Texas Tech University
Lubbock, Texas

TEXAS TECH

TEXAS PARKS AND WILDLIFE FOR THE 21st CENTURY

AN OVERVIEW OF THE

TEXAS TECH UNIVERSITY STUDIES

IN CONSERVATION AND RECREATION

FOR THE COMING DECADES

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TEXAS PARKS AND WILDLIFE FOR THE 21st CENTURY

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EXECUTIVE SUMMARY

In February 2000, Texas Parks and Wildlife contracted with Texas Tech University to produce a study of conservation and outdoor recreation issues in Texas that would establish the foundation for the Department's future planning efforts.

FOUNDATION FOR THE FUTURE

THE PROJECT WAS ORGANIZED INTO TWO PHASES, each of which was conducted by outside experts brought in as subcontractors. The first phase involved a series of focus groups and telephone surveys to learn what Texans think about the outdoors, about natural resources, and about Texas Parks and Wildlife and its programs. The second phase was directed to compile an inventory of the state's cultural and historic sites and to determine the actual gross acreage of the state's public parklands and of lands held in trust for conservation or protection of wildlife. That phase also involved an assessment of the state's future needs for such properties.

Complementing both segments of the study were GIS (Geographic Information Systems) materials provided by Texas Tech that demonstrated such factors as demographic trends and distribution of natural resources that affect the state's conservation policies.

PROJECT OBJECTIVES

:: GARNER expert opinion and public attitudes in the state about conservation and outdoor recreation.

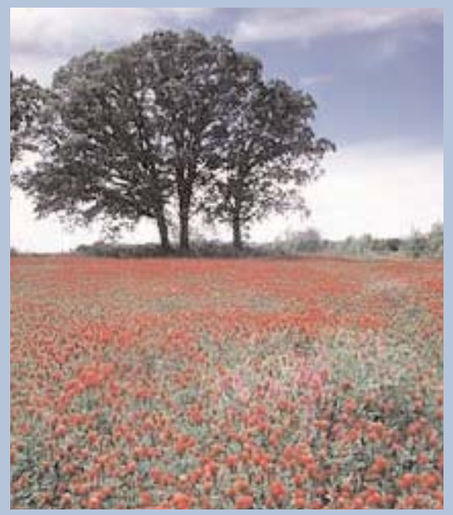
:: ASSESS the state's holdings in public lands and cultural sites.

:: ANALYZE the distribution of those holdings with regard to current and projected population and demographics.

:: PREDICT the state's future needs for parks, natural areas, recreational opportunities, and cultural and historical sites.

:: SUGGEST ways that Texas and the Department could better prepare to meet future needs and demands on the state's natural and cultural resources.

IN THE COURSE OF CONDUCTING THE DIFFERENT SEGMENTS OF THIS STUDY, RESEARCHERS AND ANALYSTS FOUND A NUMBER OF IMPORTANT POINTS OF AGREEMENT – POINTS WHERE PUBLIC OPINION, DEMOGRAPHIC PROJECTIONS, PROFESSIONAL ANALYSIS AND THE INVENTORY OF RESOURCES ALL CAME TOGETHER TO INDICATE THE STATE'S MOST PRESSING CONSERVATION NEEDS AND PROBLEMS.



KEY FINDINGS

:: The increasing need for outdoor recreation opportunities and for conserving natural resources in Texas calls for a comprehensive solution.

:: Texans have strong opinions about recreation and conservation issues, based on their love of the outdoors and their belief in the importance of protecting natural resources.

:: There is strong support among the citizens of Texas for the mission of Texas Parks and Wildlife.

:: Local and state parks are in short supply, given the size and population of Texas.

:: Private landowners must be an integral part of conservation efforts in Texas, but they cannot meet the state's total outdoor recreational needs.

:: The differences in interests and opinions among ethnic and gender groups with regard to conservation and recreation issues indicate the need for diversity in planning programs.

:: Habitat conservation and restoration efforts have not been conducted on a scale large enough to preserve biologically sustainable habitats in all of the ecoregions of Texas.

:: Conservation and heritage education, particularly for young Texans, is vital to the future.

:: The information from this project provides the foundation for a long-term master plan for Texas Parks and Wildlife.

AFTER REVIEWING THE DATA ACCUMULATED BY RESEARCHERS AND THE SOLUTIONS AND STRATEGIES CALLED FOR BY EXPERTS, THE AUTHORS OF THE TEXAS TECH STUDY COMPILED A LIST OF KEY RECOMMENDATIONS RELATING TO CONSERVATION AND RECREATION IN TEXAS. SOME RECOMMENDATIONS WERE DIRECTED PRIMARILY TO TEXAS PARKS AND WILDLIFE, WHILE OTHERS CALLED FOR A BROADER APPROACH TO ISSUES AND PROBLEMS, REQUIRING COOPERATION AND ACTIVE PARTNERSHIPS AMONG STATE AGENCIES, NONGOVERNMENTAL ORGANIZATIONS, AND PRIVATE LANDOWNERS.

RECOMMENDATIONS

STATEWIDE MASTER PLAN
Texas Parks and Wildlife should develop a statewide master plan to guide future programs to conserve the rich biodiversity of Texas; to maintain the optimum range of natural, cultural, and historic sites of statewide significance; and to provide services to the citizens of Texas.

WATER CONSERVATION
The state should manage its programs of water conservation and allocation to sustain its ecosystems as well as its people and to allow for sufficient instream flows and sufficient flows into bays and estuaries to sustain aquatic life.

ACCESS TO NATURE FOR URBANITES
The state should address the needs of urban Texans for access to nature and for opportunities of outdoor recreation.

ADDRESSING ETHNIC DIVERSITY
The state should step up efforts to protect and make available to the public a growing inventory of cultural, historic and natural sites that reflect the state's ethnic diversity and the diverse interests of its population.

TARGETING EDUCATION
Texas Parks and Wildlife should aggressively enhance programs to educate urbanites, and especially youth and ethnic minorities, about natural, cultural and historic resources in Texas.

IMPROVING LOCAL PARKS
Local governments and organizations should receive assistance in achieving the goal of 25 acres per 1,000 people to meet the demand for local parks.

PROVIDING STATE PARKS
Texas Parks and Wildlife should establish and maintain a level of service of 55 acres per 1,000 people for state parks in Texas.

PROTECTING ECOREGIONS
The state should ensure that in each of its 11 ecoregions there is a characteristic area of 100,000 acres that is protected, using a variety of strategies, in order to conserve native plants and animals.

BUILDING PARTNERSHIPS
Texas Parks and Wildlife should continue to work in partnership with other agencies and organizations to expand incentives for conservation programs on private lands.

INTRODUCTION

Texas is a special place, not only because of its great size and its unusual history, but also because of its richly varied landscape. From the Gulf Prairies to the Piney Woods, from the High Plains to the Trans-Pecos, Texas supports the greatest diversity of animal and plant life in the nation. It has also supported a diversity of people and cultures over the centuries, and that diversity has increased as the population of the state has exploded in the past decades.

A SINGULAR STATE

TEXAS CONTINUES TO INSPIRE IN ITS RESIDENTS a strong sense of place and a store of values that set the state apart. Among the strongest of those values is a powerful love of the land. Although Texans have been uprooting themselves from the countryside and flocking to the cities for decades now, the love of the land and the call of the wild have endured. If there is any single image that calls up what it means to be a Texan, it would probably be that of a lone rider, his battered hat shading his eyes from the sun, gazing out over a vast expanse of land, with no fences in sight.

Yet great changes have come to the Texas landscape, some so slow and quiet that the differences have been difficult to see, some so fast and furious that residents can't help but notice. A century ago, Texas was a sparsely settled rural stronghold whose three million people lived and worked mostly on farms and ranches. With an average distribution of a mere 11 people per square mile, there seemed little prospect at the time of running out of natural resources or places to experience the outdoors. Now, however, the state's mostly urban population, which exceeds 20 million, is distributed unevenly across the state, putting increasing pressure on the environment within and around its rapidly expanding urban areas. People have to drive farther and farther to experience the natural world that was once within easy reach.

These are some of today's images: A stand of woods, full of birds, insects, reptiles and small mammals, becomes a shopping mall; a ranch that shelters an ark of wildlife yields to development; bubbling springs go dry; a river narrows to a trickle. The mythic lone rider, turned typical Texan, is likely to be gazing out these days through the windshield of a sport utility vehicle onto a field marked by the pink flags signaling a coming subdivision. The land that once seemed so limitless is getting broken up into smaller and smaller parcels, and the state's great ecosystems are becoming fragmented. Some of the state's smaller, fragile subsystems have become so diminished that they are in danger of disappearing forever.

