

Texas Parks and Wildlife for the 21st Century

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Abstract: Recognizing the need for a statewide plan to guide its future programs, Texas Parks and Wildlife (TPWD) commissioned this study to develop a comprehensive plan for TPWD to meet the natural and cultural resources and recreation needs in Texas through the year 2030. This publication focuses on Phase I of the study, which consisted of holding a series of 13 formal focus groups and 7 telephone surveys to understand Texans' opinions on and attitudes toward the outdoors, on natural and historical resources, and on Texas Parks and Wildlife and its programs. In addition to the general population, 8 specific constituent groups were surveyed: anglers (saltwater and freshwater), hunters, boaters, park users (day and overnight), outdoor recreation enthusiasts, and landowners. Survey results indicated that Texas' natural and cultural resources and outdoor recreation are important issues to most Texans, with 97% of respondents stating

it was either very important (79%) or somewhat important (18%) that natural areas exist in Texas for enjoying and experiencing nature. Overall, all constituent groups had a high level of satisfaction with their outdoor recreational experiences in Texas. Water resources, including both water quantity and quality, were by far the most important natural resource and environmental concerns of Texans. The results of this study will be used to establish the foundation for TPWD's future planning efforts.

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At the turn of the 20th Century, Texas was a rural, sparsely populated state of 3 million people with an average population density of 11 people per square mile (U.S. Census Bur. 1996, Schmidly et al. 2001). At the turn of the 21st Century, Texas' population had grown to 20 million people with an average population density of 74 people per square mile (U.S. Census Bur. 2000, Schmidly et al. 2001). Projections indicate that Texas' population will double to 40 million by the turn of the next century (Schmidly et al. 2001). Texas' increasing population growth coupled with an historically small percentage of public land (4%) make comprehensive planning critical to protect the State's natural and cultural resources and to maintain and enhance outdoor recreation opportunities (Schmidly et al. 2001).

In 2000, the Texas Parks and Wildlife Department (TPWD) initiated a planning project with Texas Tech University, Responsive Management, and Loomis Austin, Inc. The primary objective of the project was to develop a comprehensive plan for the TPWD to meet the natural and cultural resources and recreation needs in Texas through the year 2030. This study was conducted in 2 phases. Phase I was conducted by Responsive Management and involved a needs assessment of the Texas public. Phase II was conducted by Loomis Austin, Inc., and involved a statewide conservation needs assessment. This publication focuses on the results of the work conducted by Responsive Management (Phase I), with the following objectives: to better understand the attitudes of the Texas public, constituents, and stakeholder groups toward 1) resource protection, 2) state management of natural and cultural resources, and 3) attitudes toward TPWD programs. Phase I was also designed to better understand the rates of outdoor recreation participation, identify unmet public wants and needs and establish benchmarks to allow the TPWD to measure their progress in meeting public needs by comparing attitudes, participation rates, and unmet wants at periodic intervals in the future.

This study is the latest in a long series of research projects that have helped shape the policies of the TPWD. In 1963, the Texas State Parks Board collaborated with Texas Tech College to develop a long-range plan for the state park system. The study surveyed the state's holdings at that time and became the blueprint for parks and recreation in the following decades (Dep. Park Adm. and Texas Tech. Coll. 1963).

During the 1970s, the Lyndon B. Johnson School of Public Affairs at the University of Texas produced a second study to help identify and protect significant nat-

ural areas in Texas. Along with the Texas Tech report, this study influenced subsequent acquisitions by TPWD, the National Park Service, the Nature Conservancy, and other conservation groups. Some of the state's most important parks and refuges were acquired as a result of these studies. In the late 1990s, TPWD commissioned Texas A&M University to conduct an analysis to explore the state's most pressing needs in the area of conservation and recreation and to identify the most effective methods of preparing to meet those needs (Thomas and Adams 1998).

Methods

Responsive Management conducted Phase I from May 2000 to March 2001. Phase I was a major needs assessment of the Texas public. Step 1 included a review of previous research and internal TPWD documents. Step 2 included a series of 13 formal focus groups with the public and various constituents including African Americans, hunters, anglers, boaters, urban residents, day park users, overnight park users, Hispanics, ranch owners, large landowners, suburban residents, and wildlife viewers. Step 3 consisted of a series of 7 telephone surveys of the general population as well as key stakeholder groups, including anglers (saltwater and freshwater), hunters, boaters, park users (day and overnight), outdoor recreation enthusiasts and landowners who own >260 ha.

