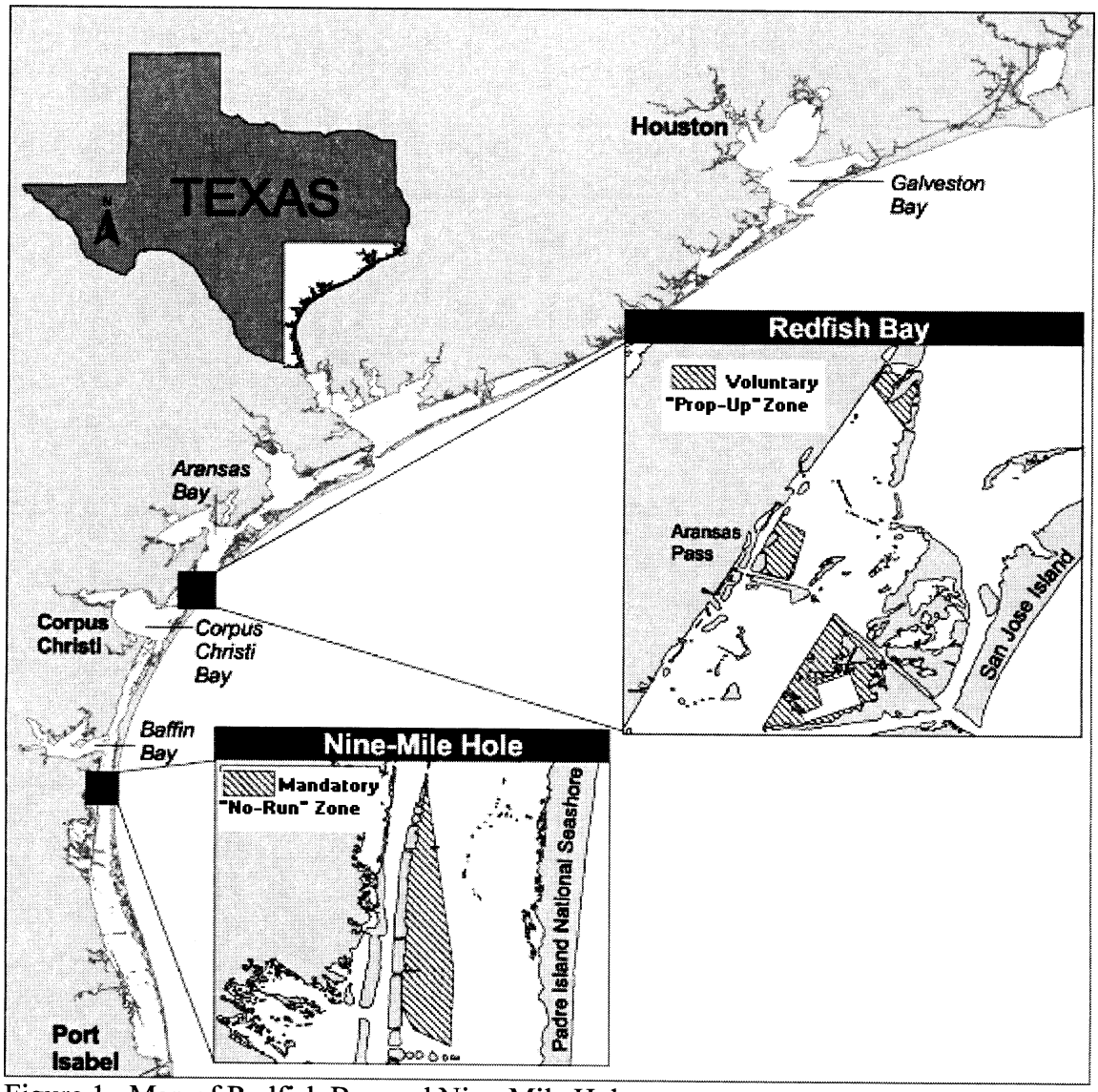

Figure 1. Map of Redfish Bay and Nine-Mile Hole.

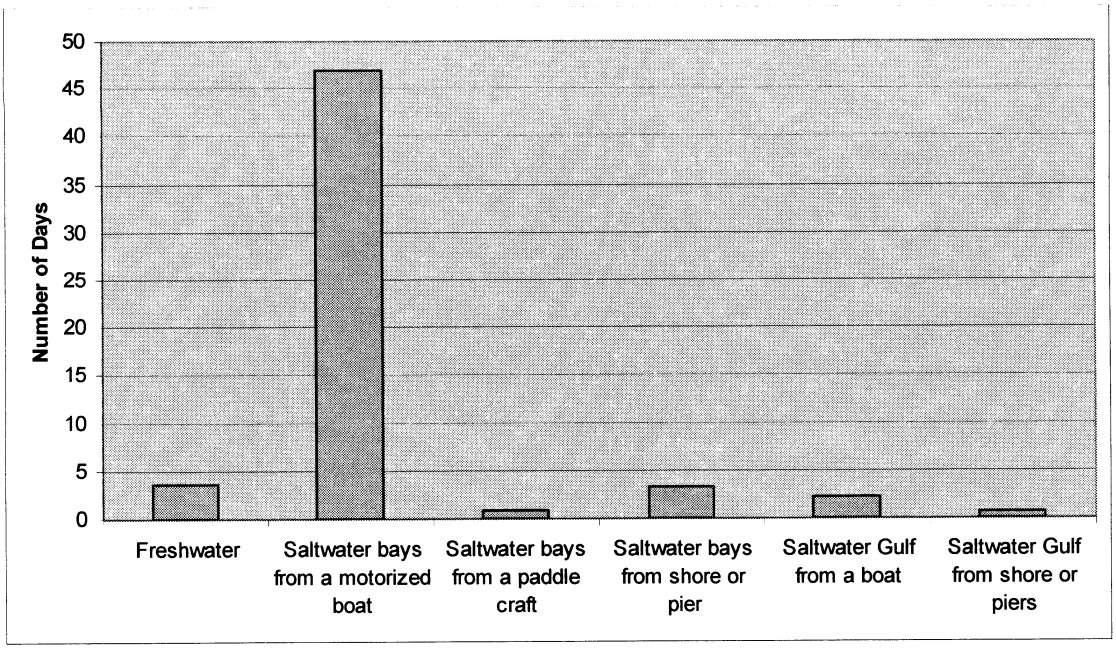

Figure 2. Mean number of days fishing in Texas by mode for Redfish Bay and Nine-Mile Hole anglers.

