Contract Study: Number 1; Part I

A Natural Resource Survey for Proposed Reservoir Sites and Selected Stream Segments in Texas

A Natural Resource Survey

For Proposed Reservoir Sites

And Selected Stream Segments In Texas

A report offered to
The Texas Water Development Board
in partial fulfillment of Interagency Contract #1756

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Introduction

First and foremost among Texas' natural resources is its vast network of rivers and streams. From the Davis Mountains in the Trans-Pecos to the Pineywoods of East Texas, from playa lakes in the Panhandle to the South Texas brush country, more than 80,000 miles of rivers and streams connect these areas together and provide nutrients to sustain living organisms. Texans are dependent upon this riverine network to transport raw materials, generate electricity, replenish municipal water supplies, aid industrial processes, provide recreational opportunities, and nourish our bottomland forests and coastal marshes. Our existence and well being are dependent upon a continuous supply of high quality water. While Texans have always relied upon an abundance of water, their increasing uses are threatening the quantity and quality of water that will be needed for the future.

Recent surveys by the Texas Water Commission (TWC, 1990) reveal that over 1,760 miles of streams are restricted from swimming. An additional 7,500 acres of lakes do not meet full contact recreation requirements. In order to provide better information on rivers and streams to assist in managing current water resources and planning for future water development, the Texas Parks and Wildlife Department (TPWD) agreed to work with the Texas Water Development Board (TWDB) through an interagency contract to survey stream sites where water development projects are proposed, and to develop existing information on important habitats, wildlife, fisheries, and recreation.

Because water development planning involves a careful accounting of all environmental impacts, a survey of existing resource information is provided whereby future planners can identify important resources so that more in depth investigations can be performed to provide a full accounting of environmental losses as well as benefits. This report should not be interpreted as a comprehensive accounting of all information, but rather a survey of available information from agency files and other printed literature. Future planning of proposed water development projects will require an extensive natural resource inventory of each proposed reservoir site to accurately determine the value of stream resources and adjacent lands that would be impacted or lost to the project.

The purpose of this report is to survey river basins and perform an investigative assessment of proposed reservoir sites found in the 1990 Texas Water Plan and to synthesize existing TPWD data and information concerning fish, wildlife, vegetation and recreational information that is important and should be addressed in future planning for water development projects.

Through an interagency contract between the TWDB and TPWD the Resource Protection Division with assistance from numerous agency staff of the TPWD conducted environmental surveys to address the following items identified in the contract as they relate to proposed reservoir development:

Part I. A Natural Resource Survey for Proposed Reservoir Sites and Selected Stream Segments in Texas

Part II. A Vegetation Inventory and Habitat Quality Assessment for the Proposed Cuero and Lindenau Reservoir Sites

Part III. An Aquatic Biological Inventory of the Proposed Lindenau Reservoir Site

Part IV. Preliminary Species Profiles for Selected Texas River Fishes

Part V. Habitat Characteristics and Feeding Ecology of Cagles Map Turtle (Graptemys cagei) Within the Proposed Cuero and Lindenau Reservoir Sites

This report addresses Part I. The report consists of: (1) a natural resource data base search specific to the vicinity of twenty proposed reservoir locations, and, (2) data compiled for major river drainage basins. TWC river basin maps identifying reservoir locations have been prepared in addition to summary pages which document terrestrial habitat quality data, occurrence of protected species, and other pertinent natural resource information. The twenty reservoir projects being evaluated are:

___ Allens Creek
___ Applewhite
___ Big Sandy
___ Bosque
___ Cibolo
___ Cuero
___ Eastex
___ George Parkhouse I
___ George Parkhouse II
___ Goliad
___ Lindenau
___ Little Cypress
___ New Bonham
___ Palmetto Bend II
___ Paluxy
___ Post
___ Rio Grande Site "A" Channel Dam
___ Shaws Bend
___ South Bend
___ Tehuacana

Additionally, TPWD has performed a natural resource survey of existing data within all major river and coastal basins to identify and map stream segments of significance according to unique habitat, protected species, significant recreational resources, and important fish, wildlife and plant resources.

While this report meets the intent, scope, and purpose of the contract agreement, it in no way represents a complete assessment of all those streams needing special consideration or protection in the State. It simply provides a starting point that can be supplemented as more complete information is developed in the future. It is intended to aid future planners of water projects or other developers by providing natural resource information worthy of early planning consideration. When adverse impacts upon natural resources can not be avoided, mitigation should be included as a project requirement.

Project Methodology

The approach used for the overall survey was to compare the significant natural resources of the specific reservoir locations to the significant natural resources of the entire pertinent basin area. Therefore, two data bases were prepared: one represents a survey of the basin as a whole; the other represents resources lost due to impacts of the reservoir on the basin. While the project methodology required separation of the data gathering tasks into a "Reservoir Site Assessment" section and a "Significant Stream Segments" section, the data summaries are presented by major river basin in the final report for clarity.

RESERVOIR SITE ASSESSMENT

A natural resource data base search was performed on the twenty proposed reservoir locations to document occurrences of protected species and identify habitat quality data. Protected species were documented using Texas Natural Heritage Program data sources and Bald Eagle monitoring information. Habitat quality data was reflected by a variety of "indicators" which either provided direct inference to the vegetation type and habitat quality present or provided indirect inference to habitat quality by identifying the degree of use by game and non-game wildlife species. In total, this is an assimilated list of biological, recreational, and aesthetic resource attributes selected from known data sources which are pertinent to the proposed reservoir locations. Information provided within the "General Data" section of each Reservoir Summary, except those for Allens Creek, Lindenau, New Bonham, and Palmetto Bend II, were taken from Texas Water and Wildlife, (Frye and Curtis) TPWD Publication # PWD-BK-7100-147-5/90, May 1990. The specific evaluation criteria and data sources used include:

1. HIGH PRIORITY HABITAT.

An analysis of "High Priority Habitat" existing at the proposed reservoir locations was made. "High Priority Habitat" is defined as Resource Category (1) and (2) habitat as referenced in Texas Water and Wildlife (Frye and Curtis, May 1990). Resource categories are based on the value (importance) and scarcity of habitat for an evaluation species. Specifically, Resource Category (1) habitat is categorized as high value habitat, unique habitat, or irreplaceable habitat for which mitigation is not possible. Resource Category (2) habitat is categorized as high value habitat, scarce habitat or becoming scarce, for which mitigation is possible with an established goal of no net loss of inkind habitat value. From a practical standpoint, Category (1) and (2) habitat for the proposed reservoir sites considered depicts either unique irreplaceable habitat or other types of habitats such as wetlands and riparian bottomland forest areas which reflect high natural resource values and high sensitivity regarding destruction. This analysis compares those proposed reservoirs where existing habitat data were available for quantity and quality of habitat, thereby providing an inference of relative habitat value. A summary of this analysis is included as Appendix A in this report entitled, "Proposed Reservoir Site Habitat Attributes: High Priority Habitat Summary."

High Priority Habitat includes resource categories (1) and (2) which, for the purposes of this report, reflects irreplaceable habitat, wetlands, and bottomland hardwood forest landscapes. Resource categories (3) and (4) make up the remainder of the habitat classification. Category (3) habitat includes abundant and medium to high value habitat (for the evaluation species) with a mitigation goal of no net loss of habitat value while minimizing loss of in-kind habitat value. Category (4) habitat includes remaining medium to low value habitat for which mimimization of habitat value deterioration would be anticipated. An excellent method for better understanding the relative importance of the existing habitat as a natural resource at proposed reservoir locations is to analyze the amount of habitat that falls into each of these resource categories. This analysis is also included in Appendix A as, "Proposed Reservoir Site Habitat Attributes: Habitat Importance as Determined by Resource Category." Other terms which are used in both the above analyses include HSI/HQ and Habitat Units. HSI (Habitat Suitability Index) and HQ (Habitat Quality Index) are indices of habitat quality for an evaluation species determined by systematic habitat assessments conducted in the field. A Habitat Unit (HU) is a measure of habitat value (quantity times quality). The number of acres of a particular habitat type (quantity) is multiplied by the habitat quality value (HSI/HQ quality index) to determine Habitat Units.

2. PRIORITY BOTTOMLAND HARDWOOD SITES.

A review was performed of proposed reservoir locations which exist at Priority Bottomland Hardwood sites in northeast Texas as identified by the U.S. Fish and Wildlife Service (USFWS). The reference for this task was Texas Bottomland Hardwood Preservation Program, USFWS, Albuquerque, May 1985. A summary of this review entitled, "Proposed Reservoir Site Habitat Attributes: A Review of Priority Bottomland Hardwood Communities in Texas" is enclosed in this report as Appendix B.

3. SIGNIFICANT NATURAL COMMUNITIES.

A review of proposed reservoir locations which exist at proposed National Natural Landmarks as identified by the Natural Heritage Program was made. The reference for this review was A Survey of Potential National Natural Landmarks of the West Gulf Coastal Plain Subregion: Biotic Themes, July, 1986, Natural Heritage Program. This survey represents a highly systematic and scientific biological evaluation of candidate natural areas for inclusion as National Natural Landmark status based on the candidate sites' level of representation of important natural biotic community themes in the West Gulf Coastal Plain Subregion. These candidate communities reflect areas of high natural resource value and high sensitivity to habitat destruction. A summary of this review is included as Appendix C entitled, "Proposed Reservoir Site Habitat Attributes: A Review of Potential National Natural Landmarks in the West Gulf Coastal Plain Subregion of Texas."

4. SELECTED WILDLIFE GAME SPECIES.

A. White-tailed Deer.

Deer population density and trend data were determined from TPWD Fisheries and Wildlife Division documents and field biologists for the counties where the reservoir projects are planned. Additionally, population density comparisons of bottomland and adjacent upland areas in the immediate vicinity of the proposed reservoirs were attained. Deer density data are summarized as Appendix D entitled, "A Summary of White-Tailed Deer Populations and Trends in the Vicinity of Twenty Proposed Reservoir Sites in Texas."

B. Turkey.

Identification of turkey restoration projects, turkey habitat ranking, and analysis of turkey populations by county where proposed reservoir projects are planned, make up Appendix E. It is entitled, "A Summary of Turkey Population Data, Restoration Projects, and Habitat Rank at Twenty Proposed Reservoir Sites in Texas." Turkey stocking locations identified in this summary are of special significance because they represent major investments of money, planning, and energy expended by TPWD in turkey restoration administered under the Federal Aid in Wildlife Restoration Act.

C. Gray Squirrel.

Gray squirrel are dependent on high quality large bottomland hardwood stands in eastern Texas. Identification of gray squirrel habitat that exists at the proposed reservoir locations provides an inference to the overall natural resource value at these reservoir locations. Appendix F entitled, "A Subjective Habitat Ranking for Gray Squirrel at Twenty Proposed Reservoir Sites in Texas" is a summary of gray squirrel habitat at these proposed reservoir sites.

5. SELECTED WILDLIFE NON-GAME SPECIES.

A. Breeding Bird Survey.

An evaluation of avian activity in proposed reservoir site areas was conducted by reviewing bird census data collected on those Breeding Bird Survey (BBS) routes located within the vicinity of the proposed reservoirs. The BBS is a standardized roadside survey comprised of permanent routes throughout the U.S. and Canada. A summary of bird census data for BBS routes which intersect the proposed reservoir areas is assembled in this report as Appendix G entitled, "A summary of Bird Census Data Collected along Breeding Bird Survey Routes which Intersect the Vicinity of Twenty Proposed Reservoir Sites in Texas."

B. Colonial Waterbird Report.

A review of the Colonial Waterbird Report, published by TPWD Non-Game Resources, was conducted for the years 1986-1990. This review identifies the locations of waterbird rookeries in the vicinity of the proposed reservoir locations. The results are summarized as Appendix H entitled, "Colonial Waterbird Census Observed in the Vicinity of Twenty Proposed Reservoir Sites in Texas." Waterbird rookery information will also be contained in the Rare Species Review, Appendix K.

C. Christmas Bird Count.

This survey was begun in 1900 by a few interested bird watchers. Now approximately 41,000 volunteers count birds at Christmas for 1540 locations in a highly organized manner for the purpose of indexing avian population levels and describing bird distribution during the winter. A review of bird sighting at Christmas Bird Count locations which are located in the vicinity of the twenty proposed reservoir locations was made for the most recent count. A summary of this review entitled "A Summary of Bird Census Data Collected at 90th Christmas Bird Count Locations which Intersect Twenty Proposed Reservoir Sites in Texas" is incorporated in this report as Appendix O.

6. TYPE I AND TYPE II WILDLIFE MANAGEMENT AREAS.

Wildlife Management Areas represent State resources owned or managed by TPWD that are significant habitat resources for game and non-game species. Loss of these resources from potential reservoir projects represent potential losses in habitat, recreational opportunity, and public use revenue. Appendix I entitled "A Summary of Type I and Type II Wildlife Management Areas Located at Proposed Reservoir Sites in Texas" provides this information.

7. AQUATIC RESOURCES.

A review was made by TPWD Fisheries personnel of known aquatic resources and water quality attributes related to the waterways observed at the twenty proposed reservoir sites. A summary of that review is included in this report as Appendix J. The aquatic resource summary is entitled "Fisheries Survey and Water Quality Data Review for Twenty Proposed Reservoir Locations in Texas."

8. ENDANGERED/THREATENED SPECIES AND TEXAS UNIQUE COMMUNITIES.

Reservoir locations were processed through the agency's Texas Natural Heritage Program Information System. A summary of this search is entitled, "A Rare Species Review of Twenty Proposed Reservoir Sites in Texas" and is assembled as Appendix K. Part D of this appendix is a summary of special specie habitats, unique community descriptions, and managed area addresses offered as additional information to the reader.

9. BALD EAGLE NESTING.

Known Bald Eagle nest site locations existing at proposed reservoir sites were identified by TPWD Non-Game Resources personnel of the Fisheries and Wildlife Division. Additionally, comments were offered regarding impacts from proposed reservoirs to known Bald Eagle distribution in Texas. A summary of this data is assembled in this report as Appendix L, "Summary of Bald Eagle Active Nest Distribution in Texas."

10. OTHER NATURAL RESOURCE ATTRIBUTES.

A. Sensitive Natural Areas.

A review of significant "natural landmarks" and "natural areas" which are located at the proposed reservoir sites is included in this summary. The summary is identified as Appendix M and entitled, "A Summary of Natural Areas and Natural Landmarks Located at Twenty Proposed Reservoir Sites in Texas". This review defines "Natural Areas" as those sites identified by the 1985 TORP (Texas Outdoor Recreation Plan) Report. The source document for the 1985 TORP natural area data originated from the Texas Natural Area Survey, The Student Council on Pollution and Environment, 1967. This document summarized a subjective evaluation of areas in Texas displaying unique natural characteristics, scenic and high aesthetic value places. Although this reference is generally viewed by the TPWD as outdated and inconsistent with the current definition of "natural area", the comments offered regarding natural resource features at the twenty proposed reservoir sites are still pertinent and, therefore, included. "Natural Landmarks" are defined as those sites registered as such with the National Registry of Natural Landmarks at the National Park Service, U.S. Department of the Interior. These sites represent high quality natural areas of national significance.

B. Significant Stream Segments.

By definition, the "Significant Stream Segment" data for each major river basin identified those stream segments in the State that TPWD feels is the most significant stream resources from a natural resource standpoint. Therefore, a review was made to identify those "Significant Stream Segments" which exist at proposed reservoir sites. This significant stream segment review is included as Appendix N and is entitled, "A Summary of Significant Stream Segments Which Occur at Twenty Proposed Reservoir Sites in Texas."

NOTE: A Heritage Program Database called the "Vertebrate Characterization Abstract" (VCA) was also reviewed for non-avian vertebrate population data in the vicinity of the twenty proposed reservoirs. At the time of data collection, this database was not complete. In the near future, it will be ready for use and would be an excellent source of additional natural resource information.

SIGNIFICANT STREAM SEGMENT IDENTIFICATION

A subjective evaluation technique which relied on the knowledge and experience of credible department scientists and planners was used to identify significant river basin stream segments. Each contributor or organizational group which offered input for the evaluation was tasked to identify the most significant river basin segments that should be protected from impact of water development projects as it related to their area of expertise. The number of significant river segments was left to the discretion of the expert but prioritized highest to lowest priority. This subjective method is quantifiable to the extent that it allows for a relative comparison of sites within the spectrum of attributes used to make the selections. Although this method meets the purpose and scope of the project, one should expect that indepth evaluations of specific natural resources will be required as reservoir planning activities continue. **NOTE: Only the highest priority stream segment selections are included in this report. Other significant stream segments remain unlisted here even though they are important stream resources.**

Significant Stream Segments are identified in red and coded by selection criteria category on TWC river and coastal basin maps located at the beginning of each major river basin section. Coastal wetland areas exhibiting particular value and influenced by one or more stream segments are identified as red crosshatch areas in lieu of solid lines. Additionally, a table entitled, "Significant Stream Segment Summary" is provided in each major river basin section which provides more specific information as to the exact locations of the stream segments. The Significant Stream Segment Summary references TWC stream segment identification codes. These TWC stream segment codes relate to a database of water quality information which might be helpful to a reader needing additional information regarding these Significant Stream Segments. TPWD Significant Stream Segment designation codes are described in Table 1 which follows.

The major evaluation criteria used for this assessment and the organizations which contributed their expertise for each criteria category include:

1. BIOLOGICAL FUNCTION.

Stream segments which display significant overall habitat value (quality and quantity) considering the degree of biodiversity, age, and uniqueness observed, are included under this criteria category. "Biological Function" includes terrestrial, aquatic, and estuarine habitats within the pertinent river basins. Inland waterway input for this criteria included TPWD Inland Fisheries biologists and the USFWS document Texas Bottomland Hardwood Preservation Program. A coastal waterway input was provided by TPWD Resource Protection aquatic habitat scientists.

2. ACQUISITION/MITIGATION/GOVERNMENTAL OPEN SPACE.

This category includes significant public open space areas lying along the pertinent river basin waterways including current or proposed state and federal refuges, wildlife management areas, preserves, parks, or mitigation areas. Information was also considered from several USFWS documents. A state perspective was provided by members from the Resource Protection Division, Public Lands Division, and Fisheries and Wildlife Division of TPWD.

3. RECREATION.

Waterways selected for recreational attributes include stream segments significant for a variety of activities such as boating, fishing, floating, swimming, nature viewing, etc. Specific listing criteria included: inclusion in the outstanding rivers list; recreational usage and popularity; whether the segment contained a federal/state park on site; and general appeal, uniqueness, and scenic beauty. The Public Lands Division of TPWD provided the input for this criteria category. Source documents used for the selections include: "American Rivers Outstanding Rivers List"; "Texas Outdoor Recreation Inventory" and other inventories of federal and state holdings; Texas Rivers and Rapids; TPWD "Recreational Rivers Maps"; 1980 and 1990 TORP.

4. HIGH WATER QUALITY/EXCEPTIONAL AQUATIC LIFE/HIGH AESTHETIC VALUE.

Biologists from the Environmental Contaminants Section of TPWD provided the input for this category. Waterway selections include those stream segments and spring resources that deserve protection from reservoir construction and other water projects to protect unique or critical habitats and exceptional aquatic life ecosystems associated or dependent on high water quality. These stream segments also represent environments which connote high aesthetic value. Source documents used in this selection process include: Texas Waterways, 1973,TPWD; The State of Texas Water Quality Inventory, 1988, TWC; Texas Surface Water Quality Standards,1988, TWC.

5. THREATENED SPECIES/ENDANGERED SPECIES/UNIQUE COMMUNITIES.

Scientists and biologists from TPWD Heritage Program and Inland Fisheries Section selected priority sites along Texas river basins where water development projects would have significant deleterious consequences for State or Federal listed Threatened and Endangered Species. Also, sites along Texas waterways significant because of the presence of unique, exemplary, or unusually extensive (i.e., functional and viable) natural communities are included.

The following section of the report is an assimilation of the "Reservoir Site Assessment" data and the "Significant Stream Segment" data assembled by major river basin.

TABLE 1
TWDB RIVER ASSESSMENT PROJECT
RIVER SEGMENT DESIGNATION CODES

River Basin Code

Code	Basin
BR	Brazos
CA	Canadian
CO	Colorado
CY	Cypress Creek
GU	Guadalupe
LA	Lavaca
NE	Neches
NU	Nueces
RE	Red
RG	Rio Grande
SA	San Antonio
SB	Sabine
SJ	San Jacinto
SU	Sulphur
TR	Trinity

Coastal Basin Code

Code	Basin
BRCO	Brazos-Colorado
COLA	Colorado-Lavaca
LAGU	Lavaca-Guadalupe
NETR	Neches-Trinity
NURG	Nueces-Rio Grande
SANU	San Antonio-Nueces
SJBR	San Jacinto-Brazos
TRSJ	Trinity-San Jacinto

Resource Function Code

Code	Function
B	Biological Function
E	Threatened species/ Endangered species/ Unique Community
Q	High Water Quality/ Exceptional Aquatic Life/High Aesthetic Value
R	Recreation
S	Acquisition/ Mitigation/ Governmental Open Space

Stream Segment Identification Code

A consecutive number accompanying each function code in each basin for a point of reference.

EXAMPLES OF INTERPRETATION OF RIVER SEGMENT DESIGNATION CODES:

CO-E1 - Colorado River Basin, Endangered Species, Segment #1.

COLA-B5 - Colorado-Lavaca Coastal Basin, Biological Function, Segment #5.

Brazos River Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

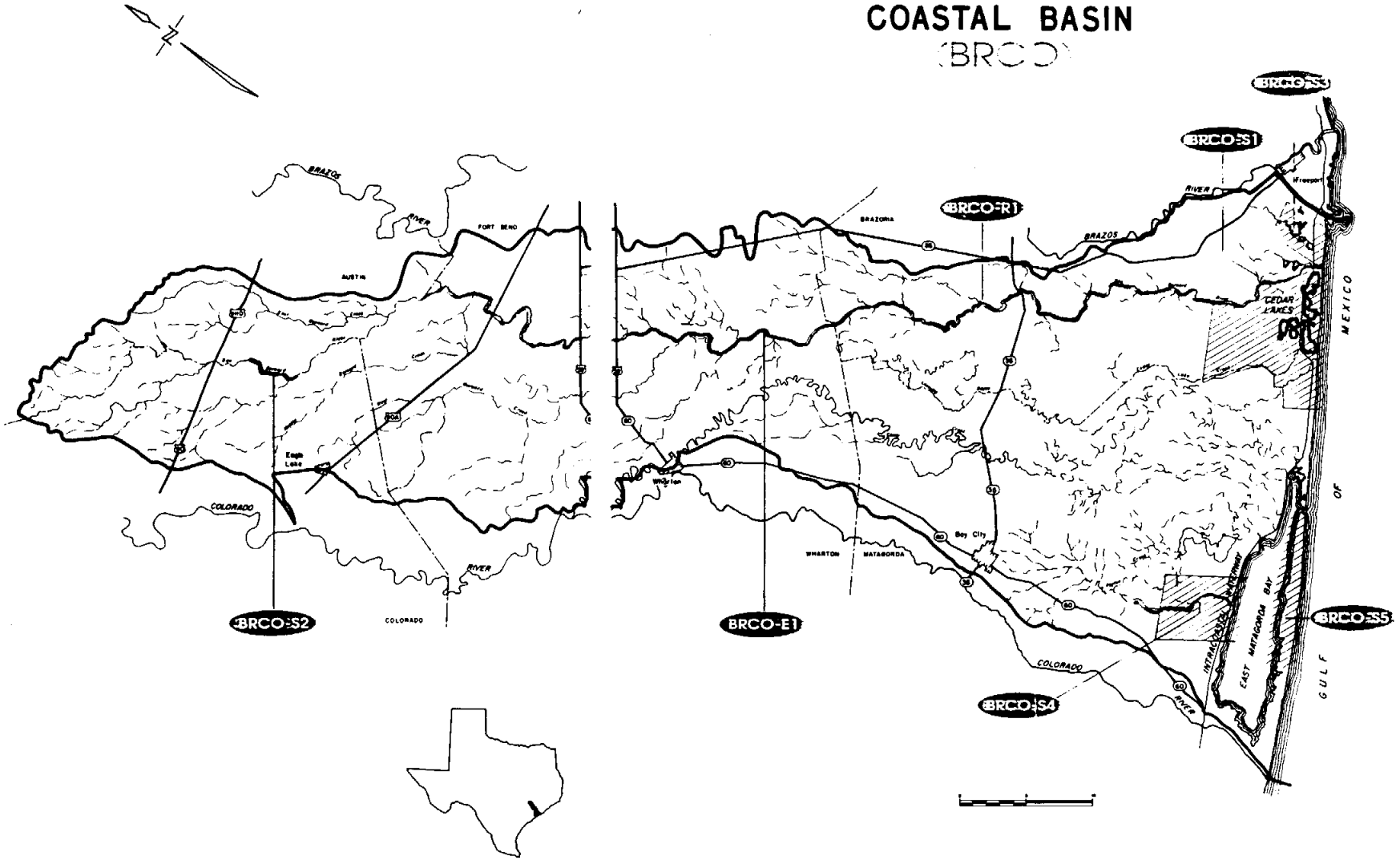
BRAZOS RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
BR-B1	Brazos River	City of Seymour downstream 90 miles to Lake Possum Kingdom	Striped bass spawning migration with unique saltwater springs.	1208
BR-B2	Brazos River	Lake Possum Kingdom downstream 90 miles to Granbury	Striped bass spawning migration, smallmouth bass fishery.	1206
BR-B3	Brazos River	Lake Granbury 60 miles downstream to Lake Whitney	Striped bass spawning migration.	1204
BR-B4	Brazos River	Lake Whitney tailrace to Gulf	Striped bass spawning migration.	1242, 1202,1201
BR-B5	Navasota River	Lake Limestone to Brazos River	Striped bass spawning migration.	1209
BR-B6	Paluxy River	Confluence with Brazos to 40 miles upstream	Striped bass spawning migration.	1229
BR-E1	Mill Creek	From confluence of Pin Oak Creek to FM 331 crossing (Austin County)	Unique community, rare gamagrass-switchgrass bottomland tallgrass prairie.	--
BR-E2	Brazos River	Austin/Fort Bend County line downstream to Gulf	Unique community, Live oak-Water oak-Pecan bottomlands.	1201,1202
BR-Q1	Sanchez Creek	Headwaters to confluence with Brazos River	Pristine and historic area.	--
BR-R1	Brazos River	Possum Kingdom Dam to Lake Granbury	Recreation.	1206
BR-R2	Paluxy River	Bluff Dale (Erath County) to Glen Rose (Somervell County)	Recreation.	1229
BR-R4	Brazos River	Lake Granbury to Lake Whitney	Recreation.	1204
BR-S1	Paluxy River	Dinosaur Valley State Park (National Natural Landmark)	Unique State holdings.	1229
BR-S2	Brazos River at Big Creek	Brazos Bend State Park	Unique State holdings	1202

* Designation Codes:

B: Biological Function
E: Protected Species: Threatened/Endangered/Unique Communities
Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
R: Recreation
S: Acquisition/Mitigation/Governmental Open Space

BRAZOS-COLORADO COASTAL BASIN (BRCO)



ALLENS CREEK RESERVOIR

General Data

Normal Pool Elevation: 118 'MSL	***Size: 8,250 Acres***
Location: Austin County. Confluence of Allens Creek & the Brazos River. Brazos River Basin. The proposed dam site is located approximately 8 miles southeast of Sealy with the reservoir extending southwest for approximately 5 miles.	***Existing Vegetation Description:*** Gulf Prairies and Marshes Ecological Area displaying a Pecan-Elm Forest vegetation regime along stream basins and primarily crops in non-riparian areas.

Natural Resource Attribute Data Summary

Habitat Quality Attributes: No information available. A thorough on-site habitat evaluation is needed.

Wildlife Game Resources: A very sparse deer population exists at the proposed reservoir site although the county maintains a moderate deer population density of approximately 37 acres/deer.

Wildlife Non-game Resources: A 90th Christmas Bird Count census was performed in the vicinity of the proposed reservoir at Borgstedt's Pond. During a recent 59.5 hour census, 428,796 individuals comprising 135 avian species were observed.

Aquatic Resources: Inland Fisheries stream surveys are not available for this site. Available data does not show this stream to have a notable fishery. However, freshwater inflow to the coastal area from the adjacent Brazos River could be affected. Additional information is available from Atomic Energy Commission E.I.S. data.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

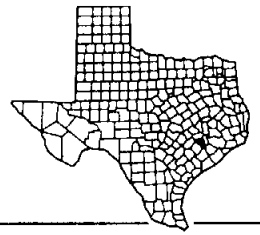
Endangered Resources: The downstream portion of the Brazos Basin is resident habitat for the **Bald eagle** although no known active eagle nests are located in the proposed reservoir vicinity. **Houston toad** -- one historic occurrence locality is partially contained in the reservoir site; very rare, critically imperiled, especially vulnerable to extinction. **Smooth green snake** -- one historic occurrence record contained within the reservoir site; critically imperiled in Texas. **Attwater's greater prairie-chicken** -- nearby occurrence record; critically imperiled in Texas. The reservoir area should be carefully and thoroughly surveyed for appropriate habitat or existence of this bird. **Sandhill four o'clock** -- nearby occurrence, very rare, especially vulnerable to extinction. **Mohlenbrock's umbrella sedge** -- nearby occurrence, rare or uncommon in Texas. **Texas garter snake** -- one nearby occurrence, rare in Texas. Natural communities present: **Little Bluestem-Brownseed Paspalum Series** -- nearby occurrence record of one excellent quality native prairie remnant, imperiled and very vulnerable throughout its range; **Little Bluestem-Indiangrass Series** -- one occurrence in the vicinity of the proposed reservoir, imperiled and very vulnerable throughout its range. Other protected species likely to occur at the proposed reservoir location include: **Timber rattlesnake, Blue sucker, Bald eagle, White-tailed hawk.**

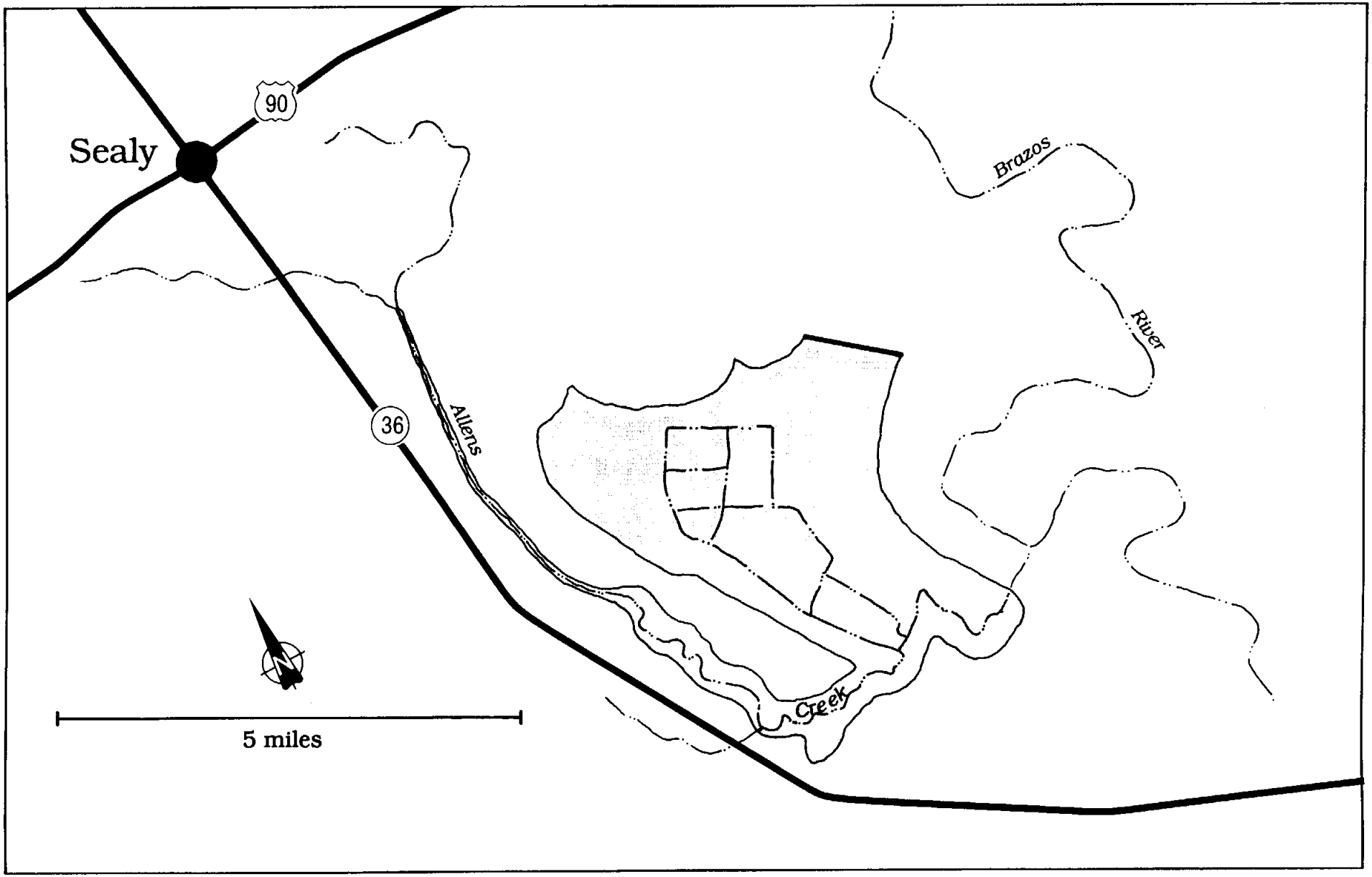
Other Resource Attributes: None identified.

Allens Creek

Normal Pool El.—118 ft. MSL
Surface Acres—8,250

Austin County





BOSQUE RESERVOIR

General Data

Normal Pool Elevation: 830 MSL

Size: 4,470 Acres

Location:

Bosque County. North Bosque River. Brazos River Basin. The proposed dam site is located approximately 4 miles northwest of Meridian with the reservoir extending northwest for approximately 8 miles.

Existing Vegetation Description:

Cross Timbers and Prairies Ecological Area currently composed of the following vegetation types:

	acres	(%)
Mixed Riparian Forest	793	18
Native Grasses/Herbland Savannah	1,511	34
Tame Grasses/Herbland Savannah	1,007	23
Deciduous Forest	110	2
Cropland	1,049	23

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Expected loss of 571 Habitat Units of High Priority Habitat. Actual habitat acreage by resource category ( ) at the proposed reservoir site includes: (1) 0; (2) 793; (3) 1,621; (4) 2,056.

Wildlife Game Resources: The proposed reservoir site supports a very high deer population density calculated at 9.2 acres/deer as compared to an estimated adjacent upland deer population density of 20-25 acres/deer. The proposed reservoir area is ranked as "excellent" turkey habitat and supports an excellent bird population.

Wildlife Non-game Resources: No census recorded in the area.

Aquatic Resources: An inland fisheries stream survey of fish species observed for this reservoir location is listed in Appendix J. The Bosque river provides intermittent fishing opportunities. The state-listed threatened species **Creek chubsucker** and **Brazos water snake** are potentially affected by this project. The river is essentially a clear stream. The bottom is largely gravel and sand with many stretches of rock hardpan. Nutrients from adjacent agricultural lands and wastewater discharges contribute to algae growth.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

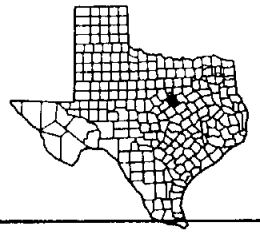
Endangered Resources: **Golden-cheeked warbler** -- occurrence records are partially contained in the proposed reservoir site. The potential for its' occurrence is high if juniper encroachment has occurred. Imperiled globally, very vulnerable to extinction throughout its range. **Guadalupe bass** -- one occurrence partially contained in the proposed reservoir site, rare in Texas. Natural Communities Present: **Texas Oak Series**, rare locally; **Ashe Juniper-Oak Series**; **Pecan-Sugarberry Series.** Other protected species likely to occur at the proposed reservoir locations include: **Black-capped vireo**.

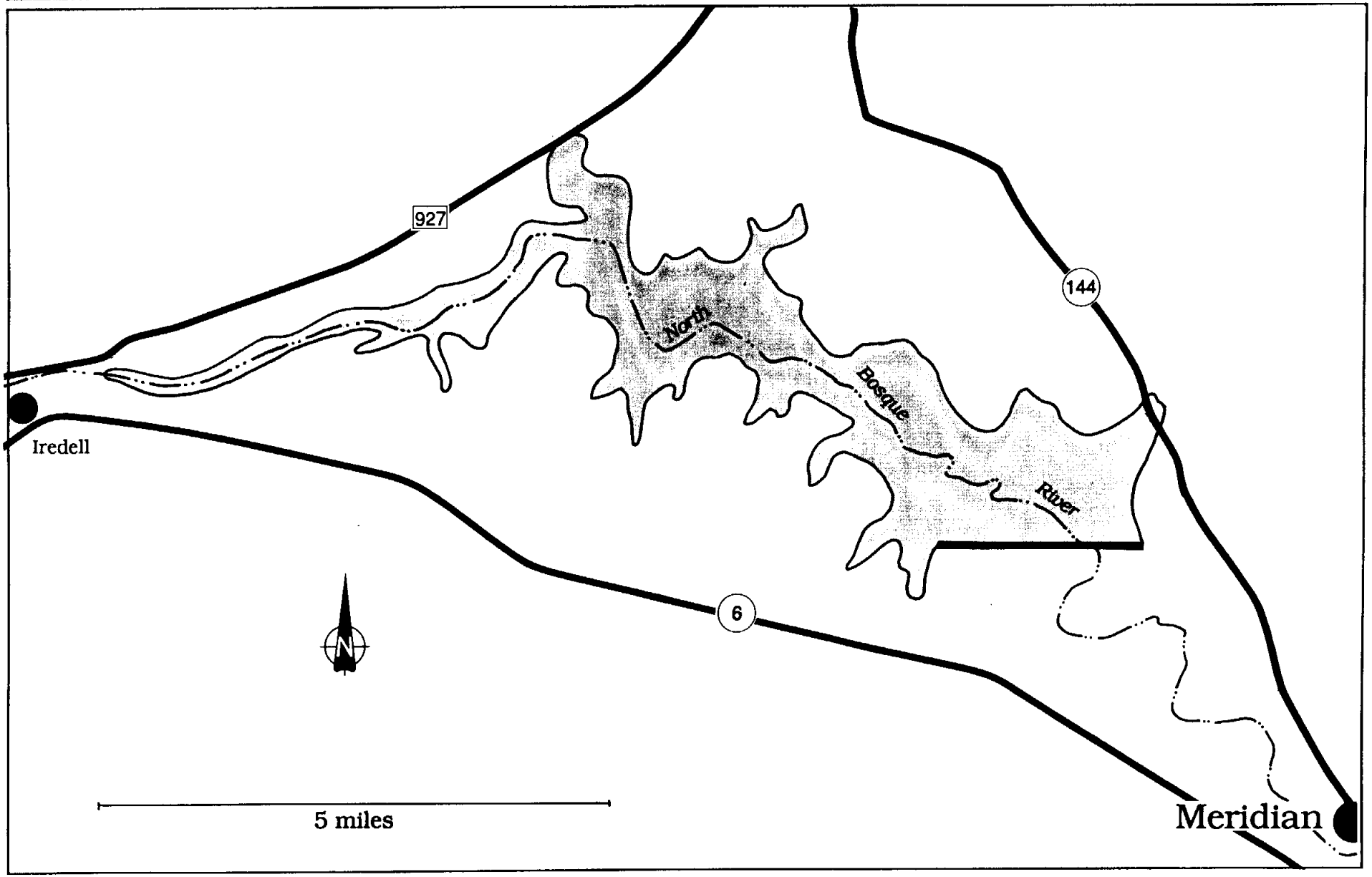
Other Resource Attributes: None identified.

Bosque

Normal Pool El.—830 ft. MSL
Surface Acres—4,470

Bosque County





PALUXY RESERVOIR

General Data

Normal Pool Elevation: 781 ' MSL

Size: 3,848 Acres

Location:

Hood and Somervell Counties. Paluxy River in the Brazos River Basin. The proposed dam site is located approximately 5 miles west of Glen Rose with the reservoir extending west northwest for approximately 8 miles.

Existing Vegetation Description:

Cross Timbers and Prairies Ecological Area currently composed of the following vegetation types:

	acres	(%)
Cropland/Grassland	2,572	67
Mixed Riparian Forest	566	15
Oak-Mesquite-Juniper Woods	395	10
Oak-Mesquite-Juniper Parks	230	6
Other	85	2

Natural Resource Attribute Data Summary

***Habitat Quality Attributes*:** Expected loss of 374 Habitat Units of High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir area include: (1) 0; (2) 566; (3) 625; (4) 2,572.

Wildlife Game Resources: A moderate deer population density of 23.6 acres/deer is known to exist at the proposed reservoir site. Adjacent upland deer populations are estimated at 30-35 acres/deer. The proposed reservoir site is categorized as "excellent" turkey habitat and supports a healthy bird population.

Wildlife Non-game Resources: A Great Blue Heron population has been documented near the proposed reservoir site by the Colonial Waterbird Census. Additionally, the Breeding Bird Survey Route #062 intersects the proposed reservoir location documenting occurrences of 73 avian species on the route since observations began in 1967.

Aquatic Resources: Inland Fisheries stream surveys are not available for this site. This river serves as one of a few striped bass spawning and migration areas in the state. Loss of the stream would prohibit striped bass spawning and alter riverine species habitat. Reduction of normal streamflow control would severely affect the fishery, particularly for White bass, Threadfin shad, Gizzard shad and Spotted bass.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

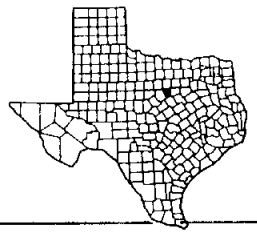
Endangered Resources: **Black-capped vireo** -- one occurrence partially contained in the proposed reservoir site, imperiled and very vulnerable to extinction. **Brazos water snake** -- one occurrence recorded in the vicinity of the proposed reservoir site, very rare globally, rare in Texas. Natural Communities Present: **Ashe-Juniper Oak Series, Post Oak-Blackjack Oak Series** and the **Sugarberry-Elm Series** -- occurrences at or near the proposed reservoir location. Other protected species likely to occur in the proposed reservoir area include: **Golden-cheeked warbler, Glen Rose yucca.**

Other Resource Attributes: The Paluxy River along the proposed reservoir site is a TPWD selected "Significant Stream Segment" because of the high recreational value (scenic and pristine); it flows through Dinosaur Valley State Park, a high quality State resource and National Natural Landmark; and, because of fisheries resources the stream provides. The Texas Natural Area Survey identified the Paluxy River at the proposed reservoir site in their listing of important "natural areas" for the river segments' scenic beauty and pristine qualities. The riverbed of the Paluxy River within the Park boundary contain dinosaur track impressions which are of National significance.

Paluxy

Normal Pool El.—781 ft. MSL
Surface Acres—3,848

Hood and Somervell Counties



POST RESERVOIR

General Data

Normal Pool Elevation: 2,430 MSL

Size: 2,063 Acres

Location:

Garza County. North Fork, Double Mountain Fork, Brazos River Basin. The proposed dam site is located approximately 7 miles east northeast of Post with the reservoir extending west northwest for approximately 6 miles.

Existing Vegetation Description:

Rolling Plains Ecological Area currently composed of the following vegetation types:

	acres	(%)
Mesquite Shrub/Grasses	1,693	82
Salt Cedar/Willow Brush	370	18

Natural Resource Attribute Data Summary

Habitat Quality Attributes: No expected loss of High Priority Habitat. Actual reservoir site habitat acreages observed by resource category ( ) type includes: (1) 0; (2) 0; (3) 2,063; (4) 0.

Wildlife Game Resources: The reservoir site supports a modest deer population density calculated at 49.8 acres/deer as compared to an adjacent upland deer population density estimated at 70-100 acres/deer. The proposed reservoir site is categorized as "excellent" turkey habitat and supports a growing bird population. Within the proposed reservoir area, two turkey release sites are evidence of the level of TPWD effort in restoration of this wildlife resource.

Wildlife Non-game Resources: The Breeding Bird Survey Route #092 intersects the proposed reservoir location documenting 61 avian species along the survey route since observations began in 1969.

Aquatic Resources: A listing of fish species observed from a stream survey in the vicinity of the proposed reservoir is reported in Appendix J.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

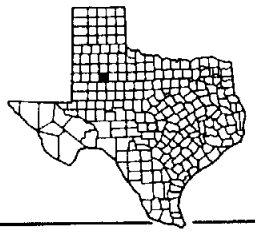
Endangered Resources: No occurrences of protected species have been documented for the immediate vicinity of the proposed reservoir. Protected species which are likely to occur in the proposed reservoir location include: **Texas poppy-mallow** -- occurs in Tivoli fine sand in this area, imperiled and very vulnerable to extinction; **Black-footed ferret** -- a survey of prairie-dog towns should be made to ascertain the existence of this species, critically imperiled and very vulnerable to extinction throughout its range; **Smalleye shiner** -- imperiled and very vulnerable to extinction.

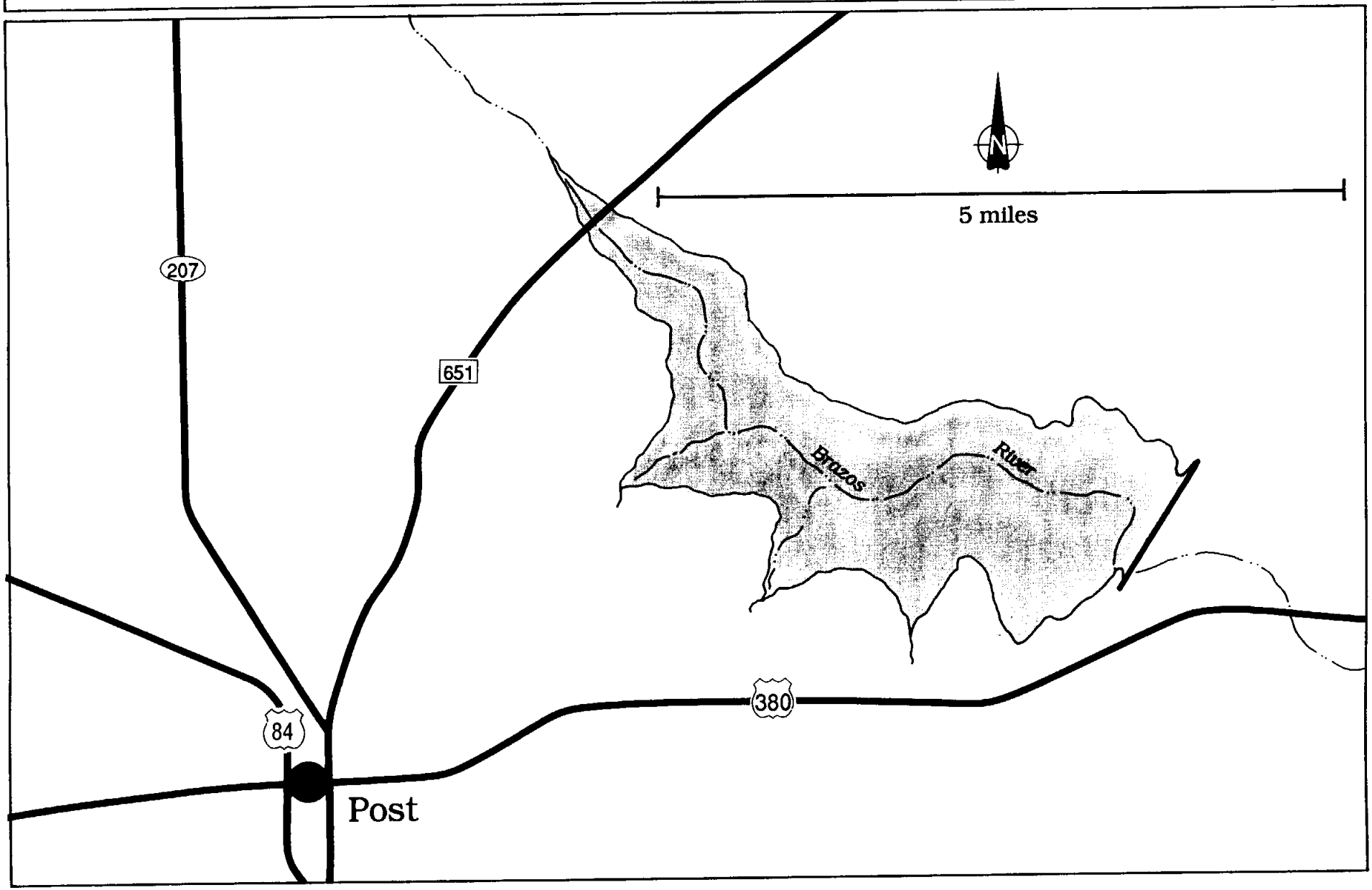
Other Resource Attributes: None identified.

Post

Normal Pool El.—2,430 ft. MSL
Surface Acres—2,063

Garza County





SOUTH BEND RESERVOIR

General Data

Normal Pool Elevation: 1,090 MSL

Size: 29,669 Acres

Location:

Stephens and Young Counties. Brazos River and Clear Fork of the Brazos River Basin. The proposed dam site is located approximately 8 miles southeast of Graham with the reservoir extending northwest for approximately 25 miles and southwest for approximately 20 miles.

Existing Vegetation Description:

Cross Timbers and Prairies Ecological Area currently composed of the following vegetation types:

	acres	(%)
Mixed Riparian Forest	2,354	8
Post Oak-Live Oak-Mesquite Parks	4,880	16
Mesquite Shrub/Grasses	12,657	43
Crops	2,991	10
Other	6,787	23

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Expected loss of 1,813 Habitat Units of High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir area include: (1) 0; (2) 2,354; (3) 17,537; (4) 2,991. Regarding habitat, this river segment has been described as the best part of the free-flowing Brazos above Possum Kingdom Reservoir.

Wildlife Game Resources: A moderate deer population density of 34.1 acres/deer is known to exist at the proposed reservoir site, as compared to an adjacent upland estimated deer population density of 50-75 acres/deer. The proposed reservoir site is categorized as "excellent" turkey habitat and supports an exceptional quality historic bird population.

Wildlife Non-game Resources: The Colonial Waterbird Census indicated several historic rookeries in the vicinity of the proposed reservoir. Additionally, the Breeding Bird Survey Route #076 intersects the proposed reservoir location documenting 75 avian species along the survey route since observation began in 1966.