The 7 travel and tourism planning regions, according to the Texas Parks and Wildlife's mapping of these regions, were 1) Big Bend Country, 2) Gulf Coast, 3) Hill Country, 4) Panhandle Plains, 5) Piney Woods, 6) Prairies and Lakes, and 7) South Texas Plains (please see Texas Dep. Transportation at www.traveltex.com).

The software used for data collection for the telephone surveys was Questionnaire Programming Language (QPL) version 4.1 (Natl. Tech. Info. Serv. 1999). The survey data was entered into the computer as the interviews were conducted, eliminating possible errors associated with manual data entry after the completion of the interviews. Data analyses were performed by computer using the Statistical Package for Social Sciences (SPSS 1999).

General Population Survey

This survey was administered to randomly selected Texas residents. A total of 2,002 residents were interviewed. The number of interviews completed in each region is as follows: Big Bend ($N = 297$), Gulf Coast ($N = 279$), Hill Country ($N = 287$), Panhandle Plains ($N = 296$), Piney Woods ($N = 287$), Prairies and Lakes ($N = 283$), and South Texas Plains ($N = 273$). The response rate for this survey was 58.3%. The sampling error, based upon 95% confidence intervals, was at most $\pm 2.2\%$ statewide and for each region the sampling error was at most $\pm 5.9\%$. Data were collected to create regional representations of Texas residents. For a statewide representation, regional data were weighted to make each region representative of the statewide proportion of residents who reside in each region. A weighting plan was developed based on the population of residents within each region. The sample was purchased from Survey Sampling, Inc., (SSI) of Fairfield, Connecticut.

Texas Licensed Angler Survey

This survey was administered to a randomly stratified sample of resident, licensed, Texas anglers who had been fishing in Texas during the past 2 years. The sample was a random stratification of coastal (49%) and inland (51%) anglers. The sample of Texas fishing license holders was supplied by the Texas Parks and Wildlife Department. This sampling procedure was a replication of the sampling procedure used by Ditton and Bohnsack (1998). The weighting procedure allowed the data to match the appropriate proportions of coastal (27%) to inland (73%) anglers described by Ditton and Bohnsack (1998). The existing data was adjusted by a factor of .553 for coastal anglers and by a factor of 1.43 for inland anglers. This resulted in the data matching the known actual distribution of all anglers as previously documented in the literature. The response rate for this survey was 51%. The sampling error, based upon 95% confidence intervals and a total population of licensed anglers of 1,533,925, was at most $\pm 3.4\%$ statewide and at most $\pm 4.9\%$ for coastal or inland anglers.

Texas Licensed Hunter Survey

This survey was administered to randomly selected Texas hunters who had purchased a hunting license in Texas for the 1999–2000 hunting season. A total of 809 licensed hunters were interviewed from a sample of license-holders supplied by the Texas Parks and Wildlife Department. The number of interviews completed in each region is as follows: Big Bend ($N = 116$), Gulf Coast ($N = 116$), Hill Country ($N = 116$), Panhandle Plains ($N = 117$), Piney Woods ($N = 116$), Prairies and Lakes ($N = 118$), and South Texas Plains ($N = 110$). The response rate for this survey was 49%. The sampling error, based upon 95% confidence intervals and a total of 941,268 licensed hunters, was at most $\pm 3.4\%$ statewide and for each region the sampling error was at most $\pm 9.3\%$.

Data were collected to create regional representations of Texas hunters. For a statewide representation, the data were weighted to have the correct proportion of 4 hunter license types in the total sample. This weighting method was developed based on the proportion of each hunter license type in the state. This data was obtained through the Texas Parks and Wildlife Department (Kelly Dziekan, pers. commun. 14 Jul 2000). These values were then converted into the weights to assure that the distribution in the sample represented the actual distribution of hunters holding each license type in the population.

Texas Boater Survey

This survey was administered to randomly selected registered boaters in Texas who had been boating in Texas in the past 2 years. A total of 811 boaters were interviewed from a population of 618,643 total boaters in the State of Texas. Texas Parks and Wildlife Department supplied the sample. The number of interviews completed in each region is as follows: Big Bend ($N = 116$), Gulf Coast ($N = 115$), Hill Country ($N = 117$), Panhandle Plains ($N = 126$), Piney Woods ($N = 124$), Prairies and Lakes ($N = 110$), and South Texas Plains ($N = 103$). The response rate for this survey was 45%.

The sampling error, based upon 95% confidence intervals, was at most $\pm 3.4\%$ statewide and for each region the sampling error was at most $\pm 9.6\%$.

