US Army Corps
of Engineers

GALVESTON DISTRICT
SOUTHWESTERN DIVISION

# MASTER PLAN

# WALLISVILLE LAKE, TEXAS PROJECT

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August 1996

# MASTER PLAN
# WALLISVILLE LAKE, TEXAS PROJECT

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# 1.0 MASTER PLAN

## 1.1 Master Plan Purpose

It is the policy of the U.S. Army Corps of Engineers (USACE) as outlined in Engineering Regulation (ER) 1130-2-435 that Master Plans be developed and kept current for all Civil Works projects for which the Corps has administrative responsibility for management. The Master Plan is the basic document guiding USACE responsibilities to preserve, conserve, manage, and develop project lands, waters, and associated resources. It is a continuing and dynamic document, unlike the feasibility study (and associated Environmental Impact Statements and Environmental Assessments) and the general/feature design memoranda which also plan for the development of resources. The Master Plan is a planning document anticipating what could and should happen to project resources and is flexible to changing conditions and needs. To maintain this flexibility, the Master Plan will be reevaluated periodically to determine if conditions have changed enough to warrant a revision to account for the changes. As such, the Master Plan deals in concepts, not in details of design or administration. Design functions (project features) and National Environmental Policy Act (NEPA) documentation for design changes subsequent to the feasibility study and authorization are handled in feature design memoranda and in contract plans and specifications. Agency and public comments and concerns on project features and functions were addressed in these documents prior to developing this Master Plan. Therefore, the Master Plan is not a vehicle for changing project features or purposes which were authorized by the Congress.

In keeping with USACE planning policy, the Master Plan is a working document which contains information, analyses, and guidelines for the administration of all land and water areas of the Project. It should be referred to frequently by Division, District, and field personnel. Subsequent aspects of planning, development, and management for the overall Wallisville Project and for specific portions of the Project, including outgrants, will be consistent with the zoning and resource use objectives presented in this Master Plan. The Master Plan is both flexible and conceptual by design and is subject to revision as indicated by changing needs and conditions.

## 1.2 Master Plan Scope

The Master Plan evaluation focuses on Project lands and includes consideration of scenic, recreational, and fish and wildlife values. The Master Plan is, however, based on an understanding of the operations of the Project. Accordingly, management recommendations and

proposed improvements relative to public use and wildlife management are formulated to be in harmony with the Project purposes.

## 1.3 Master Plan Objectives

The Wallisville Project was originally authorized to provide for five purposes: navigation, salinity control, water supply, fish and wildlife enhancement, and recreation. Based on these purposes, a number of specific objectives were developed to guide in the preparation of the Master Plan. These objectives are as follows:

- To explain the planning process applied throughout the Master Plan so that minimal effort is required to understand and follow-up on the methodology applied herein.

- To coordinate the Master Planing process with the public and pertinent local, State, and Federal agencies.

- To present an integrated plan for recreation and other purposes with the ability to move through design, construction, and into operation with little change in purpose, appearance, or utility.

- To prepare a plan which will promote the continued public utilization of all Project resources up to a capacity which is consistent with USACE policies, development and management constraints and the natural and cultural environment.

- To provide a total plan of development, including a land and water use plan, conceptual area plans, and a fish and wildlife management plan.

- To provide management guidelines designed to optimize public use of the Project, minimize environmental damage, and facilitate Project operations and management.

- To identify and discuss any unique or special problems that characterize and have any effect on the development and management of the Project.

## 1.4 Application of Public Laws

The following Federal laws provide for the development and management of Federal projects for various purposes according to the intent of the Congress:

The Flood Control Act of 1944 (Public Law 78-534), as amended by the Flood Control Acts of 1946, 1954, 1960, and 1962, authorizes the USACE to construct, maintain, and operate public park and recreational facilities at water resources development projects and to permit local interests to construct, maintain, and operate such facilities.

The Fish and Wildlife Coordination Act of 1958 (Public Law 85-624) requires that any agency impounding, diverting, or controlling water consult with the United States Department of the Interior, U.S. Fish and Wildlife Service (USFWS). The USFWS and the USACE determine the possible damage resulting to wildlife resources and the means and measures to prevent the damage and to provide concurrently for the development and improvement of such wildlife resources.

The Reservoir Salvage Act of 1960 (Public Law 86-527) requires that cultural resources to be inundated by reservoirs in excess of 5,000 acre feet or 40 surface acres be studied by professional archeologists prior to actual construction. The Archeological and Historic Preservation Act of 1974, an amendment to the Reservoir Salvage Act, authorizes Federal agencies to expend their own funds on archeological salvage projects.

Public Law 88-29, May 28, 1963, authorizes the Secretary of the Interior to inventory and classify outdoor recreation needs and resources and to prepare a comprehensive outdoor recreation plan taking into consideration the plans of the various Federal agencies, States, and other political subdivisions. It also states that Federal agencies undertaking recreational activities shall consult with the Secretary of the Interior concerning these activities and shall carry out such responsibilities in general conformance with the nationwide plan.

The Federal Water Project Recreation Act of 1965 (Public Law 89-72), as amended, requires that full consideration be given to opportunities afforded by outdoor recreation and fish and wildlife resources. It further provides for non-Federal participation in the separable costs for recreation and fish and wildlife development, and the assumption of non-Federal responsibility for operation, maintenance, and replacement of these facilities. Similar provisions for recreational development at non-reservoir projects are established by Federal policy based on this law.

The National Historic Preservation Act of 1966 (Public Law 89-655) sets forth the Federal role in historic preservation and requires the Federal agency having jurisdiction over the proposed Federal project take into account the effect of the project on any historic district, site, structure, or object included in, or eligible for, the National Register, and to coordinate with the Advisory Council on Historic Preservation concerning these matters.

The National Environmental Policy Act of 1969 (Public Law 91-190) sets forth a national policy for the protection and enhancement of the environment and requires that the significant environmental effects of each project be evaluated and presented in an environmental impact statement.

The River and Harbor and Flood Control Act of 1970 (Public Law 91-611) establishes the requirement (Section 122) for evaluating the economic, social, and environmental impact of projects.

The Endangered Species Act of 1973 (Public Law 97-304), as amended, sets forth a national policy for the protection of endangered or threatened fauna and flora. The Act requires Federal agencies, in consultation with and with the assistance of the Secretary of the Interior, to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any listed species or result in the adverse modification of habitat of such species which has been designated as critical habitat.

The American Indian Religious Freedom Act of 1978 (Public Law 95-341) states that it is the policy of the United States "to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indians, Eskimo, Aluet, and Native Hawaiians, including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rights". This act is implemented by the Archeological Resources Protection Act of 1979.

The Archeological Resources Protection Act of 1979 (Public Law 96-95) protects irreplaceable archeological resources on public and Indian lands from unauthorized excavation, defacement, removal, damage, or alterations and to enhance communication and exchange of information among government personnel, professional archeologists, and private individuals possessing artifact collections and other data acquired prior to enactment of PL 96-95. It establishes new permitting requirements for any qualified person proposing to excavate and/or remove archeological resources from Federal or Indian lands. When archeological resources are destroyed or removed from Federal or Indian lands without such a permit, the act provides for

increased civil penalties and new criminal penalties. The surface collecting of arrowheads, rocks, coins, bullets, or minerals is permitted under the act.

The Native American Grave Protection and Repatriation Act of 1990 (Public Law 101-601) regulates the removal and treatment of human remains, funerary and sacred objects, and objects of cultural patrimony that are located on Federal or tribal lands. It also makes provisions for the return, upon request, of certain cultural items to Native Americans and Hawaiians; makes illegal the trafficking of those items; and sets forth procedures for their repatriation.

The Federal Water Pollution Control Act of 1972 (Public Law 92-500) controls water pollution to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. The law was amended in 1977 to focus on toxic water pollutants and renamed the Clean Water Act. Subsequent revisions of the Act require improving water quality affected by insufficient minimum discharge standards, more effectively dealing with hazardous substance spills, identifying and protecting wetlands, controlling pollutants in stormwater runoff, and controlling oil and hazardous substances discharges.

The Comprehensive Environmental, Response, and Liability Act (CERCLA) of 1980 (Public Law 96-510), as amended, establishes a comprehensive response program for past hazardous waste activities and for responding to hazardous substance spills. CERCLA's broad scope covers all environmental media (air, surface water, groundwater, and soil) and can apply directly to any industrial, commercial, or non-commercial facility that may release (including threat of release) into the environment a hazardous substance, pollutant, or contaminant. In accordance with USACE Engineering Regulation 1165-2-132, project actions must consider Hazardous, Toxic, and Radioactive Wastes (HTRW) listed as a hazardous substance under CERCLA. Under CERCLA Section 101(14), a hazardous substance is any substance EPA has designated for special consideration under the Clean Air Act, Clean Water Act, or Toxic Substances Control Act, and hazardous waste is any material designated under the Resource Conservation and Recovery Act.

## 1.5 Issues Affecting Development of the Master Plan

### 1.5.1 Endangered Species Act of 1973, as amended

In November 1989, the endangered bald eagle (*Haliaeetus leucocephalus*) (currently classified as a threatened species in Texas and most of the other lower 48 states) was discovered nesting in a cypress swamp within the Project Area. Under the provisions of Section 7(c) of the

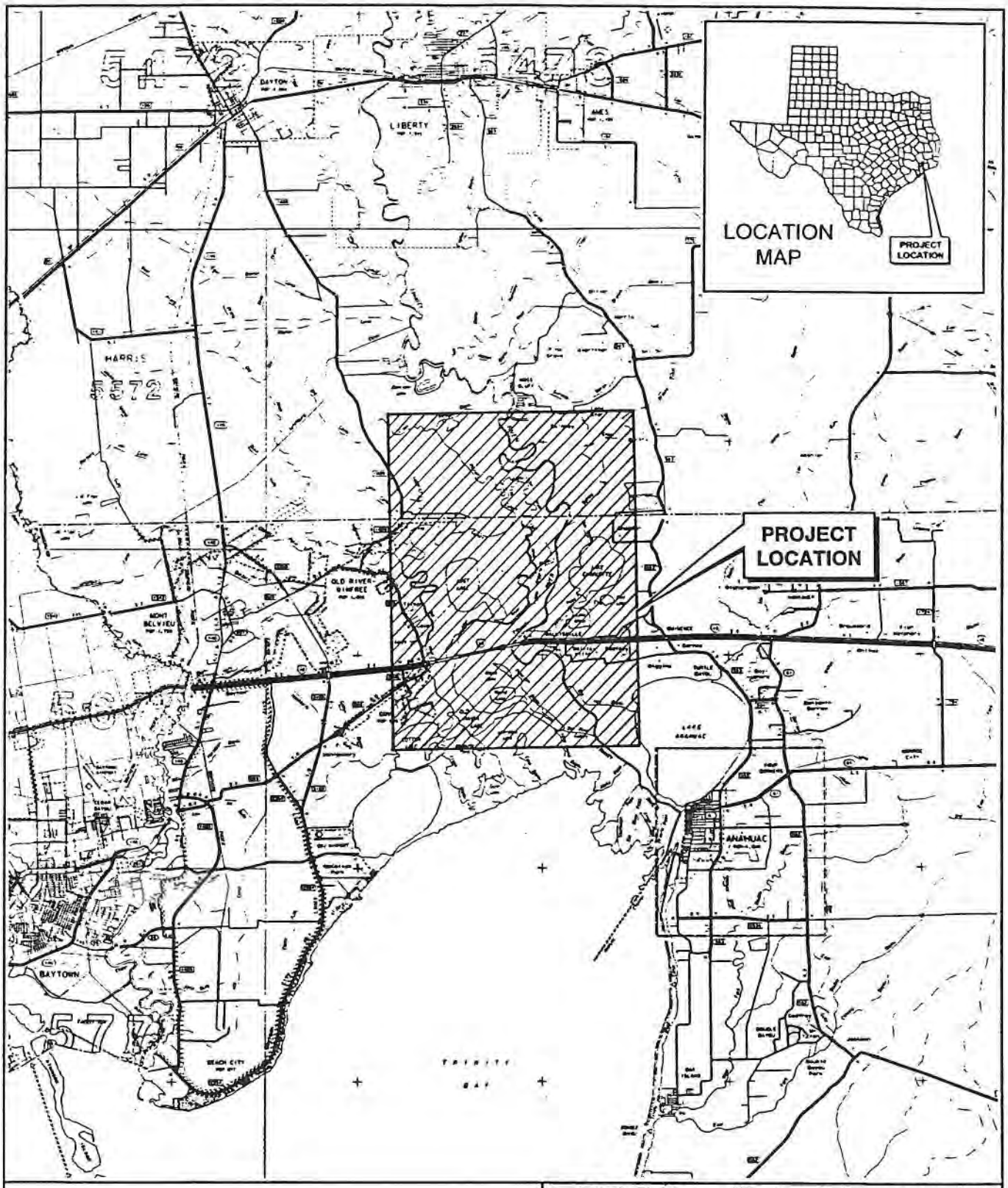
Endangered Species Act, the USFWS prepared a Biological Opinion dated July 20, 1990 which specified reasonable and prudent measures necessary to assure the survival and reproductive success of the bald eagles. These reasonable and prudent measures included: Maintaining normal water levels at the proposed reservoir at no more than 2 feet above mean sea level (msl); ensure that current levels of mortality and tree vigor within the cypress swamps are not altered by the Project; develop a regeneration scheme (including tree planting if necessary) for the bald cypress swamp; incorporate the protection of the bald eagle nest area into a management plan for the Project; and explore and implement environmentally safe methods to control large infestations of aquatic weeds. The measure concerning maintaining water levels at the 2-foot level for the reservoir is no longer applicable to the current Project since the Project has been modified to prevent saltwater intrusion without the need for a large "head" of water pressure behind the dam. Therefore, the Project has no need for a reservoir.

### 1.5.2 National Historic Preservation Act of 1966, as amended

At least 190 historic resource sites have been documented within the Project boundaries. A Memorandum of Agreement (MOA) with the Texas State Historical Preservation Officer (SHPO) and the Advisory Council on Historic Preservation was signed on November 9, 1984 which provides for the management and mitigation of sites to be affected by Project construction (Appendix B). A Mitigation Program required by this MOA was developed in coordination with the SHPO in 1993. The program is described in Feature Design Memorandum (FDM) No.10 - Historic Properties.

### 1.5.3 Authorized Project

The authorized project, located near the mouth of the Trinity River (Figure 1-1) between Houston and Beaumont, Texas (Figure 1-2), has undergone significant construction and operation changes since its inception in 1962 to eliminate or reduce environmental impacts. The Project has been scaled-down from the original 19,700-acre reservoir (Figure 1-3) in several stages to reduce environmental impacts. The first reduction in size was to a 5,600-acre reservoir (Figure 1-4), followed by a 3,800-acre reservoir (Figure 1-5), and finally to the present Project with no reservoir (Figure 1-6) which will act as a saltwater barrier during low river-flow conditions. Therefore, as presently designed, the authorized Project will not serve as a reservoir and will emulate pre-Project conditions as closely as possible. The 19,700 acres of Trinity River bottom and delta, which would have been inundated by the original Project, are owned in fee by the Federal Government and will be managed by the USACE for operations, recreation, outgranted lands (including mining), and for fish and wildlife.




