

REPORT ON THE 2002 TEXAS
ABANDONED CRAB TRAP REMOVAL PROGRAM

By

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ABSTRACT

The Texas Parks and Wildlife Department (TPWD) conducted a volunteer-based abandoned crab trap removal program 16 February to 3 March 2002 in the coastal waters of Texas. Twenty-five TPWD staff-facilitated collection sites were employed to support a directed volunteer clean up. A total of 8,070 traps were removed by 543 volunteers using 223 vessels. Sixty-six percent of the total traps collected came from Galveston Bay (3,214 traps) and San Antonio Bay (2,131 traps). Four hundred and fifty-three of the traps collected were surveyed for contents and condition. A total of 2,916 man-hours were expended by TPWD staff to facilitate the program. The success of this program is justification to continue the program into the future.

INTRODUCTION

Abandoned crab traps (“derelict traps”) are defined as lost or discarded and capable or not capable of fishing. Ghost fishing of abandoned crab traps has been identified as a significant source of mortality of blue crab (*Callinectes sapidus*) and a variety of aquatic organisms, as well as creating user conflicts, visual pollution, and possibly having negative effects on sensitive habitats throughout the range of their use (Guillory 1993, Seigel and Gibbons 1995, Guillory et al. 2001).

In Texas, removal of derelict traps was delegated to Texas Parks and Wildlife Department (TPWD) game wardens with the sole authority to remove traps if they violated certain regulations. These efforts were labor intensive, time consuming and the magnitude of the problem made it unreasonable to expect practical benefits. However, efforts from law enforcement personnel had identified the extent of the problem to the State and ultimately led to a proposed solution. The solution came during the 77th State of Texas Legislature (June 2001) in Senate Bill (SB) 1410.

Senate Bill 1410, sponsored by Sen. J.E. “Buster” Brown (R-Lake Jackson) and Rep. Debra Danburg (D-Houston) created the first abandoned crab trap removal program in the State of Texas. Prior to this bill, only the trap’s owner or TPWD game wardens could legally remove crab traps from the public waters of Texas. Provisions in SB 1410 gave TPWD authority to establish a temporary closure of the recreational and commercial crab fishery. The bill stated that a seasonal closure for the use of traps would occur during the months of February or March, extend from 10 to 30 days and during the first seven days of the closure, only game wardens could remove traps. On the eighth day of the closure, abandoned traps would be considered “litter” under state health and safety regulations and anyone could pick them up. This would provide an opportunity to use volunteers in a statewide campaign to remove abandoned traps. Working out the details would be the charge of the Texas Parks and Wildlife (TPW) Commissioners.

MATERIALS AND METHODS

With the provisions of SB 1410 in hand, TPWD Coastal Fisheries Division staff worked with industry and other stakeholders on the details of the closure. Two meetings were held in June and July 2001 with the Crab Fishery Advisory Committee, the Crab License Management Review Board and the Finfish Fishermen’s License Management Review Board (finfish fishermen are allowed to use crab traps for bait purposes only and would be affected by the closure).

A variety of options were discussed with the work group to develop a plan that would: (1) be least disruptive to the fishery; and (2) maximize use of volunteer time and effort. The option of a ten-day closure with the seven-day “waiting period” was considered the least disruptive to

the fishery. However, if inclement weather occurred on the weekend of volunteer effort, there would be little opportunity to remove traps. The option of the longest closure, 30 days, would provide for maximum use of volunteer effort, but it would be the most disruptive of the options to the fishery. Ultimately, a 16-day closure was selected. The 16-day closure would be less disruptive to the fishery but would allow nine days of volunteer effort including two weekends.

Crab fishermen and seafood dealers suggested the closure occur during mid to late February when crab landings were minimal. This led to a 16 February to 3 March 2002 proposal which allowed for two weekends of volunteer effort.

Senate Bill 1410 did not set provisions regarding the magnitude of the closure, e.g. statewide or partial closure. Nevertheless, it was determined that at least during the first year's effort a statewide closure would be most beneficial. A statewide closure would be easier to enforce than a bay-by-bay closure and alternating dates or bays would be confusing to "untrained" volunteers. The advantages of an alternating date or bay closure would be that the fishery could simply move traps from a closed area to an open area and not lose fishing time.

Finally, staff approached the TPW Commission for permission to go out for public comment with a proposal of a 16-day coastwide closure to occur from 16 February to 3 March 2002. This was granted at the 29 August 2001 TPW Commission meeting.

Six coastwide public hearings were conducted in mid-October to receive input on the proposed regulations associated with removing abandoned crab traps. Announcement of these public hearings was published on TPWD's web site and was included in the TPWD weekly news release package. Additionally, local newspapers printed articles notifying interested individuals of meeting times and places. Despite these efforts, no attendees were present at three public hearings and a total of 23 people attended the remaining three public hearings. The highest attendance (16), primarily commercial crab fishermen, occurred at the public hearing in Seadrift, Texas. The majority of attendees at the Seadrift meeting were in favor of a minimum 10-day closure. One comment received at the Dickinson, Texas public hearing requested a longer closure than the proposed length. In general, the individuals at the hearings recognized the need to remove abandoned crab traps with some individuals volunteering resources for the cleanup.