Data were collected to create regional representations of Texas boaters. For a statewide representation, regional data were weighted to make the regional proportions of boaters in the sample match the actual statewide proportion of boaters in the region. A weighting method was developed based on the population of boaters within each region.

Texas Landowner Survey

The survey of Texas landowners was administered to randomly selected landowners in Texas who owned 260 ha or more. The sample was obtained from county property tax records. A total of 563 landowners were interviewed. The survey was conducted with landowners in each of the 7 tourism regions for statewide representation. TPWD selected sample counties that were considered representative of its respective region. In total, 33 counties were contacted and 22 agreed to supply samples.

The number of interviews completed in each region is as follows: Big Bend ($N = 87$), Gulf Coast ($N = 113$), Hill Country ($N = 140$), Panhandle Plains ($N = 71$), Piney Woods ($N = 46$), Prairies and Lakes ($N = 35$), and South Texas Plains ($N = 71$). The sampling error for this study is $\pm 4.1\%$ statewide.

Overnight Park Users

This survey was administered to randomly selected individuals who had stayed overnight in a Texas state park in 2000. Participants were selected from a sample supplied by the Texas Parks and Wildlife Department. A total of 815 overnight park users were interviewed. The random sample was distributed among the 7 tourism regions: Big Bend ($N = 115$), Gulf Coast ($N = 119$), Hill Country ($N = 115$), Panhandle Plains ($N = 118$), Piney Woods ($N = 121$), Prairies and Lakes ($N = 116$), and South Texas Plains ($N = 111$). When interviewed, many individuals indicated that the last park they had visited in the previous 12 months was a park in a region other than the one from which their sample had been drawn. Because the survey questions and responses were relative to the most recent park visited, the most recent data for each region was used. Therefore, the sample was no longer evenly distributed among the regions. However, the regional re-categorization made for more accurate interpretation. The number of interviews completed for each of the more accurately recoded regions were as follows: Big Bend ($N = 64$), Gulf Coast ($N = 84$), Hill Country ($N = 244$), Panhandle Plains ($N = 123$), Piney Woods ($N = 117$), Prairies and Lakes ($N = 149$), and South Texas Plains ($N = 34$).

Day Park Users

This survey was administered by telephone to randomly selected residents who had spent time during the day in a Texas state park in 2000. A total of 785 day park users were interviewed. The survey sample was obtained through 87 state parks in Texas that each sent to Responsive Management samples of 100 day visitors. All 7 of

the tourism regions supplied data: Big Bend (11 parks), Gulf Coast (10 parks), Hill Country (10 parks), Panhandle Plains (10 parks), Piney Woods (11 parks), Prairies and Lakes (22 parks), and South Texas Plains (7 parks).

Out of this data an even distribution of 450 names per region were selected for calling. As with the night park users, many of the individuals indicated that the last park they had visited in the previous 12 months was a park in a region other than the one from which their sample had been drawn. Because the survey questions and responses were relative to the most recent park visited, the most recent data for each region was used. Therefore, the sample was no longer evenly distributed among the regions. However, the regional re-categorization made for more accurate interpretation. The number of interviews completed for each region was as follows: Big Bend ($N = 95$), Gulf Coast ($N = 91$), Hill Country ($N = 149$), Panhandle Plains ($N = 100$), Piney Woods ($N = 117$), Prairies and Lakes ($N = 148$), and South Texas Plains ($N = 85$).

The overall response rate for both day and night park users was 52% with 1,600 completed contacts out of the original sample of 3,105.

Outdoor Recreationists Survey

This survey was administered by telephone to 801 randomly selected Texas residents. Unlike the general population survey, this survey was conducted on a statewide basis. The response rate for this survey was 48%, and the sampling error was, at most, $\pm 3.5\%$. The sample was purchased from SSI.

Results

The Value of Natural and Cultural Resources and Outdoor Recreation to Texans

Results clearly indicated that Texas' natural and cultural resources and outdoor recreation are important issues to most Texans. In the general population survey of Texans, 98% felt it was either very important (72%) or somewhat important (26%) that people have opportunities to visit state parks. Ninety-seven percent stated it was either very important (80%) or somewhat important (17%) to know that wildlife exists in Texas. Ninety-seven percent stated it was either very important (79%) or somewhat important (18%) that natural areas exist in Texas for enjoying and experiencing nature. Ninety-four percent felt it was either very important (73%) or somewhat important (21%) that fish and wildlife populations be properly managed and conserved.