Aquatic Resources: Inland Fisheries stream surveys listing fish species present for this site are listed in Appendix J. The State-listed threatened species, **Brazos water snake**, would be affected by this project. Water quality data indicate high natural levels of nitrate nitrogen and sulfates. Additionally, water quality in the reservoir area is affected by secondary effluent from the City of Abilene.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

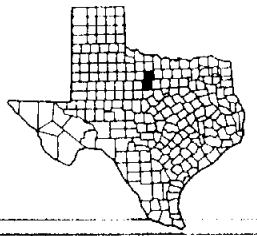
Endangered Resources: **Smalleye shiner** -- one nearby occurrence, imperiled and very vulnerable globally and in Texas. Protected species likely to occur at the proposed reservoir location include: **Brazos water snake, Golden-cheeked warbler, Black-capped vireo, Interior least tern.**

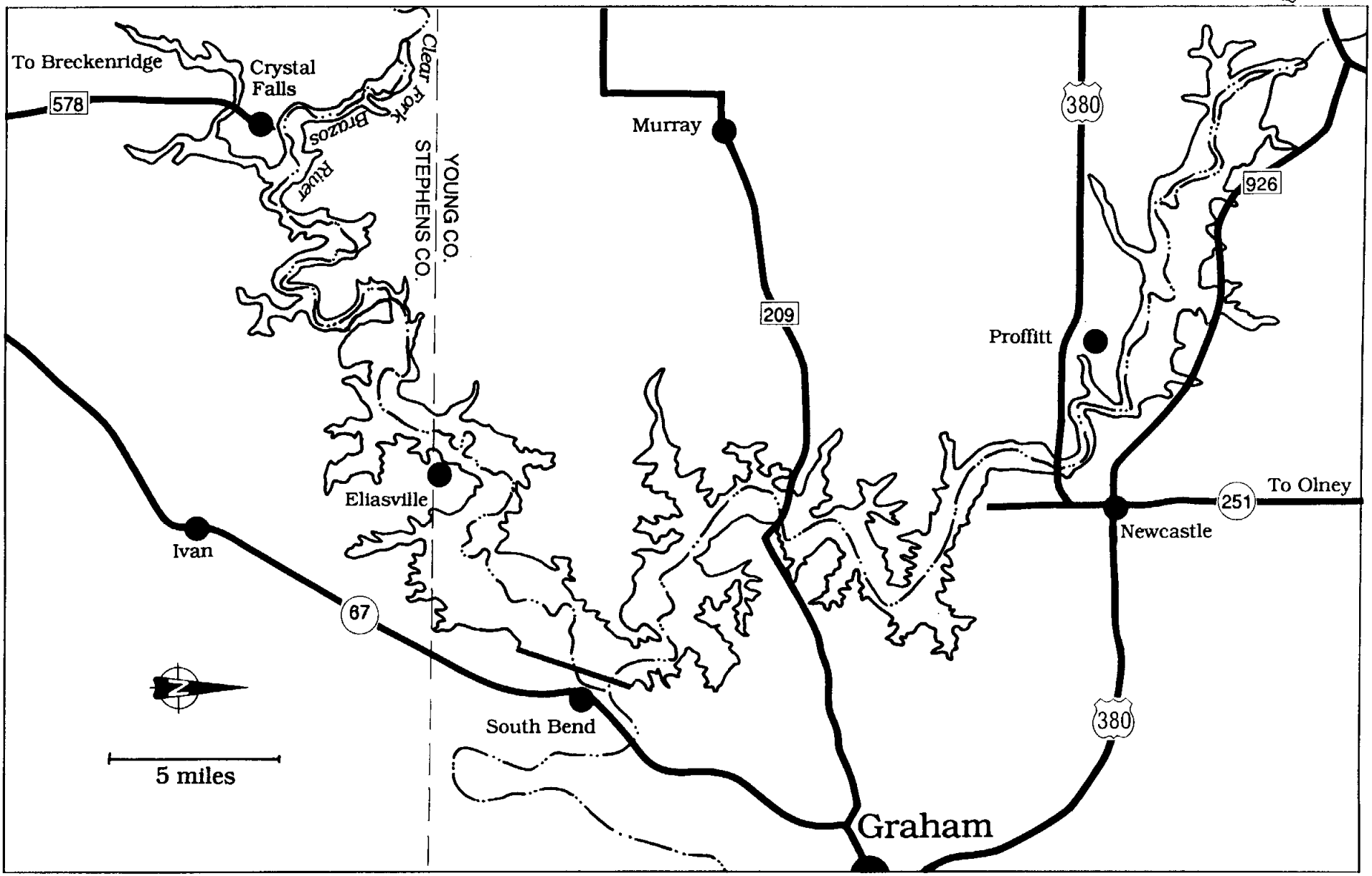
Other Resource Attributes: The Brazos River along the proposed reservoir site is a TPWD selected "Significant Stream Segment" because of the stream segments' contribution to the fisheries resource.

South Bend

Normal Pool El.—1,090 ft. MSL
Surface Acres—29,669

Young and Stephens Counties





Brazos-Colorado Coastal Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

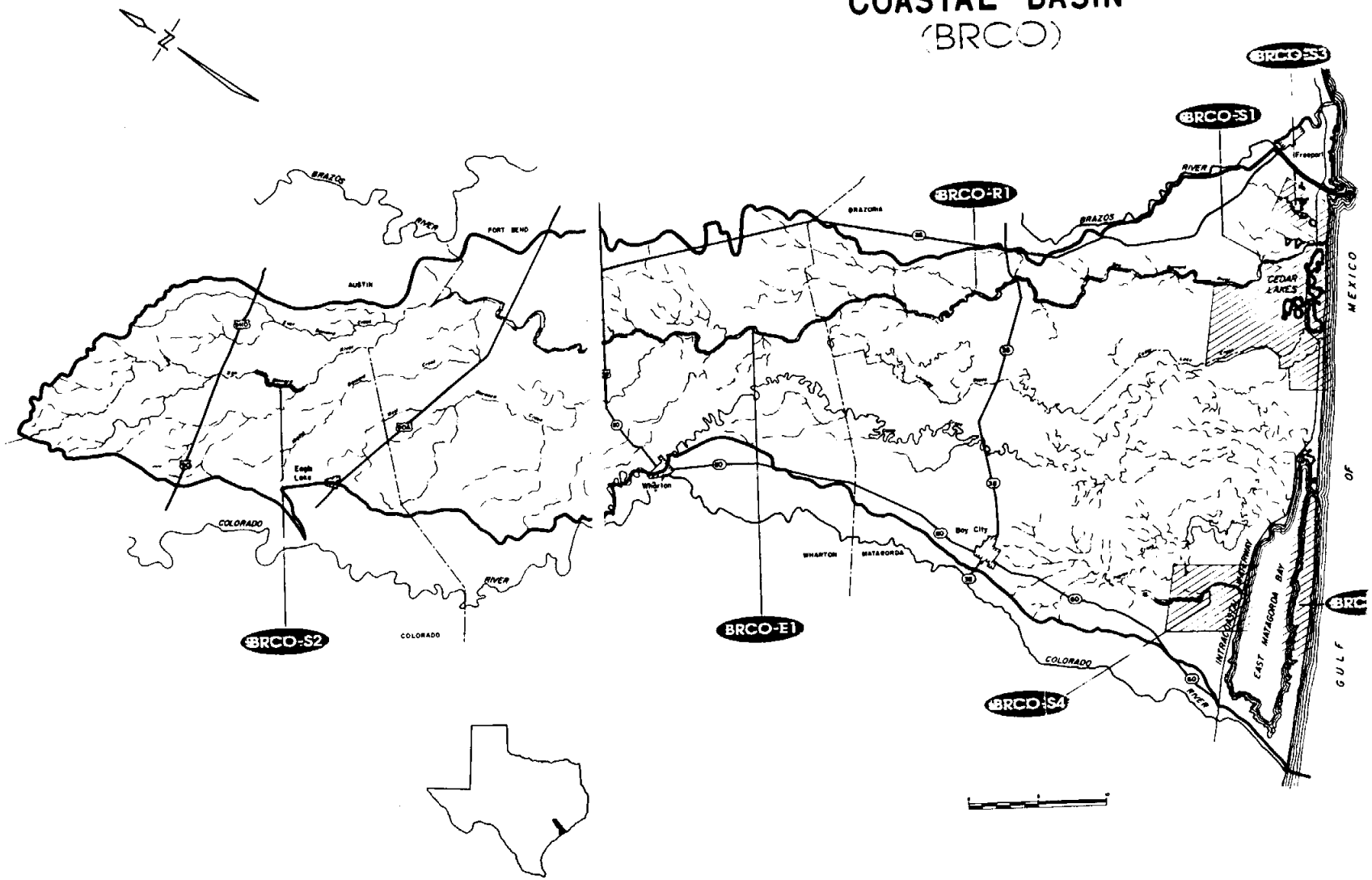
BRAZOS-COLORADO COASTAL BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
BRCO-E1	San Bernard River	From Austin-Fort Bend county line to Gulf	Unique community, Live Oak-Water Oak-Pecan bottomlands.	1301, 1302
BRCO-R1	San Bernard River	FM 442 crossing to FM 2611 crossing near Jones Creek	Recreation.	1301, 1302
BRCO-S1	San Bernard River	San Bernard National Wildlife Refuge	Unique Federal holdings.	1301
BRCO-S2	San Bernard River	Attwater Prairie Chicken National Wildlife Refuge	Unique Federal holdings.	1302
BRCO-S3	Jones Creek and Redfish Bayou	Peach Point Wildlife Management Area	Unique State holdings.	--
BRCO-S4	Big Boggy Creek	Big Boggy National Wildlife Refuge	Unique Federal holdings.	--
BRCO-S5	Gulf Coast	Matagorda Peninsula State Park	Unique State holdings.	--

* Designation Codes:

- B: Biological Function
- E: Protected Species: Threatened/Endangered/Unique Communities
- Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
- R: Recreation
- S: Acquisition/Mitigation/Governmental Open Space

BRAZOS-COLORADO COASTAL BASIN (BRCO)



Canadian River Basin

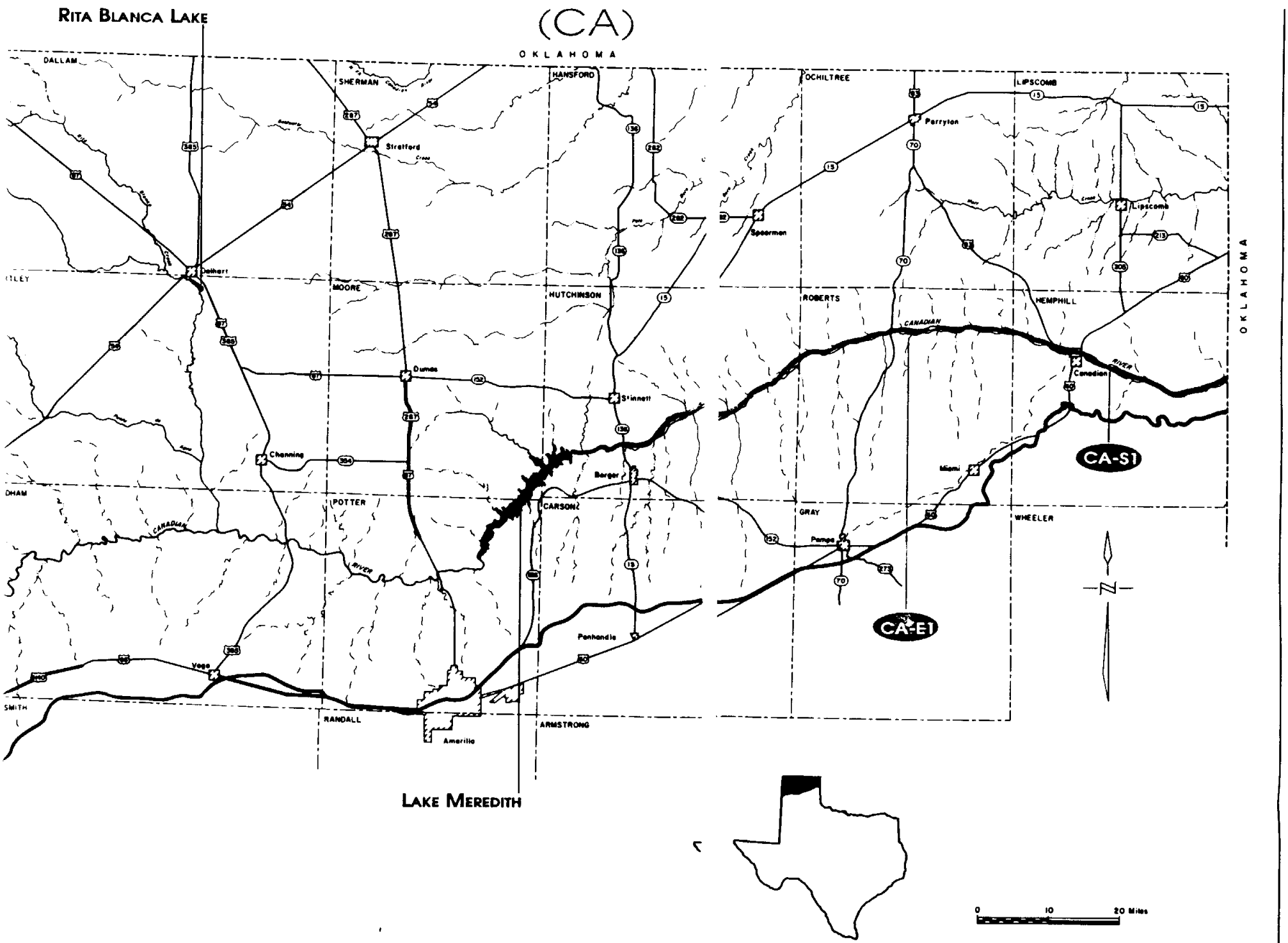
SIGNIFICANT STREAM SEGMENT SUMMARY

CANADIAN RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
CA-E1	Canadian River	Lake Meredith downstream to stateline	Essential habitat for the Least tern.	0101
CA-S1	Canadian River	Gene Howe Wildlife Management Area	Unique State holdings.	0101

* Designation Codes:

- B: Biological Function
- E: Protected Species: Threatened/Endangered/Unique Communities
- Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
- R: Recreation
- S: Acquisition/Mitigation/Governmental Open Space


RITA BLANCA LAKE
(CA)
OKLAHOMA
DALLAM
SHERMAN
HANSFORD
OCHILTREE
LIPSCOMB
Perryton
Stratford
Dalhart
Spearman
Lipscomb
MOORE
HUTCHINSON
ROBERTS
HEMPHILL
CANADIAN
RIVER
Canadian
Dumas
Sunnett
Channing
Borger
Miami
CA-S1
POTTER
CARSON
GRAY
WHEELER
Pampa
CA-E1
Penhandle
Vega
RANDALL
ARMSTRONG
Amarillo
LAKE MEREDITH
OKLAHOMA
N
0
10
20 Miles

Colorado River Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

COLORADO RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
CO-B1	Colorado River	Missouri-Pacific Railroad crossing south of Bay City down stream to Matagorda Bay	Extensive freshwater wetland habitat.	1401, 1402
CO-B2	Colorado River	Between Colorado Bend State Park and Lake Buchanan	White bass spawning and TPWD Collection Area.	1409
CO-E1	Colorado River	Source to Stacy Dam	Protected, Texas poppy-mallow (G2 S2).	1412, 1426
CO-E2	San Saba River	Schleicher-Menard County line downstream to Menard, Menard County	Protected, Clear Creek Gambusia (G1 S1).	1416
CO-E3	Barton Creek	Source to confluence with Colorado River	Protected, Barton Springs salamander (G1 S1).	1430
CO-E4	South Concho River	Headwaters to Twin Buttes Reservoir	Texas Unique species. Guadalupe bass (G3 S3) fishery.	1424
CO-E5	Spring Creek	Headwaters to Twin Buttes Reservoir	Texas Unique species. Guadalupe bass (G3 S3) fishery.	--
CO-E6	Dove Creek	Headwaters to Twin Buttes Reservoir	Texas Unique species. Guadalupe bass (G3 S3) fishery.	--
CO-E7	North Llano	Headwaters to confluence with Llano River	Texas Unique species. Guadalupe bass (G3 S3) fishery.	1415
CO-E8	South Llano	Headwaters to confluence with Llano River	Texas Unique species. Guadalupe bass (G3 S3) fishery.	1415
CO-E9	Pedernales River	Headwaters to Stonewall	Texas Unique species. Guadalupe bass (G3 S3) fishery.	1414
CO-E10	San Saba River	Headwaters to Menard	Guadalupe bass (G3 S3).	1416
CO-Q1	Pedernales River	Johnson City downstream to Pedernales Falls State Park	Pristine, Unique.	1414
CO-Q2	Barton Springs	Headwaters to Town Lake	Pristine.	1430
CO-R1	Colorado	Ballinger, Runnels County, to Lake Buchanan	Recreation.	1409, 1410, 1426
CO-R2	San Saba River	Fort McKavett, Menard County, to confluence with Colorado River	Recreation.	1416
CO-R3	Llano River	Source to Lake LBJ	Recreation.	1415
CO-R4	Pedernales River	Source to Lake Travis	Recreation.	1414
CO-R5	Barton Creek	Source to Zilker Park	Recreation.	1430

SIGNIFICANT STREAM SEGMENT SUMMARY

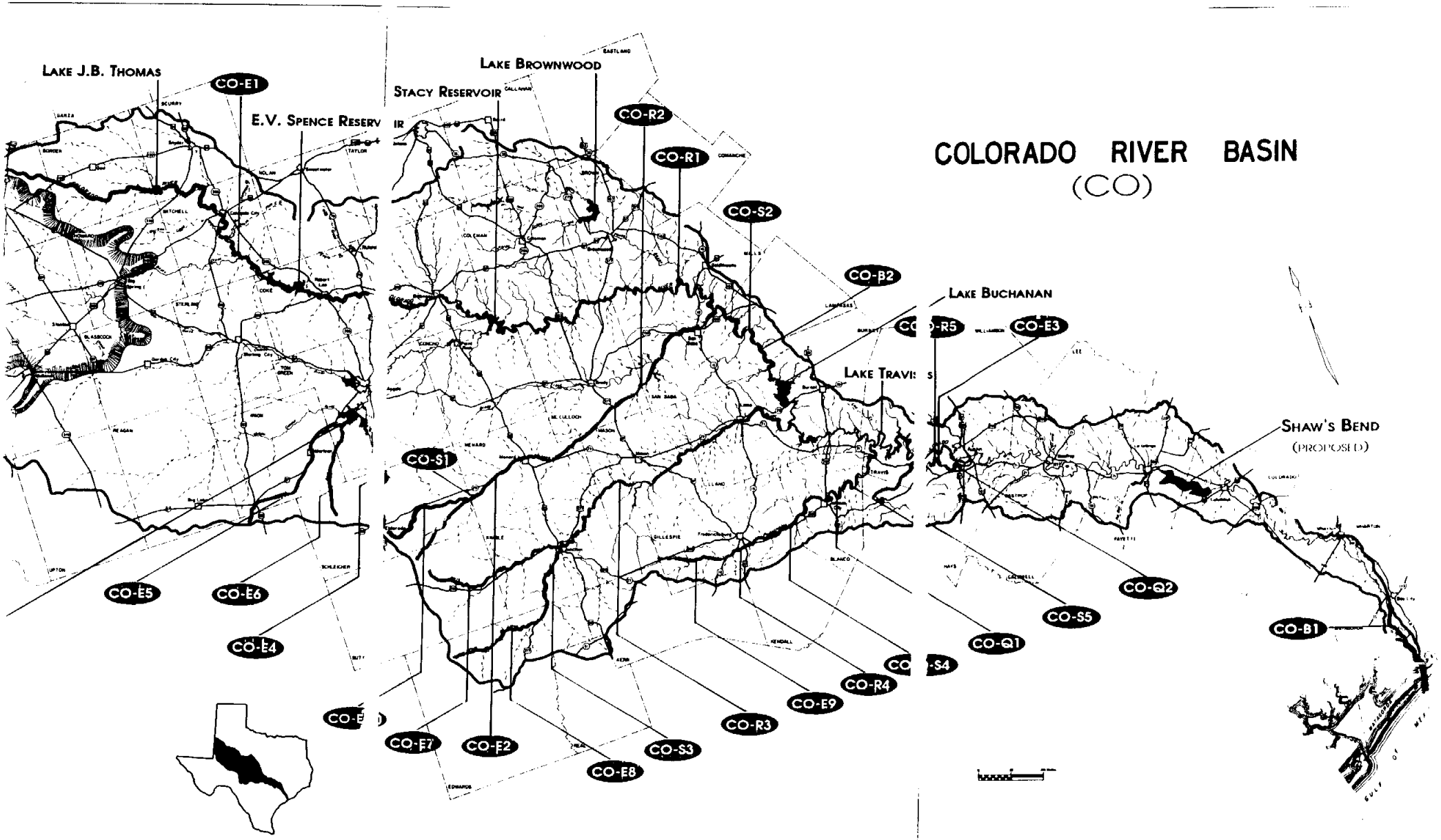
(Cont.)

COLORADO RIVER BASIN: (Cont.)

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
CO-S1	San Saba River	Fort McKavett State Historical Park	Unique State holdings.	1416
CO-S2	Colorado River	Colorado Bend State Park	Unique State holdings.	1409
CO-S3	South Llano River	South Llano State Park and Walter Buck Wildlife Management Area	Unique State holdings.	1415
CO-S4	Pedernales River	LBJ State and National Park	Unique State holdings.	1414
CO-S5	Pedernales River	Pedernales Falls State Park	Unique State holdings.	1414

* Designation Codes:

B: Biological Function
E: Protected Species: Threatened/Endangered/Unique Communities
Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
R: Recreation
S: Acquisition/Mitigation/Governmental Open Space


COLORADO RIVER BASIN
(CO)
LAKE J.B. THOMAS
E.V. SPENCE RESERV
LAKE BROWNWOOD
STACY RESERVOIR
LAKE BUCHANAN
LAKE TRAVI
SHAW'S BEND
(PROPOSED)
CO-E1
CO-E2
CO-E3
CO-E4
CO-E5
CO-E6
CO-E7
CO-E8
CO-E9
CO-R1
CO-R2
CO-R3
CO-R4
CO-R5
CO-S1
CO-S2
CO-S3
CO-S4
CO-S5
CO-B1
CO-B2
CO-Q1
CO-Q2

SHAWS BEND RESERVOIR

General Data

Normal Pool Elevation: 220 MSL

Size: 12,913 Acres

Location:

Fayette and Colorado Counties. Colorado River Basin. The proposed dam site is located approximately 5 miles west northwest of Columbus with the reservoir extending northwest for approximately 15 miles.

Existing Vegetation Description:

Blackland Prairie and Post Oak Savannah Ecological Areas currently composed of the following vegetation types:

	acres	(%)
Mixed Bottomland Hardwood Forest	4,697	36
Native and Introduced Grasses	3,591	28
Crops	2,838	22
Live Oak-Post Oak Parks	1,170	9
Mesquite-Huisache Brush	86	1
Oak-Yaupon Woods	184	1
Other	347	3

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Expected loss of 3335 Habitat Units of High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir location include: (1) 0; (2) 4,697; (3) 1,925; (4) 5,944.

Wildlife Game Resources: The proposed reservoir site supports a very high deer population calculated at 13.0 acres/deer as compared to an estimated adjacent upland deer population density of 26.0 acres/deer. The proposed reservoir location is categorized as "excellent" turkey habitat and supports a modest density turkey population. Within the proposed reservoir area, several turkey release sites are evidence of the level of TPWD effort in restoration of this wildlife resource. The area is considered as "excellent" habitat for the gray squirrel.

Wildlife Non-game Resources: A 90th Christmas Bird Count census was performed in the vicinity of the proposed reservoir near Osage. During a 10 hour census, 2,383 individuals comprised of 47 avian species were observed. Additionally, the Colonial Waterbird Census Report has documented a recent significant and species diverse rookery in the vicinity of the proposed reservoir area.

Aquatic Resources: An inland fisheries stream survey of fish species observed for this proposed reservoir location is listed in Appendix J. The state-listed threatened **Blue sucker** is expected to occur in this stream segment area as well as the state and federal-listed **Houston toad**. Reservoir construction could alter critical toad habitat. Water quality is sufficient to maintain the existing fishery.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

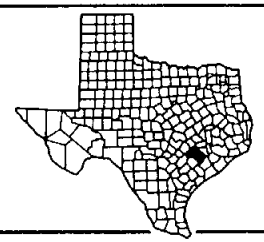
Endangered Resources: **Bald eagle** -- the downstream portion of the Guadalupe River is resident habitat of this species. An active eagle nest is present within the immediate proposed reservoir location, rare globally and in Texas. **Houston toad** -- known occurrence in the proposed reservoir location, very rare, critically imperiled and vulnerable to extinction. **Guadalupe bass** -- known occurrence in the proposed reservoir area, rare, limited range in Texas. Natural communities present: **Little Bluestem-Indiangrass Series** -- one occurrence in the near vicinity of the proposed reservoir, imperiled and rare; **Post Oak-Blackjack Oak Series** -- one occurrence in the near vicinity of the proposed reservoir location. Other protected species likely to occur in the proposed reservoir area include: **Timber rattlesnake, White-faced ibis, Wood stork, Blue sucker.**

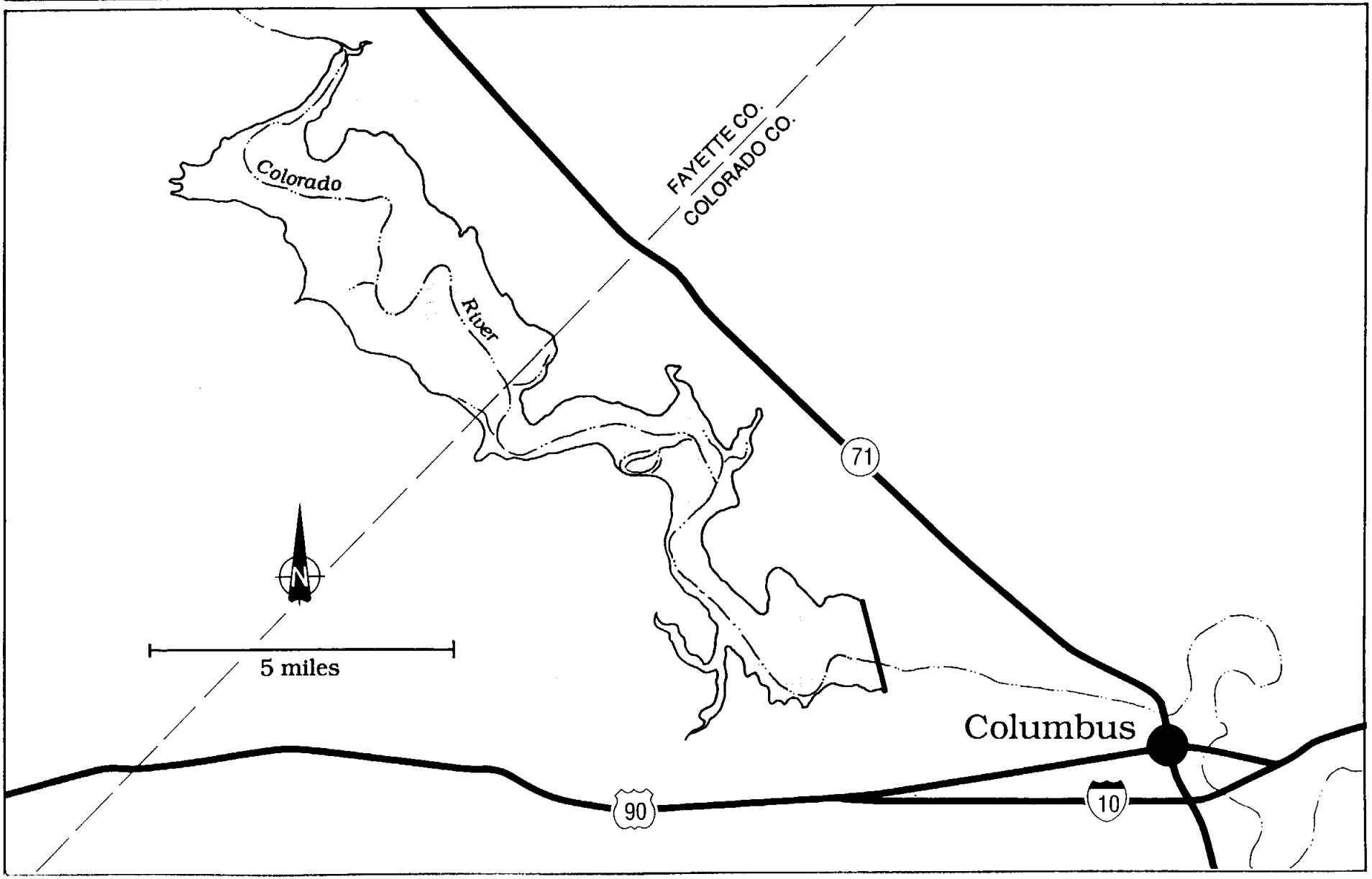
Other Resource Attributes: None identified.

Shaws Bend

Normal Pool El.—220 ft.
Surface Acres—12,913

Fayette and Colorado Counties





Colorado-Lavaca Coastal Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

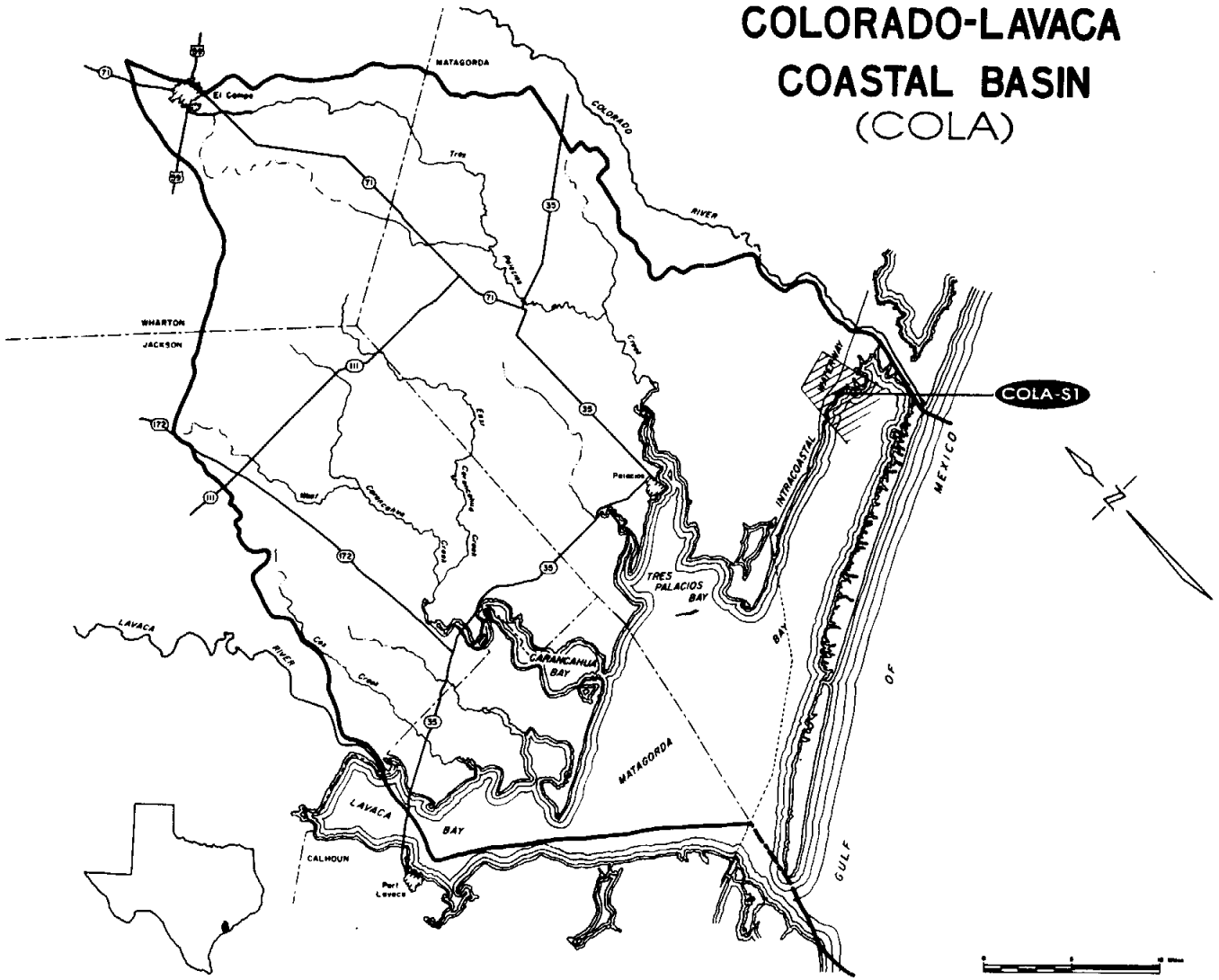
COLORADO-LAVACA COASTAL BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
COLA-S1	Matagorda Bay	Mad Island Wildlife Management Area	Unique State holdings.	--

* Designation Codes:

- B: Biological Function
- E: Protected Species: Threatened/Endangered/Unique Communities
- Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
- R: Recreation
- S: Acquisition/Mitigation/Governmental Open Space

COLORADO-LAVACA COASTAL BASIN (COLA)



Cypress Creek River Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

CYPRESS CREEK BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
CY-B1	Black Cypress Creek	Black Cypress Creek between SH 11 and US 59	Priority bottomland hardwood habitat.	--
CY-B2	Big Cypress Creek	Big Cypress Creek from SH 43 through Upper Caddo Lake	Priority bottomland hardwood habitat.	0402
CY-E1	Cypress Creek	Lake O'the Pines to Caddo Lake	Threatened & Endangered: Paddlefish (G4 S1); Chestnut lamprey (G5 S3); Cypress minnow; Mud, Black-side, River and Goldstriped darters; and Iron-colored shiner.	0402
CY-E2	Black Cypress Bayou	Headwaters to Caddo Lake	Threatened & Endangered: Paddlefish (G4 S1); Chestnut lamprey (G5 S3); Cypress minnow; Mud, Black-side, River and Goldstripped darters; and Iron-colored shiner.	0402
CY-S1	Cypress Creek	Caddo Lake State Park	Unique State holdings.	0402

* Designation Codes:

- B: Biological Function
- E: Protected Species: Threatened/Endangered/Unique Communities
- Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
- R: Recreation
- S: Acquisition/Mitigation/Governmental Open Space

LITTLE CYPRESS RESERVOIR

General Data

Normal Pool Elevation: 230 MSL

Size: 13,966 Acres

Location:

Harrison County. Little Cypress Creek in the Cypress Creek River Basin. The proposed dam site is located approximately 9 miles northwest of Marshall with the reservoir extending west for approximately 14 miles.

Existing Vegetation Description:

Pineywoods Ecological Area currently composed of the following vegetation types:

	acres	(%)
Bottomland Hardwood Forest	7,359	53
Grasses	2,507	18
Hardwood-Pine Forest	2,512	18
Hardwood-Pine Cutover Woods	1,075	8
Other	513	3

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Expected loss of 4,930 Habitat Units of High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir location include: (1) 0; (2) 7,359; (3) 6,094; (4) 0. The USFWS identified "Little Cypress Bayou" and "Big Cypress Bayou", located at and below the proposed reservoir location, as Priority 2 Bottomland Hardwood Sites because of their high habitat resource value, especially for waterfowl.

Wildlife Game Resources: The proposed reservoir site supports an excellent deer population density calculated at 20.4 acres/deer as compared to an estimated adjacent upland deer population density of 26.5 acres/deer. The proposed reservoir location is categorized as "excellent" turkey habitat . Within the proposed reservoir area, several turkey release sites are evidence of the level of TPWD effort in restoration of this wildlife resource. The area is considered "excellent" habitat for the gray squirrel because of the sizeable high quality bottomland hardwood habitat present.

Wildlife Non-game Resources: Two 90th Christmas Bird Count census points are located in the vicinity of the proposed reservoir. A recent census near Longview recorded 20,535 individuals comprised of 94 avian species in 68 hours of observation. At the Lake O' the Pines site, 22,800 individuals comprised of 103 species were observed in a 48 hour census. Additionally, the Breeding Bird Survey Route #056 intersects the proposed reservoir area documenting 82 avian species along the survey route since observations began in 1970. The Colonial Waterbird Census indicates the historic presence of rookeries in the area.

Aquatic Resources: Inland Fisheries survey data are available in Appendix J. Surveys confirm presence of state-threatened **Bluehead shiner**, **Creek chubsucker**, and **Blackside darter** at this proposed reservoir site. Stream habitat conditions suggest the likely presence of **Shovelnose sturgeon**, **Chestnut lamprey**, and **Blue sucker**, all threatened species. The water quality in this area supports excellent, diverse sportfish populations. The USFWS has modeled flow control impacts downstream on Caddo Lake and described these impacts as highly destructive.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

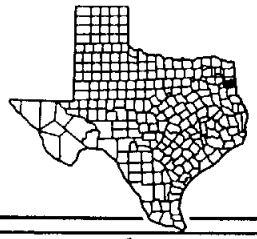
Endangered Resources: **Western painted turtle** -- one occurrence recorded in the near vicinity of the proposed reservoir, secure globally but critically imperiled in Texas. **Neches River rose-mallow** -- occurrence record in the reservoir area, further survey recommended, critically imperiled globally and in Texas; **Golden wave tickseed** and **Texas trillium** -- occurrences in the near area, imperiled in Texas because of its rarity. **Bluehead shiner**, **Creek chubsucker**, and **Blackside darter** also confirmed by TPWD Fisheries (see above). Natural communities present at the proposed reservoir site include the **Water Oak-Willow Oak Series** -- secure globally but rare in Texas. Other protected species likely to occur include: **Bachman's sparrow**, pine parklands with little hardwood understory; **Red-cockaded woodpecker**; **Northern scarlet snake**; **Alligator snapping turtle**; **Wood stork**; **Rafinesque's big-eared bat**; **Shovelnose sturgeon**; **Chestnut lamprey**; **Blue sucker**; **American swallow-tailed kite**; **Southeastern myotis**; **Eastern big-eared bat**; **Paddlefish**.

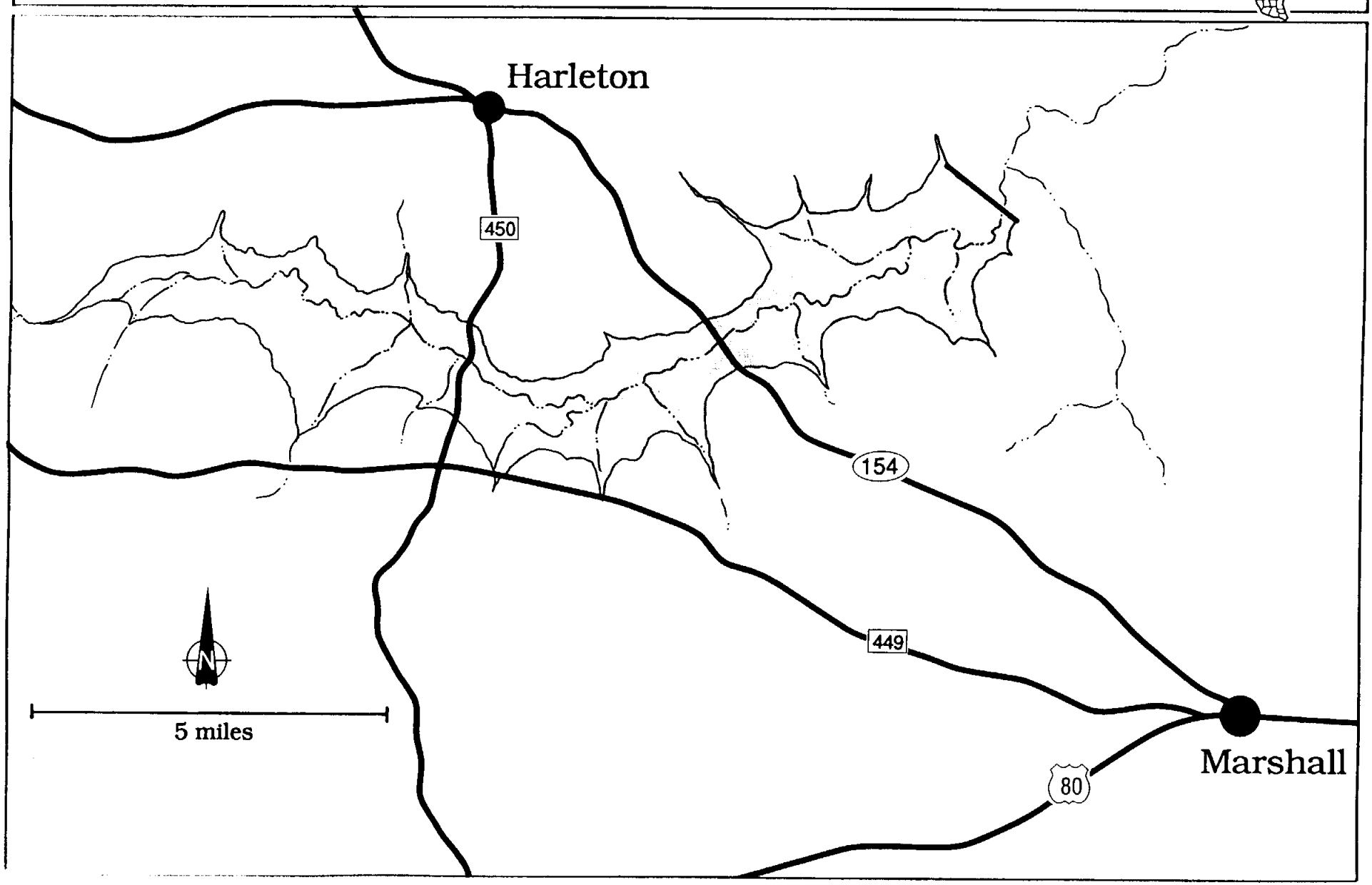
Other Resource Attributes: The Texas Natural Area Survey identified "Caddo Lake Shores" downstream from the proposed dam site in their listing of important "natural areas" for the stream segments' archeological significance and high quality streamside vegetation.

Little Cypress

Normal Pool El.—230 ft. MSL
Surface Acres—13,966

Harrison County





SIGNIFICANT STREAM SEGMENT SUMMARY

GUADALUPE RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
GU-B1	Guadalupe River	Missouri Pacific Railroad crossing, Victoria County, downstream to San Antonio Bay	Extensive freshwater wetland habitat.	1801, 1803
GU-B2	Guadalupe River	Canyon Dam to New Braunfels	Over-summer survival of trout fishery.	1812
GU-E1	San Marcos River	Source to confluence with the Guadalupe River	Protected, Texas wild-rice (G1 S1), San Marcos gambusia (G1 SX), Fountain darter (G1 S1), Guadalupe bass (G3 S3), San Marcos salamander (G1 S1), Cagle's map turtle (G3 S3).	1808, 1814
GU-E2	Guadalupe River	Victoria, Victoria County, downstream to San Antonio Bay	Unique community, extensive marshes.	1801, 1803
GU-E3	Comal River	Headwaters to Guadalupe River	Fountain darter (G1 S1).	1811
GU-E4	San Marcos River	San Marcos Springs to Blanco River	Fountain darter (G1 S1), San Marcos gambusia (G1 SX), Texas wildrice (G1 S1).	1814
GU-E5	Guadalupe River	Headwaters to Canyon Lake	Guadalupe bass (G3 S3). Unique Community, pristine.	1806, 1817, 1818
GU-Q4	Guadalupe River	Headwaters to Canyon Lake to include North and South Forks of the Guadalupe and Johnson Creek	Exceptional aquatic life.	1806, 1817, 1818
GU-Q5	Blanco River	Source to confluence with San Marcos River	Exceptional aquatic life.	1809, 1813
GU-Q6	Cypress Creek	Source to confluence with Blanco River	Exceptional aquatic life.	1815
GU-Q7	Guadalupe River	Canyon Lake Dam downstream to New Braunfels	Exceptional aquatic life.	1812
GU-Q8	San Marcos River	Source to confluence with Guadalupe River	Exceptional aquatic life.	1808, 1814
GU-R1	Guadalupe River	Source to Canyon Lake	Recreation.	1806, 1817, 1818
GU-R2	Guadalupe River	Canyon Lake Dam to New Braunfels	Recreation.	1812

SIGNIFICANT STREAM SEGMENT SUMMARY

(Cont.)

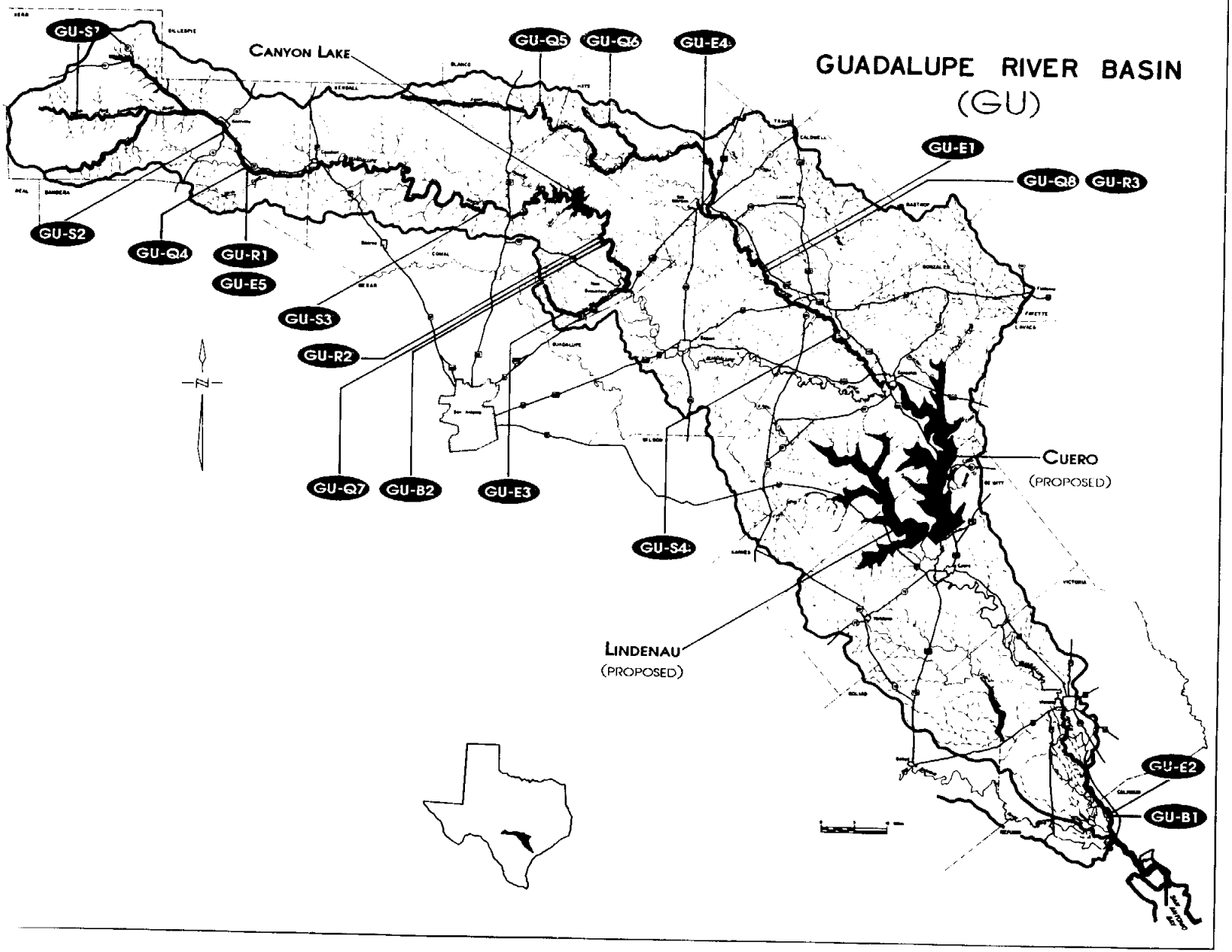
GUADALUPE RIVER BASIN:

(Cont.)

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
GU-R3	San Marcos River	Source to confluence with Guadalupe River	Recreation.	1808, 1814
GU-S1	North Fork of the Guadalupe River	Kerr Wildlife Management Area	Unique State holdings.	1817
GU-S2	Guadalupe River	Kerrville State Park	Unique State holdings.	1806
GU-S3	Honey Creek Guadalupe River	Guadalupe River State Park Honey Creek State Natural Area	Unique State holdings.	1806
GU-S4	San Marcos River	Palmetto State Park	Unique State holdings.	1808

* Designation Codes:

B: Biological Function
E: Protected Species: Threatened/Endangered/Unique Communities
Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
R: Recreation
S: Acquisition/Mitigation/Governmental Open Space


GUADALUPE RIVER BASIN
(GU)
CANYON LAKE
CUERO
(PROPOSED)
LINDENAU
(PROPOSED)
GU-S1
GU-S2
GU-S3
GU-S4
GU-Q4
GU-Q5
GU-Q6
GU-Q7
GU-Q8
GU-R1
GU-R2
GU-R3
GU-E1
GU-E2
GU-E3
GU-E4
GU-E5
GU-B1
GU-B2

General Data

Normal Pool Elevation: 242.5 MSL

Size: 42,480 Acres

Location:

DeWitt and Gonzales Counties. Guadalupe River Basin. The proposed dam site is located approximately 4 miles north of Cuero along US Highway 183 with the reservoir extending north for approximately 27 miles.

Existing Vegetation Description:

Post Oak Savannah Ecological Area currently composed of the following vegetation types:

	acres	(%)
Mixed Riparian Forest	5,805	14
Mesquite-Huisache Brush/Woods	7,145	17
Grasses/Forbes	14,523	34
Live oak-Pecan-Hackberry Parks/Forest	6,394	15
Crops	6,778	16
Other	1,835	4

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Expected loss of 4,354 Habitat Units of High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir location include: (1) 0; (2) 5,805; (3) 13,539; (4) 21,301.

Wildlife Game Resources: The proposed reservoir site supports an excellent deer population density calculated at 14.2 acres/deer as compared to an estimated adjacent upland deer population density of 28.5 acres/deer. The proposed reservoir location is categorized as "excellent" turkey habitat and supports a very high density turkey population. Within the proposed reservoir area, several turkey releases are evidence of the level of TPWD effort in restoration of this wildlife resource. The area is considered as "fair" habitat for the gray squirrel.

Wildlife Non-game Resources: A 90th Christmas Bird Count census was performed in the vicinity of the proposed reservoir at Palmetto State Park. During a 79.5 hour census, 29,654 individuals comprised of 116 avian species were observed.