Despite the majority of the public comments in favor of a 10-day closure, the TPW Commission adopted the proposed 16-day coastwide closure to occur from 16 February to 3 March 2002 as presented by staff on 7 November 2001.

Almost immediately after adoption of the proposal, efforts to seek volunteer support, donor support, and advertising of the event began. Coastal Fisheries Division staff took the lead on disseminating information about the program and to seek volunteers. With an estimated 30,000 traps lost each year in Texas, several items were immediately identified as critical program needs: (1) numerous volunteers with vessels would be needed to make a significant impact; (2) disposal facilities would be needed-either landfill or recycling if possible; (3) arrangements for staff-facilitated collection sites; (4) the crabbing and finfish industries would have to be contacted announcing the closure; and (5) abandoned traps would ultimately have to be located.

News releases were immediately sent out by the TPWD Communication Division to all written media in Texas announcing the crab trap removal program. A Coastal Fisheries Division staff member was assigned as program coordinator/contact person to facilitate both in-house and external efforts. Coastal Division staff made arrangements to give presentations to a variety of fishing organizations, conservation organizations, and any group that could possibly assist over the next three-month period. Ultimately, this effort would prove to be well spent.

It was determined that landfill disposal would be the easiest method to dispose of the traps. With no funds available to finance the project, disposal companies and municipalities willing to donate their resources to the project, including hauling and dumping, were contacted. Recycling companies were approached to take traps, but due to the lack of adequate coastwide recycling capabilities only three companies ultimately were involved with recycling. Also, it was determined that recycling of Styrofoam trap floats and nylon ropes would be available to only those recyclers permitted to recycle these materials. Because most were not permitted to handle these materials, this ultimately meant that floats and lines would have to be cut off if the traps were to be recycled. In the end, most traps were sent to the local landfills.

With over 400 miles of coastline to cleanup, numerous drop-off sites would have to be arranged. Ideally, these sites would provide volunteer orientation, disposal facilities, direction, devices to aid in collecting traps, and provide for a means of enumerating the traps that were collected. Boat ramps were identified as the most suitable locations. However, if the boat ramps were not publicly owned, then permission to utilize the premises would have to be obtained. Additionally, if launching fees were typically charged, it would be necessary to ask the owner if fees could be waived for event participants to encourage participation. In all cases where access fees were typically charged, the owner or entity in charge waived fees for program participants.

It was concluded that the most efficient method to notify approximately 1,000 commercial crab and finfish fishermen and dealers about the closure was through direct mailing. License purchase databases held by TPWD provided a means to identify fishery participants. Notices were also placed in all crab dealer establishments by TPWD staff. Finally, a TPWD newsletter "Anchor Line" directed at the commercial fishing industry would print an article about the closure in it as well. All items were earmarked for delivery to the industry during January 2002, several weeks prior to the closure. As a result, it was determined that the majority of crab fishermen had removed their active traps prior to the closure. Only a few instances of violations of the new closure were identified, with one person cited for fishing out of season. Anecdotal information from crab fishermen prior to the closure indicated that some crab dealers purchased crabs at higher than normal prices to increase stocks to carry them through the closure. However, crab catches were poor in most areas of the coast, with the exception of Aransas Bay, where above average catches were being reported.

While it was not difficult to locate abandoned traps in the bays, it was deemed necessary that during the first seven days of the closure an aerial flight would be useful in locating concentrations of derelict traps. Concerns over the expense (~\$140/hour), overall benefits of aerial flights in locating traps, use of man-power, and time required (three days to conduct a coastwide flight) were debated. Nevertheless, it was decided that a partial coastwide aerial flight would be conducted. The Laguna Madre, not known for its commercial crabbing activity (thus

likely few abandoned traps), was excluded from flight plans, allowing the rest of the coast to be surveyed depending on weather conditions and time availability. This effort proved useful in providing direction to volunteers.

TPWD recruiting efforts acquired sufficient resources to accomplish an adequate trap removal effort. With no devoted operating funds for the project, several items would need to be donated to facilitate the program. Estimated TPWD expenses, principally fuel costs and disposal fees, were projected at about \$14,000. Tarps to protect volunteer boats, crab trap hooks to help with handling traps, and gloves were targeted as potential donor items. Additionally, donations of items such as water, soft drinks and fishing tackle samples, could serve as an enticement to volunteers and were solicited as well.