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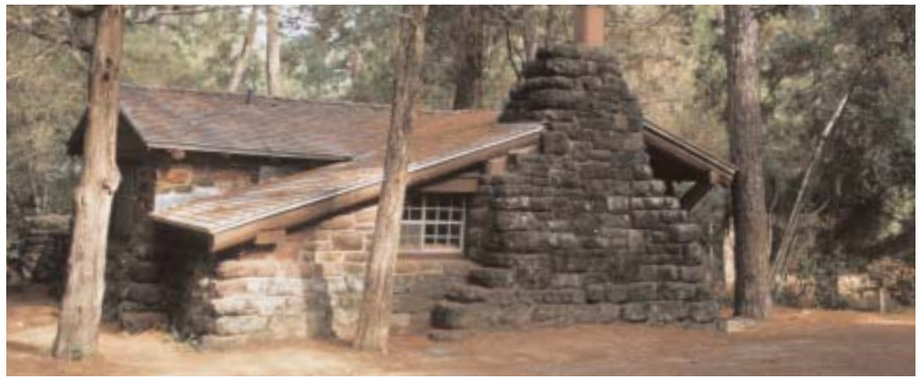
REACHING THE LIMITS

THE LAY OF THE LAND IN TEXAS IS DISTINCTIVE in yet another way. For all of its deeply etched images of wide open spaces, Texas is unusual in its relative lack of public lands. During its brief time as a republic, Texas sold the bulk of its public lands in order to finance a government. As a result, despite its vast size, the state owns relatively few public spaces in proportion to its population. More than 94 percent of the state's land remains in private hands. Consequently, the destiny of many native plants and animals in the state lies in the hands of private landowners. As the traditional stewards of the land, they play a crucial role in carrying out the work of conservation in Texas. However, as family farms and ranches break up, Texas is losing its heritage of people who have lived and worked close to the land and who have served as its caretakers.

The relative lack of public lands is also a crucial factor in the future of outdoor recreation in Texas. For the 99 percent of the population in Texas who don't own a stretch of land – a farm or ranch or weekend getaway -- the opportunities to enjoy the outdoors have depended, in large part, on access to parks. However, areas of parkland, wildlife refuges, and forests make up less than three percent of the state. Less than one percent of land in the state is managed by Texas Parks and Wildlife.

These geographic and demographic factors that make Texas such a distinctive place have also made the work of conservation and of providing outdoor recreation opportunities for all Texans an increasingly complex and difficult task. Since the early 1960s, when the Department was created by the merger of the Parks Board with the Texas Game and Fish Commission, the mission of Texas Parks and Wildlife has been to balance its duty to protect natural resources with its responsibility for providing access to outdoor recreation for an ever-growing and ever-changing constituency. The task has been like trying to hit several moving targets at once.



FROM ITS INCEPTION, TEXAS PARKS AND WILDLIFE HAS ENDEAVORED TO BASE ITS WORK ON SOUND SCIENCE. It has vastly expanded its outreach and effectiveness by becoming more entrepreneurial, by emphasizing educational programs in all its divisions, and by building partnerships with private landowners, other governmental agencies, and nonprofit groups. But in the past decades, the department has had to struggle to keep up with the needs of the public and the demand for its services. Even as wildlife management programs build up populations of some species of native animals, and state fisheries replenish supplies of game fish, other species come under increasing pressure. Even as repairs are completed in some parks, the call for repairs and improvements in other venues increases. In the past, bond issues mandated by the Texas Legislature for park repairs and improvements have helped. Likewise, innovative programs have also helped to improve infrastructure maintenance and to offer wildlife management programs to private landowners.

By the beginning of the 21st century, however, a consensus was developing among conservation professionals, concerned state leaders, and others who had studied the situation that Texas has reached a crucial stage in the areas of conservation and recreation. With the population of the state expected to double by the year 2030, the consensus, reported in a number of studies and reviews, was that Texas Parks and Wildlife is going to need a more proactive approach to its operations. Without more comprehensive planning and a more systematic approach to fulfilling its mission, warned the experts, the department will remain constantly in a catch-up mode.

Before such a comprehensive plan and system could be designed and implemented, however, some basic groundwork had to be done. There were important gaps in data to be filled – gaps relating not only to places but also to people. The leadership at Texas Parks and Wildlife realized that before they could implement a system that would anticipate needs and problems in the future, they needed to conduct a massive and precise stocktaking. They needed a clear and accurate inventory of their resources, an intensive study of relevant research and potential solutions, and a detailed survey of the needs and opinions of the people of Texas.

PRIVATE vs. PUBLIC LAND

PRIVATE LANDS

In Farms and Ranches **76%**

Under Wildlife Management **9.1%**

Texans owning homes. **63%**

Texans owning land **0.92%**

Texans owning more than 1000 acres . . . **0.11%**

PUBLIC LANDS

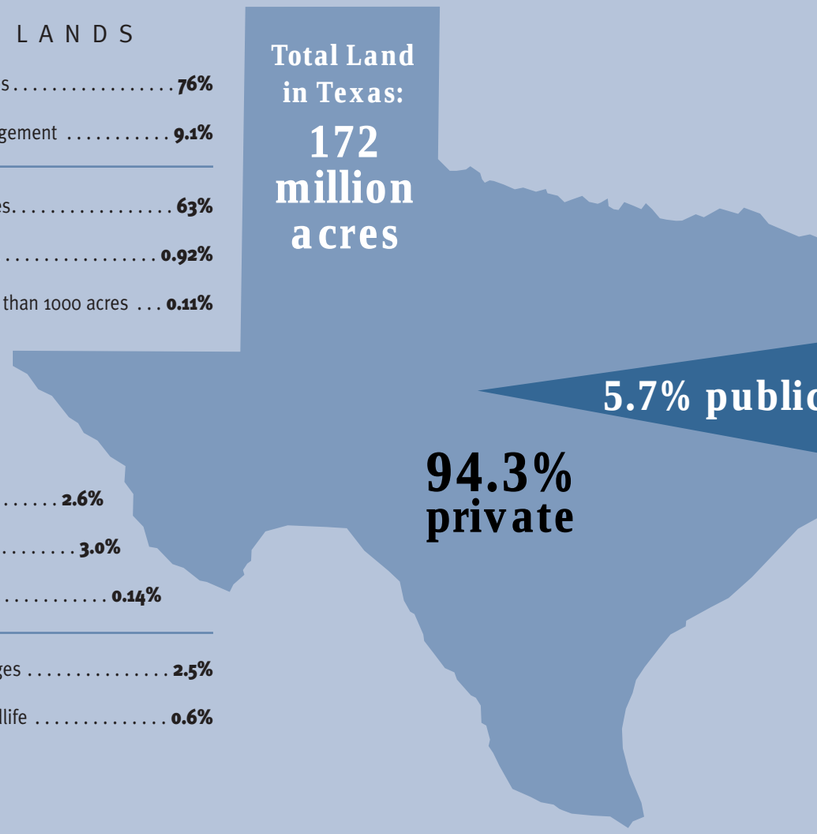
Federal **2.6%**

State **3.0%**

Local **0.14%**

Parks, Forests, Refuges **2.5%**

Texas Parks and Wildlife **0.6%**

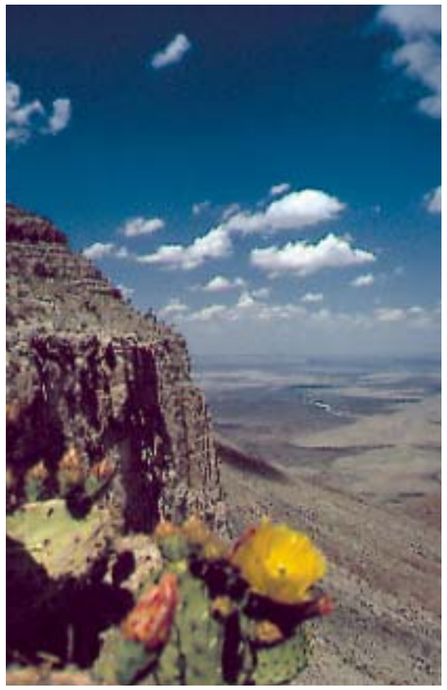


IN FEBRUARY 2000, TPW CONTRACTED WITH TEXAS TECH UNIVERSITY TO PRODUCE A MULTI-PHASED STUDY THAT WOULD SERVE AS SOURCE-BOOK AND DATABASE FOR THE DEPARTMENT'S FUTURE PLANNING EFFORTS.