Aquatic Resources: Inland Fisheries stream surveys of fish species present for this proposed reservoir location are listed in Appendix J. The state-listed threatened **Blue sucker** is expected to occur in this stream area. The USFWS recommended this project be dropped as a water supply project largely because of the concern for the effects of reduced freshwater inflow to the estuary system at San Antonio Bay.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

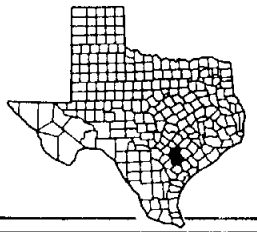
Endangered Resources: The downstream portion of the Guadalupe River Basin is resident habitat of the **Bald eagle** although no active eagle nest sites are known to be present in the proposed reservoir location. **Guadalupe bass** -- known occurrence in the proposed reservoir location, rare, limited range in Texas. **Cagle's map turtle** --multiple occurrences in the proposed reservoir area, under petition as federally listed threatened species, rare in Texas. Other protected species likely to occur in the proposed reservoir area include: **Timber rattlesnake, Texas tortoise, Bald eagle, White-faced ibis, Ghost-faced bat, Big free-tailed bat.**

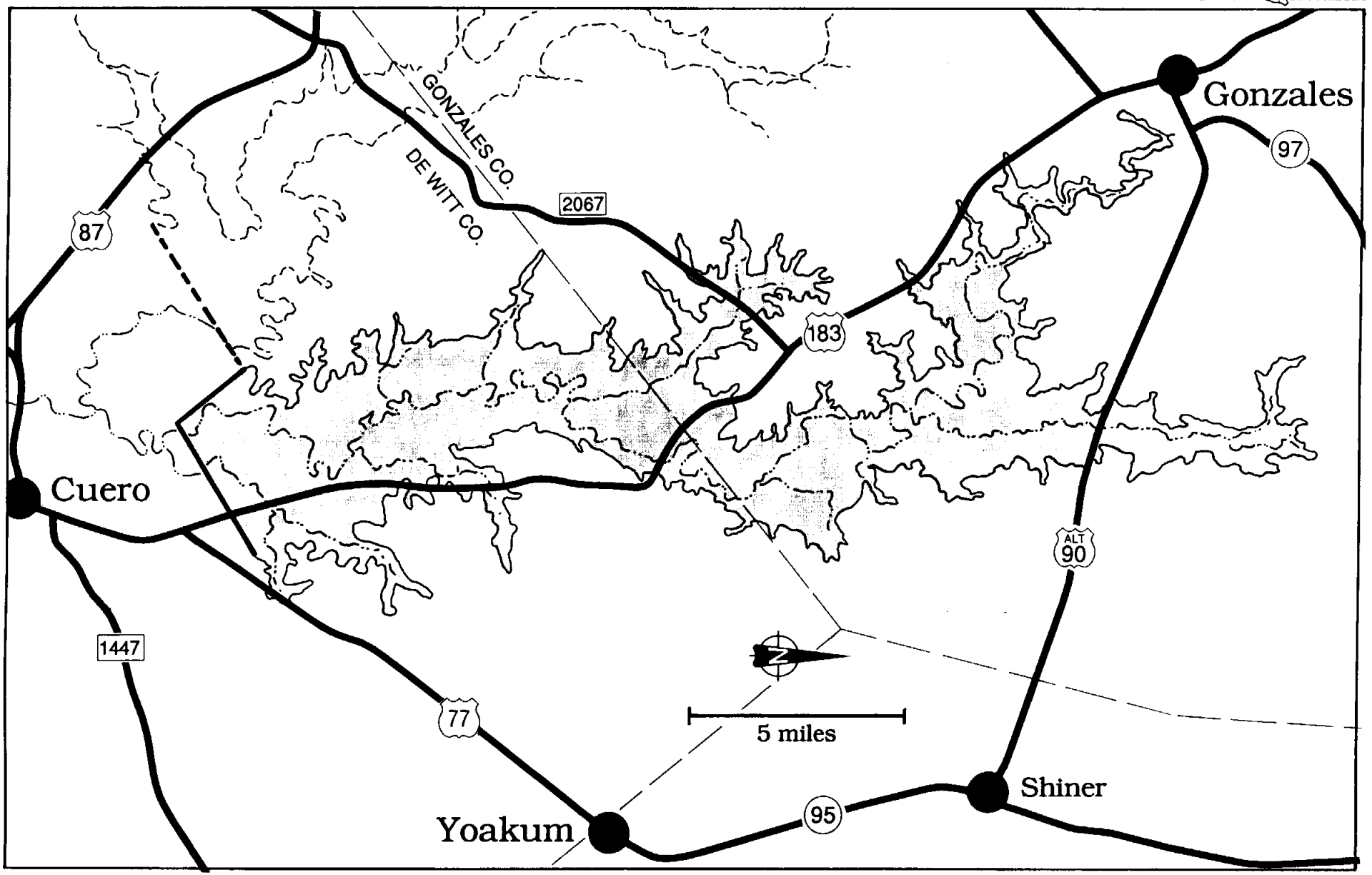
Other Resource Attributes: The Texas Natural Area Survey identified the Guadalupe River at the proposed reservoir site in their listing of important "natural areas" for the river segments' scenic and recreational qualities.

Cuero

Normal Pool El.—242.5 ft. MSL
Surface Acres—41,014

DeWitt and Gonzales Counties





LINDENAU RESERVOIR

General Data

Normal Pool Elevation: 232 MSL

Size: 29,322 Acres

Location:

DeWitt and Gonzales Counties. Sandies Creek of the Guadalupe River Basin. The proposed dam site is located approximately 6 miles northwest of Cuero with the reservoir extending northwest for approximately 18 miles.

Existing Vegetation Description:

Post Oak Savannah Ecological Area currently composed of the following vegetation types:

	acres	(%)
Mixed Riparian Forest	2,388	8
Mesquite-Hackberry-Huisache Brush/Woods	10,076	34
Grasses/Forbes	12,003	41
Elm-Hackberry-Mesquite Parks/Woods	3,740	13
Crops	1,067	4
Other	48	0

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Estimated expected loss of 1,767 Habitat Units of High Priority Habitat. Estimated habitat acreages expected by resource category ( ) in the proposed reservoir location include: (1) 0; (2) 2,338; (3) 13,816; (4) 13,070.

Wildlife Game Resources: The proposed reservoir site supports an excellent deer population density calculated at 11.4 acres/deer as compared to an estimated adjacent upland deer population density of 24.0 acres/deer. The proposed reservoir location is categorized as "excellent" turkey habitat and supports a very high density turkey population. Within the proposed reservoir area, several turkey releases are evidence of the level of TPWD effort in restoration of this wildlife resource. The area is considered "fair" habitat for the gray squirrel.

Wildlife Non-game Resources: A 90th Christmas Bird Count census was performed in the vicinity of the proposed reservoir at Palmetto State Park. During a 79.5 hour census, 29,654 individuals comprised of 116 avian species were observed.

Aquatic Resources: An inland fisheries stream survey of fish species observed for this proposed reservoir location is listed in Appendix J. The state-listed threatened **Blue sucker** is a potential resident of this stream segment area. A reduction in the quantity of freshwater inflow to the estuaries of San Antonio Bay could seriously affect marine species. The water quality is adequate to support the existing limited stream fishery. The stream is marginal for recreational fishing value.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

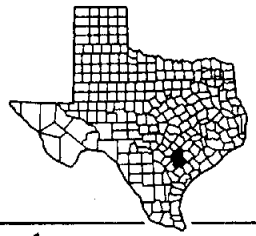
Endangered Resources: The downstream portion of the Guadalupe River Basin is resident habitat of the **Bald eagle** although no active eagle nest sites are known to be present in the proposed reservoir location. **Guadalupe bass** -- known occurrence in the proposed reservoir location, rare, limited range in Texas. **Cagle's map turtle** -- one occurrence in the proposed reservoir area, under petition as federally listed threatened species, rare in Texas. Other protected species likely to occur in the proposed reservoir area include: **Timber rattlesnake, Texas tortoise, Bald eagle, White-faced ibis, Ghost-faced bat, Big free-tailed bat.**

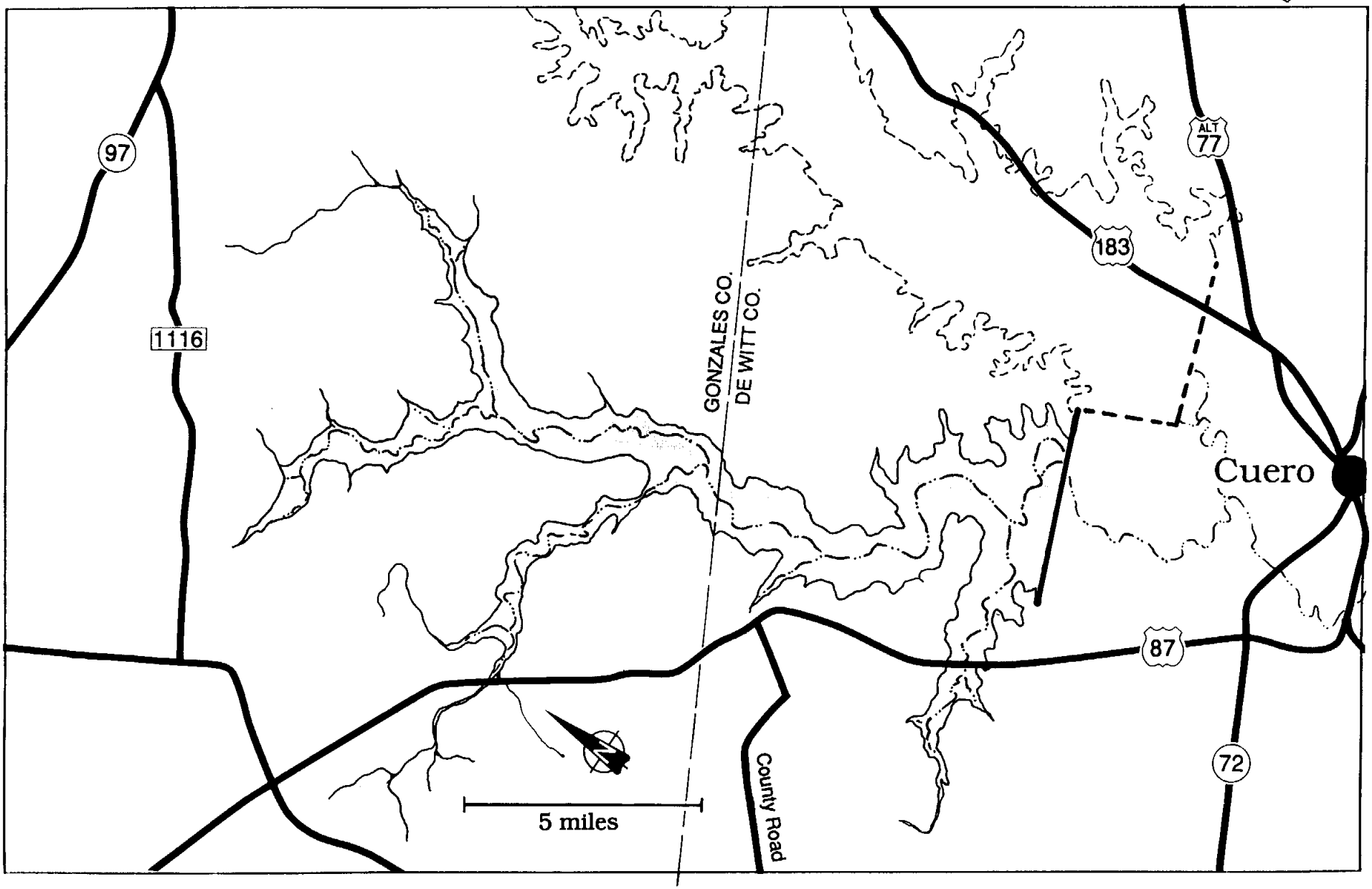
Other Resource Attributes: None identified.

Lindenau

Normal Pool El.—232 ft. MSL
Surface Acres—22,700 approx.

DeWitt and Gonzales Counties





Lavaca River Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

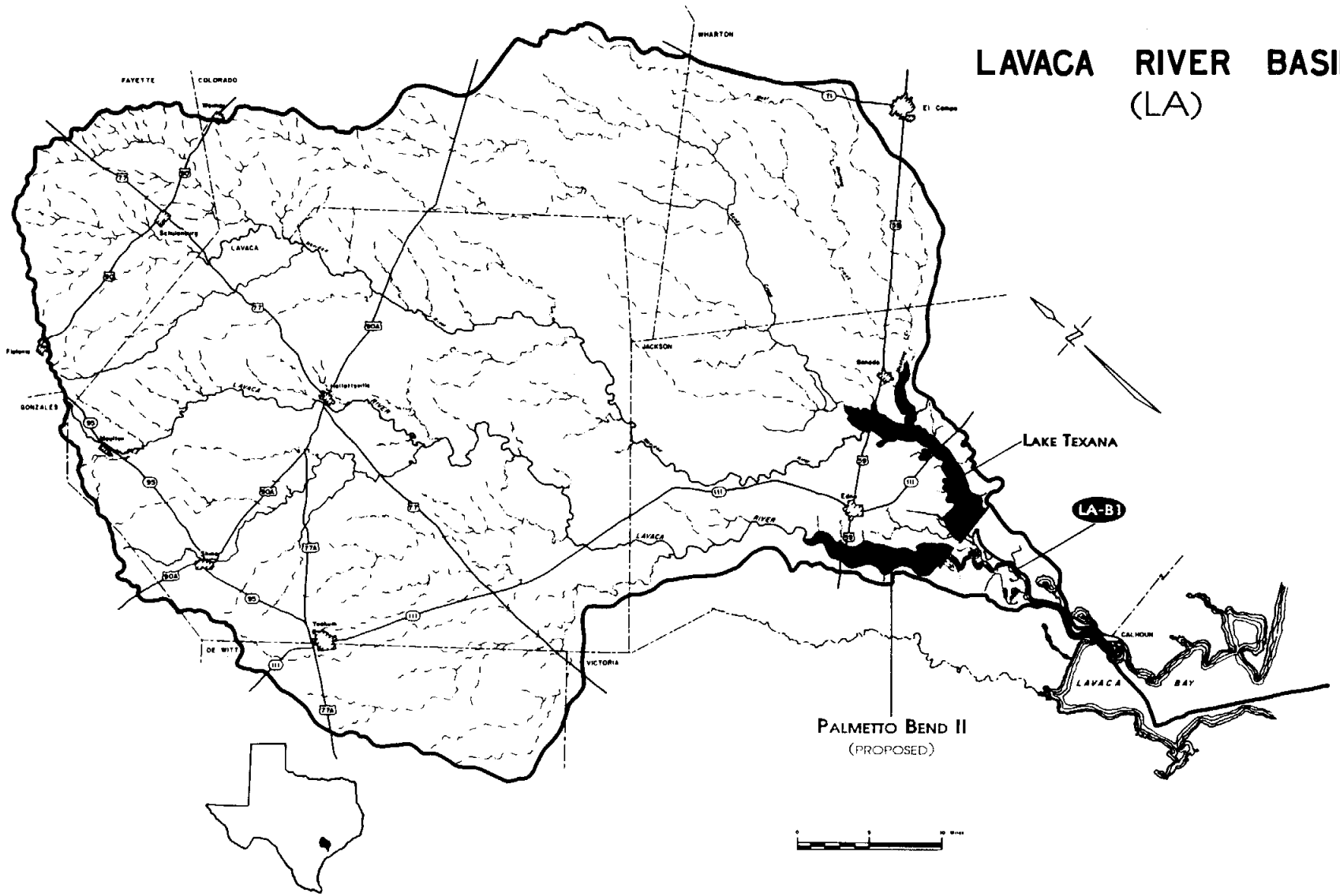
LAVACA RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
LA-B1	Lavaca River	US 59 crossing just west of Edna downstream to Lavaca Bay	Extensive freshwater wetland habitat.	1601, 1602

* Designation Codes:

- B: Biological Function
- E: Protected Species: Threatened/Endangered/Unique Communities
- Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
- R: Recreation
- S: Acquisition/Mitigation/Governmental Open Space

LAVACA RIVER BASIN
(LA)



PALMETTO BEND II RESERVOIR

General Data

Normal Pool Elevation: 44 'MSL	***Size: 6,200 (estimated) Acres***
Location: Jackson County. Lavaca River Basin. The proposed dam site is located approximately 7 miles south of Edna with the reservoir extending northwest for approximately 10 miles.	***Existing Vegetation Description:*** Gulf Prairies and Marshes Ecological Area displaying a Marsh/Barrier Island vegetation regime along the streams and crops in non-riparian areas.

Natural Resource Attribute Data Summary

Habitat Quality Attributes: No information available regarding High Priority Habitat. A thorough on-site habitat evaluation is required.

Wildlife Game Resources: The proposed reservoir site supports an excellent deer population density calculated at 13.8 acres/deer as compared to an estimated adjacent upland deer population density of 28.0 acres/deer. The proposed reservoir location is categorized as "excellent" turkey habitat which supports a growing turkey population. Within the proposed reservoir area, several turkey releases are evidence of the level of TPWD effort in restoration of this wildlife resource. The area is considered "excellent" habitat for the gray squirrel.

Wildlife Non-game Resources: The Breeding Bird Survey Route #012 intersects the immediate reservoir location documenting 62 avian species along the survey route since observations began in 1970. The Colonial Waterbird Census indicates historic presence of rookeries in the area.

Aquatic Resources: Inland Fisheries survey data are available in Appendix J. This river provides freshwater inflow to an important estuary. The management of any impoundment on the Lavaca-Navidad Rivers must include provisions for minimum flow and other water discharge requirements. The reservoir project will destroy the stream habitat, and species such as the threatened **Guadalupe bass** could be affected. The water quality in this stream segment supports a sport fishery. However, runoff from adjacent agricultural lands includes a heavy sediment load and deleterious chemicals.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

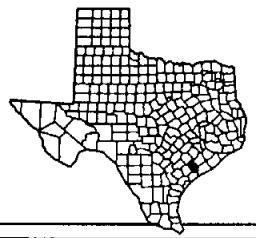
Endangered Resources: **Bald eagle** -- the downstream portion of the Lavaca River Basin is resident habitat of this species. An active eagle nest is present within the immediate proposed reservoir location, rare globally and in Texas. Other protected species likely in the proposed reservoir area include: **Wood stork, Timber rattlesnake, White-faced ibis, Reddish egret, Attwater's greater prairie-chicken, Texas palmetto.**

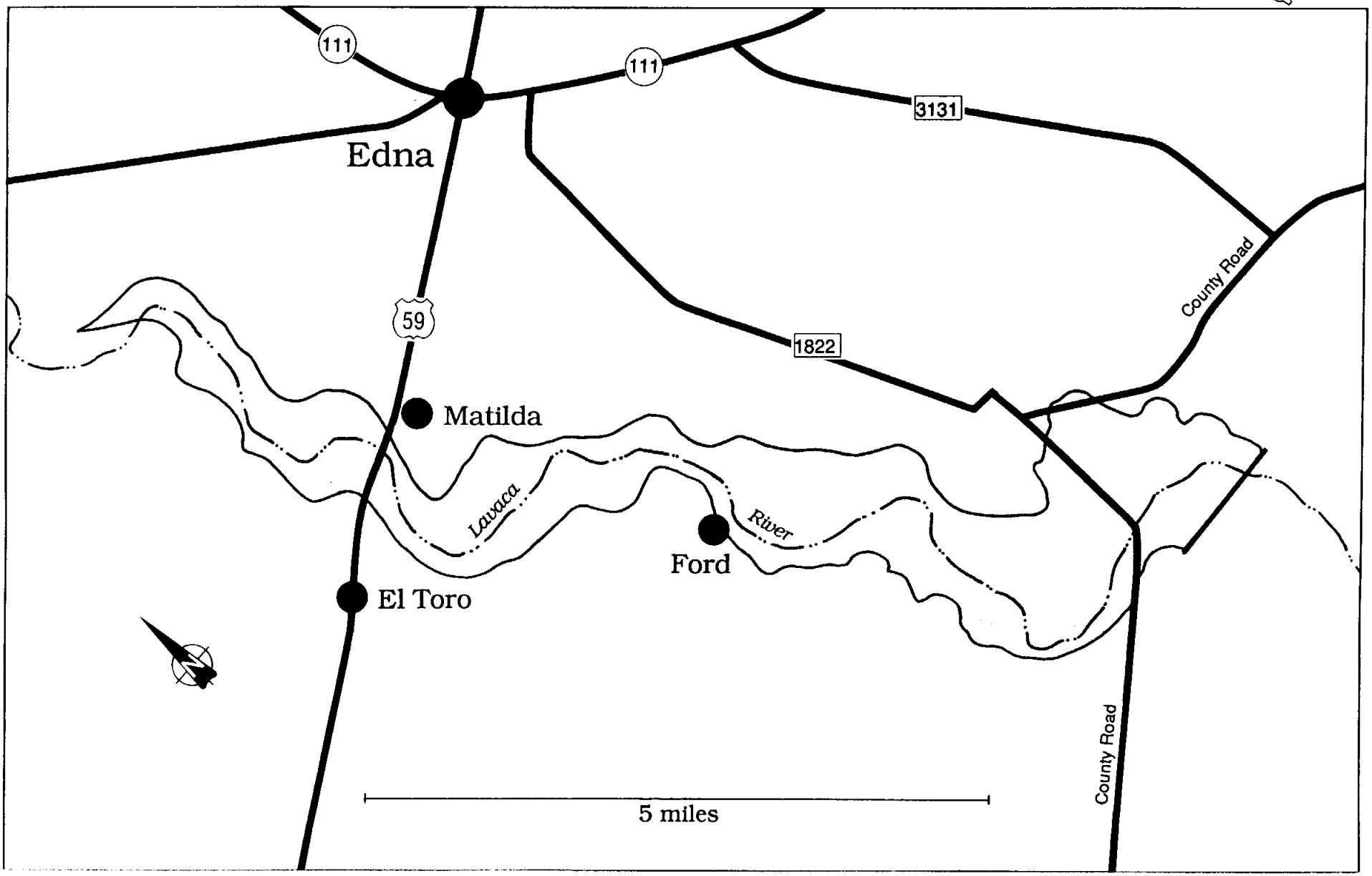
Other Resource Attributes: The Lavaca River along the proposed reservoir site is a TPWD selected "Significant Stream Segment" because of the stream segments' extensive freshwater wetland habitat and impact on the estuarine environment downstream.

Palmetto Bend II

Normal Pool El.—44 ft. MSL
Surface Acres—6,200 approx.

Jackson County





Lavaca-Guadalupe Coastal Basin

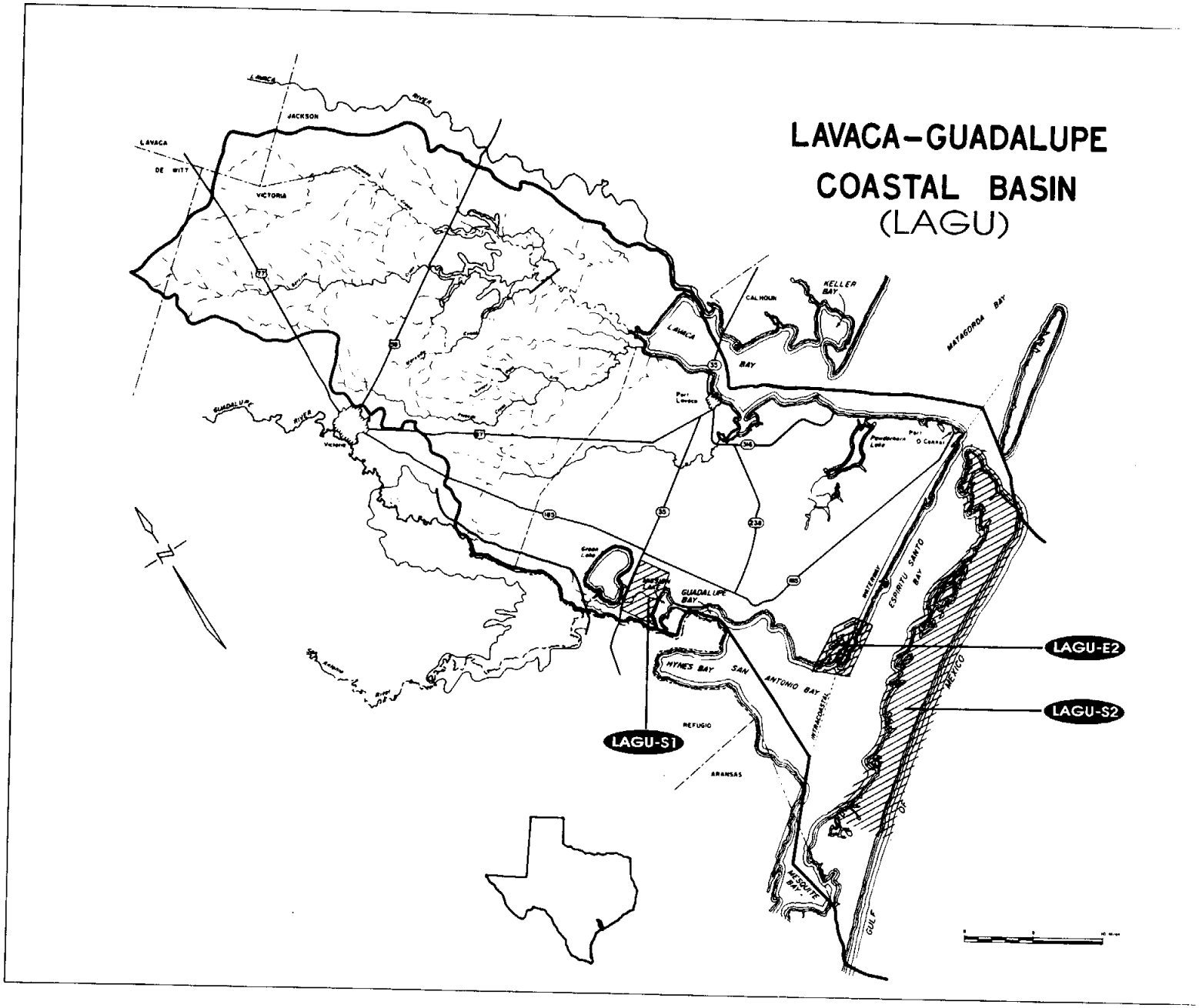
SIGNIFICANT STREAM SEGMENT SUMMARY

LAVACA-GUADALUPE COASTAL RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
LAGU-E2	Welder Flats Coastal Preserve	North end of San Antonio Bay, Calhoun County, at intersection of Gulf Intracoastal Waterway and Victoria Barge Canal	Protected, Whooping crane (G1 S1).	--
LAGU-S1	Guadalupe River Delta Area	Guadalupe Delta Wildlife Management Area	Unique State holdings.	1701
LAGU-S2	Gulf Coast	Matagorda Island National Wildlife Refuge	Unique Federal holdings.	--

* Designation Codes:

- B: Biological Function
- E: Protected Species: Threatened/Endangered/Unique Communities
- Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
- R: Recreation
- S: Acquisition/Mitigation/Governmental Open Space


LAVACA–GUADALUPE
COASTAL BASIN
(LAGU)
JACKSON
LAVACA
DE WITT
VICTORIA
CALHOUN
KELLER BAY
MATAGORDA BAY
LAVACA BAY
Port Lavaca
Powderhorn Lake
Port O'Connor
GUADALUPE RIVER
GUADALUPE BAY
ESPIRITU SANTO BAY
MATAGORDA PENINSULA
HYNES BAY
SAN ANTONIO BAY
MATAGORDA PENINSULA
REFUGIO
ARANSAS
MESQUITE BAY
GULF OF MEXICO
LAGU-E2
LAGU-S2
LAGU-S1

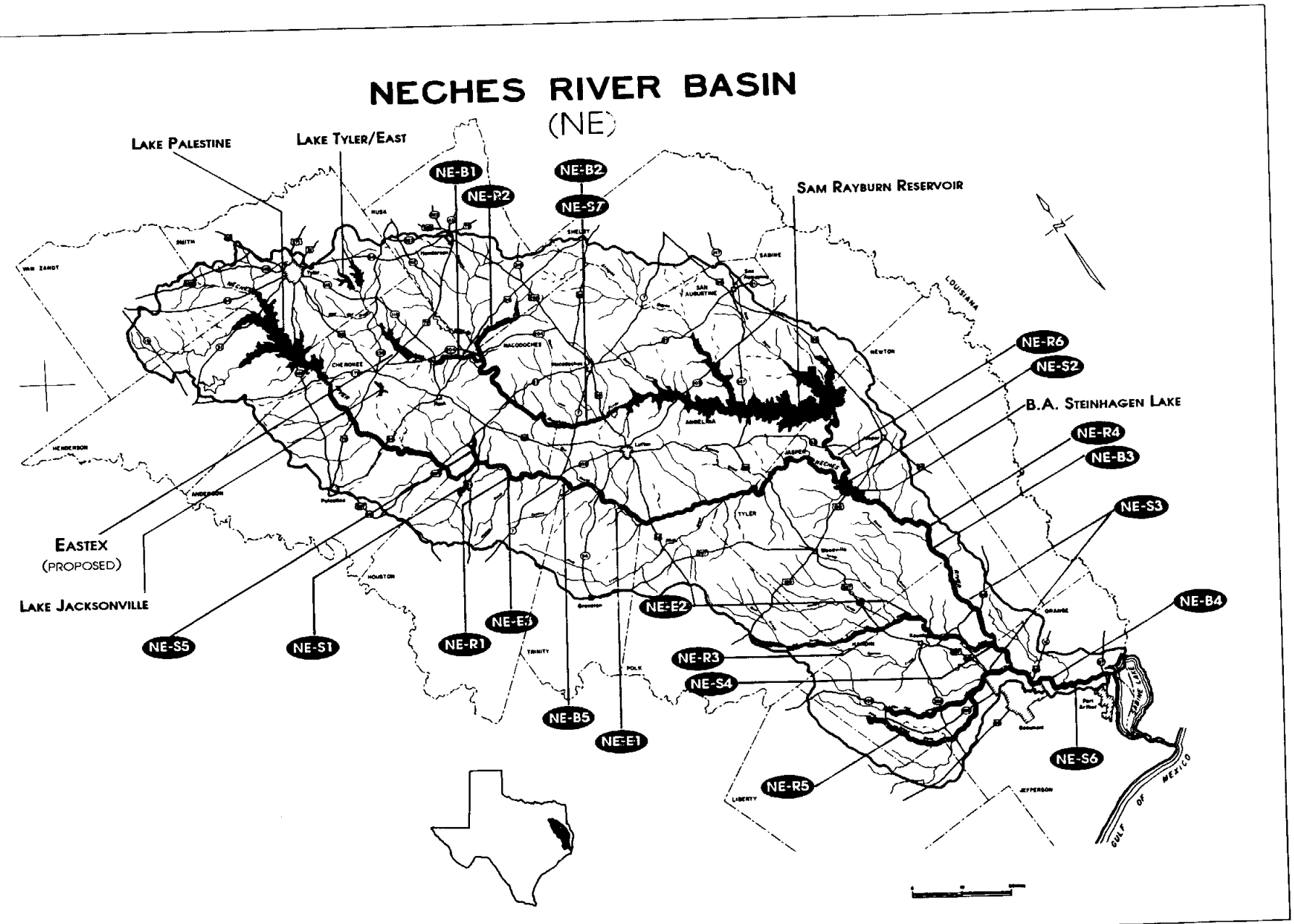
Neches River Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

NECHES RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
NE-B1	Mud Creek	SH 204 crossing downstream to confluence with Angelina River	Priority bottomland hardwood habitat.	--
NE-B2	Upper Angelina River	Angelina River between FM 1911 and US 59	Priority bottomland hardwood habitat.	0611
NE-B3	Lower Neches	FM 1013 crossing downstream to Tyler-Hardin County line	Priority bottomland hardwood habitat.	0602
NE-B4	Neches River	Confluence with Pine Island Bayou downstream to Sabine Lake	Extensive freshwater wetland habitat.	0601
NE-B5	Middle Neches	From U.S. 84 crossing downstream to the Trinity-Polk County line	Priority bottomland hardwood habitat.	0604
NE-E1	Neches River	Hwy 7 crossing downstream to Steinhagen Lake	Protected, Neches River Rose-mallow (G1 S1), Slender gayfeather (G2G3 S2S3), Bog coneflower (G2 S2), Drummond's yellow-eyed grass (G2G3 S2), Rough-leaf yellow-eyed grass (G2G3 S2).	0604
NE-E2	Village Creek	Source to confluence with Pine Island Bayou	Protected, Texas trailing phlox (G4T2 S2), White firewheel (G5T1 S1).	0602, 0608
NE-E3	Neches River	Neches River from Lake Palestine to B.A. Steinhagen	Paddlefish (G4 S1) restoration area; Creek chubsucker (G5 S2); Blue sucker (G4 S3).	0604
NE-R1	Neches River	Lake Palestine Dam to B.A. Steinhagen Lake	Recreation.	0604
NE-R2	Angelina River	East Fork Angelina River to Sam Rayburn Reservoir	Recreation.	0611
NE-R3	Big Sandy Creek Village Creek	Source to confluence with Neches River	Recreation.	0608
NE-R4	Neches River	B. A. Steinhagen Lake Dam to confluence with Pine Island Bayou	Recreation.	0602
NE-R5	Pine Island Bayou	FM 770 crossing to confluence with Neches River	Recreation.	0607

(continued)


NECHES RIVER BASIN
(NE)
LAKE PALESTINE
LAKE TYLER/EAST
SAM RAYBURN RESERVOIR
B.A. STEINHAGEN LAKE
EASTEX
(PROPOSED)
LAKE JACKSONVILLE
NE-B1
NE-B2
NE-B3
NE-B4
NE-B5
NE-R1
NE-R2
NE-R3
NE-R4
NE-R5
NE-R6
NE-S1
NE-S2
NE-S3
NE-S4
NE-S5
NE-S6
NE-S7
NE-E1
NE-E2
NE-E3
LOUISIANA
GULF OF MEXICO

(Cont.)

NECHES RIVER BASIN: (Cont.)

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
NE-R6	Angelina River	Sam Rayburn Dam to B. A. Steinhagen Reservoir	Recreation.	0609
NE-S1	San Pedro Creek	Mission Tejas State Park	Unique State holdings.	--
NE-S2	Neches River	Angelina-Neches Scientific Area and Dam B Unit Wildlife Management Area	Unique State holdings.	0609, 0604
NE-S3	Neches River	Neches River Corridor Unit and Little Pine Island Bayou Unit of the Big Thicket	Unique Federal holdings.	0602, 0607
NE-S4	Neches River	Village Creek State Park	Unique State holdings.	0602
NE-S5	Bowles Creek	Caddoan Mounds	Unique State holdings.	--
NE-S6	Neches River	Lower Neches Wildlife Management Area	Unique State holdings.	0601
NE-S7	Neches River	Upstream side of Hwy 59 crossing	TPWD planned acquisition.	0611

* Designation Codes:

B: Biological Function
E: Protected Species: Threatened/Endangered/Unique Communities
Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
R: Recreation
S: Acquisition/Mitigation/Governmental Open Space

EASTEX RESERVOIR

General Data

Normal Pool Elevation: 315 MSL

Size: 10,089 Acres

Location:

Cherokee County. Mud Creek in the Neches River Basin. The proposed dam site is located approximately 9 miles east southeast of Jacksonville with the reservoir extending north for approximately 11 miles.

Existing Vegetation Description:

Pineywoods Ecological Area currently composed of the following vegetation types:

	acres	(%)
Mixed Bottomland Hardwood Forest	3,517	35
Grasses	2,706	27
Pine-Hardwood Forest	2,999	30
Other	867	8

Natural Resource Attribute Data Summary

***Habitat Quality Attributes*:** Expected loss of 2,462 Habitat Units of High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir location include: (1) 0; (2) 3,517; (3) 2,999; (4) 2,706.

Wildlife Game Resources: The proposed reservoir site supports a modest deer population density calculated at 67.5 acres/deer as compared to an estimated adjacent upland deer population density of 88.0 acres/deer. The proposed reservoir location is categorized as "excellent" turkey habitat . Within the proposed reservoir area, several turkey releases are evidence of the level of TPWD effort in restoration of this wildlife resource. The area is considered "excellent" habitat for the gray squirrel.

Wildlife Non-game Resources: No census recorded in the area.

Aquatic Resources: Inland Fisheries surveys are not available, however, this is known to be a pristine area that provides excellent stream habitat. **Paddlefish**, a state-listed endangered species, occur in this general area and could be affected by reservoir construction. The state-listed threatened **Creek chubsucker** is also expected to occur in this stream segment area.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

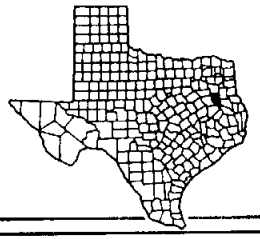
Endangered Resources: **Sandhill four o'clock** -- historic occurrence record possible in the reservoir area, critically imperiled globally and in Texas; **Warner hawthorn** -- multiple occurrences in the near area, imperiled in Texas because of its rarity. Other protected species likely to occur in the proposed reservoir area include: **Bachman's sparrow**, pine parklands with little hardwood understory; **Red-cockaded woodpecker**; **American swallow-tailed kite**; **Rough-stemmed aster**; **Golden wave tickseed**; **Mohlenbrock's umbrella sedge**; **Northern scarlet snake**; **Louisiana pine snake**; **Creek chubsucker**; **Alligator snapping turtle**; **Paddlefish**; **Bald eagle**; **Timber rattlesnake**; **Southeastern myotis**; **Eastern big-eared bat**.

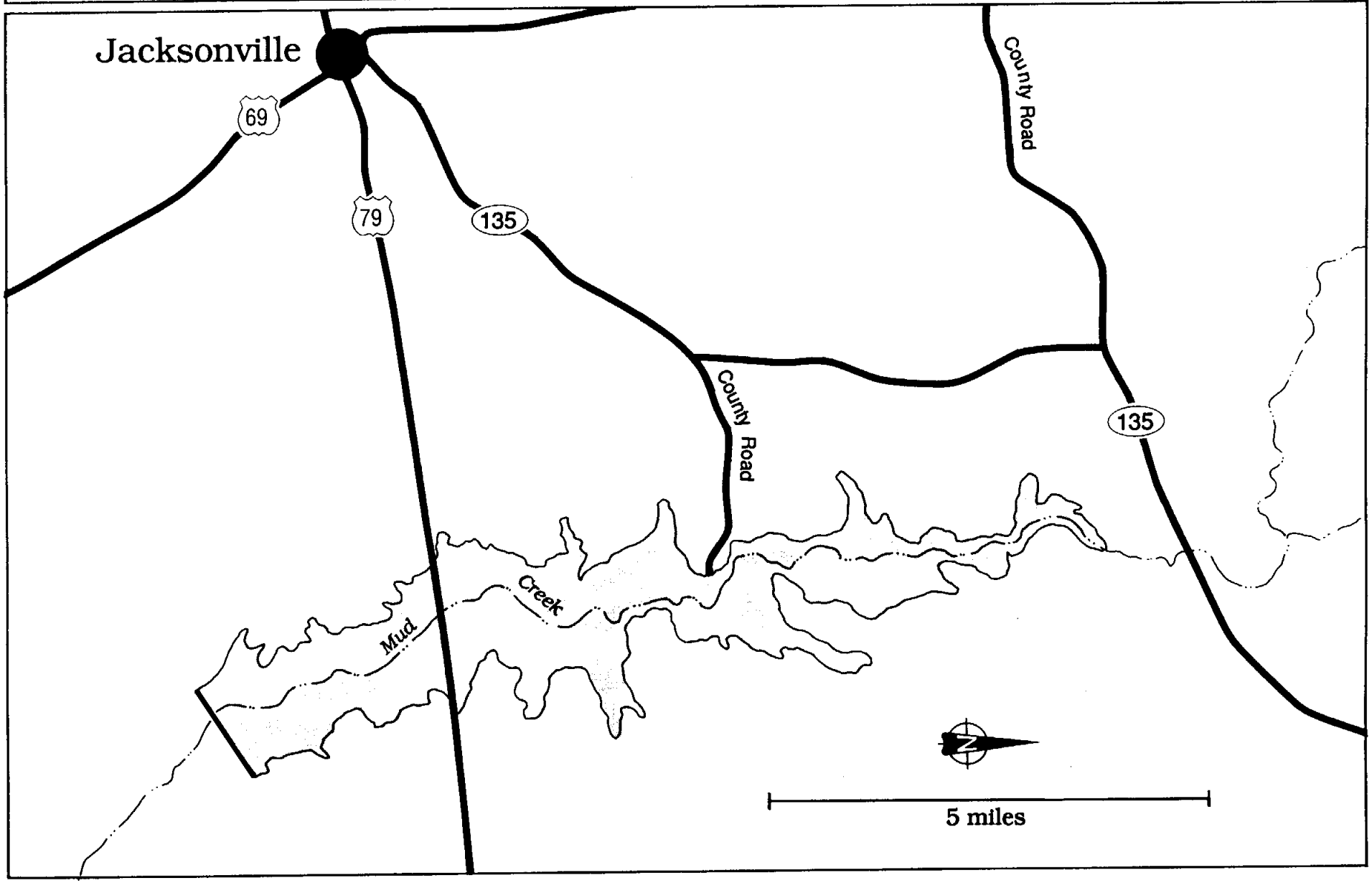
Other Resource Attributes: Mud Creek, a TPWD selected "Significant Stream Segment" because of its high bottomland hardwood resource value, is located nearby, downstream from the proposed dam site and, therefore, subject to potential deleterious effects of streamflow control.

Eastex

Normal Pool El.—315 ft. MSL
Surface Acres—10,089

Cherokee County





Neches-Trinity Coastal Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

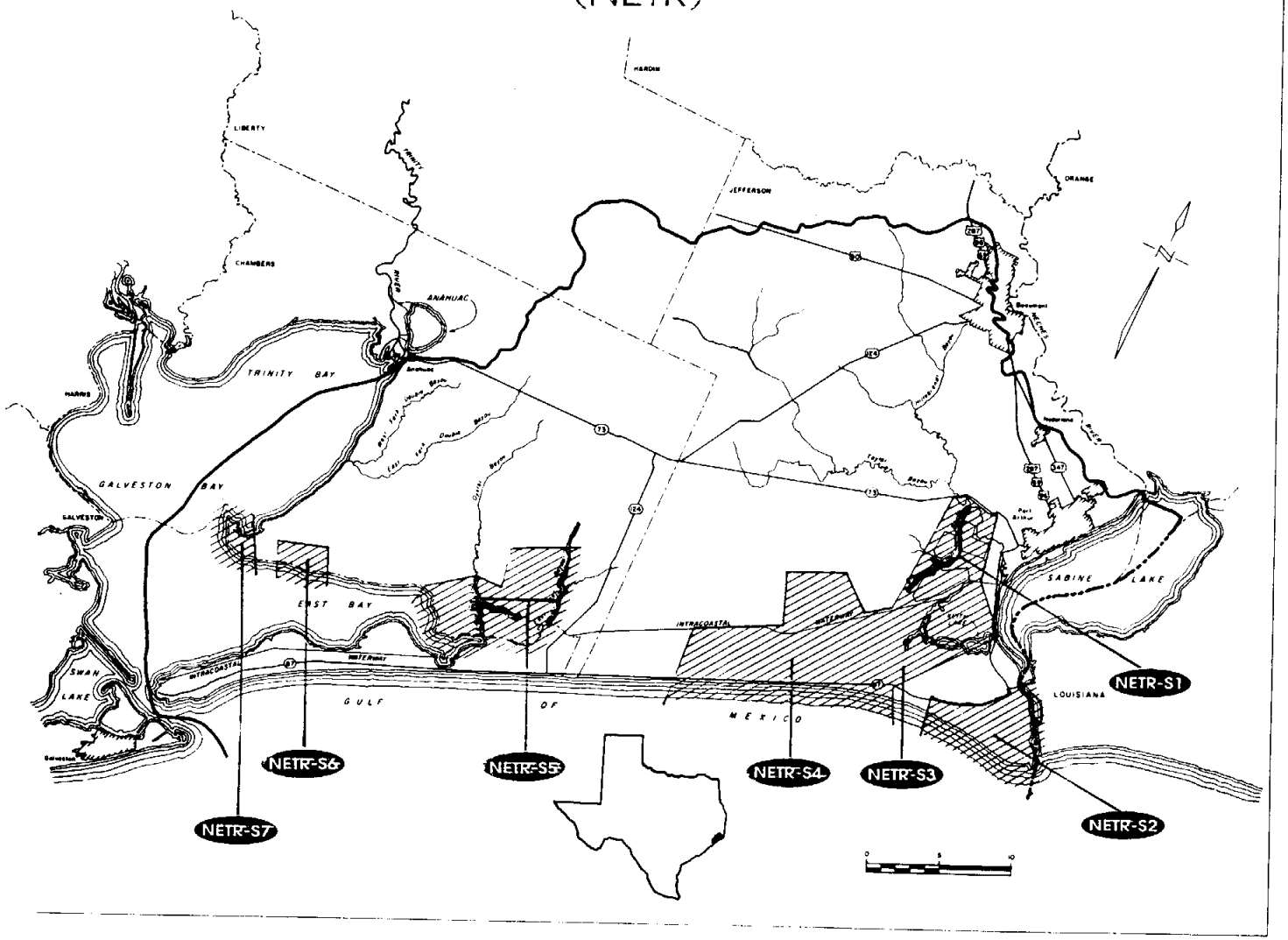
NECHES-TRINITY COASTAL RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
NETR-S1	Big Hill Bayou	J. D. Murphree Wildlife Management Area	Unique State holdings.	--
NETR-S2	Gulf Coast	Texas Point National Wildlife Refuge	Unique Federal holdings.	--
NETR-S3	Gulf Coast	Sea Rim State Park	Unique State holdings.	--
NETR-S4	Gulf Coast	McFaddin National Wildlife Refuge	Unique Federal holdings.	--
NETR-S5	Oyster, Onion, and East Bay Bayous	Anahuac National Wildlife Refuge	Unique Federal holdings.	--
NETR-S6	East Bay	Moody National Wildlife Refuge	Unique Federal holdings.	--
NETR-S7	East Bay	Candy Abshier Wildlife Management Area	Unique State holdings.	--

* Designation Codes:

B: Biological Function
E: Protected Species: Threatened/Endangered/Unique Communities
Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
R: Recreation
S: Acquisition/Mitigation/Governmental Open Space

NECHES-TRINITY COASTAL BASIN
(NETR)



Nueces River Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

NUECES RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
NU-B1	Nueces River	Nueces-Jim Wells County line downstream to Corpus Christi Bay	Extensive freshwater wetland habitat.	2101, 2102
NU-E1	Nueces River	East prong, northwest Real County	Texas snowbells (LE best site).	2112
NU-Q1	Upper Frio River	Uvalde County	Exceptional aquatic life.	2113, 2117
NU-Q2	Nueces River Tidal Zone	Nueces and San Patricio counties	Exceptional aquatic life.	2101, 2102
NU-R1	Nueces River	Source to southernmost SH 55 crossing south of Laguna, Uvalde County	Recreation.	2112
NU-R2	Frio River	Source to Concan, Uvalde County	Recreation.	2113
NU-R3	Sabinal River	Source to Hwy 90 crossing	Recreation.	2110, 2111
NU-S1	Sabinal River	Lost Maples State Natural Area and National Natural Landmark	Unique State holdings.	2111
NU-S2	Frio River	Garner State Park	Unique State holdings.	2113

* Designation Codes:

B: Biological Function
E: Protected Species: Threatened/Endangered/Unique Communities
Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
R: Recreation
S: Acquisition/Mitigation/Governmental Open Space

Nueces-Rio Grande Coastal Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

NUECES-RIO GRANDE COASTAL RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
NURG-E1	Jaboncillas Creek	East of Ricardo, Heberg County	Black lace cactus (LE, best site).	--
NURG-E2	San Fernando Creek	FM 1355 downstream to Santa Getrudis Creek	South Texas ragweed (CL, good site); Slender rush-pea (LE, best site).	--
NURG-Q1	South Bay Coastal Preserve	Southern extreme of Laguna Madre, Cameron County, south of Brownsville Ship Channel	Exceptional aquatic life, water quality, and unique communities.	--
NURG-S1	Gulf Coast	Padre Island National Seashore	Unique Federal holdings.	--
NURG-S2	Laguna Madre	Laguna Atascosa National Wildlife Refuge	Unique Federal holdings.	--

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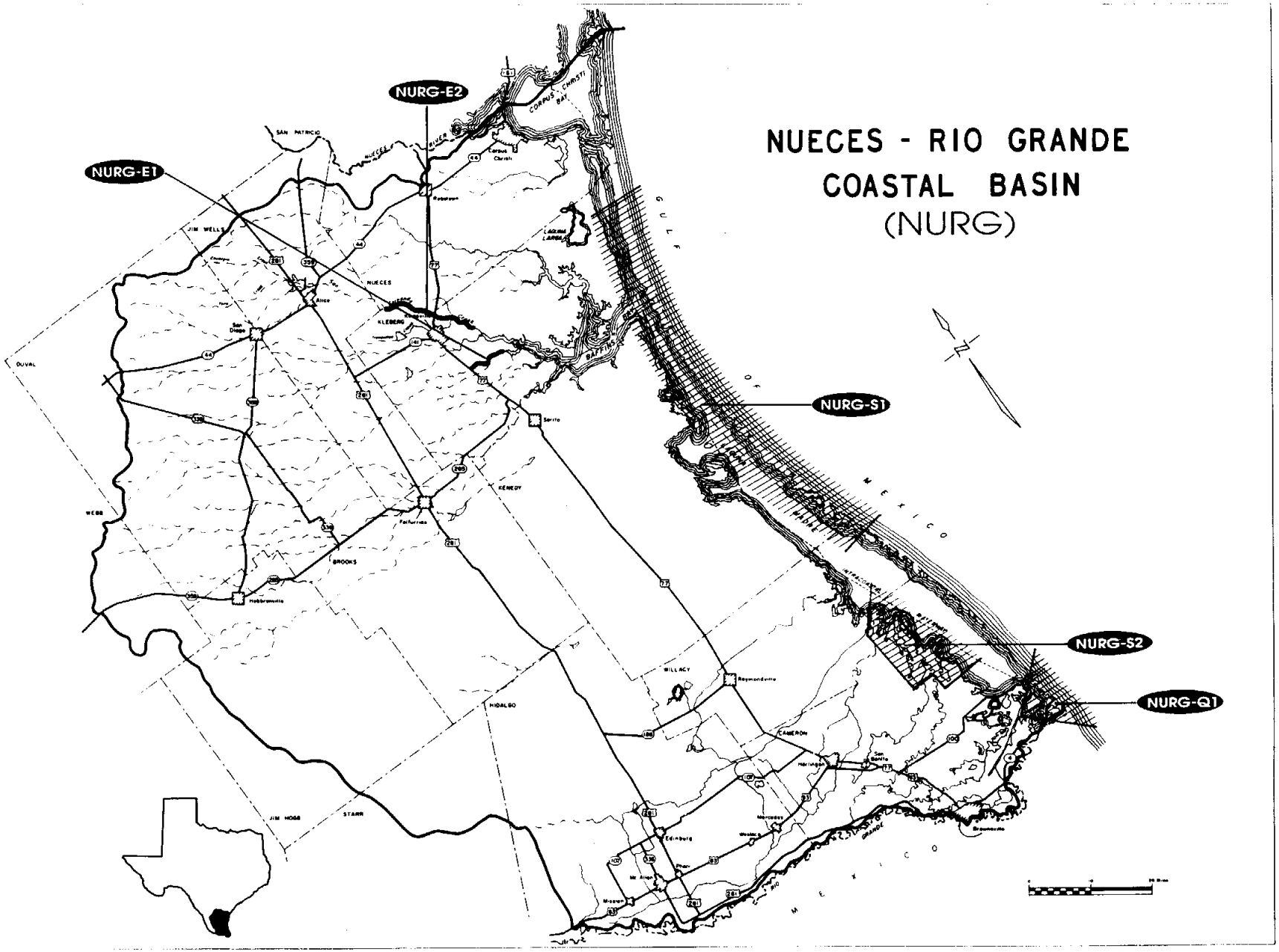
NUECES - RIO GRANDE
COASTAL BASIN
(NURG)
NURG-E1
NURG-E2
NURG-S1
NURG-S2
NURG-Q1
SAN PATRICIO
JIM WELLS
NUECES
KLEBERG
KENEDY
BROOKS
WILLACY
CAMERON
HIDALGO
STARR
JIM HOGG
DUVAL
WEBB
Corpus Christi
Alice
Kingsville
Raymondville
Harlingen
Brownsville
Edinburg
Mission
Mc Allen
Weslaco
Mercedes
Port Isabel
San Benito
Falfurrias
Hebbronville
Sarita
Rio Grande
GULF OF MEXICO
MEXICO

Red River Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

RED RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
RE-B1	Red River	Upstream 225 miles from Lake Texoma.	Striped bass spawning and migration with unique saltwater springs.	0207, 0206 0205, 0204
RE-E1	Sweetwater Creek	Sweetwater Creek and tributaries in Wheeler County	Unique community, wetlands.	--
RE-E3	Red River	Lake Texoma Dam downstream to Louisiana border	Paddlefish (G4 S1), Blue sucker (G4 S3).	0202, 0201
RE-E4	Shawnee Creek	Lake Texoma spillway to Red River (overflow basin)	Paddlefish (G4 S1).	0202
RE-E5	Prairie Dog Town Fork of Red River	Headwaters downstream to Burkburnett	Essential habitat for the Least tern.	0205, 0206 0207
RE-Q1	Rock Creek	Headwaters to Red River (8 miles)	Pristine.	--
RE-Q2	North Fish Creek	Upstream 4 miles from Lake Moss	Pristine area, spring fed, intermittent pools and riffles.	--
RE-Q3	South Fish Creek	Upstream 4 miles from Lake Moss	Pristine area, spring fed, intermittent pools and riffles.	--
RE-S1	Prairie Dog Town Fork of Red River	Lake Tanglewood Dam downstream to SH 70, including Palo Duro State Park and North and South Cita Canyons	Unique State holdings.	0207
RE-S2	North and South Prongs of Little Red River	Caprock Canyons State Park	Unique State holdings.	--
RE-S3	Middle Pease River	Matador Wildlife Management Area	Unique State holdings.	--
RE-S4	Bois d' Arc Creek	Caddo Wildlife Management Area	Unique State holdings.	--

* Designation Codes:

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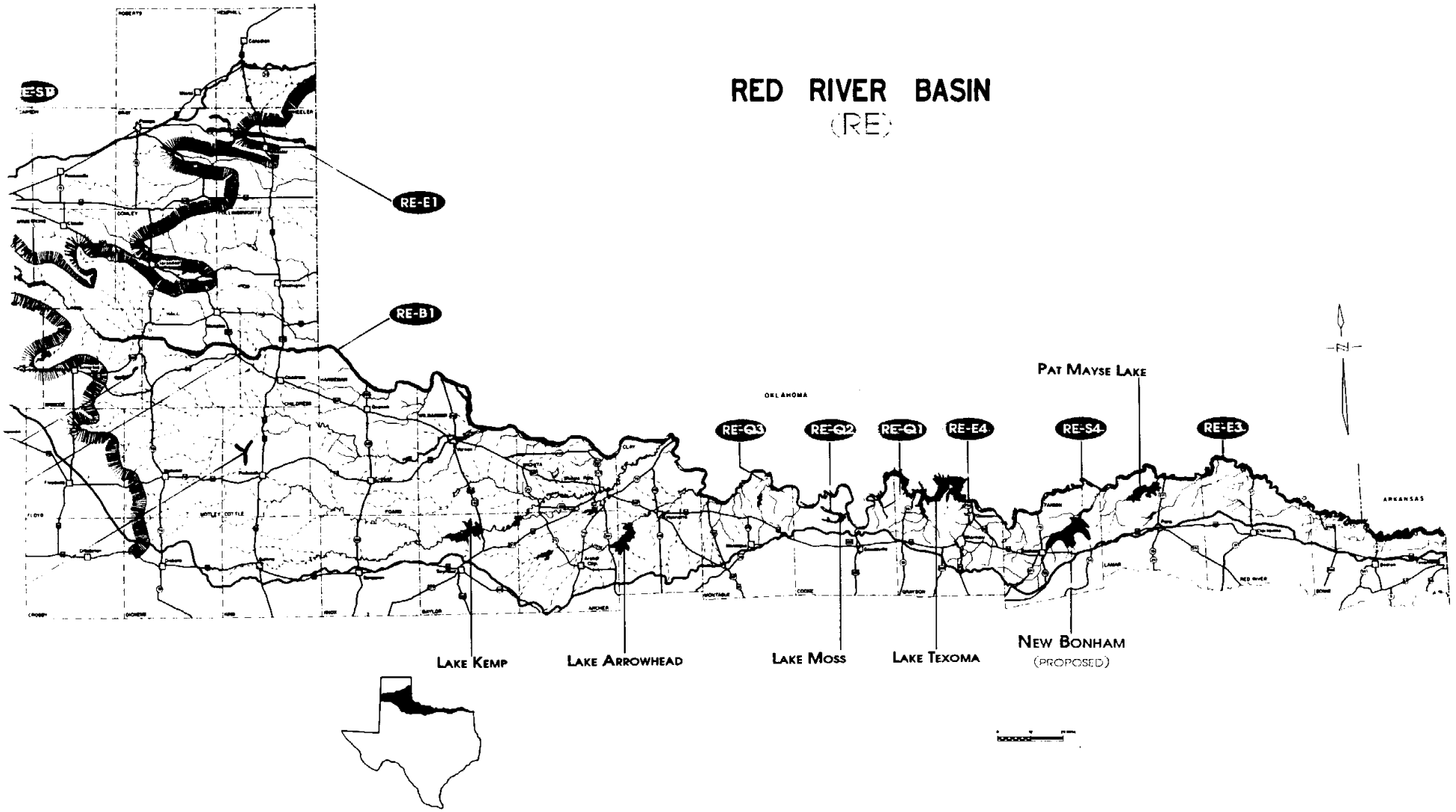
- Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
- R: Recreation
- S: Acquisition/Mitigation/Governmental Open Space

L

RED RIVER BASIN
(RE)



NEW BONHAM RESERVOIR

General Data

Normal Pool Elevation: 534 'MSL	***Size: 14,900 (estimated) Acres***
Location: Fannin County. Bois d' Arc Creek in the Red River Basin. The proposed dam site is located approximately 15 miles northeast of Bonham with the reservoir extending southwest for approximately 14 miles.	***Existing Vegetation Description:*** Blackland Prairie Ecological Area displaying a native and introduced grassland vegetation regime along the streams and crops in non-riparian areas.