Base Map: TxDOT General Hwy. Maps; Chambers and Liberty,Counties, Texas

EH&A Espey, Huston & Associates, Inc.
Engineering & Environmental Consultants

Figure 1-1

GENERAL LOCATION MAP
OF WALLISVILLE PROJECT

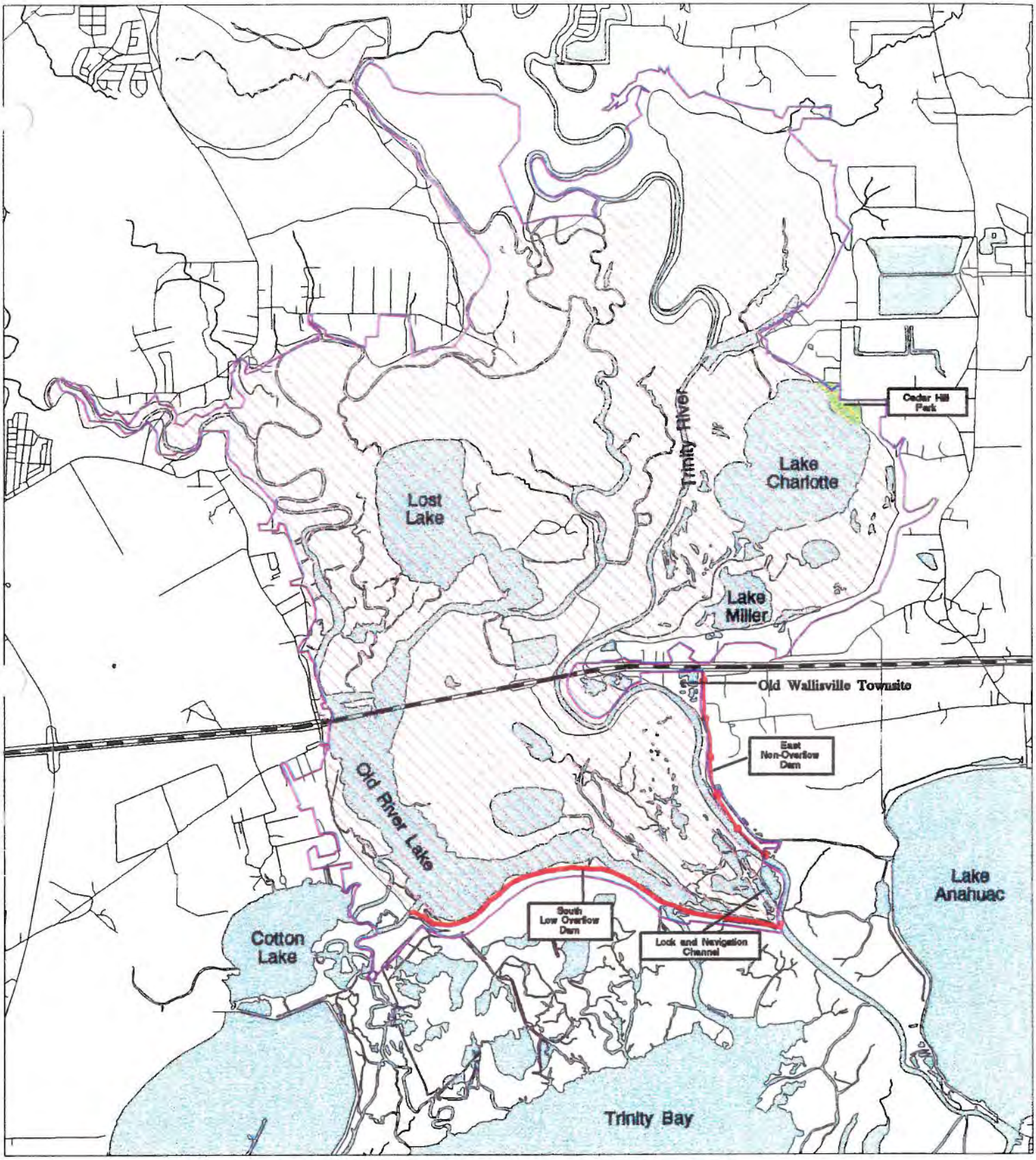



Base Map: USGS 1:1,000,000 Quadrangle; Texas

Espey, Huston & Associates, Inc.
Engineering & Environmental Consultants

Figure 1-2

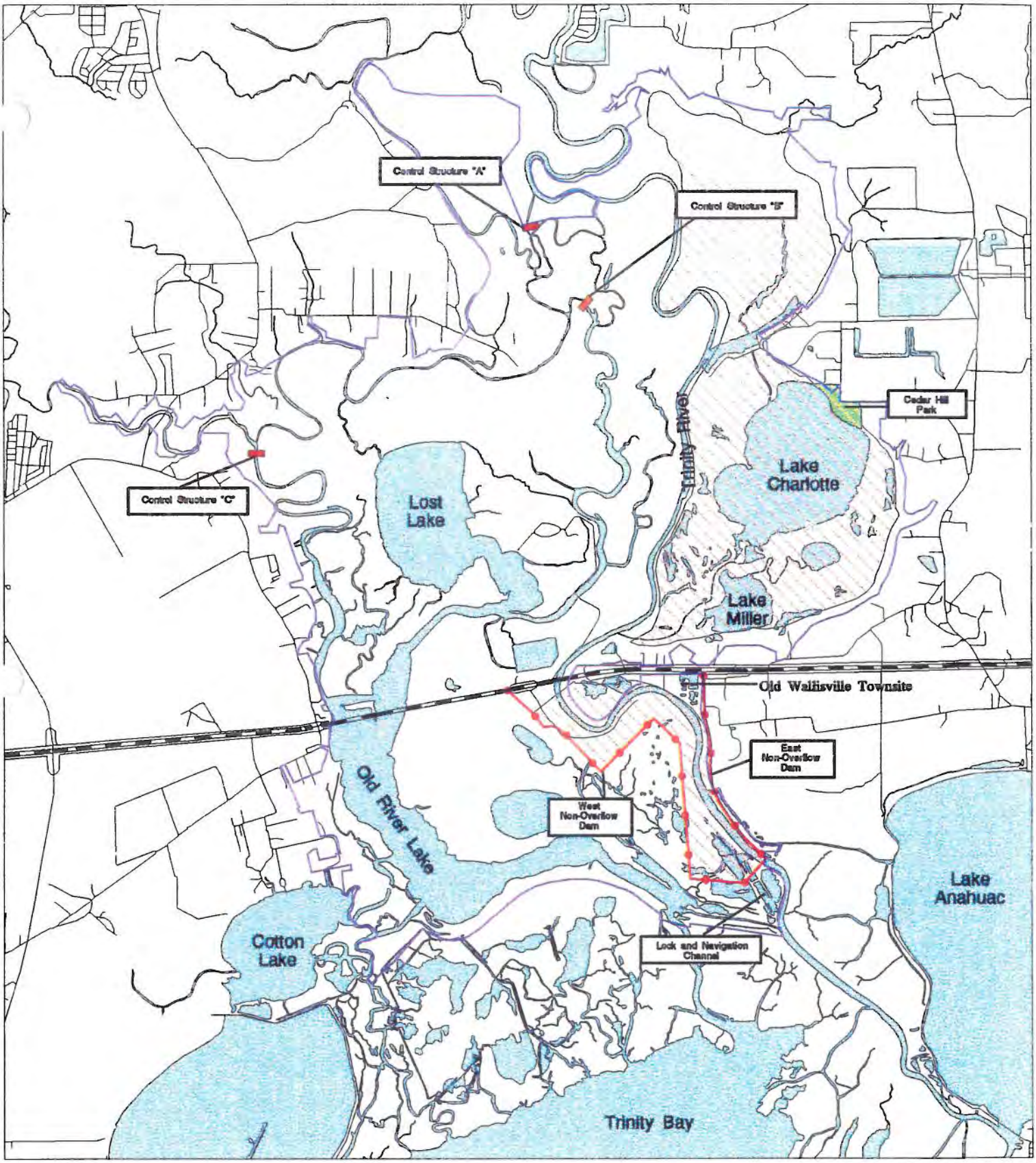
WALLISVILLE PROJECT LOCATION
IN RELATION TO
MAJOR METROPOLITAN AREAS




Wallisville Lake Project

Plan of 19,700 Acre Project

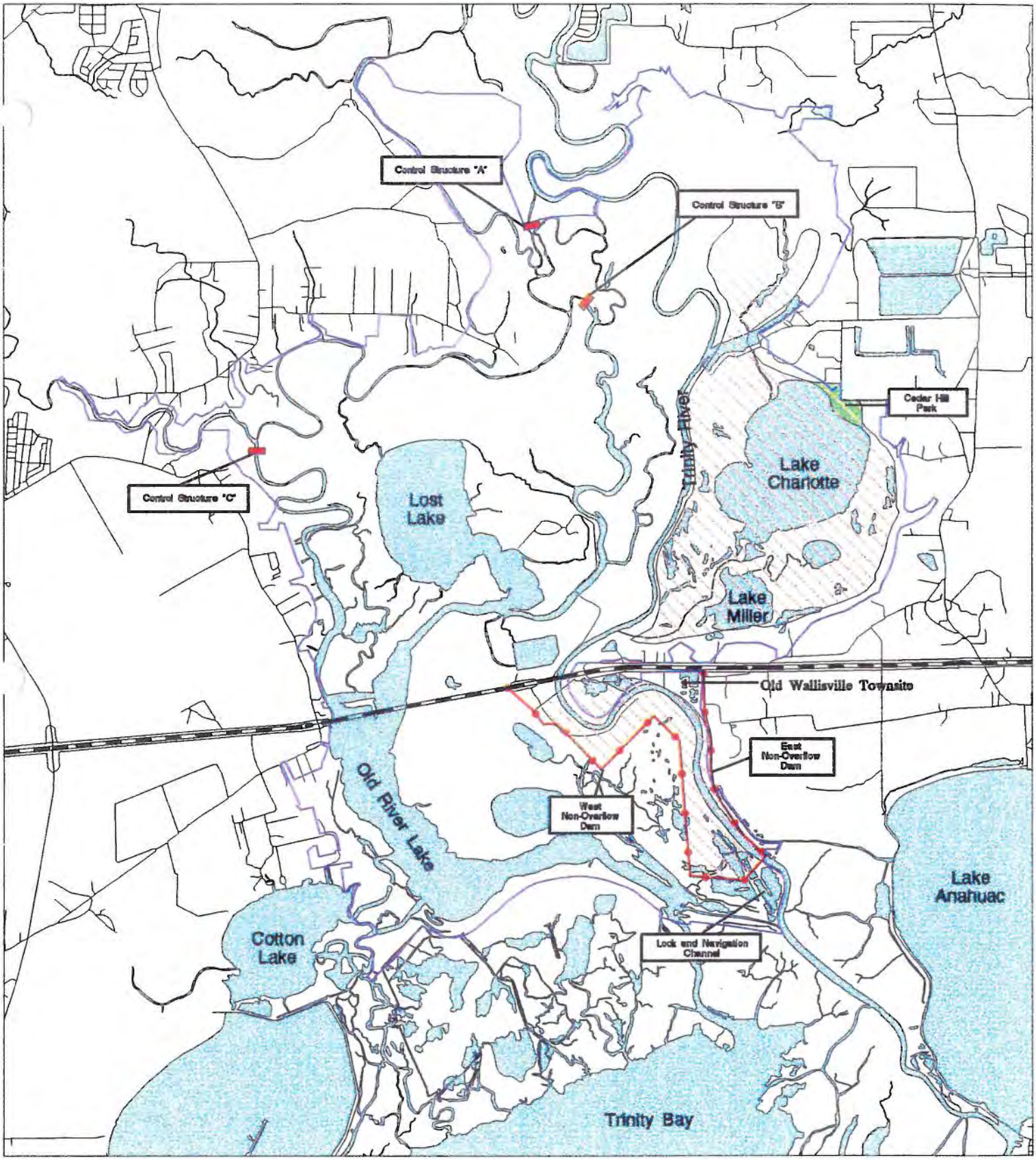
Figure 1-3




**Wallisville Lake Project**

**Plan of 5,600 Acre Project**

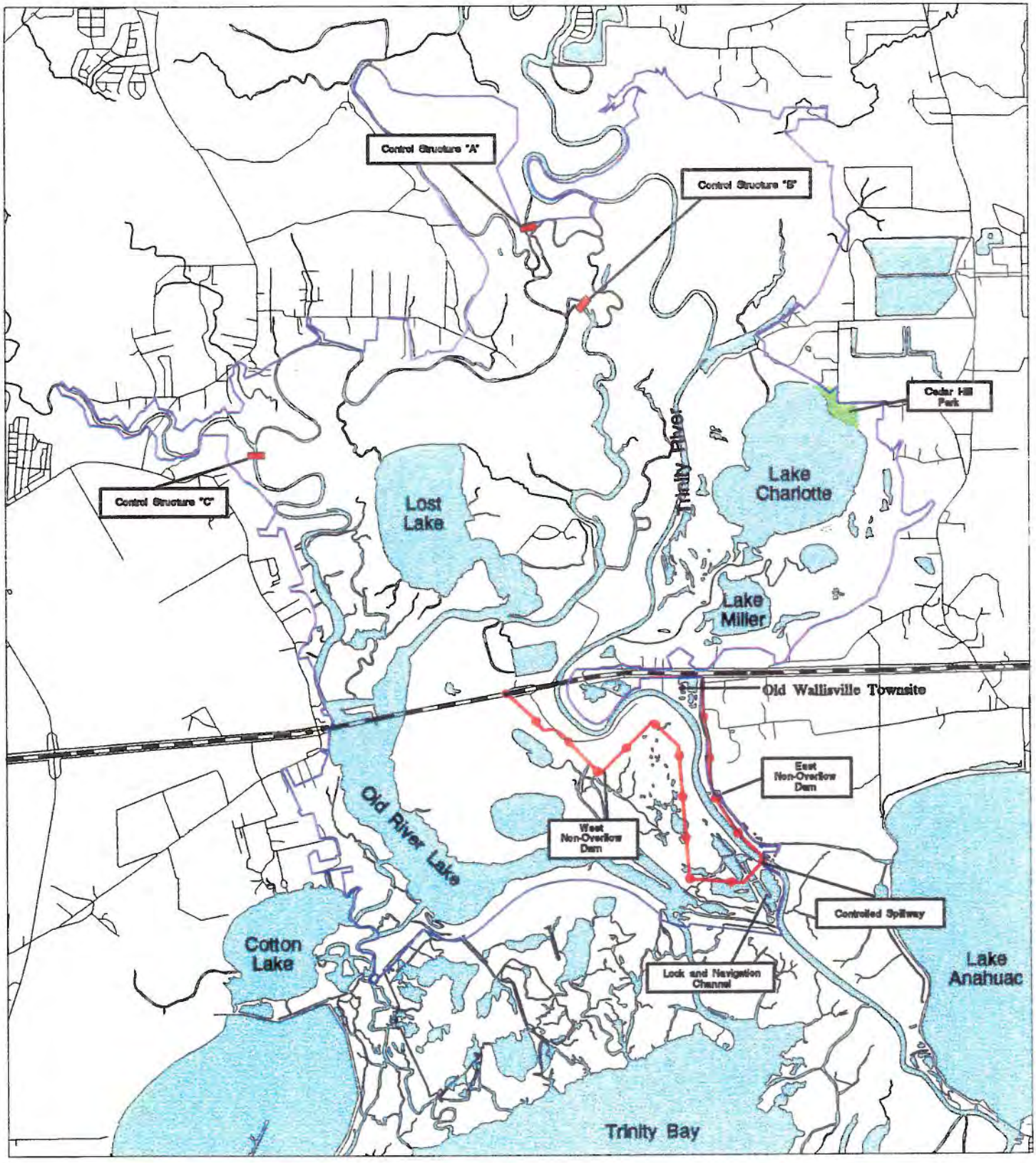
**Figure 1-4**




**Wallisville Lake Project**

**Plan of 3,800 Acre Project**

**Figure 1-5**




# Wallisville Lake Project
## Project Map

Figure 1-6

## 2.0 RESOURCE OBJECTIVES

A resource is a source of supply, support, wealth, or revenue. For a project area, such as the Wallisville Project Area, there are natural resources which are essentially unaffected, and there are those that can be affected by the operation of the Project. Examples of the first type are topography and soils and may be affected by some types of projects. However, these resources will not be affected by the present Project. They are discussed in Appendix A, Project and Area Description. Resources which can be affected by the operation of the present Project potentially include fish and wildlife, including environmentally sensitive areas, water, aesthetics, mining, commercial lands, outgranted lands, and easements.

Land allocation is the identification and documentation of lands at the Project in accordance with the authorized purposes for which they were, or are to be, acquired. There are four primary land allocation categories applicable to USACE projects; (1) operations, (2) recreation, (3) fish and wildlife, and (4) mitigation. Land classification is a distribution of project lands by management categories which, based upon available resources and public needs, will provide for full utilization while protecting project resources. Only mitigation was not a pertinent land allocation, since there are no mitigation lands associated with the Project. Viable land classifications included: (1) Project Operations, (2) Fish and Wildlife, (3) High density Recreation, (4) Low density Recreation, (5) Environmentally Sensitive Areas, and (6) Outgranted Lands. Additional information is included in Section 6.

In recent years the function of the USACE Master Plans has expanded beyond being a guide primarily for the construction and use of recreational facilities to include the stewardship of Project Resources, both natural and anthropogenic. Sound stewardship requires development and management of project resources for the public benefit, consistent with Project requirements and resource capabilities. An important element of this has been the establishment of viable Resource Objectives (ROs). ROs are definitive statements that specify attainable options for resource use, development, and management. The ROs for the various categories of resources available in the Project Area are presented below. In general, the ROs will be coordinated with pertinent Federal, State, and local agency and/or administration personnel.

### 2.1 Fish And Wildlife

- Develop a Fish and Wildlife Management Plan that will maintain or enhance native fish and wildlife resources.

- Manage the Project in such a manner that the native fisheries of the Project Area will remain in a state as near ambient as is possible.

- Manage the Project in such a manner that bald eagles will continue to utilize the Project Area for nesting.

- Maintain a public hunting program on fee-owned lands in the Project Area in accordance with State laws and regulations and Title 36 of Federal rules and regulations governing public use.

- Permit fishing in the Project Area in accordance with State laws and regulations.

## 2.2 Vegetation

- Manage the Project in such a manner that the vegetation of the Project Area, including the cypress swamp near the eagle nesting site, will be maintained in their current state or enhanced.

- Continue the Monitoring Program of the cypress swamps to assess overall health and vigor.

## 2.3 Historic Properties

- Develop a long-term historic resources management plan for the Project's historic properties in compliance with the Historic Properties MOA and incorporate this plan into the Wallisville Lake Operational Management Plan as specified in ER 1130-2-438 (Project Construction and Operation, Historic Preservation Program). This plan shall ensure compliance with Sections 106 and 110 of the National Historic Preservation Act of 1966, as amended, the Archeological Resources Protection Act of 1979, and the Native American Graves and Repatriation Act of 1990.

## 2.4 Water

- Manage the Project to prevent saltwater intrusion into the Trinity River upstream of the Control Spillway and the Locks.

- Except as required by the preceding Water Resource Objective, the Fish and Wildlife Resource Objective, and Recreation Needs, manage the Project in such a manner that the water resources of the Project Area and downstream of the Project Area will remain undisturbed by Project actions and Project personnel and other users of the Project Area.

2.5 Aesthetics

- Manage the Project in such a manner that the aesthetics of the Project Area will remain unchanged or be enhanced.

2.6 Mining

- Manage the Project in such a manner as to facilitate ongoing oil and gas activities within the Project Area which predate the project.

- Ensure that oil and gas activities within the Project Area comply with all applicable State and Federal environmental regulations.

2.7 Commercial Lands

- There are no commercial lands in the Project Area.

2.8 Outgranted Lands

- Provide for the continued use of certain parts of the Project Area for which individuals or corporations hold easements, permits, licenses, or leases, as long as the uses of these outgranted lands are compatible with other ROs of the Project Area.

2.9 Easements

- The USACE owns the Project Area lands in fee and has no easements in the Project Area.

# 3.0 RESOURCE ANALYSIS

## 3.1 Fish And Wildlife

### 3.1.1 Aquatic Biology

*General*

Several aquatic studies have been recently conducted in the Trinity River below Livingston Reservoir, the Trinity River delta marsh lands and distributary streams, and upper Trinity Bay. Nektonic populations in the freshwater portions of the Project Area between IH-10 on the lower Trinity River and Lake Livingston were studied by Hall (1972 and 1973). Bauldauf (1970) conducted a comprehensive study of the brackish water area of the Trinity River delta. During Bauldauf's study considerable data on fish of the area were collected over a three-year period and were compiled in an unpublished report by Conner. Information from the published and unpublished studies cited above and from a 13-month fishery survey by the Galveston District USACE was used to describe the fisheries of the Project Area.

The transitional zone between freshwater and saltwater in the Trinity River delta was found to harbor numerous species of fish either as temporary or long-term inhabitants. During the studies previously cited, 116 species of freshwater and marine fish were collected within the Wallisville Project Area and upstream in the Trinity River. Of the total number of fish caught by all investigators, 91 percent (%) were marine. These marine fish occupy the delta streams and marshes seasonally. About 60% of these marine fish had either sport or commercial value. Nine percent of the total number of fish caught were freshwater fish of which about 54% have commercial or sport value. Most of the remaining freshwater and marine species are of high ecological value because they enter the food chain as basic forage species for predators further up the chain. Fluctuating river flows and salinities influenced the migration of both freshwater and marine fish between the river and bay, thus controlling the distribution of the various species in the river delta. However, from the standpoint of faunal composition, the delta is essentially an estuarine environment.

Within the Project Area, which includes the vast brackish and freshwater marshes of the river delta, Lake Charlotte, and the Trinity River, 51 species of marine fish were collected during the studies. Twelve of the species are of sport or commercial value and make up a significant portion of the total number of fish caught. The commercial and sport species include sand seatrout (*Cynoscion arenarius*), spotted seatrout (*Cynoscion nebulosus*), Atlantic croaker

(*Micropogonius undulatus*), black drum (*Pogonias cromis*), red drum (*Sciaenops ocellata*), striped mullet (*Mugil cephalus*), Gulf flounder (*Paralichthys albigutta*), southern flounder (*Paralichthys lethostigma*), Gulf menhaden (*Brevoortia patronus*), sheepshead (*Archosargus probatocephalus*), gafftopsail catfish (*Bagre marinus*), and bluefish (*Pomatomus saltatrix*).

During the study by Hall (1972), a majority of the freshwater species were collected above IH 10 in the Trinity River. The USACE study, however, found substantial use of the lower river and delta by numerous freshwater species. The use of this habitat appeared to be positively correlated with high river discharges. Of the 65 species collected, 28 species, including gar, carp, buffalo, catfish, bass, crappie, freshwater drum, and several species of sunfish, are considered of sport or commercial value. During the periods of high river discharge, Trinity Bay also supported a substantial population of blue catfish (*Ictalurus furcatus*) and channel catfish (*Ictalurus punctatus*). These are the two major commercial species harvested in the delta streams. Periodic examination of the catfish digestive systems indicated that they feed extensively on marine aquatic species such as bay anchovy, Gulf menhaden, killifish, and penaeid shrimp in the delta marshes and Trinity Bay.

Species diversity of aquatic animals in an area is usually related to the variety of habitats provided. An area such as the Trinity River delta is composed of a great variety of habitats, including shallow bodies of water associated with fresh and brackish marshes, cypress swamps, creeks, rivers, and lakes. A large variety of fish range into this area; however, because of the stress associated with rapid changes in river flow and salinities, only a few species are capable of residing in the delta marshes and lakes permanently. Juvenile marine species of fish seem best suited to the changing conditions in the delta and are capable of infiltrating the area in large numbers. Migratory marine fish that are dependent on the delta for nursery and feeding areas include Gulf menhaden, bay anchovy (*Anchoa mitchilli*), sand seatrout, and Atlantic croaker. Other major marine fish that use the delta primarily as adults are southern flounder, Gulf flounder, black drum, sheepshead, red drum, and spotted seatrout.

There is also a large variety of freshwater fish that use the delta primarily as a feeding area, but only a few freshwater fish appear to be as tolerant of the changing delta environment as marine fish. The species that seem best suited to the delta are blue and channel catfish. Young of these species were caught year round in the deep channels and bayous in the delta. Because the ecosystem is continuously undergoing periods of adjustment, freshwater species diversity at any given period of time is generally low and the dominant species are usually found in large numbers.

As discussed previously, the most abundant fish caught in the delta were those with a marine affinity. Even during periods of low salinity, i.e., less than 8 parts per thousand (ppt), marine species dominated the fish catches. The most abundant marine fishes collected during the 1975-76 survey were the bay anchovy, Gulf menhaden, Atlantic croaker, tidewater silverside (*Menidia beryllina*), sheepshead minnow (*Cyprinodon variegatus*), and the Gulf killifish (*Fundulus grandis*). The anchovy, menhaden, and croaker accounted for 92% of the fish taken. Other marine species were either occasional inhabitants, dependent on temporary salinity conditions in the delta, or inhabited the area at low population densities.

Connor and Truesdale (1973) also found that the anchovy, menhaden, and croaker accounted for more than 80% of the fish taken during their survey of the Trinity River delta. Atlantic croaker accounted for more than 43% of the total number of fish taken. The bay anchovy and the Gulf menhaden ranked second and third in abundance, respectively. They also observed that most of the major migrating marine fish concentrated in the shallow, semi-enclosed lakes and bayous during their period of peak occupancy in the delta. The delta appears to be the prime nursery habitat sought by ladyfish (*Elops saurus*), Gulf menhaden, bay anchovy, Atlantic croaker, sand seatrout, pinfish (*Lagodon rhomboides*), bay whiff (*Citharichthys spilopterus*), southern flounder, and hogchoker (*Trinectes maculatus*).

The distribution of marine and freshwater fish in the delta was related to salinity tolerance of the various species. The lowest occurrence of freshwater species was in the bay with the number of species increasing in the inland or up-river areas and in Lake Charlotte. The marine species had a different distributional pattern with a decrease in number of species with distance from the marsh both inland and bayward. This distributional pattern reflects the high usage of marshes as a nursery and feeding area for larval and juvenile marine fish and the fact that some marine-brackish water species permanently reside in the marsh areas.

Tidal influences are occasionally evident upstream in the Trinity River to near Liberty, Texas, which accounts for the penetration of some marine species up river. Hall (1972) recorded marine and brackish water species, including Gulf killifish (*Fundulus grandis*), striped mullet (*Mugil cephalus*), and tidewater silverside, in the river near the Lake Livingston Dam. There have also been unconfirmed reports of flounder being caught in the river near Lake Livingston. Gulf menhaden, a major commercial species, was also found in large numbers in the lower Trinity River by Hall (1972) and Turner *et al.* (1974).

Six species of shrimp and one crayfish species were caught within the limits of the study area. These included river shrimp (*Macrobrachium* sp.), grass shrimp (*Palaemonetes* sp.),

white shrimp (*Penaeus setiferus*), brown shrimp (*Penaeus aztecus*), sergestid shrimp (*Acetes* sp.), mysid shrimp (*Mysidopsis* sp.), and crayfish (*Procambarus* sp.). Of these, crayfish and white and brown shrimp are important to the Texas commercial and sport fishery. The importance of the other species lies primarily in their value as a link in the food chain for higher aquatic organisms. Shrimp are browsers that feed on organic detrital material and on living organisms that colonize the detritus. As such, they feed near the base of the aquatic food chain and are important converters of food for higher consumers.

The most abundant shrimp caught in the delta marsh, lakes, and streams were white shrimp, followed in abundance by grass shrimp, mysid shrimp, river shrimp, and brown shrimp. Brown shrimp appeared in the biological catches from the delta marsh only occasionally during the 1975 season, whereas postlarval and juvenile brown shrimp were relatively abundant during the spring of 1976. All major bayous are open for migration of shrimp into or out of the area. The level of freshwater inflow and salinities seem to be the major environmental factors that influenced the utilization of the delta marshes by the commercial shrimp species, particularly brown shrimp during the District's 1975-76 study and Baldauf's study (1970). White shrimp were abundant at salinities below 5 ppt, whereas brown shrimp seemed to prefer higher salinities.

Postlarval and early juvenile stages of both brown and white shrimp were distributed throughout the delta marshes and lakes west of the Trinity River. Only a few juvenile white shrimp appeared in the biological samples from Lake Charlotte during Baldauf's and the Galveston District's studies. Population densities of these shrimp were generally higher in the delta marshes and lakes than in either the open waters of Trinity Bay or the freshwater areas such as Lake Charlotte. These young shrimp concentrated in the shallow water areas of the delta in greater numbers than in Trinity Bay, apparently taking advantage of an abundance of food and protection from predators. As the season progressed they increased in size and gradually migrated back to Trinity Bay, and eventually to the Gulf to complete their life cycle. Most other species of non-commercial shrimp taken in the samples were associated with the shallow shoreline zone of the delta marshes and lakes. The freshwater shrimp, known as the river shrimp, was distributed primarily in deep river and bayou channels.

Two species of crabs were collected within the delta area. Mud crabs (Family *Xanthidae*) were collected in Cross Bayou and in Old River Lake on two occasions, whereas blue crabs (*Callinectes sapidus*) were collected throughout the study area.

The blue crab was one of the most abundant crustaceans taken during the various surveys within the Trinity River delta. Its abundance was relatively high throughout the year.

The greatest concentrations of blue crabs were found in the marshes and lakes west of the Trinity River. Blue crabs not only concentrate in the low salinity delta because of its value as a nursery and feeding area, but because it is also a major mating site. Trawl catches during the USACE's 1975-76 survey indicated greater numbers of small crabs per unit area in the delta lakes and streams than in the open bay.

The blue crab was found in all habitat types within the Wallisville Project Area. McCullough and Champ (1973) has also reported that blue crabs are relatively abundant in the Trinity River up to Lake Livingston Dam which creates a barrier for further migration up river. Because of the wide distribution and abundance of the blue crab, there exists an active sport fishery along the lower Trinity River for this species.

Insects, mostly aquatic larval stages, were also taken along with the fish and crustaceans sampled. The types of insects in the general area are known to be numerous; however, only nine taxonomic groups were identified during the 1975-76 survey in the Project Area. The greatest number of species was collected from Lake Charlotte, and the greatest total number of insects was collected from the marshes above IH-10 and west of the river. The species with the greatest influence on man within the Wallisville area are the mosquitoes. Their larvae were abundant in the marshes west of the Trinity River. Besides the pest insects, many others, such as the mayfly, provide an important food supply to the aquatic system, and others, such as the aquatic beetles, are predators that feed heavily on young fish and shrimp.

Benthic samples collected with an Ekman dredge during 1975-76 indicated that the diversity of molluscs within the Project Area was low. Common rangia clams (*Rangia cuneata*) and some small unidentified clams and gastropods (snails) were the only species caught. The low diversity of mollusca is probably related to the dynamic hydrographic changes that occur within the Trinity River delta. Hopkins *et al.* (1973) reported that rangia is one of the few permanent inhabitants of the low-salinity brackish water zone and may make up as much as 99% of the benthic biomass.

Of the species of mollusca collected during the 1975-76 survey, rangia was by far the most abundant in the delta area. The mean density of rangia in the Trinity River delta is estimated at 9.7 clams per square meter (Hopkins *et al.* 1973). It is evident from the numerous archeological sites (shell middens) throughout the Project Area that rangia was an important element in the diet of the early inhabitants of the area.

Other invertebrates collected in the bottom samples were annelids (polychaetes and oligochaetes), nematodes, ostracods, isopods, and insect larvae. Annelids were found throughout the Project Area, but their population densities appeared to be generally low except in Old River Lake. The insect larvae were found throughout the river delta but were in greatest abundance in Lake Charlotte. Barnacles (*Balanus improvisus*) were observed attached to tree stumps as far inland as Lake Charlotte.

Planktonic communities are composed of many types of organisms that are generally separated into two main groups. These include the phytoplankton (microscopic plants) and zooplankton (microscopic animals). The single feature characteristic of most planktonic organisms is that they have limited ability of locomotion and thus drift subject to water currents. The major contribution of plankton to the aquatic ecosystem is that they compose the base of the food chain. Along with the organic detritus derived from land and marsh plants, plankton contribute carbon compounds and proteins that are passed up the food chain to larger animals.

Trinity River phytoplankton populations have been shown in recent studies to increase downstream of Livingston Reservoir to the lower river (McCullough and Champ, 1973). This increase may have been related to reduced stream flow. It has been shown in other river systems that the development of high concentrations of phytoplankton is partially dependent on slow to moderate stream flow (Hartsmann, 1958). The Trinity River phytoplankton communities included diatoms with both centric and pinnate forms, but were dominated by centric forms, reflecting relatively high water quality. Common centric diatoms reported from the river were *Melosira distans*, *Melosira granulata*, and *Cyclotella glomerate* (McCullough and Champ, 1973).

McCullough and Champ (1973) found that zooplankton population diversity immediately downstream of Livingston Reservoir was low and was probably related to freshwater releases from the reservoir along with stress involved in changing from a flowing water to a still water environment. Zooplankton diversity rose again at river mile 70, but fell again at about mile 10, even though the total number of zooplankton was rather high. This situation on the lower river is thought to be related to special conditions present near the river mouth such as reduced freshwater flow and saltwater intrusion that affected plankton diversity.

Parker *et al.* (1972) found that bay zooplankton populations were dominated by copepods and that larval forms of various crustaceans formed only a small part of the total populations. These microorganisms are an important intermediary level which serves as an energy exchanger for both phytoplankton and detrital input from the Trinity River and adjacent marshes.

As such, they comprise a significant source of food for larger estuarine animals and an important energy pool.

*Endangered or Threatened Aquatic Species*

There are no endemic, threatened, or endangered fish species within the Trinity River system (Hall, 1973). Species inhabiting the river are generally widespread geographically and many are tolerant to adverse environmental conditions. The paddlefish (*Polyodon spathula*), which is listed by the USFWS as a Category 2 candidate, occurs in the Project Area.