Overall, natural resource/ecological values and "passive" types of outdoor recreation were more important to Texans than "consumptive" or "active" types of recreation such as hunting, fishing, and boating, although it is important to note that both were shown to be important. The McNemar test for dependent categorical samples (Sheskin 2000) was selected to test for differences between "passive" and "consumptive" values. A test for dependent (rather than independent) variables was selected because the same people (dependent) responded to these 2 categories of

variables. Had this been a test of opinions from different people (i.e., opinions from 2 different regions) an independent test (i.e., a test based on independent populations such as a chi-square) would have been used. The results indicated a significantly higher percentage of individuals supporting natural resource/ecological values and “passive” outdoor recreation over “consumptive” or “active” types of outdoor recreation [$\chi^2(1, N = 2,002) = 156.89, P < 0.001$]. This would be the equivalent of a z-score value of 12.53, or a difference between these values that was so very different that it would fall well outside of the range of chance customarily used in statistical testing. For instance, by conservative standards a z-score of 2.58 would have indicated that the results could happen by chance 1 time in 100.

Water resources, including both water quantity and quality, were by far the most important natural resource and environmental concerns of Texans. It was not only the most important “top-of-the-mind” issue but also the most important issue in relation to other natural resource and environmental issues facing Texas. In the focus groups, concern over water resources was the only topic that was consistently mentioned as a major natural resource and environmental issue facing Texas. In an open-ended question in the general population survey on the most important natural resources or environmental issues facing Texas, almost half of Texans (49%) mentioned some type of water resource-related issue without prompting. Following water resource-related issues other responses for this question included: don’t know (25%), air quality-related issues (16%), general pollution issues (10%), habitat loss/fragmentation (7%), urban sprawl/over-development (7%), and endangered species (4%). When affirmative water resource-related responses were compared to the next highest issue (don’t know, 25%) using McNemar’s test for dependent categorical samples (Sheskin, 2000), the results indicated a significantly higher number of affirmative responses regarding water resource-related issues [$\chi^2(1, N = 2,002) = 180.52, P < 0.001$].

Awareness of and Attitudes toward Texas Parks and Wildlife

Texas Parks and Wildlife has higher name recognition when compared to fish and wildlife/natural resource agencies in other states. Thirty-six percent of Texans when asked in an open-ended manner could accurately name TPWD as the state agency responsible for managing and conserving natural and historical resources and providing outdoor recreation opportunities in Texas. The accurate identification of Texas Parks and Wildlife at 36% is high when compared to other states’ residents’ awareness of their state fish and wildlife/natural resource agency. In some states, <10% of the residents can accurately identify the state fish and wildlife agency by name, although in general, the ability to accurately identify the agency is approximately 25% (Duda et al. 1998).

Awareness of and attitudes toward TPWD were higher among constituent and stakeholder groups than the general population. Twenty-five percent of freshwater anglers, 29% of saltwater anglers, 24% of hunters, 27% of boaters, and 24% of large landowners said they knew a great deal about TPWD compared to 9% of the general population.

Public Program Priorities

The importance of 22 Texas Parks and Wildlife activities as perceived by constituents were measured. Of the 22 activities presented, 18 were rated very important by more than half of the respondents. Each program was rated as either very or somewhat important by more than half of all respondents. Not one of the activities presented was rated as unimportant by a majority of Texans. Upkeep and maintenance of state parks was considered very important (84%) by more respondents than any other activity. Law enforcement programs, education programs, protecting fish and wildlife habitat, and managing and preserving places to enjoy and experience nature were also considered very important by a strong majority of Texans. The top 5 programs and the percentage of respondents that rated the program as very important were: 1) upkeep and maintenance at state parks (84%), 2) enforcing fishing, hunting, and boating laws and regulations (81%), 3) providing hunter safety education (79%), 4) enforcing laws that protect fish and wildlife habitat (79%), and 5) providing boating safety education (76%).

A majority (64%) of Texans are interested in more information about Texas' natural resources, historic sites and outdoor recreation. The top 2 ways Texans want this information is by direct mail (51% said this is the best way) and via the TPWD website or the internet (24%).

Contact and Attitudes toward TPWD Game Wardens

There are high levels of interaction between TPWD game wardens and TPWD constituents. Fifty percent of licensed freshwater anglers had some type of personal contact within the previous 5 years with a TPWD game warden while freshwater fishing. Sixty percent of saltwater anglers had contact with a TPWD game warden while saltwater fishing. Forty-one percent of hunters had contact while hunting, and 61% of boaters had contact while boating. Fifty-four percent of large landowners had contact with a game warden. In addition to the high level of contact, TPWD constituents think very highly of TPWD game wardens. Ninety-two percent of freshwater anglers, 93% of saltwater anglers, 93% of hunters, 96% of boaters, and 97% of large landowners who came in contact with a game warden either strongly or moderately agreed the warden was professional and courteous.