Natural Resource Attribute Data Summary

Habitat Quality Attributes: No information available regarding High Priority Habitat. A thorough on-site habitat evaluation is required. The USFWS identified "Bois d' Arc Creek", located at the proposed reservoir location, as a Priority 4 Bottomland Hardwood Area because of its high habitat resource value, especially for waterfowl.

Wildlife Game Resources: The proposed reservoir site supports a moderate deer population density calculated at 34.0 acres/deer as compared to an estimated adjacent upland deer population density of 59.0 acres/deer. The proposed reservoir location is categorized as "fair" turkey habitat which supports a modest turkey population. The area is considered "fair" habitat for the gray squirrel.

Wildlife Non-game Resources: A 90th Christmas Bird Count census point is located in the vicinity of the proposed reservoir at Caddo Lake National Grasslands. During the most recent 55 hour observation, 20,089 individuals comprised of 102 avian species were recorded. The Colonial Waterbird Census indicates historic presence of rookeries in the area.

Aquatic Resources: Inland Fisheries survey data are available in Appendix J. Water quality is sufficient to sustain the existing stream fishery.

Wildlife Management Areas: Bois d' Arc Unit, Caddo WMA includes 13,360 acres dispersed in and around Caddo National Grassland including a portion of the proposed reservoir near and downstream from the dam. The reservoir project would likely destroy or modify a significant portion of the existing habitat within the WMA immediately downstream to the proposed reservoir.

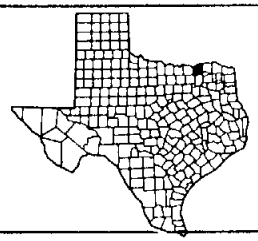
Endangered Resources: Natural communities present at the proposed reservoir site include: **Little Bluestem-Indiangrass Series** -- multiple occurrences in the vicinity of the proposed reservoir, rare and very vulnerable to extinction globally and in the State; **Post Oak-Blackjack Oak Series** -- multiple occurrences in the near vicinity of the proposed reservoir location and one occurrence at the reservoir location. Other protected species likely to occur at the proposed reservoir location include: **Alligator snapping turtle, Blue sucker, American swallow-tailed kite, Timber rattlesnake, White-faced ibis, Paddlefish, Shovelnose sturgeon, Interior least tern, Bald eagle.**

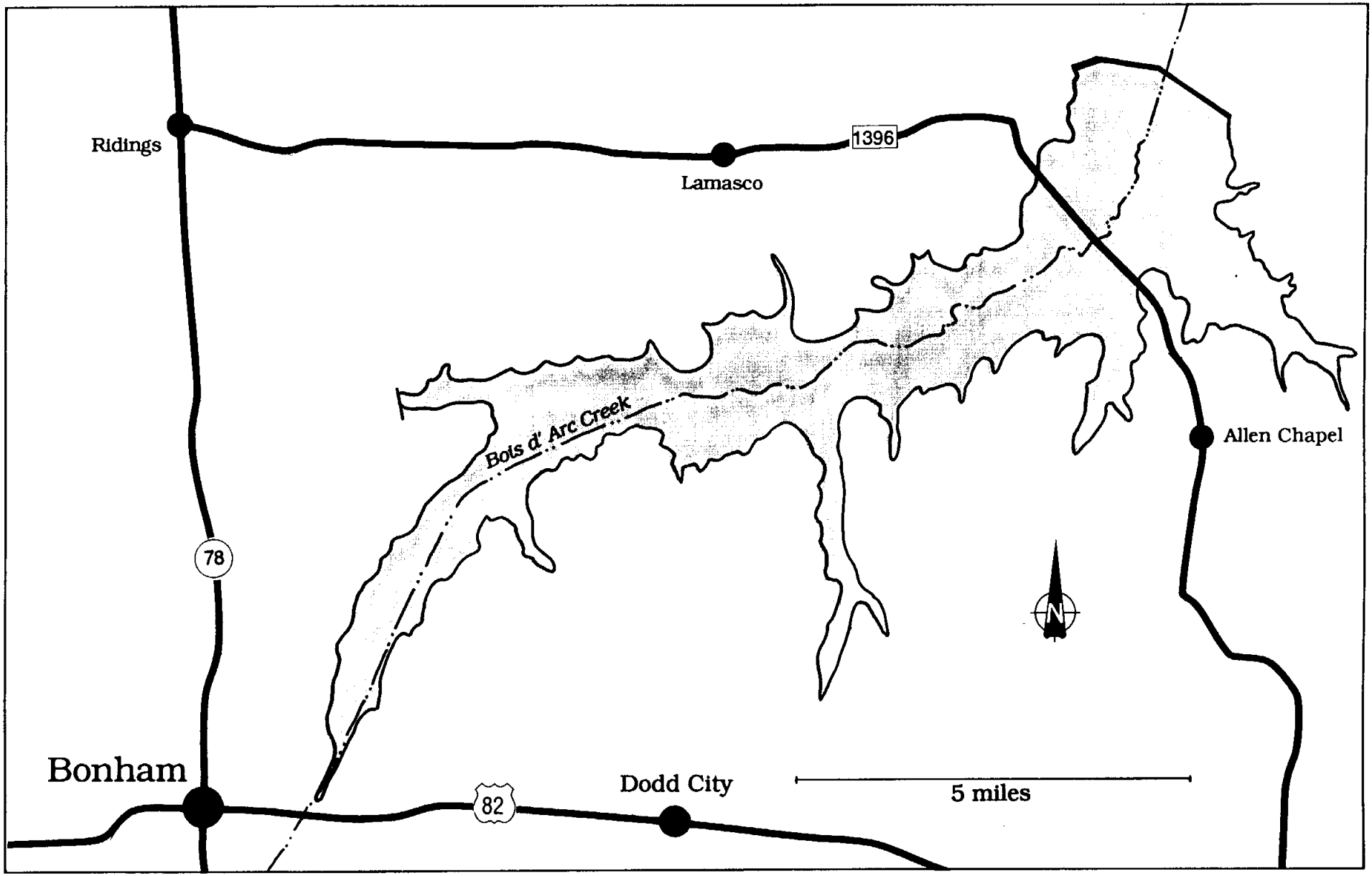
Other Resource Attributes: The Texas Natural Area Survey identified "White Ash Wetlands" at the proposed reservoir location in their listing of important "natural areas" for the high quality hardwood bottomlands drained by Bois d' Arc Creek.

New Bonham

Normal Pool El.—534 ft. MSL
Surface Acres—14,900 approx.

Fannin County





Rio Grande River Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

RIO GRANDE RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
RG-B1	Lower Rio Grande	Falcon Lake Dam to downstream river mouth	Priority bottomland habitat.	2301, 2302
RG-B2	Rio Grande River	Upstream-most boundary of Brownsville downstream to Gulf	Extensive freshwater wetland habitat.	2301
RG-E1	Pecos River	From Sheffield, Pecos County, to Amistad Reservoir	Protected, Proserpine shiner (G3 S2); Rio Grande darter (G3 S2).	2310, 2311
RG-E2	Devil's River	Source to Lake Amistad including Dolan Creek and Howard Springs	Protected, Proserpine shiner (G3 S2); Devil's River pupfish (G4 S1); Blotched gambusia (G4 SX); Devil's river minnow (G2 S1); Rio Grande darter (G3 S2).	2309
RG-E3	Salt Creek	Source to confluence with Pecos River	Protected, Pecos pupfish (G1 S1).	--
RG-E4	Toyah Creek, Reeves County	Headwaters to FM 2448 crossing	Protected, Pecos gambusia (G2 S2), Comanche Springs pupfish (G1 S1).	--
RG-E5	Leon Creek	Entire stream	Protected, Pecos gambusia (G2 S2), Leon Springs pupfish (G1 S1).	--
RG-E6	Rio Grande River	Presidio, Presidio County downstream to lower boundary of Black Gap Wildlife Management Area, to include Alamito, Terlingua and Tornillo Creeks	Protected, Chihuahua shiner (G3 S2), Big Bend gambusia (G1 S1), Mexican stoneroller (G3 S1), Chihuahua mud turtle (G3T3 S1).	2306
RG-E7	Rio Grande River	Candelaria, Presidio County, downstream to Lake Amistad	Protected, Golden-spined prickly-pear (G1 S1), Hickley's columbine (G1Q S1), Fresno Creek thelypody (G1Q S1), Chisos hedgehog cactus (G2T1 S1), Bigpod bonamia (G1 S1), Silver cholla (G5T1 S1), Three-tongued spurge (G5T1 S1), Brush pea (G1 S1), Cutler's twist flower (G2 S2), Bunched cory cactus (G2 S2), Cliff bedstraw (G2 S1), Heather leaf-flower (G2 S1), Swallow spurge (G2 S2), Hard spined cob cory cactus (G3T2 S2), Lloyd's mariposa cactus (G2 S2).	2306, 2307
RG-E8	Rio Grande River	Laredo, Webb County, downstream to Gulf	Protected, Ashy dogweed (G1 S1), Prostrate milkweed (G1 S1), Walker's manihot (G1 SH), Star cactus (G2 S1), Texas ayenia (G2 S1), Runyon's water-willow (G2 S2).	2301, 2302, 2304

SIGNIFICANT STREAM SEGMENT SUMMARY

(Cont.)

RIO GRANDE RIVER BASIN: (Cont.)

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
RG-E9	Capote Creek	Source to confluence with Rio Grande River	Protected, Hinckley's columbine (G1Q S1).	--
RG-E10	Fresno Creek	Source to confluence with Rio Grande River	Protected, Fresno Creek thelypody (G1Q S1).	--
RG-E11	Little Aguja Creek	Source downstream to Jeff Davis-Reeves County line	Protected, Little aguja pondweed (G1 S1).	--
RG-E12	Dolores Creek	Source to confluence with Rio Grande River	Protected, Ashy dogweed (G1 S1), Prostrate milkweed (G1 S1).	--
RG-E13	Arroyo Grande	Source to Jim Hogg-Zapata County line	Protected, Bushy whitlow-wort (G1 S1).	--
RG-E14	Leon Creek	Entire stream	Protected, Puzzle sunflower (G1 S1).	--
RG-E15	Unnamed Stream	12.4 km east of Brownsville, Route 4	Blackfin goby (G3 S1).	--
RG-E16	Toyah Creek, Reeves County	Headwaters to FM 2448 crossing	Comanche Springs pupfish (G2 S2).	--
RG-E18	San Felipe Creek, Val Verde County	All	Pecos River pupfish (G1 S1); Rio Grande darter (G3 S2); Devil's River minnow (G2 S1); Proserpine shiner (G3 S2).	2313
RG-E19	Pinto Springs	All	Rio Grande darter (G3 S2); Devil's River minnow (G2 S1); and Proserpine shiner (G3 S2).	--
RG-E20	Devil's River	Headwaters to Lake Amistad (Dolan Creek and Howard Springs)	Blotched gambusia (G4 SX); Proserpine shiner (G3 S2); Devil's River minnow (G2 S1).	2309
RG-E21	Las Moras Springs	All	Rio Grande darter (G3 S2); Devil's River minnow (G2 S1); and Proserpine shiner (G3 S2).	--
RG-E22	Terlingua Creek	All	Terlingua Creek cat's-eye (PE all sites); Brush-pea (C2, only U.S. sites); Brushy wild buckwheat (C2, best site).	--
RG-E23	Los Olmos Creek	North of Rio Grande City, Starr County	Star cactus (C2, only U.S. site).	--
RG-E24	Llano Grande Lake/ Arrroyo Colorado	Arroyo Colorado from FM 493 to highway 83	Texas ayenia (C2, only U.S. site).	2302
RG-Q1	Devil's River	Val Verde County	Exceptional aquatic life.	2309
RG-Q2	Leon Creek and Diamond Y Springs	Entire stream	Exceptional aquatic life.	--

SIGNIFICANT STREAM SEGMENT SUMMARY

(Cont.)

RIO GRANDE RIVER BASIN: (Cont.)

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
RG-Q3	Balmorhea Spring	Reeves County	High water quality/ exceptional aquatic life.	--
RG-Q4	Independence Creek	Pecos-Terrell County line downstream to confluence with Pecos River	High water quality/ exceptional aquatic life.	--
RG-Q5	Rio Grande River	Big Bend Area	Wild and scenic river/ exceptional aquatic life.	2306
RG-Q6	Rio Grande tidal zone	Cameron County	Exceptional aquatic life.	2301, 2302
RG-Q7	Rio Grande River and tributaries	All waters at Big Bend Ranch	Unique, pristine.	2306
RG-R1	Devil's River	Source to Amistad Reservoir including Dolan Creek and Howard Springs	Recreation.	2309
RG-R2	Rio Grande River	Presidio, Presidio County, to Langtry, Val Verde County	Recreation.	2306
RG-S1	Upper Rio Grande	Rio Grande River between Candelaria and Ruidosa, Presidio County	Las Palomas Wildlife Management Area, Ocotillo Unit	2307
RG-S2	Upper Rio Grande	Lower Big Bend National Park boundary downstream to Brewster-Terrell County line	National Park designation as "Wild and Scenic River".	2306
RG-S3	Lower Rio Grande River	Hidalgo County, downstream to Gulf	Unique State and Federal holdings.	2301, 2302
RG-S4	Devil's River and Dolan Creek	Devil's River State Natural Area	Unique State holdings.	2309
RG-S5	San Solomon Springs	Balmorhea State Park	Unique State holdings.	--
RG-S6	Rio Grande River and tributaries	All stream segments within Big Bend Ranch State Park	Unique State holdings.	2306
RG-S7	Rio Grande River and tributaries	All stream segments within Big Bend National Park	Unique Federal holdings.	2306
RG-S8	Rio Grande River and tributaries	All stream segments within the Black Gap Wildlife Management Area	Unique State holdings.	2306

* Designation Codes:

- B: Biological Function
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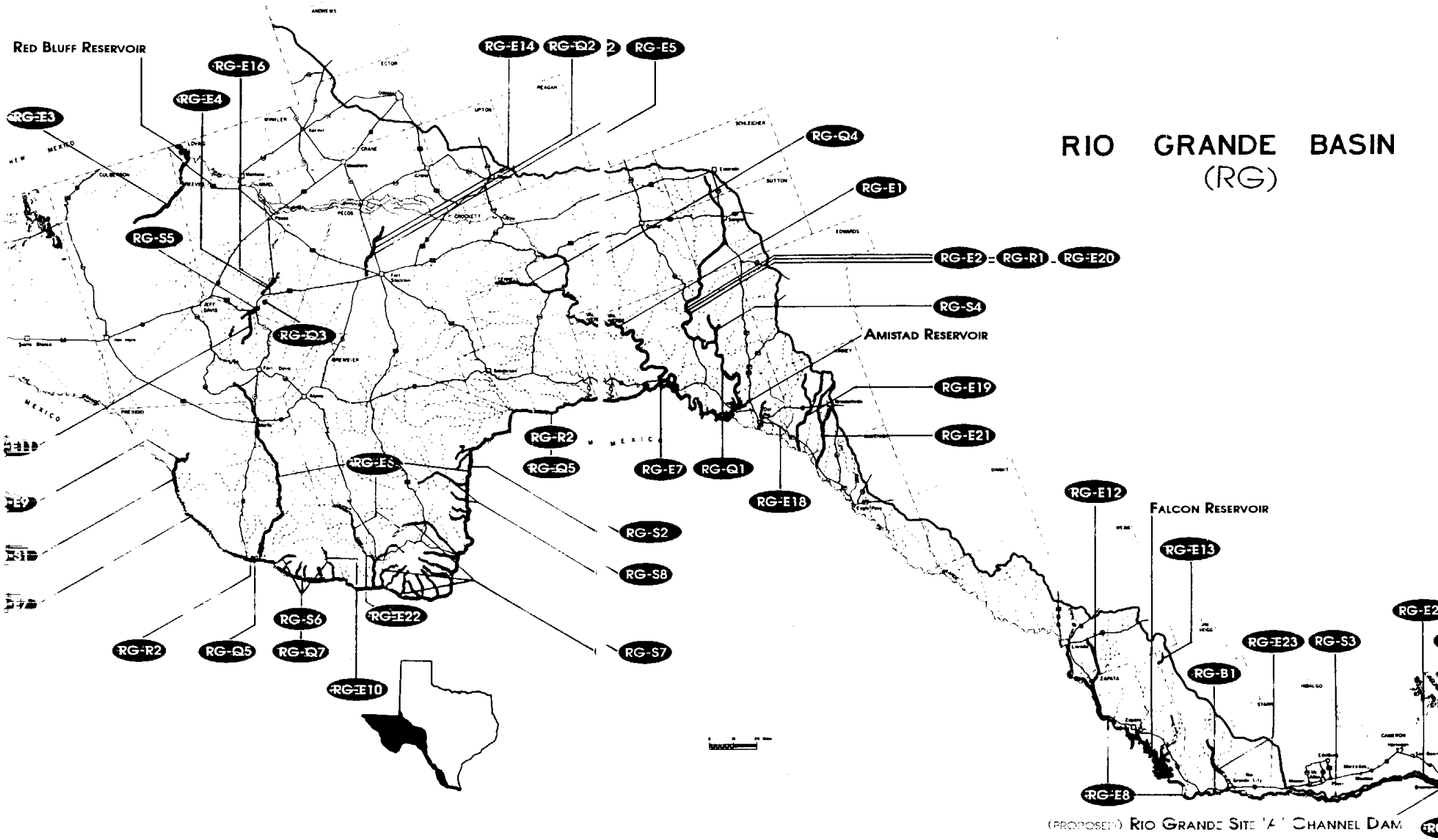
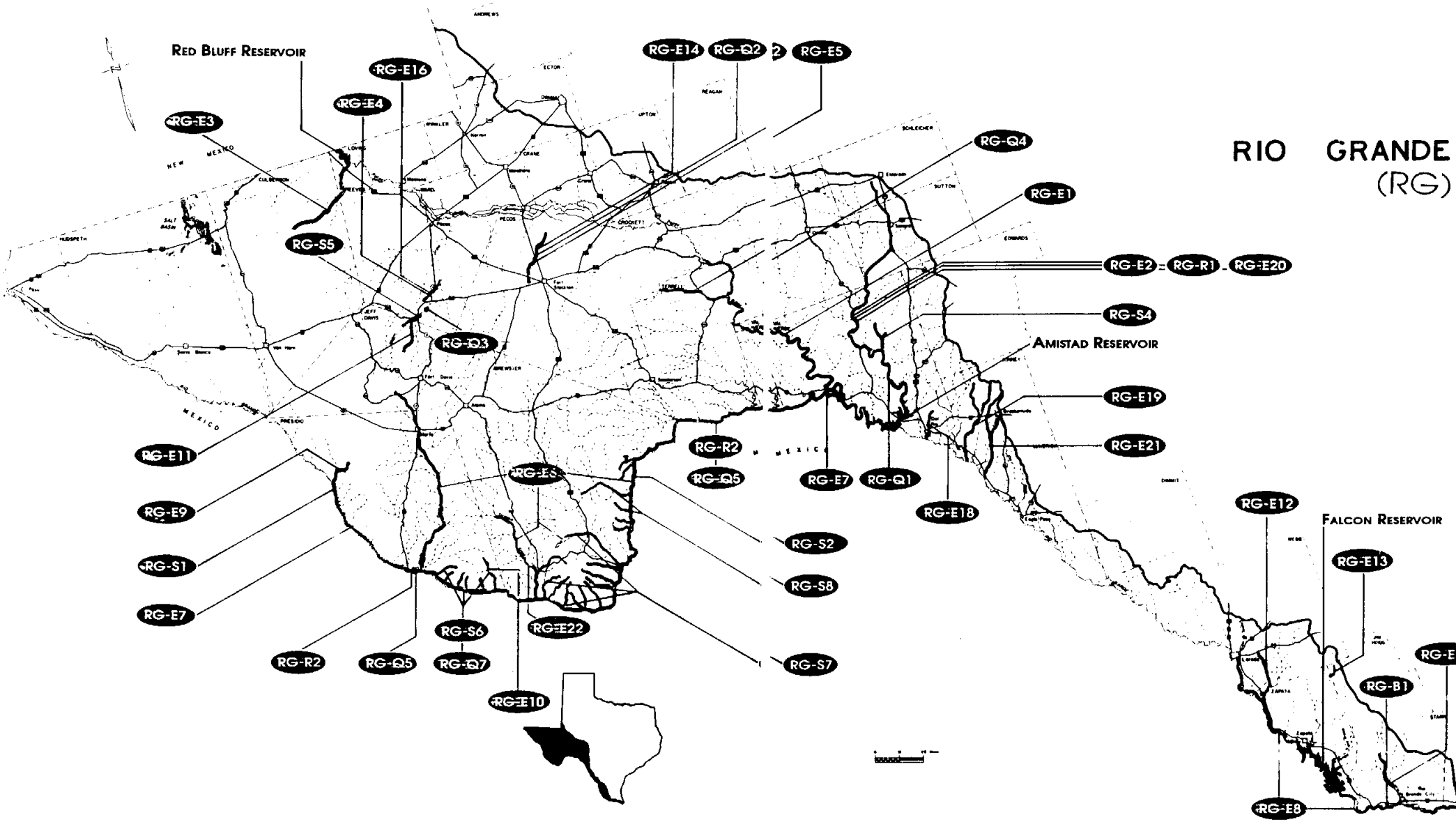

RIO GRANDE BASIN
(RG)
RED BLUFF RESERVOIR
AMISTAD RESERVOIR
FALCON RESERVOIR
(PROPOSED) RIO GRANDE SITE 'A' CHANNEL DAM
RG-E3
RG-E4
RG-E16
RG-E14
RG-Q2
RG-E5
RG-Q4
RG-E1
RG-S5
RG-E2
RG-R1
RG-E20
RG-S4
RG-Q3
RG-E19
RG-E21
RG-R2
RG-Q5
RG-E7
RG-Q1
RG-E18
RG-E12
RG-E13
RG-S2
RG-S8
RG-S6
RG-E22
RG-E23
RG-S3
RG-R2
RG-Q5
RG-Q7
RG-S7
RG-B1
RG-E10
RG-E8


RIO GRANDE
(RG)
RED BLUFF RESERVOIR
AMISTAD RESERVOIR
FALCON RESERVOIR
RG-E3
RG-E16
RG-E4
RG-E14
RG-Q2
RG-E5
RG-Q4
RG-E1
RG-S5
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RG-Q3
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RG-S8
RG-E7
RG-S6
RG-E22
RG-R2
RG-Q5
RG-Q7
RG-S7
RG-B1
RG-E10
RG-E8
(PROPOSED) RIO GRANDE SITE 'A'

RIO GRANDE CHANNEL DAM SITE "A" RESERVOIR

General Data

Normal Pool Elevation: 21.5 MSL	***Size: 422 Acres***
Location:	***Existing Vegetation Description:***
Cameron County. Rio Grande River and Basin. The proposed dam site is located approximately 4 miles southeast of Brownsville with the reservoir extending northwest for approximately 3 miles.	Gulf Prairies and Marshes Ecological Area composed entirely of Mixed Riparian Woods vegetation.

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Expected loss of 422 acres of irreplaceable High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir location include: (1) 422; (2) 0; (3) 0; (4) 0. The National Natural Landmark Survey identified "Palm Grove Sanctuary" and "Southmost Ranch", each lying downstream from the proposed reservoir site, as representative of the Texas Ebony Ecological Theme and candidates for selection as a National Natural Landmarks for their high quality habitat characteristics.

Wildlife Game Resources: A very sparse deer population exists at the proposed reservoir site.

Wildlife Non-game Resources: A 90th Christmas Bird Count census area includes the proposed reservoir area near Brownsville. During the most recent census which included 53 hours of observation, 17,824 individuals comprised of 161 avian species were recorded.

Aquatic Resources: Recent inland fisheries survey data are available in Appendix J. The water quality of the Rio Grande near Brownsville is poor due to varied contaminate inflow. The proposed reservoir project would likely reduce freshwater streamflow to the Rio Grande estuary adversely affecting fish and shellfish species in the bay. The sensitive mangrove habitat would also be affected. Issues which need thorough study for this reservoir project should include: trapped contaminant level of the new conservation pool from pesticides, nutrients, and sediment; effects on the migration of fish and other aquatic species; and, affects on the riverine habitat and brush corridor.

Wildlife Management Areas: Several WMA's are located around Brownsville in Cameron County, however, none appear in close or critical proximity to the proposed reservoir location.

Endangered Resources: **Texas ayenia** -- historic occurrence in the vicinity of the reservoir site, imperiled and very vulnerable to extinction. **Plains gumweed**, **Runyon's water-willow**, and **Vasey's adelia** -- multiple occurrences at or near the reservoir location, each imperiled and very vulnerable to extirpation. **Lila de los llanos** -- multiple occurrences near the proposed reservoir site, very rare. **Texas palmetto** -- multiple occurrences at or immediately downstream from the proposed reservoir location, secure globally but critically imperiled and vulnerable to extirpation from Texas. **Black-spotted newt** -- multiple occurrences listed at and near the proposed reservoir location, critically imperiled and vulnerable to extinction. **Rio Grande lesser siren** and **Sheep frog** -- at least one recent or historic occurrence in the immediate vicinity of the proposed reservoir location, each considered very rare in Texas although secure globally. **Mexican treefrog** -- one historic occurrence in the immediate vicinity of the proposed reservoir site, rare in Texas. **Speckled racer** and **Black-striped snake** -- multiple occurrences at or near the reservoir site, each is considered imperiled or critically imperiled and vulnerable to extirpation from Texas. **Northern cat-eyed snake** -- a single occurrence record in the immediate vicinity of the proposed reservoir location, imperiled because of its

- continued on next page

RIO GRANDE CHANNEL DAM SITE "A" RESERVOIR (Cont.)

Natural Resource Attribute Data Summary

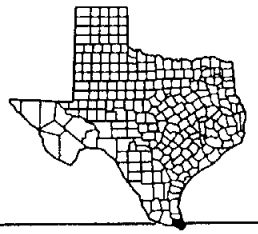
Endangered Resources: (Cont.) rarity. **Jaguarundi** -- one occurrence listed for the immediate vicinity of the proposed reservoir area, critically imperiled and vulnerable to extirpation from Texas. Natural communities present: **Texas Palmetto Series** and **Texas Ebony-Anacua Series** -- multiple occurrences listed for the vicinity of the proposed reservoir site, each considered imperiled throughout their range and especially vulnerable to extirpation from Texas. Other likely protected species in this area include: **River goby, Common black-hawk, Gray hawk, Northern beardless-tyrannulet, Texas scarlet snake, Texas indigo snake, Ocelot, Ferruginous pygmy-owl, Blackfin goby, Texas tortoise, Southern yellow bat, White-lipped frog, Wood stork, Coati, Coues' rice rat, Rose-throated becard, Tropical parula, White-faced ibis, Ghost-faced bat, Long-tongued bat, Hairy-legged vampire, Big free-tailed bat.**

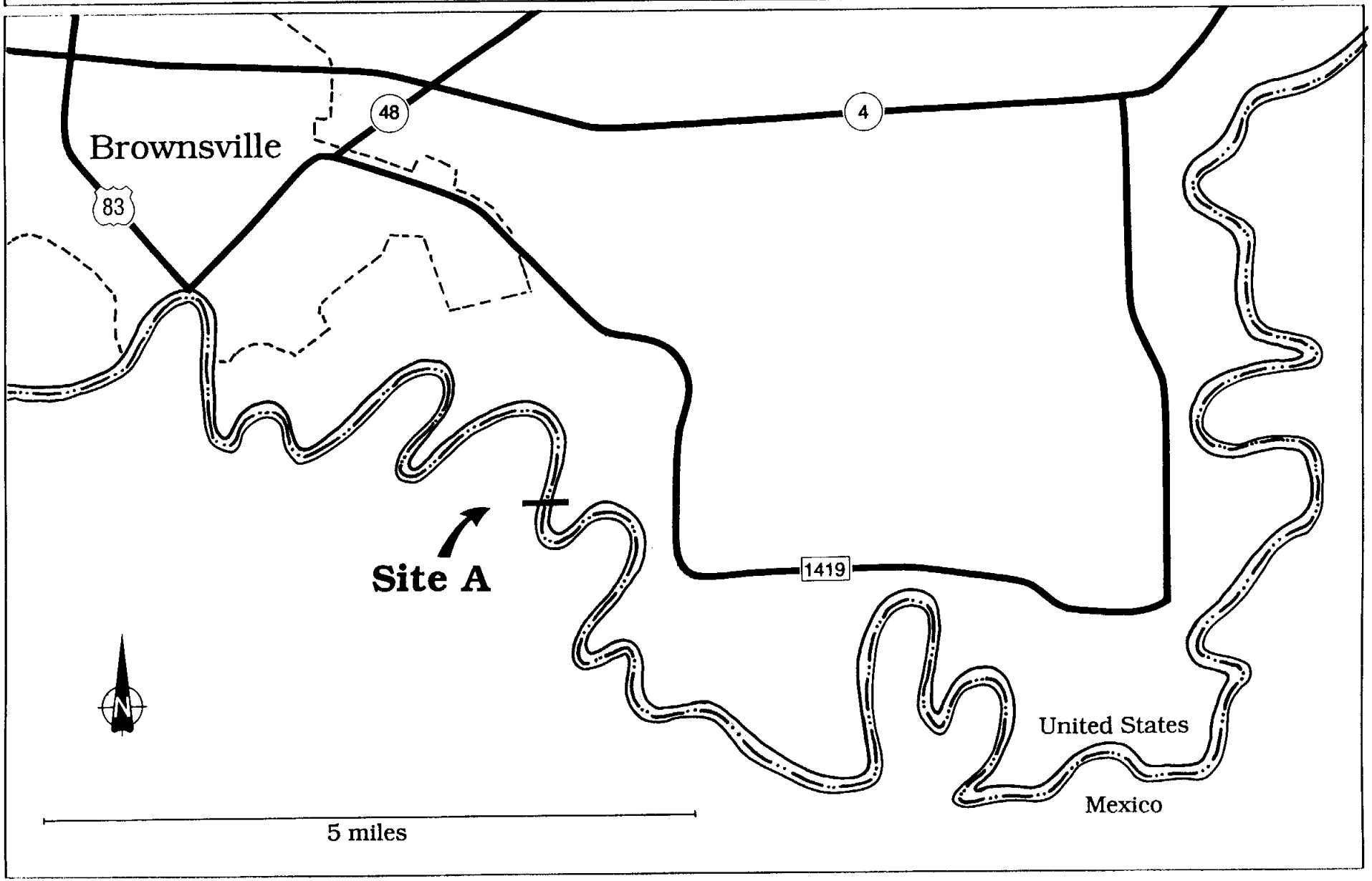
Other Resource Attributes: The Rio Grande River along the proposed reservoir site is a TPWD selected "Significant Stream Segment" because of the stream segments' exceptional aquatic life found in the tidal zone and the extensive freshwater habitat found upstream from the tidal zone. Additionally, the Texas Natural Area Survey identified two sites near the proposed reservoir in their listing of important "natural areas". They include "Brownsville Whitewing Dove Habitat" representing South Texas Brushland, and "Sabal Palm Grove" which represents the Texas Ebony Biotic Theme locations identified above in the National Natural Landmark Survey.

Site A - Channel Dam

Normal Pool El.—21.5 ft. MSL
Surface Acres—422 approx.

Cameron County





Sabine River Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

SABINE RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
SB-B1	Middle Sabine River	FM 1804 crossing downstream to FM 14 crossing	Priority bottomland hardwood habitat.	0506
SB-B2	Lower Sabine River	Rusk-Panola County line downstream to Louisiana State line	Priority bottomland hardwood habitat.	0505
SB-B3	Sabine River	IH 10 crossing, Orange County downstream to Sabine Lake	Extensive freshwater wetland habitat.	0501
SB-E1	Sabine River	Gladewater to Toledo Bend	Suckermouth minnow, Chestnut lamprey (G5 S3); Iron-colored shiner and Longnose shiner.	0505
SB-E2	Sabine River	Toledo Bend Reservoir to Sabine Lake	Paddlefish (G4 S1); Creek chubsucker (G5 S2S3); Blue sucker (G4 S3).	0501, 0503
SB-Q1	Little Sandy Creek	Headwaters to Lake Hawkins	Unique swamp/bog area, biodiversity.	--
SB-Q2	Glade Creek	Headwaters to Gladewater	Unique swamp/bog area, biodiversity.	0506, 0514
SB-S1	Sabine River	Little Sandy Hunting and Fishing Club south of Crow and Hawkins (Wood County)	Unique Federal holdings.	0506
SB-S2	Sabine River	North Toledo Bend Wildlife Management Area	TPWD wetland acquisition development project.	0504

* Designation Codes:

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- Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
- R: Recreation
- S: Acquisition/Mitigation/Governmental Open Space

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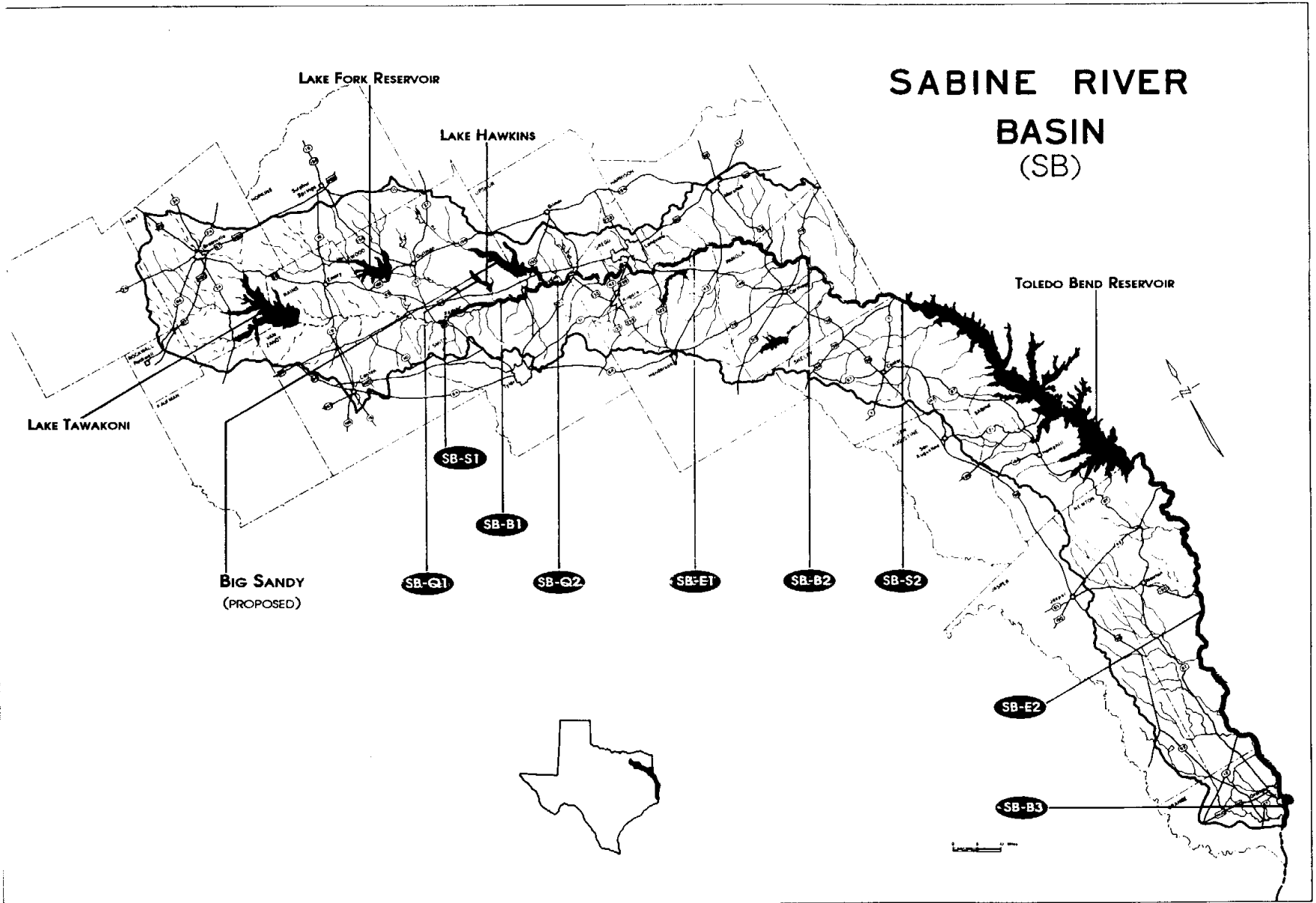

SABINE RIVER
BASIN
(SB)
LAKE FORK RESERVOIR
LAKE HAWKINS
TOLEDO BEND RESERVOIR
LAKE TAWAKONI
BIG SANDY
(PROPOSED)
SB-S1
SB-B1
SB-Q1
SB-Q2
SB-E1
SB-B2
SB-S2
SB-E2
SB-B3

BIG SANDY RESERVOIR

General Data

Normal Pool Elevation: 336 MSL

Size: 4,405 Acres

Location:

Upshur and Wood counties. Big Sandy Creek in the Sabine River Basin. The proposed dam site is located approximately 3 miles north of Big Sandy with the reservoir extending northwest for approximately 13 miles.

Existing Vegetation Description:

Pineywoods Ecological Area currently composed of the following vegetation types:

	acres	(%)
Bottomland Hardwood Forest	1,894	43
Hardwood-Pine Forest	1,498	34
Grassland/Savannah	617	14
Pine Hardwood Forest	352	8
Crops	44	1

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Expected loss of 1,155 Habitat Units of High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir location include: (1) 0; (2) 1,894; (3) 2,467; (4) 44. The National Natural Landmark Survey identified "The Glades", a portion of the proposed reservoir site, as representative of the Baldcypress-Tupelo Ecological Theme and a candidate for selection as a National Natural Landmark for its high quality habitat characteristics. The USFWS identified "Upper Big Sandy Creek and Glades" and "Lower Big Sandy Creek" as Priority 2 Bottomland Hardwood Sites because of their high habitat resource value, especially for waterfowl.

Wildlife Game Resources: The proposed reservoir area supports a modest deer population density calculated at 58.8 acres/deer as compared to an estimated adjacent upland deer population density of 76.0 acres/deer. The proposed reservoir location is categorized as "excellent" turkey habitat . Within the proposed reservoir area, several turkey releases are evidence of the level of TPWD effort in restoration of this wildlife resource. The area is considered "excellent" habitat for the gray squirrel because of the sizeable high quality bottomland hardwood habitat present.

Wildlife Non-game Resources: A significant and species diverse rookery has been documented in the immediate vicinity of the proposed reservoir area as well as several historic rookeries by the Colonial Waterbird Census.

Aquatic Resources: Inland Fisheries surveys are not available, however, this is known to be a pristine area that provides excellent stream habitat. **Paddlefish**, a state-listed endangered species, occur in this general area and could be affected by reservoir construction. The state-listed threatened **Creek chubsucker** is also expected to occur in this stream segment area. It is assumed there is very good water quality in this stream based on conditions in the surrounding watershed.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

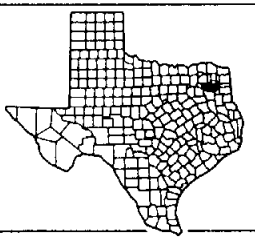
Endangered Resources: **Louisiana pine snake** -- historic occurrence record in the reservoir area, stable globally but very rare and vulnerable to extinction from Texas; **Rough-stemmed aster** -- one occurrence in the near area and likely in marshy areas along creeks in the immediate area, imperiled in Texas because of its rarity; **Sandhill four o'clock, Golden wave tickseed**, and **Mohlenbrock's umbrella sedge** -- occurrences in the near area and highly likely on areas with somewhat excessively drained sand, rare to extremely rare in Texas. Natural Community occurrences include: **Bluejack Oak-Pine Series**, imperiled in Texas; **Baldcypress-Water Tupelo Series**, rare in the state with a high quality example existing at the proposed reservoir site; **Water Oak-Willow Oak Series**, also rare in the State. Other protected species likely to occur in the area include: **Bachman's sparrow, Northern scarlet snake, Creek chubsucker, Alligator snapping turtle, Paddlefish, Bald eagle, American swallow-tailed kite, Southeastern myotis, Eastern big-eared bat.**

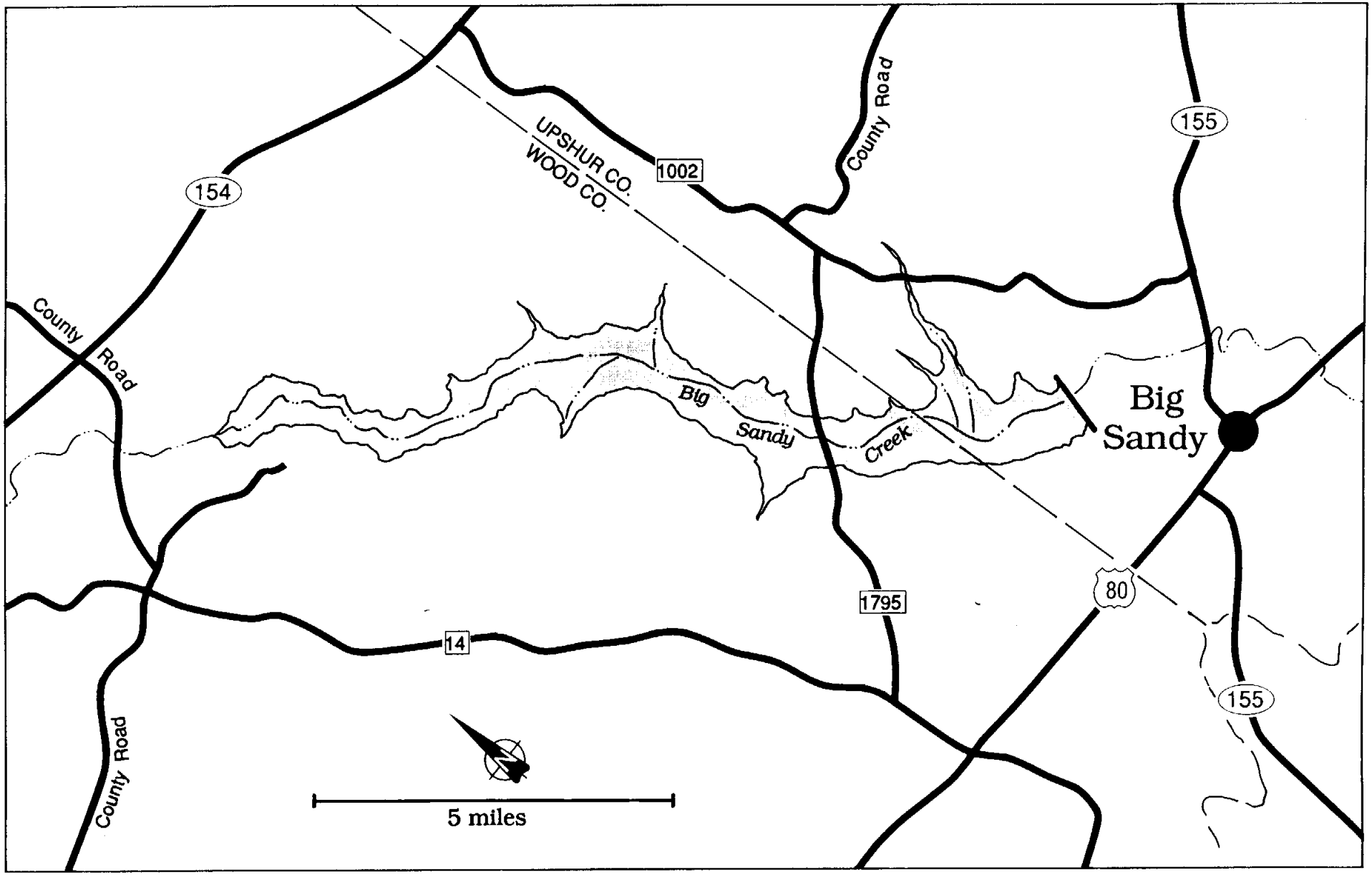
Other Resource Attributes: Glade Creek, along the proposed reservoir site, is a TPWD selected "Significant Stream Segment" because of the stream segments' unique bog/swamp habitat and biodiversity.