BUILDING ON A TRADITION: THE MANDATE FOR PROGRESS

Called Texas Parks and Wildlife for the 21st Century, this study is the latest in a long series of research projects over the years that have helped to shape the policies of the department – and that have helped to shape the landscape of Texas.

Nearly 40 years earlier, the Texas State Parks Board contracted with Texas Tech College, as it was known then, to produce a long-range plan for the state park system. The resulting document, published in 1963, was accepted by state leadership and became the blueprint for parks and recreation in the following decades. The study was strongly worded, even blunt, in defining the needs of the state. Surveying the state's holdings at that time, the authors of the report concluded that "the parks do not rank well with the nation's average state parks. They are wholly inadequate to measure up to future demand for state park services."



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 natural areas in Texas. Along with the Texas Tech report, this study influenced subsequent acquisitions by Texas Parks and Wildlife, the National Park Service, the Nature Conservancy, and other conservation groups. Some of the state's most cherished parks and refuges were acquired as a result of these studies.

By the late 1990s, however, as the state's growing population put increasing pressure on its natural resources and increased the demand for outdoor recreation, the Texas Legislature stepped in, authorizing a joint study of the situation by the State Recreational Resources Committee and the House Appropriations Committee. To complement the legislative inquiry, Texas Parks and Wildlife commissioned Texas A&M University to conduct an analysis to explore the state's most pressing needs in the areas of conservation and recreation and to identify the most effective methods of preparing to meet those needs.

Among the most critical issues identified by the authors of the study was the department's need for more up-to-date and accurate information about the resources it was managing and about the users of those resources. With such rapid, sweeping demographic shifts in the state's population, the department was going to have to find ways to meet the needs of an increasingly large, increasingly urbanized and increasingly diverse population.

The Department's need for a more systematic approach to planning for the future was identified as well by two other key groups that studied the situation. Following a year-long review of the Department, the Legislature's Sunset Commission found that while the Department is doing good and necessary work, its decision-making process has been hampered by the lack of a comprehensive approach to managing the state's public resources. The Commission recommended that the Department develop a comprehensive system to assess future public conservation and recreational needs, beginning with a comprehensive inventory of all the state's natural and cultural resources.

THE GOVERNOR'S TASK FORCE ON CONSERVATION, APPOINTED BY THEN-GOVERNOR GEORGE W. BUSH, CONCLUDED IN ITS FINAL REPORT THAT TEXAS NEEDS A MORE COMPREHENSIVE, SCIENCE DRIVEN STRATEGY FOR THE CONSERVATION OF ITS OUTDOOR RESOURCES.

Similarly, the Governor's Task Force on Conservation, appointed by then-Governor George W. Bush, concluded in its final report that Texas needs a more comprehensive, science-driven strategy for the conservation of its outdoor resources. The Task Force, which conducted its work concurrently with some phases of the Texas Tech study, asserted that the Tech study should help provide an objective, scientific basis for future conservation planning and programs.

ASSEMBLING THE TEAM

The mandate given to Texas Tech and its research partners was to provide a firm foundation of data and recommendations that Texas Parks and Wildlife could use in its next crucial step of designing a statewide system and a comprehensive plan for its future operations.

THE PROCESS OF BUILDING A FOUNDATION FOR CONSERVATION PLANNING IN TEXAS

THE DEPARTMENT AND THE TEXAS TECH SCIENTISTS who were directing the study recognized the need to bring a broad range of experts and stakeholders into this massive undertaking. In order to help guide the direction and progress of the project, the Department appointed a steering committee representing the interests of landowners, of municipal recreation, of historic preservation, and of statewide conservation and recreation.

The project was divided into five major components: outreach to experts and stakeholders; public opinion polling; taking stock of lands and historic sites available for public use; assessing conservation and recreation needs; and collating the findings of those studies within the context of demographic and ecological trends. Although much of this work was concurrent, the components of the study were allocated into two major phases, with a major portion of the work to be carried out by experts who subcontracted with Texas Tech.

THE STUDY SOUGHT ANSWERS TO SOME KEY QUESTIONS ABOUT THE FUTURE OF CONSERVATION AND RECREATION IN TEXAS:

- :: What do the experts think?
- :: What do Texans think?
- :: How do Texans experience the outdoors?
- :: What does Texas have in the way of places for the public to experience the outdoors?
- :: What does Texas need now in the way of outdoor recreation?
- :: What are the state's gaps in lands and in historic and cultural sites of statewide significance?
- :: What will Texas need in the future to accommodate the recreation needs and cultural and historical interests of a diverse population?
- :: What will the population of Texas look like 30 years from now?
- :: What places and resources in the state will come under the most pressure in the future?

CONSULTING THE EXPERTS

THE FIRST STEP IN THIS COMPLEX PROJECT WAS TO CONSULT EXPERTS FROM AROUND THE STATE in the fields of natural resources, historic and cultural resources, and outdoor recreation. The Professional Needs Analysis Conference, held on June 20 and 21, 2000, at the Lady Bird Johnson Wildflower Center in Austin, brought together some 125 specialists from universities, from the field, from state agencies and from nongovernmental organizations. The objectives of the conference were to identify key issues and problems, suggest possible solutions, and most importantly, to help establish professionally accepted conservation goals for recreation, open space, wildlife habitat, and cultural resources for Texas through the year 2030.

POLLING THE PUBLIC

THE MAIN PURPOSE OF THE PUBLIC-OPINION PHASE OF THE PROJECT WAS TO GAIN A BETTER UNDERSTANDING OF THE TEXAS PUBLIC in order to help the Department carry out its work. This segment of the project represented the largest public opinion survey about outdoor recreation and natural resources ever undertaken in Texas. One important objective was to document the attitudes of Texas residents, from the general public to specific user groups, toward conservation issues as well as toward various Texas Parks and Wildlife programs. Another aim was to get a better picture of the users of the state's recreation opportunities. Still other objectives were to determine outdoor recreation participation rates, to identify Texans' unmet wants and needs, and to establish benchmarks that would allow the Department to measure its progress in meeting the needs of all Texans.

To conduct this phase of the project, Texas Tech contracted with Responsive Management, a Virginia-based polling and research firm with a long and successful track record of conducting public opinion surveys on the subject of natural resources.

FOCUS GROUPS

After conducting a review of previous research and internal Texas Parks and Wildlife documents, Responsive Management set up a series of formal focus groups with the general public and with various constituent groups. The participants were chosen to represent 13 different demographic groups, based upon place of residency, ethnicity, land ownership, and participation in recreational activities. For example, focus groups in the Houston area were conducted with African Americans, overnight park users, hunters, and anglers. In the Dallas area, focus groups were held with boaters, urban residents, and day park users. In San Antonio, focus groups were held with residents of Hispanic descent and ranch owners.

TELEPHONE SURVEYS

The next stage of the study consisted of a series of telephone surveys, including a major survey of the general population as well as in-depth surveys of seven key constituent and stakeholder groups. For the general population survey, subjects were chosen at random within each of the seven travel and tourism planning regions of the state so that the data could be analyzed by region when needed. Questions were designed to elicit opinions about the relative importance of state parks, of local parks, of wildlife protection, of historic sites, of access to nature, and of safety and protection of water and other natural resources. Surveys of specific user and stakeholder groups within the state included licensed anglers (freshwater and saltwater), licensed hunters, boaters, landowners, park users (day and overnight), and participants in outdoor recreation. In order to address issues of ethnic diversity in opinions and interests, each of the surveys also contained questions to determine the subjects' ethnicity so that data could be tabulated based on ethnic origin.

Researchers for Responsive Management experienced a high response rate in securing interviews of 15 to 20 minutes with the 6,600 Texans chosen for the sample.

TAKING STOCK AND ANALYZING NEEDS

CONDUCTED CONCURRENTLY WITH THE POLLS AND SURVEYS SEGMENT OF THE STUDY WAS AN IN-DEPTH ASSESSMENT OF CONSERVATION AND RECREATION NEEDS. This component of the study was subcontracted to Loomis Austin, Inc., an environmental engineering and conservation planning firm based in Austin. There were two main objectives for this portion of the study. The first was to compile an accurate inventory of existing parks, natural areas, and cultural and historic sites accessible to the public. The second was to set forth basic conservation and recreation needs for the state, through the year 2030, based on an analysis of the current inventory, on population projections, and on professionally accepted national standards.