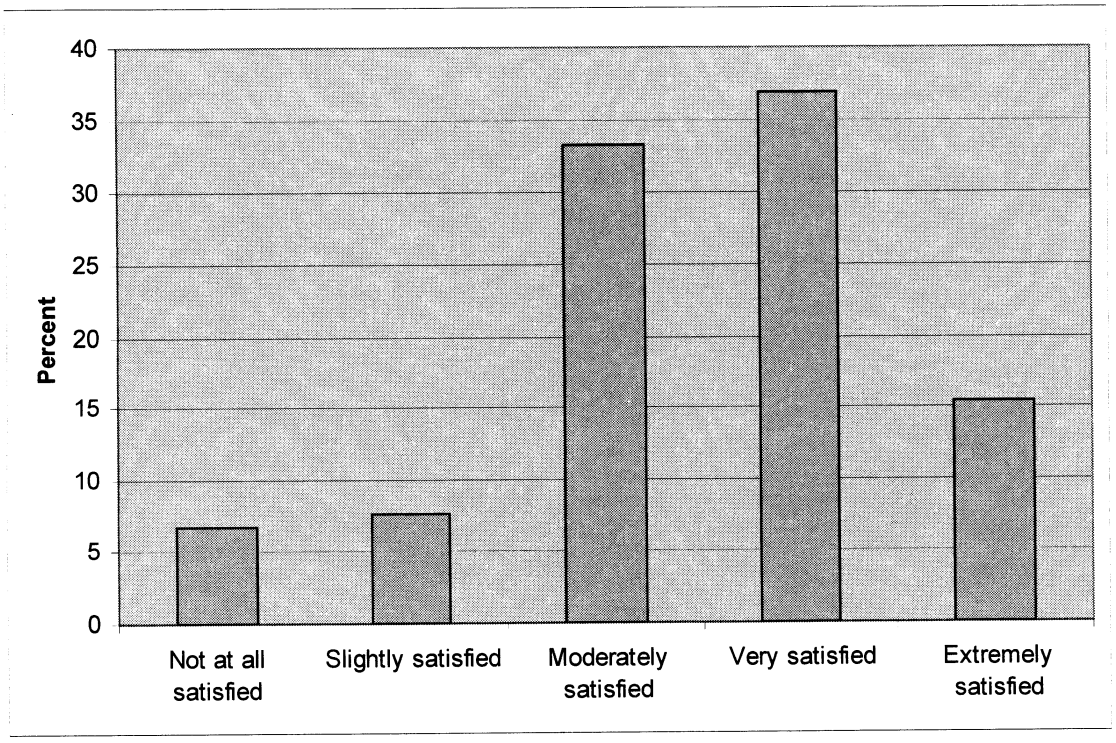

Figure 3. Distribution of Redfish Bay and Nine-Mile Hole anglers by levels of overall fishing satisfaction.

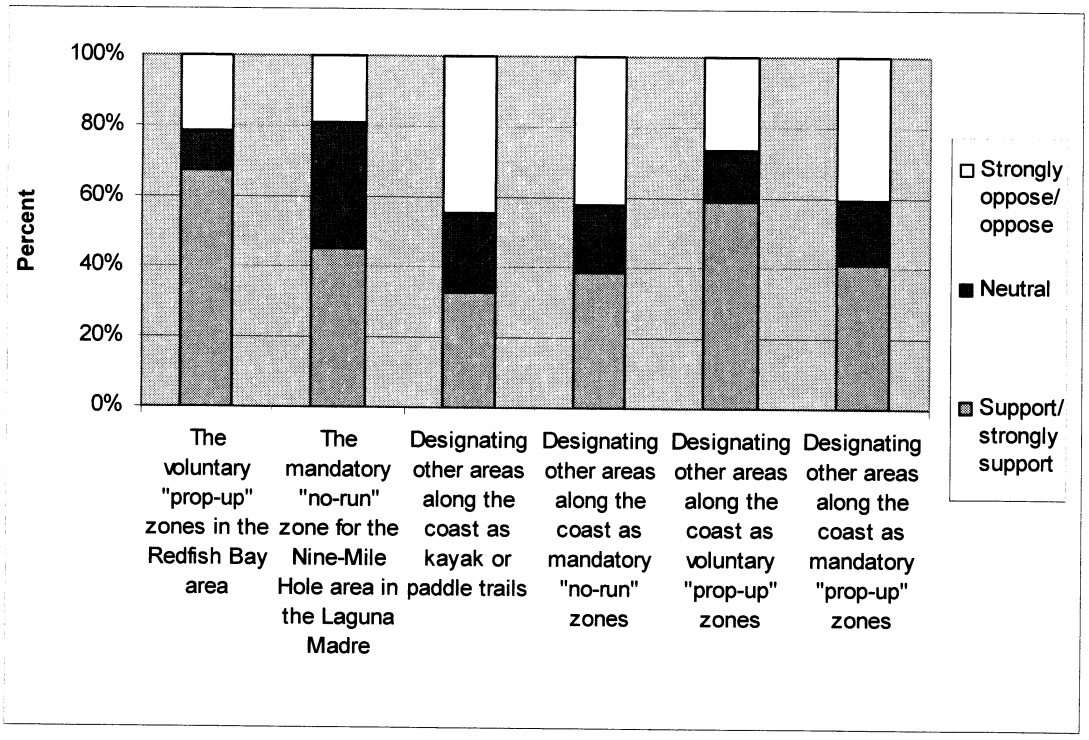

Figure 4. Distribution of Redfish Bay and Nine-Mile Hole anglers by levels of support for various seagrass management options.