Big Sandy

Normal Pool El.—336 ft. MSL
Surface Acres—4,405

Wood and Upshur Counties





San Antonio River Basin

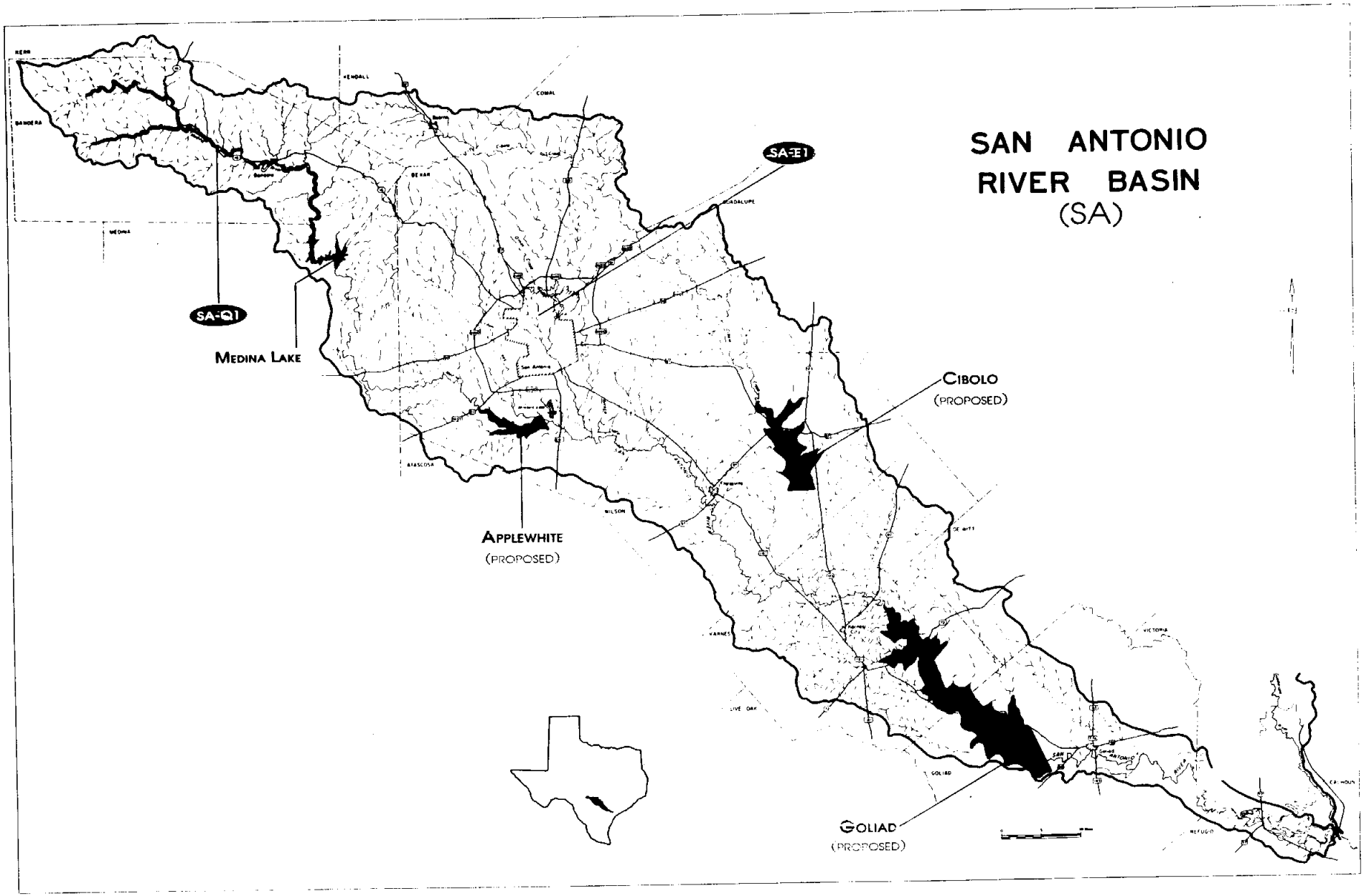
SIGNIFICANT STREAM SEGMENT SUMMARY

SAN ANTONIO RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
SA-E1	N/A	Bexar County - 5 artesian wells	Toothless blindcat (G1 S1); Widemouth blindcat (G1 S1).	--
SA-Q1	Medina River	Source to Medina Lake	Exceptional aquatic life.	1905

* Designation Codes:

- B: Biological Function
- E: Protected Species: Threatened/Endangered/Unique Communities
- Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
- R: Recreation
- S: Acquisition/Mitigation/Governmental Open Space


SAN ANTONIO
RIVER BASIN
(SA)
SA-E1
SA-Q1
MEDINA LAKE
CIBOLO
(PROPOSED)
APPLEWHITE
(PROPOSED)
GOLIAD
(PROPOSED)

APPLEWHITE RESERVOIR

General Data

Normal Pool Elevation: 536 MSL	***Size: 2,500 Acres***
Location: Bexar County. Medina River of the San Antonio River Basin. The Proposed dam site is located approximately 11 miles south of San Antonio near Lakefield Airport with the reservoir extending west for approximately 8 miles.	***Existing Vegetation Description:*** South Plains Ecological Area currently composed of the following vegetation types:

	acres	(%)
Riparian Forest	908	36
Mesquite Brush	940	38
Grasses/Shrub	62	3
Crops	584	23

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Expected loss of 590 Habitat Units of High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir location include: (1) 0; (2) 908; (3) 940; (4) 646.

Wildlife Game Resources: The reservoir site supports a moderate deer population density calculated at 36.0 acres/deer as compared to an estimated adjacent upland deer population density of 80-100 acres/deer. The proposed reservoir location is categorized as "fair" turkey habitat (The area exhibits excellent habitat but supports a modest population of birds because of heavy human impact in the area).

Wildlife Non-game Resources: A 90th Christmas Bird Count census area includes the upstream two-thirds of the proposed reservoir. During a 151 hour census, 59,529 individuals comprised of 155 avian species were observed.

Aquatic Resources: A listing of fish species observed from a stream survey in the vicinity of the proposed reservoir is reported in Appendix J. Water quality conditions of the lower 7-mile portion of the Medina River are heavily influenced by the treated sewage discharged from San Antonio's Leon Creek Plant. This condition reduces natural dissolved oxygen levels and increase the concentrations of nutrient compounds in this segment of the river.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

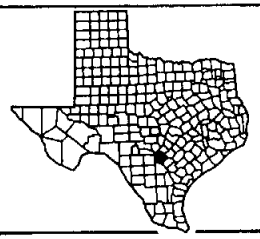
Endangered Resources: **Guadalupe bass** -- resident of the Medina River, rare or uncommon in Texas. **Widemouth blindcat** and **Toothless blindcat** -- both occur only in the San Antonio pool of the Edwards Aquifer and are occasionally observed from artesian wells that puncture through to the surface in the area. Each is considered critically imperiled globally and in Texas and especially vulnerable to extinction. Other protected species likely to occur in the area include: **Cagle's map turtle**, historically known from the San Antonio River is very rare or uncommon and under petition for federal listing as threatened; **Texas indigo snake**; **Texas tortoise**; **Bald eagle**; **Big red sage**; **Ghost-faced bat**; **Big free-tailed bat**.

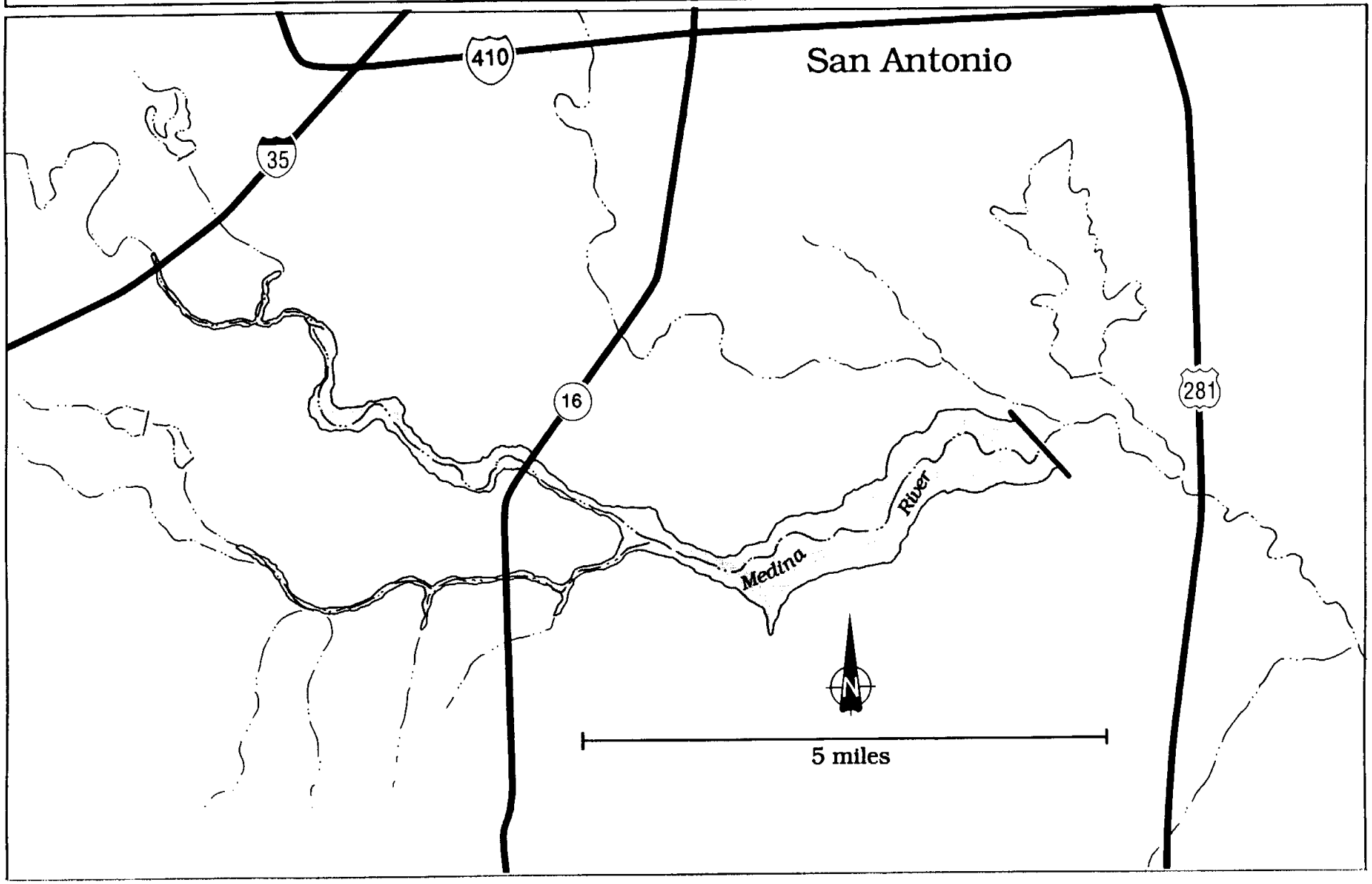
Other Resource Attributes: The Texas Natural Area Survey identified the Medina River at the proposed reservoir site in their listing of important "natural areas" for the river segments' scenic beauty and pristine qualities. The upstream portion of the proposed reservoir is included in this listing.

Applewhite

Normal Pool El.—536 ft. MSL
Surface Acres—2,500

Bexar County





CIBOLO RESERVOIR

General Data

Normal Pool Elevation: 400.1 MSL

Size: 9,493 Acres

Location:

Wilson County. San Antonio River Basin. The proposed dam site is located approximately 11 miles east of Floresville with the proposed reservoir extending north for approximately 12 miles.

Existing Vegetation Description:

Post Oak Savannah and South Texas Plains Ecological Areas currently composed of the following vegetation types:

	acres	(%)
Mixed Riparian Forest	625	7
Grasses	1,510	16
Mesquite/Granjeno Brush/Woods	4,372	46
Other	2,032	21
Cropland	954	10

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Expected loss of 431 Habitat Units of High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir location include: (1) 0; (2) 625; (3) 4,372; (4) 2,464.

Wildlife Game Resources: The proposed reservoir site supports a modest deer population density calculated at 80 acres/deer as compared to an estimated adjacent upland deer population of 160 acres/deer. The proposed reservoir location is categorized as "excellent" turkey habitat and supports a very high density turkey population. Within the proposed reservoir area, several turkey releases are evidence of the level of TPWD effort in restoration of this wildlife resource.

Wildlife Non-game Resources: The Breeding Bird Survey Route #029 intersects the proposed reservoir location documenting 80 avian species along the survey route since observations began in 1967.

Aquatic Resources: Inland Fisheries stream surveys of fish species present for this proposed reservoir location are listed in Appendix J. Freshwater flow to the San Antonio Bay estuary system is of major concern regarding this proposed water supply project. Regarding water quality, Cibolo Creek is typical of streams bordering the Rio Grande Plain with high hardness and alkalinity but is within acceptable limits for fish and wildlife. Dissolved oxygen is consistently high and clarity is moderate.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

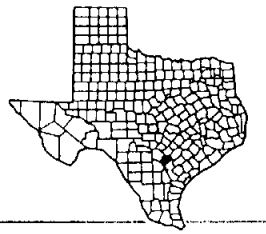
Endangered Resources: The downstream portion of the San Antonio River Basin is resident habitat of the **Bald eagle** although no active eagle nest sites are known to be present in the proposed reservoir location. **Big red sage** -- historic occurrence possible in the proposed reservoir location, imperiled and very vulnerable to extinction throughout its range. **Parks' jointweed** -- historic occurrence possible in the proposed reservoir area, imperiled and very vulnerable throughout its range. **Elmendorf onion** -- multiple occurrences in the near vicinity and highly likely in the immediate proposed reservoir area, imperiled and very vulnerable to extinction throughout its range. Other protected species likely to occur in the area include: **Timber rattlesnake, Texas tortoise, White-faced ibis, Cagle's map turtle, Bald eagle, Ghost-faced bat, Big free-tailed bat.**

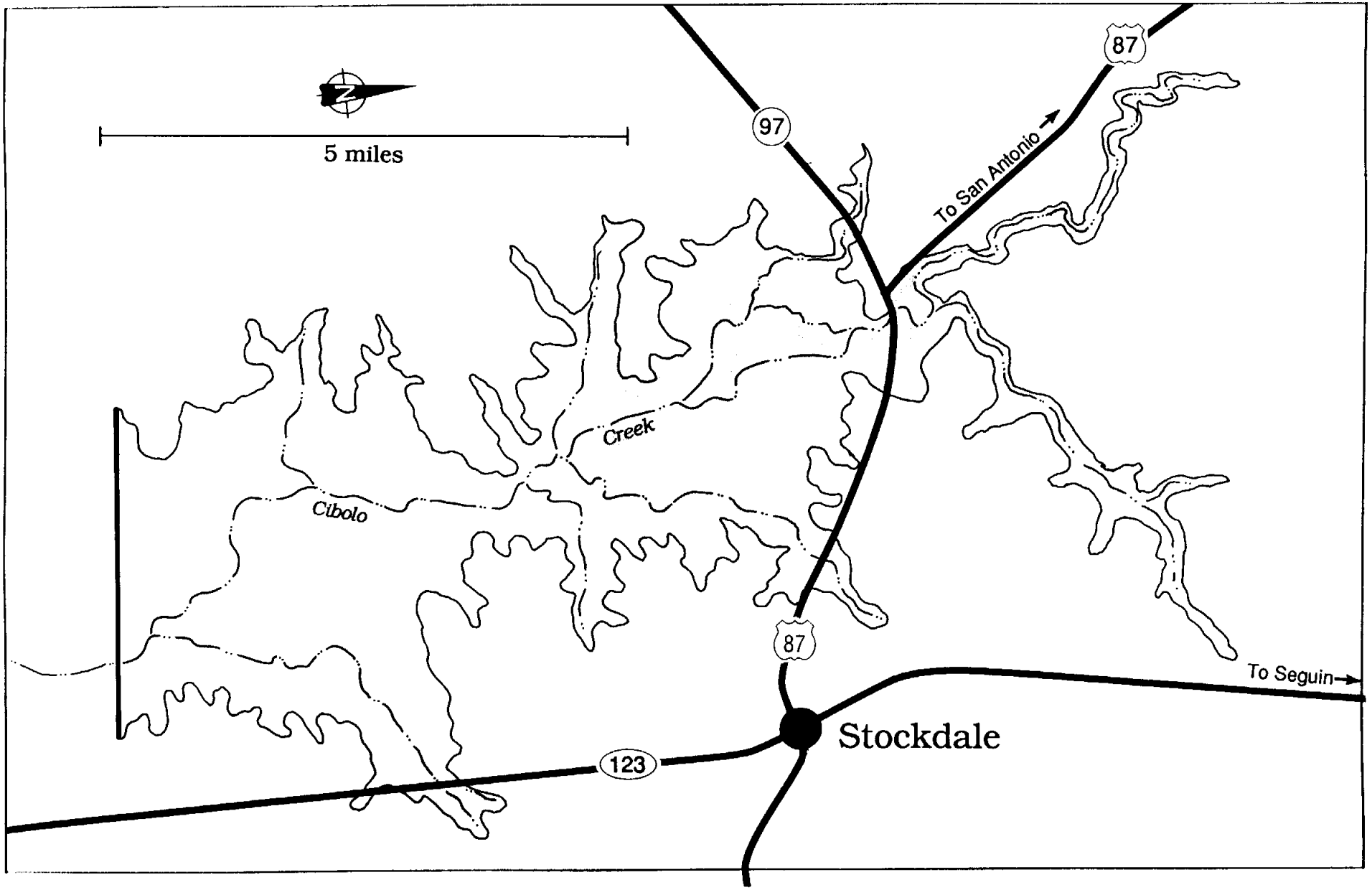
Other Resource Attributes: None identified.

Cibolo

Normal Pool El.—400.1 ft. MSL
Surface Acres—9,493

Wilson County





GOLIAD RESERVOIR

General Data

Normal Pool Elevation: 207 MSL	*Size: 32,002 Acres*
Location: Goliad and Karnes Counties. San Antonio River Basin. The proposed dam site is located approximately 6 miles west of Goliad with the proposed reservoir extending northwest for approximately 30 miles.	***Existing Vegetation Description:*** South Texas Plains Ecological Area currently composed of the following vegetation types: Mixed Riparian Forest — 2,541 acres (8%) Grasses — 9,988 (31) Mesquite/Granjeno Brush/Woods — 12,990 (40) Other — 3,014 (10) Cropland — 3,469 (11)

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Expected loss of 2,007 Habitat Units of High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir location include: (1) 0; (2) 2,541; (3) 12,990; (4) 13,457. The National Natural Landmark Survey identified "Goliad State Park", an area just below the proposed dam site, as representative of the Sugarberry-Elm Ecological Theme and a candidate for selection as a National Natural Landmark for its high quality habitat characteristics.

Wildlife Game Resources: The proposed reservoir site supports a moderate deer population density calculated at 37.5 acres/deer as compared to an estimated adjacent upland deer population density of 160.0 acres/deer. The proposed reservoir location is categorized as "excellent" turkey habitat and supports a very high density turkey population.

Wildlife Non-game Resources: The Breeding Bird Survey Route #015 intersects the proposed reservoir area documenting 83 avian species along the survey route since observations began in 1968.

Aquatic Resources: An inland fisheries stream survey of fish species observed for this proposed reservoir location is listed in Appendix J. The fishery at the proposed reservoir site is considered marginal for recreational value.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

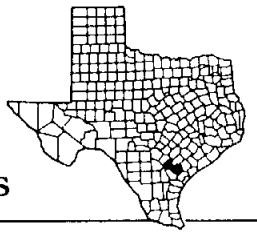
Endangered Resources: **Bald eagle** -- historic occurrence in the vicinity of the proposed reservoir location, the downstream portion of the San Antonio River Basin is resident habitat of this species, imperiled and rare in Texas. Natural communities present include: **Sugarberry-Elm Series** -- classic example present; **Blackbrush Series.** Other protected species likely to occur in the proposed reservoir area include: **Timber rattlesnake, Texas tortoise, White-faced ibis, Cagle's map turtle, Texas indigo snake, Attwater's greater prairie-chicken, Ghost-faced bat, Big free-tailed bat.**

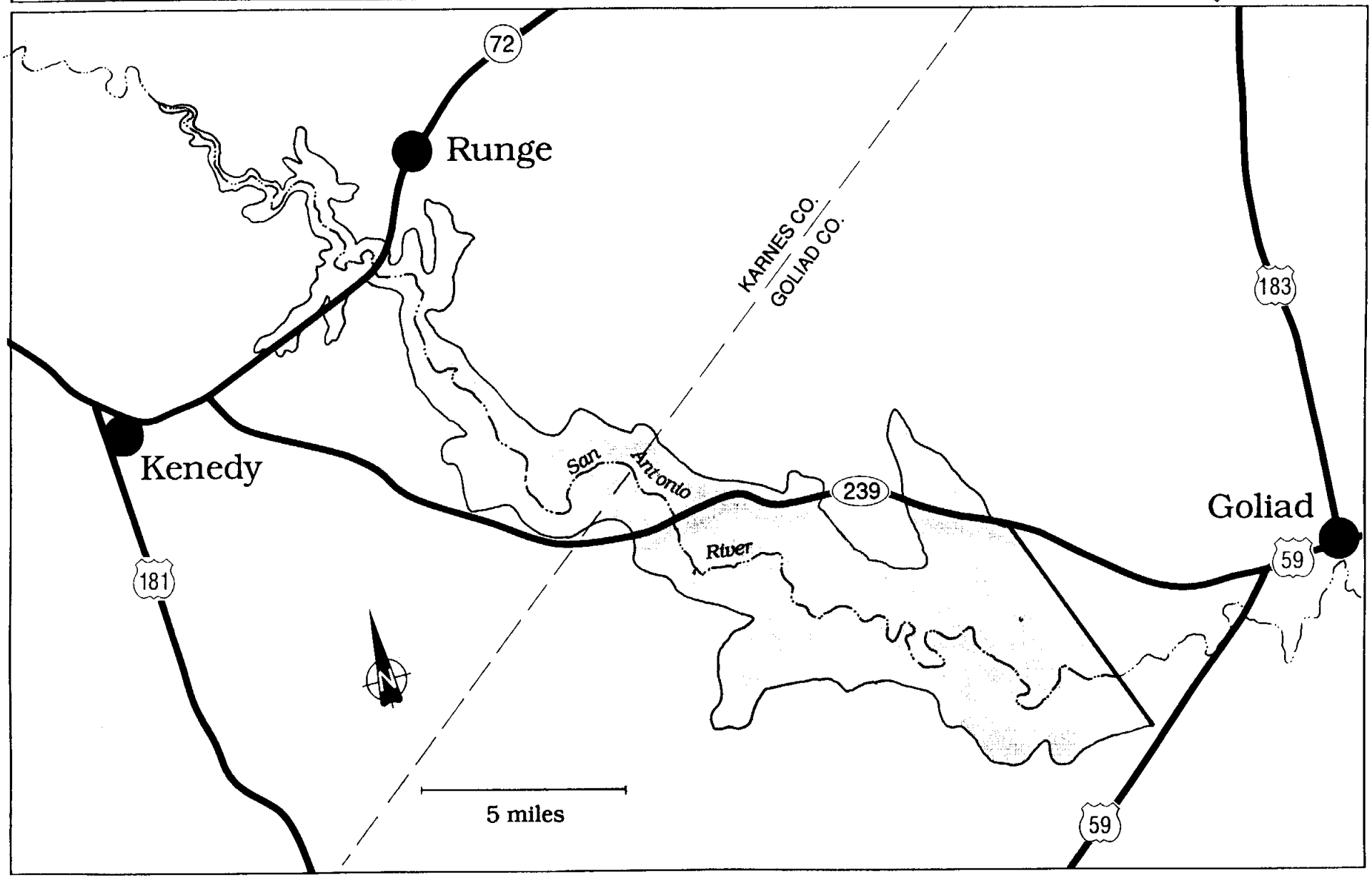
Other Resource Attributes: None identified.

Goliad

Normal Pool El.—207 ft. MSL
Surface Acres—32,002

Goliad and Karnes Counties





San Antonio-Nueces Coastal Basin

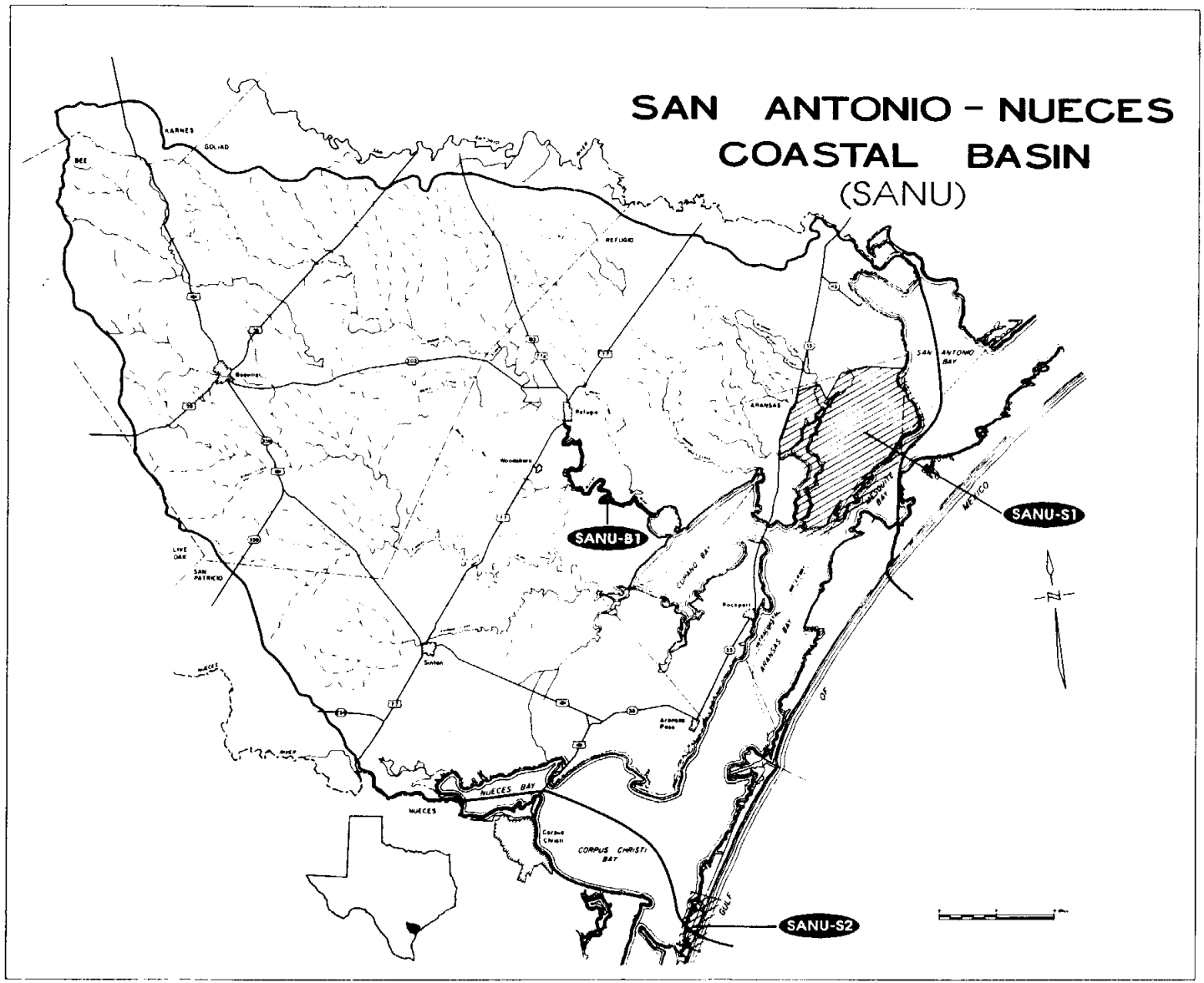
SIGNIFICANT STREAM SEGMENT SUMMARY

SAN ANTONIO-NUECES COASTAL BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
SANU-B1	Mission River	FM 136 crossing downstream to Mission Bay	Extensive freshwater wetland habitat.	2001, 2002
SANU-S1	St. Charles Bay	Aransas National Wildlife Refuge	Unique Federal holdings.	--
SANU-S2	Gulf Coast	Mustang Island State Park	Unique State holdings.	--

* Designation Codes:

B: Biological Function
E: Protected Species: Threatened/Endangered/Unique Communities
Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
R: Recreation
S: Acquisition/Mitigation/Governmental Open Space


SAN ANTONIO - NUECES
COASTAL BASIN
(SANU)
SANU-B1
SANU-S1
SANU-S2
NUECES BAY
CORPUS CHRISTI BAY
ARANSAS BAY
MEXICO
GULF

San Jacinto River Basin

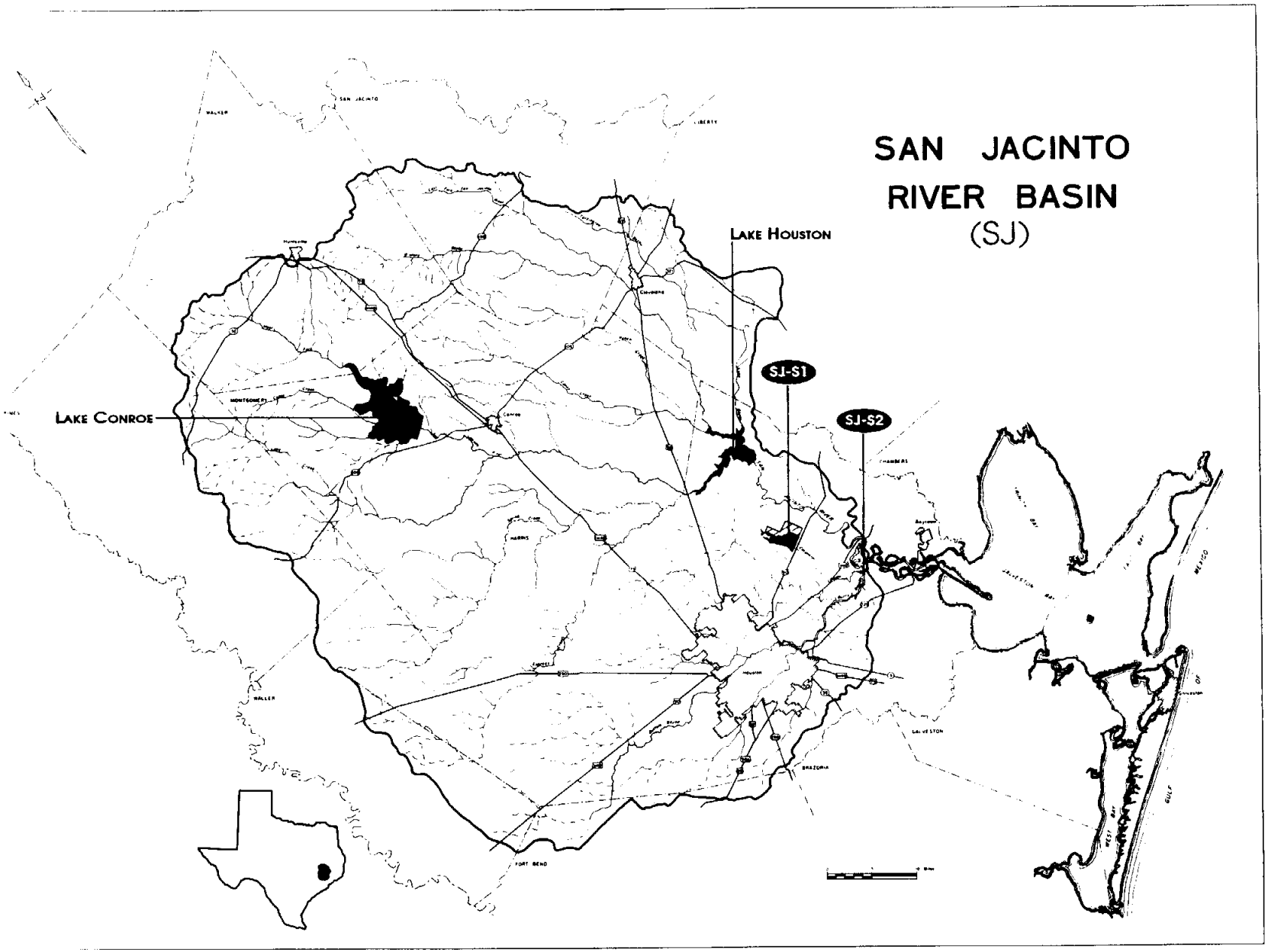
SIGNIFICANT STREAM SEGMENT SUMMARY

SAN JACINTO RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
SJ-S1	Sheldon Reservoir	Sheldon Wildlife Management Area	Unique State holdings.	–
SJ-S2	Houston Ship Channel	San Jacinto State Park	Unique State holdings.	1005, 1006

* Designation Codes:

- B: Biological Function
- E: Protected Species: Threatened/Endangered/Unique Communities
- Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
- R: Recreation
- S: Acquisition/Mitigation/Governmental Open Space


SAN JACINTO
RIVER BASIN
(SJ)
LAKE HOUSTON
LAKE CONROE
SJ-S1
SJ-S2
SAN JACINTO
LIBERTY
WALKER
MONTGOMERY
HARRIS
WALLER
FORT BEND
BRAZORIA
GALVESTON
CHAMBERS
GULF OF MEXICO

San Jacinto-Brazos Coastal Basin

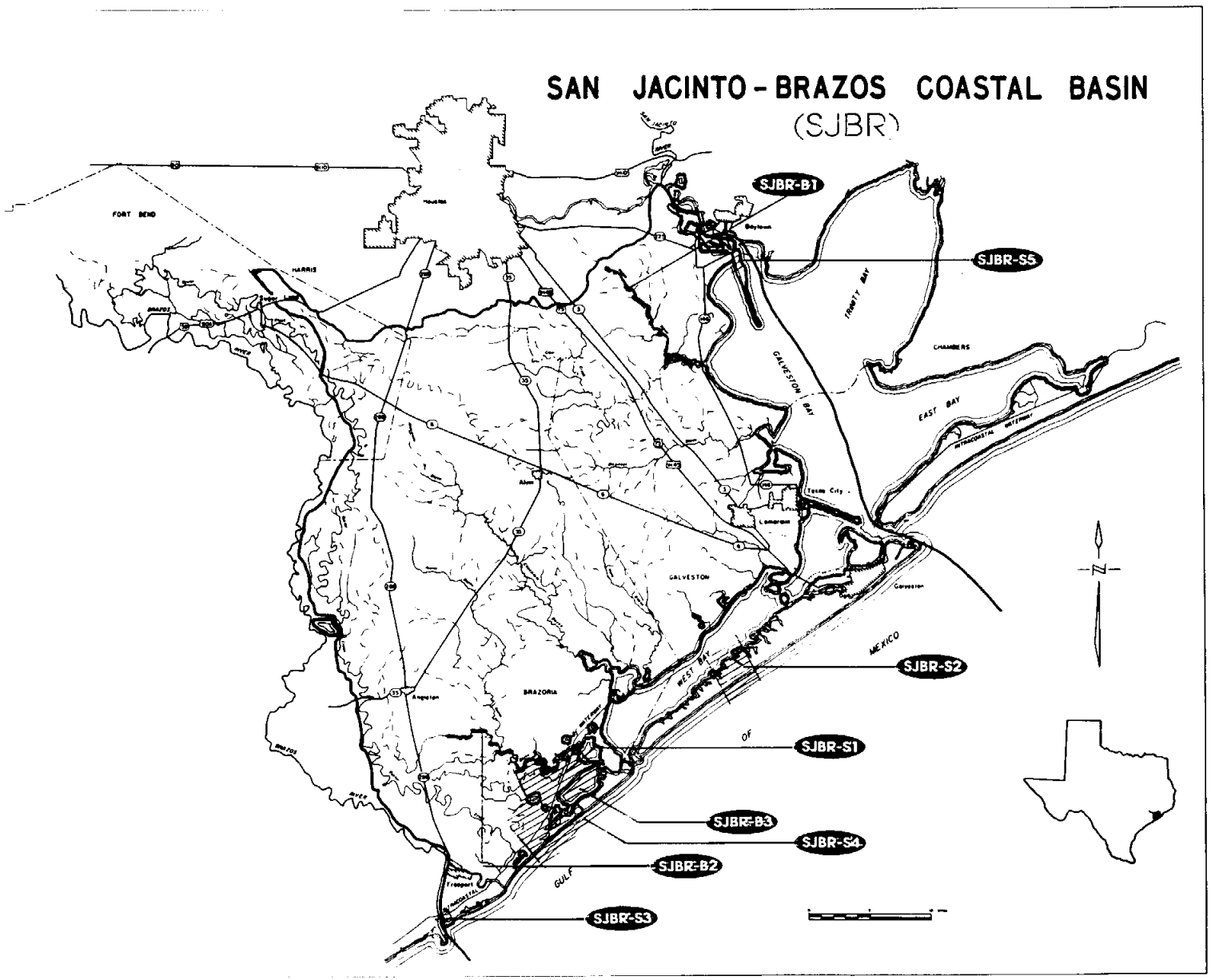
SIGNIFICANT STREAM SEGMENT SUMMARY

SAN JACINTO-BRAZOS COASTAL RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
SJBR-B1	Armand Bayou Coastal Preserve	Source to Mud Lake	Extensive freshwater wetland habitat.	1113
SJBR-B2	Bastrop Bayou	FM 523 crossing downstream to intersection with Intra-coastal Waterway	Extensive freshwater wetland habitat.	1105
SJBR-B3	Christmas Bay Coastal Preserve	Southwestern extreme of West Bay, Brazoria County	Estuarine function.	--
SJBR-S1	Bastrop Bayou	Brazoria National Wildlife Refuge	Unique Federal holdings.	1105
SJBR-S2	Gulf Coast	Galveston Island State Park	Unique State holdings.	--
SJBR-S3	Gulf Coast	Bryan Beach State Park	Unique State holdings.	--
SJBR-S4	Gulf Coast	Christmas Bay State Park	Unique State holdings.	--
SJBR-S5	Galveston Bay, Atkinson Island	Atkinson Island Wildlife Management Area	Unique State holdings.	--

* Designation Codes:

B: Biological Function
E: Protected Species: Threatened/Endangered/Unique Communities
Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
R: Recreation
S: Acquisition/Mitigation/Governmental Open Space


SAN JACINTO - BRAZOS COASTAL BASIN
(SJBR)
SJBR-B1
SJBR-S5
SJBR-S2
SJBR-S1
SJBR-B3
SJBR-S4
SJBR-B2
SJBR-S3
FORT BEND
HARRIS
BRAZORIA
GALVESTON
TRINITY BAY
GALVESTON BAY
EAST BAY
CHAMBERS
WEST BAY
GULF OF MEXICO
N

Sulphur River Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

SULPHUR RIVER BASIN:

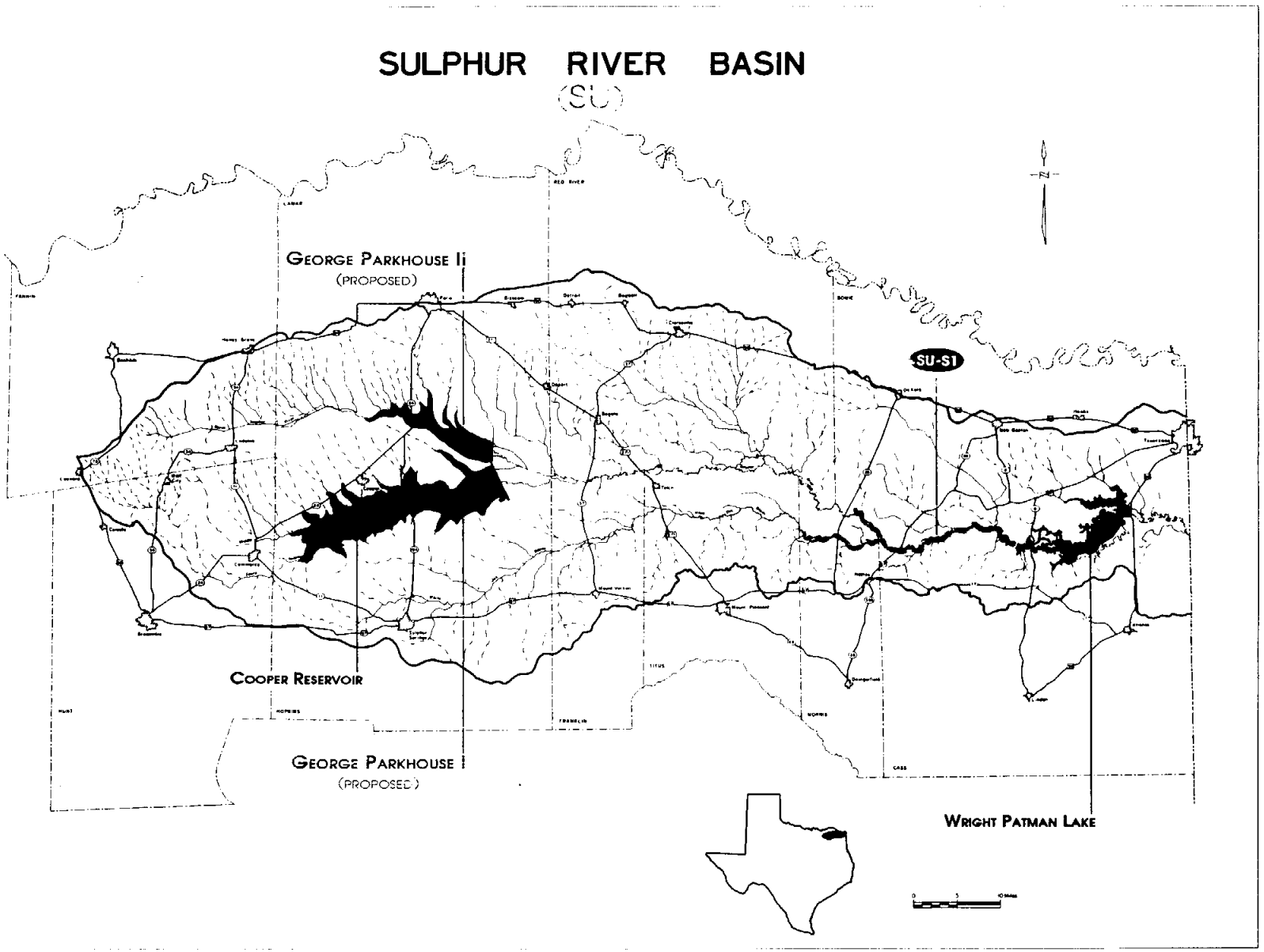
Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
SU-S1	Sulphur River and White Oak Creek	Hwy I-30 crossing downstream to Wright Patman Reservoir	TPWD proposed acquisition, White Oak Creek Wildlife Management Area	0303

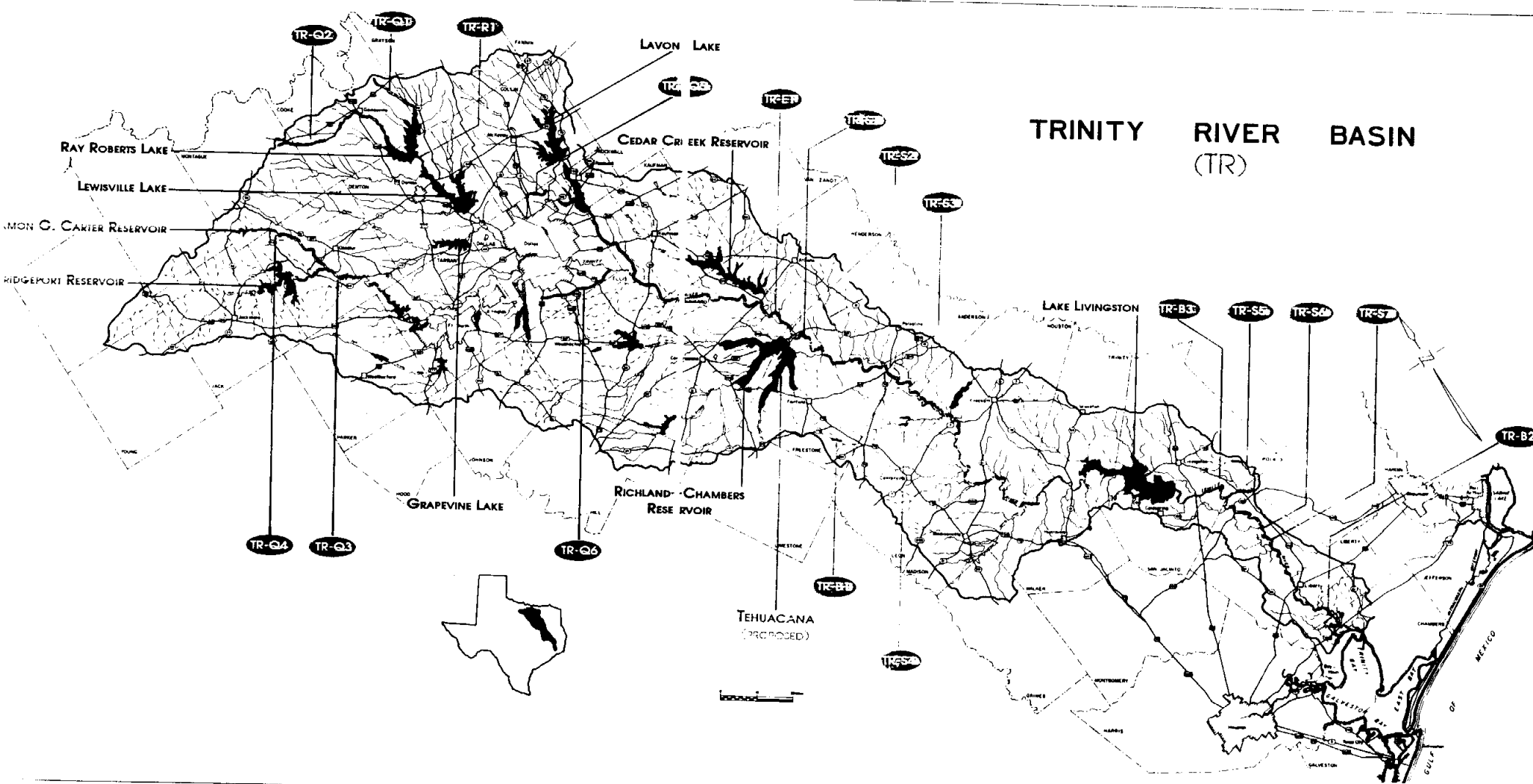
* Designation Codes:

- B: Biological Function
- E: Protected Species: Threatened/Endangered/Unique Communities
- Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
- R: Recreation
- S: Acquisition/Mitigation/Governmental Open Space

SULPHUR RIVER BASIN

(SU)




TRINITY RIVER BASIN
(TR)
TR-Q2
TR-Q1
TR-R1
LAVON LAKE
TR-E2
TR-E1
TR-E3
TR-S2
TR-S3
RAY ROBERTS LAKE
LEWISVILLE LAKE
MON G. CARTER RESERVOIR
RIDGEPORT RESERVOIR
CEDAR CREEK RESERVOIR
LAKE LIVINGSTON
TR-B3
TR-S5
TR-S4
TR-S7
TR-B2
GRAPEVINE LAKE
RICHLAND-CHAMBERS RESERVOIR
TR-Q4
TR-Q3
TR-Q6
TR-B1
TEHUACANA
(PROPOSED)
TR-S1
GULF OF MEXICO

GEORGE PARKHOUSE I RESERVOIR

General Data

Normal Pool Elevation: 401 MSL	*Size: 27,970 Acres*
Location:	***Existing Vegetation Description:***
Delta and Hopkins Counties. South Sulphur River in the Sulphur River Basin. The proposed dam site is located approximately 13 miles southwest of Bogata with the reservoir extending west for approximately 15 miles.	Blackland Prairie Ecological Area currently composed of the following vegetation types:

	acres	(%)
Mixed Bottomland Hardwood Forest	10,690	39
Grasses	8,204	29
Cropland	4,553	16
Other	4,523	16

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Expected loss of 7,804 Habitat Units of High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir location include: (1) 0; (2) 10,690; (3) 8,204; (4) 4,553. The USFWS identified "Horton Bottom", located near the upstream extremity of the proposed reservoir as a Priority 4 Bottomland Hardwood Site because of the sites' high habitat resource value, especially for waterfowl. Very little equal quality habitat exists in the local area if George Parkhouse II Reservoir were also constructed.

Wildlife Game Resources: The proposed reservoir site supports an excellent deer population density calculated at 21.0 acres/deer as compared to an estimated adjacent upland deer population density of 55.0 acres/deer. The proposed reservoir location is categorized as "excellent" turkey habitat . Within the proposed reservoir area, several turkey releases are evidence of the level of TPWD effort in restoration of this wildlife resource. The area is considered "excellent" habitat for the gray squirrel because of the sizeable acreage of high quality bottomland hardwood habitat present.

Wildlife Non-game Resources: Several historic rookeries are documented by the Colonial Waterbird Census. Additionally, the Breeding Bird Survey Route #'s 070 and 071 intersect the proposed reservoir area. Since observations began in 1970, 71 and 79 avian species have been documented along these respective routes.

Aquatic Resources: An inland fisheries survey identifying fish species observed along the proposed reservoir area is listed in Appendix J. **Paddlefish** and **Creek chubsucker**, state-listed as endangered and threatened, respectively, would be affected by this project. Chemical and biological parameters evaluated indicate that during summer low flow conditions dissolved oxygen levels are generally low and frequently critical.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

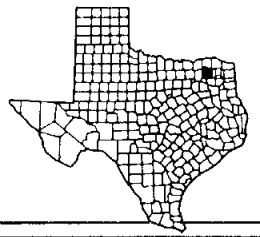
Endangered Resources: Natural communities present in the proposed reservoir area include: **Silveanus Dropseed Series** -- imperiled and very rare globally and in Texas; **Sugarberry-Elm Series**. Other protected species likely to occur in the proposed reservoir area include: **Bachman's sparrow, Creek chubsucker, Alligator snapping turtle, Paddlefish, Interior least tern, Bald eagle, American swallow-tailed kite, Timber rattlesnake, Southeastern myotis**.

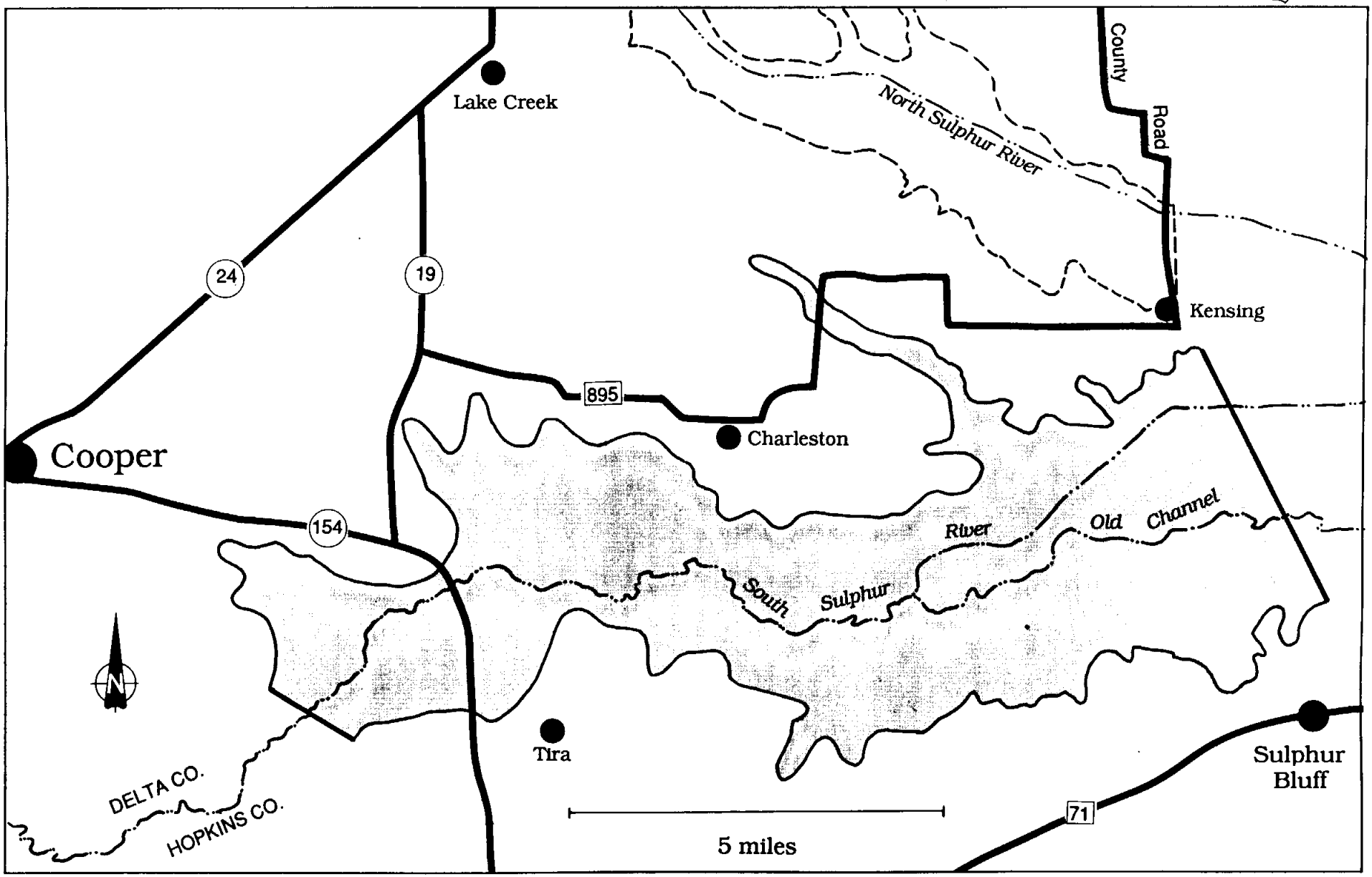
Other Resource Attributes: The Texas Natural Area Survey identified the Sulphur River immediately downstream from the proposed dam site in their listing of important "natural areas" because of the stream segments' scenic beauty and pristine qualities.