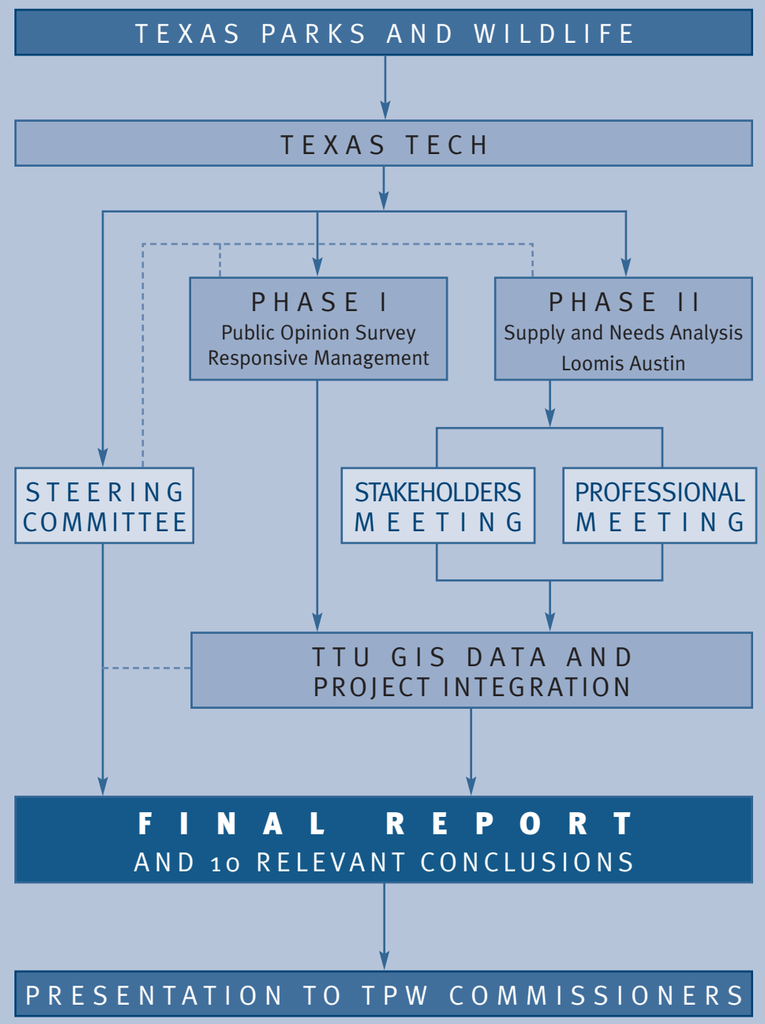
SUPPLY ANALYSIS

In order to assess the nature and extent of the state's public parklands, wildlife refuges, hatcheries, conservation land held in trust, and cultural and historical sites, researchers for Loomis Austin mailed out letters and questionnaires to administrators at county, state, national and local levels. This survey was supplemented by telephone calls and interviews when needed for clarification.

NEEDS ANALYSIS

The next step for Loomis Austin was to determine a professionally accepted baseline of desired levels of conservation for urban recreation, rural recreation, natural heritage, open space, wildlife habitat, and cultural and historical resources through the year 2030. Using a comparative analysis of those baseline levels and the inventory data, Loomis Austin next developed graphic presentations of what Texas will require to meet its conservation and recreation needs in the coming decades. Researchers determined not only how much acreage would be needed to fulfill those needs, but where it would be needed most. In addition, Loomis Austin surveyed the state's existing programs to determine a variety of means to meet those needs.

STUDY FLOWCHART



PROJECT TIMELI

23 February 2000
:: TPW / TTU Contract Signed

14 April 2000
:: Loomis Austin awarded contract for Phase II

18 May 2000
:: Steering Committee meeting

24 May 2000
:: Responsive Management awar contract for Phase I

21-22 June 2000
:: Professional meeting

22 June 2000
:: Steering Committee meeting

20 July 2000
:: Steering Committee meeting

26 September 2000
:: Stakeholders meeting

26 September 2000
:: Steering Committee meeting

March 2001
:: Phases I & II delivered

30 Aug 2001
:: Final Presentation to Texas Par and Wildlife commission
:: 20 reports, 2826 pages

KEY FINDINGS

In the course of conducting the different segments of this study, researchers and analysts found a number of important points of agreement – points where public opinion, demographic projections, professional analysis and the inventory of resources all came together to indicate the most pressing needs and problems for Texas Parks and Wildlife and for other state agencies and leaders to address.

The Department has already put in place a number of programs to address some of the state's most pressing needs and problems in the areas of conservation and recreation. But this study has underlined the urgency of acting as soon as possible to strengthen those programs and to develop new strategies as well.

What follows are the key issues and findings pinpointed by the research teams and the analysts.

THE NEED FOR A COMPREHENSIVE SOLUTION

KEY FINDING

IN A STATE WHERE ABOUT 94% OF THE LAND IS PRIVATELY OWNED AND 85% OF THE RESIDENTS LIVE IN URBAN AREAS, THERE IS A GROWING DEMAND FOR ACCESS TO LANDS TO EXPERIENCE NATURE.

:: There is a need to provide more local parks in all categories (cities, counties, and special districts). A goal of 25 acres per 1000 people should be adopted. This will necessitate an additional 558,722 acres of land by 2030.

:: There is a need to provide more state parks in all categories (State Parks, State Natural Areas, and State Historic Sites). For state parks, Loomis Austin recommended that Texas adopt the ratio of 55 acres per 1000 people. This goal would place Texas at the 75th percentile in national ranking for state parks. Achieving this goal would require an additional 1,428,117 acres of land by 2030.

:: When existing wildlife management areas are included in the aggregate with existing TPW parklands, the amount of additional parkland that will be needed for recreation by the year 2030 to keep up with the state's growing population is 1.2 million acres.

:: There is an uneven distribution of recreational opportunity relative to population. Opportunity for land acquisition efforts should be evaluated to provide public recreational areas closer to population centers. Residents desire more parks within a one-hour travel distance from their homes.

:: There is a need to acquire and preserve more historic properties representing the diversity of all Texans.

:: Residents support the acquisition of additional lands for parks by Texas Parks and Wildlife.

:: Shortages of outdoor recreation lands will be particularly acute around the major population centers of Texas.

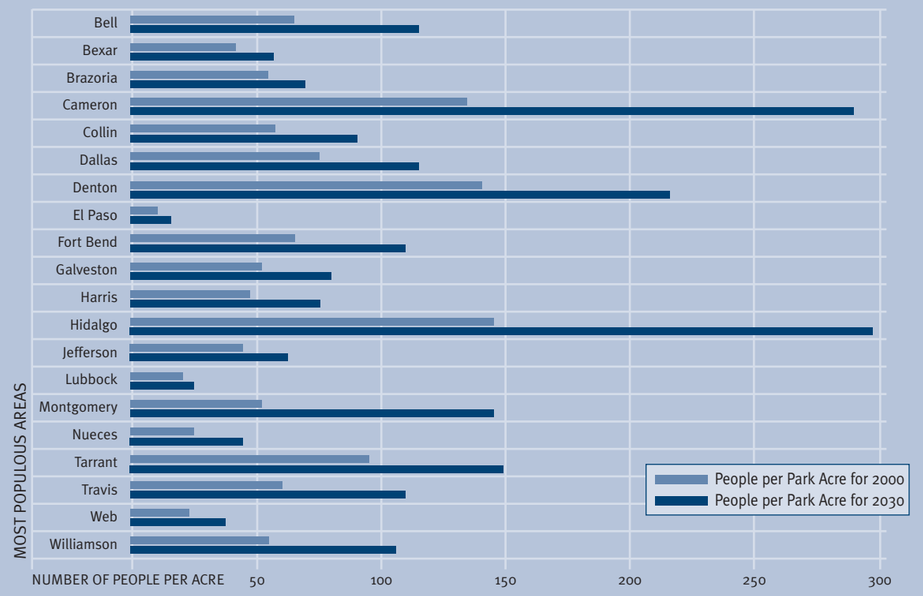
:: There is a need to upgrade the current park system, and some parks now operated by TPW would probably be more appropriate for local management. For example, Texas Tech University recently assumed management of the Lubbock Lake Landmark site, formerly operated by TPW.

DISTRIBUTION OF PARKLAND

Total acres of State Parks plus Wildlife Management Areas for the year 2000 in the eleven ecoregions of Texas.