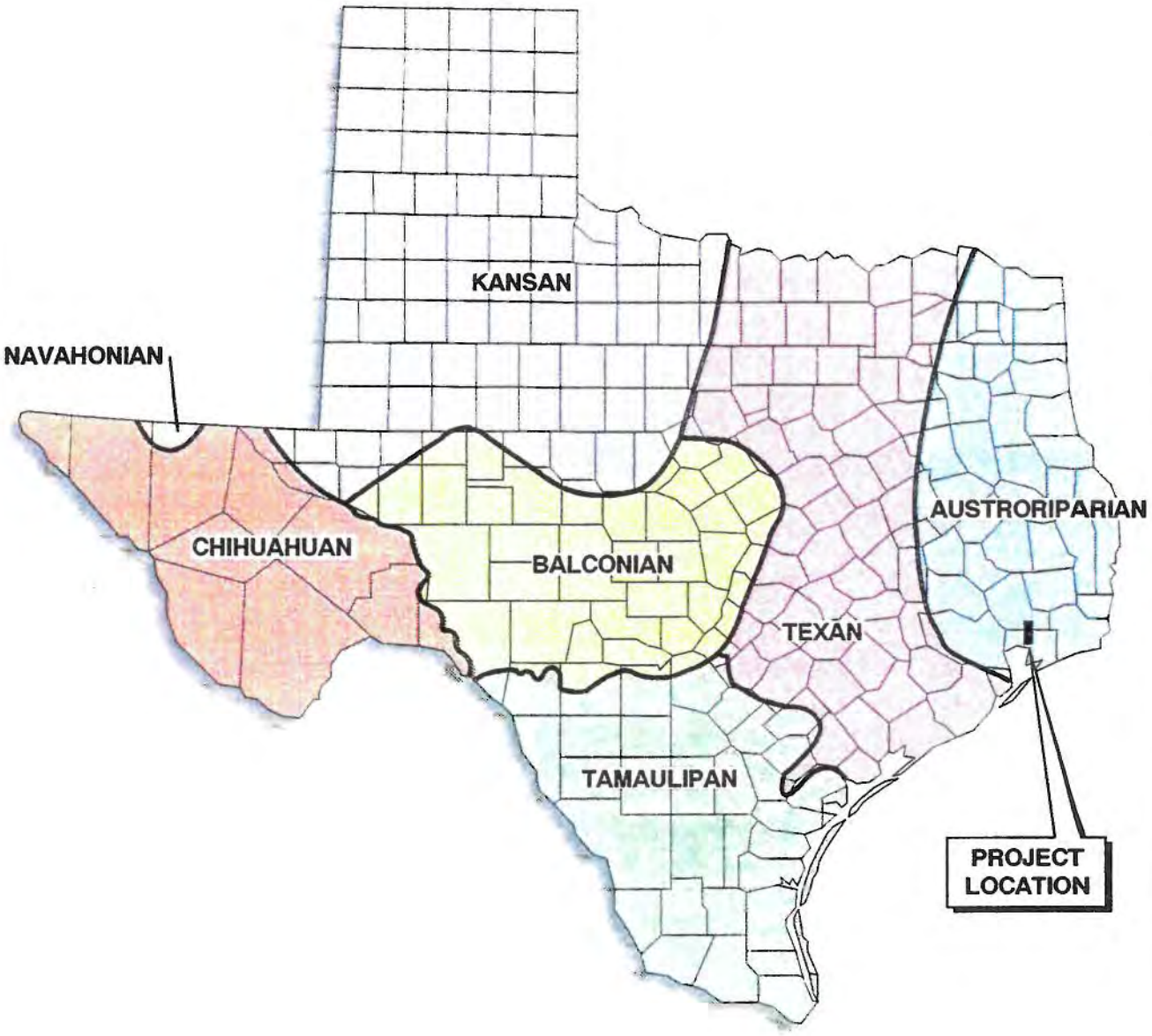
The paddlefish primarily inhabits large slow moving rivers and some lakes. Spawning occurs on clean gravel bars and riffle areas (Linam *et al.*, 1994). Reaching weights of almost 200 pounds and lengths to seven feet, they are still classed as game and/or commercial fish in some states (Pitman, 1991). Populations in Texas still appear to be declining, despite restocking efforts. Impoundment of large rivers, channelization, siltation, and water pollution appear to be the major threats to this species throughout its range in the U.S. (Linam *et al.*, 1994). Prior to the building of Livingston Reservoir, the Trinity River offered a great variety of habitat for the paddlefish, and they still occur downstream from the reservoir (Pitman, 1991).

### 3.1.2 Wildlife

The Project Area lies in the Austroriparian biotic province (Figure 3-1), as described by Blair (1950). This province encompasses the Gulf Coastal Plain from the Atlantic Ocean to East Texas, where the western edge of the main body of pine and hardwood forests form its vaguely defined western boundary. With few exceptions, the vertebrate fauna of this region is typical of the fauna of more easterly portions of this region.

*Mammals*

Although 47 species of terrestrial and semi-aquatic mammals have ranges encompassing Liberty and Chambers Counties, only 19 species were documented in the Project Area by investigations during 1975-76. Several factors probably contribute to the low mammalian diversity here, including (1) extensive overgrazing in high marshes and grasslands, (2) saline soils and brackish waters of lower marshes, and (3) the periodic inundation of most of the Project Area, especially in the spring and late winter (USACE, 1981). Common mammals observed in the Project Area were: Virginia opossum (*Didelphis virginiana*), swamp rabbit (*Sylvilagus aquaticus*), eastern fox squirrel (*Sciurus niger*), American beaver (*Castor canadensis*), nutria




north

100 0 100 200

scale in miles

Source: Blair, 1950

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Figure 3-1

LOCATION OF THE
WALLISVILLE PROJECT AREA
IN RELATION TO THE
BIOTIC PROVINCES OF TEXAS

(*Myocastor coypus*), common raccoon (*Procyon lotor*), feral pig (*Sus scrofa*), and white-tailed deer (*Odocoileus virginianus*).

*Birds*

The lower Trinity River and upper Trinity Bay area offers large areas of important avian habitat, with approximately 360 species of birds potentially occurring in Liberty and Chambers Counties (USACE, 1981). Approximately 264 species of birds have been documented on the nearby Anahuac National Wildlife Refuge (U.S. Department of Interior (USDI), 1969). During 20 field trips from May 1975 through May 1976, 183 bird species were documented in the Wallisville Project Area (USACE, 1981). Fifty-three avian species were observed during the July 17-20, 1995 Project Area investigation. Many species occur primarily as seasonal migrants, but the Project Area often harbors large numbers of waterfowl in the winter and fish-eating wading birds in the summer (USACE, 1981). Several species of wading birds nest in rookeries in and near the Project Area (USACE, 1981; Texas Natural Heritage Program (TNHP), 1995b), including the great blue heron (*Ardea herodias*), great egret (*Casmerodius albus*), snowy egret (*Egretta thula*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), cattle egret (*Bubulcus ibis*), green heron (*Butorides striatus*), and black-crowned night-heron (*Nycticorax nycticorax*).

*Reptiles and Amphibians*

Approximately 90 species of reptiles and amphibians have potential ranges which include Liberty or Chambers Counties, with 63 species documented for Liberty County, and 42 for Chambers County. Thirty-one species were documented in the Wallisville Project Area by investigations during 1975-76. The majority of these species were semi-aquatic or at least partially dependent on wetlands for survival (USACE, 1981). Species commonly observed in the Project Area include the northern cricket frog (*Acris crepitans crepitans*), Green treefrog (*Hyla cinerea*), bronze frog (*Rana clamitans clamitans*), southern leopard frog (*Rana utricularia utricularia*), red-eared slider (*Trachemys scripta elegans*), American alligator (*Alligator mississippiensis*), green anole (*Anolis carolinensis*), broad-banded watersnake (*Nerodia fasciata confluens*), and western cottonmouth (*Agkistrodon piscivorous leucostoma*).

*Endangered or Threatened Vertebrate Species*

Table 3-1 lists terrestrial wildlife species whose geographic range includes the Project Area and that are considered rare, threatened, or endangered by the Texas Organization for

TABLE 3-1

ENDANGERED, THREATENED, AND SENSITIVE TERRESTRIAL VERTEBRATES[1]
OF POTENTIAL OCCURRENCE IN THE PROJECT AREA[2]
CHAMBERS AND LIBERTY COUNTIES, TEXAS

| Common Name | Scientific Name | Status[3] | | | |
|---|---|---|---|---|---|
| | | TOES | TNHP | TPWD | USFWS |
| Brown pelican | *Pelecanus occidentalis* | E | G5/S2 | E | E |
| American peregrine falcon | *Falco peregrinus anatum* | E | G3T2/S2 | E | E |
| Arctic peregrine falcon | *Falco peregrinus tundrius* | T | G3T2/S2 | T | E/SA |
| Eskimo curlew | *Numenius borealis* | E | G1/S1 | E | E |
| Interior least tern | *Sterna antillarum athalassos* | E | G4T2/S1 | E | E |
| Red-cockaded woodpecker | *Picoides borealis* | E | G2/S2 | E | E |
| American alligator | *Alligator mississippiensis* | WL | -- | -- | T/SA |
| Bald eagle | *Haliaeetus leucocephalus* | E | G3/S2 | E | T |
| Piping plover | *Charadrius melodus* | T | G2/S2 | T | T |
| Alligator snapping turtle | *Macroclemys temminckii* | T | G3G4/S3 | T | C2 |
| Texas diamondback terrapin | *Malaclemys terrapin littoralis* | T | G5T3/S3 | -- | C2 |
| Reddish egret | *Egretta rufescens* | -- | G4/S2 | T | C2 |
| White-faced ibis | *Plegadis chihi* | T | G5/S2 | T | C2 |
| Southeastern snowy plover | *Charadrius alexandrinus tenuirostris* | -- | G4TU/S2 | -- | C2 |
| Migrant loggerhead shrike | *Lanius ludovicianus migrans* | -- | G4T2/S2 | -- | C2 |
| Bachman's sparrow | *Aimophila aestivalis* | WL | G3/S2 | T | C2 |
| Henslow's sparrow | *Ammodramus henslowii* | -- | G4/S1 | -- | C2 |
| Rafinesque's big-eared bat | *Plecotus rafinesquii* | T | G3/S3 | T | C2 |
| American swallow-tailed kite | *Elanoides forficatus* | T | G5/S2 | T | 3C |
| Timber rattlesnake | *Crotalus horridus* | T | G5/S5 | T | -- |
| Wood stork | *Mycteria americana* | T | G5/SN | T | -- |

[1] Nomenclature follows Collins (1990), AOU (1983, 1985, 1987, 1989, 1991, 1993), and Jones et al (1992).

[2] According to Peterson (1963), Raun and Gehlbach (1972), Oberholser (1974), Davis (1974), Conant (1975), Burt and Grossenheider (1976), Smith (1978), Scott (1983), Schmidly (1983), Robbins et al. (1983), Tennant (1984, 1985), TOS (1984), FWS (1988, 1994a, 1994b, 1994c, 1994d), TPWD (1987b, 1988), TNHP (1993, 1995b), Dixon (1987), and TOES (1995).

[3]
- E - Endangered.
- E/SA - Endangered due to similarity of appearance. No longer biologically threatened or endangered but listed because of similarity of appearance to the endangered peregrine falcon (*Falco peregrinus*).
- T - Threatened.
- T/SA - Threatened due to similarity of appearance.
- C2 - Federal category 2 candidate species: insufficient data for definite listing as threatened or endangered
- 3C - Federal subcategory 3C species: taxa once considered for listing as threatened or endangered, but found to be more abundant and/or widespread than previously thought
- WL - Watch List.
- -- - Not listed.
- S - species at risk, which might be chosen in the future as candidates for endangered or threatened species.
- G1 through G5 - global ranking with G1 being critically imperiled globally and G5 globally secure.
- T1 through T5 - global ranking for subspecies, varieties or races with T1 being critically imperiled and T5 globally secure.
- TU - subspecies, variety, or race possibly in peril range-wide, but status uncertain.
- S1 through S5 - state ranking with S1 being critically imperiled in state and S5 secure in state.
- SN - regularly occurring, usually migratory, and typically non-breeding.

Endangered Species (TOES), TNHP, TPWD, or the USFWS. Several sources were reviewed to develop the list presented in Table 3-1 including the following: Peterson (1963), Raun and Gehlbach (1972), Oberholser (1974), Conant (1975), Burt and Grossenheider (1976), Smith (1978), Scott (1983), Schmidly (1983), Robbins *et al.* (1983), Tennant (1984, 1985), TOES (1995), Texas Ornithological Society (TOS) (1984), USFWS (1988, 1994a, 1994b, 1994c, 1994d), TPWD (1987, 1988), Dixon (1987), TNHP (1993, 1995b), and Davis and Schmidly (1994). It should be noted that inclusion on the list does not imply that a species is known to occur in the Project Area, but only acknowledges the potential for occurrence. The following paragraphs present distributional data concerning each species, along with a brief evaluation of the potential for the species to occur in the Project Area.

Eight species listed in Table 3-1 are considered either endangered or threatened by the USFWS. They include the brown pelican (*Pelecanus occidentalis*), bald eagle (*Haliaeetus leucocephalus*), American peregrine falcon (*Falco peregrinus anatum*), Arctic peregrine falcon (*Falco peregrinus tundrius*), piping plover (*Charadrius melodus*), eskimo curlew (*Numenius borealis*), interior least tern (*Sterna antillarum athalassos*), and red-cockaded woodpecker (*Picoides borealis*). These eight species are the only ones in Table 3-1 which are afforded protection under the Endangered Species Act of 1973, as amended (ESA). The State-listed species and candidate species are not protected under the ESA.

The brown pelican is Federally and State listed as endangered. Formerly numerous on the Texas coast, populations crashed precipitously in the late 1950's. Although susceptible to disturbance of nesting colonies, the greatest mortality factor seemed to be related to thinning of egg shells due to pesticides in the food chain (Oberholser, 1974). Populations in Texas have begun increasing in recent years (Arroyo, 1992). Although typically not straying far from coastal saltwater beaches and bays, the brown pelican occasionally strays far inland (Oberholser, 1974) and has been observed in the Project Area (USACE, 1981).

The bald eagle is a regular migrant and winter resident in east Texas, and is usually found in association with large bodies of water. In Texas, wintering and migrating bald eagles frequently stop over along the shores of reservoirs and large rivers, which provide the eagle with the bulk of its dietary requirements. Currently, the bald eagle is known to nest in at least 29 counties of Texas (Mitchell, 1995). Wintering and migrating bald eagles are not uncommon along rivers and reservoirs of east Texas and can be expected in the Project Area. A pair of bald eagles regularly nests within the Project Area, and have fledged young each year since their discovery in 1989 (Mitchell, 1995). Because of their overall nesting and survival success, the bald eagle was reclassified from endangered to threatened in the lower 48 states in July 1995.

The arctic peregrine falcon (*Falco peregrinus tundrius*) is a statewide migrant commonly observed along the lower Gulf coast. This subspecies was removed from the USFWS list of threatened species in October 1994, but continues to be classified as endangered within the 48 conterminous states because of its similarity of appearance to the other endangered subspecies that may occur in the area. The American peregrine falcon (*Falco peregrinus americanus*), which is currently State and Federally listed as endangered, also possibly occurs in the Project Area, but is much less common along the Texas coast than the arctic subspecies. It has been recently proposed to remove the American peregrine falcon from the list of endangered and threatened wildlife, and to remove the similarity of appearance provision that currently exists for all free flying peregrine falcons within the 48 conterminous states (USFWS, 1995). Peregrines forage over marshes, mudflats, and coastal waters, feeding on waterfowl, shorebirds, and small wading birds (Oberholser, 1974). Padre Island is the most important known staging area for migrant peregrines in the western hemisphere (Morizot and Maechtle, 1987), and peregrines are regular migrants along the rest of the Texas coast. In this area, peregrine falcons would be considered to be occasional spring and fall migrants or winter residents (USDI, 1969). The times of most likely occurrence would be during the fall migration, from late September through October, or from April to mid-May during the spring migration. Peregrine falcons have been observed in the Project Area (USACE, 1981).

The piping plover is a common to uncommon migrant and winter resident on the upper Texas coast. This small shorebird breeds in the northern Great Plains of the U.S. and Canada, along beaches of the Great Lakes, and along the Atlantic coastline from North Carolina to Newfoundland (Haig and Oring, 1987). Post-breeding and wintering sites include the southern U.S. Atlantic coastline; the Gulf of Mexico from Florida to Veracruz, Mexico; and on scattered Caribbean islands (Haig and Oring, 1985). The piping plover can be found along Texas beaches and tidal flats from mid-July through April, preferring wide unvegetated areas. Although most of the Project Area is unsuitable habitat, the piping plover could occur there as a migrant or during periods of very low water levels.

The eskimo curlew, State and Federally listed as endangered, was formerly very abundant. One single flock alighting in Nebraska was said to have covered 40 or 50 acres of ground (Forbush and May, 1939). Harvested in huge numbers by commercial hunters and suffering from habitat destruction along its migratory route and winter range, it has hovered near extinction since the end of the nineteenth century. A bird of grasslands and tundra, the eskimo curlew breeds in the arctic and winters on the pampas of South America. The fall migration route is off the east coast, but spring migration brings these birds across the Gulf of Mexico and through the midwest. Most sightings in recent years have been on the central and upper Texas coasts.

Texas sightings most often occur in old fields, closely grazed pastures, burned prairies and marshes, beaches, and sand flats (Linam *et al.*, 1994) or the drier parts of salt and brackish marshes (Farrand, 1983).

The interior least tern, State and Federally listed as endangered, breeds on sandy flats and bars along rivers and winters along the coast, including the vicinity of the Project Area. The interior least tern is very difficult to distinguish from the more common eastern least tern (*Sterna antillarum antillarum*), whose breeding range includes all of the Texas coast. The eastern least tern is fairly common during spring, summer, and fall in the Project Area (USACE, 1981). The interior least tern could occur there as a migrant or winter resident.

The endangered red-cockaded woodpecker inhabits mature pine forests of the southeastern United States and nests almost exclusively in old living pines infected with red heart disease (*Fomes pini*) (USFWS, 1985). There is a high correlation between the occurrence of the red-cockaded woodpecker and the distribution of the longleaf pine (*Pinus palustris*), for which the bird has a particular affinity, and also slash pine (*P. elliotti*), loblolly pine, shortleaf pine, pitch pine (*P. rigida*), and pond pine (*P. serotina*) (Thompson and Baker, 1971). The historical range of the red-cockaded woodpecker extends from Texas primarily east of the Trinity River (TOES, 1995), east to the Atlantic, and as far north as Maryland (Hooper *et al.*, 1980). Habitat loss is the major contributing factor responsible for the red-cockaded woodpecker's endangered status (USFWS, 1985). According to the USFWS (1988), Liberty County is the southernmost extension of the woodpecker's range in Texas. The red-cockaded woodpecker is unlikely to occur in the Project Area, due to the lack of suitable habitat, and the location of the Project Area is at the periphery of the bird's range.

The American alligator (*Alligator mississippiensis*) was first Federally listed as endangered in 1967 because hunting and poaching had substantially reduced its numbers. In 1983, it was reclassified in Texas as threatened due to similarity of appearance (T/SA), reflecting complete recovery of the species in the State. Thus, the alligator in Texas is no longer biologically threatened or endangered, but because of the similarity of appearance of its hides and parts to the appearance of hides and parts of protected crocodilians elsewhere, it is necessary to restrict commercial activities involving alligators taken in Texas to safeguard against excessive harvesting, and to ensure the conservation of other crocodilians that are still biologically threatened or endangered. Currently, TPWD has delisted the species and TOES has reduced it from threatened to watch list. In addition, USFWS (52 FR 21059, June 4, 1987) reclassified all alligators in the United States as T/SA. Presently, the American alligator may be found along the Gulf coast and eastern inland counties. Inland alligator habitat consists of any permanent or

mostly permanent aquatic habitat including rivers, bayous, creeks, oxbows, stock tanks, lakes, marshes, and swamps. The American alligator is a common resident of many portions of the Project Area.

Nine of the species from Table 3-1 currently have no Federal status, but are considered as Category 2 candidate species by the USFWS. Category 2 includes taxa which may be appropriate for listing as endangered or threatened, but for which there are not enough biological data to support listing at this time. Category 2 species potentially occurring in the Project Area are: the alligator snapping turtle (*Macroclemys temminckii*), Texas diamondback terrapin (*Malaclemys terrapin littoralis*), reddish egret (*Egretta rufesceus*), white-faced ibis (*Plegadis chihi*), southeastern snowy plover (*Charadrius alexandrinus tenuirostris*), migrant loggerhead shrike (*Lanius ludovicianus migrans*), Bachman's sparrow (*Aimophila aestivalis*), Henslow's sparrow (*Ammodramus henslowii*), and Rafinesque's big-eared bat (*Plecotus rafinesquii*).

The alligator snapping turtle is an inhabitant of deep rivers, lakes, and large streams with muddy bottoms, and may occasionally enter brackish water (Garrett and Barker, 1987). The Project Area is within its range, and it has been collected from Harris, Jefferson, and Liberty Counties (Dixon, 1987).

The Texas diamondback terrapin inhabits coastal marshes, lagoons, and tidal flats, and is never found far from brackish or saltwater (Garrett and Barker, 1987). It has been documented from Long Island Bayou at the lower end of the Project area (USACE, 1981).

The reddish egret is a coastal resident which prefers salty waters over fresh or brackish waters. It is most abundant on the central and south Texas coast, being much less abundant on the upper Texas coast, especially during winter. It sometimes wanders inland, especially during post-breeding dispersal (Oberholser, 1974), and could occur in the Project Area.

The white-faced ibis in Texas is now primarily confined to coastal regions, although it formerly bred inland also. It prefers freshwater marshes, sloughs, and rice fields to salt or brackish marshes (Oberholser, 1974). At times, it is very common within the Project Area.

The snowy plover is a bird of beaches, intertidal flats, and barren shores of inland bodies of water. In Texas it is locally fairly common along the coast and in its inland breeding range. There is some confusion as to the subspecies of snowy plover on the Texas coast. Oberholser (1974) states that all birds breeding in Texas are southeastern snowy plovers, but that western snowy plovers (*Charadrius alexandrinus nivosus*) winter along the Texas coast. The

western snowy plover was recently downgraded to a C3 species, meaning it is no longer being considered for listing as threatened or endangered, but the southeastern snowy plover is still considered to be a C2 species. The snowy plover could occur in the Project Area, although it is not as likely to occur there as at nearby beaches.

The loggerhead shrike is an inhabitant of open country with scattered trees, fence rows, and roadsides. Migrant and winter birds in the Project Area could be the migrant loggerhead shrike, while summer residents are most likely the southern loggerhead shrike (*Lanius ludovicianus ludovicianus*)(Oberholser, 1974) which is not a C2 species. Loggerhead shrikes were found to be fairly common during fall and winter in some portions of the Project Area, with only scattered individuals observed in the summer (USACE, 1981).

Bachman's sparrow inhabits open pine or oak woods and brushy pastures (Peterson, 1963). Oberholser (1974) states habitat for the species consists of tall pines intermixed with grasses, wildflowers, scattered oaks and shrubs. Although Bachman's sparrow is known from Liberty, Chambers, and all surrounding counties to the east, north, and west (Oberholser, 1974), the lack of suitable habitat in the Project Area makes its occurrence there unlikely.

Henslow's sparrow is a bird of damp, open meadows, but occasionally occurs in grassy areas among open pine woods. In Texas it is known to breed only in Harris County, but is a rare and local winter resident in the eastern half of Texas (Oberholser, 1974), and has been documented in both Chambers and Liberty County. For winter habitat it favors moist, grassy spots under open pine forests, broomsedge fields, and weedy damp areas (Linam *et al.*, 1994). It could occur in the Project Area.

Rafinesques's big-eared bat occurs throughout forested areas of the southeastern U.S., with east Texas being the western limit of its range. It is strictly nocturnal and roosts most frequently in unoccupied buildings, wells, cisterns and hollow trees (Schmidly, 1983). This bat has been recorded from Liberty and Hardin Counties and could occur in the Project Area, although the limited habitat and location on the periphery of its range make this unlikely.

The remaining taxa listed in Table 3-1 are not being considered for listing as endangered or threatened by the USFWS, but are considered threatened by the TPWD. They include the timber rattlesnake (*Crotalus horridus*), wood stork (*Mycteria americana*), and American swallow-tailed kite (*Elanoides forficatus*).

The timber rattlesnake inhabits dense thickets and brushy areas, typically along the floodplains of major creeks and rivers of east Texas. It has been recorded from Liberty County and several adjacent counties (Dixon, 1987). It is possible this species could occur in the Project Area.

The wood stork is listed as endangered in Alabama, Florida, Georgia, North Carolina, and South Carolina, but is not considered endangered in Texas (USFWS, 1994a). The wood stork formerly bred in southeast Texas (Oberholser, 1974), but now only occurs during post-breeding dispersal. Potential habitat within the study area includes shallow water habitats such as pond fringes, flooded fields, marshes, and lake fringes. This species occurs in the study area and is sometimes common (USACE, 1981).

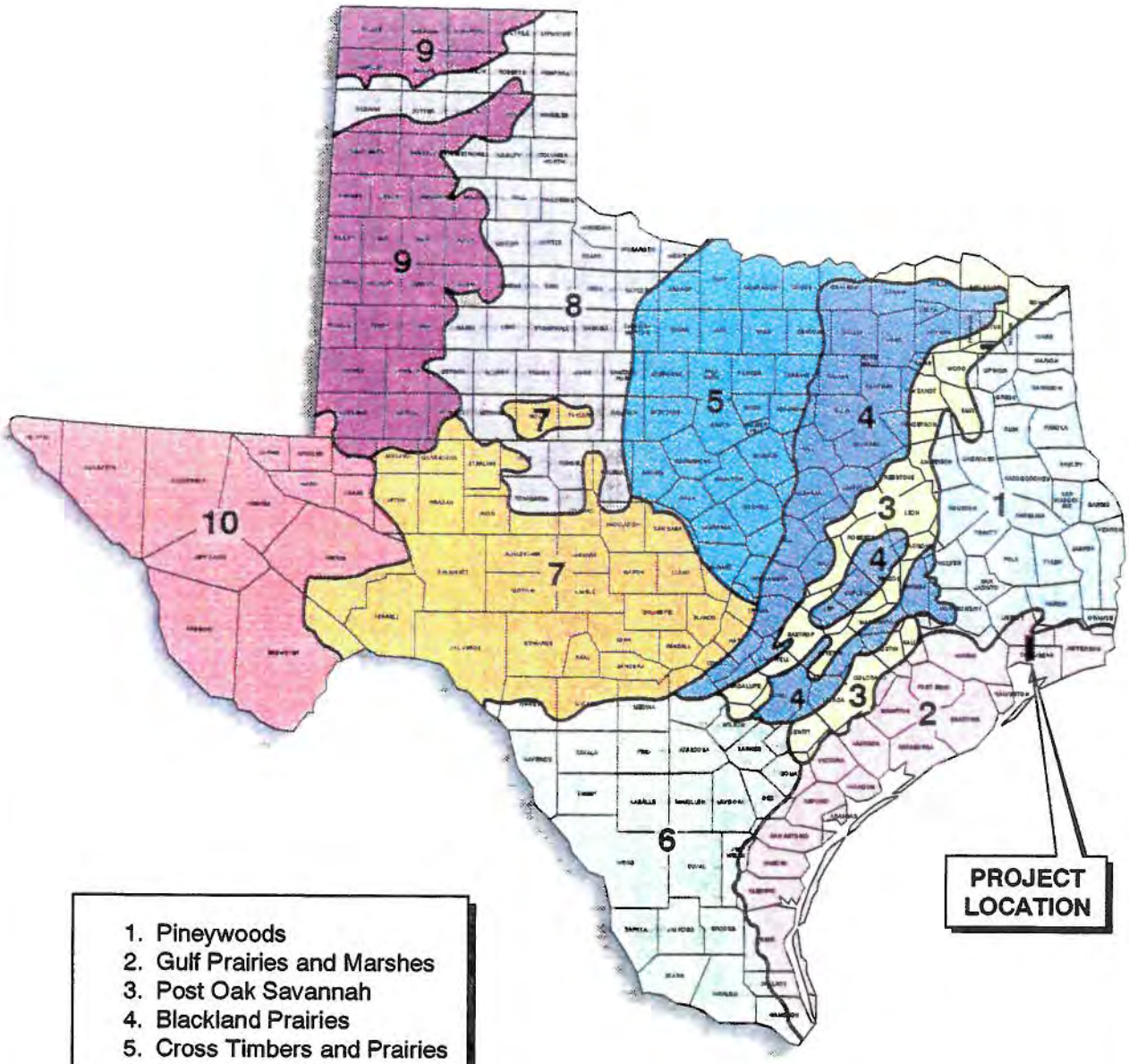
The American swallow-tailed kite was formerly being considered for listing as threatened or endangered, but is now listed as a category 3C species. Category 3C status indicates the species is no longer being considered for listing as threatened or endangered because it has been found to be more prevalent or widespread than previously thought. Habitat for the American swallow-tailed kite consists of wetlands, open woodlands, and bottomlands with adjacent prairie habitat (Oberholser, 1974). It is a rare nester and uncommon migrant on the upper Texas coast, with records from Chambers, Liberty, and all surrounding counties (Oberholser, 1974). The first Texas nest in recent years was recently discovered in Tyler County, and the extensive cypress swamps and marshes of the study area offer potential breeding habitat to this species.