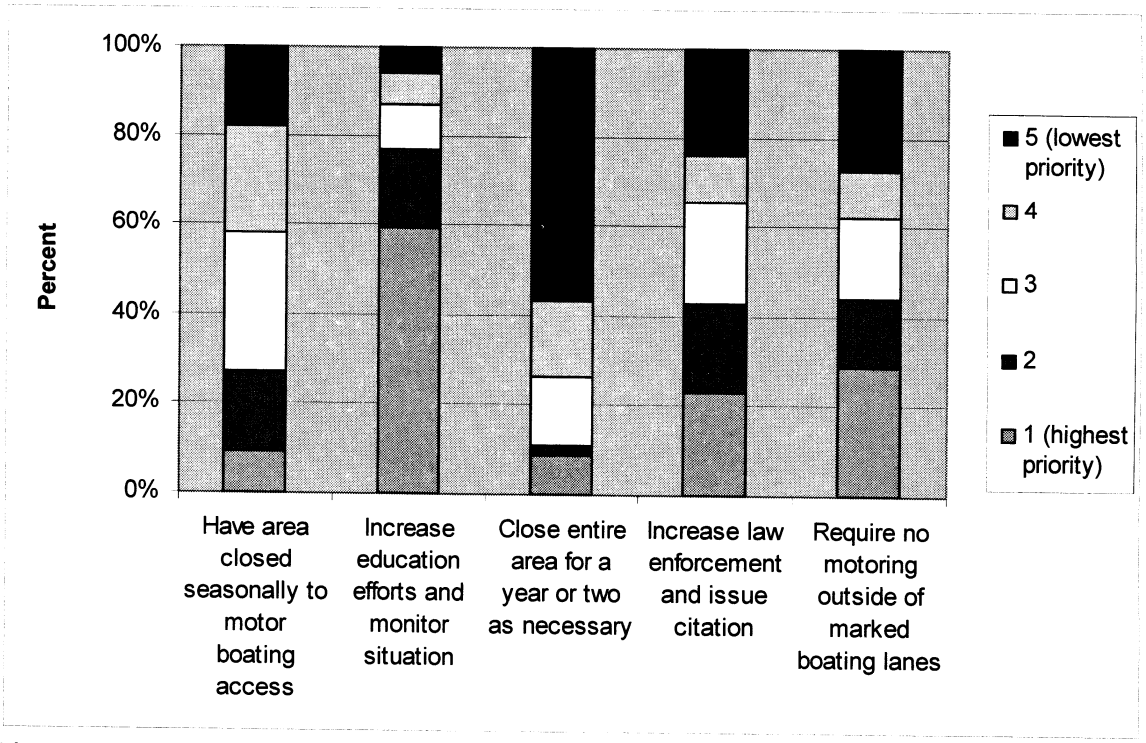

Figure 5. Distribution of Redfish Bay and Nine-Mile Hole anglers by preferences towards various seagrass management options.

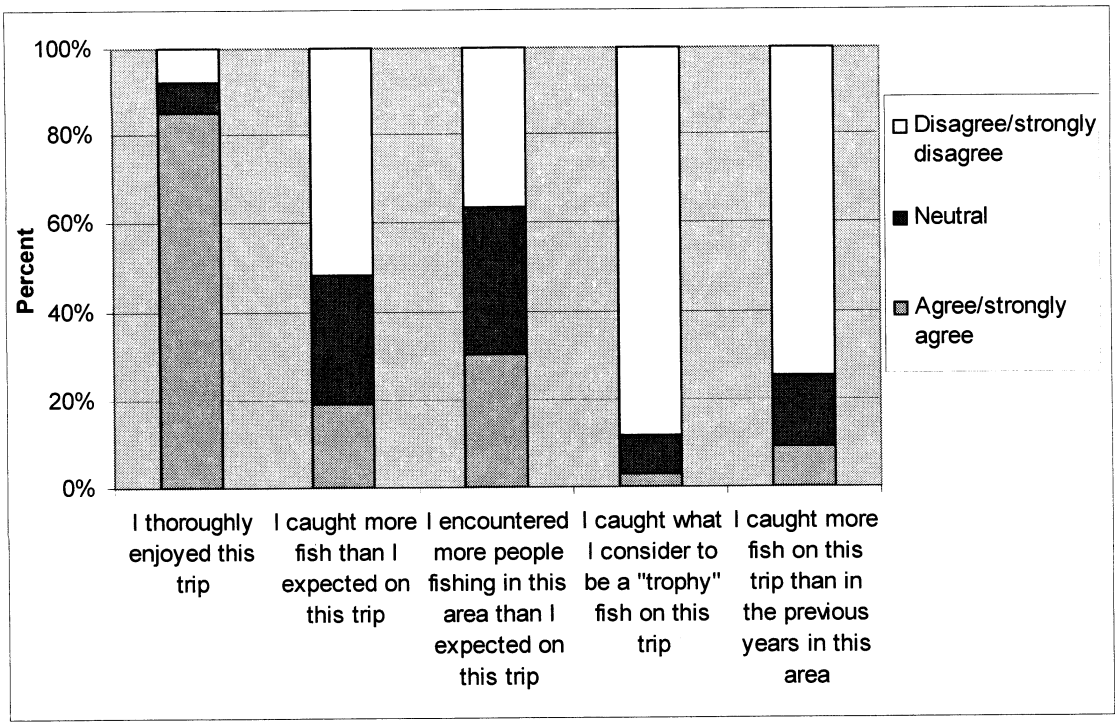

Figure 6. Distribution of Redfish Bay and Nine-Mile Hole anglers by opinions about their fishing trip to the Redfish Bay or Nine-Mile Hole area.