Companies and organizations were amenable to donating resources due to the projected resource benefits, potential for reducing user conflicts and the popularity of debris cleanups. Ultimately, 61 companies, organizations, municipalities, and government entities donated resources to the project or helped with the cleanup efforts (Appendix A).

The most difficult donation to secure was trap disposal. A large disposal company, with facilities located coastwide, was approached to donate the disposal for the entire project. Unfortunately, a donation request to the parent company was denied based on the cost and scope of the project. Each bay system ultimately secured disposal and/or recycling at the local level, which involved several companies, municipalities and counties. This task was time consuming, but eventually all disposal was donated.

Late in the donation acquisition process, the Coastal Conservation Association Texas (CCA Texas), headquartered in Houston, Texas, secured a \$14,000 grant from the National Oceanic and Atmospheric Administration (NOAA) Restoration Center through the FishAmerica Foundation. Staff involvement in the grant request process was limited to providing an itemized list of materials that funds would be used for: TPWD fuels costs, aerial flights, volunteer recruitment, and other associated items. Staff also provided a "Letter of Support" for the grant request and a project description. Conditions of the grant agreement included adhering to the projected material purchase list and funds had to be spent within one year. Reporting requirements included an interim report and final report due no later than 5 April 2003.

Saturday, 23 February 2002, was selected as the "main event" day, with a 0900 to 1600 hours schedule. Although it was the eighth day of the closure, it was the first day volunteers could collect abandoned crab traps. This would maximize the time allotment available to use volunteers or in the case of inclement weather it allowed for the next available weekend day to hold the event. Weekend days were the best available days to expect volunteer participation.

The plan was to use TPWD personnel to staff 24 sites coastwide, plus a staff-only site within the TPWD J.D. Murphree Wildlife Management Area in Sabine Lake and one site in Aransas Bay where traps could be dropped off for staff to remove later (Figure 1). Staff would provide orientation, available resources, direction, disposal facilities, and provide for a media contact if the situation arose. Those bays predicted to have the most abandoned traps had more sites than those with less traps. Galveston Bay, due to the size of its crab fishery and its large

geographic size had the most (8) staff facilitated sites. The least number of sites was at Sabine Lake (1). However, because the TPWD J.D. Murphree Wildlife Management Area, a fresh, intermediate and brackish water marsh, covers about 12% of the Sabine Lake ecosystem and concerns over using “untrained” volunteers traversing the delicate marsh habitat led to the decision that staff only would cleanup that area (J. Mambretti personal communication).

Two sites were designated as major “media” sites, located near the two largest metropolitan areas on the Texas coast – Seabrook Public Ramp near Houston and Conn Brown Harbor in Aransas Pass near Corpus Christi. Local television and written media were invited to document the event and provide exposure for the program to stimulate interest in future cleanups. Legislators, TPW Commissioners, and local dignitaries were invited to observe the event at these sites. These two sites would ultimately provide for public relation opportunities to not only the program, but for donors that actively participated at the site.

Contacts with federal wildlife management areas and refuges would provide additional weekday effort. Generally, these facilities were more interested in using their staff or their volunteers to work more sensitive areas available to them. This additional effort would prove to be effective in areas where access was limited or restricted and allowed for extended collection dates that otherwise would not have occurred.

Additionally, some volunteer effort was slated for weekday effort for those that could not participate on the staff-facilitated date. Most notable was the Exxon-Mobil Emergency Oil Spill Response Team that wanted to use their 50-man crew and 19 vessels to work on their own, using their own equipment and disposal facilities, as a training exercise for the team. Weekday effort would have to be self-facilitated, but by contacting the local TPWD Coastal Fisheries Division office, direction and disposal of traps could be arranged.

At each staff-facilitated site, one person would be designated as the official trap counter. This would allow the on-site facilitator to focus on other duties. Data collection cards were provided to participants that collected traps on days other than 23 February. This provided a means to record the location and number of traps collected and information on how to contact TPWD with questions (Appendix B.1). The data card was available on the TPWD website (www.tpwd.state.tx.us) or could be mailed or faxed to the participant.

Being the first event of its kind ever to be held in Texas provided an opportunity to collect limited data on condition of the traps and organisms found in these traps. Allowing “untrained” volunteers to collect data could lead to improper data collection, species misidentification, location miscues, and other problems that would affect the integrity of the information. Maintaining quality control on a full-scale data collection regime would be too difficult and was not a priority of the program. Therefore, a minimum of 30 observations per bay system was recommended to be collected, dispersed evenly within the bay system as best as possible, using trained individuals (e.g., TPWD staff, trained biologists, university biology students, retired biologists, etc.) to collect the data. The data would provide reasonably accurate anecdotal information on what organisms were in the trap, their condition (live or dead) and some information about the trap condition, i.e., if escape rings, degradable panels or owner

identification were present. Standardized data collection cards were developed to accomplish this task (Appendix B.2).