Funding

In the general population survey, 84% of Texans supported more TPWD funding to enhance efforts for managing and conserving fish and wildlife populations. Funding mechanisms with the highest level of support (either strongly or moderately supportive) were developers paying a fee to compensate the state for the negative impact on the environment (80%), unclaimed motorboat fuel tax refunds (81%), and TPWD receiving a larger portion of revenue from sporting goods sales tax (77%). Almost half of licensed freshwater anglers (48%) and saltwater anglers (46%) strongly or moderately opposed increasing fishing license sales as a way to increase funding for TPWD. Forty-nine percent of hunters opposed increasing hunting license fees,

with most of the opposition expressing strong opposition. Sixty-eight percent of registered boaters strongly or moderately opposed requiring canoes, kayaks, and manually powered vessels to pay a fee to be registered. The major finding here is that the general population showed support for fees paid by someone else rather than out of their own pocket.

Anglers and Fishing in Texas

Although Texas licensed anglers come from a variety of backgrounds, 93% are male, 88% are white, and 48% have lived in Texas for >40 years. While 27% of freshwater anglers fished primarily for the sport and 24% for relaxation, only 3% fished to catch large fish while 11% fished for the food. Among saltwater anglers, the top reason for fishing was for the sport (31%), for relaxation (21%), for food (16%), and for the fun of the catch (15%).

Almost all Texas freshwater and saltwater anglers were satisfied with their fishing in Texas in the previous 2 years (83% and 88%, respectively). Almost half (41%) of Texas licensed anglers who fish primarily in saltwater felt that in the previous 5 years, the quality of saltwater fishing in Texas had improved. However, freshwater anglers were less satisfied with improvement of fishing conditions. Texas' freshwater anglers were split on whether or not they felt the quality of freshwater fishing in Texas had declined (26%) or improved (22%). Almost half (47%) of freshwater anglers felt that freshwater shoreline access was only fair to poor and 32% of saltwater anglers felt saltwater shoreline access in Texas was fair to poor. Twenty-five percent of freshwater anglers reported problems with jet skiers.

Priority freshwater fisheries programs where freshwater anglers felt that much more time and money should be spent included: improving water quality (51%), teaching fishing skills to kids (48%), acquiring more public areas to increase fishing opportunities (43%), and making more efforts to stock fish in the freshwaters of Texas (41%). The 2 top TPWD program priority areas where saltwater anglers felt that much more time and money should be spent were teaching fishing skills to kids (54%) and improving water quality (54%).

Half (50%) of freshwater anglers have had personal contact with a Texas Parks and Wildlife game warden while freshwater fishing in Texas in the previous 5 years. Almost all freshwater anglers (92%) who had contact agreed (78% strongly and 14% moderately) that the game wardens they met were professional and courteous. Sixty percent of saltwater anglers have had personal contact with a Texas Parks and Wildlife game warden while saltwater fishing in Texas in the past 5 years. Among those who had contact, a strong majority either strongly agreed (80%) or somewhat agreed (13%) that the game wardens they came in contact with were professional and courteous. Only 5% disagreed.

Hunters and Hunting in Texas

Although Texas licensed hunters come from a variety of backgrounds, 93% are male, 88% are white, and 49% have lived in Texas for >40 years. Hunters reported hunting for a variety of reasons. Thirty-one percent of Texas hunters hunted primari-

ly for the sport and recreation while 27% hunted to be with friends and family. Seventeen percent hunted for the meat.

Almost all Texas hunters were satisfied with their hunting in Texas over the past 2 years (90%). While 17% of Texas hunters felt that in the previous 5 years the quality of hunting had declined, 41% felt it had improved. However, 37% of hunters felt access to public hunting lands was fair to poor while 43% felt access to private lands was fair to poor. Eighty-eight percent of hunters reported they did not experience any interference by others while hunting. Only 8% reported interference from other hunters. A majority (53%) of Texas hunters felt much more effort should be placed on educating non-hunters about hunting than any other of the 22 programmatic areas presented.