ECOREGION		ACREAGE
1	Blackland Prairie	28,154
2	Coastal Sand Plains	0
3	Edwards Plateau	63,525
4	Gulf Coast Prairies & Marshes	89,617
5	High Plains	34,097
6	Llano Uplift	14,734
7	Oak Woods & Prairies	85,788
8	Pineywoods	98,660
9	Rolling Plains	74,375
10	South Texas Plains	55,810
11	Trans-Pecos	562,257

Comparison of numbers of people per acre of TPW-managed land and the twenty most populous metropolitan statistical areas for the year 2000 with projections for 2030



WHAT TEXANS THINK ABOUT RECREATION & CONSERVATION

KEY FINDING

TEXANS LOVE THE OUTDOORS. MANAGING AND PRESERVING PLACES TO ENJOY AND EXPERIENCE NATURE ARE CONSIDERED VERY IMPORTANT ACTIVITIES BY A LARGE MAJORITY OF TEXANS.

:: Texans believe that natural resource values are more important than recreational values.

:: Less consumptive recreational activities such as nature hikes and bird-watching are highly valued by Texans, even more so than consumptive activities such as hunting, fishing, and boating.

:: Although only a minority of Texans purchase hunting and fishing licenses each year, the Texas public values these activities. The value of and support for these activities goes far beyond simply the number of Texans purchasing licenses.

:: Texans are greatly concerned about water-related issues. The condition of water resources, including both water quality and quantity, is by far the most important natural resource and environmental concern of Texans.

:: Habitat loss and habitat fragmentation are not major top-of-the-mind natural resource or environmental problems on a state-wide basis to most Texans, although over-development is seen by many Texans as a major quality-of-life problem at the local level. Texans are very much concerned about growth and development locally, but the impact of those activities statewide does not appear to be immediately recognized.

:: Texans are becoming increasingly frustrated about the lack of access to lands to experience nature.

:: Among people who do not currently participate in outdoor recreational activities, the top two activities desired are visiting state parks and visiting a park or natural area within one mile of home.

WHAT TEXANS THINK ABOUT TEXAS PARKS AND WILDLIFE

KEY FINDING

CONSTITUENT AND STAKEHOLDER GROUPS ARE SATISFIED WITH TEXAS PARKS AND WILDLIFE.

:: A majority of individuals from various constituent and stakeholder groups feel that TPW is doing a good to excellent job providing opportunities for the outdoor recreation activities in which Texans participate. Poor ratings are virtually non-existent.

:: Texans support the full range of TPW programs, although to varying degrees.

:: Texans support increased funding for TPW to fund additional natural and cultural resources and outdoor recreation programs.

:: Although a majority of Texans support more TPW funding for enhanced natural and cultural resources and outdoor recreation programs, some funding mechanisms are more acceptable to Texans than others to help pay for these programs.

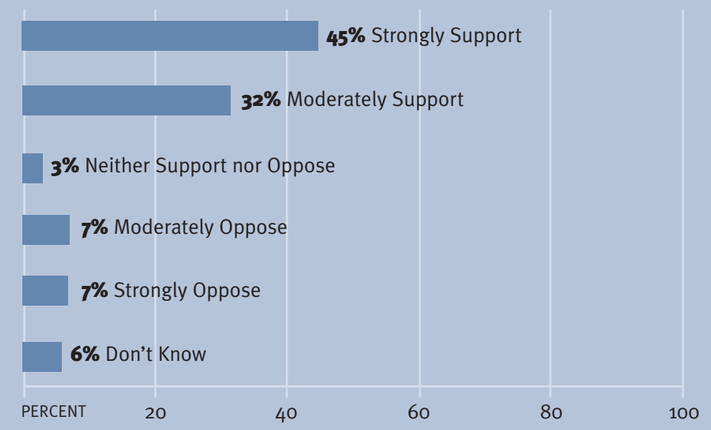
:: The most important TPW activities to Texans are law enforcement (recreation and habitat), upkeep and maintenance of state parks, education (hunting, boating, wildlife and environmental), and endangered species management.

:: Texans participating in various outdoor recreational activities are satisfied with their experiences. Few participants in outdoor recreation are dissatisfied.

:: Most residents who participate regularly in a particular outdoor recreational activity feel that TPW is doing a good to excellent job in providing them opportunities to participate in that activity. Very few participants feel that Texas Parks and Wildlife is doing a poor job in providing them with opportunities to participate.

SUPPORT FOR INCREASED TPW FUNDING

"Would you support or oppose more Texas Parks and Wildlife funding to buy additional land for conservation of natural resources and outdoor recreation?"



THE SHORT SUPPLY OF LOCAL & STATE PARKS

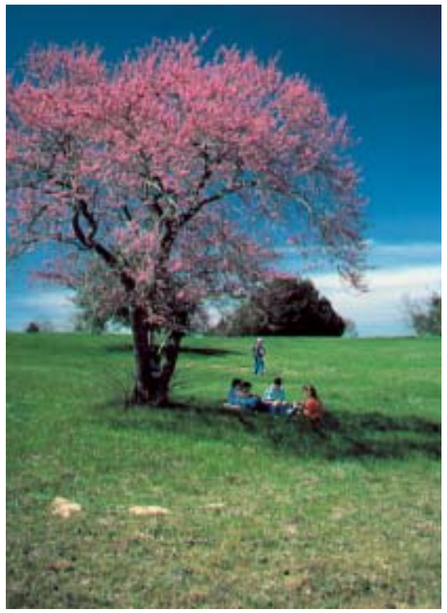
KEY FINDING

THE CURRENT ACREAGE AVAILABLE FOR OUTDOOR RECREATION DOES NOT MEET DEMAND IN MANY CASES.

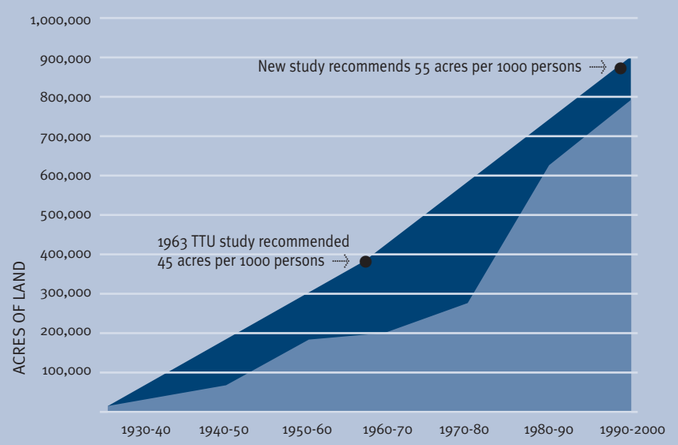
:: Texas has a statewide average of 12.2 acres per 1,000 people in local parks, ranking it substantially below the national goal of 25 acres per 1,000 people, as established by the National Recreation and Park Association.

:: Local parks primarily fill local recreational needs, and do not mitigate the need for state parks and natural areas.

:: The State Park System of Texas currently provides about 52 acres of state park system lands per 1,000 people. The national average of all states (excluding Alaska) is 45.25 acres per 1,000 residents. The 75th percentile (excluding Alaska) is 54.9 acres per 1,000 residents.



COMPARISON OF VARIOUS STATE LAND ACREAGE GOALS WITH ACTUAL HOLDINGS: 1930 - 2000



1.4 million acres will be needed by year 2030 to reach the goal of 55 acres state parkland per 1000 people.

TPW Actual Acreage

Recommended Acreage Goals per 1000 Persons

THE IMPORTANCE OF PRIVATE LANDOWNERS

KEY FINDING

ANY MAJOR CONSERVATION EFFORT WILL HAVE TO DEPEND ON THE PARTICIPATION AND COOPERATION OF PRIVATE LANDOWNERS. HOWEVER, WHILE PRIVATE LANDOWNERS ARE VITAL TO THE FUTURE OF NATURAL RESOURCES IN TEXAS, THEY CANNOT MEET THE TOTAL OUTDOOR RECREATIONAL NEEDS OF THE GENERAL PUBLIC.

:: Ranching is by far the most important use of large tracts of land in Texas, although hunting and wildlife habitat are also very important to a majority of large landowners.

:: A number of large landowners (45%) in Texas have major concerns about allowing access to their land for outdoor recreation in general and hunting in particular.

:: A majority of large landowners (64%) in Texas are not interested in opening up their land to provide more outdoor recreational opportunities for others.

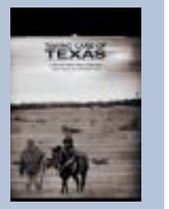
:: A majority of large landowners (60%) in Texas are interested in doing more on their property for wildlife conservation and habitat protection.

:: More large landowners (33%) are very interested in generating revenue from hunting rather than other outdoor recreation activities.