Dealing with volunteers is never a certain undertaking, but it was estimated, based largely on word of mouth and some written commitment, that about 600 volunteers with 200 vessels had indicated that they would help out with the project. Also dealing with a predisposed time line, weather would be a factor in the ability to conduct a successful cleanup. Additionally, if the volunteers thought of this as an opportunity for an overall debris clean up as well, it would require other or more disposal capabilities on site. In fact, the Valley Sportsman's Club had coordinated their annual bay debris cleanup with the crab trap cleanup at the same site and date at Adolph Thomae County Park in the lower Laguna Madre.

During the first seven days of the closure (16-22 February), two aerial flights were scheduled to fly as much of the coast as possible, surveying the shallow waters to get information that would aid in directing volunteer effort toward concentrations of traps. These aerial surveys could also be useful in measuring the success of the program. However, enumerating abandoned traps from the air proved to not be as useful as originally hoped based on the discrepancy in the number of traps seen from the air and from what was collected during the cleanup. Also, TPWD game wardens monitored the field situation during this time period to ensure that no one violated the closure.

Weather conditions on the "main event day" (23 February) turned out to be as favorable as could be expected. A cold front had passed on 21 February and clearing weather conditions turned out to be ideal for the event – sunny, about 23.0°C, light wind, calm sea conditions and low tide early in the morning. Volunteer interest was keen and energetic. Registration began as soon as staff was able, largely beginning by 0800 hours, with sign in sheets and liability waivers (Appendix C) signed. Donated equipment (3.6 m x 4.3 m) polyethylene tarps, crab trap hooks, gloves, etc.) were dispersed and after a short orientation at 0900 hours most volunteers were off to collect traps. Those that did not have boats would act as crew for those who brought a boat, but did not have crewmembers.

By 1030 hours many boats had returned to drop off traps. Ground crews transferred traps to dumpsters, dump trucks, trailers or what ever was used to haul traps. At some sites, this would prove to be a major undertaking and indicated a need for additional people. By 1400 hours most volunteers had ceased collecting traps and by 1600 hours all personnel had cleaned up their respective sites and were done for the day.

While a concerted volunteer effort was not planned from 24 February to 3 March, there were a few opportunities that could prove fruitful. Most notable would be the Exxon-Mobil Oil Spill Emergency Response Team efforts in Galveston Bay. Their team could be directed to collect abandoned traps that were missed. However, cold fronts during the week doomed the team's efforts and in one day's effort only 12 traps were recovered. In fact, deteriorating weather conditions proved to greatly diminish most attempts throughout the week.

Nevertheless, despite inclement weather conditions federal refuge staff and TPWD staff efforts, particularly in the Galveston Bay and Sabine Lake systems, did manage to collect more traps.

RESULTS

During the closure (16 February to 3 March), a total of 8,070 traps were collected by 554 volunteers using 228 vessels (Table 1). The number of traps ranged from 86 in the lower Laguna Madre to 3,214 in Galveston Bay. Two-thirds of the traps came from Galveston and San Antonio Bays. Most of the traps (6,888) were collected on 23 February, with the majority (2,713) coming from Galveston Bay and the least (38) coming from the lower Laguna Madre.

The TPWD Law Enforcement Division collected 318 traps from 16 February to 22 February. Twelve citations were written to one person for illegal use of traps during the closure. No other illegal activities were reported.

Data were recorded on the condition and contents of 453 traps (Table 2). Less than 10% of the traps were lying on sea grass beds. Forty-two percent had some sort of owner identification present. Thirty-four percent were in a "fishable" condition. Thirty-four percent had degradable panels present, with 41% of those open. Sixty-seven percent had escape rings present.

Of these 453 traps, 21 species of organisms were observed, most in live condition. Blue crab was the most numerous species observed (46%), followed by Gulf stone crab (*Mennippe adina*) (30%) and sheephead (*Archosargus probatocephalus*) (8%) (Table 3).

Overall, out of pocket expenses for the project (not counting administrative salaries) were approximately \$16,000. However, this was largely recovered through a donation of a grant secured by CCA Texas from the FishAmerica Foundation funded by the NOAA Restoration Center.

Donations to the project included 600 pairs of waterproof gloves (Best Manufacturing), 200 crab trap gaffs (Wimberly Investments), 200 12' x 14' polyethylene tarpaulins (Coastal Bend Bays and Estuaries Program), \$600 worth of soft drinks and water (HEB), 600 samples of suntan lotion (SmartShield), and 600 grab bags of fishing tackle (Berkley), plus donated services for disposal, hauling, and dump fee waivers. Volunteers expended roughly 4,400 man-hours estimated to be worth more than \$73,000 to the program.

Prior to the cleanup, TPWD staff made 22 presentations to 14 different organizations in eight different cities. During the entire project, staff expended 2,916 man-hours to the program, either by making presentations or facilitating drop off sites.