Boaters and Boating in Texas

Most registered boaters in this study were white males (89%) who had lived in Texas for >40 years (52%). Almost all Texas boaters were satisfied with their current boating in Texas over the previous 2 years (92%). Unlike hunters and saltwater anglers where more than 40% felt their activity had improved, a high percentage (30%) of boaters felt that the overall quality of boating in Texas had declined. Although 56% of boaters said that they did not feel any facilities need to be built or improved, 21% of boaters wanted to see launch ramps built or improved in the area they boat most often, followed by docks (12%), restrooms (11%), and parking areas (7%). Following reckless/careless operators (49%) and alcohol/drug use (49%) as safety concerns were concerns over safety issues regarding personal watercraft (26%). Additionally, 38% of boaters reported that interference from jet skiers took away from their enjoyment while boating.

Day Park Users

Eighty-five percent of day park visitors stated they were very satisfied with their experiences while taking day trips in Texas State parks over the previous 2 years. Only 2% stated they were dissatisfied. A strong majority of day park users rated the quality of the state park staff as excellent to good, very knowledgeable, courteous, and friendly in providing adequate information about the park's facilities and services. Poor ratings for any of these categories were virtually non-existent. The primary reasons park visitors said they went to state parks were to fish (17%), for relaxation (16%), to get away from it all (15%), to enjoy nature (14%), to sightsee (13%), to be with friends and family (13%), to camp (13%), to hike (11%), and to swim in natural waters (6%). The primary activities day park visitors participated in included hiking (25%), fishing (21%), camping (14%), attending a group gathering (12%), swimming in natural waters (11%), wildlife viewing (9%), boating (5%), beach/recreational/leisure (5%), nature viewing (4%), and historic site visitation (4%). Less than 2% reported mountain biking, biking, visiting a nature center, canoeing or kayaking, rock climbing, jet skiing, or target shooting. Eighty-eight percent of day park users said they did not experience any interference from others that took away from their enjoyment of the park.

Overnight Park Users

Eighty-four percent of overnight park visitors stated they were very satisfied with their experiences while taking overnight trips in Texas State parks over the previous 2 years. Only 2% stated they were somewhat or very dissatisfied. Forty-two percent felt that the quality of Texas State parks had remained the same over the previous 5 years. Thirty-one percent stated the quality had improved in the previous 5 years. The overall quality of the park's facilities were rated as either excellent or good by 9 out of 10 overnight users, with 36% giving parks an excellent rating and 55% rating park conditions as good. Sixty-three percent of overnight park users did not want to see more restaurants provided at state parks while 77% did not want to see more hotel accommodations provided at Texas state parks. Eighty-two percent of overnight park users felt facility use fees to stay overnight in a Texas state park were about the right amount while 13% felt they were too high. Eighty-two percent of overnight park users said they did not experience any interference from others that took away from their enjoyment of the park. Their primary reasons for visiting the park were to camp (36%), to get away from it all (24%), for relaxation (22%), to be with friends and family (17%), to enjoy nature (13%), to hike (10%), to fish (9%), close to home/convenient (7%), and to sightsee (6%).

Large Landowners

Ranching was considered as a very important land use for 72% of the large landowners interviewed. Hunting and providing fish and wildlife habitat were considered very important for a majority of these large landowners at 55% and 52% respectively. Farming (30%), wildlife viewing (29%), and fishing (15%) were considered very important by a minority of large landowners. Sixty-seven percent of landowners stated they had a major concern over legal liability when considering allowing access to their land for outdoor recreation while 66% expressed major concerns over legal liability when considering allowing access to their land for hunting. Less, but large numbers of landowners, expressed major concerns over legal liability when considering allowing access to their land for camping (43%), hiking (40%), viewing wildlife (40%), studying nature (40%), fishing (29%), and river or canoe access (24%). Only 20% of large landowners were aware that the State of Texas provides liability protection for landowners that allow outdoor recreation use on their property; 79% stated they were not aware. In a separate but related question, 36% (17% strongly and 19% moderately) of large landowners agreed that if they did not have to worry about legal liability, they would be more likely to open up their land for more outdoor recreation opportunity for others (55% disagreed; 43% strongly and 12% moderately). Eleven percent, however, were very interested and 22% were somewhat interested in opening up their land to provide more outdoor recreational opportunities for others. Sixty-six percent of landowners felt that TPWD programs that assist landowners in protecting the quality and quantity of water on their land were very important while only 6% felt TPWD programs that encourage private landowners to open their land for camping were very important, 8% for programs to

encourage canoe and river access, 17% for hunting access, and 10% for fishing access. Following programs for water quality and quantity protection, landowners placed a high priority on programs that teach landowners how to manage wildlife through such practices as prescribed burning and rotational grazing, addressing landowner liability for recreational use, the Private Lands Advisory Board and assisting landowners in developing wildlife management plans.