:: Large landowners (66%) are more interested in TPW programs that assist landowners in protecting the quality and quantity of water on their land and least interested in encouraging them to provide access for outdoor recreation activities.

:: Wildlife is important to large Texas landowners. Positive opinions were by far the most prevalent, with negative, utilitarian, and neutral opinions being held by only a minority of landowners (29%).

:: A majority of large landowners in Texas (60%) are interested in doing more on their property for wildlife conservation and habitat protection.



The report from Governor Bush's Conservation Task Force contains several recommendations relevant to Texas Parks and Wildlife programs and private landowners. The Task Force pointed out a number of ways to protect land and resources in partnership with private landowners. In particular, the Task Force recommended that a statewide Purchase of Development Rights program be established, which would compensate willing landowners for restricting development on their land. The Task Force also recommended that the state expand incentives and assistance to landowners for habitat management, citing the existing TPW Wildlife Management Plans that provide guidance for landowners in managing their lands to enhance habitats for native plants and animals, including game species.

:: The state has already initiated a number of innovative ways to involve landowners and managers in conservation efforts.

:: There is a need for coordination among natural resource agencies to present a more integrated and holistic approach to landowner technical assistance and incentive programs.

:: There is a need to develop strategies and funding for Conservation Easement and Purchase of Development Rights programs and other incentives for habitat management and outdoor recreation on private lands.

:: There are major opportunities to cooperate with landowners to improve watershed management, protection of groundwater resources, development of riparian corridors and other corridors necessary for wildlife survival, forestry practices supportive of wildlife and especially endangered species, and native plant utilization in landscaping and pasturage.

THE DEMANDS OF DIVERSITY

KEY FINDING

MANY DIFFERENCES EXIST AMONG ETHNIC AND GENDER GROUPS WITH REGARD TO NATURAL AND CULTURAL RESOURCE AND OUTDOOR RECREATION ISSUES. SEGMENTATION IS AN IMPORTANT FACTOR IN PLANNING SPECIFIC PROGRAMS.

:: There is a need to expand and diversify programs to increase public support for biological and cultural preservation for all Texans.

:: Traditional Texas Parks and Wildlife clients (white males aged 40 or older) are becoming a minority in Texas.

:: Hispanics support natural and cultural resource management programs but are less aware of TPW. strongly support TPW programs for hunting, fishing and recreational shooting range programs.

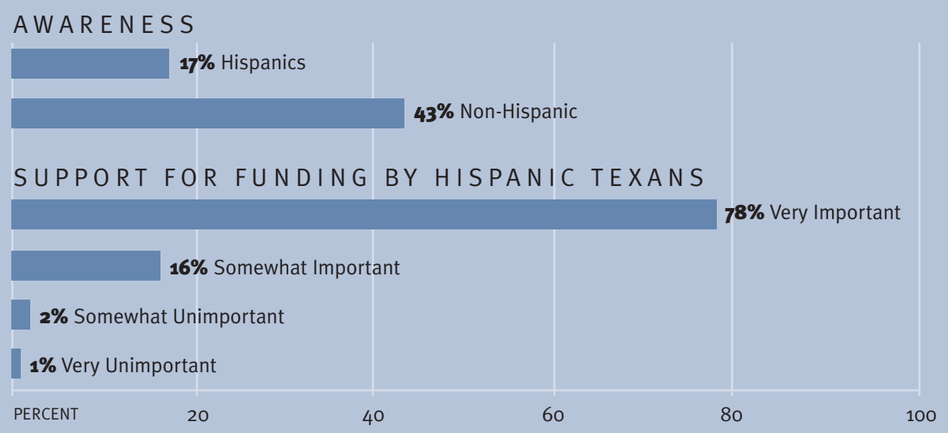
:: Hispanics are significantly more supportive than non-Hispanics of increased funding for additional access to outdoor recreation, preservation of historic sites, and for other natural resource activities.

:: African Americans participate less in many outdoor activities than whites but express an interest in many TPW programs. They believe that natural and cultural resources and outdoor recreation are important.

:: African Americans feel particularly strongly that access to outdoor recreation opportunities can help keep youth out of trouble.

:: There appear to be only minor differences between females and males in overall attitudes toward natural and cultural resources and outdoor recreation, though women are less likely to

HISPANIC TEXANS ARE LESS AWARE OF TPW PROGRAMS BUT SUPPORTIVE OF INCREASED FUNDING



THE LOSS OF SUSTAINABLE HABITATS

KEY FINDING

EFFORTS TO CONSERVE AND RESTORE BIOLOGICALLY SUSTAINABLE HABITATS IN EACH OF THE ECOREGIONS OF TEXAS REMAIN INADEQUATE.

:: Protection is needed for relict habitats in Texas -- that is, the remnants of what were once widespread and characteristic habitats now reduced in scope.

:: Many of the formerly common habitat types such as bottomland hardwoods, blackland prairies, coastal prairies, and short grass prairies are now very restricted in distribution, and, even where found, are often highly fragmented.

:: There is a need for habitat conservation and restoration on a scale large enough to preserve biologically sustainable habitats, on the order of 50,000 to 100,000 acres for major sites.

:: There is a need for better protection of native species and their habitats with emphasis on management of communities rather than individual species.

:: There is a need for water conservation, especially removal from natural areas of invasive plants that deplete both surface and ground water.

:: There is a need to preserve adequate stream flows, instream flows, and fresh water supplies to the estuaries to protect existing areas.

DISAPPEARING TEXAS: THE BLACK-TAILED PRAIRIE DOG

DRAWN FROM DAVID J. SCHMIDLY'S *TEXAS NATURAL HISTORY: A CENTURY OF CHANGE*

A striking example of the changes occurring in Texas is the plight of the black-tailed prairie dog. This highly social creature was once so numerous that a 25,000 -square-mile area of plains east of San Angelo was described early in the century as a continuous dog town, inhabited by as many as 400 million animals. Following an extended program of extermination, the population was reduced to small, scattered colonies. Today, it is estimated that 98 percent of the population has been lost, and that only 300,000 prairie dogs remain in Texas – an estimate that some scientists feel is actually too high because of the small size of the colonies and their scattered nature. The National Wildlife Federation has petitioned the U.S. Fish and Wildlife Service to list the prairie dog as an endangered species – a listing that would have been considered preposterous at the beginning of the 20th century.

THE IMPORTANCE OF CONSERVATION & HERITAGE EDUCATION

KEY FINDING

A MAJORITY OF TEXANS ARE INTERESTED IN RECEIVING MORE INFORMATION ABOUT THE STATE'S NATURAL RESOURCES, HISTORIC SITES AND OUTDOOR RECREATION.

:: There are opportunities to enhance public awareness and understanding of natural resources, cultural and historic sites by enhancing education programs.

:: There is a need to develop a holistic approach to public use and education by integrating recreation, conservation and preservation components at all sites.

:: Outdoor educational programs are essential if tomorrow's generation of urban voters is to understand the importance of natural and cultural resources to both the economic and environmental well being of society.

:: There is a need to promote heritage tourism internally within TPW and externally throughout the state.

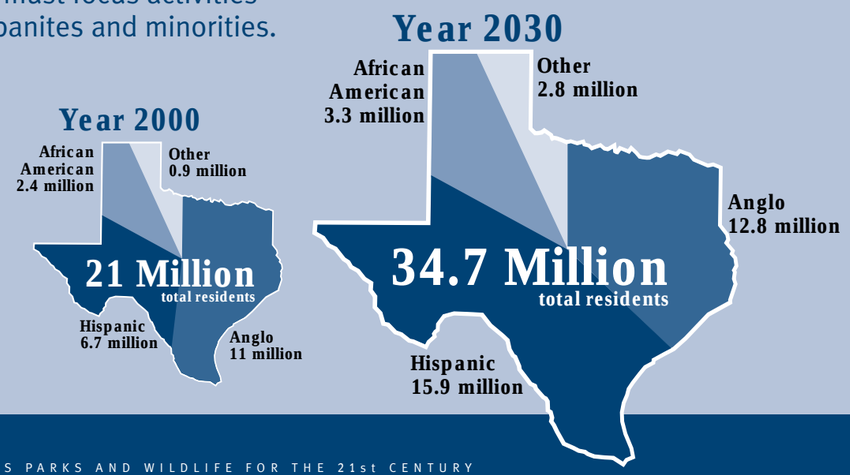
:: There is a need to educate communities about the economic benefits of preservation and heritage tourism.

:: There is a need to educate Texans about the intangible, but vitally important, benefits of having heritage visibly present in the community.