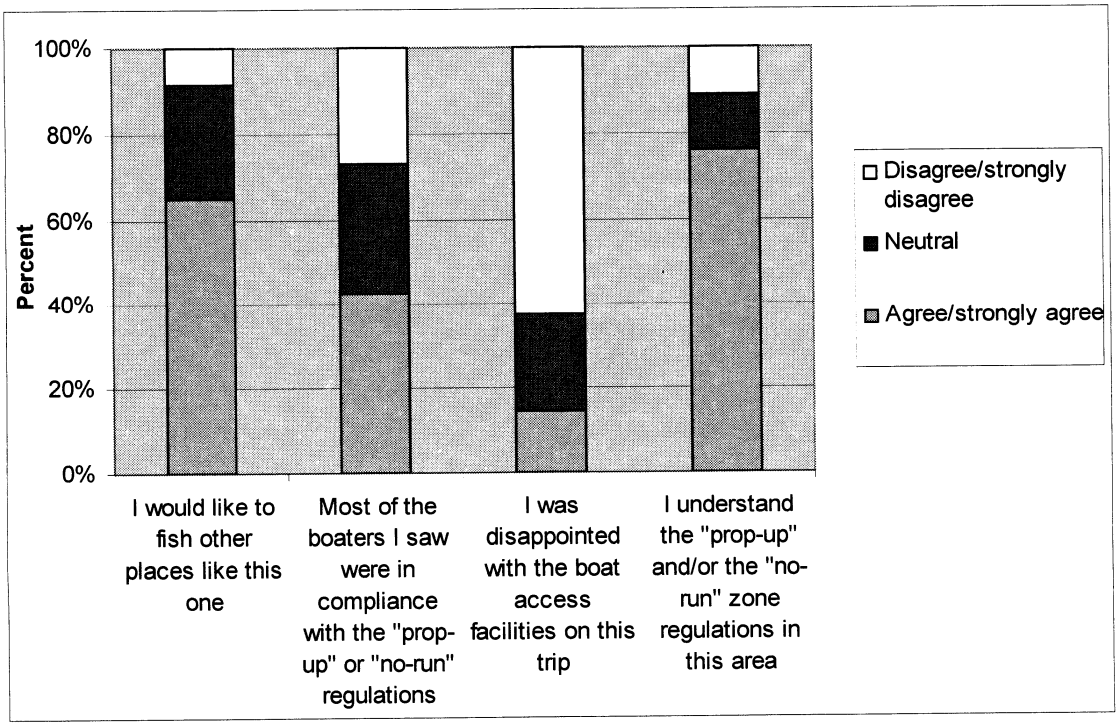

Figure 7. Distribution of Redfish Bay and Nine-Mile Hole anglers by opinions about their fishing trip to the Redfish Bay or Nine-Mile Hole area.

Appendix A. Boat Ramp Handout Letter, Cover Letters and Survey Questionnaire

Boat Ramp Handout Letter

2000-2001 Survey of Redfish Bay and Nine-Mile Hole Anglers

Texas Parks and Wildlife is conducting a survey to assess **YOUR** attitudes and opinions towards the voluntary and mandatory boating restrictions at Redfish Bay near Rockport and Aransas Pass and Nine-Mile Hole in the Laguna Madre. These new regulations established "Prop-Up" zones in Redfish Bay and a "No-Run Zone" in Nine-Mile Hole. The purpose of the regulations is to conserve seagrass beds and other sensitive areas and to provide quality fishing opportunities. **YOUR** response is important and will provide input to fishery managers regarding these types of management efforts.

The Texas Parks and Wildlife Commission established Redfish Bay near Rockport and Aransas Pass and Nine-Mile Hole as state scientific areas in the summer of 2000. These areas contain seagrasses and other important aquatic habitat. Shallow-water seagrasses provide nursery areas for marine life, food and cover for game fish, bottom stabilization, and better water quality. Studies indicate seagrass coverage has declined in some areas on the Texas coast and increased in others. In the Redfish Bay area, the total acreage of seagrass has declined by 13 percent since 1958. Seagrass acreage has increased 20 percent along the Intracoastal Waterway side of Mustang Island in Corpus Christi Bay between 1974 and 1994.

Individuals surveyed will receive a letter in the mail encouraging their participation. Approximately one week later a second letter with a survey and return envelope will be mailed, followed by a reminder postcard. An additional letter and survey will be sent to individuals that have not responded to the initial mailings. **If you want to avoid extra mailings, please respond quickly to the survey.**

Responses will remain **confidential**. Your name will not be associated with the survey or your response. Each survey will be numbered to allow names of respondents to be checked off to reduce mailings to individuals that respond to the survey. Names and addresses of participants will be destroyed as soon as data collection is completed.

We appreciate your cooperation. For questions about the survey please contact Brian Bohnsack, Coastal Fisheries Division, Texas Parks and Wildlife, in Austin at 1-800-792-1112 extension 4492.

Pre-survey Letter

TEXAS PARKS & WILDLIFE

9 March 2001

COMMISSIONERS
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CAROL E. DINKINS
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CHAIRMAN EMERITUS
FT. WORTH

ANDREW SANSOM
EXECUTIVE DIRECTOR

Dear

Texas Parks and Wildlife is conducting a survey to assess anglers' attitudes and opinions towards the new voluntary boating restrictions in Redfish Bay near Rockport and mandatory boating restrictions in the Nine-Mile Hole area of the Laguna Madre. These new regulations established "Prop-Up" zones in Redfish Bay and a "No-Run Zone" in Nine-Mile Hole. These regulations are intended to conserve seagrass beds and to provide quality fishing opportunities. **YOUR** response is important and will provide input to guide our agency with future saltwater fisheries management efforts.

Within the next few days you will receive a questionnaire in the mail regarding your opinions and attitudes towards these new regulations. Your response will remain **confidential**. Your name will not be associated with the survey or your response.

We appreciate you taking the few minutes to complete and return your questionnaire on this important issue.

Sincerely,

Larry D. McKinney
Senior Director for Aquatic Resources

Give Thanks for the Memories...

Lone Star Legacy

Give to the Lone Star Legacy Endowment Fund

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512-389-4800
www.tpwd.state.tx.us

To manage and conserve the natural and cultural resources of Texas for the use and enjoyment of present and future generations

Cover Letter

TEXAS PARKS & WILDLIFE

COMMISSIONERS

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ALVIN

MARK E. WATSON, JR.
SAN ANTONIO

PERRY R. BASS
CHAIRMAN-EMERITUS
FT. WORTH

ANDREW SANSOM
EXECUTIVE DIRECTOR

14 March 2001

Dear

We are conducting a survey to assess anglers' attitudes and opinions towards the new voluntary boating restrictions in Redfish Bay near Rockport and mandatory boating restrictions in the Nine-Mile Hole area of the Laguna Madre. These new regulations established "Prop-Up" zones in Redfish Bay and a "No-Run Zone" in Nine-Mile Hole. These regulations are intended to conserve seagrass beds and to provide quality fishing opportunities.

We have enclosed a questionnaire to help us learn more about the opinions and attitudes of saltwater anglers' towards these new regulations. **YOUR** response will provide important input to guide our agency with future saltwater fisheries management efforts.