DISCUSSION

The number of traps collected is clearly indicative of the abandoned crab trap problem in Texas and may be indicative of the problem in other states. Anecdotal information suggests that there could be thousands of traps remaining in Texas bays. This is not unexpected due to prior estimates (based on interviews with crab fishermen) of over 30,000 traps lost each year in Texas. This effort was concentrated in the shallow waters along shorelines of islands and the mainland, however there is plenty of deep water that likely harbors more traps. Although low tides occurred on the morning of 23 February, it appears that extremely low tides often associated with a frontal passage may make conditions more favorable for trap removal, exposing more traps to passing observers. A method to find and collect deep-water traps would be useful in collecting additional traps.

While difficult to measure, most parties involved have deemed this a successful first attempt at removing traps from the Texas coast. Volunteer enthusiasm, a directed promotional program, media attention, the relatively large number of stakeholder groups/organizations in Texas, and the proactive nature of the program were factors that positively influenced the program's success. Despite the accomplishment, there is always room for improvement and TPWD staff made several recommendations that may be useful in future cleanups (Appendix D).

Staff presentations to stakeholder groups and media attention were useful in recruiting volunteers. Organizations with sport fishing ties were targeted as most likely to participate in the program. Often these types of organizations are well established, having numerous members, and generally have a resource/habitat protection mission or goal that lend them to be ideally suited to participate in such programs. Drawbacks were that some organizations were too wide spread (many chapters spread out over a wide area) to approach with one or two presentations. This led to several chapters of the same organization being approached, when ideally one presentation to the main chapter or head quarters would condense staff effort. Also, these types of organizations may not be networked with each other enough to ensure that word gets out to all chapters. Therefore, approaching each individual chapter may be the best solution even though more staff effort is required. Media, particularly written media, is often looking for new stories and the proactive nature of this program was well suited and should not be overlooked in future endeavors. Several contacts with volunteers were made simply by people reading about the program in their local newspaper.

However, using volunteers as the "backbone" of the program can be problematic. The uncertainty of their participation, getting accurate response to inquiries on the amount of resources offered, liability issues (especially when TPWD equipment is involved), and ensuring accurate information dissemination can be of concern. Nevertheless, the costs associated with conducting such a project with only department resources and staff would outweigh the problems considering the magnitude of such a project, therefore the uncertainties must be coordinated around a "worst case scenario". In this case, coordinators should plan around the possibility of little or no volunteer participation.

It has been suggested that conducting cost-benefit analyses of the program should be considered. While the monetary expenditures to conduct the project are fairly easy to obtain, the benefits are extremely difficult to measure. The data collection design did not effectively address the intangible benefits of removing traps, such as value of organisms "saved", the importance of removing debris from the water, the loss of productivity of the fisherman, or the benefits of reducing user conflicts.

Nevertheless, there are numerous benefits to removing abandoned crab traps. The amount of organisms wasted due to the ghost fishing effects of abandoned traps was reduced. These organisms have the potential to contribute to the spawning success of the species and/or can be harvested, as in the case of blue crabs, at a later date. Additionally, removing unsightly debris from Texas bays has aesthetic value. Removing abandoned traps should reduce bay user conflicts. Finally, there are benefits to species of special concern, such as diamondback terrapins (*Malaclemys terrapin*) which are being considered for threatened or endangered species status. The many benefits associated with removing abandoned crab traps provide the justification to continue the program into the future.

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Table 1. Number and percent by bay system of abandoned crab traps collected, number of volunteers and number of volunteer vessels used during the Texas Abandoned Crab Trap Removal Program held 23 February to 3 March 2002.

Major Bay	<u>Traps collected</u>		<u>Volunteers</u>		<u>Vessels used</u>	
	no.	%	no.	%	no.	%
Sabine Lake	438	5	16	3	8	4
Galveston Bay	3214	40	190	34	77	34
Matagorda Bay	526	7	36	6	12	5
San Antonio Bay	2131	26	106	19	43	19
AB/CCB ^a	1392	17	124	22	53	23
Upper Laguna Madre	283	4	18	3	7	3
Lower Laguna Madre	86	1	64	12	28	12
Total	8070	100	554	100	228	100

^a(AB/CCB = Aransas Bay and Corpus Christi Bay combined)

Table 2. Number and summary of observations (in percent) by bay system on condition of abandoned crab traps observed during the 2002 Texas Abandoned Crab Trap Removal Program (23 February to 3 March).

Major Bay	Sabine Lake	Galveston Bay	Matagorda Bay	San Antonio Bay	Aransas Bay	Corpus Christi Bay	Upper Laguna Madre	Lower Laguna Madre	Coastwide
No. of traps observed	83	93	31	48	62	68	31	37	453
On seagrass ^a	0	0	0	6	30	6	26	0	7
ID present ^b	35	37	48	60	61	32	32	41	42
Fishable condition ^c	17	29	42	77	23	23	42	57	34
Degradable panel present ^d	40	67	23	42	14	14	19	14	34
Degradable panel open ^e	52	30	33	55	60	57	100	40	41
Escape rings present ^f	76	70	74	88	80	46	45	49	67

^aOn seagrass = trap was resting on seagrass beds.