:: There is a need to partner with the Texas Historical Commission to educate private landowners about preservation and conservation techniques.

RELATIVE PROJECTED POPULATION IN TEXAS

The population of Texas is changing rapidly.
Texas must focus activities on urbanites and minorities.



THE FOUNDATION FOR A LONG-TERM MASTER PLAN FOR TEXAS PARKS & WILDLIFE

KEY FINDING

THE DATA FROM THIS STUDY CAN PROVIDE THE BASIC BUILDING BLOCKS FOR A PLAN TO GUIDE THE ACQUISITION, DIVESTMENT, AND MANAGEMENT OF ITS LANDS.

:: This plan should:
- meet the requirements laid out in the Sunset Commission Report.
- envision and ensure a system of public lands in Texas to benefit a new generation of citizens in a changing world.
- serve broader segments of Texans in ways that will make outdoor recreation and open space conservation more meaningful.
- provide more opportunities for outdoor recreation near major population centers; adequate conservation of the state's natural regions and cultural heritage; and expand programs that will provide even more involvement and opportunity for landowners.
- quantify and justify the funding required to meet deficiencies and to provide opportunities necessary to meet these challenges.

RECOMMENDATIONS

After reviewing the data accumulated by researchers and the solutions and strategies called for by experts, the authors of the Texas Tech study compiled a list of key recommendations relating to conservation and recreation in Texas.

Some recommendations by the authors of the Tech study were directed primarily to Texas Parks and Wildlife, while others called for a broader approach to issues and problems, requiring cooperation and active partnerships among state agencies, nongovernmental organizations, and private landowners.

STATEWIDE MASTER PLAN

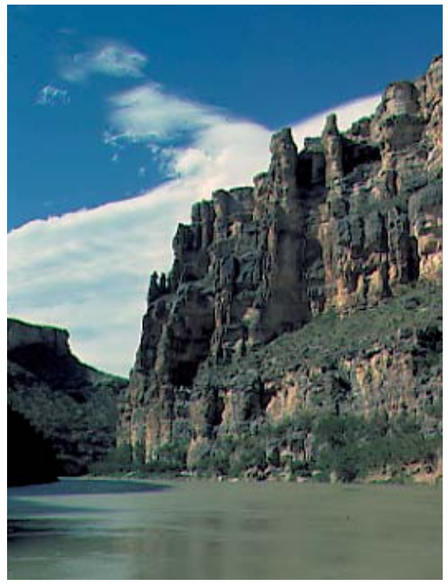
RECOMMENDATION Texas Parks and Wildlife should develop a statewide master plan to guide future programs to conserve the rich biodiversity of Texas; to maintain the optimum range of natural, cultural, and historic sites of statewide significance; and to provide services to the citizens of Texas.

Without a statewide master plan to guide the Department's acquisitions, some of the current holdings managed by Texas Parks and Wildlife have been acquired in a somewhat haphazard way, as opportunities have presented themselves. As a result, there are notable gaps in the state's inventory of natural, cultural and historic sites of statewide significance. Some properties now held by Texas Parks and Wildlife would probably be more appropriate for management at the local level. Criteria and priorities should be established to define properties of statewide significance.

WATER CONSERVATION

RECOMMENDATION The state should manage its programs of water conservation and allocation to sustain its ecosystems as well as its people and to allow for sufficient freshwater instream flows and sufficient freshwater flows into bays and estuaries to sustain indigenous aquatic life.

No issue was more important to Texans polled for this study than was water -- both quantity and quality. Texans desire to maintain a healthy natural environment, but do not typically understand the importance of maintaining instream flows and the flow of freshwater to coastal estuaries and bays. Texans were supportive of water conservation programs, but often require education to understand the contributions to water conservation in programs such as removal of exotic and invasive plants to restore native grasslands. These programs require the partnership of Texas Parks and Wildlife with landowners and other agencies.



ACCESS TO NATURE FOR URBANITES

RECOMMENDATION The state should address the needs of urban Texans for access to nature and for opportunities of outdoor recreation.

In a state where 85% of the citizens are urbanites, 63% own homes, but only 0.92% own land, there is a critical need for TPW to provide sites for outdoor recreation and simple access to green and wild public places. Urbanites are demanding sites to get them off of asphalt and in touch with nature.

ADDRESSING ETHNIC DIVERSITY

RECOMMENDATION The state should step up efforts to preserve and make available to the public a growing inventory of cultural, historic and natural sites that reflect the state's ethnic diversity and the diverse interests of its population.

Many of the cultural and historic sites available to the Texas public today are not representative of the cultural and ethnic diversity of Texas. Minorities, especially the rapidly expanding Hispanic population, desire to visit sites reflecting their historical contributions to Texas and sites culturally representative of their interests today.

TARGETING EDUCATION

RECOMMENDATION Texas Parks and Wildlife should aggressively enhance programs to educate urbanites, especially youth and ethnic minorities, about natural, cultural and historic resources in Texas.

In addition to making available the kinds of natural and cultural resources that reflect the interests and heritage of its diverse public, the Department should intensify its already strong outreach and education programs to involve urbanites, especially young people and ethnic minorities. As Texans have moved from rural to urban dwellings, many have lost touch with the land, their roots, and with nature. Most urbanites fail to understand the complexities of ecosystems and how the richness of the flora and fauna of Texas enhances their quality of life, both culturally and economically.

IMPROVING LOCAL PARKS

RECOMMENDATION Local governments and organizations should receive assistance in achieving the goal of 25 acres per 1,000 people to meet the demand for local parks.

Urbanites desired to have a park for themselves and their children within one mile of their homes. Providing this local service is not a responsibility of TPW, but TPW could form partnerships with local groups to assist the local entities in providing the service. Local parks, even golf courses and baseball diamonds, provide space used at some level by birds and other attractive wildlife such as butterflies and lightning bugs.

PROVIDING STATE PARKS

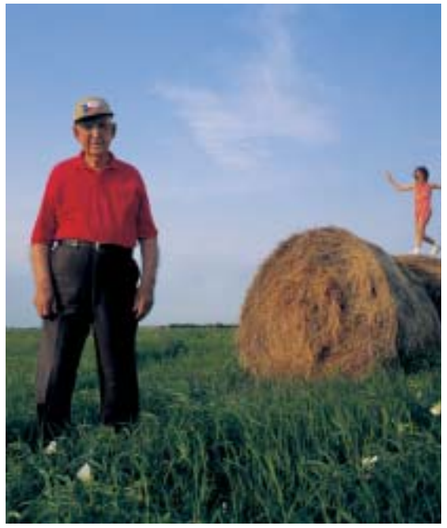
RECOMMENDATION Texas Parks and Wildlife should establish a level of service of 55 acres per 1,000 people for state parks in Texas.

Texans take great pride in being better than average. They like to brag that everything is bigger and better in Texas. A state park system providing 55 acres per 1,000 people would place Texas at the 75th percentile ranking when compared nationally to other states.

PROTECTING ECOREGIONS

RECOMMENDATION The state should ensure that in each of its 11 ecoregions there is a characteristic area of 100,000 acres that is protected, using a variety of strategies, in order to conserve native plants and animals.

In the conference conducted by Loomis Austin to solicit the views of natural resource managers, scientists and others, these professionals recommended that at least 50,000 and, more desirably, 100,000 acres of native habitat in one large block be protected in each of the 11 ecoregions of Texas. This could include both existing lands managed by Texas Parks and Wildlife and lands to be acquired to provide outdoor recreational opportunities and in partnership with private landowners. This goal can be achieved through long-term contracts that benefit the private landowner as well as meeting the state's needs. In some ecoregions, such as the Blackland Prairie, the average parcel size of undisturbed (or minimally disturbed) native habitat is only 63 acres. With the daily average conversion of 164 acres of ranch and farmland into urban sites (this is the average daily conversion per day over the next 30 years, based on projected population growth), immediate action is imperative if sites representative of native flora and fauna are to exist for Texans of tomorrow.



BUILDING PARTNERSHIPS

RECOMMENDATION Texas Parks and Wildlife should continue to work in partnership with other agencies and organizations to expand incentives for conservation programs on private lands.

In a state where TPW manages only 0.6% of the land, only 0.92% of the citizens own ranches or farmland, and 94.3% of the land is privately owned, it is imperative that conservation programs be maintained and expanded on private lands.