You may be assured of complete **confidentiality** with your survey response. The questionnaire has an identification number for mailing purposes only. Your name will not be associated with the survey or your response.

Your prompt response is appreciated and will save us the costs of mailing additional surveys. **If we do not receive your returned questionnaire within two weeks, we will send you another.** After you complete the questionnaire, please return it in the postage-paid business reply envelope as soon as possible. For questions or clarifications about the survey, please contact Dr. Bill Harvey of Texas Parks and Wildlife's Resource Protection Division at 512-389-4453.

Thank you very much for your cooperation with this research effort.

Sincerely,

Larry D. McKinney

Larry D. McKinney, Ph.D.
Senior Director of Aquatic Resources

2033

Give Thanks for the Memories...

Lone Star Legacy

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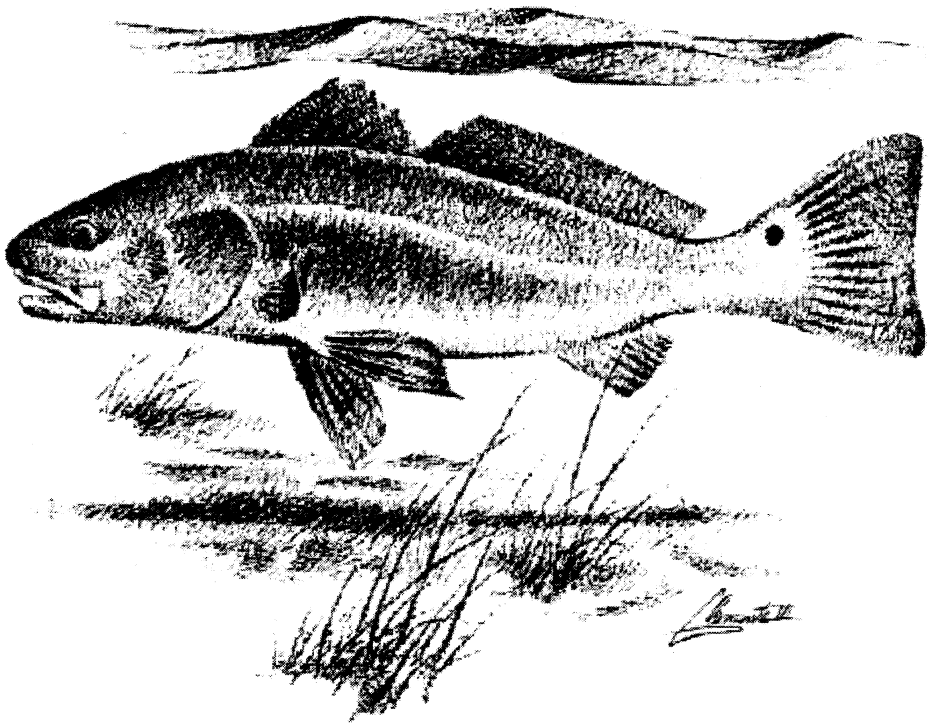
Survey of Redfish Bay and Nine-Mile Hole Questionnaire

SURVEY OF REDFISH BAY AND NINE MILE HOLE ANGLERS



Coastal Fisheries and Resource Protection Divisions
Texas Parks and Wildlife

Survey of Redfish Bay and Nine Mile Hole Anglers *Page 1*

In the following questions, please tell us about your fishing activity and experience. The information you provide will remain strictly confidential and you will not be identified with your answers.

1. Since this time last year, how many days did you go fishing **in Texas: (If NONE, please enter 0)**

   _____ FRESHWATER

   _____ SALTWATER BAYS FROM A **MOTORIZED** BOAT (airboats and jet prop included)

   _____ SALTWATER BAYS FROM A **PADDLE CRAFT** (kayak, canoe,etc)

   _____ SALTWATER BAYS FROM SHORE OR PIER

   _____ SALTWATER GULF FROM A BOAT

   _____ SALTWATER GULF FROM SHORE OR PIERS

   _____

   _____ TOTAL DAYS FISHED SINCE THIS TIME LAST YEAR (Sum of above)

2. What species of fish do you prefer to catch in salt water in Texas?

   _____ FIRST CHOICE

   _____ SECOND CHOICE

   _____ THIRD CHOICE

3. What length do you consider a "trophy" fish for your First Choice listed above?

   _____ inches

4. Since this time last year, how many days did you go fishing in the **Redfish Bay** area **(bounded by Rockport, Port Aransas and Ingleside)? (IF NONE, please enter 0)**

   _____ DAYS

   How many days did you fish in one of the voluntary "prop up" zones? (See Map)

   _____ DAYS

5. Since this time last year, how many days did you go fishing in the **Nine-Mile Hole** area of the Laguna Madre? **(IF NONE, please enter 0)**

   _____ DAYS

   How many days did you fish in the mandatory "no run" zone? (See Map)

   _____ DAYS

6. During your fishing or boating experience, have you seen what you would consider bottom scarring of seagrasses (vegetated areas that look as if they had lanes made through them or have been disturbed by boat motors?)
   1 YES
   2 NO

7. Are you a member of a fishing club or organization?
   1 YES **(If YES, please identify:** _____)
   2 NO

8. Do you make use of the following sources of information for SALTWATER FISHING?

   a. Newspaper columns and articles
      1 YES **(If YES, which newspaper or writer?)**_____
      2 NO

   b. Radio shows?
      1 YES **(If YES, which station or show?)**_____
      2 NO

   c. TPW office or personnel?
      1 YES **(If YES, which office or personnel?)**_____
      2 NO

   d. Texas Parks and Wildlife magazine
      1 YES
      2 NO

   e. Texas Parks and Wildlife Internet web site?
      1 YES
      2 NO

   f. Other sources?
      1 YES **(If YES, which?**_____)
      2 NO

9. Within the past 2 years, have you paid to go fishing with a fishing guide in saltwater?
   1 YES
   2 NO **(If NO, please skip ahead to Question #10)**

   If YES, how many days did you go fishing with a guide? _____ DAYS

   What saltwater species were you fishing for?_____

   Did you use live bait on this trip? YES NO

   What type of live bait did you use? _____

   Did you catch what you consider to be a "trophy" fish on this trip? YES NO

10. If you have spent one or more days fishing **in saltwater bays in Texas (See Question 1)**, where have you fished **most often** since this time last year? **(Please circle only one answer)**