## 3.2 Vegetation

### 3.2.1 General

The Project Area lies in the Gulf Prairies and Marshes vegetation area (Figure 3-2), as delineated by Hatch *et al.* (1990). The marsh component of this area occupies approximately 500,000 acres of the barrier islands and a narrow strip of coastal lowlands extending from Louisiana to Mexico (Schuster and Hatch, 1990). The prairie component comprises approximately 9 million acres of the nearly flat plains extending 30 to 80 miles inland from the Gulf Marshes. Originally dominated by tallgrass prairie and post oak savannah, large portions of the Gulf Prairie have been invaded by woody species (Schuster and Hatch, 1990).

The vegetation of the Project Area forms a complex mosaic of plant communities, the distribution of which is dictated by patterns of inundation and salinities, which in turn are dictated by often very minor elevational changes and proximity to riverine and estuarine drainage features.




1. Pineywoods
2. Gulf Prairies and Marshes
3. Post Oak Savannah
4. Blackland Prairies
5. Cross Timbers and Prairies
6. South Texas Plains
7. Edwards Plateau
8. Rolling Plains
9. High Plains
10. Trans-Pecos

north

100 0 100 200

scale in miles

Source: Hatch et al., 1990

Espey, Huston & Associates, Inc.
Engineering & Environmental Consultants

Figure 3-2

LOCATION OF THE
WALLISVILLE PROJECT AREA
IN RELATION TO THE
VEGETATION REGIONS OF TEXAS

Wooded areas are similar in structure and makeup to the Pineywoods vegetational area as described by Schuster and Hatch (1990).

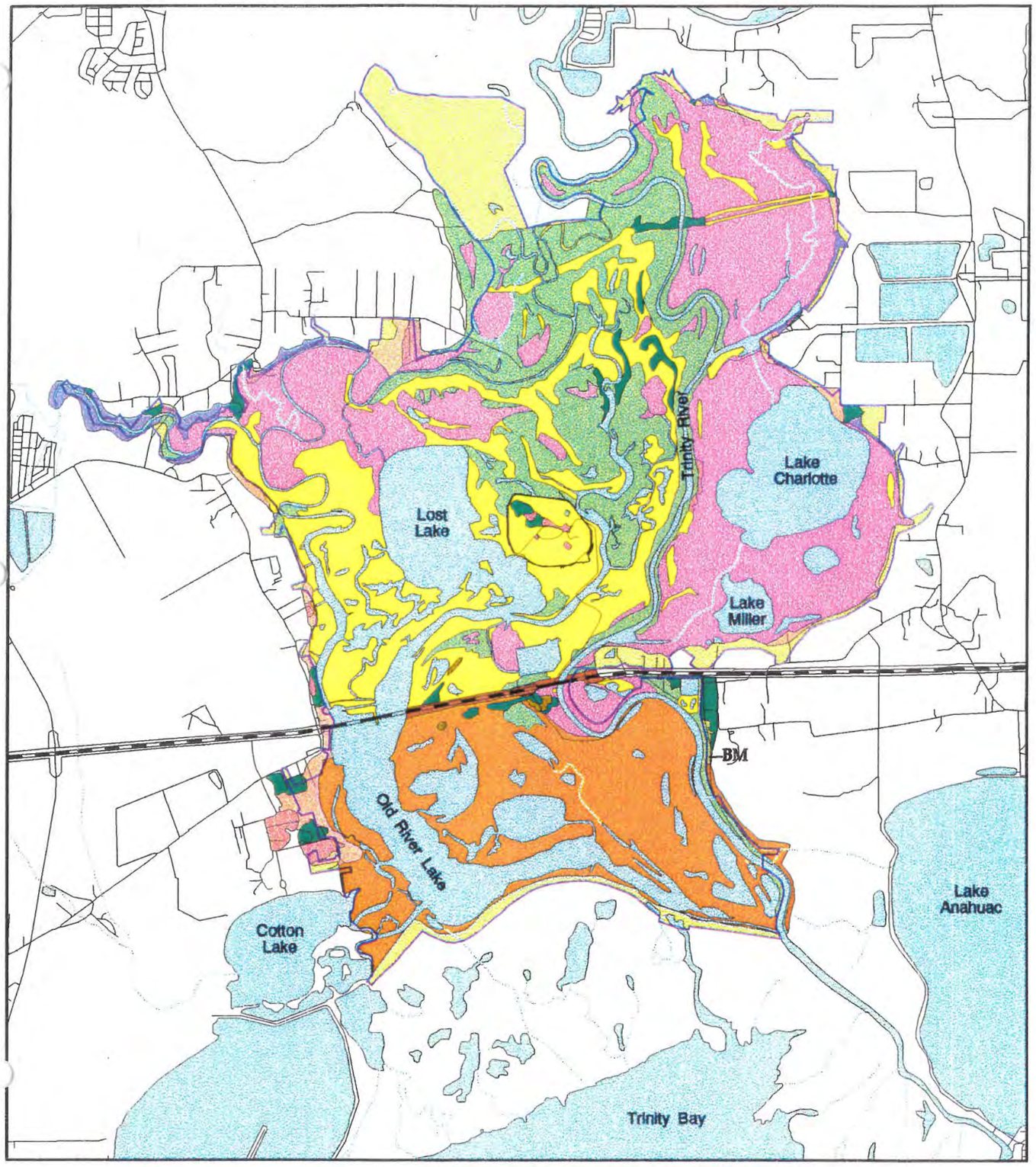
The various vegetational types of the Project Area are often characterized by only very subtle differences, often having many species in common. Boundaries between habitat types may be ill defined, existing only as a continuum of gradually shifting ratios of species composition. The following paragraphs offer descriptions of eight vegetation types delineated in Figure 3-3.

Boundaries of vegetational areas shown in Figure 3-3 were determined from several sources, but primarily by analysis of 1:24,000 color infrared photography dated December 1989. Further clarification was provided by comparisons to national wetland inventory mapping of the four 7.5-minute topographical quadrangles which include the study area. Other sources which were compared and referenced included previous habitat maps in published reports (Smith, 1973; Harcombe, 1974; USACE, 1981) and a 1:24,000 computer generated land use/land cover map produced by Earth Information Systems Corporation from TPWD data. Descriptions of these vegetation types were based on the investigations of the Project Area made from July 17-20, 1995. These investigations provided qualitative but not quantitative data on representative portions of the study area.

Vegetation within the Project Area has been described by several recent papers (Nixon and Willet, 1972; Smith, 1973; Harcombe, 1974; USACE, 1981). The five vegetation zones delineated by Smith (1973) were primarily concerned with habitat for waterfowl but were generally consistent with the findings of this report. Other discrepancies between these reports can be attributed to differences in study focus and sampling techniques, phenological differences due to season of investigation, and ecological changes related to changes in hydrology and inundation patterns from year to year. Vegetative mapping of this report is defined on a smaller scale than that of the previous reports. This yields a more complicated mosaic which more precisely maps the varied vegetation types within the broad areas mapped by previous investigations.

### 3.2.2 Saltwater Marshes

The three types of saltwater marsh (saline, brackish, and intermediate) are not sharply delineated from each other, but reflect subtle shifts in species composition across the salinity gradient. These marsh types share many species in common with each other and with freshwater marshes. Saltwater marshes are particularly dynamic systems in the Gulf Coastal Plain, with




Brackish Marsh (BM)

Intermediate Marsh

Freshwater Marsh

Grassland

Wooded Upland

Swamp

Bottomland/Riparian Forest

Mixed Hardwoods

Pine

Disturbed

Interstate Highway 10

Water

Unclassified Project Lands

Project Boundary

Roads

N

The vegetation coverage was interpreted from 1:24,000 scale color infrared photographs acquired December 1989. The results were ground truthed in July of 1995.

1 0 1 2 3 4 5 6 7 8

Kilometers

Figure 3-3

# Wallisville Lake Project Vegetation Map

U.S. Army Corps of Engineers

Espey Huston & Associates, Inc.

Earth Information Systems Corporation

significant changes in structure and composition of vegetation occurring from one year to the next (USAEWES, 1978).

Saline marsh, dominated by smooth cordgrass (*Spartina alterniflora*) and black rush (*Juncus roemarianus*) was not observed during the field investigations of July 1995. Extensive areas of saltmarsh south of the Old River, as mapped by Smith (1973) are isolated from the study area by a levee along the south side of the Old River. A small amount of brackish marsh was mapped on the east side of the East Non-overflow dam and access road. This small pasture appeared to be harboring a relictual brackish marsh, somewhat isolated by levees and altered drainage patterns. Higher elevations here were dominated by bushy sea-ox-eye (*Borrichia frutescens*) and bermudagrass (*Cynodon dactylon*), with marshhay cordgrass (*Spartina patens*) also common.

The majority of the study area south of IH-10 is mapped as intermediate marsh, indicating a transitional zone between brackish marsh to freshwater marsh. Species composition during the July 1995 field investigations indicated that this area had been more influenced by freshwater than saltwater. This could change from year to year, as determined by rainfall, storm events, or other changes to the hydrology.

Important species in this area during July of 1995 included longtom (*Paspalum lividum*), alligator weed (*Alternanthera philoxeroides*), Florida crinum (*Crinum americanum*), spider lily (*Hymenocallis* sp.), marshhay cordgrass, gulf cordgrass (*Spartina spartinae*), arrowhead (*Sagittaria* spp.), hierba del marrano (*Aster subulatus*), common water hyacinth (*Eichhornia crassipes*), Drummond sesbania (*Sesbania drummondii*), deer pea (*Vigna luteola*), smartweeds (*Polygonum* spp.), softstem bullrush (*Scirpus validus*), marshmillet (*Zizaniopsis milliacea*), and various bulrushes (*Scirpus* spp.), spikerushes (*Eleocharis* spp.), flatsedges (*Cyperus* spp.), and fimbries (*Fimbristylis* spp.).

### 3.2.3 Freshwater Marshes

Freshwater marshes are abundant and widespread in the study area north of IH-10. Important species are longtom, alligator weed, seacoast sumpweed (*Iva annua*), hierba del marrano, Florida crinum, spiderlily, smartweed, marshmillet, common water hyacinth, Drummond sesbania, deer pea, frog-fruit (*Phyla* sp.), water hyssop (*Bacopa* sp.), cocklebur (*Xanthium strumarium*), creeping spotflower (*Spilanthes americana*), shore milkweed (*Asclepias perennis*), dock (*Rumex* spp.), flatsedges, bullrushes, and sedges (*Carex* spp.).

### 3.2.4 Grasslands

Grasslands occur at slightly higher elevations than the marshes, usually on land that has been significantly disturbed. Typically these areas support a number of exotic species, have been heavily grazed, and are not representative of the original tallgrass prairies of this area, which have been virtually eliminated from Chambers County (Harcombe, 1974; USACE, 1981). An important category of grassland within the study area is the corridors maintained as pipeline rights-of-way.

Important species in the grassland area include bermudagrass, smutgrass (*Sporobolis indicus*), bahiagrass (*Paspalum notatum*), longtom, crabgrass (*Digitaria* sp.), common carpetgrass (*Axonopus affinis*), St. Augustine grass (*Stenotaphrum secundatum*), sedges, flatsedges, frog-fruit, goldenrod (*Solidago* spp.), verbena (*Verbena* sp.), ragweed (*Ambrosia* sp.), cocklebur, sensitive briar (*Schrankia* sp.), hierba del marrano, and seacoast sumpweed. These grasslands are interspersed to varying degrees with trees and shrubs such as yaupon (*Ilex vomitoria*), hawthorne (*Crataegus* sp.), Chinese tallow (*Sapium sebiferum*), and gum-elastic (*Bumelia lanuginosa*). Wet depressional areas are scattered throughout the grasslands, forming small pockets of marshland.

### 3.2.5 Wooded Uplands

A few well-drained areas have developed woodland vegetation, ranging from dense thickets of the woody species mentioned in the grassland section, to forests dominated by live oak (*Quercus virginiana*) and sugar hackberry (*Celtis laevigata*). Openings within these woodlands are occupied by grassland species.

### 3.2.6 Swamps

Swamps occupy extensive areas north of IH-10. They are widely distributed, but are often associated with former river channels. Swamps in the study area vary in type and structure from homogenous stands of large bald cypress (*Taxodium distichum*) to shrubby thickets of swamp-privet (*Forestiera acuminata*) and water honey locust (*Gleditsia aquatica*). Other trees occurring in these swamps, especially near the upper elevational boundaries, include black willow (*Salix nigra*), red ash (*Fraxinus pennsylvanica*), water elm (*Planera aquatica*), water hickory (*Carya aquatica*), red maple (*Acer rubrum*), and Chinese tallow. American buckwheat vine (*Brunnichia ovata*) and climbing hempweed (*Mikania scandens*) are common vines. Common buttonbush (*Cephalanthus occidentalis*) and water tupelo (*Nyssa aquatica*), although present in the Project Area, are not important components of the swamp flora here. Understory and

herbaceous layers are typically not well developed, but species present include common lizard-tail (*Saururus cernuus*), small-spike false nettle (*Boehmeria cylindrica*), smartweed, dwarf palmetto (*Sabal minor*), Florida crinum, spiderlily, pickerel weed (*Pontederia cordata*), common water hyacinth, seedbox (*Ludwigia* sp.), horned beakrush (*Rhynchospora corniculata*), savannah panicum (*Panicum gymnocarpon*), rushes, and bulrushes.

### 3.2.7 Bottomland/Riparian Forests

Often occurring at slightly higher elevations than neighboring swamps and marshes, bottomland forests are most common in the northern portion of the Project Area. They often occur upon natural levees, and follow the banks of the Trinity River for most of its length through the study area. All of the species mentioned in the swamp section could occur in lower or wetter areas of bottomland forests, and are joined by a rich assortment of additional species in this vegetative type. Additional tree species occurring in these bottomland forests include sugar hackberry, American sycamore (*Platanus occidentalis*), eastern cottonwood (*Populus deltoides* ssp. *deltoides*), hickories (*Carya* spp.), American elm (*Ulmus americana*), cedar elm (*Ulmus crassifolia*), yaupon, hawthorne, water oak (*Quercus nigra*), and overcup oak (*Quercus lyrata*). Vines are common, including Alabama supplejack (*Berchemia scandens*), poison ivy (*Rhus toxicodendron*), peppervine (*Ampleopsis arborea*), greenbriars (*Smilax* spp.), and American buckwheat vine. Plants present in the shrub and herbaceous layers include dwarf palmetto, alligatorweed, St. Augustine grass, longtom, savannah panicum, goldenrod, flatsedges, and rushes.

### 3.2.8 Mixed Hardwood

Areas mapped as mixed hardwood are relatively small, and are located mainly around the periphery of the Project Area, on and above the slopes which define and contain the Trinity River floodplain. These well-drained upland forests support a diverse, well structured forest. Important species include sweetgum (*Liquidambar styraciflua*), water oak, hickory (*Carya* sp.), loblolly pine (*Pinus taeda*), pecan (*Carya illinoinensis*), swamp chestnut oak (*Quercus michauxii*), sugar hackberry, American elm, arrowwood viburnum (*Viburnum dentatum*), American beauty-berry (*Callicarpa americana*), yaupon, common persimmon (*Diospyros virginiana*), and rough-leaf dogwood (*Cornus drummondii*). The wide variety of vines includes muscadine grape (*Vitis rotundifolia*), saw greenbriar (*Similax bona-nox*), peppervine, Alabama supplejack, crossvine (*Bignonia capreolata*), poison ivy, trumpet creeper (*Campsis radicans*), and Japanese honeysuckle (*Lonicera japonica*). Species in the herbaceous layer include elephant foot (*Elephantopus* sp.), smartweed, and narrowleaf woodoats (*Chasmanthium sessiliflorum*).

### 3.2.9 Pine Forest

Pine forests in the Project Area have a distribution similar to that of the mixed hardwoods, mainly on slopes and uplands around the periphery of the Project Area. These well drained forests are dominated by loblolly pine. Many of the species from the mixed hardwood forests occur in the pine forest, although with less frequency in the canopy. These species may occur in the shrub and subcanopy layers with a greater frequency than in the canopy. In areas of thick canopy the herbaceous layer is scant, and is replaced by a thick carpet of pine needles.

### 3.2.10 Disturbed Areas

Lands mapped as disturbed areas have been heavily impacted by human activities. These activities include petroleum exploration and drilling, maintenance activities related to human residences, roadsides, and pipeline and electric transmission line rights-of way (ROWs). The vegetation occurring in disturbed areas is dependent somewhat on the existing vegetation of the surrounding area, but is also influenced to a large degree by early successional species and/or invader species and exotics such as alligator weed, Chinese tallow, common bermuda grass, southern dewberry, and hierba del marrano.

### 3.2.11 Aquatic Weeds

Although not mapped as a specific vegetation type, aquatic weeds occur within certain open water areas and marsh areas of the Project Area and deserve mentioning. Two South American plants, alligatorweed and water hyacinth, have become firmly established as pest species in the Project Area. Alligatorweed is especially abundant and widespread within the Project Area, covering great expanses of intermediate and freshwater marshes, and is present to a lesser extent in swampy regions. The ecological relationships of alligatorweed are not well known, but it is not considered to be a valuable plant for wildlife (Martin *et al.*, 1951; USACE, 1981).

Water hyacinth, although not a serious problem in most of the Project Area, is present in localized infestations throughout the region. The reason for its limited abundance is probably the continuous flushing of the delta by tidal action and river flow. The only substantial stands of hyacinth occur in sluggish ponds and streams where the plant completely covers the water surface. One area of heavy infestation is the bird rookery area south of IH-10 and east of the Trinity River.

Duckweed (*Lemna* sp.) is common seasonally in freshwater swamplands and bayous of the Project Area. Although a native species, duckweed can become a severe problem by covering the surface of the water, thus shading the bottom in sluggish or standing water.

### 3.2.12 Endangered Plants

No plant species listed as endangered or threatened by the Federal Government or the State of Texas are known to occur in Chambers or Liberty Counties, including the Project Area (TNHP, 1995a, 1995b). Several plant species known to occur in Chambers and Liberty Counties are considered by the USFWS to be C2 species. These species could be listed in the future as threatened or endangered, but currently receive no protection. These species are Texas windmillgrass (*Chloris texensis*) and corkwood (*Leitneria floridana*), known from Chambers County, and scarlet catchfly (*Silene subciliata*), known from Liberty County (TNHP, 1995a). Texas windmillgrass is known to occur west of the Project Area (TNHP, 1995b).

Vegetational studies by Mahler (1972) and Nixon and Willet (1974) for the Trinity River Project (USACE, 1975) mentioned two additional rare plants as potentially occurring in the lower Trinity River area: Texas prairie dawn (*Hymenoxys texana*) and Grand Prairie evening primrose (*Oenothera pilosella* var. *sessilis*). Texas prairie dawn, Federally and State listed as endangered, is known only from Harris and Fort Bend Counties, with a possible historical collection from La Salle County. This plant occurs in sparsely vegetated areas of fine-sandy compacted soil, often in poorly drained depressions or at the base of mima mounds (USFWS, 1989).

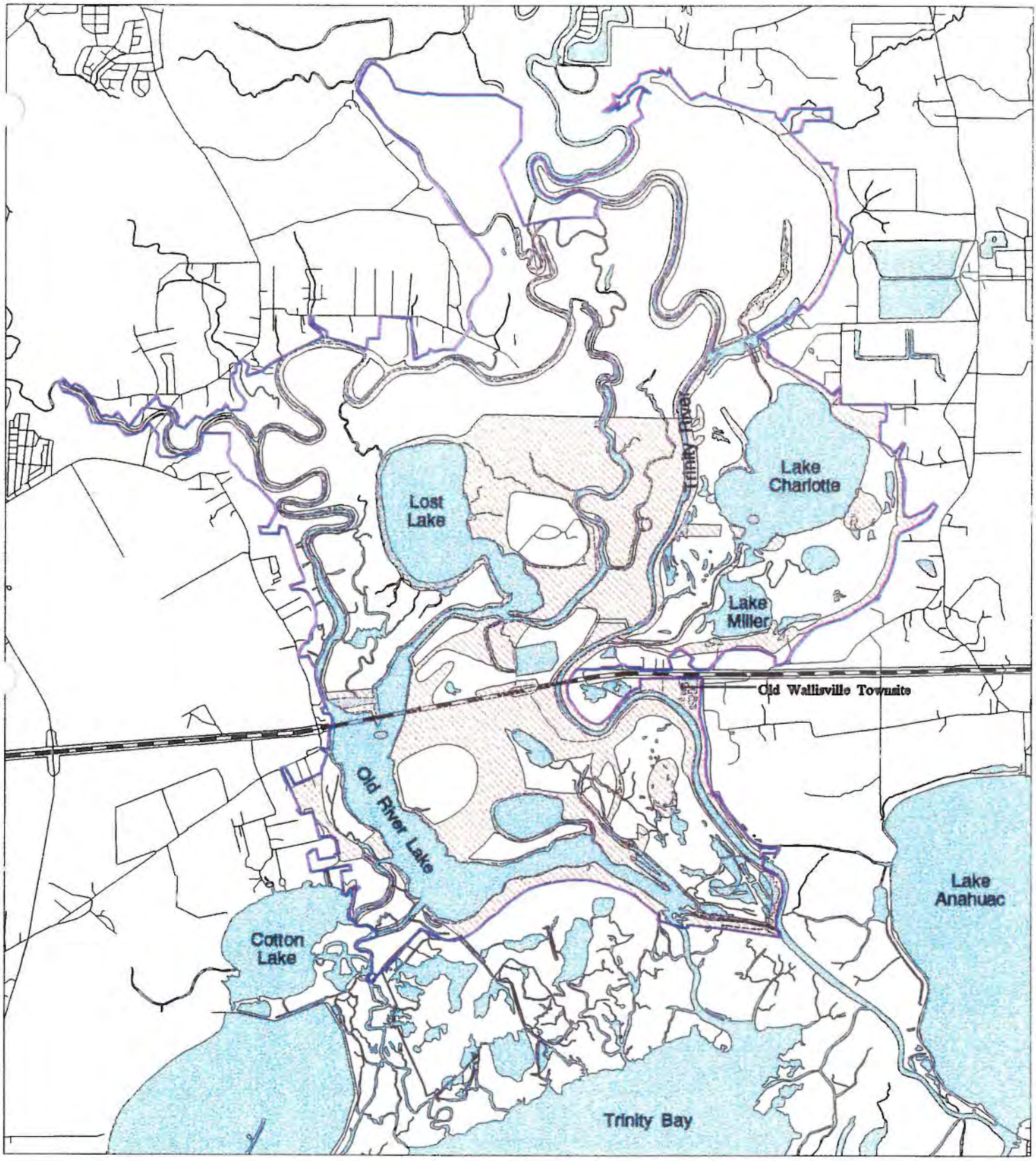
The Grand Prairie evening primrose is known from marshy places in Louisiana and Arkansas, and historically from Galveston County, but has not been collected in Texas since the mid-nineteenth century (Correll and Johnston, 1970). Habitat in Arkansas and Louisiana is seasonally wet tallgrass prairies on sandy or silty Alfisoils over claypan (TOES, 1993).

Texas windmillgrass is a rare, fall blooming grass endemic to silty loam areas of the coastal prairie of southeast Texas and the northeastern Rio Grande plains (Correll and Johnston, 1970). Habitat is sandy to sandy loam soils in relatively bare areas in coastal prairie grassland remnants, but it occasionally occurs on roadsides (TOES, 1993). It has been documented just outside of the western boundary of the Project Area, near Old River-Winfree (TNHP, 1995b).

## 3.3 Historic Properties

Several large-scale, intensive surveys of Federal property have covered all areas that will be affected by Project construction and operation, as well as substantial other Project areas (Ambler, 1970; Aten, 1983; Fox *et al.*, 1980; Mercado-Allinger, 1982; Prewitt *et al.*, 1986; Shafer, 1966). Although actual acreages surveyed were not recorded by the earlier investigations, coverage areas have been inferred from the locations of recorded sites. These approximations have been combined with the more precise records of later surveys to produce the map of surveyed areas presented as Figure 3-4. It is calculated that approximately 6,483 acres have received intensive survey coverage, out of the total 23,277 acres of Project property. These surveys concentrated on accessible areas such as the shorelines of lakes and streams, marshlands in the southern project area, and the upland terrace margins. A large area of dense bottomland hardwoods and scattered cypress swamps in the northern Project Area has not been surveyed.