George Parkhouse I

Normal Pool El.—401 ft. MSL
Surface Acres—27,970

Delta and Hopkins Counties





GEORGE PARKHOUSE II RESERVOIR

General Data

Normal Pool Elevation: 401 'MSL

Size: 11,018 Acres

Location:

Delta and Lamar Counties. North Sulphur River in the Sulphur River Basin. The proposed dam site is located approximately 13 miles west southwest of Bogata with the reservoir extending west northwest for approximately 14 miles.

Existing Vegetation Description:

Blackland Prairie Ecological Area currently composed of the following vegetation types:

	acres	(%)
Mixed Bottomland Hardwood Forest	1,865	17
Grasses	4,120	37
Cropland	3,057	28
Other	1,976	18

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Expected loss of 1,324 Habitat Units of High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir location include: (1) 0; (2) 1,865; (3) 4,120; (4) 3,057. Very little equal quality habitat would exist in the local area if G. Parkhouse I Reservoir were also constructed.

Wildlife Game Resources: The proposed reservoir site supports a moderate deer population density calculated at 47.0 acres/deer as compared to an estimated adjacent upland deer population density of 128.0 acres/deer. The proposed reservoir location is categorized as "excellent" turkey habitat . Within the proposed reservoir area, several turkey releases are evidence of the level of TPWD effort in restoration of this wildlife resource. The area is considered "excellent" habitat for the gray squirrel because of the sizeable high quality bottomland hardwood habitat present.

Wildlife Non-game Resources: Several historic rookeries are documented by the Colonial Waterbird Census. Additionally, the Breeding Bird Survey Route # 071 intersects the proposed reservoir area documenting 79 avian species along the survey route since observations began in 1970.

Aquatic Resources: An inland fisheries survey identifying fish species observed along the proposed reservoir area is listed in Appendix J. **Paddlefish** and **Creek chubsucker**, state-listed as endangered and threatened, respectively, would be affected by this project. Chemical and biological parameters evaluated indicate that during summer low flow conditions, dissolved oxygen levels are generally low and frequently critical.

Wildlife Management Areas: None in the immediate vicinity of the proposed reservoir.

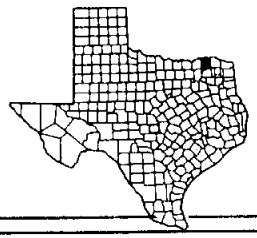
Endangered Resources: Natural communities present in the proposed reservoir area include: **Silveanus Dropseed Series** -- imperiled and very rare globally and in Texas; **Sugarberry-Elm Series**. Other protected species likely to occur in the proposed reservoir area include: **Bachman's sparrow, Creek chubsucker, Alligator snapping turtle, paddlefish, Bald eagle, American swallow-tailed kite, Timber rattlesnake, Blue sucker, Interior least tern, Southeastern myotis.**

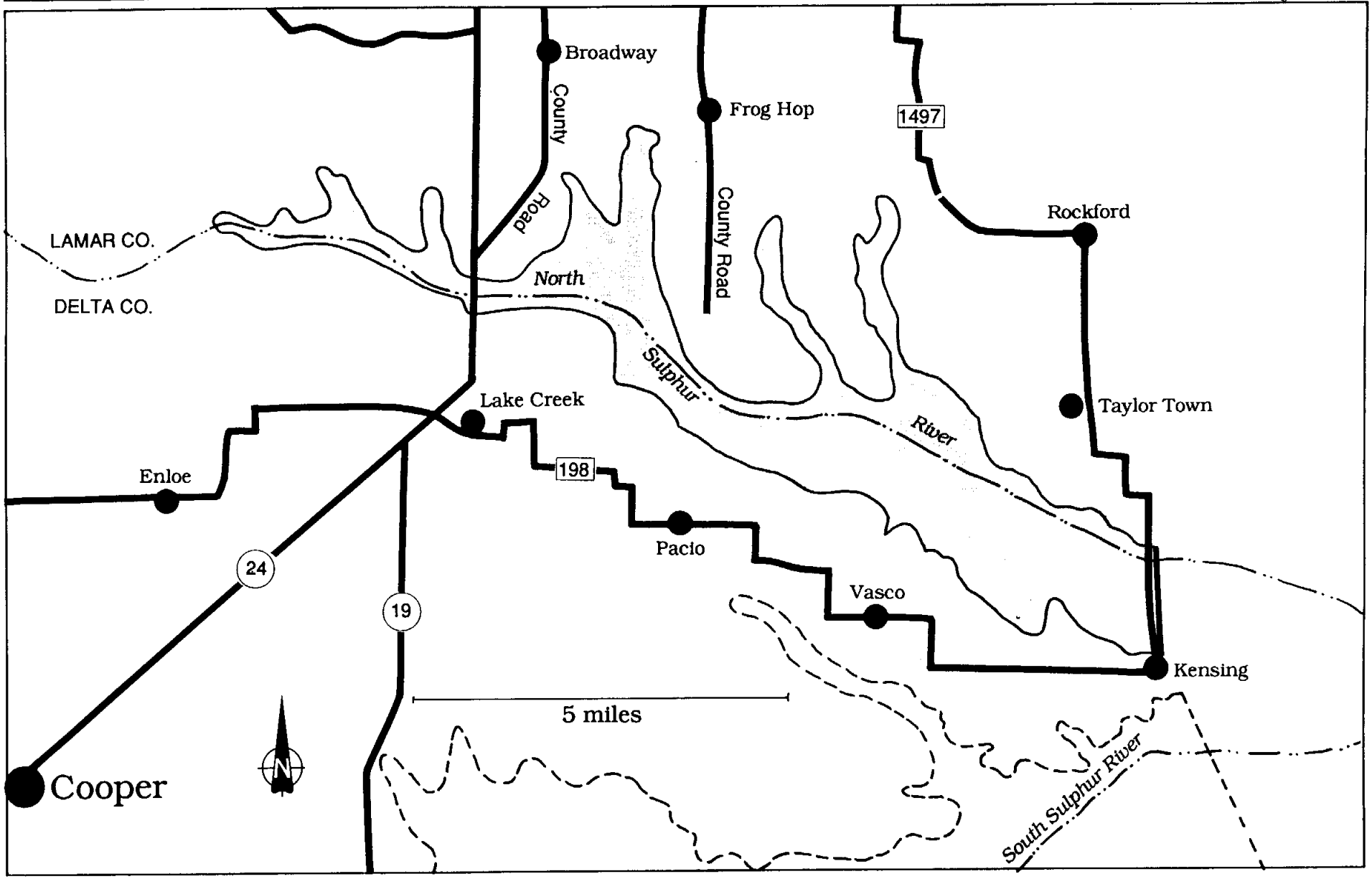
Other Resource Attributes: The Texas Natural Area Survey identified the Sulphur River immediately downstream from the proposed dam site in their listing of important "natural areas" because of the stream segments' scenic beauty and pristine qualities.

George Parkhouse II

Normal Pool El.—401 ft. MSL
Surface Acres—11,018

Lamar and Delta Counties





Trinity River Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

TRINITY RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
TR-B1	Confluence of Buffalo and Linn Creeks	Northwest of Buffalo, Freestone County	Priority bottomland hardwood habitat.	--
TR-B2	Trinity River	Moss Bluff, Liberty County, downstream to Trinity Bay	Extensive freshwater wetland habitat.	0801
TR-B3	Trinity	Lake Livingston to Gulf	Prime spawning area for striped bass restoration.	0801, 0802
TR-E1	Trinity	Ray Hubbard Reservoir to Lake Livingston	Paddlefish stocking area (G4 S1).	0819, 0805, 0804, 0803
TR-Q1	Timber Creek	From Callisburg to Ray Roberts (17 miles)	Unique, pristine.	--
TR-Q2	Elm Fork	Headwaters to Ray Roberts (30 miles)	Unique, pristine.	0824
TR-Q3	West Fork of Trinity River	Lake Bridgeport tailrace to Eagle Mountain	Unique, pristine.	0810
TR-Q4	Big Sandy Creek	Amon G. Carter Reservoir tailrace to West Fork of the Trinity River	Unique, pristine.	--
TR-Q5	Spring Creek	Dallas County (2 miles), near Garland	Unique, pristine.	--
TR-Q6	Tenmile Creek	Dallas County	Unique, pristine diverse fishery.	--
TR-R1	Elm Fork, Trinity River	Lake Ray Roberts Dam to Lake Lewisville	Recreation.	0839
TR-S1	Trinity River	Richland Creek Wildlife Management Area	Unique State holdings.	0804
TR-S2	Catfish Creek	Engeling Wildlife Management Area (National Natural Landmark)	Unique State holdings.	--
TR-S3	Trinity River	Big Lake Bottom Wildlife Mangement Area	Unique State holdings.	0804
TR-S4	Keechi Creek at confluence with Buffalo Creek	Keechi Creek Wildlife Management Area	Unique State holdings.	--

(continued)

SIGNIFICANT STREAM SEGMENT SUMMARY

(Cont.)

TRINITY RIVER BASIN:

(Cont.)

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification
TR-S5	Menard Creek	Menard Creek Unit of Big Thicket National Preserve	Unique Federal holdings.	–
TR-S6	Trinity River	Davis Hill State Park	Unique State holdings.	0802
TR-S7	Trinity River	FM 787 crossing downstream to Dayton Lakes, Liberty County	USFWS.	0802

* Designation Codes:

- B: Biological Function
- E: Protected Species: Threatened/Endangered/Unique Communities
- Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
- R: Recreation
- S: Acquisition/Mitigation/Governmental Open Space

TEHUACANA RESERVOIR

General Data

Normal Pool Elevation: 315 MSL

Size: 14,804 Acres

Location:

Freestone County. Tehuacana Creek in the Trinity River Basin. The proposed dam site is located approximately 13 miles north of Fairfield with the reservoir extending west southwest for approximately 16 miles.

Existing Vegetation Description:

Blackland Prairies and Post Oak Savannah Ecological Areas currently composed of the following vegetation types:

	acres	(%)
Mixed Bottomland Hardwood Forest	6,993	47
Mixed Post Oak Forest	5,491	37
Other	2,320	16

Natural Resource Attribute Data Summary

Habitat Quality Attributes: Expected loss of 5,524 Habitat Units of High Priority Habitat. Actual habitat acreages observed by resource category ( ) in the proposed reservoir location include: (1) 0; (2) 6,993; (3) 5,491; (4) 0. The USFWS identified "Tehuacana Creek" located downstream from the proposed reservoir location and "Caney Creek" located just upstream from the proposed reservoir location as Priority 5 Bottomland Hardwood Areas because of their high habitat resource value, especially for waterfowl.

Wildlife Game Resources: The proposed reservoir site supports an excellent deer population density calculated at 15.0 acres/deer as compared to an estimated adjacent upland deer population density of 40.0 acres/deer. The proposed reservoir location is categorized as "excellent" turkey habitat. Within the proposed reservoir area, several turkey releases are evidence of the level of TPWD effort in restoration of this wildlife resource. The area is considered "excellent" habitat for the gray squirrel because of the sizeable high quality bottomland hardwood habitat present.

Wildlife Non-game Resources: Several historically significant and species diverse rookeries have been documented in the immediate vicinity of the proposed reservoir area by the Colonial Waterbird Census.

Aquatic Resources: Inland Fisheries surveys are not available. Tehuacana Creek and it's tributaries display intermittent flow conditions with some small permanent potholes occurring in the lower reaches. The fishery resource is limited to the small potholes except during seasonal flow. The lower four miles of this stream are affected by channel degradation. Erosion and other degrading factors also exist.

Wildlife Management Areas: Richland Creek WMA, South Unit (#703) includes 9,700 acres along the Trinity River, Alligator Creek, and Tehuacana Creek south of Highway 287. The proposed reservoir project would likely affect the WMA through habitat destruction or modification immediately downstream from the proposed reservoir because of dam construction and streamflow control.

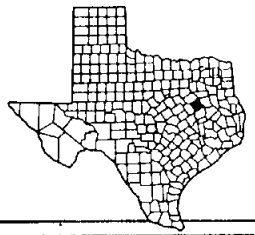
Endangered Resources: **Warner hawthorn** -- historic occurrence record in the reservoir area, imperiled and very vulnerable to extinction throughout its range. Natural communities present: **Pecan-Sugarberry Series** and **Post Oak-Blackjack Oak Series** -- one occurrence each in the near proposed reservoir area. Other protected species likely to occur at the proposed reservoir location include: **Bachman's sparrow, White-faced ibis, Wood stork, Bald eagle, Houston toad, Timber rattlesnake, American swallow-tailed kite, Southeastern myotis, Eastern big-eared bat.**

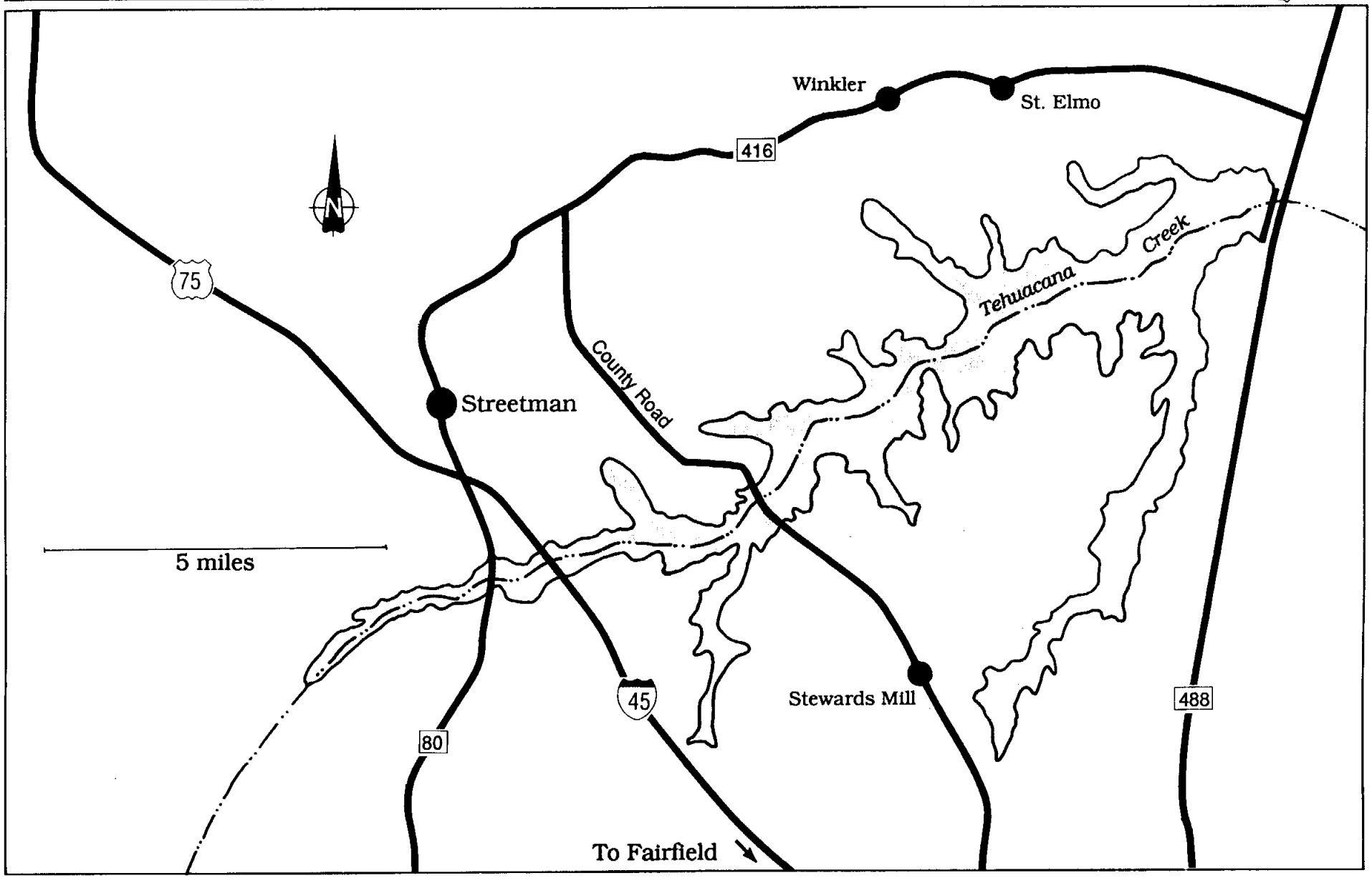
Other Resource Attributes: None identified.

Tehuacana

Normal Pool El.—315 ft. MSL
Surface Acres—14,804

Freestone County





Trinity-San Jacinto Coastal Basin

SIGNIFICANT STREAM SEGMENT SUMMARY

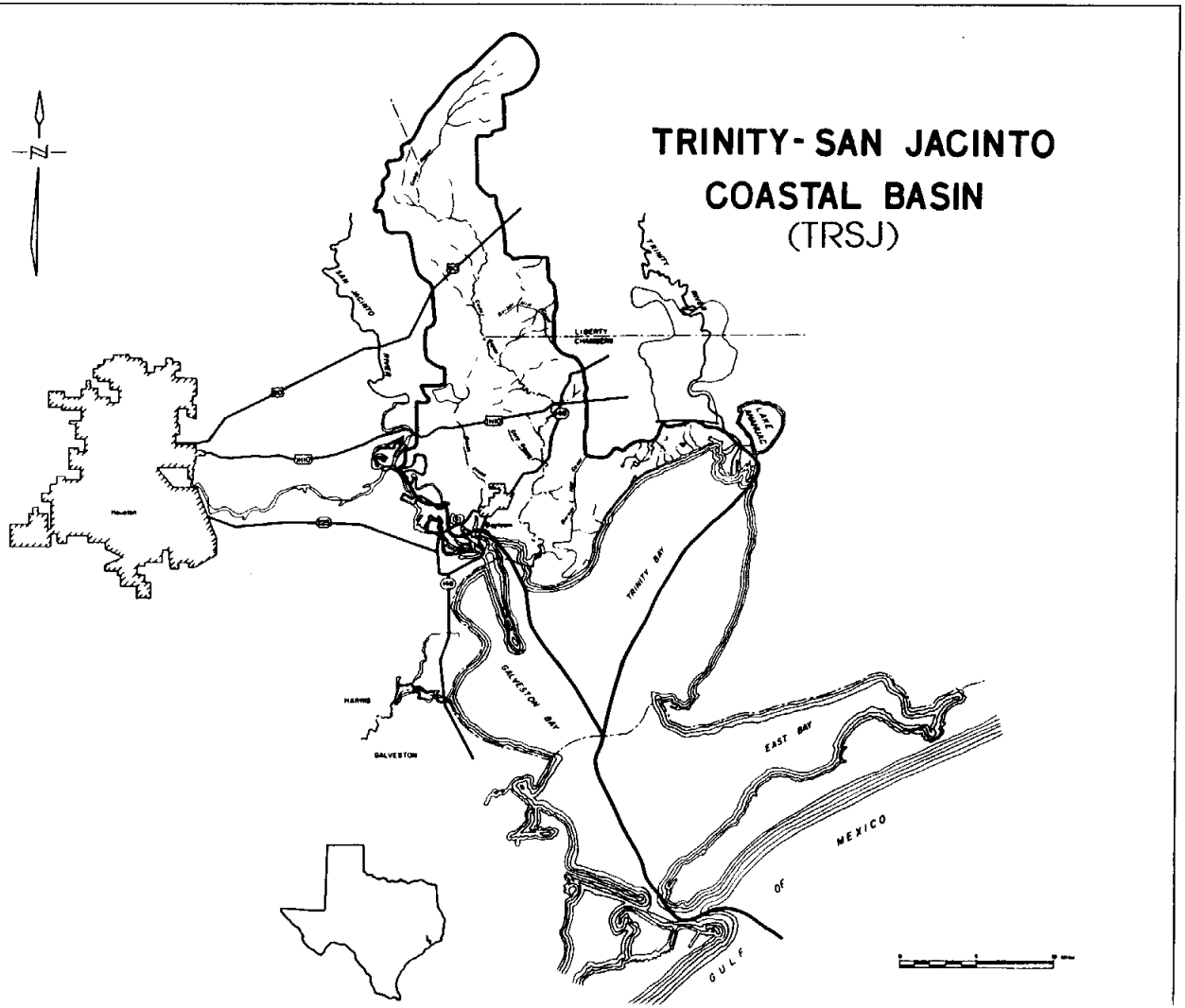
TRINITY-SAN JACINTO COASTAL RIVER BASIN:

Segment * Designation	Waterway	Segment Description	Justification	TWC Segment Identification

None selected

* Designation Codes:

- B: Biological Function
- E: Protected Species: Threatened/Endangered/Unique Communities
- Q: Water Quality/Exceptional Aquatic Life/High Aesthetic Value
- R: Recreation
- S: Acquisition/Mitigation/Governmental Open Space


N
TRINITY - SAN JACINTO
COASTAL BASIN
(TRSJ)
LAKE JACINTO
TRINITY RIVER
LIBERTY
CHAMBERS
LAKE
HOUSTON
HOUSTON
TRINITY BAY
GALVESTON BAY
HARRIS
GALVESTON
EAST BAY
GULF OF MEXICO

Appendices

APPENDIX A

PART A:

PROPOSED RESERVOIR SITE HABITAT ATTRIBUTES: HABITAT IMPORTANCE AS DETERMINED BY RESOURCE CATEGORY**

RESERVOIR	ACRES OF HABITAT PRESENT BY RESOURCE CATEGORY (1)	(2)	(3)	(4)	RESOURCE CATEGORY (2) HABITAT QUALITY RANK (HQ/HSI)***
APPLEWHITE	0	908	940	646	.65
BIG SANDY	0	1894	2467	44	.61
BOSQUE	0	793	1621	2056	.72
CIBOLO	0	625	4372	2464	.69
CUERO	0	5805	13,539	21,301	.75
EASTEX	0	3517	2999	2706	.70
G. PARKHOUSE I	0	10,690	8204	4553	.73
G. PARKHOUSE II	0	1865	4120	3057	.71
GOLIAD	0	2541	12,990	13,457	.79
LINDENAU	0	2388	13,816	13,070	.74
LITTLE CYPRESS	0	7359	6094	0	.67
PALUXY	0	566	625	2572	.66
POST	0	0	2063	0	NA
RIO GRANDE SITE "A"	422	0	0	0	*
SHAWS BEND	0	4697	1925	5944	.71
SOUTH BEND	0	2354	17,537	2991	.77
TEHUACANA	0	6993	5491	0	.79
ALLENS CREEK	UNKNOWN				NA
NEW BONHAM	UNKNOWN				NA
PALMETTO BEND II	UNKNOWN				NA

* Not calculated.

** Resource categories are based on the value (importance) and scarcity of habitat for an evaluation species. Specific definitions for each category are available in the Project Methodology Section of this document under "High Priority Habitat."

*** HSI (Habitat Suitability Index) and HQ (Habitat Quality Score) are indices of habitat quality and are determined by a highly systematic procedure by habitat specialists for habitat assessment.

APPENDIX A

PART B:

PROPOSED RESERVOIR SITE HABITAT ATTRIBUTES: HIGH PRIORITY* HABITAT SUMMARY

RESERVOIR	ACRES HABITAT LOST BY RESOURCE CATEGORY (1)	(2)	HABITAT QUALITY RANK (HQ/HSI)****	HABITAT UNITS (VALUE) LOST	SENSITIVITY**
RIO GRANDE SITE "A"	422	0	not calculated	not calculated	HIGH
G. PARKHOUSE I	0	10,690	.73	7804	HIGH
CUERO	0	5805	.75	4354	HIGH
TEHUACANA	0	6993	.79	5524	HIGH
LITTLE CYPRESS	0	7359	.67	4930	HIGH
SHAWS BEND	0	4697	.71	3335	HIGH
EASTEX	0	3517	.70	2462	MEDIUM
GOLIAD	0	2541	.79	2007	MEDIUM
SOUTH BEND	0	2354	.77	1813	MEDIUM
G. PARKHOUSE II	0	1865	.71	1324	MEDIUM
LINDENAU	0	2388	.74	1767	MEDIUM
BIG SANDY	0	1894	.61	1155	MEDIUM
BOSQUE	0	793	.72	571	LOW
APPLEWHITE	0	908	.65	590	LOW
CIBOLO	0	625	.69	431	LOW
PALUXY	0	566	.66	374	LOW
POST	0	0	NA	0	LOW
ALLENS CREEK	UNKNOWN***				UNKNOWN
NEW BONHAM	UNKNOWN***				UNKNOWN
PALMETTO BEND II	UNKNOWN***				UNKNOWN

* Prime habitat defined as Category (1) or Category (2) habitat as referenced in the Project Methodology Section of this document under "High Priority Habitat".

** Subjective

*** No information available. Thorough on-site habitat evaluation required.

**** Referenced as in * above

APPENDIX B

PROPOSED RESERVOIR SITE HABITAT ATTRIBUTES: A REVIEW OF PRIORITY BOTTOMLAND HARDWOOD COMMUNITIES IN TEXAS

Source: Texas Bottomland Hardwood Preservation Program, Category 3. U.S. Fish and Wildlife Service, Albuquerque, May 1985.

RESERVOIR	COUNTY	BOTTOMLAND HARDWOOD PRIORITY/REMARK	SENSITIVITY
Allens Creek	Austin	Not in the evaluation area.	Not ranked.
Applewhite	Bexar	Not in the evaluation area.	Not ranked.
Big Sandy	Wood, Upshur	Priority 2, "Upper Big Sandy Creek and Glades". Includes "The Glades" proposed Natural Landmark and the upper proposed reservoir section. **Reservoir Impact: Resource destruction.**	High.
		Priority 2, "Lower Big Sandy Creek". Includes all of the remainder of the proposed reservoir and dam location. **Reservoir Impact: Resource destruction.**	High.
Bosque	Bosque	Not in the evaluation area.	Not ranked.
Cibolo	Wilson	Not in the evaluation area.	Not ranked.
Cuero	DeWitt, Gonzales	Not in the evaluation area.	Not ranked.
Eastex	Cherokee	Priority 1, "Mud Creek". Approximately 5 miles downstream from the proposed dam site. **Reservoir Impact: Potential adverse alteration of the resources.**	Medium.
G. Parkhouse I	Delta, Hopkins	Priority 4, "Horton Bottom". Located upstream from normal pool elevation. **Reservoir Impact: Unknown.**	Medium.
G.Parkhouse II	Delta, Lamar	No conflict.	
Goliad	Goliad, Karnes	Not in the evaluation area.	Not ranked.
Lindenau	DeWitt, Gonzales	Not in the evaluation area.	Not ranked.
Little Cypress	Harrison	Priority 2, "Little Cypress Bayou". Includes the lower portion of the proposed reservoir and downstream of the dam site. **Reservoir Impact: Resource destruction.**	High.
		Priority 2, "Big Cypress Bayou". Adjacent and downstream from Little Cypress Bayou. **Reservoir Impact: Probable adverse alteration of the resource.**	Medium.
New Bonham	Fannin	Priority 4, "Bois d'Arc Creek". Entirely included within the proposed reservoir site. **Reservoir Impact: Resource destruction.**	High.
Palmetto Bend II	Jackson	Not in the evaluation area.	Not ranked.

APPENDIX B

PROPOSED RESERVOIR SITE HABITAT ATTRIBUTES: A REVIEW OF PRIORITY BOTTOMLAND HARDWOOD COMMUNITIES IN NORTHEAST TEXAS
(Cont.)

RESERVOIR	COUNTY	BOTTOMLAND HARDWOOD PRIORITY/REMARK	SENSITIVITY
Paluxy	Hood, Somervell	Not in the evaluation area.	Not ranked.
Post	Garza	Not in the evaluation area.	Not ranked.
Rio Grande Site "A"	Cameron	Not in the evaluation area.	Not ranked.
Shaws Bend	Fayette, Colorado	Not in the evaluation area.	Not ranked.
South Bend	Young, Stephens	Not in the evaluation area.	Not ranked.
Tehuacana	Freestone	Priority 5, "Tehuacana Creek". Site is located just downstream from the proposed dam site. **Reservoir Impact: Probable adverse alteration of resource.**	Medium.
		Priority 5, "Caney Creek". Site's just upstream of the normal pool elevation. **Reservoir Impact: Unknown, possible partial destruction at high water periods.**	Medium.

APPENDIX C

PROPOSED RESERVOIR SITE HABITAT ATTRIBUTES: A REVIEW OF POTENTIAL NATIONAL NATURAL LANDMARKS IN THE WEST GULF COASTAL PLAIN SUBREGION OF TEXAS.

Source: A Survey of Potential National Natural Landmarks of the West Gulf Coastal Plain Subregion: Biotic Themes, July 1986, Texas Natural Heritage Program, General Land Office

The following document search identifies those sites evaluated and prioritized as candidates as National Natural Landmarks.

RESERVOIR	COUNTY	DOCUMENT SEARCH REMARKS
Allens Creek	Austin	None noted in the vicinity of the proposed reservoir.
Applewhite	Bexar	None noted in the vicinity of the proposed reservoir.
Big Sandy	Wood, Upshur	"The Glades", an example of a shrub dominated swamp representing the Baldcypress-tupelo ecological theme. This site coexists with the upper extent of the proposed reservoir site. **IMPACT: Destruction of at least a portion of the site from water inundation with the majority of the site impacted adversely during high water periods.**
Bosque	Bosque	None noted in the vicinity of the proposed reservoir.
Cibolo	Wilson	None noted in the vicinity of the proposed reservoir.
Cuero	DeWitt, Gonzales	None noted in the vicinity of the proposed reservoir.
Eastex	Cherokee	None noted in the vicinity of the proposed reservoir.
G. Parkhouse I	Delta, Hopkins	None noted in the vicinity of the proposed reservoir.
G. Parkhouse II	Delta, Lamar	None noted in the vicinity of the proposed reservoir.
Goliad	Goliad, Karnes	**"Goliad State Park"**, an example of the Sugarberry-Elm ecological theme. The San Antonio floodplain site is just downstream of the proposed dam site. **It is likely that flow control of the San Antonio River by reservoir construction will impact this area. The extent of the impact is not known; further evaluation of instream flow control affects are warranted.**

APPENDIX C

PROPOSED RESERVOIR SITE HABITAT ATTRIBUTES: A REVIEW OF POTENTIAL NATIONAL NATURAL LANDMARKS IN THE WEST COAST PLAIN SUBREGION OF TEXAS.
(Cont.)

RESERVOIR	COUNTY	DOCUMENT SEARCH REMARKS
Lindenau	DeWitt, Gonzales	None noted in the vicinity of the proposed reservoir.
Little Cypress	Harrison	None noted in the vicinity of the proposed reservoir.
New Bonham	Fannin	None noted in the vicinity of the proposed reservoir.
Palmetto Bend II	Jackson	None noted in the vicinity of the proposed reservoir.
Paluxy	Hood, Somervell	None noted in the vicinity of the proposed reservoir.
Post	Garza	None noted in the vicinity of the proposed reservoir.
Rio Grande Site "A"	Cameron	"Palm Grove Sanctuary" is one of the best known and one of the very few examples of a subtropical flood plain containing Texas palmetto and representative of the Texas Ebony ecological theme. **The site is down stream of the proposed reservoir site and therefore will be impacted by further flow control of the Rio Grande River. The extent of impact is not known; further evaluation of instream flow control affects are warranted.** "Southmost Ranch" is a good quality riparian forest also representative of the Texas Ebony ecological theme. **Like the Palm Grove Sanctuary, it is located downstream from the proposed dam site and could be expected to be negatively impacted by flow control from the proposed reservoir.**
Shaws Bend	Fayette, Colorado	None noted in the vicinity of the proposed reservoir.
South Bend	Young, Stephens	None noted in the vicinity of the proposed reservoir.
Tehuacana	Freestone	None noted in the vicinity of the proposed reservoir.

APPENDIX D

A SUMMARY OF WHITE-TAILED DEER POPULATIONS AND TRENDS IN THE VICINITY OF TWENTY PROPOSED RESERVOIR SITES IN TEXAS

RESERVOIR	COUNTY	DATA REPORTING UNIT	TPWD DEER STOCKING (Y/N)	COUNTY DEER DENSITY * AND DENSITY TREND **	RESERVOIR SITE DEER DENSITY (BOTTOMLAND) ***	ADJACENT UPLAND ESTIMATED DEER DENSITY ***
Allens Creek	Austin	14	No	37.0 (±)	NO DEER	NO DEER
Applewhite	Bexar	25	No	13.0 (-)	36.0	80-100
Big Sandy	Upshur	1	No	101.1 (0)	58.8	76.0
	Wood	5	No	28.1 (±)		
Bosque	Bosque	22	No	9.7 (0)	9.2	20-25
Cibolo	Wilson	16	No	36.0 (-)	80.0	160
Cuero	DeWitt	34	No	19.7 (+)	14.2	28.5
	Gonzales	16	No	37.2 (-)		
Eastex	Cherokee	3	No	36.1 (-)	67.5	88.0
G. Parkhouse I	Delta	18	No	40.7 (±)	21.0	55.0
	Hopkins	18	No	40.4 (-)		
G. Parkhouse II	Delta	18	No	40.7 (±)	47.0	128.0
	Lamar	11	No	24.0 (±)		
Goliad	Goliad	34	No	22.5 (0)	37.5	160
	Karnes	34	No	207.2 (-)		
Lindenau	DeWitt	34	No	19.7 (+)	11.4	24.0
	Gonzales	16	No	36.1 (-)		
Little Cypress	Harrison	2	No	25.1 (-)	20.4	26.5
New Bonham	Fannin	11	No	82.5 (±)	34.0	59.0
Palmetto Bend II	Jackson	9	No	16.2 (0)	13.8	28
Paluxy	Hood	5	No	26.2 (±)	23.6	30-35
	Somervell	22	No	21.2 (±)		
Post	Garza	42	No	57.8 (±)	49.8	70-100

APPENDIX D

A SUMMARY OF WHITE-TAILED DEER POPULATIONS AND TRENDS IN THE VICINITY OF TWENTY PROPOSED RESERVOIR SITES IN TEXAS

(Cont.)

RESERVOIR	COUNTY	DATA REPORTING UNIT	TPWD DEER STOCKING (Y/N)	COUNTY DEER DENSITY * AND DENSITY TREND **		RESERVOIR SITE DEER DENSITY (BOTTOMLAND) ***	ADJACENT UPLAND ESTIMATED DEER DENSITY ***
Rio Grande Site "A"	Cameron	37	No	37.5	(±)	0	0
Shaws Bend	Fayette	15	No	22.5	(+)	13.0	26.0
	Colorado	14	No	14.6	(-)		
South Bend	Young	21	No	77.8	(±)	34.1	50-75
	Stephens	21	No	50.9	(±)		
Tehuacana	Freestone	12	No	19.3	(+)	15.0	40.0

* Deer Density: Acres/Deer, 5-Year Mean, 1985-1989, County Wide
Source: White-tailed Deer Population Trends, TPWD Federal Aid Project # W-125-R-1, 1990.

** Density Trend by County:
(+) = Density increasing, i.e., Acres/Deer number decreasing
(-) = Density decreasing, i.e., Acres/Deer number increasing
(±) = Highly variable, i.e., No trend identifiable
(0) = Density stable

*** Actual census line data or TPWD field biologist estimates for bottomland and adjacent upland sites near the proposed reservoir.

APPENDIX E

A SUMMARY OF TURKEY POPULATION DATA, RESTORATION PROJECTS, AND HABITAT RANK AT TWENTY PROPOSED RESERVOIR SITES IN TEXAS.

PROPOSED RESERVOIR	COUNTY	STOCKING in VICINITY (Y/N) *	1990 TURKEY POPULATION **	TURKEY HABITAT RANK ***	REMARKS
Allens Creek	Austin	No	0	Poor	
Applewhite	Bexar	No	1373	Fair	Excellent habitat but poor turkey population potential (human impact).
Big Sandy	Upshur	Yes	0	Excellent	
	Wood	Yes	1144		
Bosque	Bosque	No	2045	Excellent	
Cibolo	Wilson	No	973	Excellent	
Cuero	DeWitt	Yes	3091	Excellent	
	Gonzales	Yes	2862		
Eastex	Cherokee	Yes	0	Excellent	
G. Parkhouse I	Delta	Yes	0	Excellent	
	Hopkins	Yes	0		
G.Parkhouse II	Delta	Yes	0	Excellent	
	Lamar	No	251		
Goliad	Goliad	No	4694	Excellent	
	Karnes	No	1546		
Lindenau	DeWitt	Yes	3091	Excellent	
	Gonzales	Yes	2862		
Little Cypress	Harrison	Yes	0	Excellent	
New Bonham	Fannin	No	92	Fair	Not ideal habitat but the only remaining suitable habitat.
Palmetto Bend II	Jackson	Yes	515	Excellent	

APPENDIX E

A SUMMARY OF TURKEY POPULATION DATA, RESTORATION PROJECTS, AND HABITAT RANK AT TWENTY PROPOSED RESERVOIR SITES IN TEXAS.

(Cont.)

PROPOSED RESERVOIR	COUNTY	STOCKING in VICINITY (Y/N) *	1990 TURKEY POPULATION **	TURKEY HABITAT RANK ***	REMARKS
Paluxy	Hood	No	2386	Excellent	
	Somervell	No	512		
Post	Garza	Yes	630	Excellent	
Rio Grande Site "A"	Cameron	No	114	Poor	
Shaws Bend	Fayette	Yes	228	Excellent	
	Colorado	Yes	915		
South Bend	Young	No	3067	Excellent	An exceptional quality historic population.
	Stephens	No	4090		
Tehuacana	Freestone	Yes	114	Excellent	

* Turkey release sites under the Federal Aid in Wildlife Restoration Act; project # W-125-R-1; TPWD, Don Wilson, Manager. These sites represent major investments of money, planning, and energy expended in turkey restoration. Release sites identified are coincidental to the immediate vicinity of the affected proposed reservoir.

** Population estimate by county. Source: * above.

*** Don Wilson, TPWD, Turkey Program Manager. Turkey habitat quality rank for the area in the immediate vicinity of the proposed reservoir site.

EXCELLENT:	Representative of the best habitat in the state. Habitat capable of supporting a growing population and meets the following biological activities for turkey: nesting, feeding, and roosting.
FAIR:	Habitat which will sustain a static or decreasing population and minimally satisfies all of the following biological activities for turkey: nesting, feeding, and roosting.
POOR:	Non-habitat for turkey.

APPENDIX F

A SUBJECTIVE HABITAT RANKING FOR GRAY SQUIRREL AT TWENTY PROPOSED RESERVOIR SITES IN TEXAS.

Sources: Don Wilson, Biologist and TPWD Bulletin #42, The Gray Squirrel in Texas, Phil Goodrum, 1967 Revision.

The following table represents a subjective ranking of each proposed reservoir site relative to habitat for the gray squirrel.

PROPOSED RESERVOIR	COUNTY	HABITAT RANK (*)
Allens Creek	Austin	Poor
Applewhite	Bexar	Poor
Big Sandy	Wood, Upshur	Excellent
Bosque	Bosque	Poor
Cibolo	Wilson	Poor
Cuero	DeWitt, Gonzales	Fair
Eastex	Cherokee	Excellent
G. Parkhouse I	Delta, Hopkins	Excellent
G. Parkhouse II	Delta, Lamar	Excellent
Goliad	Goliad, Karnes	Poor
Lindenau	DeWitt, Gonzales	Fair
Little Cypress	Harrison	Excellent
New Bonham	Fannin	Fair
Palmetto Bend	Jackson	Excellent
Paluxy	Hood, Somervell	Poor
Post	Garza	Poor
Rio Grande Site "A"	Cameron	Poor
Shaws Bend	Fayette, Colorado	Excellent
South Bend	Young, Stephens	Poor
Tehuacana	Freestone	Excellent

* Habitat Rank:

EXCELLENT -	Diverse and dense bottomland hardwood forest of sufficient size to promote relatively dense populations of gray squirrel.
FAIR -	Diverse and dense bottomland hardwood forest of sufficient size to promote sparse populations of gray squirrel.
POOR -	Non-habitat for gray squirrel.

APPENDIX G

A SUMMARY OF BIRD CENSUS DATA COLLECTED ALONG BREEDING BIRD SURVEY ROUTES WHICH INTERSECT THE VICINITY OF TWENTY PROPOSED RESERVOIR SITES IN TEXAS.

Source: Bruce Peterjohn and BBS Summary - USFWS, Washington, D.C.

BREEDING BIRD REVIEW*

RESERVOIR	COUNTY	LOCAL BBS ROUTE	CUMULATIVE TOTAL SPECIES	CUMULATIVE TOTAL INDIVIDUALS	YEAR OBSERVATION BEGAN
Allens Creek	Austin				
Applewhite	Bexar				
Big Sandy	Upshur				
	Wood				
Bosque	Bosque				
Cibolo	Wilson	029	80	10,350	1967
Cuero	DeWitt				
	Gonzales				
Eastex	Cherokee				
G. Parkhouse I	Delta	070	71	10,936	1967
	Hopkins	071	79	9,194	1970
G. Parkhouse II	Delta	071	79	9,194	1970
	Lamar				
Goliad	Goliad	015	83	11,200	1968
	Karnes				
Lindenau	DeWitt				
	Gonzales				
Little Cypress	Harrison	056	82	4,391	1970
New Bonham	Fannin				
Palmetto Bend II	Jackson	012	62	3,943	1970
Paluxy	Hood	062	73	10,737	1967
	Somervell				
Post	Garza	092	61	10,767	1969
Rio Grande Site "A"		Cameron			
Shaws Bend	Fayette				
	Colorado				
South Bend	Young	076	75	8,420	1966
	Stephens				
Tehuacana	Freestone				

* The North American Breeding Bird Survey (BBS) is run by approximately 2,000 skilled amateur ornithologists and is coordinated cooperatively by the U.S. Fish and Wildlife Service and the Canadian Wildlife Service. Since 1966, BBS cooperators have been collecting standardized information on North American bird populations. The BBS is a roadside survey, comprised of permanent routes that are surveyed yearly. Each route is 39.4 km (24.5 miles) long and consists of 50 stops spaced 0.8 km (0.5 mile) apart. All birds heard or seen during a 3-min observation period at each stop are recorded, and, for each species, the sum of the counts on individual stops is used as an index of species density on the route. Survey routes occur throughout the continental United States and most of Canada.

APPENDIX H

COLONIAL WATERBIRD CENSUS OBSERVED IN THE VICINITY OF TWENTY PROPOSED RESERVOIR SITES IN TEXAS.

OBSERVATION YEARS 1986-1990

Source: Texas Colonial Waterbird Census Summary, TPWD, 1986-1990

RESERVOIR	COUNTY	OBSERVATION POINT NEAR RESERVOIR	SITE NUMBER	SITE NAME	REMARKS
Allens Creek	Austin	No			
Applewhite	Bexar	No			
Big Sandy	Upshur	Yes	556-003	Ambassador College	Inactive.
			556-016	L. Cooper	Inactive.
	Wood	Yes	556-018	Lake Fork #2	Significant and species diverse rookery.
			556-021	Little Sandy Club Lake #2	Inactive.
Bosque	Bosque	No			
Cibolo	Wilson	No			
Cuero	DeWitt	No			
	Gonzales	No			
Eastex	Cherokee	No			
G. Parkhouse I	Delta	Yes	536-005	South Sulphur	Inactive.
	Hopkins	No			
G. Parkhouse II	Delta	Yes	536-005	South Sulphur	Inactive.
	Lamar	No			
Goliad	Goliad	No			
	Karnes	No			
Lindenau	DeWitt	No			
	Gonzales	No			
Little Cypress	Harrison	No			

APPENDIX H

COLONIAL WATERBIRD CENSUS OBSERVED IN THE VICINITY OF TWENTY PROPOSED RESERVOIR SITES IN TEXAS.

OBSERVATION YEARS 1986-1990
(Cont.)

RESERVOIR	COUNTY	OBSERVATION POINT NEAR RESERVOIR	SITE NUMBER	SITE NAME	REMARKS
New Bonham	Fannin	Yes	535-051	Bonham	Lake Bonham, Inactive.
			536-004	Honey Grove	Inactive.
Palmetto Bend II	Jackson	Yes	599-052	Lake Texana	Inactive.
			609-030	Palmetto Dam	Inactive.
Paluxy	Hood	Yes	555-005	Squaw Creek	Great Blue Heron population.
	Somervell	No			
	Erath	Yes	555-004	Cowan Ranch	Inactive.
Post	Garza	No			
Rio Grande Site "A"	Cameron	No			
Shaws Bend	Fayette	Yes	599-050	La Grange	Inactive.
	Colorado	Yes	599-051	Eagle Lake	Downstream. Significant species diverse rookery.
South Bend	Young	Yes	534-055	Lake Graham	Inactive.
		Yes	534-061	Bull Branch Tanks	Inactive.
	Stephens	Yes	554-033	Hubbard Creek Lake	Inactive.
		Yes	554-052	Hubbard Creek Lake	Inactive.
Tehuacana	Freestone	Yes	573-055	Wortham	Inactive.
		Yes	573-053	Mexia	Inactive.
		Yes	573-052	Mexia	Inactive.

APPENDIX I

A SUMMARY OF TYPE I AND TYPE II WILDLIFE MANAGEMENT AREAS LOCATED AT PROPOSED RESERVOIR SITES IN TEXAS

Sources: Texas Parks and Wildlife Department Publications:

Hunting Opportunity Type I Wildlife Management Area 1990-1991, TPWD. September 1, 1990.

Public Hunting Type II Wildlife Management Areas Map Booklet 1990-1991. TPWD. September 1, 1990.

BELOW IS A LISTING OF COUNTIES WHICH CONTAIN BOTH WILDLIFE MANAGEMENT AREAS (WMA) AND A TEXAS WATER DEVELOPMENT BOARD PROPOSED RESERVOIR SITE.

TYPE I WMA's

CAMERON COUNTY - RIO GRANDE SITE "A" RESERVOIR

1. Anacua Unit, Las Palomas WMA, 24 miles west of Brownsville. 200 acres of white-winged dove habitat.

   IMPACT: None, not in the vicinity of the proposed reservoir.

2. Carricitos Unit, Las Palomas WMA, 18 miles northwest of Brownsville. 118 acres of white-winged dove and chachalacas habitat.

   IMPACT: None, not in the vicinity of the proposed reservoir.

3. Resaca De La Palma Unit, Las Palomas WMA, 6.5 miles west and 2.2 miles north of Brownsville. 1,100 acres managed for dove, ocelot, jaguarundi, and other endemic wildlife.

   IMPACT: Possible habitat modification by partial inundation or occasional flooding. Need additional information.

LAMAR COUNTY - GEORGE PARKHOUSE II RESERVOIR.

1. Pat Mayse WMA, 12 miles northwest of Paris. 8,925 acres adjacent to Pat Mayse Reservoir.

   IMPACT: None, not in the vicinity of the proposed reservoir.

APPENDIX I

A SUMMARY OF TYPE I AND TYPE II WILDLIFE MANAGEMENT AREAS LOCATED AT PROPOSED RESERVOIR SITES IN TEXAS
(Cont.)

TYPE II WMA's

FANNIN COUNTY - NEW BONHAM RESERVOIR.

1. Bois d'Arc Unit, Caddo WMA. 13,360 acres dispersed in and around Caddo National Grassland along Bois d'Arc Creek in the vicinity of Carson and Monkstown.

   IMPACT: Destruction of a portion of the habitat as the area is coincidental to the dam site and a portion of the reservoir along Bois d'Arc Creek. Probable modification of a significant portion of the WMA immediately downstream to the dam site.

2. Ladonia Unit, Caddo WMA. 2,780 acres dispersed in and around Caddo National Grassland approximately 5 miles west of Ladonia.

   IMPACT: None, not in the vicinity of the proposed reservoir (different creek basin).

CHEROKEE COUNTY - EASTEX RESERVOIR.

1. Unit #120 WMA. 36,334 acres dispersed along the Neches river in Cherokee and Anderson Counties south of Neches.

   IMPACT: None, not in the immediate vicinity of the proposed reservoir.

2. Unit #119 WMA. 921 acres approximately 5 miles east of Rusk along Highway 343 and North Falcon Creek.

   IMPACT: None, not in the immediate vicinity of the proposed reservoir.

FREESTONE COUNTY - TEHUACANA RESERVOIR.

1. Richland Creek WMA, North Unit (#703). 4,000 acres between the Trinity River and Alligator Creek north of Highway 287.

   IMPACT: None, not in the immediate vicinity of the proposed reservoir.

2. Richland Creek WMA, South Unit (#703). 9,700 acres along the Trinity River, Alligator Creek, and Tehuacana Creek south of Highway 287.

   IMPACT: Probable alteration of habitat as the area is immediately downstream to the proposed dam site. The area would also be subject to construction pressure and probable modification because of stream flow interruption.

APPENDIX J

FISHERIES SURVEY AND WATER QUALITY DATA REVIEW FOR TWENTY PROPOSED RESERVOIR LOCATIONS IN TEXAS

ALLENS CREEK

Species Present: Inland Fisheries stream surveys are not available for this site.

Fisheries Impacts: Available data does not show this stream has a notable fishery. However, adjacent Brazos River's important freshwater inflow to coastal areas could be affected.

Water Quality: No data available from Inland Fisheries.

Reference: None.

APPLEWHITE (Medina River)

***Species Sampled* (1985 and 1989)**:

Alligator gar
American eel
Blacktail shiner
Bluegill
Bullhead minnow
Channel catfish
Common carp
Gray redhorse
Green sunfish
Inland silverside
Log perch
Longear sunfish
Largemouth bass
Mosquitofish
Red shiner
Rio Grande perch
Sailfin molly
Smallmouth buffalo
Speckled chub
Spotted bass
Stoneroller
Tilapia
White crappie

Fisheries Impacts: There would be a loss of stream habitat.

Water Quality: Water quality conditions of the lower portion (7 miles) of the Medina River are heavily influenced by the treated sewage discharged from San Antonio's Leon Creek Plant. This tends to reduce natural dissolved oxygen levels and increase the concentrations of nutrient compounds in the river (Twidwell).

Reference:

Twidwell, Steve. 1977. Intensive Surface Water Monitoring Survey for Segment 1903, Medina River, Report No. IMS 46. Texas Water Development Board. Austin.

BIG SANDY

Species Present: Inland Fisheries surveys are not available.

Impacts: This is a pristine area and provides excellent stream habitat. Paddlefish, a state-listed endangered species, occur in this general area and could be affected by construction. Construction would affect the creek chubsucker, a state-listed threatened species identified in this area.