    1. SABINE LAKE
    2. GALVESTON BAY (East Bay, West Bay, Trinity Bay, Christmas Bay, etc.)
    3. MATAGORDA BAY (Lavaca Bay, Tres Palacios, etc)
    4. SAN ANTONIO BAY (Espiritu Santo Bay, Hynes Bay,etc)
    5. ARANSAS BAY (Copano Bay, Redfish Bay, Mesquite Bay, etc)
    6. CORPUS CHRISTI BAY (Port Aransas Pass, Nueces Bay, Redfish Bay, etc)
    7. UPPER LAGUNA MADRE (Baffin Bay, and bays north of Land Cut)
    8. LOWER LAGUNA MADRE (All bays south of Land Cut)

In the following questions, we are interested in your attitudes and opinions on a variety of fishing related issues and management. Please read the description of the "prop up" and "no run" zones on the enclosed map.

11. Please indicate whether you support or oppose each of the following management scenarios:

	Strongly Oppose	Oppose	Neutral	Support	Strongly Support
a. The voluntary "prop up" zones in the Redfish Bay area **(bounded by Rockport, Port Aransas and Ingleside)**?	1	2	3	4	5
b. The mandatory "no run zone" for the Nine Mile Hole area in the Laguna Madre.	1	2	3	4	5
c. Designating other areas along the coast as kayak or paddle trails (fishing allowed).	1	2	3	4	5
d. Designating other areas along the coast as mandatory "no run zones".	1	2	3	4	5
e. Designating other areas along the coast as voluntary "prop up zones."	1	2	3	4	5
f. Designating areas along the coast as <u>mandatory</u> "prop up" zones.	1	2	3	4	5

12. Please indicate whether you agree or disagree with each of the following statements:

I feel:	Strongly Disagree	Disagree	Neutral	Slightly Agree	Strongly Agree
a. The quality of my fishing experience can be enhanced by less noise from other recreationists.	1	2	3	4	5
b. Boating through shallow bays, estuaries or grass flats has a significant negative impact on these environments.	1	2	3	4	5
c. Boating through shallow bays, estuaries, or grass flats should be restricted in some way.	1	2	3	4	5
d. TPW should temporarily close certain bays, estuaries, or grass flats when they may be susceptible to damage.	1	2	3	4	5
e. TPW should restrict boating and fishing access to certain areas to improve the quality of the fishing experience.	1	2	3	4	5
f. The voluntary "prop up" zone at Redfish Bay has increased the populations of red drum and spotted seatrout.	1	2	3	4	5
g. The mandatory "no run" zone in Nine Mile Hole has increased the populations of red drum and spotted seatrout.	1	2	3	4	5
h. The voluntary "prop up" zone at Redfish Bay has enhanced the quality of my fishing experience by reducing noise and conflicts with other anglers.	1	2	3	4	5
i. The mandatory "no run" zone in Nine Mile Hole has enhanced the quality of my fishing experience by reducing noise and conflicts with other anglers.	1	2	3	4	5

	Not at all Satisfied	Slightly Satisfied	Moderately Satisfied	Very Satisfied	Extremely Satisfied
13. Overall how satisfied are you with saltwater fishing in Texas?	1	2	3	4	5

14. There are several things TPW can do to protect habitat. If resource managers determined that bottom scarring/prop scarring was a problem where you fish most often in coastal waters, which of the following management options do you feel TPW should use to protect seagrasses in shallow water habitats? **[Please rank your preferences below from 1-5 (1-highest, 5-lowest)]**

_____ Have area closed seasonally to motor boating access
_____ Increase education efforts and monitor situation
_____ Close entire area for a year or two as necessary
_____ Increase law enforcement and issue citation
_____ Require no motoring outside of marked boating lanes

15. How well do the following statements describe your feelings about your fishing trip in the Redfish Bay or Nine Mile Hole area on December 11 when you were interviewed by TPW staff?

		Strongly Disagree	Disagree	Neutral	Slightly Agree	Strongly Agree
a.	I thoroughly enjoyed this trip.	1	2	3	4	5
b.	I caught more fish than I expected on this trip.	1	2	3	4	5
c.	I encountered more people fishing in this area than I expected on this trip. ..	1	2	3	4	5
d.	I caught what I consider a "trophy" fish on this trip.	1	2	3	4	5
e.	I caught more fish on this trip than in previous years in this area.	1	2	3	4	5
f.	I would like to fish other places like this one.	1	2	3	4	5
g.	Most of the boaters I saw were in compliance with the "prop up" or "no run zone" regulations in effect for the area where I fished.	1	2	3	4	5
h.	I was disappointed with the boat access facilities on this trip.	1	2	3	4	5
i.	I understand the "prop up" and/or "no run zone" regulations in this area.....	1	2	3	4	5

In the following questions we are interested in your attitudes and opinions on a variety of natural resource issues.

16. Please indicate whether you agree or disagree with the following statements.

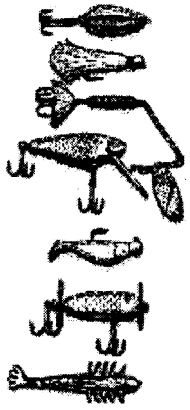
I feel:	Strongly Disagree	Disagree	Neutral	Slightly Agree	Strongly Agree
a. Red drum populations are increasing.	1	2	3	4	5
b. Spotted seatrout populations are increasing.	1	2	3	4	5
c. Flounder populations are increasing.	1	2	3	4	5
d. Shark populations are increasing.	1	2	3	4	5
e. Atlantic croaker populations are increasing.	1	2	3	4	5
f. Black drum populations are increasing.	1	2	3	4	5
g. Seagrasses recover quickly from propeller scarring.	1	2	3	4	5
h. Seagrass coverage in bays is important.	1	2	3	4	5
i. Seagrasses are important to water quality.	1	2	3	4	5
j. Seagrasses provide important nursery areas.	1	2	3	4	5
k. Seagrass acreage is increasing.	1	2	3	4	5

17. Are you?
    1 MALE
    2 FEMALE

18. What is your age? _____YEARS

19. Are you of Spanish/Hispanic or Latino heritage?
    1 YES
    2 NO

20. What is your race?
    1 WHITE
    2 BLACK
    3 AMERICAN INDIAN
    4 ASIAN
    5 OTHER



21. Was this survey completed by the person to whom it was addressed?
    1 YES
    2 NO

Is there anything else you would like to share with us?