REPORTING THE RESULTS

Detailed descriptions of the methodology and results of the various studies that comprise *Texas Parks and Wildlife for the 21st Century* are compiled in 20 volumes that are available to the public in online form at...

www.tcru.ttu.edu/21century

P H A S E I

RESPONSIVE MANAGEMENT REPORTS

Volume 1: *Executive Overview and Implications of the Public Opinion and Attitude Research*

:: Summarizes the findings of the public opinion segment of the study and discusses the implications of those findings for the operations and policies of Texas Parks and Wildlife and for the state as a whole.

Volume 2: *Focus Group Report*

:: Analyzes the results of 13 focus groups conducted by Responsive Management in the spring and summer of 2000.

"Twenty years ago I used to hunt in what is now a subdivision of the city... and it bothers me, the fact that... our poor farmers... just can't take it anymore, they just can't pay the interest payments... [they are] going to have to sell the farm. And so there goes the farm, next comes the subdivision and next thing, well, you're not going to be there [to hunt] next year."

- Statement by a longtime hunter
Volume 2: *Responsive Management Reports*

Volume 3: *Telephone Surveys Report*

:: Describes the methodology used in the eight telephone surveys conducted by Responsive Management and summarizes highlights of the results.

Volume 4: *General Population Graphs and Survey Instrument*

:: Contains the questions asked of respondents in the general population survey and graphs representing their responses. Of particular importance was determining the nature and extent of respondents' outdoor activities and their attitudes toward recreation and natural resources.

PERCENTAGE OF THOSE SURVEYED WHO HAVE PARTICIPATED IN VARIOUS ACTIVITIES REGARDING CULTURAL AND RECREATIONAL AND NATURAL SITES:

Percentage who have visited historic sites	**49%**
Percentage who have visited a state park	**44%**
Percentage who birdwatch	**37%**
Percentage who camp	**30%**
Percentage who participate in freshwater fishing	**30%**
Percentage who have hunted in the past 2 years	**16%**

- From Volume 4, *General Population Graphs and Survey Instrument*

P H A S E I

RESPONSIVE MANAGEMENT REPORTS

Volume 5: *Angler Graphs and Survey Instrument*

:: Contains the questions asked of a randomly stratified sample of resident licensed Texas anglers, with graphed results weighted to match proportions of coastal to inland anglers and to reflect the distribution of freshwater and saltwater anglers.

Volume 6: *Hunter Graphs and Survey Instrument*

:: Contains the questions asked of randomly selected licensed Texas hunters who had purchased a hunting license for the 1999/2000 season and graphs depicting their responses, broken down by region and type of hunting activity.

Volume 7: *Boater Graphs and Survey Instrument*

:: Contains the questions asked of randomly selected boaters and graphs depicting their responses, broken down by region.

Volume 8: *Landowner Graphs and Survey Instrument*

:: Contains the questions asked of randomly selected landowners in Texas who owned 640 acres or more, according to county property tax records, and graphs representing their responses, reported by region. This survey focused particularly on attitudes and practices regarding hunting, conservation and recreational activities on private lands.

Volume 9: *Outdoor Recreation Graphs and Survey Instrument*

:: Lists the detailed questions asked of participants in outdoor recreation and graphs depicting their responses. This survey honed in on detailed responses regarding specific activities such as hiking, biking, swimming, and visiting historical sites.

Volume 10: *Park Users Graphs and Survey Instrument*

:: Compiles the detailed questions used in surveys of park users, day and overnight, and graphs representing their responses.

REPORTING THE RESULTS: AN ANNOTATED TABLE OF CONTENTS OF THE TTU STUDIES

P H A S E I I

LOOMIS AUSTIN REPORTS

Proceedings of the Professional Needs Analysis Conference.

:: Describes the purpose and proceedings of the Professional Needs Analysis Conference and summarizes the common themes and findings that emerged from the conference as well as detailed recommendations for solutions and strategies addressing specific issues by region and by subject.

Directions in Land Conservation and Historic Preservation.

:: Surveys federal and state laws, policies and programs to protect and expand natural and cultural resources. Contains in-depth surveys of states regarded by experts as progressive in their land and historic preservation measures. Compares park systems in Texas with those of other states.

Inventory of Conservation and Recreation Land in Texas.

:: Provides a detailed inventory of local parks, state and federal lands, land trusts, historic and cultural resources, private lands conservation and assistance programs, and surface water area. Includes brief descriptions of the resources inventoried, the methods used, the results, and a discussion of any possible sources of variations in data.

Exploring the Needs for Recreation, Conservation, and Preservation in Texas.

:: Analyzes the gaps between what Texas has and what it needs in the way of local and state parklands, conservation lands, and historical and cultural sites. Suggests strategies to meet those needs, including the expansion of current programs.

Local Parks Funding Needs Analysis.

:: Analyzes needs for acreage and funding for local parks, reported by county and by travel region, and taking into account local master plans for parks.

TYING IT TOGETHER

TEXAS TECH RESEARCH AND ANALYSIS

Project Completion Report.

:: Summarizes the origins, objectives, methods, and results of the multiple phases of Texas Parks and Wildlife for the 21st Century. Condenses the key findings of the study into 10 relevant conclusions, supported by data and analysis.

Geography of Biodiversity and Land Conversion in Texas.

:: Studies the increasing fragmentation of the state's native habitats using vegetation maps derived from Landsat V satellite images and depicts other measures of fragmentation indicated by cropland, roads, and population distribution. Uses GIS (geographical information systems) to project future availability of water supplies around the state.

Geospatial and Database Analysis Products.

:: Contains graphic representations of current and projected parklands acreage, population density, markers of biodiversity, and other statistics, illustrating distribution by ecoregion, by county, and other means of comparison.

Texas Natural History: A Century of Change.

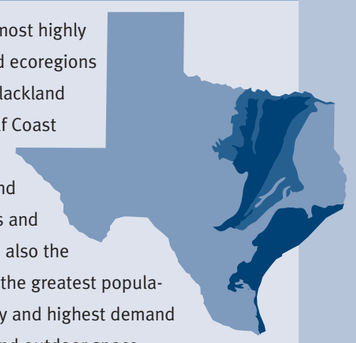
:: The full text of Dr. David Schmidly's groundbreaking study of the changing landscape of Texas and the dangers posed to the state's remarkable biodiversity.

Texas Parks and Wildlife for the 21st Century: Compiled References.

:: A complete list of references used in all phases of the Texas Tech study.

PLACES UNDER PRESSURE

The three most highly fragmented ecoregions in Texas (Blackland Prairie, Gulf Coast Prairie and Marshes and Oak Woods and Prairie) are also the areas with the greatest population density and highest demand for parks and outdoor space.



- From Texas Tech Research Analysis

AFTERWORD

As Texas Parks and Wildlife enters the 21st century, it has a responsibility of great importance. It is to proclaim anew the meaning and value of parks, historic sites, cultural sites, conservation, and outdoor recreation; to expand the learning and research occurring on state lands and share that knowledge broadly; and to encourage all Texans to experience our great natural heritage. The quality of life for the people of Texas — our very health and well-being — depends in a most basic way on the protection of nature, the accessibility of open space and recreation opportunities, and the preservation of landmarks that illustrate our history. By caring for the land and by conveying the land ethic, we care for ourselves and act on behalf of our future. The larger purpose of this mission is to build a citizenry that is committed to conserving its heritage and its place on earth.

- From Texas Tech Research Analysis
Project Completion Report.

ACKNOWLEDGEMENTS

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TEXAS TECH UNIVERSITY

The studies conducted by Texas Tech University for the Texas Parks and Wildlife for the 21st Century project drew on the work of many contributors from a number of departments at the university. The project was led and directed by three principal investigators: Dr. David J. Schmidly, Professor, Department of Biological Sciences; Dr. Robert J. Baker, Horn Professor, Department of Biological Sciences; and Dr. Nick C. Parker, Professor, Texas Cooperative Fish and Wildlife Research Unit. This team directed the overall study; wrote the project completion report, which is the basis for this overview; coordinated with the steering committee and the two subcontractors; analyzed the data that came in; and contributed data and analysis from sources at Texas Tech University. In the course of the project, students and faculty from five colleges and 14 departments at Texas Tech worked with the Texas Cooperative Fish and Wildlife Research Unit. The contributors to this report listed by their college and departments are as follows:

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The authors of the study would like to thank the many Texas Parks and Wildlife personnel who were involved throughout this project, specifically Darcy Hamburg, Mike Herring (now retired), Karen Leslie, Lydia Saldaña, and Andrew Sansom.

This report was prepared by consultant Carol Flake Chapman, Ph.D. Art direction and design were by Tim Peterson.

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Texas Tech University, Lubbock, Texas, 48 pp.