The historical research and archeological surveys described above have recorded 190 historic properties representing a spectrum of aboriginal, colonial European, and early Texas occupations dating from approximately 3,500 BC through the mid-twentieth century. These properties and all related investigations on Project lands are described in the 1993 Historic Properties FDM (FDM No. 10). Aboriginal sites in the Project Area are believed to have originated with roving hunter-fisher-gatherer bands of the Akokisa Indians, a group affiliated with the Atakapans of the lower Mississippi River valley. These sites are primarily of the type known as shell middens, which are mound-like accumulations of shells (primarily *Rangia cuneata* and *Crassostrea virginica*) and habitation debris scattered throughout the delta and terrace margins. A much less frequent prehistoric site type found in the area is the inland earth midden. Found in wooded uplands along the terrace margins, these sites are generally evidenced by charcoal-stained soil, artifacts, and faunal remains. Historic archeological sites include an extremely significant mid-eighteenth century French trading post and Spanish presidio, mission, and Akokisa Indian camp complex which dates between 1754 and 1771. These sites have been placed on the National Register as the El Orcoquisac Archeological District. Also present are 18 residential and commercial sites associated with early Texas immigrants and the town of Wallisville which was founded in 1854. The Old Wallisville Townsite has also been placed on the National Register as an Archeological District. Because of the high density of significant historic resources in the delta, all Federal property acquired for the original Wallisville Project was determined eligible as a National Register District in 1984.




# Wallisville Lake Project

## Historic Properties

## Total Acreage Surveyed

Figure 3-4

## 3.4 Aesthetics

Aesthetics deals with the subjective perception of natural beauty in a landscape by attempting to define and measure an area's scenic or visual qualities. Visual quality in the natural landscape is a resource that must be recognized and planned for in the same manner as other resources. Aesthetic values considered in this study, which combine to give an area its aesthetic identity, include:

- topographical variation
- prominence of water in the landscape
- vegetation variety
- degree of human development or alteration
- overall uniqueness of the scenic environment compared to the larger region

For the purposes of this study, areas considered to be of high aesthetic value are those of remarkable scenic quality. In addition, areas which are accessible and designated public recreation facilities, and those areas considered to be of a high sensitivity to the public, such as the views from a designated overlook or along a scenic drive, are also considered to be of high aesthetic value. Most of the Project Area should be considered as having high aesthetic value or scenic quality. The diversity of scenic elements and vegetation types, the prominence of water in the landscape, low degree of human development, and overall uniqueness of the Project Area combine to provide a high scenic quality to the area.

Certain portions of the Project Area exhibit lower visual characteristics or aesthetic values, due primarily to the degree of human development or alteration. Examples of these areas include the existing Ranger's Station, Lost Lake Oil Field, and partially completed water control structures and locks in the southern end of the Project Area. Visual quality will be further impacted from completion of the Project. Construction of the south non-overflow dam, controlled spillway structure, access road and bridge, navigation locks, administration building, and control structure "A" (and "C", if needed) will have negative impacts on the natural scenic quality of the area. By grouping most of these visual impacts into one area, the visual quality of the south end of the Project Area will be negatively impacted, while the visual quality and character of the Project Area as a whole will not be significantly altered.

## 3.5 Mining

Mining lands within the Project Area consist of the Lost Lake Oil and Gas Field located between Lost River and Lost Lake (Figures 3-5a and 3-5b). The oil field predates the Project, is operated by Natural Exploration of Oklahoma City, and consists of two oil leases with a saltwater disposal system. The oil field includes a total of 31 wells. The Federal Government owns the minerals under a portion of the oil field. Six of the wells are used in the production of Government-owned minerals.

## 3.6 Commercial Lands

There are no existing or proposed commercial lands within the Project.

## 3.7 Outgranted Lands

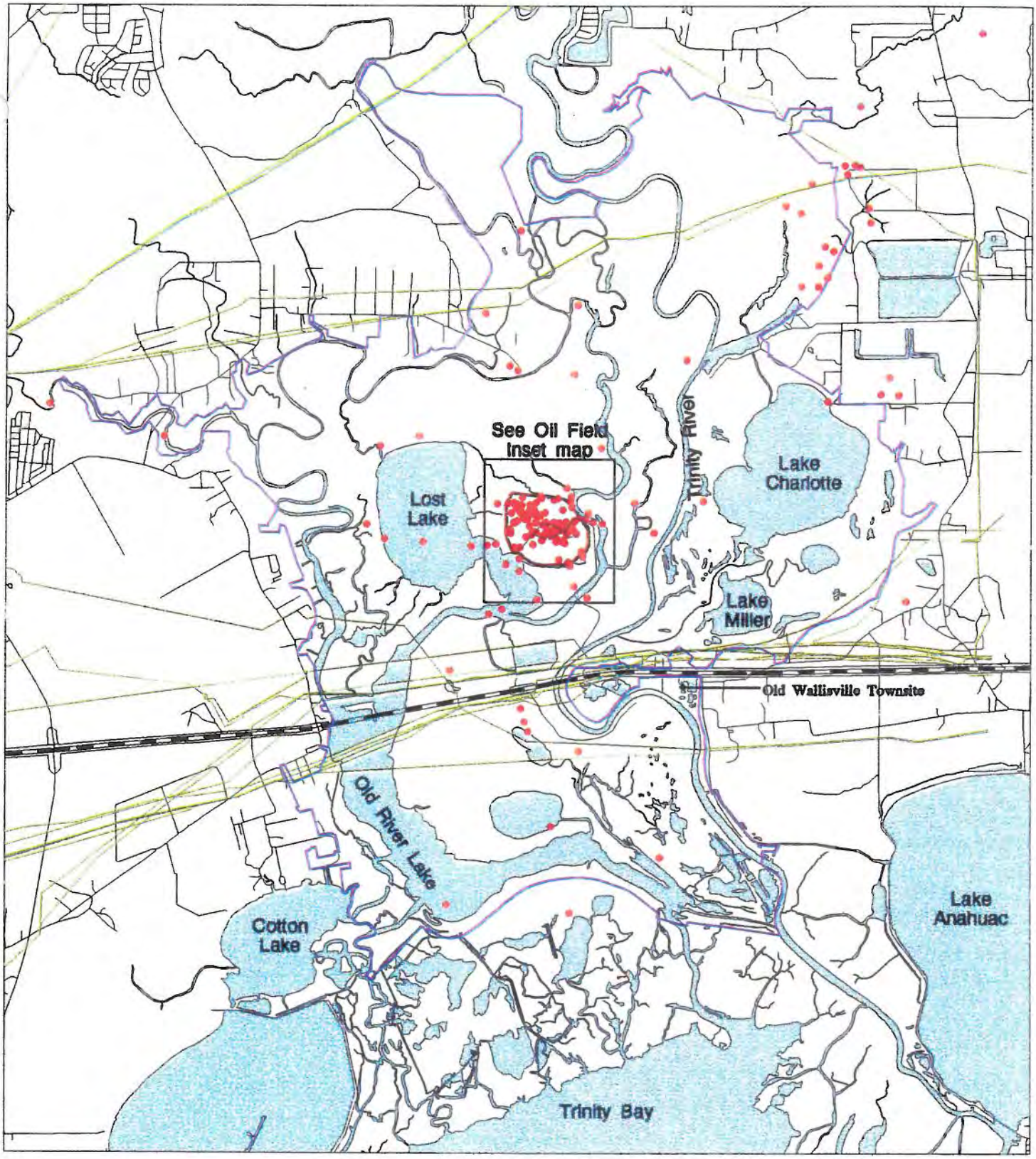
Outgranted lands include those lands which have been leased from the Federal Government for grazing; easements for pipelines, roads, transmission lines, and water intake structures; and licenses for various activities such as oil and gas wells and related facilities, roads, saltwater barriers, and landing areas for military helicopters. Table 3-2 presents a list of all outgranted lands within the Project Area.

## 3.8 Easements

All lands within the Project Area are owned in fee by the Federal Government. The Federal Government has no easements in the Project Area.

## 3.9 Water

Commonly inundated areas lacking emergent vegetation or tree cover are mapped as water. Major water bodies in the Project Area include the Trinity River, Old River, Lost River, Lake Charlotte, Lost Lake, Round Lake, Lake Miller, Mud Lake, and numerous smaller lakes, ponds, creeks, bayous, and old river channels. The extent of water areas is highly variable, depending on current hydrological conditions. Boundaries of water areas mapped as part of this study reflect field conditions of July 17 - 20, 1995, with reference to color infrared photography taken in December 1989. Some areas mapped as water appear as barren mudflats on aerial photographs and previous habitat maps.




# Wallisville Lake Project

## Pipelines and Petroleum Wells

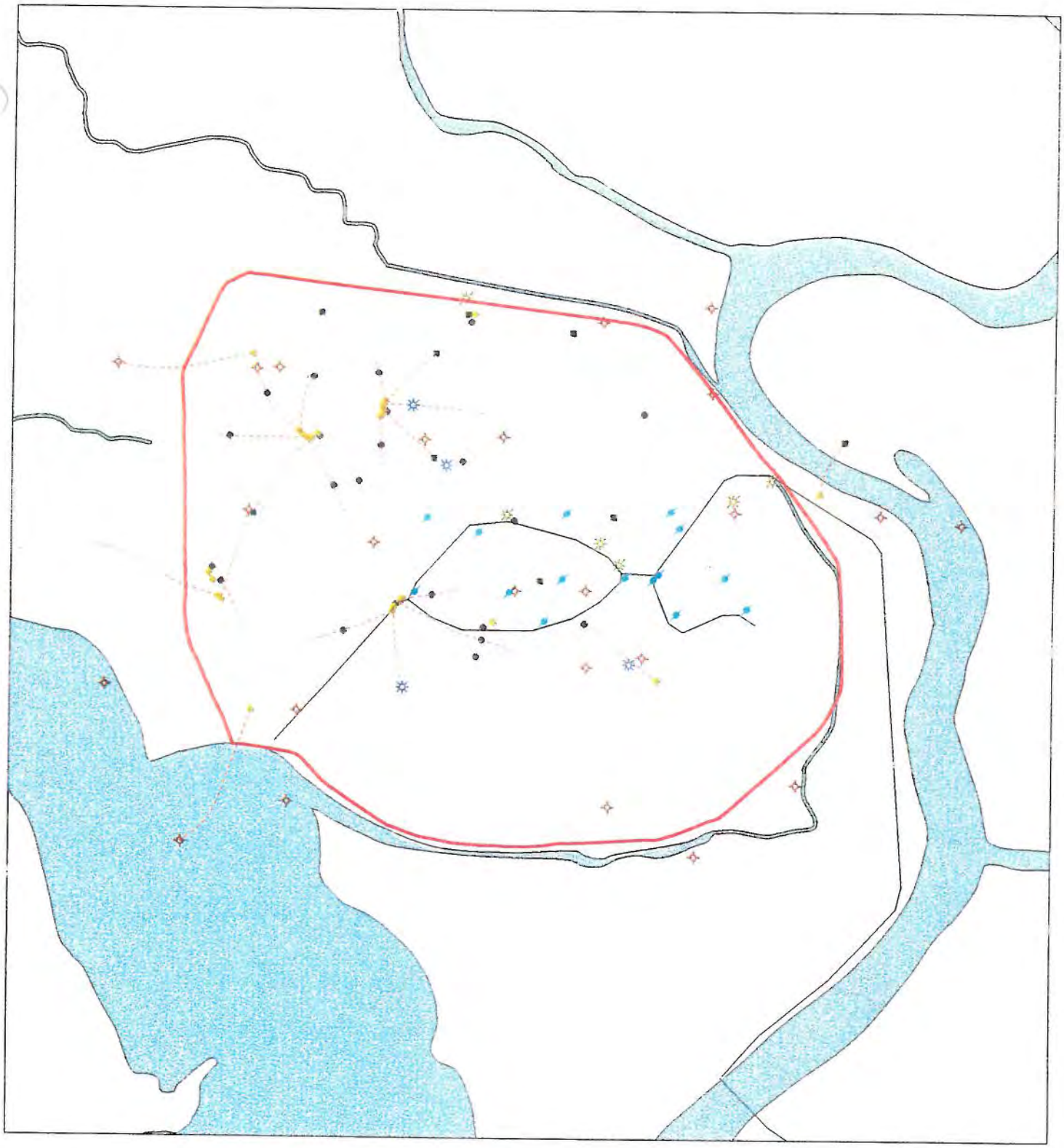
N

Inset Map
Wells
Project Boundary
Roads
Pipelines

1 0 1 2 3 4 5 6

Kilometers

Figure 3-5a




# Wallisville Lake Project

## Oil Field Inset Map

Figure 3-5b

TABLE 3-2

OUT-GRANTED LANDS FOR 1995

| CONTRACT NUMBER (DACW64-1-) | LESSEE | SIZE (ac) | TERMINATION DATE | DESCRIPTION |
|---|---|---|---|---|
| 69-25 | Exxon Pipeline | - | 11/11/2018 | Easement: Pipeline, 6" gas/30' ROW |
| 69-32 | Chevron Pipeline | - | 10/30/2018 | Easement: Pipeline, 10" ethylene |
| 69-87 | Chambers/Liberty Counties Navigation District | - | 11/11/2018 | Easement: Hog Bayou Intake |
| 71-39 | Explorer Pipeline | - | 12/03/2020 | Easement: Pipeline, 28" |
| 74-02 | Chevron Pipeline | - | 9/04/2024 | Easement: Pipeline, 12.75" crude oil |
| 74-19 | Big Three Industries, Inc. | - | 11/18/2023 | Easement: Pipeline, 2 x 12" |
| 74-52 | Cajun Outback, Inc. | - | 2/20/1999 | Easement: Powerline |
| 78-19 | Continental Oil | - | 3/31/2008 | Consent: 2 - 8" pipelines across flow easement |
| 79-01 | Colonial Pipeline | - | 4/30/2009 | Easement: Pipeline, 40" |
| 79-02 | Shell Pipeline | - | 1/07/2009 | Easement: Pipeline, 12.75"/30' ROW |
| 79-17 | Enterprise | - | 9/20/2009 | Easement: Pipeline, 4.5" |
| 81-42 | Exxon Pipeline | - | Indefinite | Easement: four pipelines, 3-8" and 1-6" |
| 82-67 | Seagull Products | - | 3/31/2012 | Consent: Pipeline, Tract 801El |
| 82-74 | J.L. Wallace | - | Indefinite | Easement: 10' road on Tract No. 737 |
| 82-75 | J.L. Wallace | - | Indefinite | Easement: Road ROW |
| 82-76 | J.L. Wallace | - | Indefinite | Easement: Powerline, 10' ROW on tract 737 |
| 95-41 | Texas National Guard | - | 9/30/2000 | License: Landing Areas |

Table 3-2 (Continued)

| CONTRACT NUMBER (DACW64-1-) | LESSEE | SIZE (ac) | TERMINATION DATE | DESCRIPTION |
|---|---|---|---|---|
| 90-37 | Cayuse Pipeline | - | Indefinite | Easement: Pipeline, 8" |
| 91-05 | Enron Products | - | Indefinite | Easement: Existing ROW, 12" pipeline |
| 91-06 | Chevron | - | Indefinite | Easement: Valve site |
| 91-19 | B.E. Wood, Jr. | 65 | 12/31/1995 | Grazing Lease: Tract Nos. 731-734 |
| 91-20 | G.W. Munger | 87 | 12/31/1995 | Grazing Lease: Tract Nos. 461,462,463(pt),464(pt),466(pt) |
| 91-21 | V. Moorhead | 23 | 12/31/1995 | Grazing Lease: Tract Nos. 4742, 743-1 |
| 91-35 | NEI Production | - | 1/31/1996 | License: Mayes 39, 40 |
| 91-36 | NEI Production | - | 1/31/1996 | License: N-1, P-1, Q-1, R-1 |
| 91-37 | NEI Production | - | 1/31/1996 | License: Storage facility |
| 91-38 | NEI Production | - | 1/31/1996 | License: K-1 |
| 91-39 | NEI Production | - | 1/31/1996 | License: E-4 Salt Water Disposal |
| 92-17 | L. Singleton | 68 | 12/31/1996 | Grazing Lease: Tract Nos. 216,218,219,221 |
| 92-18 | E. Johnson | 160 | 12/31/1996 | Grazing Lease: Tract Nos. 222-224,226-2,227-2,228 |
| 92-19 | B.G. Lawrence | 6,200 | 12/31/1996 | Grazing Lease: Tract Nos. 372,501,503,504,827,828 |
| 92-20 | H.L. Foster | 30 | 12/31/1996 | Grazing Lease: Tract No. 438 |
| 92-21 | V. Moorhead | 9 | 12/31/1996 | Grazing Lease: Tract Nos. 824,826 |
| 92-22 | L.A. Dugat, Sr. | 17 | 12/31/1996 | Grazing Lease: Tract Nos. 744-1 (pt), 901, 902, 903 |

Table 3-2 (Continued)

| CONTRACT NUMBER (DACW64-1-) | LESSEE | SIZE (ac) | TERMINATION DATE | DESCRIPTION |
|---|---|---|---|---|
| 92-23 | H.G. Daves, Jr. | 23 | 12/31/1996 | Grazing Lease: Tract Nos. 904 - 919 |
| 92-31 | D. Blum | 95 | 12/31/1996 | Grazing Lease: Tract Nos. 667- 678-2, 702, 712, 714, 716 |
| 93-14 | L. Singleton | 699 | 12/31/1997 | Grazing Lease: Tract Nos. 201- 212, 214, 217 |
| 93-15 | J.C. McManus | 112 | 12/31/1997 | Grazing Lease: Tract Nos. 471,472,474,476,454(EP) |
| 93-16 | F. McConnell | 2,285 | 12/31/1997 | Grazing Lease: Tract Nos. 504-524,473,473-2,455,454(NP) |
| 93-18 | G. W. Collier, Jr | 33 | 12/31/1997 | Grazing Lease: Tract Nos. 743-2, 920 - 928 |
| 93-19 | G. W. Collier | 101 | 12/31/1997 | Grazing Lease: Tract Nos. 718, 719, 721, 722 |
| 93-23 | J. Foster | 70 | 12/31/1997 | Grazing Lease: Tract Nos. 402 - 433 |
| 93-31 | Cajun Outback, inc. | - | 1/05/1998 | License: Road in Tracts 209, 211, 212 |
| 94-10 | C. Simien | 77 | 12/31/1998 | Grazing Lease: Tract No. 401 |
| 95-05 | K. Franssen | 7 | 12/31/1999 | Grazing Lease: Tract Nos. 759-766 |
| 95-06 | V. R. Hylton | 10 | 12/31/1999 | Grazing Lease: Tract No. 439 |
| 95-07 | V.R. Hylton | 680 | 12/31/1999 | Grazing Lease: Tract Nos. 441-443,446,447 |
| 95-08 | H. Huffman | 8 | 12/31/1999 | Grazing Lease: Tract Nos. 816-819 |

## 4.0 LAND ALLOCATION/CLASSIFICATION

### 4.1 Operations

Lands in this category are allocated to provide for the safe, efficient operation of the project for authorized purposes other than recreation or fish and wildlife enhancement. These lands include the lands on which the operational structures, maintenance facilities, and administration buildings are located (Figure 1-6). These include:

- Administration Building/Visitor Center
- Lock Access Road/East Non-Overflow Dam
- Two Lane Bridge For Lock/Administration Building Access
- Controlled Spillway In Trinity River Channel
- Navigation Channel
- Navigation Lock
- South Non-Overflow Dam
- West Non-Overflow Dam
- Control Structure A
- Control Structure B
- Control Structure C (if needed)
- Freshwater Diversion Works

### 4.2 Recreation

#### 4.2.1 Intensive Recreation

Lands in this classification are those lands allocated for intensive recreation development to meet the needs of the public (generally near large urban centers or at highly popular sites). Activities and facilities in this category include paved roads, restroom facilities with showers, concessions with fishing and picnic supplies, playgrounds, group pavilions, rental cabins and shelters, guide services, horse, bike, and boat rentals, ball fields, hiking trails, picnic tables, boat launches, fishing piers, overnight camping, and electric hookups for recreational vehicles and trailers. There are no lands designated in this project for intensive recreation.

### 4.2.2 Low-Density Recreation

These lands are designated as public use areas for low-density recreational activities by the visiting public. Activities such as fishing, hunting, hiking, boating, photography, and nature study are included in this category. Facilities to support these activities may include some roads, restrooms, playgrounds, boardwalks for hikers in wetland areas, picnic tables, canoe launches, and overnight primitive camping sites. Natural conditions preclude intensive public use development because extensive alterations of natural systems would be required. This classification is generally acceptable on other lands allocated for fish and wildlife, except access may be restricted during certain periods when fish or wildlife resources would otherwise be adversely affected. Cedar Hill Park will be allocated for low-density recreation because of the sensitive wetland habitat surrounding the park (see Section 6.0 for a full description of the park). Access to the park will not be restricted; however, access to a nearby eagle nest site will be seasonally restricted for certain activities (see Section 5.1.2).

## 4.3 Fish And Wildlife

This classification includes lands and waters designated as habitat for fish and wildlife or for the propagation of species and where wildlife habitat maintenance or improvement is appropriate. Vehicles will not be permitted except on designated roads. Licenses, permits, or easements may be issued on a case-by-case basis for certain man-made intrusions such as pipelines, cables, and electric transmission lines. Fish and wildlife management lands and waters are generally available for selected low-density recreation activities.

## 4.4 Mitigation

Mitigation lands are those lands acquired or designated to offset habitat losses associated with the project. The Wallisville Project has no lands classified within this category.

## 4.5 Environmentally Sensitive Areas

Environmentally Sensitive Areas contain special scientific, ecological, historical, archeological, or visual values, or threatened or endangered species of flora or fauna, and are managed to maintain those values. Since preservation and conservation are the principal purposes of these lands, all other uses must be compatible with them. Limited or no development is normally allowed. Low-impact management activities necessary to protect the integrity of these values, including erosion control, use restrictions, or interpretive displays may be permitted. No

agricultural uses are permitted on these lands. For the present Project, the Endangered Species Management Zones, bird rookeries (Figure 4-1), and a portion of the El Orcoquisac National Register District (near the Old Wallisville Townsite) are included in this land classification.

Low-density recreation activities that do not negatively impact the special values of Environmentally Sensitive Areas may be permitted, including hunting and fishing in accordance with State fish and wildlife management regulations. At the Wallisville Project, these areas are normally found within (encompassed by) one of the other classification categories and must be managed to insure that the special attributes are not adversely impacted.

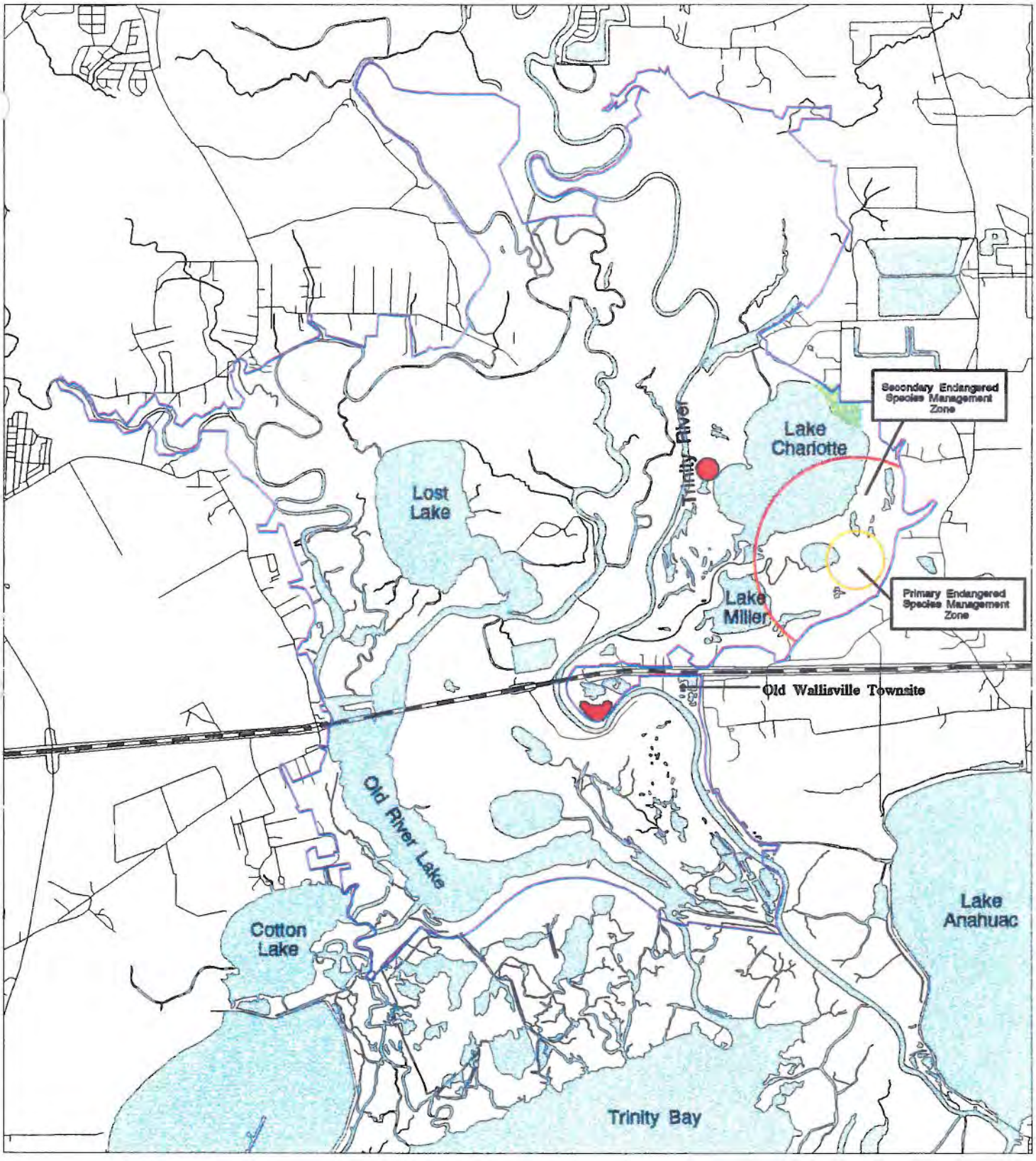
## 4.6 Outgranted Lands

Outgranted lands include those lands which have been made available by the Federal Government for use by others. This includes leases for cattle grazing (Figure 4-2, where the various colors denote individual leases for 1995); easements for pipelines (Figure 3-5a), roads, transmission lines, and water intake structures; and licenses for various activities such oil and gas wells and related facilities (Figure 3-5a), roads, saltwater barriers, and landing areas for military helicopters.