Water Quality: It is assumed there is very good water quality in this stream based on conditions in the surrounding watershed.

Reference: None.

APPENDIX J

BOSQUE

***Species Survey* (1988)**:

Longnose gar
Gizzard shad
Carp
Golden shiner
Pugnose minnow
Suckermouth minnow
Blacktail shiner
Red shiner
Broadhead shiner
Ghost shiner
Spotted bass
Mimic shiner
Bullhead minnow
Fathead minnow
River carpsucker
Gray redhorse
Creek chubsucker
Channel catfish
Blackstripe topminnow
Mosquitofish
Largemouth bass
Warmouth
Green sunfish
Longear sunfish
Bluegill
White crappie
Log perch
Orangethroat darter
Bigscale logperch
Dusky darter

Fisheries Impacts: The Bosque River, ending in Lake Waco, provides intermittent fishing opportunity. The state-listed threatened species, creek chubsucker and Brazos water snake are potentially affected by this project.

Water Quality: The Bosque River is essentially a clear stream. The bottom is largely gravel and sand with many stretches of rock hardpan. Nutrients from adjacent agriculture lands and wastewater discharges contribute to algae growth.

Reference:

Sellers, K. 1988. Testimony on Proposed Lake Bosque.

CIBOLO

***Species Sampled* (1978)**:

Gizzard shad
Mexican tetra
Gray redhorse
Red shiner
Mimic shiner
Bullhead minnow
Channel catfish
Yellow bullhead
Flathead catfish
Mosquitofish
Spotted bass
Largemouth bass
Green sunfish
Bluegill
Longear sunfish
River darter
Rio Grande perch

Impacts: Clearing of brush and trees should be minimized to benefit production of good reservoir fisheries. Water flow to San Antonio Bay estuary must be maintained at suitable levels.

Water Quality: The creek is typical of streams bordering the Rio Grande Plain with high hardness and alkalinity. Water quality is within acceptable limits for fish and wildlife. Dissolved oxygen is consistently high and water clarity is moderate (Dean, 1979).

Reference:

Dean, W. J., Jr. 1979. Management Recommendations for Proposed Reservoir and Other Public Water Projects, Cibolo Creek Reservoir. Performance Report, Federal Aid Project F-30-R-4. TPWD.

APPENDIX J

CUERO (Guadalupe River, Dewitt and Gonzales Counties)

Species Present **(USFWS, 1976)**:

American eel
Alligator gar
Spotted gar
Longnose gar
Gizzard shad
Threadfin shad
Mexican tetra
Smallmouth buffalo
River carpsucker
Gray redhorse
Speckled chub
Pugnose minnow
Weed shiner
Roundnose minnow
Stoneroller
Bullhead minnow
Freshwater drum
Mimic shiner
Palid shiner
Lake chubsucker
Rio Grande perch
Carp
Goldfish
Golden shiner
Texas shiner
Red shiner
Silverband shiner
Ghost mimic shiner
Mimic shiner
Blacktail shiner
Sand shiner
Channel catfish
Blue catfish
Flathead catfish
Tadpole madtom
Black-band topminnow
Fathead minnow
River darter
Logperch
Bluntnose darter
Slough darter
Spotted sucker
Mosquitofish
Amazon molly
Sailfin molly
Smallmouth bass
White bass
Spotted bass
Guadalupe bass
Largemouth bass
Rock bass
Warmouth
Green sunfish
Longear sunfish
Redear sunfish
Redbreast sunfish
Yellow bullhead
Black bullhead
Bluegill
White crappie
Black crappie
Mozambique tilapia

Impacts: Construction and operation of this reservoir could adversely impact the downstream fisheries. Because of this, the USFWS recommended that this project be dropped from alternative considerations for water supply projects (USFWS, 1976). Reducing the quantity of freshwater inflow to the estuaries of San Antonio Bay could seriously affect marine species. The state-listed threatened blue sucker could occur in this area.

Water Quality: The water quality of the stream is adequate to support existing fishery.

Reference:

U.S. Fish and Wildlife Service. 1961. Memorandum: Cuero Unit, Guadalupe Division, Texas Basins Project, Texas - Bureau of Sport Fisheries and Wildlife Report.

U.S. Fish and Wildlife Service. 1976. Fish and Wildlife Service Planning Aid Report, San Antonio-Guadalupe Unit, Texas Basins Project, Texas. U.S. Department of the Interior, F&WS. Albuquerque, N.M.

APPENDIX J

EASTEX

Species Present: Inland Fisheries stream surveys are not available for this creek.

Impacts: Loss of natural stream adversely affects the riverine species. Maintaining natural flow regime in both Mud Creek and downstream areas is important. Construction would affect the creek chubsucker, a state-listed threatened species identified in this area. A state-listed endangered species, paddlefish, is historically found in this area and could be affected.

Water Quality: Primary water quality parameters include dissolved oxygen, nutrients, heavy metals, and trace elements.

Reference: None.

GEORGE PARKHOUSE I (South Sulphur River)

Species Present (1955):

Spotted gar
Longnose gar
Gizzard shad
Smallmouth buffalo
Bigmouth buffalo
Black buffalo
River carpsucker
Carp
Golden shiner
Red shiner
Parrot minnow
Fathead minnow
Stoneroller
Channel catfish
Flathead catfish
Black bullhead
Blackstripe topminnow
Mosquitofish
Largemouth bass
Spotted bass
Warmouth
Green sunfish
Bluegill
Orange-spotted sunfish
Longear sunfish
White crappie
Freshwater drum
Paddlefish
American eel
Plains shiner
River darter

Impacts: The paddlefish and creek chubsucker, state-listed as endangered and threatened, respectively, would be affected by this project.

Water Quality: Chemical and biological parameters evaluated indicate that during summer low flow conditions dissolved oxygen levels are generally low and frequently fall below the 5.0 mg/l stream standard (Twidwell, 1976).

Reference:

Twidwell, Steve. 1976. Intensive Surface Water Monitoring Survey for Segment 0303, Sulphur River, Report No. IMS 18. Texas Water Development Board. Austin.

APPENDIX J

GOLIAD (San Antonio River, Goliad and Karnes Counties)

***Species Present* (Kuehne, 1955) (USFWS, 1976):**

American eel
Alligator gar
Spotted gar
Longnose gar
Gizzard shad
Mexican tetra
Smallmouth buffalo
River carpsucker
Gray redhorse
Speckled chub
Pugnose minnow
Weed shiner
Roundnose minnow
Stoneroller
Bullhead minnow
Freshwater drum
Mimic shiner
Pallid shiner
Lake chubsucker
Rio Grande perch
Carp
Goldfish
Golden shiner
Texas shiner
Red shiner
Ghost mimic shiner
Mimic shiner
Blacktail shiner
Sand shiner
Channel catfish
Blue catfish
Flathead catfish
Tadpole madtom
Black-band topminnow
Fathead minnow
River darter
Logperch
Bluntnose darter
Slough darter
Mosquitofish
Amazon molly
Sailfin molly
White bass
Spotted bass
Guadalupe bass
Largemouth bass
Warmouth
Green sunfish
Longear sunfish
Redear sunfish
Redbreast sunfish
Yellow bullhead
Black bullhead
Bluegill
White crappie
Black crappie
Mozambique tilapia

Impacts: The fishery at the site of the proposed reservoir is considered of marginal recreational value (USFWS, 1976).

Water Quality: Information not available from Inland Fisheries.

Reference:

Kuehne, R.A. 1955. Stream surveys of the Guadalupe and San Antonio Rivers. Texas Game and Fish Comm. Austin.

U.S. Fish and Wildlife Service. 1976. Fish and Wildlife Service Planning Aid Report, San Antonio-Guadalupe Unit, Texas Basins Project, Texas. U.S. Department of the Interior, F&WS. Albuquerque, N.M.

APPENDIX J

LINDENAU (Sandies Creek)

***Species Present* (USFWS, 1976):**

Spotted gar
Longnose gar
Threadfin shad
Gizzard shad
Golden shiner
Pugnose minnow
Blacktail shiner
Red shiner
Ghost mimic shiner
Bullhead minnow
Striped mullet
White mullet
Rio Grande perch
Smallmouth buffalo
Grey redhorse
Channel catfish
Blue catfish
Flathead catfish
Sheepshead minnow
Mosquitofish
Sailfin molly
Spotted bass
Guadalupe bass
Largemouth bass
Warmouth
Green sunfish
Redear sunfish
Bluegill
Longear sunfish
White crappie
Black crappie
Logperch
River darter
Bluntnose darter

Impacts: A reduction in the quantity of freshwater inflow to the estuaries of San Antonio Bay could seriously affect marine species. The state-listed threatened blue sucker could occur in this area.

Water Quality: The water quality is adequate to support existing limited stream fishery (Kuehne, 1955). The stream is marginal for recreational fishing value and this project would have little impact on recreational fishing (USFWS, 1976). However, this project would cause irreversible adverse impacts to the estuarine resources (USFWS, 1976).

Reference:

Kuehne, R.A. 1955. Stream surveys of the Guadalupe and San Antonio Rivers. Texas Game and Fish Comm. Austin.

U.S. Fish and Wildlife Service. 1976. Fish and Wildlife Service Planning Aid Report, San Antonio-Guadalupe Unit, Texas Basins Project, Texas. U.S. Department of the Interior, F&WS. Albuquerque, N.M.

APPENDIX J

LITTLE CYPRESS

***Species Present* (1984)** (Schlagenhaft, 1987):

Spotted gar
Gizzard shad
Grass pickerel
Chain pickerel
Spotted sucker
Yellow bullhead
Tadpole madtom
Flathead catfish
Pirate perch
Blackstripe topminnow
Green sunfish
Warmouth
Bluegill
Longear sunfish
Redear sunfish
Spotted sunfish
Spotted bass
Largemouth bass
Black crappie
Freshwater drum

***Probable Species Present* (partial list) (--, 1989)** :

Alligator gar
Shortnose gar
Spotted gar
Longnose gar
Bowfin
American eel
Skipjack herring
Threadfin shad
Gizzard shad
Redfin
Chain pickerel
Bigmouth buffalo
Golden shiner
Paddlefish
Creek chubsucker
Walleye
Spotted sunfish
Ribbon shiner
Redfin shiner
Ironcolor shiner
Weed shiner
Mosquitofish
Bluehead shiner
Cypress minnow
Bullhead minnow
Bluegill
Black buffalo
Bluehead shiner
Smallmouth buffalo
River carpsucker
Spotted sucker
Lake chubsucker
Warmouth
Spotted bass
Hybrid striped bass
Largemouth bass
Channel catfish
White bass
Yellow bass
Redear sunfish
Green sunfish
Blackside darter

Impacts: Endangered and threatened species would be affected by this project. Confirmed presence of state-threatened bluehead shiner, creek chubsucker, and blackside darter at this site. Possible habitat of threatened species (shovelnose sturgeon, chestnut lamprey and blue sucker).

Water Quality: The water quality in this area supports excellent, diverse sportfish populations.

Reference:

---- 1989. Environmental Report for the Proposed Kelsey Creek Reservoir. Horizon Environmental Services. Austin.

Schlagenhaft, Tim. 1987. Testimony presented for Proposed Little Cypress Reservoir. TPWD.

APPENDIX J

NEW BONHAM (Bois d'arc Creek; Fannin County)

***Species Present* (1982):**

Spotted gar
Carp
River carpsucker
Channel catfish
Warmouth
Golden shiner
Smallmouth buffalo
Gizzard shad
Red shiner
Bullhead minnow
Channel catfish
Bluegill
Longear sunfish
Green sunfish
Largemouth bass
White crappie
Freshwater drum
Mosquitofish
Blackstripe topminnow

Impacts: The loss of natural stream habitat caused by this construction would be irreversible.

Water Quality: Water quality is sufficient to sustain the existing stream fisheries.

Reference:

Lyons, B. W. 1983. Job A, Existing Reservoir and Stream Management Recommendations, Coffee Mill Reservoir, 1982. TPWD, Austin.

PALMETTO BEND II

***Species Present* (Partial list)** (1973):

Bull shark
Spotted gar
Alligator gar
Bay anchovy
Golden shiner
Redfin shiner
Black bullhead
Blue catfish
Channel catfish
Flathead catfish
Mosquitofish
Redbreast sunfish
Warmouth
Bluegill
Green sunfish
Longear sunfish
Redear sunfish
Largemouth bass
Guadalupe bass
Freshwater drum
White crappie

Impacts: This river provides freshwater inflow to an important estuary. The management of any impoundment on the Lavaca-Navidad must include provisions for minimum flow and other water discharge requirements. The stream habitat would be lost, and species such as the Guadalupe bass could be affected.

Water Quality: The water quality supports a sport fishery in this area. However, runoff from adjacent rice fields includes a heavy sediment load and pesticides.

Reference:

Provine, William C. 1973. Job No. 13a: A Preimpoundment Study of Palmetto Bend Reservoir and a Basic Survey of the Lavaca River Basin. TPWD.

APPENDIX J

PALUXY

Species Present: Inland Fisheries stream survey is not available.

Fisheries Impacts: This river serves as one of a few striped bass spawning and migration areas in the state. Loss of stream would prohibit striped bass spawning and alter riverine species habitat.

In addition, the downstream fishery would be severely affected if instream flows of 8 cfs (Jul-Feb) and 13 cfs (Mar-Jun) were not maintained (Sellers, 1986). A 5 cfs flow would have adverse effects on the fisheries, particularly for spotted bass in the summer. Even 6 cfs would be restrictive for threadfin and gizzard shad. Less than 12 cfs would eliminate white bass habitat (Rieff, 1986).

Water Quality: Information not available in Inland Fisheries.

References:

Sellers, Kenneth. 1986. Flow recommendations presented in testimony of witnesses in the Paluxy Reservoir Water Rights Hearing conducted by the Texas Water Commission.

Rieff, Susan. 1986. Office memorandum dated December 16, 1986, SUBJECT: Paluxy Reservoir Project, Staff Recommendation and Briefing Information Concerning the Water Permit.

POST (North Fork, Double Mountain Fork, Brazos River)

Species Present (1964):

Golden shiner	Largemouth bass	Orangespotted sunfish
Red shiner	Green sunfish	White crappie
Flathead minnow	Redear sunfish	Channel catfish
Black bullhead	Bluegill	

Impacts: The construction of a reservoir at this site would permanently alter the stream habitat.

Water Quality: No data available from Inland Fisheries.

Reference:

Fischer, R. 1964. A PRE-impoundment Management Program for a New Lake on the Double Mountain Fork of the Brazos River in Lubbock County, Texas. TPWD, Austin.

APPENDIX J

SHAWS BEND (Colorado River, Fayette & Colorado Counties)

Species Present (1980):

Spotted gar
Longnose gar
American eel
Gizzard shad
Threadfin shad
Stoneroller
Carp
Speckled chub
Blackspot shiner
Red shiner
Mimic shiner
Suckermouth minnow
Bullhead minnow
River carpsucker
Blue sucker
Smallmouth buffalo
Gray redhorse
Channel catfish
Flathead catfish
Mosquitofish
Sailfin molly
White bass
Striped bass
Redbreast sunfish
Green sunfish
Warmouth
Orangespot sunfish
Bluegill
Longear sunfish
Redear sunfish
Spotted sunfish
Smallmouth bass
Largemouth bass
Guadalupe bass
White crappie
Orangethroat darter
Dusky darter
Freshwater drum
Logperch
Rio Grande perch

Impacts: The Houston toad, a state and federal-listed endangered species, occurs in this area. Construction could alter critical toad habitat. State-listed as threatened, blue sucker were collected in the Colorado River in Bastrop County in a 1980 survey. Fish habitat would be altered by construction of a main channel reservoir.

Water Quality: Water quality is sufficient to maintain the existing fisheries.

Reference:

Bonn, T.D. 1980. Federal Aid Performance Report: Job A. Existing Reservoir and Stream Management Recommendations, Lower Colorado River, 1979. TPWD, Austin.

APPENDIX J

SOUTH BEND (Clear Fork of the Brazos)

Species Present (1960):

Longnose gar
Gizzard shad
Smallmouth buffalo
River carpsucker
Carp
Golden shiner
Redhorse shiner
Mimic shiner
Ghost shiner
Parrot minnow
Fathead minnow
Channel catfish
Black bullhead
Yellow bullhead
Flathead catfish
Plains killifish
Red River pupfish
Blackstripe topminnow
Mosquitofish
White bass
Largemouth bass
Warmouth
Green sunfish
Redear sunfish
Bluegill
Orangespotted sunfish
Longear sunfish
White crappie
Black crappie
Logperch
Freshwater drum

Impacts: The State-listed threatened species, Brazos water snake, would be affected by this project. Existing stream habitat would be lost.

Water Quality: Water quality data indicate high natural levels of nitrate nitrogen and total dissolved solids, particularly chlorides and sulphates. Water quality in the Clear Fork of the Brazos is affected by nutrients from the secondary effluent of the City of Abilene as well as dissolved solid such as chlorides and sulfates from undetermined points and/or non-point sources (TWQB, 1976)

References:

Texas Water Quality Board. 1976. Intensive Surface Water Monitoring Survey for Segment No. 1232 (Clear Fork of the Brazos River). Report No. IMS-13. TWQB.

Wilcox, James. 1960. Basic Survey and Inventory of Species as Well as Their Distribution in the Clear Fork of the Brazos River in Region 3-B, Texas. TPWD.

TEHUACANA

Species Present: Inland Fisheries stream surveys are not available for this site. According to a 1976 Public Hearing Announcement, Tehuacana Creek and its major tributaries have intermittent flow conditions with some small permanent potholes occurring in the lower reaches. The fishery resource is limited to the small potholes except during seasonal flow. The lower 4 miles of this resource are affected by channel degradation.

Impacts: Because this is an intermittent stream, impacts would be minimal for the species present, reported as primarily catfish.

Water Quality: Erosion and other degrading factors exist.

Reference:

Soil Conservation Service. 1976. Announcement of Public Hearing to discuss Environmental Assessment ... Tehuacana Creek watershed.

APPENDIX K

PART A: RARE SPECIES REVIEW OF TWENTY PROPOSED RESERVOIR SITES IN TEXAS

RESERVOIR: ALLENS CREEK

ENDANGERED RESOURCES SUMMARY:
Bufo houstonensis - historic occurrence locality partially contained in reservoir site; Buteo albicaudatus - reservoir may flood some nesting territories and surrounding grassland hunting areas; Little Bluestem-Brownseed Paspalum Series - nearby occurrence record of one excellent quality native prairie remnant; Opheodrys vernalis - one historic occurrence record contained within the reservoir site; Tympanuchus cupido attwateri - nearby occurrence records, triangle formed by IH-10, Highway 36, and San Bernard River roughly defines an expanse of prairie considered essential habitat for this bird in the 1983 Recovery Plan, this is within 4-5 km of reservoir site so it is likely that the area to be inundated may support or has supported this bird, the reservoir area should be carefully and thoroughly surveyed for appropriate habitat or existence of this bird.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS		GLOBAL/STATE RANK	
** PLANTS:					
007	Mirabilis collina sandhill four o'clock	C2		G1G2	S1S2
009	Cyperus grayioides Mohlenbrock's umbrella sedge	3C		G3	S3
** AMPHIBIANS:					
005 009	Bufo houstonensis Houston Toad	LE	E	G1	S1
** REPTILES:					
001 002	Opheodrys vernalis Smooth Green Snake		E	G5T5	S1
025	Thamnophis sirtalis annectens Texas Garter Snake	C2		G5T3	S3
** BIRDS:					
002 003 004 005, 006, 007, 008, 009, 010, 011, 012	Tympanuchus cupido attwateri Attwater's Greater Prairie-chicken	LE	E	G4T1	S1
** NATURAL COMMUNITIES:					
004 005, 006	Little Bluestem-Brownseed Paspalum Series			G2	S2
052	Little Bluestem-Indiangrass Series			G2	S2

ALLENS CREEK - (Cont.)

** MANAGED AREAS:
Attwater Prairie Chicken National Wildlife Refuge
Stephen F. Austin State Historic Park

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Buteo albicaudatus White-tailed Hawk		T	G5	S2
Crotalus horridus Timber Rattlesnake		T	G5	S?
Cycleptus elongatus Blue Sucker	C2	T	G4	S3
Elanoides forficatus American Swallow-tailed Kite	3C	T	G5	S2
Falco peregrinus tundrius Arctic Peregrine Falcon	LT	T	G3T1	S1
Grus americana Whooping Crane	LE	E	G1	S1
Haliaeetus leucocephalus Bald Eagle	LE	E	G3	S2
Mycteria americana Wood Stork	LE	T	G5	S?
Phrynosoma cornutum Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi White-faced Ibis	C2	T	G5	S2

APPENDIX K

RESERVOIR: APPLEWHITE, BEXAR COUNTY

ENDANGERED RESOURCES SUMMARY:
Graptemys caglei - historically known from San Antonio River; Plegadis chihi - look for in any heron rookeries that might be inundated.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS		GLOBAL/STATE RANK	
** FISH:					
027	Micropterus treculi Guadalupe Bass	C2		G3	S3
001 002	Satan eurystomus Widemouth Blindcat	C2	T	G1	S1
001 002 003	Trogloglanis pattersoni Toothless Blindcat	C2	T	G1	S1

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Drymarchon corais erebennus Texas Indigo Snake	T		G5T?	S?
Egretta rufescens Reddish Egret	C2	T	G4	S2
Elanoides forficatus American Swallow-tailed Kite	3C	T	G5	S2
Falco peregrinus tundrius Arctic Peregrine Falcon	LT	T	G3T1	S1
Gopherus berlandieri Texas Tortoise		T	G4	S3
Graptemys caglei (under petition for listing as federal threatened) Cagle's Map Turtle	C2		G3	S3
Haliaeetus leucocephalus Bald Eagle	LE	E	G3	S2
Jacana spinosa Northern Jacana			G5	S3
Mycteria americana Wood Stork	LE	T	G5	S?
Phrynosoma cornutum Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi White-faced Ibis	C2	T	G5	S2
Salvia penstemonoides big red sage	C2		G1G2	S1S2
Sterna antillarum athalassos Interior Least Tern	LE	E	G4T2	S2

BIG SANDY - (Cont.)

** NATURAL COMMUNITIES:

002	Bluejack Oak-Pine Series	G4	S2
003			
003	Baldcypress-Water Tupelo Series	G4	S3
025	Water Oak-Willow Oak Series	G4	S3
026			

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Aimophila aestivalis				
Bachman's Sparrow	C2	T	G3	S2
Cemophora coccinea copei				
Northern Scarlet Snake		T	G5T5	S3
Elanoides forficatus				
American Swallow-tailed Kite	3C	T	G5	S2
Erimyzon oblongus				
Creek Chubsucker		T	G5	S2S3
Falco peregrinus tundrius				
Arctic Peregrine Falcon	LT	T	G3T1	S1
Haliaeetus leucocephalus				
Bald Eagle	LE	E	G3	S2
Macroclemys temminckii				
Alligator Snapping Turtle	C2	T	G3?	S3
Mycteria americana				
Wood Stork	LE	T	G5	S?
Phrynosoma cornutum				
Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi				
White-faced Ibis	C2	T	G5	S2
Polyodon spathula				
Paddlefish	3C	E	G4	S1

GENERAL COMMENT: Upland or slope sandyland-type oak (bluejack oak-post oak, maybe) woodlands may be present and are significant from a community standpoint.

APPENDIX K

RESERVOIR: BOSQUE

ENDANGERED RESOURCES SUMMARY:
Dendroica chrysoparia - occurrence records are partially contained in reservoir site, potential for occurrence if juniper encroachment has occurred since Pulich described the area; Falco peregrinus tundrius - slim chance of using the area while in passage; Grus americana - slim chance of using the area while in passage; Haliaeetus leucocephalus - inundation destroys potential or actual bottomland nest sites; Micropterus treculi - occurrence partially contained in reservoir site; Plegadis chihi - should be looked for in any rookeries; Vireo atricapillus - should be surveyed for as it also possibly occurs.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS		GLOBAL/STATE RANK	
** PLANTS:					
010	Aster puniceus ssp. elliottii var. scabricaulis rough-stemmed aster	C1		G4T2	S2
008	Mirabilis collina sandhill four o'clock	C2		G1G2	S1S2
008 009 019	Coreopsis intermedia golden wave tickseed	C2		G2G3	S2S3
026 028 029	Cyperus grayioides Mohlenbrock's umbrella sedge	3C		G3	S3
** REPTILES:					
003	Pituophis melanoleucus ruthveni Louisiana Pine Snake	C2	E	G5T3	S2

** BIRDS:

327 Rookery, Colony # 556-003, Ambassador College, Upshur County, 32°35′N 95°04′W - active 1974; Cattle Egrets, Little Blue Herons, Great Blue Herons, Great Egrets, Anhingas

--- Rookery, Colony # 556-016, L Cooper, Upshur County, 32°35′N 95°04′W - active 1987; Anhingas, Little Blue Herons, Cattle Egrets

--- Rookery, Colony # 556-002, Little Sandy Club Lake, Wood County, 32°35′N 95°16′W (printout not yet available) - active 1989; Cattle Egrets, Little Blue Herons, Great Blue Herons

--- Rookery, Colony # 556-021, Little Sandy Club Lake #2, Wood County, 32°35′N 95°16′W (printout not yet available) - active 1990; Anhingas, Little Blue Herons, Snowy Egrets, Cattle Egrets

329 Rookery, Colony # 556-001, Kelsey, Upshur County, 32°46′N 95°03′W - active 1975; Cattle Egrets

APPENDIX K

BOSQUE - (Cont.)

** FISH:					
036	Micropterus treculi				
	Guadalupe Bass	C2		G3	S3
** BIRDS:					
002	Dendroica chrysoparia				
007	Golden-cheeked Warbler	LE	E	G2	S2
** NATURAL COMMUNITIES:					
018	Texas Oak Series			G3	S3
014	Ashe Juniper-Oak Series			G4	S4
006	Pecan-Sugarberry Series			G4	S4
** MANAGED AREAS:					
	Meridian State Recreation Area				

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Falco peregrinus tundrius				
Arctic Peregrine Falcon	LT	T	G3T1	S1
Grus americana				
Whooping Crane	LE	E	G1	S1
Haliaeetus leucocephalus				
Bald Eagle	LE	E	G3	S2
Phrynosoma cornutum				
Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi				
White-faced Ibis	C2	T	G5	S2
Vireo atricapillus				
Black-capped Vireo	LE	E	G2G3	S2

APPENDIX K

RESERVOIR: CIBOLO

ENDANGERED RESOURCES SUMMARY:
Allium elmendorfii - highly likely in reservoir area; Falco peregrinus tundrius - unlikely, unless wetlands are present; Mycteria americana - should be looked for in any rookeries; Plegadis chihi - should be looked for in any rookeries; Polygonella parksii - highly likely in reservoir area, one historic occurrence possibly contained in reservoir site; Salvia penstemonoides - highly likely on ungrazed sites, historic occurrence possibly contained in reservoir site.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS	GLOBAL/STATE RANK	
** PLANTS:				
007	Salvia penstemonoides big red sage	C2	G1G2	S1S2
004 006 008, 017	Allium elmendorfii Elmendorf onion		G2	S2
001 005 007	Polygonella parksii Parks' jointweed	3C	G2	S2

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Crotalus horridus Timber Rattlesnake		T	G5	S?
Elanoides forficatus American Swallow-tailed Kite	3C	T	G5	S2
Falco peregrinus tundrius Arctic Peregrine Falcon	LT	T	G3T1	S1
Gopherus berlandieri Texas Tortoise		T	G4	S3
Graptemys caglei (under petition for listing as federal threatened) Cagle's Map Turtle	C2		G3	S3
Grus americana Whooping Crane	LE	E	G1	S1
Mycteria americana Wood Stork	LE	T	G5	S?
Phrynosoma cornutum Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi White-faced Ibis	C2	T	G5	S2

APPENDIX K

RESERVOIR: CUERO

ENDANGERED RESOURCES SUMMARY:
Elanoides forficatus - formerly nested in bottoms of neighboring county, should be surveyed for in big bottomland woods during breeding season; Falco peregrinus tundrius - would be found only at good wetland sites; Graptemys caglei - two occurrence records partially contained in reservoir site; Haliaeetus leucocephalus - inundation destroys potential or actual bottomland nest sites; Micropterus treculi - occurrence partially contained in reservoir site; Plegadis chihi - should be looked for in any rookeries.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS		GLOBAL/STATE RANK	
** FISH:					
046	Micropterus treculi Guadalupe Bass	C2		G3	S3
** REPTILES:					
002	Graptemys caglei				
004	Cagle's Map Turtle	C2		G3	S3
008	(under petition for listing as federal threatened)				

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Crotalus horridus Timber Rattlesnake		T	G5	S?
Egretta rufescens Reddish Egret	C2	T	G4	S2
Elanoides forficatus American Swallow-tailed Kite	3C	T	G5	S2
Falco peregrinus tundrius Arctic Peregrine Falcon	LT	T	G3T1	S1
Gopherus berlandieri Texas Tortoise		T	G4	S3
Grus americana Whooping Crane	LE	E	G1	S1
Haliaeetus leucocephalus Bald Eagle	LE	E	G3	S2
Phrynosoma cornutum Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi White-faced Ibis	C2	T	G5	S2

APPENDIX K

RESERVOIR: EASTEX

ENDANGERED RESOURCES SUMMARY:

Aimophila aestivalis - possibly present in pine parklands with little hardwood understory; Coreopsis intermedia - likely on deep sands on uplands; Cyperus grayioides - likely on deep sands on uplands; Erimyzon oblongus - possibly present; Falco peregrinus tundrius - unlikely, unless wetlands are present; Haliaeetus leucocephalus - inundation destroys potential or actual bottomland nest sites; Mirabilis collina - historic occurrence possibly contained in reservoir site; Phrynosoma cornutum - probably introduced, if present; Picoides borealis - survey for presence of colonies, cavity trees, or foraging areas; Plegadis chihi - should be looked for in any rookeries.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS		GLOBAL/STATE RANK	
** PLANTS:					
004	Mirabilis collina sandhill four o'clock	C2		G1G2	S1S2
008 009 011	Crataegus warneri Warner hawthorn	C2		G2Q	S2
** MANAGED AREAS:					
	Jim Hogg State Historic Park				
	Rusk State Recreation Area				

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Aimophila aestivalis Bachman's Sparrow	C2	T	G3	S2
Aster puniceus ssp. elliottii var. scabricaulis rough-stemmed aster	C1		G4T2	S2
Cemophora coccinea copei Northern Scarlet Snake		T	G5T5	S3
Coreopsis intermedia golden wave tickseed	C2		G2G3	S2S3
Crotalus horridus Timber Rattlesnake		T	G5	S?
Cyperus grayioides Mohlenbrock's umbrella sedge	3C		G3	S3
Erimyzon oblongus Creek Chubsucker		T	G5	S2S3
Falco peregrinus tundrius Arctic Peregrine Falcon	LT	T	G3T1	S1
Haliaeetus leucocephalus Bald Eagle	LE	E	G3	S2
Macroclemys temminckii Alligator Snapping Turtle	C2	T	G3-	S3
Phrynosoma cornutum Texas Horned Lizard	C2	T	G5	S5
Picoides borealis Red-cockaded Woodpecker	LE	E	G2	S2
Pituophis melanoleucus ruthveni Louisiana Pine Snake	C2	E	G5T3	S2
Plegadis chihi White-faced Ibis	C2	T	G5	S2
Polyodon spathula Paddlefish	3C	E	G4	S1

APPENDIX K

RESERVOIR: GEORGE PARKHOUSE I

ENDANGERED RESOURCES SUMMARY:
Aimophila aestivalis - unlikely, unless pine parklands with little hardwood understory are present; Falco peregrinus tundrius - unlikely, but possible in passage; Phrynosoma cornutum - probably introduced, if present; Sugarberry-Elm Series - occurrence partially contained in reservoir site, USF&WS Priority 4 preservation area.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS		GLOBAL/STATE RANK	
** BIRDS:					
346	Rookery, # 536-002, Sulphur Springs Lake, Hopkins County, 33°09′N 95°38′W - active 1986; Cattle Egrets, Little Blue Herons, Anhingas				
** NATURAL COMMUNITIES:					
004	Silveanus Dropseed Series			G2	S2
007	Sugarberry-Elm Series			G4	S4

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Aimophila aestivalis				
Bachman's Sparrow	C2	T	G3	S2
Crotalus horridus				
Timber Rattlesnake		T	G5	S?
Elanoides forficatus				
American Swallow-tailed Kite	3C	T	G5	S2
Erimyzon oblongus				
Creek Chubsucker		T	G5	S2S3
Falco peregrinus tundrius				
Arctic Peregrine Falcon	LT	T	G3T1	S1
Haliaeetus leucocephalus				
Bald Eagle	LE	E	G3	S2
Macroclemys temminckii				
Alligator Snapping Turtle	C2	T	G3?	S3
Phrynosoma cornutum				
Texas Horned Lizard	C2	T	G5	S5

APPENDIX K

RESERVOIR: GEORGE PARKHOUSE II

ENDANGERED RESOURCES SUMMARY:
Aimophila aestivalis - unlikely, unless pine parklands with little hardwood understory are present; Elanoides forficatus - survey for bottomland treetop nests; Falco peregrinus tundrius - unlikely, except in passage; Haliaeetus leucocephalus - inundation destroys potential or actual bottomland nest sites; Phrynosoma cornutum - probably introduced, if present; Sterna antillarum athalassos - survey for possible breeding sites; Sugarberry-Elm Series - occurrence partially contained in reservoir site, USF&WS Priority 4 preservation area.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS		GLOBAL/STATE RANK	
** BIRDS:					
346	Rookery, # 536-002, Sulphur Springs Lake, Hopkins County, 33°09′N 95°38′W - active 1986; Cattle Egrets, Little Blue Herons, Anhingas				
** NATURAL COMMUNITIES:				G2	S2
004	Silveanus Dropseed Series				
007	Sugarberry-Elm Series			G4	S4

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Aimophila aestivalis Bachman's Sparrow	C2	T	G3	S2
Crotalus horridus Timber Rattlesnake		T	G5	S?
Cycleptus elongatus Blue Sucker	C2	T	G4	S3
Elanoides forficatus American Swallow-tailed Kite	3C	T	G5	S2
Falco peregrinus tundrius Arctic Peregrine Falcon	LT	T	G3T1	S1
Haliaeetus leucocephalus Bald Eagle	LE	E	G3	S2
Phrynosoma cornutum Texas Horned Lizard	C2	T	G5	S5
Polyodon spathula Paddlefish	3C	E	G4	S1
Sterna antillarum athalassos Interior Least Tern	LE	E	G4T2	S2

APPENDIX K

RESERVOIR: GOLIAD

ENDANGERED RESOURCES SUMMARY:
Buteo albicaudatus - survey for in any grasslands to be inundated; Crotalus horridus - possibly occurs, but not likely; Elanoides forficatus - survey for nests in bottomland woods; Falco peregrinus tundrius - unlikely, except in passage; Haliaeetus leucocephalus - nest sites on San Antonio River in Goliad County, see appendix for contact on up-to-date localities, survey for additional nest sites within the area inundated; Mycteria americana - should be looked for in any rookeries; Plegadis chihi - should be looked for in any rookeries; Tympanuchus cupido attwateri - need thorough survey for this bird or its habitat.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS		GLOBAL/STATE RANK	
** BIRDS:					
003	Haliaeetus leucocephalus Bald Eagle	LE	E	G3	S2
** NATURAL COMMUNITIES:					
018	Sugarberry-Elm Series			G4	S4
007	Blackbrush Series			G5	S5
** MANAGED AREAS:					
	Goliad State Historic Park				

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Buteo albicaudatus White-tailed Hawk		T	G5	S2
Crotalus horridus Timber Rattlesnake		T	G5	S?
Drymarchon corais erebennus Texas Indigo Snake		T	G5T?	S?
Elanoides forficatus American Swallow-tailed Kite	3C	T	G5	S2
Falco peregrinus tundrius Arctic Peregrine Falcon	LT	T	G3T1	S1
Gopherus berlandieri Texas Tortoise		T	G4	S3
Graptemys caglei (under petition for listing as federal threatened) Cagle's Map Turtle	C2		G3	S3
Grus americana Whooping Crane	LE	E	G1	S1
Mycteria americana Wood Stork	LE	T	G5	S?
Phrynosoma cornutum Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi White-faced Ibis	C2	T	G5	S2
Tympanuchus cupido attwateri Attwater's Greater Prairie-chicken	LE	E	G4T1	S1

APPENDIX K

RESERVOIR: LINDENAU

ENDANGERED RESOURCES SUMMARY:
Elanoides forficatus - survey for nest sites; Graptemys caglei - one occurrence record partially contained in reservoir site; Haliaeetus leucocephalus - inundation destroys potential or actual bottomland nest sites; Plegadis chihi - should be looked for in any rookeries.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS		GLOBAL/STATE RANK	
** FISH:					
046	Micropterus treculi				
	Guadalupe Bass	C2		G3	S3
** REPTILES:					
002	Graptemys caglei				
004	Cagle's Map Turtle	C2		G3	S3
008	(under petition for listing as federal threatened)				

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Crotalus horridus				
Timber Rattlesnake		T	G5	S?
Egretta rufescens				
Reddish Egret	C2	T	G4	S2
Elanoides forficatus				
American Swallow-tailed Kite	3C	T	G5	S2
Falco peregrinus tundrius				
Arctic Peregrine Falcon	LT	T	G3T1	S1
Gopherus berlandieri				
Texas Tortoise		T	G4	S3
Grus americana				
Whooping Crane	LE	E	G1	S1
Haliaeetus leucocephalus				
Bald Eagle	LE	E	G3	S2
Phrynosoma cornutum				
Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi				
White-faced Ibis	C2	T	G5	S2

APPENDIX K

RESERVOIR: LITTLE CYPRESS

ENDANGERED RESOURCES SUMMARY:
Aimophila aestivalis - possible if pine parklands with little hardwood understory are present; Elanoides forficatus - survey for in bottoms; Haliaeetus leucocephalus - inundation destroys potential or actual bottomland nest sites; Hibiscus dasycalyx - would be submerged if present making this plant a survey priority; Mycteria americana - should be looked for in any rookeries; Picoides borealis - survey for presence of colonies, cavity trees, or foraging areas; Trillium pusillum var. texanum - may occur on lower slopes where likely to be inundated; Water Oak-Willow Oak Series - occurrence contained within the reservoir site, USF&WS Priority 2 preservation area, patchy.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS	GLOBAL/STATE RANK
** PLANTS:			
002	Hibiscus dasycalyx Neches River rose-mallow	C2	G1 S1
001	Coreopsis intermedia golden wave tickseed	C2	G2G3 S2S3
009	Trillium pusillum var. texanum Texas trillium	C2	G2G3Q S2S3
** REPTILES:			
002	Chrysemys picta bellii Western Painted Turtle		G5T5 S1
** BIRDS:			
315	Rookery, # 556-052, Longview, Harrison County, 32°25′N 94°39′W - active 1979; Great Egrets, Great Blue Herons, Anhingas		
---	Rookery, # 556-067, Talley Road Eastman, Harrison County, 32°25′N 94°39′W (printout not yet available) - active 1988; Little Blue Herons, Cattle Egrets		
** NATURAL COMMUNITIES:			
033	Water Oak-Willow Oak Series		G4 S3

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Aimophila aestivalis Bachman's Sparrow	C2	T	G3	S2
Cemophora coccinea copei Northern Scarlet Snake		T	G5T5	S3
Elanoides forficatus American Swallow-tailed Kite	3C	T	G5	S2
Erimyzon oblongus Creek Chubsucker		T	G5	S2S3
Haliaeetus leucocephalus Bald Eagle	LE	E	G3	S2

LITTLE CYPRESS - (Cont.)

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS: (Cont.)

Macroclemys temminckii Alligator Snapping Turtle	C2	T	G3?
Mycteria americana Wood Stork	LE	T	G5
Notropis hubbsi Bluehead Shiner		T	G3
Percina maculata Blackside Darter		T	G
Picoides borealis Red-cockaded Woodpecker	LE	E	G
Plecotus rafinesquii Rafinesque's (Eastern) Big-eared Bat	C2	T	(
Polyodon spathula Paddlefish	3C	E	
Ursus americanus Black Bear	PT	E	

APPENDIX K

RESERVOIR: NEW BONHAM

ENDANGERED RESOURCES SUMMARY:

Elanoides forficatus - survey for nest sites; Falco peregrinus tundrius -unlikely, unless wetlands are present; Haliaeetus leucocephalus - survey for nest sites, good chance of locating a nesting pair; Little Bluestem-Indiangrass Series - one occurrence record partially contained in reservoir site; Mycteria americana - should be looked for in any rookeries; Plegadis chihi - should be looked for in any rookeries; Post Oak-Blackjack Oak Series - one occurrence record partially contained in reservoir site; Rookeries - occurrences partially contained in reservoir site; Sterna antillarum athalassos - unlikely, but should survey for breeding colonies.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS	GLOBAL/STATE RANK
	** BIRDS:		
---	Rookery, Colony # 535-051, Bonham, Fannin County, 33°37′N 96°10′W (printout not yet available) - either inactive or not surveyed during 1986-1990 surveys		
---	Rookery, Colony # 536-004, Honey Grove, Fannin County, 33°35′N 96°04′W (printout not yet available) - active 1987; Little Blue Herons, Cattle Egrets		
	** NATURAL COMMUNITIES:		
064 065	Little Bluestem-Indiangrass Series	G2	S2
011 012, 013	Post Oak-Blackjack Oak Series	G4	S4
	** MANAGED AREAS: Bonham State Recreation Area Caddo Wildlife Management Area (Bois D'Arc Unit)		

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Crotalus horridus Timber Rattlesnake		T	G5	S?
Cycleptus elongatus Blue Sucker	C2	T	G4	S3
Elanoides forficatus American Swallow-tailed Kite	3C	T	G5	S2
Falco peregrinus tundrius Arctic Peregrine Falcon	LT	T	G3T1	S1
Grus americana Whooping Crane	LE	E	G1	S1
Haliaeetus leucocephalus Bald Eagle	LE	E	G3	S2
Macroclemys temminckii Alligator Snapping Turtle	C2	T	G3?	S3
Mycteria americana Wood Stork	LE	T	G5	S?
Phrynosoma cornutum Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi White-faced Ibis	C2	T	G5	S2
Polyodon spathula Paddlefish	3C	E	G4	S1
Scaphirhynchus platorynchus Shovelnose Sturgeon		E	G4	S?
Sterna antillarum athalassos Interior Least Tern	LE	E	G4T2	S2

APPENDIX K

RESERVOIR: PALMETTO BEND II

ENDANGERED RESOURCES SUMMARY:
Egretta rufescens - should be looked for in any rookeries; Elanoides forficatus - survey for in bottoms; Falco peregrinus tundrius - potential wintering area; Haliaeetus leucocephalus - survey for nest sites which likely occur; Mycteria americana - should be looked for in any rookeries; Rookery - occurrence partially contained in reservoir site; Plegadis chihi - should be looked for in any rookeries; Tympanuchus cupido attwateri - survey thoroughly for this bird or its habitat, area is within historic range.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS		GLOBAL/STATE RANK	
** BIRDS:					
009	Haliaeetus leucocephalus Bald Eagle	LE	E	G3	S2
---	Rookery, Colony # 609-030, Palmetto Dam, Jackson County, 28°53′N 96°40′W (printout not yet available) - active 1987; Anhingas, Great Egrets, Cattle Egrets				
** MANAGED AREAS:					
	Lake Texana State Recreation Area				

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Crotalus horridus Timber Rattlesnake		T	G5	S?
Egretta rufescens Reddish Egret	C2	T	G4	S2
Elanoides forficatus American Swallow-tailed Kite	3C	T	G5	S2
Falco peregrinus tundrius Arctic Peregrine Falcon	LT	T	G3T1	S1
Grus americana Whooping Crane	LE	E	G1	S1
Mycteria americana Wood Stork	LE	T	G5	S?
Phrynosoma cornutum Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi White-faced Ibis	C2	T	G5	S2
Sabal mexicana Texas palmetto			G5	S1
Tympanuchus cupido attwateri Attwater's Greater Prairie-chicken	LE	E	G4T1	S1

APPENDIX K

RESERVOIR: PALUXY

ENDANGERED RESOURCES SUMMARY:
Ashe Juniper-Oak Series - occurrence partially contained in reservoir site; Dendroica chrysoparia - Pulich mentions this bird for Paluxy River drainage; Dinosaur Valley State Park - partially contained in reservoir site; Falco peregrinus tundrius - unlikely, unless wetlands are present; Haliaeetus leucocephalus - survey for nest sites which may occur; Plegadis chihi - should be looked for in any rookeries; Sugarberry-Elm Series - occurrence partially contained in reservoir site; Vireo atricapillus - one occurrence partially contained in reservoir site.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS		GLOBAL/STATE RANK	
** REPTILES:					
001	Nerodia harteri harteri Brazos Water Snake	C2	T	G2T2	S2
** BIRDS:					
002	Vireo atricapillus				
006	Black-capped Vireo	LE	E	G2G3	S2
338	Rookery, Colony # 555-004, Cowan Ranch, Erath County, 32°15′N 97°59′W - active 1988; Great Blue Herons				
---	Rookery, Colony # 555-005, Squaw Creek, Hood County, 32°21′N 97°50′W (printout not yet available) - active 1990; Great Blue Herons				
** NATURAL COMMUNITIES:					
021	Ashe Juniper-Oak Series			G4	S4
005	Post Oak-Blackjack Oak Series			G4	S4
030	Sugarberry-Elm Series			G4	S4
** MANAGED AREAS:					
	Dinosaur Valley State Park				

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Dendroica chrysoparia Golden-cheeked Warbler	LE	E	G2	S2
Falco peregrinus tundrius Arctic Peregrine Falcon	LT	T	G3T1	S1
Grus americana Whooping Crane	LE	E	G1	S1
Haliaeetus leucocephalus Bald Eagle	LE	E	G3	S2
Phrynosoma cornutum Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi White-faced Ibis	C2	T	G5	S2
Yucca necopina Glen Rose yucca			G1Q	S1

APPENDIX K

RESERVOIR: POST

ENDANGERED RESOURCES SUMMARY:
Callirhoe scabriuscula - may be present as suitable soil type (Tivoli fine sand) occurs along this section of the North Double Mountain Fork of the Brazos River; Mustela nigripes - check for prairie dog towns, which could eventually serve as reintroduction sites for the ferret.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS		GLOBAL/STATE RANK	

No presently known occurrences of special species in the immediate vicinity of the proposed reservoir.

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Callirhoe scabriuscula				
Texas poppy-mallow	LE	E	G2	S2
Mustela nigripes				
Black-footed Ferret	LE	E	G1	SX
Notropis buccula				
Smalleye Shiner	C2		G2	S2
Phrynosoma cornutum				
Texas Horned Lizard	C2	T	G5	S5

APPENDIX K

RESERVOIR: RIO GRANDE SITE "A"

ENDANGERED RESOURCES SUMMARY:

Adelia vaseyi - one occurrence possibly contained in reservoir site; Ayenia limitaris - historic occurrence possibly contained in reservoir site; Buteogallus anthracinus - likely more common in the area in the past; Buteo nitidus - likely more common in this area in the past; Coniophanes imperialis -occurrence records possibly contained in reservoir site; Coryphantha macromeris var. runyonii - historic occurrence record possibly contained in reservoir site; Dendroica chrysoparia - migrates through this area; Drymobius margaritiferus - occurrence records possibly contained in reservoir site; Egretta rufescens - unlikely, but should be looked for in any rookeries; Elanoides forficatus - in passage; Felis yagouaroundi and Felis pardalis - possibly contained in reservoir site; Haliaeetus leucocephalus - unlikely; Hypopachus variolosus - historic occurrence record possibly contained in reservoir site; Justicia runyonii - some occurrences possibly contained or affected in reservoir site; Leptodeira septentrionalis septentrionalis -occurrence possibly contained in reservoir site; Mycteria americana - in passage and possibly former breeding resident; Notophthalmus meridionalis - occurrence records possibly contained in reservoir site; Plegadis chihi - should be looked for in any rookeries; Sabal mexicana - occurrence records possibly contained or affected in reservoir site; Sabal Palm Grove Sanctuary - partially contained or affected in reservoir site; Siren intermedia texana - occurrence records possibly contained in reservoir site; Smilisca baudinii - historic occurrence record possibly contained in reservoir site; Sterna antillarum athalassos - wintering resident; Texas Palmetto Series - occurrence records possibly contained or affected in reservoir site; Vireo atricapillus - in passage only.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS	GLOBAL/STATE RANK	
** PLANTS:				
002	Ayenia limitaris			
	Texas ayenia	C2	G2	S1
001	Justicia runyonii			
004	Runyon's water-willow	C2	G2	S2
009, 012 (three additional printouts not yet available)				
005	Anthericum chandleri			
007	lila de los llanos	C2	G3	S3
003	Adelia vaseyi			
005	Vasey's adelia		G2	S2
009, 010				
004	Grindelia oolepis			
010	plains gumweed	3C	G2	S2
011, 016, 018				
001	Sabal mexicana			
003	Texas palmetto		G5	S1
004, 005, 006, 008, 012				

APPENDIX K

RIO GRANDE SITE "A" - (Cont.)

** AMPHIBIANS:					
001 012 028, 033	Notophthalmus meridionalis Black-spotted Newt	C2	E	G1	S1
007 010 012, 018, 019	Siren intermedia texana Rio Grande Lesser Siren	C2	E	G5T2	S2
003	Hypopachus variolosus Sheep Frog		T	G5	S2
001	Smilisca baudinii Mexican Treefrog		T	G5	S3
** REPTILES:					
002 003	Drymobius margaritiferus Speckled Racer		E	G5	S1
003	Leptodeira septentrionalis septentrionalis Northern Cat-eyed Snake		E	G5T5	S2
001 007 008, 010	Coniophanes imperialis Black-striped Snake		T	G3?	S2
** MAMMALS:					
001	Felis yagouaroundi Jaguarundi	LE	E	G4	S1
** NATURAL COMMUNITIES:					
001 002, 003	Texas Palmetto Series			G2	S1
001 004, 009	Texas Ebony-Anacua Series			G2	S1

** MANAGED AREAS:
Las Palomas Wildlife Management Area - Voshell Unit
Lower Rio Grande Valley National Wildlife Refuge
Resaca de la Palma
Sabal Palm Grove Sanctuary

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Awaous tajasica River Goby		T	G5	S1
Buteogallus anthracinus Common Black-hawk		T	G5	S2
Buteo nitidus Gray Hawk		T	G5	S1
Camptostoma imberbe Northern Beardless-tyrannulet	C2	T	G5	S3

APPENDIX K

RIO GRANDE SITE "A" - (Cont.)