Texas Markets

The general population survey indicated that Hispanic Texans supported natural and cultural resource management programs in Texas but were less aware of TPWD. Overall, Hispanics showed very positive attitudes toward Texas' natural and cultural resources and outdoor recreation. Hispanics were significantly different in their "strongly agree" ratings for whether they felt that Texas' state parks were properly managed and conserved [$\chi^2(1, N = 1,961) = 4.50, P < 0.05$]. An unexpectedly high number of Hispanics strongly agreed to this statement. In terms of program priorities, there were no significant differences between Hispanics and non-Hispanics on many TPWD program priorities. There were, however, significant differences between Hispanics and non-Hispanics on the issues of enforcing fishing, hunting, and boating laws [$\chi^2(1, N = 1,002) = 19.29, P < 0.001$] and providing boating education [$\chi^2(1, N = 1,002) = 7.17, P < 0.01$]. In particular, Hispanics were significantly less supportive of the enforcement of hunting, fishing, and boating laws and significantly more supportive of boater education activities than non-Hispanics.

A dramatic difference between Hispanic and non-Hispanic respondents was their ability to identify Texas Parks and Wildlife as the agency responsible for managing and conserving natural and historical resources and providing outdoor recreation in Texas. While 41% of non-Hispanics accurately identified Texas Parks and Wildlife, only 15% of Hispanics accurately identified Texas Parks and Wildlife. This was a significant difference [$\chi^2(1, N = 1,961) = 99.98, P < 0.001$]. Hispanics were also less likely to feel they knew much about Texas Parks and Wildlife. However, Hispanics were almost as likely as non-Hispanics to be satisfied with Texas Parks and Wildlife.

African Americans (25%) were significantly [$\chi^2(1, N = 2,002) = 9.74, P < 0.01$] less likely than Caucasians (44%) to be able to accurately identify Texas Parks and Wildlife as the agency responsible for managing and conserving natural and historical resources and providing outdoor recreation opportunities in Texas. African Americans were also significantly [$\chi^2(1, N = 2,002) = 4.51, P < 0.05$] less satisfied with the Department. Overall, African Americans were supportive of increased Texas Parks and Wildlife funding to provide access to outdoor recreation opportunities, to preserve additional historic sites, to enhance efforts for managing and conserving fish and wildlife populations, and to buy additional land for the conservation of natural resources and outdoor recreation.

Females were significantly less likely [$\chi^2(1, N = 1,997) = 21.51, P < 0.001$] than males to be able to accurately identify Texas Parks and Wildlife as the agency responsible for managing and conserving natural and historical resources and pro-

viding outdoor recreation opportunities in Texas. Females were significantly less satisfied with the Department [$\chi^2(1, N = 1,997) = 5.39, P < 0.05$] and significantly less likely than males to say they knew much about the Department [$\chi^2(1, N = 1,997) = 14.20, P < 0.001$]. Protecting and preserving Texas' historic sites, however, was particularly [$\chi^2(1, N = 737) = 6.91, P < 0.01$] important to females. Females and males supported the programs of Texas Parks and Wildlife, and for many of the programs no major differences were observed. However, females were significantly less likely than males to strongly support hunting [$\chi^2(1, N = 1,016) = 14.93, P < 0.001$] or recreational shooting range opportunities [$\chi^2(1, N = 1,016) = 8.63, P < 0.05$] and fishing [$\chi^2(1, N = 1,016) = 6.53, P < 0.05$] programs.

Discussion

Texas Parks and Wildlife is in an enviable but challenging position at the beginning of the new millennium. On one hand, TPWD finds its mission and programs supported by the vast majority of Texans. Overall, Texans care deeply about the state's natural and cultural resources as well as the outdoor recreation opportunities the Texas landscape provides. However, TPWD faces major resource management challenges resulting from human population growth. These challenges include loss and fragmentation of habitat, degradation and increased competition for limited water resources, and increases in total numbers of outdoor recreationists due to an increasing population.

Texans as a whole support natural and cultural resource management and protection and outdoor recreation programs in Texas and support increased TPWD funding toward these ends. However, they will accept some funding mechanisms and reject others. Funding mechanisms should not be seen simply for the revenue they produce but also for the bond it creates between TPWD and the constituent group affected. Outreach efforts highlighting the benefits of current funding mechanisms should be developed. In these outreach efforts, TPWD should stress the many accomplishments that have been made through past programs. The results of this in-depth study on Texans' attitudes toward natural and cultural resources and outdoor recreation indicate that Texans are very concerned about the state's natural and cultural resources and want something done about it.