^bID present = some type of identification traceable to trap owner was present.

^cFishable condition = trap could be reused with simple modifications.

^dDegradable panel present = traps was equipped with a legal degradable panel device.

^eDegradable panel open = degradable panel was open.

^fEscape rings present = 60.3 mm escape rings present.

Table 3. Numbers and percent composition of organisms observed in 453 abandoned crab traps collected coastwide during the Texas Abandoned Crab Trap Removal Program held 23 February to 3 March 2002.

Species observed	Scientific name	No. observed	% of total
Blue crab	<i>Callinectes sapidus</i>	314	49
Stone Crab	<i>Menippe adina</i>	179	28
Sheepshead	<i>Archosargus probatocephalus</i>	48	7
Thinstripe hermit crab	<i>Clibanarius vittatus</i>	30	5
Gulf toadfish	<i>Opsanus beta</i>	28	4
Black drum	<i>Pogonias cromis</i>	12	2
Hardhead catfish	<i>Arius felis</i>	6	1
Striped mullet	<i>Mugil cephalus</i>	6	1
Red drum	<i>Sciaenops ocellatus</i>	4	1
Pinfish	<i>Lagodon rhomboides</i>	3	<0.01
Bay whiff	<i>Citharichthys spilopterus</i>	3	<0.01
Diamondback terrapin	<i>Malaclemys terrapin littoralis</i>	2	<0.01
Longnose spider crab	<i>Libinia dubia</i>	2	<0.01
Southern flounder	<i>Paralichthys lethostigma</i>	2	<0.01
Spotted scorpionfish	<i>Scorpaena plumieri</i>	2	<0.01
Pelecypoda	<i>Rangia</i> sp.	1	<0.01
Musk turtle	Family Kinosternidae	1	<0.01
Spotted seatrout	<i>Cynoscion nebulosus</i>	1	<0.01
Gray snapper	<i>Lutjanus griseus</i>	1	<0.01
Gulf killifish	<i>Fundulus grandis</i>	1	<0.01
Inshore lizardfish	<i>Synodus foetens</i>	1	<0.01
Total observed		647	100