Cemophora coccinea lineri				
Texas Scarlet Snake		T	G5T2	S2
Dendroica chrysoparia				
Golden-cheeked Warbler	LE	E	G2	S2
Drymarchon corais erebennus				
Texas Indigo Snake		T	G5ST	S?
Egretta rufescens				
Reddish Egret	C2	T	G4	S2
Elanoides forficatus				
American Swallow-tailed Kite	3C	T	G5	S2
Falco peregrinus tundrius				
Arctic Peregrine Falcon	LT	T	G3T1	S1
Felis pardalis				
Ocelot	LE	E	G2?	S1
Glaucidium brasilianum				
Ferruginous Pygmy-owl				
Gobionellus atripinnis				
Blackfin Goby		E	G3	S1
Gopherus berlandieri				
Texas Tortoise		T	G4	S3
Haliaeetus leucocephalus				
Bald Eagle	LE	E	G3	S2
Lasiurus ega				
Southern Yellow Bat		T	G5	S1
Leptodactylus fragilis				
White-lipped Frog		E	G4	S1
Mycteria americana				
Wood Stork	LE	T	G5	S?
Nasua nasua				
Coati		E	G5	S2
Oryzomys couesi				
Coues' Rice Rat		T	G5	S2
Pachyramphus aglaiae				
Rose-throated Becard		T	G4G5	S2
Parula pitiayumi				
Tropical Parula	C2	T	G5	S3
Phrynosoma cornutum				
Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi				
White-faced Ibis	C2	T	G5	S2
Smilisca baudinii				
Mexican Treefrog		T	G5	S3
Sterna antillarum athalassos				
Interior Least Tern	LE	E	G4T2	S2
Vireo atricapillus				
Black-capped Vireo	LE	E	G2G3	S2

(GENERAL COMMENT: This project is in conflict with projects to restore LRGV wildlife corridor.)

APPENDIX K

RESERVOIR: SHAWS BEND

ENDANGERED RESOURCES SUMMARY:

Buteo albicaudatus - possibly in grasslands of area to be inundated; Egretta rufescens - should be looked for in any rookeries; Elanoides forficatus - historic nest sites in vicinity, survey old bottomlands for possibly occurrence; Falco peregrinus tundrius - in passage, possibly wintering birds present; Haliaeetus leucocephalus - survey for possible nest sites, inundation destroys potential or actual bottomland nest sites; Micropterus treculi - occurrence partially contained in reservoir site; Mycteria americana - should be looked for in any rookeries; Plegadis chihi - should be looked for in any rookeries; Tympanuchus cupido attwateri - reservoir site just outside historic distribution, but should survey for possible presence of this bird or its habitat to be sure.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS		GLOBAL/STATE RANK	
** FISH:					
051	Micropterus treculi Guadalupe Bass	C2		G3	S3
** AMPHIBIANS:					
015	Bufo houstonensis Houston Toad	LE	E	G1	S1
** BIRDS:					
189	Rookery, Colony # 599-050, La Grange, Fayette County, 29°54′N 96°45′W - active 1979; Cattle Egrets, Little Blue Herons, Anhingas, Olivaceous Cormorants, Great Egrets				
** NATURAL COMMUNITIES:					
058	Little Bluestem-Indiangrass Series			G2	S2
020	Post Oak-Blackjack Oak Series			G4	S4
** MANAGED AREAS:					
	Kreische Brewery State Historic Park				

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Buteo albicaudatus White-tailed Hawk		T	G5	S2
Crotalus horridus Timber Rattlesnake		T	G5	S?
Egretta rufescens Reddish Egret	C2	T	G4	S2
Elanoides forficatus American Swallow-tailed Kite	3C	T	G5	S2
Falco peregrinus tundrius Arctic Peregrine Falcon	LT	T	G3T1	S1
Grus americana Whooping Crane	LE	E	G1	S1
Haliaeetus leucocephalus Bald Eagle	LE	E	G3	S2
Mycteria americana Wood Stork	LE	T	G5	S?
Phrynosoma cornutum Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi White-faced Ibis	C2	T	G5	S2
Tympanuchus cupido attwateri Attwater's Greater Prairie-chicken	LE	E	G4T1	S1

APPENDIX K

RESERVOIR: SOUTH BEND

ENDANGERED RESOURCES SUMMARY:
Dendroica chrysoparia - probably does not occur in reservoir area; Elanoides forficatus - unlikely; Falco peregrinus tundrius - unlikely; Haliaeetus leucocephalus - survey for nest sites and wintering roosts; Nerodia harteri harteri - occurs in this area, surveys should be conducted for impacts.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS	GLOBAL/STATE RANK
** FISH:			
002	Notropis buccula Smalleye Shiner	C2	G2 S2
** BIRDS:			
349	Rookery, Colony # 534-055, Lake Graham, Young County, 33°12′N 98°39′W - active 1975; Great Blue Herons		
---	Rookery, Colony # 534-059, Bitter Creek, Young County, 33°23′N 98°52′W (printout not yet available) - either inactive or not surveyed during 1986-1990 surveys		
---	Rookery, Colony # 534-061, Bull Branch Tanks, Young County, 33°15′N 98°51′W (printout not yet available) - active 1988; Great Blue Herons		
---	Rookery, Colony # 554-033, Hubbard Creek Lake (Breckenridge), Stephens County, 32°45′N 98°55′W (printout not yet available) - either inactive or not surveyed during 1986-1990 surveys		
---	Rookery, Colony # 554-052, Hubbard Creek Lake, Stephens County, 32°46′N 99°05′W (printout not yet available) - active 1986; Great Blue Herons		
** MANAGED AREAS:			
	Possum Kingdom State Recreation Area		

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Dendroica chrysoparia Golden-cheeked Warbler	LE	E	G2	S2
Elanoides forficatus American Swallow-tailed Kite	3C	T	G5	S2
Falco peregrinus tundrius Arctic Peregrine Falcon	LT	T	G3T1	S1
Grus americana Whooping Crane	LE	E	G1	S1
Haliaeetus leucocephalus Bald Eagle	LE	E	G3	S2
Nerodia harteri harteri Brazos Water Snake	C2	T	G2T2	S2
Phrynosoma cornutum Texas Horned Lizard	C2	T	G5	S5

APPENDIX K

RESERVOIR: TEHUACANA

ENDANGERED RESOURCES SUMMARY:
Aimophila aestivalis - probably does not occur, unless the reservoir site contains some open pine parklands; Bufo houstonensis - possible, but unlikely; Crataegus warneri - historic occurrence record partially contained in reservoir site; Elanoides forficatus - if present, would nest in old-growth bottomland trees; Haliaeetus leucocephalus - survey for likely nest sites, inundation destroys potential or actual bottomland nest sites; Mycteria americana - should be looked for in any rookeries; Plegadis chihi -should be looked for in any rookeries.

ELEMENTS OF OCCURRENCE:

EO#	SCIENTIFIC/COMMON NAMES	FEDERAL/STATE STATUS	GLOBAL/STATE RANK	
** PLANTS:				
001	Crataegus warneri Warner hawthorn	C2	G2Q	S2
** BIRDS:				
276	Rookery, Colony # 573-051, Fairfield State Park, Freestone County, 31°46′N 96°05′W - active 1974; Cattle Egrets, Great Blue Herons			
---	Rookery, Colony # 573-055, Wortham, Freestone County, 31°47′N 96°27′W (printout not yet available) - active 1986; Great Egrets, Little Blue Herons, Cattle Egrets			
---	Rookery, Colony # 555-061, Lodge Lake, Henderson County, 32°03′N 96°00′W (printout not yet available) - either inactive or not surveyed during 1986-1990 surveys			
---	Rookery, Colony # 574-005, Beaver-Catfish Club, Anderson County, 31°52′N 95°53′W - active 1989; Cattle Egrets, Anhingas, Little Blue Herons, Snowy Egrets, Great Egrets, Olivaceous Cormorants, White-faced Ibis			
---	Rookery, Colony # 574-004, Gum Pond, Anderson County, 31°55′N 95°53′W - active 1987; Great Egrets, Little Blue Herons, Cattle Egrets, Snowy Egrets			
---	Rookery, Colony # 574-003, Beaver Dam Island, Anderson County, 31°56′N 95°53′W - active 1976; Yellow-crowned Night-herons			
---	Rookery, Colony # 574-002, McDonald Swamp, Anderson County, 31°57′N 95°53′W - active 1986; Cattle Egrets, Little Blue Herons, Anhingas, Great Egrets, Snowy Egrets, White Ibis			
---	Rookery, Colony # 574-001, Scarborough Hole, Anderson County, 31°59′N 95°53′W - active 1975; Great Blue Herons			
---	Rookery, Colony # 556-012, Strickland Ranch, Anderson County, 32°00′N 95°57′W - active 1974; Great Blue Herons			
** NATURAL COMMUNITIES:				
004	Pecan-Sugarberry Series		G4	S4
008	Post Oak-Blackjack Oak Series		G4	S4

TEHUACANA - (Cont.)

** MANAGED AREAS:
I.D. Fairchild State Forest
Richland Creek Wildlife Management Area (North)
Richland Creek Wildlife Management Area (South)

OTHER LIKELY SPECIES - INCLUDING MIGRATORY BIRDS:

Aimophila aestivalis				
Bachman's Sparrow	C2	T	G3	S2
Bufo houstonensis				
Houston Toad	LE	E	G1	S1
Crotalus horridus				
Timber Rattlesnake		T	G5	S?
Elanoides forficatus				
American Swallow-tailed Kite	3C	T	G5	S2
Falco peregrinus tundrius				
Arctic Peregrine Falcon	LT	T	G3T1	S1
Grus americana				
Whooping Crane	LE	E	G1	S1
Haliaeetus leucocephalus				
Bald Eagle	LE	E	G3	S2
Mycteria americana				
Wood Stork	LE	T	G5	S?
Phrynosoma cornutum				
Texas Horned Lizard	C2	T	G5	S5
Plegadis chihi				
White-faced Ibis	C2	T	G5	S2

APPENDIX K

PART B: Texas Natural Heritage Program Species Status Code Key

FEDERAL STATUS

LE - Listed Endangered
LT - Listed Threatened
LELT - Listed Endangered in part of range, Threatened in a different part
PE - Proposed to be listed Endangered
PT - Proposed to be listed Threatened
PEPT - Proposed Endangered, Threatened
S - Synonyms
C1 - Candidate, Category 1. USFWS has substantial information on biological vulnerability and threats to support proposing to list as endangered or threatened. Data are being gathered on habitat needs and/or critical habitat designations.
C1* - C1, but lacking known occurrences
C1** - C1, but lacking known occurrences, except in captivity/cultivation
C2 - Candidate, Category 2. Information indicates that proposing to list as endangered or threatened is possibly appropriate, but substantial data on biological vulnerability and threats are not currently known to support the immediate preparation of rules. Further biological research and field study will be necessary to ascertain the status and/or taxonomic validity of the taxa in Category 2.
C2* - C2, but lacking known occurrences
C2** - C2, but lacking known occurrences, except in captivity/cultivation
3 - Taxa no longer being considered for listing as threatened or endangered. Three subcategories indicate the reasons for removal from consideration.
3A - Former Candidate, rejected because presumed extinct and/or habitats destroyed
3B - Former Candidate, rejected because not a recognized taxon; i.e. synonym or hybrid
3C - Former Candidate, rejected because more common, widespread, or adequately protected
blank - Not currently listed

STATE STATUS

E - Listed as Endangered in the State of Texas
T - Listed as Threatened in the State of Texas
blank - Not currently listed

GLOBAL RANK

G1 - Critically imperiled globally, extremely rare, 5 or fewer occurrences. [Critically endangered throughout range.]
G2 - Imperiled globally, very rare, 6 to 20 occurrences. [Endangered throughout range.]
G3 - Very rare and local throughout range or found locally in restricted range, 21 to 100 occurrences. [Threatened throughout range.]
G4 - Apparently secure globally.
G5 - Demonstrably secure globally.
GA - Accidental in North America, now G#NA.
GE - An exotic species established in North America, now G#NE.
GH - Of historical occurrence through its range.
GU - Uncertain; most likely rank/uncertain (G2?), range (G1G2)
GX - Believed to be extinct throughout range.
Q - Qualifier denotes questionable rank or taxonomic assignment.
T - Subrank of subspecies or variety.

APPENDIX K

PART B: Texas Natural Heritage Program Species Status Code Key (Cont.)

STATE RANK

S1 - Critically imperiled in state, extremely rare, very vulnerable to extirpation, 5 or fewer occurrences.
S2 - Imperiled in state, very rare, vulnerable to extirpation, 6 to 20 occurrences.
S3 - Rare in state, 20+ occurrences.
S4 - Apparently secure in state.
S5 - Demonstrably secure in state.
SA - Accidental in state.
SE - An exotic species established in state.
SH - Of historical occurrence in state. May be rediscovered.
SX - Apparently extirpated from State.

PRECISION

S
or SC - Occurrence mapped to seconds of latitude/longitude. SC indicates element occurrence is a confirmed occurrence.
M - Occurrence mapped to minutes of latitude/longitude, approximately 2 km or 1.5 mi radius.
G - Occurrence mapped general to quad or place name precision only, precision within about 8 km or 5 mi radius.
U - Unmappable record.

OCCURRENCE RANK

A - Excellent
B - Good
C - Marginal
D - Poor
X - Destroyed
blank - Unknown

APPENDIX K

Source: Dean Keddy-Hector, TPWD Natural Heritage Program Zoologist

PART C: BATS POTENTIALLY AFFECTED BY PROPOSED RESERVOIRS

NOTE: This important information was not available at the time the Natural Heritage Program database search was performed. This information supplements part A of this Appendix.

Ghost-faced bat Mormoops megalophylla (G4G5, S2).
Lindenau, Cuero, Applewhite, Cibolo, Goliad, Retamal and Site A Channel Dams.

Long-tongued bat Choeronycteris mexicana (GS?, S1, C2)
Retamal and Site A Channel Dams.

Hairy-legged vampire Diphylla ecaudata (G5 S1)
Retamal and Site A Channel Dams.

Southeastern myotis Myotis autroriparius (G4? S3 C2)
Big Pine, Liberty Hill, George Parkhouse I and II, Marvin Nichols I, Big Sandy, Carl Estes, Prairie Creek, Little Cypress, Eastex, Tehaucana, Tennessee Colony, Weches, Rockland, Bon Weir.

Eastern small-footed bat Myotis leibii (G3 S3 C2)
Breckenridge, Ringgold.

Southern yellow bat Lasiurus ega (G5 S1 State Threatened)
Retamal and Site A Channel Dams.

Eastern big-eared bat Plecotus rafinesquii (G4 S4 C2 State Threatened)
Big Pine, Liberty Hill, George Parkhouse I and II, Marvin Nichols I, Big Sandy, Carl Estes, Prairie Creek, Little Cypress, Eastex, Tehaucana, Tennessee Colony, Weches, Rockland, Bon Weir.

Big free-tailed bat Tadarida macrotis (G5 S3)
Lindenau, Cuero, Applewhite, Cibolo, Goliad, Retamal, and Site A Channel Dams.

APPENDIX K

PART D: SPECIAL SPECIES HABITATS, UNIQUE COMMUNITY DESCRIPTIONS, AND MANAGED AREA ADDRESSES

PLANTS:

Adelia vaseyi (Vasey's adelia) - subtropical woodlands in lower Rio Grande Valley; flowering January-June.

Allium elmendorfii (Elmendorf onion) - endemic; deep sands derived from Queen City and similar Eocene formations; flowering April-May.

Anthericum chandleri (lila de los llanos) - grasslands and openings in subtropical woodlands and brush on clay soils; common in windblown saline clay on lomas near mouth of Rio Grande; flowering (May-) September-December; fruiting October-December.

Aster puniceus ssp. elliottii var. scabricaulis (rough-stemmed aster) - endemic; wet unshaded habitats ranging from sphagnum bogs to roadside ditches; flowering in fall.

Ayenia limitaris (Texas ayenia) - in woodlands on alluvial deposits on floodplains and terraces along the Rio Grande; flowering throughout the year with sufficient rainfall.

Callirhoe scabriuscula (Texas poppy-mallow) - deep, loose sands (Tivoli soil series) on ancient and contemporary river terraces; flowering April-June.

Coreopsis intermedia (golden wave tickseed) - deep sandy soils of sandhills in post oak woodlands and pine-oak forests; flowering April-August (more commonly in spring than summer).

Coryphantha macromeris var. runyonii (Runyon's cory cactus) - endemic; low hills and flats on gravelly soils, in Taumaulipan shrub communities along the Rio Grande.

Crataegus warneri (Warner hawthorn) - endemic; margins of upland oak-hickory and oak-hickory-pine woodlands or forests, mostly on sandy soils; flowering March-April.

Cyperus grayioides (Mohlenbrock's umbrella sedge) - sands and sandy soils in dry, almost barren openings in upland longleaf pine savannas and oak-pine forests.

Grindelia oolepis (plains gumweed) - endemic; prairies and grasslands on black clay soils of the Gulf Coastal Bend; may occur along railroad rights-of-way and in urban areas; flowering May-December.

Hibiscus dasycalyx (Neches River rose-mallow) - endemic; wet alluvial soils in swamps or open riparian woodlands; flowering June-August.

Justicia runyonii (Runyon's water-willow) - on calcareous silt loam, silty clay, or clay in openings in subtropical woodlands on active or former floodplains; flowering (July-) September-November.

Mirabilis collina (sandhill four o'clock) - endemic; deep sands on sandhills in openings in pine-oak woodlands; flowering April-June.

Polygonella parksii (Parks' jointweed) - endemic; deep loose sands of Carrizo and similar Eocene formations, including disturbed areas; flowering spring-summer.

Sabal mexicana (Texas palmetto) - flatlands along rivers and resacas along lower Rio Grande.

Salvia penstemonoides (big red sage) - endemic; moist to seasonally wet clay or silt soils in creekbeds and seepage slopes of limestone canyons; flowering June-October.

Trillium pusillum var. texanum (Texas trillium) - acid hardwood bottoms and lower slopes, often in or downslope from acid sphagneous hillside seeps; flowering March-mid April.

Yucca necopina (Glen Rose yucca) - endemic; sandy soil; flowering April-June.

APPENDIX K

PART D: SPECIAL SPECIES HABITATS, UNIQUE COMMUNITY DESCRIPTIONS, AND MANAGED AREA ADDRESSES

(Cont.)

FISH:

Micropterus treculi (Guadalupe Bass) - endemic to headwater streams of Edwards Plateau.
Notropis buccula (Smalleye Shiner) - Brazos River drainage.
Satan eurystomus (Widemouth Blindcat) - a troglobitic blind catfish living in the San Antonio Pool of the Edwards Aquifer that can wash to the surface in artesian wells that puncture the Edwards Aquifer.
Trogloglanis pattersoni (Toothless Blindcat) - a troglobitic blind catfish living in the San Antonio Pool of the Edwards Aquifer that can wash to the surface in artesian wells that puncture the Edwards Aquifer.

AMPHIBIANS:

Bufo houstonensis (Houston Toad) - sandy substrate, water in pools, ephemeral pools, stock tanks; breeds in spring especially after rains; burrows in soil when inactive; breeds February-June.
Hypopachus variolosus (Sheep Frog) - predominantly grassland and savanna; moist sites in arid areas.
Notophthalmus meridionalis (Black-spotted Newt) - can be found in wet or sometimes wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods; Gulf Coastal Plain south of the San Antonio River.
Smilisca baudinii (Mexican Treefrog) - subtropical region of extreme southern Texas; breeds May-October coinciding with rainfall, eggs laid in temporary rain pools.
Siren intermedia texana (Rio Grande Lesser Siren) - can be found in wet or sometimes wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods, but does require some moisture to remain; southern Texas south of Balcones Escarpment; breeds February-June.

REPTILES:

Chrysemys picta bellii (Western Painted Turtle) - disjunct Rio Grande and Pecos River populations; courtship March-June, breeds May-June; slow-moving, shallow water with solf bottom, basking sites, and aquatic vegetation; streams, marshes, ponds, lakes, creeks; hibernates in water in bottom mud.
Coniophanes imperialis (Black-striped Snake) - extreme south Texas; semi-arid coastal plain, warm, moist micro-habitats and sandy soils; proficient burrower; eggs laid April-June.
Drymobius margaritiferus (Speckled Racer) - extreme south Texas; dense thickets near water; Texas palm groves, riparian woodlands; eggs laid April-August and hatch in about 6 weeks.
Graptemys caglei (Cagle's Map Turtle) - Guadalupe River system; pools and slow-moving sections of rivers and tributaries with exposed rocks, cypress knees, and logs (used as basking sites); breeds April-September.
Leptodeira septendrionalis septentrionalis (Northern Cat-eyed Snake) - Gulf Coastal Plain south of Nueces River; thornbrush woodland; dense thickets bordering ponds and streams; semi-arboreal.
Nerodia harteri harteri (Brazos Water Snake) - Brazos River system; shallow, fast-flowing water with rocky or gravel substrate preferred; adults can be found in deep water with mud bottom; breeds April-October.
Opheodrys vernalis (Smooth Green Snake) - Gulf Coastal Plain; mesic coastal shortgrass prairie vegetation; prefers dense vegetation.
Pituophis melanoleucus ruthveni (Louisiana Pine Snake) - mixed deciduous-longleaf pine woodlands; breeds April-September.
Thamnophis sirtalis annectens (Texas Garter Snake) - wet or moist habitats; hibernates underground or in or under surface cover; breeds March-August.

APPENDIX K

PART D: SPECIAL SPECIES HABITATS, UNIQUE COMMUNITY DESCRIPTIONS, AND MANAGED AREA ADDRESSES

(Cont.)

BIRDS:

Dendroica chrysoparia (Golden-cheeked Warbler) - nesting habitat is found in juniper-oak woodlands distributed along steep scarps and canyons; stands composed entirely of mature juniper do not constitute good warbler habitat; Golden-cheeks forage for insects in broad-leaved trees and shrubs; prime habitat has a diverse mixture of hardwood trees, especially Texas oak, Lacey oak, and scaleybark oaks (shin oak); Arizona walnut, sycamore, escarpment choke-cherry, madrone, Bumelia, cedar elm, and bigtooth maple are often lesser components of this unique habitat; in many places only a few mature junipers or nearby cedar brakes provide the necessary nest material; the steep narrow canyons of the Hill Country, with the tall deciduous trees along the drainage bottoms and junipers on the slopes provide an ideal mix of vegetation; arrives in Texas in March and stays through summer; eggs laid April-June.

Haliaeetus leucocephalus (Bald Eagle) - contact David Mabie, 715 South Bronte, Rockport, Texas 78382, 512/729-2315 for up-to-date information on eagle nesting localities; usually nests in tall trees or on cliffs near water; artificial reservoirs may improve habitat for wintering Bald Eagles, while destroying potential or actual nest sites for nesting Bald Eagles in mature bottomland forests.

Tympanuchus cupido attwateri (Attwater's Greater Prairie-chicken) - endemic; open prairies of mostly thick grass one to three feet tall; sandhill country with bunch grass, sage, and shinnery oak; from near sea level to 200 feet along coastal plain on upper two-thirds of Texas coast; only grouse which lives under near salt-marsh conditions; males form communal display flocks during late winter-early spring; booming grounds important; breeding February-July.

Vireo atricapillus (Black-capped Vireo) - requires foliage reaching to ground level for nesting cover; nests in oak-juniper woodlands with a distinctive, patchy, two-layered aspect; typical habitat is characterized by a shrub layer extending from the ground to about six feet and covering about 30 to 45 percent of the total area, combined with a tree layer featuring trees reaching to 30 feet or more; open, grassy spaces separate the trees and shrubs; deciduous and broad-leaved shrubs and trees, especially oak, are needed to provide insects, on which the vireo feeds; in Texas, habitat is found on rocky limestone soils of the Edwards Plateau, the Lampasas Cut Plain, the eastern Trans-Pecos, and to a limited extent, on igneous soils in the Chisos Mountains; common components of the habitat include: Texas oak, Lacey Oak, shin oak, live oak, mountain laurel, evergreen sumac, squawbush sumac, flame-leaf sumac, redbud, Texas persimmon, ashe juniper, mesquite, and agarita; species composition appears to be less important than the presence of adequate broad-leaved shrubs, foliage to ground level, and the required structure; arrives in Texas in late March-April and stays through summer.

MAMMALS:

Felis pardalis (Ocelot) - contact Dr. Mike Tewes at Caesar Kleberg Wildlife Research Institute, Texas A & I University, Campus Box 218, Kingsville, Texas 78363 or phone 512/595-3922 for information on the Ocelot, its habitat, distribution, and known localities; extreme south Texas; dense chaparral thickets; mesquite-thorn scrub and live oak mottes; avoids open areas; breeds and raises young June-November.

Felis yagouaroundi (Jaguarundi) - contact Dr. Mike Tewes at Caesar Kleberg Wildlife Research Institute, Texas A & I University, Campus Box 218, Kingsville, Texas 78363 or phone 512/595-3922 for information on the Jaguarundi, its habitat, distribution, and known localities; southern Texas; thick brushlands, near water favored; six month gestation, young born twice per year in March and August.

APPENDIX K

PART D: SPECIAL SPECIES HABITATS, UNIQUE COMMUNITY DESCRIPTIONS, AND MANAGED AREA ADDRESSES

(Cont.)

NATURAL COMMUNITIES:

Ashe Juniper-Oak Series - This evergreen shrubland or woodland primarily inhabits shallow-soiled, sloping sites over limestone in the Edwards Plateau. Disturbed areas over deeper soils on flat uplands may also support this community. It circumscribes a fairly wide degree of variation, and on dry sites may form an open shrubland with midgrasses and xeromorphic shrubs or may form closed canopy woodlands or low forest on more favorable sites. Texas, scalybark, scrub, and plateau live oaks along with evergreen sumac and agarito are components. To the west and north this type may grade into the redberry juniper-midgrass series. This community type forms landscape mosaics with plateau live oak woodland and grasslands on uplands and deciduous oak woodlands on adjacent mesic slopes.

Baldcypress-Water Tupelo Series - This deciduous swamp forest occupies hydric soils in east Texas. Composition depends on depth and duration of flooding and on past disturbance, with baldcypress often present in the deepest water or in cut-over swamp, and species such as water tupelo, overcup oak, water hickory, and ash present in shallow or less frequently flooded areas. Minor elevational differences can cause marked variation in depth and frequency of flooding, and hence vegetation. Oak-dominated bottomland hardwood communities and shrub swamps may interdigitate with this type.

Blackbrush Series - This shrubland occupies uplands, primarily over shallow soils, in the South Texas Plains. A variety of shrubs may be important, depending on soils, slope, and cultural influences. Mesquite, guajillo, granjeno, lotebush, Acacia spp., and other species may be present. This series is intermixed with the guajillo, mesquite-granjeno, and cane bluestem-mesquite series, and grades into subtropical ebony-dominated shrublands in the lower Rio Grande Valley.

Bluejack Oak-Pine Series - This mainly deciduous woodland usually occupies island-like patches or ridges of deep, sandy soils in east Texas. Longleaf pine and shortleaf pine are important in the south and east, but longleaf pine is not a component in the north and west. Other common components include southern red oak, post oak, blackjack oak, black hickory, farkelberry, and yaupon. Surrounding upland woodlands and forests on heavier textured soils are oak-hickory or oak-pine dominated.

Little Bluestem-Brownseed Paspalum Series - This tallgrass grassland occupies uplands of the Coastal Prairie and loamy soils of the Fayette Prairie. Indiangrass, tall dropseed, Setaria spp., big bluestem, hairyawn (gulf coast) muhly, fimbry, and a variety of forbs and sedges may be important. To the north similar habitats are occupied by Blackland Prairie tallgrass communities, while gulfward the type contacts coastal marshes, especially the gulf cordgrass series.

Little Bluestem-Indiangrass Series - This broadly-defined upland tallgrass grassland once occurred throughout the Blackland, Fayette, and Grand prairies, but is now restricted to small, isolated relicts. Composition of secondary species varies rather distinctly with soil type (clayey Vertisols versus loamy Alfisols). Tall dropseed, big bluestem, sideoats grama, fimbry, Carex microdonta, Florida paspalum, and other grasses and sedges may be important, along with a variety of forbs such as Maximilian sunflower, heath aster, and Mexican hat. Bottomlands of the prairies are wooded or support a gammagrass-switchgrass community type.

Pecan-Sugarberry Series - This deciduous forest or woodland occupies floodplains, primarily within the South Texas Plains, Edwards Plateau, and Blackland Prairie. It is best developed along major rivers, and soils are often heavy textured and calcareous. Important species may include netleaf hackberry, cedar elm, bur oak, American elm, plateau live oak, black walnut, ash, Texas oak, and box-elder. Drier floodplains of smaller streams may fall within the plateau live oak-hackberry series, while to the east more mesic floodplains support oak-dominated bottomland hardwood communities. Adjacent dry slopes may be ashe juniper or Acacia spp. dominated in the Edwards Plateau and South Texas Plains.

Post Oak-Blackjack Oak Series - This deciduous woodland or forest occurs in east and east-central Texas, including the Pineywoods, Post Oak Savannah, and Cross-Timbers. Composition of this broadly defined community type varies with geographic region and soils, with open woodlands occurring to the west or over drier soils and closed forests occurring to the east or over mesic soils. Cedar elm, southern red oak, yaupon, American beautyberry, water oak, black hickory, redbud, and deciduous holly are variously important. Eastern red cedar is a common invader. Open woodlands often contain components of tallgrass grasslands in the herbaceous layer, and this type may intergrade with the post oak-black hickory or bluejack oak-pine series.

Silveanus Dropseed Series - This tallgrass community type occupies loamy, low pH upland soils in the northeastern Blackland Prairie. Important species include sedges, thick-spiked tridens, Indiangrass, switchgrass, and eastern gammagrass along with a diversity of forbs. On clayey soils in this region relict communities are dominated by gammagrass and switchgrass.

Sugarberry-Elm Series - This broadly defined deciduous forest occurs on floodplains and mesic slopes, primarily in central and south Texas. American elm is common on wetter sites, while cedar elm increases to the west and south. Composition varies with flooding regime and geographic location. Pecan, ash, oaks, and sycamore are variously important, but geographic differences are poorly documented. The plateau live oak-netleaf hackberry and pecan-sugarberry series are defined for the Edwards Plateau, South Texas Plains, and Blackland Prairie. Sugarberry or netleaf hackberry and cedar elm dominated communities are a widespread and common disturbance type of uplands and floodplains of central and south Texas. To the east this type grades into typical bottomland hardwoods communities within the water oak-willow oak series.

Texas Ebony-Anacua Series - This evergreen subtropical forest occurs primarily on well-drained but moist river or resaca terraces in the lower Rio Grance Valley. Snake-eyes, coma, Tenaza, tepeguaje, colima, brasil, granjeno, lotebush, and mesquite may be important. This type is similar to subtropical shrubland, which occupies drier sites.

Texas Oak Series - This mainly deciduous woodland or forest occurs primarily on mesic slopes over calcareous soils of the eastern and southern Edwards Plateau and Lampasas Cut-Plain. Cedar elm, sugarberry, netleaf hackberry, plateau live oak, chinkapin oak, scalybark oak, ashe juniper, black cherry, and Texas ash are variously important. Plateau live oak woodlands or mixed grasslands occupy adjacent deep upland soils, while ashe juniper woodlands occupy drier slopes. Adjacent floodplains are sugarberry, elm, pecan, or live oak dominated. In a relatively small postion of the south central Edwards Plateau similar sites may support the Lacey oak series, and to the east scalybark oak is locally dominant.

Texas Palmetto Series - This evergreen subtropical woodland or forest is limited to a few sites along the Rio Grande south of Brownsville, although populations of palm are known from as far north as Victoria County. It was probably never widespread in Texas, and may be dependent on frequent flooding and fire. Texas ebony, brasil, cedar elm, anacua, Tenaza, tepeguaje, and coma are present. This type is closely related to the Texas Ebony-Anacua Series.

Water Oak-Willow Oak Series - This broadly defined deciduous bottomland hardwood forest occupies often-inundated floodplains of major streams in east Texas. Composition varies with minor changes in elevation and with geographic location. Common components include sweetgum, cherrybark oak, ash, and overcup oak in the overstory and ironwood, eastern hop-hornbeam, deciduous holly, and Florida maple in the understory. Swamps and marshes are often intermixed, and surrounding uplands are usually oak-hickory or oak-pine types.

APPENDIX K

PART D: SPECIAL SPECIES HABITATS, UNIQUE COMMUNITY DESCRIPTIONS, AND MANAGED AREA ADDRESSES

(Cont.)

MANAGED AREAS:

Attwater Prairie Chicken National Wildlife Refuge - Tom Prusa, Refuge Manager; Gary Montoya, Assistant Manager; Box 518, Eagle Lake, Texas 77434; 409/234-3021.

Bonham State Recreation Area - Michael Steen, Park Superintendent; Route 1, Box 337, Bonham, Texas 75418; 214/583-5022.

Caddo Wildlife Management Area (Bois D'Arc Unit) - David Sierra; P.O. Box 2127, Sulphur Springs, Texas 75482; 214/885-3922.

Dinosaur Valley State Park - Billy Paul Baker, Park Superintendent; Box 396, Glen Rose, Texas 76043; 817/897-4588.

Goliad State Historic Park - Robert L. Ellis, Park Superintendent; P.O. Box 727, Goliad, Texas 77963; 512/645-3405.

I.D. Fairchild State Forest - Texas A & M University, College Station, Texas 77843.

Jim Hogg State Historic Park - John Garbutt, III, Park Superintendent; Route 2, Box 29, Rusk, Texas 75785; 214/683-4850.

Kreische Brewery State Historic Park - Ellen Buchanon, Park Superintendent; P.O. Box C, La Grange, Texas 78945; 409/968-5658.

Lake Texana State Recreation Area - William Granberry, Park Superintendent; P.O. Box 666, Edna, Texas 77957; 512/782-5718.

Las Palomas Wildlife Management Area (Voshell Unit) - Gary Waggerman; 410 North 13th Street, Edinburg, Texas 78539; 512/383-8982.

Lower Rio Grande Valley National Wildlife Refuge - Dennis Prichard; c/o Santa Ana National Wildlife Refuge, Route 2, Box 202A, Alamo, Texas 78516; 512/787-3079.

Meridian State Recreation Area - Kenneth Klose, Park Superintendent; Box 188, Meridian, Texas 76665; 817/435-2536.

Possum Kingdom State Recreation Area - Steve Jones, Park Superintendent; Box 36, Caddo, Texas 76029; 817/549-1803.

Resaca de la Palma - Rey Ortiz; c/o Bentsen-Rio Grande Valley, P.O. Box 988, Mission, Texas 78572; 512/585-1107.

Richland Creek Wildlife Management Area (North) & (South) - Hayden Haucke; Route 1, Box 44H, Tennessee Colony, Texas 75861; 214/928-2251.

Rusk State Recreation Area - Dennes Walsh, Park Superintendent; Route 4, Box 431, Rusk, Texas 75785; 214/683-5126.

Sabal Palm Grove Sanctuary - Rose Farmer, Refuge Manager; Box 5052, Brownsville, Texas 78523; 512/541-8034.

Stephen F. Austin State Historic Park - Johnny Finch, Park Superintendent; P.O. Box 125, San Felipe, Texas 77473; 409/885-3613.

APPENDIX L

SUMMARY OF BALD EAGLE ACTIVE NEST DISTRIBUTION IN TEXAS

Source: David Mabie, Biologist Texas Parks and Wildlife Department, Rockport, Texas.

ACTIVE NEST SITE/PROPOSED RESERVOIR ANALYSIS.

The following proposed reservoir locations contain an active Bald Eagle nest site in or immediately adjacent to the reservoir boundary and would be adversely affected by construction of the reservoir:

1 - SHAWS BEND, Fayette and Colorado Counties

2 - PALMETTO BEND II, Jackson County

NOTE: Although no other proposed reservoir project will directly affect currently known nest sites, many acres of suitable but unoccupied habitat will be affected.

SUMMARY OF BALD EAGLE ACTIVE NEST DISTRIBUTION IN TEXAS BY RIVER BASIN

RIVER BASIN SYSTEM	PERCENT-OF-TOTAL ACTIVE NESTS ASSOCIATED WITH RIVER BASINS IN TEXAS	SPECIFIC BASIN SEGMENT CONTAINING ACTIVE NESTS
San Antonio/ Guadalupe	32 %	Goliad to Coast
Colorado	25 %	Bastrop to Coast
Brazos	18 %	Fort Bend County to Coast
Trinity	11 %	Liberty and Chambers Counties
Sabine	7 %	Extreme Eastern Segment

SUMMARY:

This data suggests that a vast majority of the Texas resident Bald Eagle population is confined to the downstream segments of the San Antonio, Guadalupe, Colorado, and Brazos River Basins to include the coastal basins between Houston and Rockport. This further suggests that planning for Cuero, Allens Creek, Lindenau, Cibolo, Goliad, and Shaws Bend proposed reservoirs should include protecting habitat for the Bald Eagle.

APPENDIX M

A SUMMARY OF NATURAL AREAS AND NATURAL LANDMARKS LOCATED AT TWENTY PROPOSED RESERVOIR SITES IN TEXAS.

RESERVOIR IMPACT ON REGISTERED NATURAL AREA/NATURAL LANDMARK PLACES

Source: The Natural Areas of Texas, Texas Natural Area Survey, 1967, unpublished.

NA = Natural Area (Texas Natural Area Survey)
NL = Natural Landmark (National Register of Natural Landmarks)
L = Location
D = Description

Allens Creek, Austin County

NL - Attwater Prairie Chicken National Wildlife Refuge approximately 18 miles west-northwest of reservoir site.

Impact: **None Noted**

Applewhite, Bexar County

NA - Medina River Basin (18-BX-8)

L: Medina River from western boundary of county to confluence south San Antonio River

D: Beautiful scenic river lined with Bald Cypress

Impact: **Loss of the majority of this natural area because of inundation by reservoir water.**

Big Sandy, Upshur County

Impact: **None Noted**

Bosque, Bosque County

NA - Devils Elbow south of reservoir site on Middle Bosque River

Impact: **None Noted**

Cibolo, Wilson County

Impact: **None Noted**

Cuero, DeWitt and Gonzales Counties

DeWitt County - **None Noted**

Gonzales County

NA - Guadalupe River (17-GZ-1)

L: West to East boundary of Gonzales County.

D: Clear, free flowing stream, ancient bald cypress.

Impact: **Loss of a large section of the natural area because of inundation by the reservoir.**

NA - San Marcos River (17-GZ-2)

L: San Marcos River from west line of county to confluence with Guadalupe River.

D: Beautiful stream crossed by only two roads above Gonzales.

Impact: **Loss of a small section due to inundation of the reservoir. Probable modification because the area lies immediately adjacent to the proposed reservoir and would be subject to the potential of high water flooding.**

Eastex, Cherokee County

Impact: **None Noted**

George Parkhouse I, Delta County and Hopkins County

Delta County

NA - Horton Bottoms (5-DT-1)

L: Both sides of the South Sulphur River from east of Horton to Highway 1880.

D: River bottom hardwood forest.

Impact: **Probable modification through potential flooding from reservoir.**

NA - Sulphur River (5-TT-9)

L: Entire south bank of Sulphur River.

D: Southern Flood Plain forest.

Impact: **Probable alteration because the natural area is immediately downstream from the proposed dam and subject to flow reduction.**

Hopkins County

NA - Horton Bottoms (5-DT-1)

L: Both sides of the South Sulphur River from east of Horton to Highway 1880.

D: River bottom hardwood forest.

Impact: Probable modification through potential flooding of high water from reservoir.

NA - Sulphur River (5-TT-9)

L: Entire south bank of Sulphur River.

D: Southern Flood Plain forest.

Impact: Probable alteration because the natural area is immediately downstream from the proposed dam and subject to flow reduction.

George Parkhouse II, Delta and Lamar Counties

Delta County

NA - Sulphur River (5-TT-9)

L: Entire south bank of Sulphur River.

D: Southern Flood Plain forest.

Impact: Probable alteration because the natural area is immediately downstream from the proposed dam and subject to flow reduction.

Lamar County

NA - Sulphur River (5-TT-9): Same comments are applicable as for Delta County.

Goliad, Goliad and Karnes Counties

Goliad County - No Conflict

Karnes County - No Conflict

Impact: None Noted

Lindenau, DeWitt and Gonzales Counties

DeWitt County - No Conflict

Gonzales County - No Conflict

Impact: **None Noted**

Little Cypress, Harrison County

NA - Caddo Lake North Shores (6-MR-1)

L: Caddo Lake North Shores (downstream, Marion County)

D: Indian artifacts, village sites, hardwoods.

Impact: **Unknown downstream impact on this natural area. Possible impact from reduction of flow.**

New Bonham, Fannin County

NA - White Ash Wetland (22-FN-2)

L: Northeast quadrant of county.

D: Overflow hardwood bottomland, laced by sloughs and drained by Bois d'Arc Creek.

Impact: **Loss of a major portion of the natural area because of reservoir water inundation.**

Palmetto Bend II, Jackson County

Impact: **None Noted**

Paluxy, Hood and Somervell Counties

NA - Paluxy River (4-HD-2)

L: A zone from 1 to 3 miles wide encompassing the Paluxy River in Hood County.

D: Clean River flowing through pastoral valleys between limestone hills.

Impact: **Loss of the majority of this natural area because of reservoir water inundation.**

NL - Dinosaur Valley State Park

Impact: **Probable loss by dam construction and stream flow interruption.**

Post, Garza County

No Conflict

Impact: **None Noted**

Rio Grande Site "A", Cameron County

NA - Brownsville Whitewing Dove Habitat (21-CF-10)

L: Located just inside the city limits of Brownsville on FM 802 around 1-½ miles east of U.S. 83.

D: Approximately 45 acres in size, the tract provides good representation of the South Texas Brushland. The mesquite trees provide good habitat for the whitewing dove. Much of the good whitewing dove habitat in South Texas is being cleared.

Impact: **Loss of at least a portion of the area near or coincidental to the reservoir site. Probable destruction or modification of the areas adjacent or in the vicinity of the reservoir.**

NA - Sabal Palm Grove (21-CF-2)

L: Occupies a part of the two southern most bends of the Rio Grande below Brownsville.

D: Elf Owls - the only place in the U.S. where Bolteri's sponoro is known to nest.

D: Turk's cap, binch (species unknown) black berry, ash, cedar, elm, willow

Impact: **Probable habitat alteration from flow control downstream from dam site.**

Shaws Bend, Fayette and Colorado Counties

Fayette County - No Conflict

Colorado County - No Conflict

Impact: **None Noted**

APPENDIX M

South Bend, Young and Stephens Counties

Young County - No Conflict

Stephens County - No Conflict

Impact: **None Noted**

Tehuacana, Freestone County

No Conflict

Impact: **None Noted**

APPENDIX N

A SUMMARY OF SIGNIFICANT STREAM SEGMENTS WHICH OCCUR AT TWENTY PROPOSED RESERVOIR SITES IN TEXAS.

RESERVOIR	COUNTY	SEGMENT REFERENCE NUMBER	REMARKS
Allens Creek	Austin	None	
Applewhite	Bexar	None	(NA=Medina River)
Big Sandy	Wood Upshur	# 166 SB-Q2	Glade Creek: Headwaters to Gladewater, coded 'Q': Unique swamp/bog area, biodiversity. **Proposed reservoir impact: loss of habitat feature.**
Bosque	Bosque	None	
Cibolo	Wilson	None	
Cuero	DeWitt Gonzales	None	
Eastex	Cherokee	NE-B1	Immediately upstream from priority 1 bottomland hardwood habitat regime. **Proposed reservoir impact: Probable modification of priority bottomland hardwood site because of reduced stream flow.**
G. Parkhouse I	Delta Hopkins	None	
G. Parkhouse II	Delta Lamar	None	
Goliad	Karnes Goliad	None	
Lindenau	DeWitt Gonzales	None	
Little Cypress	Harrison	None	
New Bonham	Fannin	None	

APPENDIX N

A SUMMARY OF SIGNIFICANT STREAM SEGMENTS WHICH OCCUR AT TWENTY PROPOSED RESERVOIR SITES IN TEXAS.
(Cont.)

RESERVOIR	COUNTY	SEGEMENT REFERENCE NUMBER	REMARKS
Palmetto Bend II	Jackson	LA-B1	Lavaca River, SH 35 crossing just west of Edna downstream to Lavaca Bay, coded: "B": Extensive freshwater wetland habitat. **Proposed reservoir impact: Probable loss of priority wetland habitat and significant impact on estuarine habitat downstream from stream flow control.**
Paluxy	Hood Somervell	BR-R2	Paluxy River: Bluff Dale, Erath County, to Glen Rose, Somervell County, coded, "R": High Recreation Value. **Proposed reservoir impact: Loss of stream recreation resource.**
		BR-S1	Paluxy River: Dinosaur Valley State Park, coded, "S": Unique State holding, National Natural Landmark. **Proposed reservoir impact: Significant impact on the existing state resources and destruction of prehistoric record from reduced stream flow.**
		BR-B6	Paluxy River: Confluence with Brazos River to 40 miles up stream, coded, "B": Striped bass spawning and migration. Proposed reservoir impact: Loss of the stream network providing completion of the biological function of the fishery resource.
Post	Garza	None	

APPENDIX N

A SUMMARY OF SIGNIFICANT STREAM SEGMENTS WHICH OCCUR AT TWENTY PROPOSED RESERVOIR SITES IN TEXAS.
(Cont.)

RESERVOIR	COUNTY	SEGMENT REFERENCE NUMBER	REMARKS
Rio Grande Site "A"	Cameron	RG-Q6	Rio Grande Tidal Zone, coded, "Q": Exceptional Aquatic Life. **Proposed reservoir impact: Significant impact on estuarine habitat downstream from stream flow control.**
		RG-B2	Rio Grande River: Upstream-most boundary of Brownsville downstream to Gulf, coded, "B": Extensive freshwater wetland habitat. **Proposed reservoir impact: Significant modification of priority wetland habitat and significant impact on estuarine habitat downstream from streamflow control.**
		RG-B1	Falcon Lake Dam to downstream river mouth, coded "B": Priority bottomland habitat. **Proposed reservoir impact: Significant modification of bottomland habitat.**
		RG-E8	Laredo downstream to gulf, coded"E": Protected, Ashy dogwood (G1S1), Prostrate milkweed (G1S1), Walker's manihot (G1SH), Star cactus (G2S1), Runyon's water-willow (G2S2) **Proposed reservoir impact: Probable destruction or significant alteration of protected species habitat in the vicinity of the reservoir.**

APPENDIX N

A SUMMARY OF SIGNIFICANT STREAM SEGMENTS WHICH OCCUR AT TWENTY PROPOSED RESERVOIR SITES IN TEXAS.
(Cont.)

RESERVOIR	COUNTY	SEGMENT REFERENCE NUMBER	REMARKS
Shaws Bend	Fayette Colorado	None	
South Bend	Young Stephens	BR-B1	Brazos River: City of Seymour downstream 90 miles to Lake Possum Kingdom reservoir, coded, "B": Striped bass spawning, migration with unique saltwater springs. **Proposed reservoir impact: Interference with biological reproduction of fishery resource in the segment of the stream.**
Tehuacana	Freestone	None	

APPENDIX O

A SUMMARY OF BIRD CENSUS DATA COLLECTED AT 90TH CHRISTMAS BIRD COUNT LOCATIONS WHICH INTERSECT TWENTY RESERVOIR LOCATIONS IN TEXAS.

Source: American Birds, 90th Christmas Bird Count, 1991

APPROXIMATE RESERVOIR LOCATIONS	COUNTY	BIRD COUNT NAME	OBSERVATIONS BEGAN	LOCATION CODE	OBSERVATION SUMMARY		
					TIME (HRS)	SPECIES	COUNT
Allens Creek	Austin	Cypress Creek, Texas	1977	CY TX	59.5	135	428,796
		Attwater Prairie Chicken N.W.R., Texas	1975	AP TX	89.5	155	118,069
Applewhite	Bexar	San Antonio, Texas	1956	SA TX	151	155	59,529
Big Sandy	Wood Upshur	No count in the area.					
Bosque	Bosque	No count in the area.					
Cibolo	Wilson	No count in the area.					
Cuero	DeWitt Gonzales	Palmetto State Park, Texas	1986	PM TX	79.5	116	29,654
Eastex	Cherokee	No count in the area.					
G. Parkhouse I	Delta Hopkins	No count in the area.					
G. Parkhouse II	Delta Lamar	No count in the area.					
Goliad	Goliad Karnes	No count in the area.					
Lindenau	DeWitt Gonzales	Palmetto State Park, Texas	1986	PM TX	79.5	116	29,654
Little Cypress	Harrison	Lake O' the Pines, Texas	-	LO TX	48	103	22,800
		Longview, Texas	-	LG TX	68	94	20,535

APPENDIX O

A SUMMARY OF BIRD CENSUS DATA COLLECTED AT 90TH CHRISTMAS BIRD COUNT LOCATIONS WHICH INTERSECT TWENTY RESERVOIR LOCATIONS IN TEXAS.

(Cont.)

APPROXIMATE RESERVOIR LOCATIONS	COUNTY	BIRD COUNT NAME	OBSERVATIONS BEGAN	LOCATION CODE	OBSERVATION SUMMARY		
					TIME (HRS)	SPECIES	COUNT
New Bonham	Fannin	Caddo National Grasslands, Texas	-	CA TX	55	102	20,089
Palmetto Bend II	Jackson	No count in the area.					
Paluxy	Somervell	No count in the area.					
Post	Garza	No count in the area.					
Rio Grande Site "A"	Cameron	Brownsville, Texas	1949	BV TX	53	161	17,824
Shaws Bend	Fayette Colorado	Osage, Texas	-	OS TX	10	47	2,383
South Bend	Young Stephens	No count in the area.					
Tehuacana	Freestone	No count in the area.					

CHRISTMAS BIRD COUNT

Purpose: This survey was begun in 1900 when about 25 persons counted birds on Christmas. The annual survey is now conducted for the purpose of indexing population levels and describing bird distribution during the winter.

Location: Data are stored at the Cornell Laboratory of Ornithology, 159 Sapsucker Woods Road, Ithaca, NY 14850.

Contact person: Jim Lowe, (607) 254-2414

Description of variables: Counts are conducted within a 15-mile diameter circle by an unspecified number of volunteers for an unspecified period in 1 day. Counting effort is documented by party (person) miles and party hours. Christmas Bird Counts (CBC's) include birds counted at feeders, and birds detected with special effort (e.g. owling).

About 1540 circles are searched by about 41,000 persons (1986-87).

Data are computerized by species, state, latitude-longitude and physiographic region (the same delineations as used in the Breeding Bird Survey). Population trends can be estimated by special arrangement.

Geographic coverage: North America; primarily S. Canada and the United States.

Time coverage: 1961-1988 data are in computer data bank. Earlier data are available from publications and reports (Contact Jim Lowe).

Status: active; continuing.

Software: The Cornell Laboratory of Ornithology maintains software for data management, mapping and some statistical analyses.

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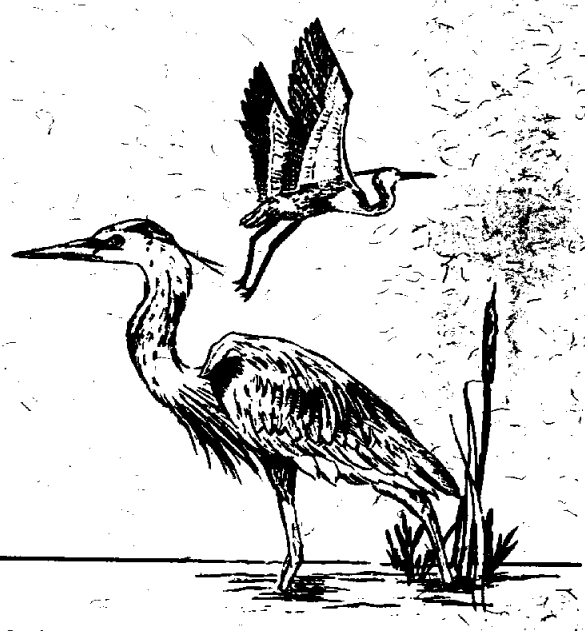

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