Your contribution of time to this study is greatly appreciated. Please return your completed questionnaire in the return envelope as soon as possible.

Thank you.

TEXAS PARKS & WILDLIFE

Coastal Fisheries and Resource Protection Divisions
February 2001

CS BK V3400-002 (2/01)

Appendix B. Summary of Responses to Survey Questions

1. Since this time last year, how many days did you go fishing in Texas:

N=196	Mean	Min	Max
Freshwater	3.7	0	85
Bay – motorized boat	46.9	0	245
Bay – paddle craft	0.9	0	25
Bay – shore/pier	3.2	0	60
Gulf – boat	2.2	0	150
Gulf – shore/pier	0.6	0	15
Total days	60.0	0	250

2a. What species of fish do you prefer to catch in salt water in Texas (first choice)?

N=193	Frequency	Percent
Red drum	125	64.8
Drum family	35	18.1
Spotted seatrout	31	16.1
Flounder	1	0.5
Sheepshead	1	0.5

2b. What species of fish do you prefer to catch in salt water in Texas (second choice)?

N=189	Frequency	Percent
Drum family	62	32.8
Red drum	61	32.3
Spotted seatrout	32	16.9
Flounder	20	10.6
Black drum	8	4.2
Red snapper	2	1.1
Other species	4	2.0

2c. What species of fish do you prefer to catch in salt water in Texas (third choice)?

N=161	Frequency	Percent
Flounder	83	51.6
Drum family	25	15.5
Black drum	18	11.2
Red drum	8	5.0
Sheepshead	8	5.0
King mackerel	6	3.7
Spotted seatrout	4	2.5
Red snapper	2	1.2
Other species	7	4.3

3. What length do you consider a "trophy" fish for your first choice listed above?

N=179	Mean	Min	Max
	30.9"	18"	46"

4. Since this time last year, how many days did you go fishing in the Redfish Bay area?

N=196	Mean	Min	Max
Redfish Bay	33.7	0	245
Voluntary "prop-up" zones	10.3	0	100

5. Since this time last year, how many days did you go fishing in the Nine-Mile Hole area?

N=196	Mean	Min	Max
Nine-Mile Hole	3.4	0	105
Voluntary "no-run" zone	3.5	0	105

6. During your fishing or boating experience, have you seen what you consider to be scarring of seagrasses?

N=172	Frequency	Percent
Yes	166	96.5
No	6	3.5

7. Are you a member of a fishing club or organization?

N=190	Frequency	Percent
Yes	64	33.7
No	126	66.3

8. Do you make use of the following sources of information for saltwater fishing?

	Yes (%)	No(%)	N
Newspaper columns/articles	74.2	25.8	194
Radio shows	10.6	89.4	188
TPWD office/personnel	22.5	77.5	187
TPWD magazine	39.1	60.9	192
TPWD website	30.8	69.2	185
Other	62.1	37.9	174

9a. Within the past 2 years, have you paid to fishing with a guide in saltwater?

N=190	Frequency	Percent
Yes	64	33.7
No	126	66.6

9b. If yes, how many days did you go fishing with a guide?

N=75	Mean	Min	Max
Yes	2.6	0	20

9c. What saltwater species were you fishing for?

N=63	Frequency*	Percent
Red drum	48	47.1
Spotted seatrout	40	39.2
Red snapper	3	2.9
Drum family	2	2.0
Kingfish	1	1.0
Halibut	1	1.0
Sheepshead	1	1.0
Shark	1	1.0
Vermillion snapper	1	1.0
Flounder	1	1.0
Tuna	1	1.0
Wahoo	1	1.0
Marlin	1	1.0

* Sums to more than 63 due to anglers indicating more than one species

9d. Did you use live bait on this trip?

N=63	Frequency	Percent
Yes	44	69.8
No	19	30.2

9e. What type of live bait did you use?

N=49	Frequency*	Percent
Croaker	28	38.4
Shrimp	20	27.4
Perch	11	15.1
Mullet	9	12.3
Ribbonfish	2	2.7
Cigar minnows	1	1.4
Squid	1	1.4
Shad	1	1.4

*Sums to more than 49 due to anglers indicating more than one bait type

9f. Did you catch what you consider to be a "trophy" fish on this trip?

N=63	Frequency	Percent
Yes	11	17.5
No	52	82.5

10. If you have spent one or more days fishing in saltwater bays in Texas, where have you fished most often since this time last year?

N=184	Frequency	Percent
Aransas Bay	115	62.2
Corpus Christi Bay	40	21.6
Upper Laguna Madre	15	8.1
Lower Laguna Madre	8	4.3
Galveston Bay	3	1.6
San Antonio Bay	3	1.6
Matagorda Bay	0	0.0
Sabine Lake	0	0.0

11a-f. Please indicate whether you support or oppose each of the following management scenarios. Numbers represent the percentage of respondents.

	SO	O	NE	S	SS	N	M
The voluntary "prop-up" zones in the Redfish Bay area	9.8	11.3	13.9	33.5	31.4	194	3.7
The mandatory "no-run" zone for the Nine-Mile Hole area in the Laguna Madre	10.8	11.8	32.8	19.9	24.7	186	3.4
Designating other areas along the coast as voluntary "prop-up" zones	11.6	13.8	20.1	32.3	22.2	189	3.4
Designating other areas along the coast as mandatory "no-run" zones	18.6	25.0	19.7	15.4	21.3	189	3.0
Designating other areas along the coast as mandatory "prop-up" zones	21.5	20.9	19.4	16.2	22.0	191	3.0
Designating other areas along the coast as kayak or paddle trails	27.4	17.9	23.7	14.7	16.3	190	2.8

SO=Strongly Oppose O=Oppose NE=Neutral S=Support SS=Strongly Support N=Sample Size M=Mean

12a-i: Please indicate whether you agree of disagree with each of the following statements. Numbers represent the percentage of respondents.