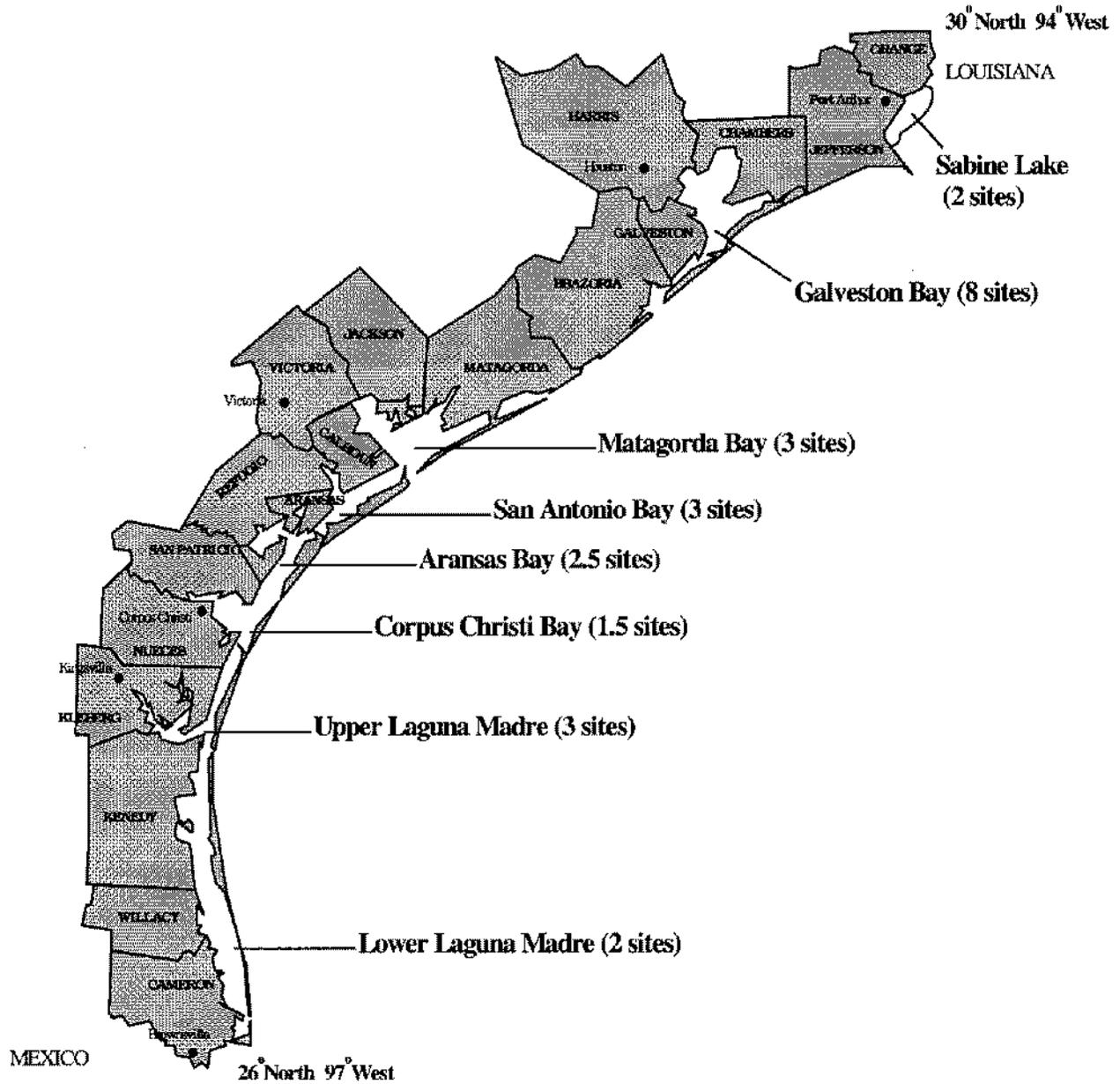


Figure 1. Map of Texas coast with bay systems and number of facilitated sites. Aransas Bay and Corpus Christi Bay shared a site.

Appendix A. Name of participant organizations and donors.

Appendix A. List of participant organizations and donors to the 2002 Texas Abandoned Crab Trap Removal Program.

Aransas County	Saltwater Anglers League of Texas
Bass Enterprises	Marker 37 Marina
Berkley	Matagorda County
Boots & Coots International Well Control	Mississippi Department of Marine Resources
Brazoria County	Padre Island National Seashore
Calhoun County	Pompano Lease Service, Inc.
Cameron County Causeway Bait Camp	Port Mansfield Port Authority
Best Manufacturing	Port of Bay City
Center for Fisheries Research and Development- Gulf Coast Research Laboratory	Republic Waste Services
Chambers County	Saltwater Conservation Association of Texas
Charlie's Bait Stand	Saltwater-Fisheries Enhancement Association
Christmas Bay Foundation	Shore Fishing and Casting Club International
City of Aransas Pass	Smart Shield
City of Corpus Christi	Stingaree Marina
City of Kingsville	Team Oso
City of Palacios	Texas A&M University-Corpus Christi
City of Port Lavaca	Science Club
Clear Creek Environmental Foundation	Texas A&M University-Corpus Christi Tri- Beta Society
Coastal Bend Bays & Estuaries Program	Texas General Land Office
Coastal Bend Guides Association	Texas Marine Mammal Stranding Network
Coastal Conservation Association	Texas Parks and Wildlife Department
Commercial Metals	Texas Outdoor Writers Association
Crawley's Bait Camp	Trailer Trash
Dawson Recycling	U.S. Coast Guard Auxiliary
Eagle Point Bait Camp	University of Texas Marine Science Institute
ExxonMobil	U.S. Fish & Wildlife Service
Galveston County	Valley Sportsman Club
Gulf States Marine Fisheries Commission	Victoria College Biology Club
HEB	Waste Management Inc.
Jefferson County	Willacy County
Kirby Inland Marine	Wimberly Investments

Appendix B. Data collection cards.

Appendix B.2. Front and back page of observer data collection card.

LOCATION _____

PLEASE FILL OUT ONE COLUMN PER TRAP 1 2 3 4 5

1. Was trap lying on seagrass? (Y/N)					
2. ID present (gear tags, # on buoy) (Y/N)					
3. Condition of trap? Usable (U) Non-usable (N)					
4. Degradable panel present? (Y/N)					
4a. If yes, was degradable panel open (Y/N)					
5. Escape vents/rings present? (Y/N)					

Number of bycatch species/live (L) or dead (D). Eg. Blue crab = 2L 1

Blue crab					
Stone crab					
Diamondback terrapin (See description on back)					
Other species, please write in:					

COMMENTS

TEXAS ABANDONED CRAB TRAP DATA CARD

INSTRUCTIONS
 Please fill out a column for each trap. Location can be major bay or minor bay.
 Question 3: Usable (fishable with minor repairs)
 Non-usable (too heavily damaged to be fished)
 Question 4: Degradable panel (can be loop of string or wire for attaching trap lid
 tie-down strap OR 3"x6" panel on side of trap.
 Question 5: Escape vents present (PVC rings 2 3/8" in diameter located on the
 outside trap walls)