Outgranted lands include:

- Twenty-two contracts for cattle grazing totalling approximately 10,865 acres.
- NEI Production, of Oklahoma City, which operates the Lost Lake Oil and Gas Field, has licenses for 28 oil and gas wells, a storage facility, and 3 saltwater disposal wells. The Lost Lake Oil and Gas Field predates the Project.
- Thirteen easement or contracts for pipeline corridor rights-of-way.
- Three easement contracts for roads.
- Two powerline easement contracts.
- One easement contract for the freshwater intake at Hog Bayou.
- One license for a landing area for the Texas National Guard.

An Environmental Review Guide for Operations (ERGO) was conducted for the Project Area in March 1995 (EH&A, 1995b). No significant or major findings of noncompliance were found in the Project Area, and only 16 minor findings of noncompliance were found. Ten of these were procedural. There were four minor findings of noncompliance which are pertinent to outgranted lands and all were concerned with the Lost Lake Oil and Gas Field: concerns about the adequacy of secondary dikes around storage tanks within the Field and concerns with the



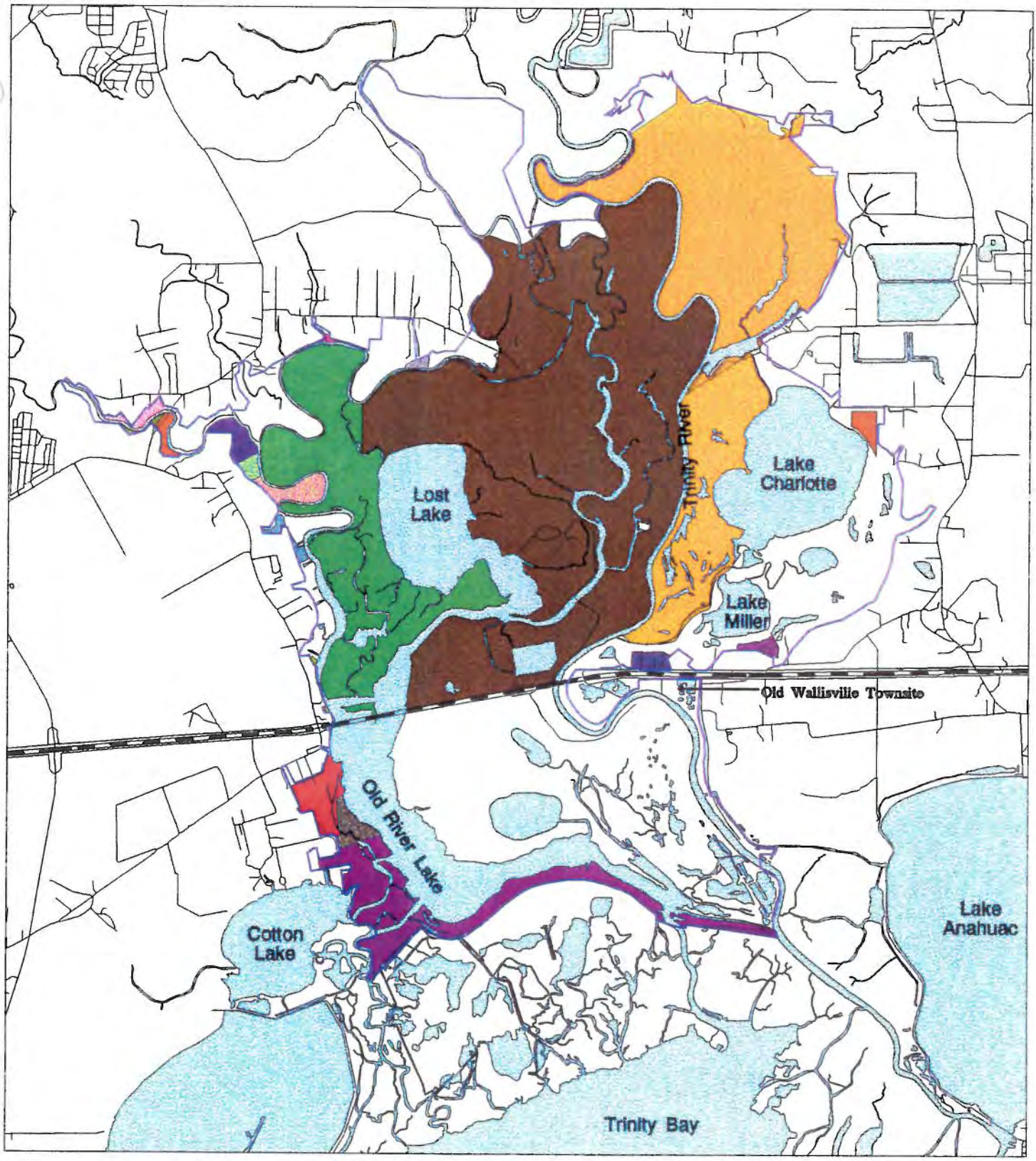

Wallisville Lake Project
Endangered Species Map

Figure 4-1

Rookery Management Site
Primary Endangered Species Management Zone
Secondary Endangered Species Management Zone
Project Boundary
Roads

N

1 0 1 2 3 4 5
Kilometers




**Wallisville Lake Project**

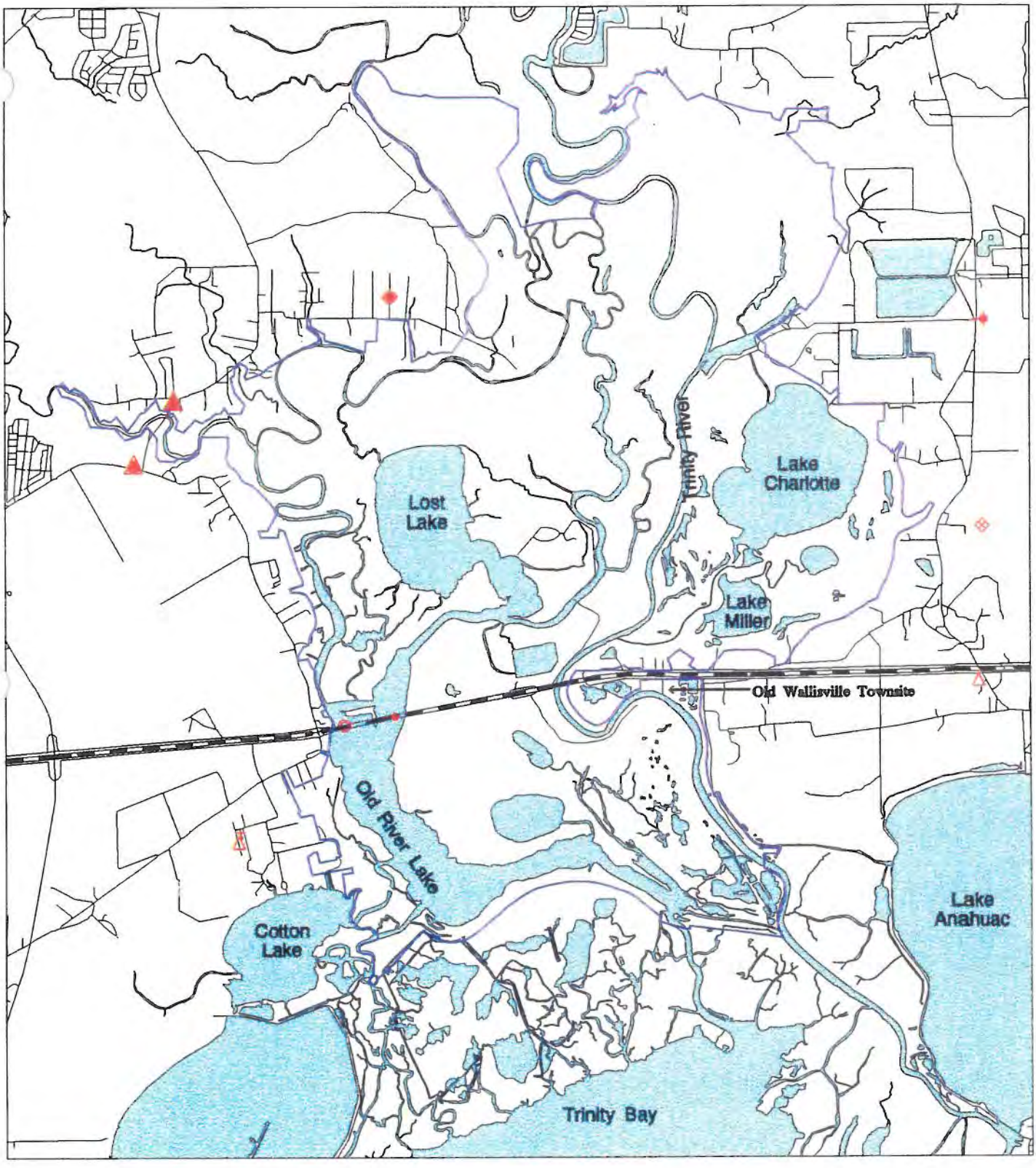
**1995 Grazing Leases**

**Figure 4-2**

contamination and vegetation kills near the northwesternmost diked containment area in the Lost Lake Oil and Gas Field. The ERGO recommended that the dikes be inspected and that the pertinent State and Federal Agencies be notified to determine if remediation is necessary.

Starting in April 1995 and running concurrently with the ERGO, a Hazardous, Toxic, and Radioactive Waste Preliminary Assessment (HTRWA) was conducted for the Project (EH&A, 1995a). The HTRWA revealed that, in addition to the wells in the Lost Lake Oil and Gas Field, there are 42 dry holes elsewhere in the Project Area. The HTRWA indicated that there have been no major leaks from any of the pipelines that cross the Project Area, although there is always the potential. The only problems found in the Project Area by the HTRWA was a significant area of surface soil contamination and dead vegetation around an above-ground storage tank and breach in the tank's containment dike at the Lost Lake Oil and Gas Field. The HTRWA recommended that remedial actions and spill clean-up be conducted and monitored at the Lost Lake Oil and Gas Field. These regulated sites of concern are shown in Figure 4-3.

Subsequent to these investigations, the Bureau of Land Management (BLM) issued several citations to NEI Production Company (NEI) with warnings to correct non-compliance issues. In September 1995, the BLM followed up on the citations with a letter to NEI concerning the State and Federal violations and their non-compliance with the laws and regulations. Subsequent to this action, the Railroad Commission of Texas inspected the site after another spill occurred in 1996 and directed NEI to conduct a cleanup. By June 1996, only minor cleanup and remedy of the historical problems have been conducted at the oilfield. NEI continues to operate the oilfield without regard for environmental regulations and laws, which includes dumping regulated material onsite, improper record keeping, improper disposal, spills, and poor equipment maintenance. The BLM and Railroad Commission are continuing efforts to get NEI to correct all deficiencies and follow all environmental regulations and laws.




**Wallisville Lake Project**

**HTRW Sites**

**Figure 4-3**

# 5.0 RESOURCE MANAGEMENT PLANS

## 5.1 Fish And Wildlife Management Plan

A meeting was held at the USFWS Anahuac National Wildlife Refuge with personnel from the Refuge and with Texas Parks and Wildlife Department personnel from the J.D. Murphree Wildlife Management Area on July 18, 1995. The meeting was to seek input from these Federal and State agencies into the Fish and Wildlife Management Plan as described below.

### 5.1.1 Fisheries Management Plan

The fisheries of the portion of the Project Area fed by the Trinity River and downstream of the Project Area will be influenced by Project Operations. During periods of normal or high flows, conditions will remain similar to conditions prior to the Project. When river flows drop below about 1,000 cfs, the spillway gates will be gradually closed to prevent saltwater encroachment. These operations will result in fishery management in the Project Area during low flow periods which is primarily for freshwater species at the expense of marine species. For the portion of the Project Area which is fed by the Old and Lost Rivers, there will be few, if any, impacts to the fisheries from the Project, except when conditions require closure of Control Structure A.

Since the Wallisville Lake Project does not include any reservoir, there will be no clearing for impoundment, creation of artificial habitat from clearing, or tailrace design to enhance fishing, as would be expected from a normal reservoir project. Part of the Fisheries Management Plan was included in the modifications to the Project (i.e., the present Project) by impounding no water and maintaining only the small head necessary to prevent saltwater intrusion. The present Project creates the least possible impacts to the existing fishery that is compatible with the Project's primary function: saltwater control.

Therefore, the Fisheries Management Plan entails managing the fisheries resources of the Project Area to maintain the native fisheries in a condition that is as close to pre-Project conditions as possible and still meet the requirements of saltwater control. This will impact some marine species, depending on the frequency and duration of low-flow events.

It is the policy of the USACE to permit fishing at its projects in accordance with local, State, and Federal regulations. Fishing will be monitored by the Park Ranger and State game wardens. As noted in the Recreation Plan, a canoe launch will be provided at Cedar Hill Park,

but power boats may not launch there. However, power boats may gain access to Lake Charlotte through Mac Bayou or Lake Pass when water conditions permit.

### 5.1.2 Wildlife Management Plan

The Wildlife Management Plan will be directly related to the Vegetation Management Plan since one must manage the habitat (vegetation and land) in order to manage for wildlife. Several management tools are available to the USACE for habitat management. They include switching from a continual grazing system to a rotational grazing system; using controlled burns in grassland and marsh habitats; and using mechanical means to manage and manipulate vegetation. These management tools are discussed further in Section 5.2.

One of the objectives of the Wildlife Management Plan is to continue to provide public hunting opportunities within the Project boundaries. The USACE currently manages public hunts for waterfowl within the Project Area and this program will be continued in its current form.

Other public hunting opportunities exist on the Project and could be incorporated into the public hunting program in the future. An example of one such opportunity is the ever-expanding feral hog population which occurs on the Project. Thinning or eliminating the feral hog population in the area would be beneficial to many of the native wildlife species present in the area in addition to the increased recreation opportunities for the Project. Alligator hunts could be another opportunity to manage wildlife and provide public hunting opportunities at the same time. Alligators are common throughout the Project Area and occur in sufficient numbers to sustain a controlled harvest. Small game hunting (rabbits and squirrels) also is potentially feasible on the Project. While an expansion in the hunting program could provide increased recreation opportunities, they would also entail close monitoring, management, enforcement, and increased man-power requirements. These opportunities will be examined in the future when the Master Plan is updated and may be implemented, depending on funding and staffing levels.

Another objective of the Wildlife Management Plan is the protection of a nesting site used by a pair of bald eagles within the Project Area. As a result of Section 7 Consultation with the USFWS, Project features and operations have been revised so that it will not impound water for a reservoir, which would have caused permanent flooding of the cypress swamps. Permanent flooding of the swamps would have resulted in a decrease in tree vigor, thinning of the tree canopy, and an increase in tree mortality. Under the revised Project, the cypress swamps will seasonally flood and drain under natural conditions which should not result in increased stress to

the cypress swamps. The USACE is currently monitoring the health of the cypress trees in the Project Area.

Endangered species management zones have been incorporated into the Project to protect the current bald eagle nest site from human disturbances. These management zones include a primary zone and secondary zone. The primary zone is the most critical and encompasses an area extending up to a 1,500-ft radius around the nest site. Restrictions for this area at all times are: no residential, commercial, or industrial development, tree cutting, logging, construction, mining, and no use of chemicals toxic to wildlife. Restrictions during the nesting period are no unauthorized human entry and no helicopter or fixed-wing aircraft operation within 500 feet vertical distance or 1,000 feet horizontal distance from a nest. Signs have been posted around the primary zone warning the public of restricted entry.

The secondary zone encompasses an area extending outward from the boundary of the primary zone to a distance of one mile. Restrictions for this area at all times are: no development of new commercial and industrial sites, no construction of multi-story buildings and high density housing developments between the nest and the eagles' feeding area, no construction of new roads, trails, and canals which would tend to facilitate access to the nest, and no use of chemicals toxic to wildlife. Minor activities such as hiking, bird watching, fishing, camping, and picnicking may be permitted in the secondary zone at any time.

The majority of fee lands within the Project Area are to be set aside for the conservation and management of fish and wildlife resources. Controlled access will be an important part of the overall management plan. The Project perimeter will be fenced, with limited access points at boat ramps and Cedar hill Park. Vehicles will not be allowed except on authorized roads. Off-road vehicle use will be prohibited in the Project Area, except for Project Operations.

## 5.2 Vegetation Management Plan

The primary objective of the Vegetation Management Plan is to manage the Project so that vegetation communities will be maintained in their current condition or be enhanced. The revised Project should accomplish this objective since no water will be purposefully impounded to form a reservoir. A monitoring program of the cypress swamps is being performed to determine health and vigor of the cypress swamps surrounding Lake Charlotte and Mac Bayou. This monitoring program will become part of the management plan in order to assess health and trends in the cypress swamps.

Another area of the Project that was recommended for remediation and monitoring by the HTRWA, was a section of the Lost Lake Oil and Gas Field which experienced a spill and vegetation kill around an oil storage tank (Section 4.6). The remediation and revegetation of the spill area will be incorporated into the Vegetation Management Plan, as well as the Mining and Outgranted Lands Management Plans.

Several management tools are available to the USACE to help manage the vegetation communities of the Project Area. A controlled grazing program is one management tool that could be implemented on the Project which could benefit vegetation communities, particularly the upland grasslands and marsh communities. A rotational grazing system would allow areas to be grazed, then rested for a period of time allowing them to recover and regenerate. The continual grazing system currently employed does not allow for this and has resulted in overgrazing in some areas. A carefully managed grazing system would also be beneficial in suppressing the encroachment of brush within the upland grassland areas and minimizing soil erosion caused by loss of vegetation (overgrazing).

The use of fire as a management tool could be beneficial to the grassland and marsh communities, as well as the wildlife that utilize them. The use of controlled burns in the grassland and marsh communities could be used to remove thick accumulations of rough vegetation, recycle nutrients, and promote the growth of more desirable plant species. The careful use of fire in conjunction with controlled grazing could be instrumental in reducing or eliminating brush encroachment and the invasion of noxious, exotic species into the grasslands and marshes. Controlled burns are currently used as a vegetation management tool at the Anahuac National Wildlife Refuge in conjunction with controlled grazing. The results of this program have been beneficial to the vegetation communities and the wildlife that utilize them, particularly for waterfowl. Prescribed burning can be one of the most efficient and practical management tools employed in coastal grassland ecosystems (Neaville, 1994).

Mechanical manipulation of vegetation is another management tool available to the USACE. Mechanical treatments (bulldozing, hand clearing, shredding, plowing, discing, planting, etc.) to vegetation may be costly as well as time and labor intensive. Additionally, inaccessibility of many parts of the Project Area could render mechanical treatments unfeasible if heavy machinery or large equipment is required. The use of mechanical treatments to vegetation, as well as all other management tools, will depend on future funding and staffing levels. All aspects of the vegetation management plan will be open-ended and decisions will be made as needed during future revisions of the Master Plan.

## 5.3 Historic Properties Management Plan

The historic properties MOA requires development and implementation of a mitigation program and a long-term historic properties management plan for the Wallisville Lake Project. The mitigation program described in FDM No. 10 (USACE, 1993) and the 1995 EA (USACE, 1995) will be completed by the end of 1996. This program mitigates for all Project and recreation impacts described in the 1995 EA. Impacts associated with future Project modifications not identified in the EA are not covered by this mitigation program and must be coordinated separately. The MOA's long-term historic properties management plan requirement is addressed by the following management plan and subsequent operational management plans.

The primary objective of the historic properties management plan is to administer these resources in such a way as to prevent damage from Project operations, outgrants, vandalism, and recreation. Operating plans for District land management activities, monitoring, and security will be used to fulfill these management objectives. Each will be developed in consultation with the Texas State Historic Preservation Officer.

A historic properties operating plan will be developed to ensure that all District actions related to Project management comply with the National Historic Preservation Act. Procedures to be formulated during preparation of the Operational Management Plan will address: 1) real estate actions such as leases, licenses, excessing of property, and the Archeological Resources Protection Act permits; 2) recreational activities; 3) emergency activities; 4) Project operations; 5) unanticipated discovery; and 6) North American Graves Protection and Repatriation Act coordination. These procedures will provide a step-by-step process to guide District personnel in the treatment of historic properties during day-to-day operation of the Project. They will also facilitate development of a Heritage Park at the Wallisville Townsite when a master plan for the park has been submitted by the proposed local sponsor. To assist District and Project personnel in these tasks, a Geographic Information System relational database is currently in development. This database will contain easily accessible and updatable information on site location, eligibility, description, and condition, as well as other crucial information such as areas which have been surveyed, high probability geomorphic landforms, and areas disturbed by construction. The historic properties database will be regularly updated to facilitate Project management.

A systematic monitoring program will be developed to assess affects of Project operation on historic properties. This monitoring program will record the current condition of sites at the onset of Project operation and at regular intervals thereafter. The monitoring program will record and assess the effect of public use and ongoing natural processes (i.e. siltation,

erosion, subsidence) on sites throughout the Project. Particular attention will be paid to the most significant properties in the Project area, including the El Orcoquisac mission and presidio sites, and the Honeycomb site (41LB4).

A security plan will be developed to address site vandalism under the Archeological Resources Protection Act. This plan will establish procedures for monitoring all significant or potentially significant sites in the Project for signs of vandalism. A portion of the El Orcoquisac National Register District will be declared a sensitive area, allowing the restriction of development and land use in the area. In addition, an intensive monitoring program will be established for the Orcoquisac District which focuses on vandalism and unauthorized public use. The plan will outline required coordination procedures should any National Register or eligible property be damaged or endangered by vandalism.

## 5.4 Aesthetics Management Plan

The primary objective of the Aesthetics Management Plan is to maintain the natural character of the Project Area to the greatest extent possible. This will be achieved primarily as a result of the Project modifications and the land allocations and classifications. No commercial development will be permitted in the Project Area and centralized recreation will be limited to Cedar Hill Park. This developed park will be constructed from native materials where possible and designed to blend with the surrounding landscape. The majority of the Project Area will be devoted to fish and wildlife management. Areas allocated for fish and wildlife management will be retained in native vegetation communities which should help preserve the scenic quality of the Project Area. The revised Project will also serve to maintain the health and vigor of the cypress swamps which provide some of the most picturesque views of the Project Area.

## 5.5 Mining Management Plan

The Lost Lake Oil and Gas Field within the Wallisville Project Area is also an important operational consideration for the environmental welfare of the Project. The oil field is operated by Natural Exploration of Oklahoma City and consists of two mineral leases with a salt water disposal system. There is the potential for an oil spill from the Lost Lake Oil and Gas Field which could cause significant environmental damage. One aspect of the management plan will be routine inspections of the oil and gas facilities on a regular basis. Any spillage observed during the inspections will be reported to the operator, to the Real Estate Division of the Galveston District, and to the Railroad Commission of Texas. Spill clean-up, remediation, and

revegetation of the spill area of the Lost Lake Oil and Gas Field is included in this Mining Management Plan.

The operator of the Lost Lake Oil and Gas Field must prepare and follow a system of written procedures for conducting normal operations and maintenance activities and handling emergencies. The response plan must account for resources for responding to the worst case discharge, and to a substantial threat of such a discharge. The response plan must be consistent with the National Contingency Plan (NCP) (40 CFR part 300) and each applicable Area Contingency Plan (ACP).

The control and monitoring of oil and hazardous substances pollution for the Wallisville Project Area is the responsibility of the Galveston District. The Wallisville Project Area lies within Environmental Protection Agency (EPA) Region 6 for the development of the NCP. The purpose of the NCP is to explain the responsibilities and powers created by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Clean Water Act (CWA).

The NCP was developed to comply with section 105 of CERCLA, 42 U.S.C. 9605 and section 311(c)(2) of the CWA, as amended, to incorporate responsibilities under CERCLA. The CERCLA and the CWA mandate certain information that must be included in the NCP. Within limitations imposed by regional concerns, those information requirements also serve as a guide for the scope of the Regional Contingency Plan (RCP).

The RCP provides for efficient, coordinated, and effective response to discharges of oil and releases of hazardous substances, pollutants, and contaminants in accordance with the authorities of CERCLA and the CWA. The Galveston District, working through the EPA, shall provide the On-Scene Coordinator (OSC) with oil discharges and hazardous substance releases into or threatening the Wallisville Project Area. The OSC directs Federal fund-financed response efforts and coordinates all other Federal efforts at the scene of a discharge or release subject to Executive Order 12316.