For most Texans, human population growth and development on a state-wide basis were not a top-of-the-mind natural resource or environmental issue or equated with loss of wildlife habitat. However, these issues are seen as major quality-of-life issues on a local level to many Texans, as seen in the focus groups. The implication of Texans' lack of connection between these quality of life issues and Texas natural resources is that Texans' awareness that rapid population growth and urban sprawl are indeed habitat-related issues and natural resource/environmental problems on a state-wide basis needs to be increased. This outreach effort should build on the recognition that where there are problems on the local level those problems can be multiplied to a state-wide level. The second implication is that information and education programs or campaigns that assume Texans understand the direct connection

between development and urban sprawl to habitat loss or assume the recognition of a state-wide problem possess a high risk of failure. Programs that seek to inform and educate Texans about habitat loss should begin focusing on the local level since many Texans relate better and are more cognizant of local issues, albeit not as a habitat, natural resource or environmental issue at first.

Although Texans may vary on specific program preferences and participation in outdoor recreation activities, the overriding conclusion is that Texans support programs that will manage and protect the state's unique natural and cultural and outdoor recreation opportunities. The focus groups showed that most Texans do not want to be called "environmentalists" because they have a negative view of the word, yet Texans care about the state's environment and natural and cultural resources and their protection. It is recommended that TPWD embark on a major initiative to increase the scope and the depth of their natural and cultural resource and outdoor recreation programs in order to meet both the needs of Texans and the needs of the state's resources.

Adequate facilities and adequate land and natural resources are critical to quality outdoor recreation experiences. The results of this study indicate that TPWD has done a good job in this arena, although improvements should still be made in providing hunting and fishing access opportunities. Access to hunting and fishing lands is a need that must be met. TPWD must maintain the quality of its facilities, land, and resource base for outdoor recreation and have these resources increase in proportion to Texas' expanding population.

For certain activities managed by TPWD—hunting, fishing, and boating—the majority of license buying or registered participants are white males who have lived in Texas for >40 years. Special effort should be made to offer these opportunities to a broader range of Texans who may be interested in participating in these activities. TPWD should work toward breaking down any and all constraints to participation by non-traditional audiences in these traditional activities. If there are specific constraints to participation among individuals who want to participate in these activities, TPWD should confront them. However, there is an important difference between meeting demands versus attempting to create demand. Instead of attempting to create demand among groups not interested in traditional outdoor activities, TPWD can offer outdoor opportunities that interest these target groups. For example, women may be less likely to hunt than men: however, TPWD should not try to increase hunting participation among women who are not interested in hunting. Rather, TPWD should seek to expand outdoor opportunities that women are interested in, such as bird watching, enjoying wildlife around their home, and historic site visitation.

Current programs for hunters, anglers, boaters, and day and overnight state park users have been tremendously successful. In fact, a commonality among the groups was that they felt that the quality of hunting, fishing and visiting a state park had stayed the same or improved over the previous 5 years. Management efforts have paid off. With the exception of some small programmatic changes, such as to decrease conflicts between jet skiers and boaters and anglers, no major changes to these programs are justified, although increased outreach efforts to these constituents is warranted.

A majority of TPWD constituents want more information about Texas' natural and cultural resources and outdoor recreation. This is a major opportunity for TPWD to increase interaction with these individuals and continue to increase TPWD's already high approval ratings. Information can also serve to inform outdoor recreationists about close to home recreational opportunities or motivate interested participants to actively get involved in outdoor recreation. The general population reported that direct mail was one of the ways they would most like to receive information about the Department.

Texas Parks and Wildlife should recognize that it is as much a service organization as a product organization. Among recreationists, as well as the Texas public, the intangible benefits of natural and cultural resources and outdoor recreation are just as important as the tangible benefits. People want to know Texas' natural and cultural resources are being protected, even though they might not visit state parks or natural areas.

TPWD game wardens and State Park personnel have very high credibility as well as very high public approval ratings among TPWD constituents. TPWD can harness this high credibility and approval rating in outreach campaigns for expanding programs and funding by utilizing these individuals as spokespersons.

Overall, TPWD enjoys strong support from the Texas public. The immediate challenge for TPWD is to harness this strong public support and forge it into greatly expanded programs, services and land acquisition efforts necessary to protect Texas' natural and cultural resources and outdoor recreation opportunities well into the 21st Century.

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