SAFETY TIPS
 Wear life vest, gloves, protective clothing
 Use caution with barnacles, shell, rusty wire
 Be careful when pulling/lifting traps stuck in mud
 Use VHF radio or cell phone for emergency communication

IN THE EVENT OF FOUL WEATHER:
 The decision to postpone the first day's efforts in case of inclement weather will be
 made sometime that morning at the local level. Nevertheless, using common sense
 would dictate whether to participate or not during marginal weather conditions.
Trap Drop-Off sites will be manned from 9:00 a.m. to 4:00 p.m.
 Other trap disposal can be facilitated by contacting one of the following:

TPWD CONTACTS

Sabine Lake	Jerry Mambretti	(409) 983-1104
Galveston Bay	Lance Robinson	(281) 474-2611
Matagorda Bay	Bill Balboa	(361) 972-6263
San Antonio Bay	Norman Boyd	(361) 983-4425
Aransas Bay	Karen Meador	(361) 729-2328
Corpus Christi Bay	Terry Cody	(361) 729-2328
Upper Laguna Madre	Kyle Spiller	(361) 825-3353
Lower Laguna Madre	Randy Blankinship	(956) 350-4480
Coastwide Coordinator	Art Morris	(361) 825-3856

Please return data cards to the facilitator on site or mail to:

Texas Parks and Wildlife
 Attn: Art Morris
 6300 Ocean Drive, Ste. 2500
 Corpus Christi, TX 78412

Diamondback terrapin ID
 -Usually have small black spots on heads and legs
 -May have blue or gray heads & a diamond shaped spot on head
 -The shell is brown to black, w/ diamond-shaped patterns; underside yellow or brown

Appendix C. Volunteer liability waiver form.

Appendix C. 2002 Abandoned crab trap removal program volunteer liability waiver form.

LIABILITY RELEASE

In consideration for the opportunity to participate in the Crab Trap Cleanup on or about February 23, 2002, **I AGREE TO RELEASE, DISCHARGE, INDEMNIFY, AND HOLD HARMLESS THE TEXAS PARKS & WILDLIFE DEPARTMENT FROM ANY AND ALL CLAIMS, LOSSES, DAMAGES, DEMANDS, CAUSES OF ACTION, SUITS, AND LIABILITY OF EVERY KIND RESULTING FROM THE CRAB TRAP CLEANUP, INCLUDING WITHOUT LIMITATION ANY CLAIM FOR LOSS, DAMAGE, OR DESTRUCTION OF PROPERTY, OR INJURY (INCLUDING DEATH) REGARDLESS OF WHETHER SUCH LOSS ARISES IN WHOLE OR IN PART FROM THE NEGLIGENCE OF TPWDD.** The released parties include all agents, employees, officers, directors, and contractors of TPWDD. I have read this release and I understand all of its terms.

I understand that water activities pose risks of personal injury and property damage, including but not limited to drowning, animal stings or bites, and hypothermia. I understand that litter such as abandoned crab traps presents dangers of cuts, punctures, and other injury.

I understand that I am participating in the Crab Trap Cleanup at my own risk and that TPWDD does not have responsibility for my safety or the safety of persons under my care.

I WILL WEAR A PERSONAL FLOTATION DEVICE (LIFE PRESERVER) AT ALL TIMES WHILE IN OR ON THE WATER AND I WILL ASSURE THAT ALL PERSONS UNDER MY CARE DO SO AS WELL. I WILL USE ALL APPROPRIATE PROTECTIVE EQUIPMENT TO PROTECT MYSELF AND ALL PERSONS UNDER MY CARE FROM INJURY DUE TO LITTER.

I sign this release voluntarily and with full knowledge of the legal consequences.

Signature of Volunteer or Parent/Guardian
(Parent/Guardian must sign if participant is under 18)

Date

Printed Name

Appendix D. Texas Parks and Wildlife Department staff recommendations for improving future abandoned crab trap removal programs in Texas.

Appendix D. Texas Parks and Wildlife Department staff recommendations for improving future abandoned crab trap removal programs in Texas.

- .Re-evaluate the use of data card for volunteers at staff facilitated sites.
- .Consolidate sites where there was little or no turnout of volunteers.
- .Obtain washing equipment for cleaning up site/docks after the event.
- .Implement awards program to recognize individual(s) effort and to garner future support/participation.
- .Involve commercial crab industry by invitation.
- .Obtain more crab trap hooks.
- .Document incidence of escape rings and degradable panels that have been intentionally disabled.
- .Document the presence or absence of bait in traps.
- .Document the location of trap as being on shore or in water.
- .Start times and end times should be earlier, e.g. 8:00 a.m. to 2:00 p.m.
- .The initial seven-day period of the closure should be arranged to allow game wardens to collect traps without the burden of storing traps as evidence.
- .Plan for more shore based personnel to facilitate disposing of traps brought to dock.