Each OSC should maintain a Federal local plan for response in their area of responsibility. Local plans should provide for a well-coordinated response that is integrated and compatible with the pollution response, fire, emergency, and disaster plans for local, State, and other non-Federal elements. They should also identify:

- the probable locations of discharges or releases;
- the available resources for response to multi-environmental media incidents;
- location of these resources;
- waste disposal methods and facilities consistent with local and State plans developed under the Resource Conservation and Recovery Act;
- a local structure for responding to discharges or releases.

The USACE, acting as the Federal trustee for natural resources at Wallisville Project, is also responsible for assessing damages to the Project Area resources in accordance with regulations promulgated under section 301(c) of CERCLA, seeking recovery for the losses from the person responsible for the Fund, and devising and carrying out restoration, rehabilitation, and replacement plans pursuant to CERCLA.

Each State within EPA Region 6 comprises a subregional unit for purposes of this plan. The State of Texas has prepared statewide or other contingency plans (SCPs) to provide coordinated emergency response to oil discharges and hazardous substance releases. The SCP development and revision should be coordinated, as much as possible, with the State and local plans.

The Galveston District will also evaluate what industrial and commercial materials will be used and stored within the Wallisville Project Area. This will also involve a review of available environmental assessments, engineering reports, and site visits. This information, along with a regulatory review, will support the procedural development of a program to handle, store, and dispose of petroleum, oil, and lubricants (POL). This plan would include managing POLs generated at the facility, storage and containment, a spill contingency plan, and a training plan for operations personnel.

For safety reasons, the Lost Lake Oil and Gas Field will be closed to the public. The gate at IH-10 will remain locked, and signs will be posted warning the public to keep out. Only authorized persons and vehicles will be permitted in the Lost Lake Oil and Gas Field.

## 5.6 Outgranted Lands Management Plan

The Management Plan for Outgranted Lands will entail routine inspections of outgranted lands to ensure compliance with local, State, and Federal environmental regulations, as well as compliance with conditions specific to individual leases, easements, and licenses. In 1995, a HTRWA and an ERGO (Section 4.6) were conducted for the Project. The only problem

found in the Project Area was a significant area of surface soil contamination and dead vegetation around an above-ground storage tank and breach in the tank's containment dike at the Lost Lake Oil and Gas Field. Spill clean-up, remediation, and revegetation of the spill area of the Lost Lake Oil and Gas Field is included in this Outgranted Lands Management Plan.

Each pipeline operator must prepare and follow for each pipeline system a manual of written procedures for conducting normal operations and maintenance activities and handling abnormal operations and emergencies. Each pipeline operator must submit their response plan for approval to Pipeline Response Programs Administration, Department of Transportation, Washington, DC. Each response plan must plan for resources for responding, to the maximum extent practicable, to a worst case discharge and to a substantial threat of such a discharge. Each response plan must be consistent with the NCP and each applicable ACP. The Oil and Hazardous Substance Pollution Contingency Plan for the Wallisville Lake Project contains the basic management plan for spill response and each operator's spill response plan and is an essential part of the Outgranted Lands Management Plan.

All pipeline operators will be required to provide spill response plans as discussed in the previous section. In the event of a spill, pipeline operators will be required to properly remediate affected areas. Should Project personnel discover a pipeline failure or leak, the pipeline operator and the appropriate Federal and State agencies will be notified.

## 5.7 Water Management Plan

The Water Management Plan for the Project will be dictated by the operating procedures for salinity control. Under normal and high flow conditions, the spillway gates will remain open, allowing water to flow through the Project unimpeded. During drought or low-flow conditions, the spillway gates will be gradually closed in order to build enough head to flush encroaching saltwater from the Project. A more detailed discussion of Project Operations can be found in Appendix A.

# 6.0 RECREATION PLAN

## 6.1 Introduction

This section presents the recreation portion of the Wallisville Lake Master Plan. The purpose of the Recreation Plan is to provide a comprehensive guide for the development of Cedar Hill Park and describe the limited recreation features planned for other areas in the Project. This comprehensive guide incorporates the sensitivity of the ecological system of Lake Charlotte into its design, provides wise and orderly use of the proposed facilities, and protects the habitat of the bald eagle nesting area.

The goals of the Recreation Plan are:

- Provide high-quality recreational opportunities for all visitors to the Project area that will not impact the nesting success of the endangered bald eagle;
- Promote public health, safety, welfare, and overall quality of life;
- Incorporate recreational opportunities into the natural and historic features of the Project without impacting the endangered bald eagle;
- Provide an effective and site-sensitive design that can move through construction and into operation with few changes in purpose, appearance, or utility.

The objectives of the Recreation Plan are:

- To prepare a data base that identifies the major characteristics of the natural and historic properties in the Project area and to utilize this data base as a tool in preparing appropriate development plans and management recommendations;
- To explain the planning process methods used in developing the Recreation Plan so that minimum effort is required to understand and follow up on those methods;
- To coordinate the development of the Recreation Plan with other Federal and State agencies and special interest groups;
- To identify suitable locations for the various recreational activities;

- To incorporate protection of the bald eagle into the design and management of the recreational aspects of the Project;

- To develop design criteria that result in a unified architectural theme and serve to protect and preserve the park's natural environment.

## 6.2 Local and Regional Recreational Opportunities and Needs

Currently, the USACE does not provide any developed recreational facilities in the Project area. However, the USACE does operate a manned on-site Project office and provides limited recreational activities. The Park Ranger monitors and patrols all activities in the Project area, including the annual duck hunting program, fishing, canoeing, recreational boating, wildlife observation, and hiking. Additionally, there are two public boat launches in the Project area: one is on the west bank of the Trinity River, under the IH-10 bridge, and is operated by Chambers County while the other is on the opposite side of the Trinity River and has no sponsor.

The authorized plan for the Project includes the recreational development of Cedar Hill Park and a heritage park at the old Wallisville Townsite. However, development of the Wallisville Townsite is dependent upon the participation of a local sponsor who has not provided sufficient information for it to be included in the Recreation Plan. Therefore, the Recreation Plan does not address the Wallisville Townsite, but will focus on the development of Cedar Hill Park as described below.

Recreational opportunities in the region are diverse and centered around the City of Houston, a city with numerous recreational opportunities. The character of recreational activities potentially available at Wallisville Lake Project are different from most of those available within the Houston or other municipal non-reservoir facilities. The typical urban recreation activities available throughout Houston include softball, swimming, golf, tennis, cycling, soccer, football, walking, and basketball. Table 6-1 represents other water-oriented parks and reservoirs within a 50-mile radius of the Project that offer recreational opportunities similar to those available within the Project boundaries.

Obviously, the Project can provide some of the same recreational opportunities offered at the sites in Table 6-1. However, recreational opportunities at the Project differ from those listed above in that the Project will not be developed to the same degree and can, therefore, offer scenic and wildlife opportunities lacking at the other sites. The basic difference in recreational development at the Project and elsewhere is that although the name Wallisville Lake implies a

TABLE 6-1

Parks and Reservoirs within 50 miles of Wallisville Lake Project

| Name | County | Distance (miles) | Admin. Agency | Project Purpose |
|---|---|---|---|---|
| Lake Anahuac | Chambers | 4 miles | Chambers-Liberty Co. Navigation Dist | Irrigation, Industrial water supply, & Recreation |
| Lake Highlands | Harris | 20 miles | San Jacinto River Authority | Municipal, Industrial & Irrigation water supply, & Recreation |
| Lake Houston | Harris | 30 miles | City of Houston | Municipal, Industrial & Irrigation water supply, & Recreation |
| Sheldon Reservoir | Harris | 32 miles | Texas Parks & Wildlife Dept. | Game Preserve, Fish Hatchery, & Recreation |
| Big Hill Reservoir | Jefferson | 45 miles | Texas Parks & Wildlife Dept. | Wildlife Refuge & Recreation |
| * San Jacinto Battleground | Harris | 20 miles | San Jacinto State Park Commission | Historical & Recreation |

* Park Only - adjacent to Houston Ship Channel

reservoir or large body of water is present, that is not the case with this Project. A typical USACE reservoir project includes a large manmade reservoir developed for flood control or other purposes with the classic USACE recreational activities such as swimming, fishing, power boating, water skiing, sailing, camping, and picnicking. The Wallisville Lake Project is atypical in that it will not impound a reservoir, but consists of naturally occurring numerous small ponds, shallow lakes, rivers, and interconnecting channels and bayous between lakes and rivers. The water depths of the lakes vary according to frequently fluctuating water levels, but are generally less than 5 feet, whereas the water depths of the Trinity River and Old River vary from 15 to

25 feet. The overall volume of water within the Project is dependent on seasonal changes and the amount of rainfall occurring in the area.

Based on the paucity of water-based recreational opportunities around such a large urban population as found in Houston and on the economic analysis described in Section 6.6, the amount of demand for recreation of the type that can be furnished by the Wallisville Lake Project far exceeds that which the Project can provide. The unmet demand for recreation of this type will have to be absorbed by other recreational opportunities elsewhere.

## 6.3 Site Inventory and Analysis

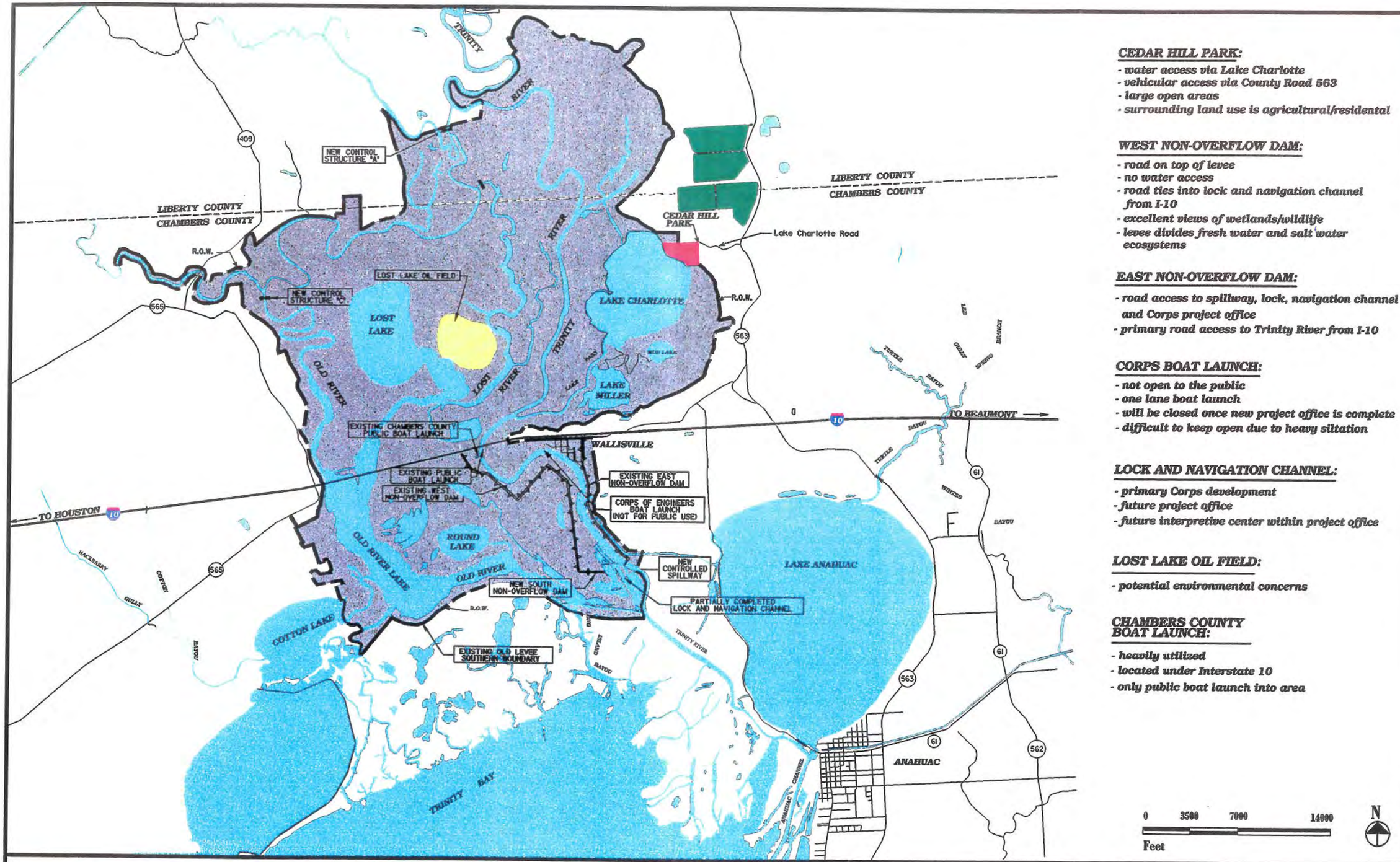
### 6.3.1 Introduction

The initial planning requirement for development of Cedar Hill Park consists of a complete site inventory and analysis of all available resources. The purpose of the site inventory is to graphically represent the existing conditions at Cedar Hill Park, including Project location, roads, topography, boundary lines, water, trees, etc. The purpose of the site analysis is to develop a relationship between the site inventory and the objectives of the recreation master plan. The most important objective of the Cedar Hill Park development is to provide recreational facilities and activities that do not impact the nesting habitat of the bald eagles. The site analysis describes both assets and constraints of the site related to the recreation development.

A description of the physical features, climate, topography, soils, vegetation and wildlife resources, historic properties, and endangered species found in the Project area can be found in Section 1.0 of Appendix A and Section 3.0 above. These data were used in compiling the site inventory for the Wallisville Lake Project and the Cedar Hill Park area. The results are presented in Figures 6-1 and 6-2. The site analysis for the Wallisville Lake Project and Cedar Hill Park is presented in Figures 6-3 and 6-2, respectively.

### 6.3.2 Current Uses

The lands within the Project boundaries are currently being used for a variety of activities, including the following:




***CEDAR HILL PARK:***

- *water access via Lake Charlotte*
- *vehicular access via County Road 563*
- *large open areas*
- *surrounding land use is agricultural/residental*

***WEST NON-OVERFLOW DAM:***

- *road on top of levee*
- *no water access*
- *road ties into lock and navigation channel from I-10*
- *excellent views of wetlands/wildlife*
- *levee divides fresh water and salt water ecosystems*

***EAST NON-OVERFLOW DAM:***

- *road access to spillway, lock, navigation channel and Corps project office*
- *primary road access to Trinity River from I-10*

***CORPS BOAT LAUNCH:***

- *not open to the public*
- *one lane boat launch*
- *will be closed once new project office is complete*
- *difficult to keep open due to heavy siltation*

***LOCK AND NAVIGATION CHANNEL:***

- *primary Corps development*
- *future project office*
- *future interpretive center within project office*

***LOST LAKE OIL FIELD:***

- *potential environmental concerns*

***CHAMBERS COUNTY BOAT LAUNCH:***

- *heavily utilized*
- *located under Interstate 10*
- *only public boat launch into area*

**WALLISVILLE LAKE RECREATION MASTER PLAN**

**U.S. Army Corps of Engineers, Galveston District**

PROJECT LOCATION

**WALLISVILLE SITE INVENTORY**

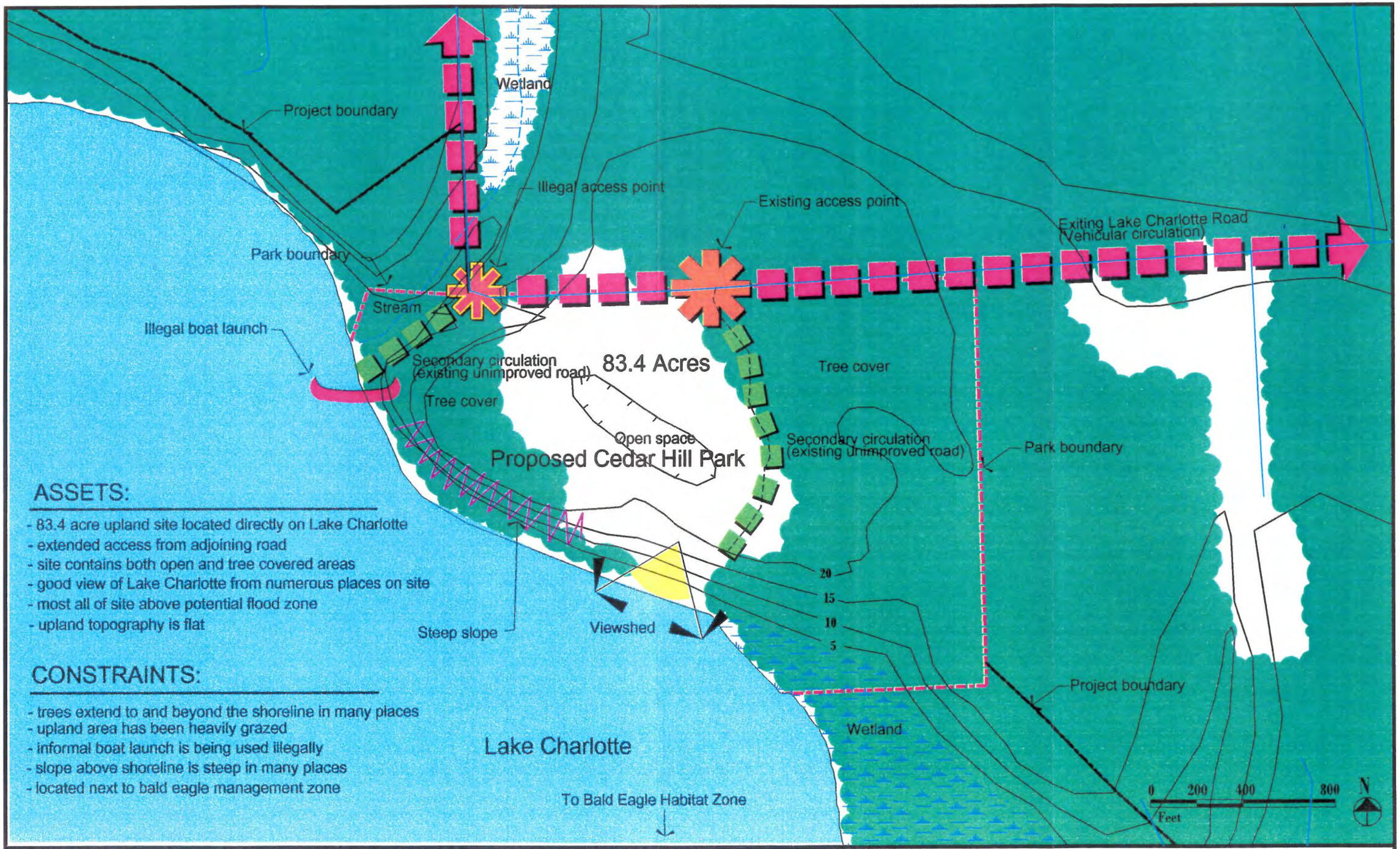
Prepared by:
U.S. Army Corps of Engineers, Fort Worth
Corps of Engineers
Planning Division

DATE: September 1995 (revised Nov 95, Jan 96)

DRAWN BY: KH/BGB

FIGURE NO: Figure 6-1

FILE NAME: wallis_si.dgn



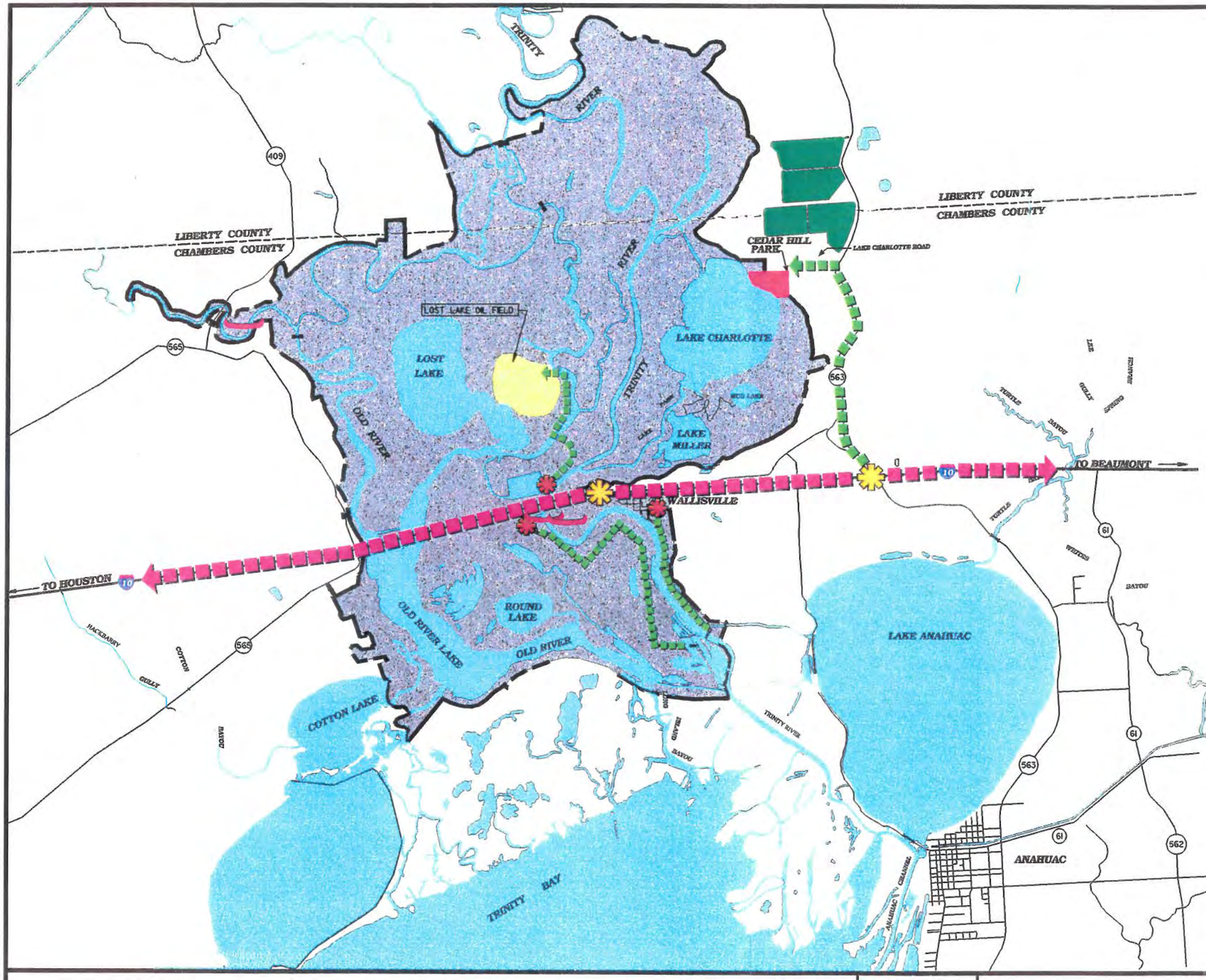

# WALLISVILLE LAKE RECREATION MASTER PLAN

U.S. Army Corps of Engineers, Galveston District

PROJECT LOCATION

## CEDAR HILL PARK SITE INVENTORY\ANALYSIS

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|---|---|---|
| U.S. Army Corps of Engineers, Fort Worth<br>Corps of Engineers<br>Planning Division | September 1995 (revised Nov 95, Jan 96, Jan 96) | EH/RGB |
| | FIGURE NO: **Figure 6-2** | FILE NAME: cedar_m.dgn |




## ASSETS:

- easy access via I-10
- located less than 50 miles from Houston/Harris Co.
- primarily undisturbed wetland habitat
- abundant wildlife, scenic beauty
- existing waterfowl hunting and fishing programs
- large area (approximately 19,700 acres)
- new levees and roads will provide vehicular access to inner portions of the project
- historical districts

## CONSTRAINTS:

- access to majority of project limited to boats
- summer heat and insect problems
- potentially dangerous wildlife species
- Lost Lake Oil Field is potential environmental concern
- numerous pipelines cross the project
- vehicular access is primarily limited to perimeter of project
- Bald Eagle Habitat Management Area

# WALLISVILLE LAKE RECREATION MASTER PLAN

U.S. Army Corps of Engineers, Galveston District

PROJECT LOCATION

## WALLISVILLE SITE ANALYSIS

| | | |
|---|---|---|
| Prepared by: U.S. Army Corps of Engineers, Fort Worth Corps of Engineers Planning Division | DATE: September 1995 (revised Nov 95) | DRAWN BY: EM/RGB |
| | FIGURE NO: Figure 6-3 | FILE NAME: wallis_sa.dgn |

- hunting
- fishing
- canoeing
- recreational boating
- wildlife observation
- oil and gas production
- cattle grazing
- Army National Guard training

Waterfowl hunting is the only USACE-organized program on Project lands. A Project waterfowl hunting map is displayed in Figure 6-4.