	SD	D	N	Sl. A	St. A	N	M
The quality of my fishing experience can be enhanced by less noise from other recreationists	9.8	11.9	16.1	25.9	36.3	193	3.7
Boating thought shallow bays, estuaries, or grass flats has significant negative impacts on these environments	11.9	19.6	12.4	33.5	22.7	194	3.4
Boating thought shallow bays, estuaries, or grass flats should be restricted in some way	13.7	19.0	15.8	26.8	24.7	190	3.3
The mandatory "no-run" zone in Nine-Mile Hole has enhanced the quality of my fishing experience by reducing noise and conflicts with other anglers	10.4	9.3	66.5	7.1	6.6	182	2.9
TPWD should temporarily close certain bays, estuaries, or grass flats when they may be susceptible to damage	22.7	23.2	17.0	22.7	14.4	194	2.8
TPWD should restrict boating and fishing to certain areas to improve the quality of the fishing experience	23.7	21.6	17.9	21.6	15.3	190	2.8
The mandatory "no-run" zone in Nine-Mile Hole has increased the populations of red drum and spotted seatrout	12.9	9.0	70.2	5.6	2.3	178	2.8
The voluntary "prop-up" zone at Redfish Bay has enhanced the quality of my fishing experience by reducing noise and conflicts with other anglers	18.7	25.9	30.1	14.0	11.4	193	2.7
The voluntary "prop-up" zone at Redfish Bay has increased the populations of red drum and spotted seatrout	18.0	26.5	45.5	5.8	4.2	189	2.5

SD=Strongly Disagree D=Disagree N=Neutral Sl. A=Slightly Agree St. A=Strongly Agree N=Sample Size M=Mean

13. Overall, how satisfied are you with saltwater fishing in Texas? Numbers represent the percentage of respondents.

N=194	NS	SS	MS	VS	ES	Mean
	6.7	7.7	33.0	37.1	15.5	3.5

NS=Not at all satisfied SS=Somewhat satisfied MS=Moderately Satisfied VS=Very Satisfied ES=Extremely Satisfied

14. There are several things TPWD can do to protect habitat. If resource managers determined that bottom scarring/prop scarring was a problem where you fish most often in coastal waters, which of the following management options do you feel TPWD should use to protect seagrasses in shallow water habitats (1-Highest, 5-Lowest)? Numbers represent the percentage of respondents.

	1	2	3	4	5	N	Mean
Increase education efforts and monitor situation	59.3	17.9	9.8	7.3	5.7	144	1.9
Increase law enforcement and issue citation	22.7	20.0	22.7	10.9	23.6	168	2.9
Require no motoring outside of marked boating lanes	28.8	15.3	18.0	10.8	27.0	141	3.0
Have area closed seasonally to motor boating access	9.3	17.8	30.8	24.3	17.8	149	3.2
Close entire area for year or two as necessary	8.7	1.9	15.4	17.3	56.7	149	4.1

15a-i: Please indicate whether you agree of disagree with each of the following statements. Numbers represent the percentage of respondents.

	SD	D	N	Sl. A	St. A	N	M
I thoroughly enjoyed this trip	2.1	6.9	5.3	37.2	48.4	188	4.3
I understand "prop-up" and/or "no-run" zone regulations in this area	2.7	7.6	12.5	32.6	44.6	184	4.0
I would like to fish other places like this one	5.4	5.9	25.8	31.2	31.7	186	3.9
Most of the boaters I saw were in compliance with the "prop-up" or "no-run" zone regulations in effect for the area where I fished	13.5	13.5	28.7	22.7	21.6	185	3.2
I encountered more people fishing in this area than I expected on this trip	9.1	29.6	32.3	17.2	11.8	186	3.0
I caught more fish than I expected on this trip	21.7	28.8	27.7	14.7	7.1	184	2.5
I was disappointed with the boat access facilities on this trip	22.0	38.2	23.7	7.5	8.6	186	2.4
I caught more fish on this trip than in previous years in this area	37.6	35.0	16.1	7.0	4.3	186	2.0
I caught what I consider to be a "trophy" fish on this trip	54.4	31.9	9.9	1.1	2.8	182	1.6

SD=Strongly Disagree D=Disagree N=Neutral Sl. A=Slightly Agree St. A=Strongly Agree N=Sample Size M=Mean

16a-k: Please indicate whether you agree of disagree with each of the following statements. Numbers represent the percentage of respondents.

	SD	D	N	Sl. A	St. A	N	M
Seagrass coverage in bays is important	0.0	0.5	8.3	25.8	65.5	194	4.6
Seagrasses provide important nursery areas	0.0	0.5	6.2	23.2	70.1	194	4.6
Seagrasses are important to water quality	0.0	0.5	9.3	29.4	60.8	194	4.5
Red drum populations are increasing	11.5	18.9	16.8	34.6	18.3	191	3.2
Black drum populations are increasing	4.3	14.1	47.6	28.7	5.4	185	3.2
Seagrass acreage is increasing	4.2	23.3	42.5	17.6	12.4	193	3.2
Seagrasses recover quickly from propeller scarring	11.0	29.8	24.6	20.4	14.1	191	3.0
Spotted seatrout populations are increasing	13.1	28.3	24.1	26.7	7.9	191	2.9
Shark populations are increasing	8.8	12.6	65.9	8.2	4.4	182	2.9
Atlantic croaker populations are increasing	14.2	12.6	63.9	6.0	3.3	183	2.8
Flounder populations are increasing	18.0	37.0	37.0	11.6	3.2	189	2.5

SD=Strongly Disagree D=Disagree N=Neutral Sl. A=Slightly Agree St. A=Strongly Agree N=Sample Size M=Mean

17. Are you...?

N=193	Frequency	Percent
Male	185	95.9
Female	8	4.2

18. What is your age in years?

N=196	Mean	Min	Max
	52.1	23	82

19. Are you of Spanish/Hispanic or Latino heritage?

N=186	Frequency	Percent
Yes	9	4.8
No	177	94.7

20. What is your race?

N=185	Frequency	Percent
White	181	97.8
Other	2	1.1
Black	1	0.5
Asian	1	0.5
American Indian	0	0.0

21. Was this survey completed by the person to whom it was addressed?

N=193	Frequency	Percent
Yes	189	97.9
No	4	2.1

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