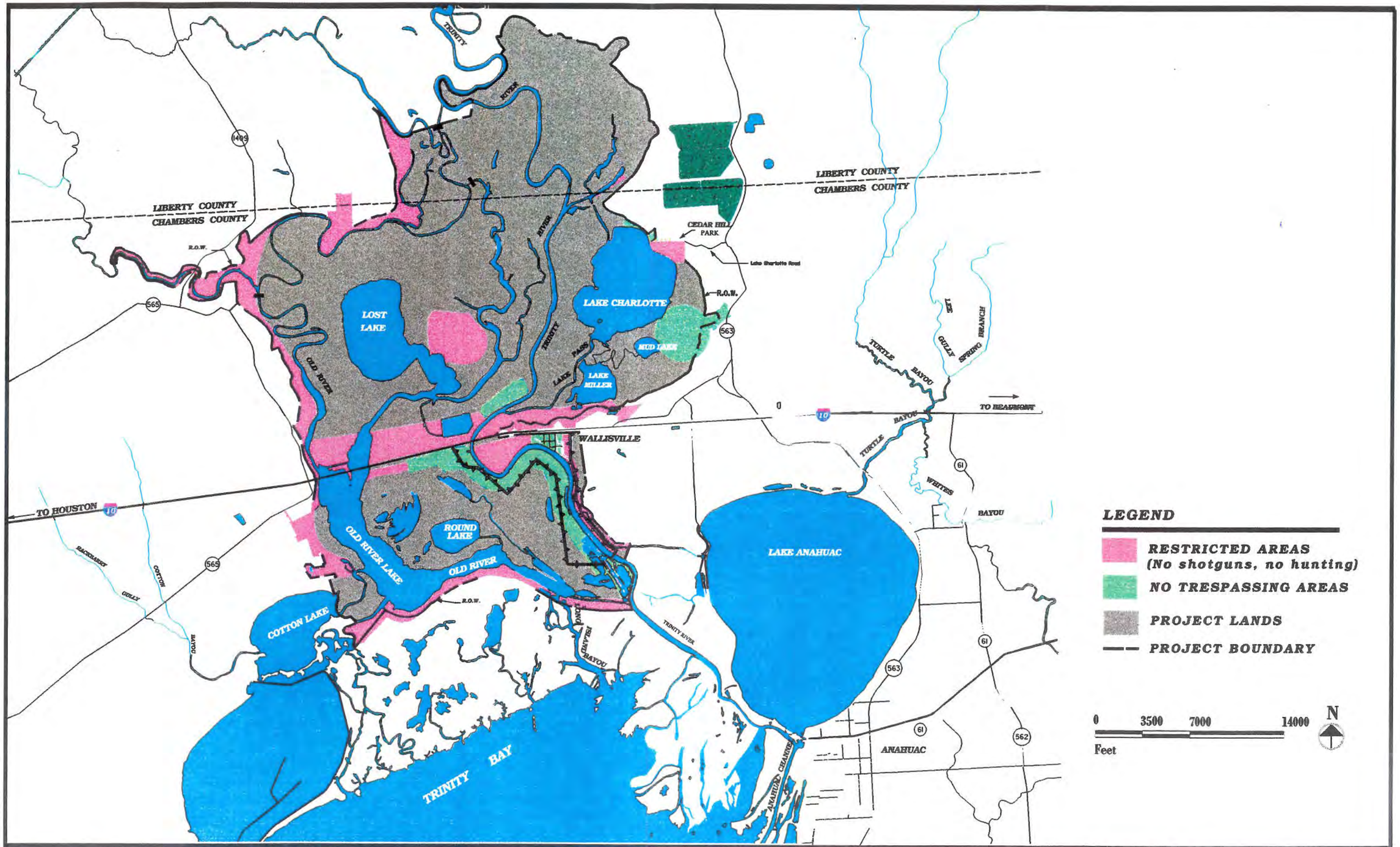
Land designated for Cedar Hill Park is currently being used for cattle grazing. There are no historical or environmental restrictions for most development at the site. However, Cedar Hill Park is located near the nesting area of a pair of endangered bald eagles, which does require careful planning to avoid park-induced impacts to the eagles. Therefore, the park is most suitable for day and primitive overnight camping. Minimizing tree removal at the park is also a primary consideration to retain the aesthetic values of the site.

### 6.3.3 Site Characteristics

Cedar Hill Park, an 83.4-acre site located on the north shore of Lake Charlotte, will be the primary location for recreational activity on Project lands. Lake Charlotte is a shallow, freshwater lake of approximately 1,000 surface acres. The highest points of Cedar Hill Park are approximately 25 - 30 feet above msl and are not prone to flooding. The shoreline along Cedar Hill Park, which contains cypress trees and various other bottomland hardwood species, fluctuates due to normal seasonal water level variations and flooding. The eastern one-third of the site is comprised of a stand of old southern yellowpine, the center one-third is a grazed open field with scattered brush, and the western one-third is dominated by an overstory of water oak and cypress with thick, virtually impassable understory. These upland areas of the park are designated for recreational development and contain no sensitive wetland areas.

### 6.3.4 Transportation and Circulation

Highway access to the Wallisville Lake Project is achieved primarily via IH-10, which bisects the Project lands and provides several exits to the Project. Currently there are no existing roads or plans to build roads that will provide access to the inner portions of the Project, except




# WALLISVILLE LAKE RECREATION MASTER PLAN

U.S. Army Corps of Engineers, Galveston District

PROJECT LOCATION

## WALLISVILLE WATERFOWL HUNTING MAP

| Prepared by: | DATE: | DRAWN BY: |
|---|---|---|
| U.S. Army Corps of Engineers, Fort Worth<br>Corps of Engineers | September 1995 (revised Nov '95, Jan '96) | SJPARGE |
| | FIGURE NO.: Figure 6-4 | FILE NAME: wallis_h.dgn |

for the development at Cedar Hill Park and the administration office. All vehicular access is limited to the perimeter of the Project. Because of the primitive development of the area, access to the inner portions of the Project is restricted to shallow-draft boats which can negotiate the sometimes tortuous bayous and sloughs connecting the rivers and lakes.

The Trinity River is the primary waterway passing through the Project area. Public access to the Trinity River within the Project boundaries is currently limited to two boat launches located under the IH-10 bridge. The USACE does not have a public boat launch in the Project area. Other major waterways and lakes at the Wallisville Lake Project include, Old River Lake, Old River, Lost River, Long Island Bayou, The Cutoff, Lost Lake, Lake Charlotte, Lake Miller, Mud Lake, and Round Lake. Access to most of these waterways and lakes are not dependable because of fluctuating water levels and frequent snags and windfalls clogging the connecting sloughs.

Cedar Hill Park can be reached by automobile by exiting IH-10 at Farm-to-Market Road 563, traveling north 3 miles to Lake Charlotte Road, and then turning west 3/4 miles to the park boundary located on the south side of Lake Charlotte Road. FM 563 is in good condition and capable of transporting large vehicles and trailers. Lake Charlotte Road is a narrow, asphalt-surfaced road that can restrict the size of vehicles due to its width and need for repair.

Cedar Hill Park can be reached by boat through Lake Charlotte. Boats can be launched in the Trinity River under the IH-10 bridge and then motor upstream to Lake Pass which connects directly to the southern end of Lake Charlotte. Another access point to Lake Charlotte is by taking the Sulphur Cut off the Trinity River further upstream from Lake Pass and then following Mac Bayou down to the north end of Lake Charlotte. Access through both passes can be difficult, depending on water levels and debris/obstructions in the pass. Direct boat launching into Lake Charlotte is currently not available from Federal lands.

### 6.3.5 Adjacent Land Use

The majority of the Trinity River flood plain in the area is used primarily for livestock grazing, with secondary uses of fishing, duck and goose hunting, and fur trapping. Several hunting and fishing camps and clubs are located along both banks of the Trinity River and in the delta marsh. Some fishing camps have facilities for public use, but many of the camps are private, requiring membership for utilization of the facilities. The area along the west bank of Old River contains tracts with numerous weekend cabins or permanent homes. The majority of the land east of the Trinity River is used for livestock grazing or rural homesites. There is also

an abandoned sulphur production facility and a salt dome used for petroleum storage just north of Cedar Hill Park. Subdivisions containing permanent homes and weekend cabins are developing along the banks of the Trinity River about 18 miles above the river mouth.

There are multiple land uses for the area outside the Project boundaries, but the overall character of the area is that of a rural setting with a relatively low human population. The houses that surround the Project boundary often have created private boat access points that are illegally using government-owned property to gain access to the water.

The privately-owned land surrounding Cedar Hill Park can be categorized as rural residential land use consisting of private residences in a natural or rural setting. The residential lots are large and the distance between houses can be significant. Livestock grazing is a common activity in this setting.

### 6.3.6 Utility Services

Utilities and easements present at the Wallisville Lake Project include the following: Altel phone services, various pipeline easements, road easements, and oil and gas production easements. The USACE plan for development in the Project area requires utility services at Cedar Hill Park and the administration/operation facility at the navigation lock.

There are no utility services at Cedar Hill Park. Existing utility services in the immediate area south of Lake Charlotte Road consist of electricity and telephone. Potable water can be provided through water wells as needed. Sanitary sewer services will be provided through the use of a septic field in accordance with state regulations. Propane gas will be used for heating if necessary.

## 6.4 Recreation Plan

### 6.4.1 Proposed Development

To avoid adverse impacts to the nesting success of the endangered bald eagle and to retain the area's aesthetic qualities, Cedar Hill Park will be developed as a "primitive" site. The primitive development will be restricted to day and overnight use activities, including picnicking, canoeing, hiking, wildlife observation, fishing, and camping. A description of the restrictions imposed on recreational development by the endangered eagle's nest site is given in Section 5.1.2.

*Total Recreational Development*

The items to be developed at the park are based on a survey mailed out to the public and environmental and recreational groups. A summary of the comments returned to the District is provided in Section 7.0. The individual comments with District responses are provided in Appendix C. The total proposed recreational facilities for Cedar Hill Park are provided in Table 6-2.

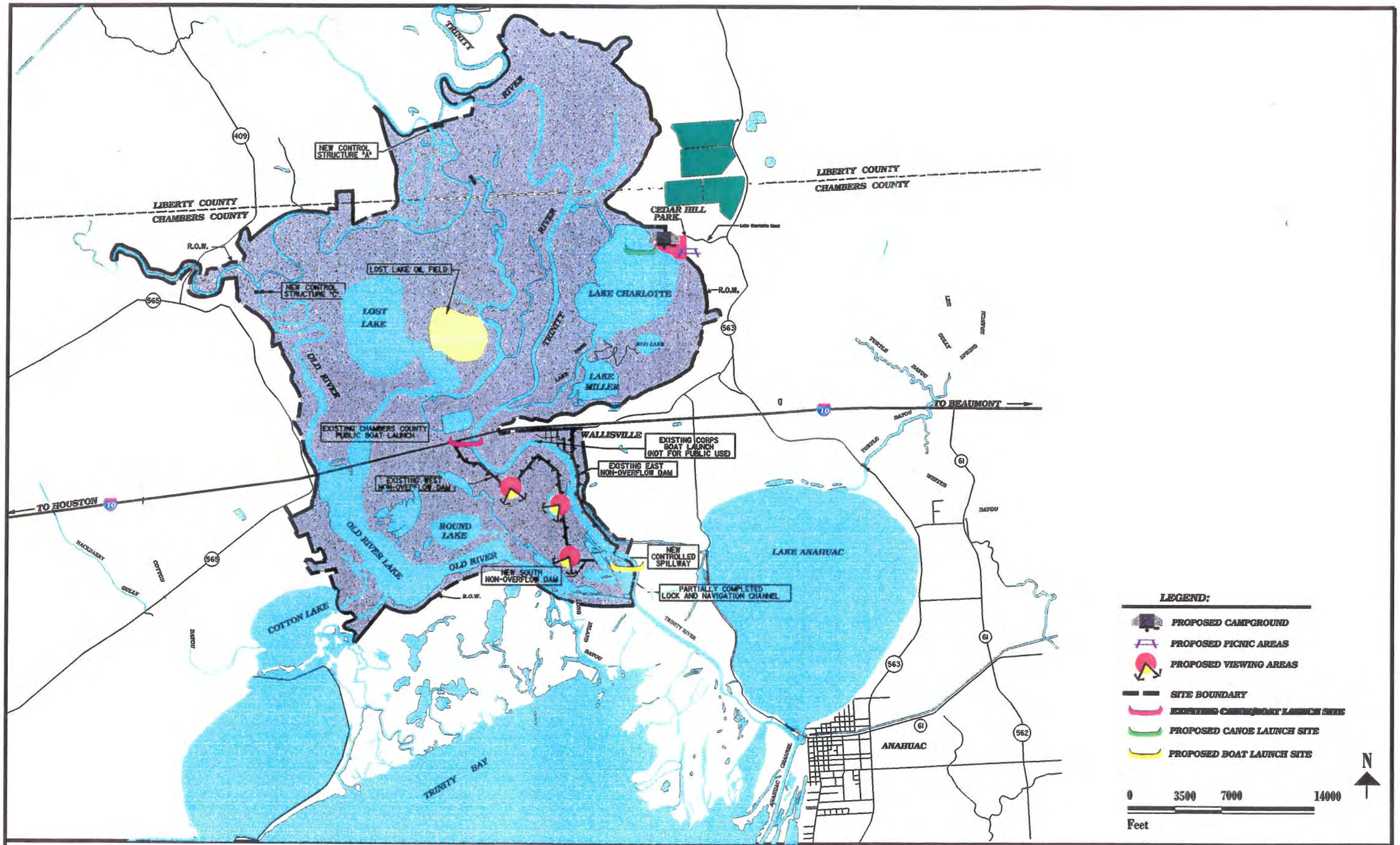
TABLE 6-2

Total Proposed Recreational Facilities

| Number | Facility |
|---|---|
| 1 | Playground |
| 1 | Gate House/Registration Office Building |
| 30 | Overnight Campsites |
| 2 | Canoe Launches |
| 2 | Observation Decks |
| 1 mile | Board Walks |
| 1 mile | Hiking Trail |
| 30 | Covered Picnic Tables |
| 2 | Restrooms |
| as needed | Miscellaneous Facilities/Amenities (barbecue grills, trash receptacles, signage, benches, lights, parking lots, trash dumpsters, electricity, water, sewage, roads, etc.) |

*Recreation Outside of Cedar Hill Park*

Additional recreational facilities provided by the Corps of Engineers outside of Cedar Hill Park are limited to the visitor center/Project office at the Lock and Navigation Channel and vehicle turnouts along the west non-overflow dam (Figure 6-5). The turnouts are intended to allow the public visual access to the marsh south of IH-10 that are normally only accessible by




# WALLISVILLE LAKE RECREATION MASTER PLAN

**U.S. Army Corps of Engineers, Galveston District**

PROJECT LOCATION

## WALLISVILLE RECREATION PLAN

| Prepared by: | DATE: | DRAWN BY: |
|---|---|---|
| U.S. Army Corps of Engineers, Fort Worth<br>Corps of Engineers<br>Planning Division | September 1995 (revised Nov 95, Jan 96) | EM/DCB |
| | FIGURE NO: Figure 6-5 | FILE NAME: walls_fl_6.dgn |

boat. The turnouts will provide the general public with excellent opportunities for wildlife viewing and photography. IH-10 provides easy access to the west non-overflow dam.

### 6.4.2 Functional Use Areas

Activity areas at Cedar Hill Park will be located at sites where the topography is suitable for each particular activity. Related activities will be grouped together and unrelated activities separated as much as possible. Passive, quiet activities will be located away from the active, noisy areas, and all use areas will be accessible from the main circulation route. The circulation routes will be well-defined and not divide or cross individual use areas. Parking will be directly adjacent to the area served. All design elements will take advantage of existing natural features such as terrain, vegetation, and views. Since Lake Charlotte is the major attraction at Cedar Hill Park, proximity to the lake or a good view of the lake is desirable.

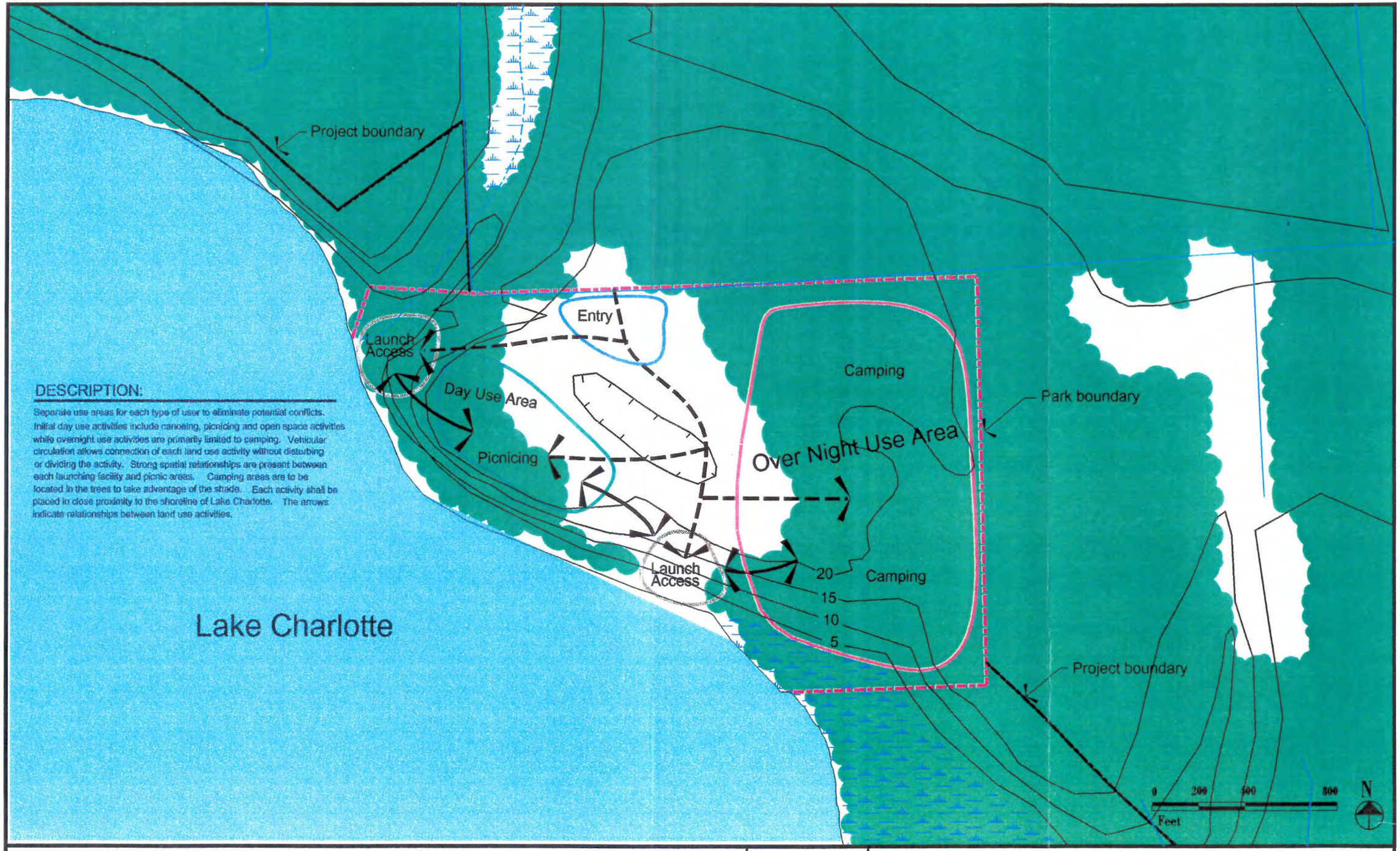
In the design process, functional diagrams are used to determine the relationship between use areas. The functional diagram (Figure 6-6) provides good land and water circulation patterns, separates functional use areas, effectively utilizes existing conditions, retains as much vegetation as possible, and blends facilities into the vertical relief of Cedar Hill Park.

The recreation plan is intended as a conceptual guide to future development and is subject to changes as the design is implemented. The central recreation concept of the plan is to provide diverse low impact recreational opportunities to the public without destroying or jeopardizing the natural habitat of the area.

### 6.4.3 Recreational Facilities Plan

The facilities plan (Figure 6-7) is built upon the functional use diagram. The plan is intended as a conceptual guide for siting of facilities listed in Table 6-2. Although the facilities plan is drawn to scale, it should not be used for direct siting of facilities. Plans and specifications should be developed to ensure precise placement of each plan feature in consideration of existing conditions. In turn, all facilities should be field located to preserve as much as possible the natural landform and vegetation at Cedar Hill Park. The following paragraphs will further explain the design intent of the facilities plan.

The integral parts of the plan are the primitive camping area, separate canoe launches, trails with board walks and observation decks, and the picnicking area. The primitive camping area is located in the portion of the park covered in pine forest. The large existing pines will




## DESCRIPTION:

Separate use areas for each type of user to eliminate potential conflicts. Initial day use activities include canoeing, picnicing and open space activities while overnight use activities are primarily limited to camping. Vehicular circulation allows connection of each land use activity without disturbing or dividing the activity. Strong spatial relationships are present between each launching facility and picnic areas. Camping areas are to be located in the trees to take advantage of the shade. Each activity shall be placed in close proximity to the shoreline of Lake Charlotte. The arrows indicate relationships between land use activities.

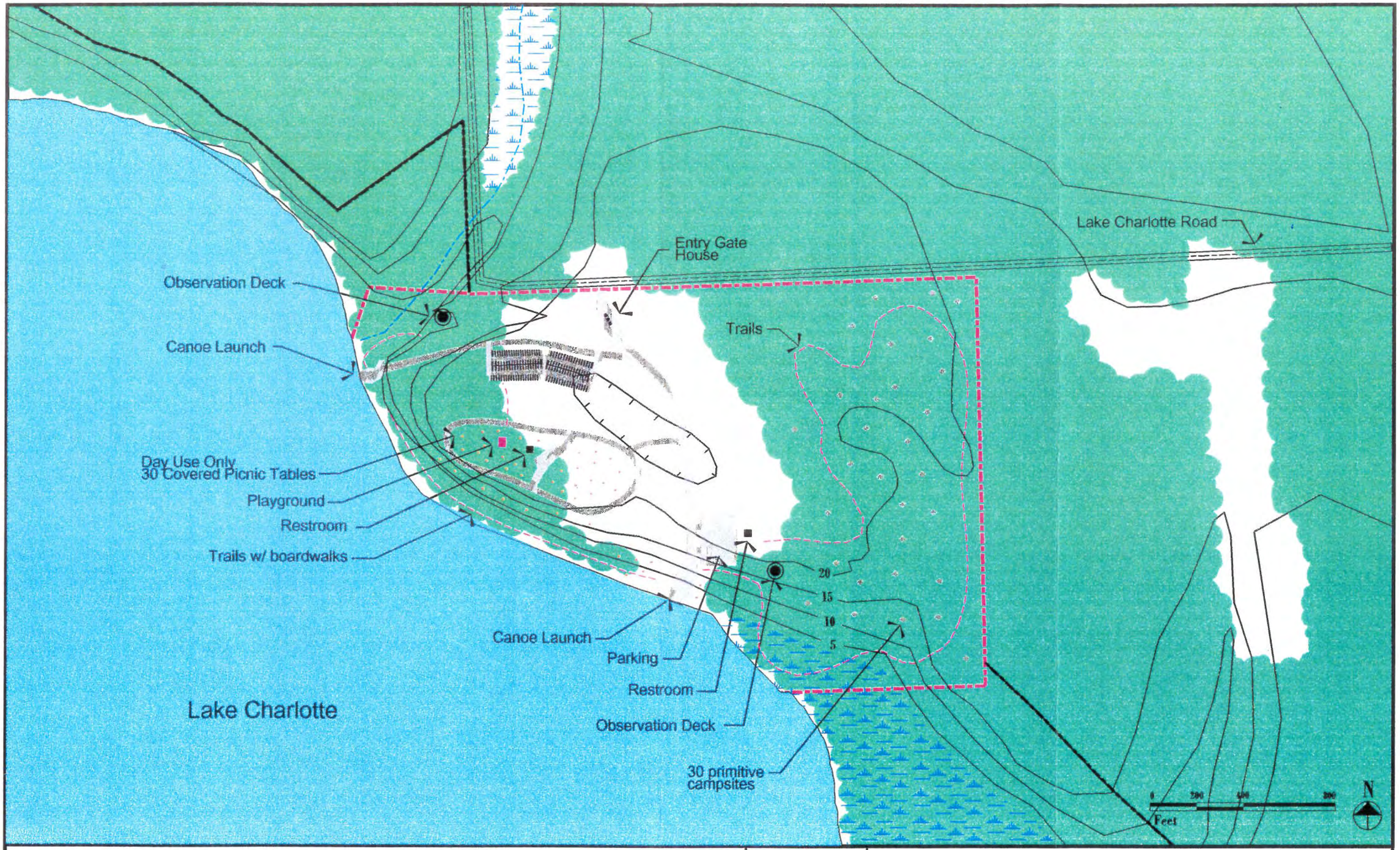
# WALLISVILLE LAKE RECREATION MASTER PLAN

U.S. Army Corps of Engineers, Galveston District

PROJECT LOCATION

## CEDAR HILL PARK FUNCTIONAL DIAGRAM

| Prepared by: | DATE: | DRAWN BY: |
|---|---|---|
| U.S. Army Corps of Engineers, Fort Worth<br>Corps of Engineers<br>Planning Division | September 1995 (revised Nov 95) | EJRIGS |
| | FIGURE NO: Figure 6-6 | FILE NAME: cedar_fd.dgn |




# WALLISVILLE LAKE RECREATION MASTER PLAN

U.S. Army Corps of Engineers, Galveston District

PROJECT LOCATION

## CEDAR HILL PARK PROPOSED RECREATION PLAN

| Prepared by: | DATE: | DRAWN BY: |
|---|---|---|
| U.S. Army Corps of Engineers, Fort Worth<br>Corps of Engineers<br>Planning Division | September 1995 (revised Nov 95, Jan 96, May 96) | EJB/RSB |
| | FIGURE NO: **Figure 6-7** | FILE NAME: cedar_fd.dgn |

provide shaded and secluded campsites. The camping area of the park shall have a single access road leading to the edge of the pine forest. Hiking trails will connect the primitive camping sites to the access road.

The layout of campgrounds shall adhere to the following design guidelines:

- Hiking trails should be between 6 - 8 feet wide
- Primitive camping sites should be located in the most secluded areas
- Use "peanut" shaped hiking loops within the camping area
- One-way streets should be 10 - 12 feet wide

Two canoe launches will be located in the park. Motorized boating activities such as water skiing, jet-skiing, and high-speed cruising are not recommended in Lake Charlotte because of the shallow depth and hidden snags/debris. Launching of motorized craft from the canoe launch sites will be prohibited.

The picnic areas shall be located close to the water. Picnickers will be provided not only visual contact with the water but also physical access to other water-based activities, including fishing and wildlife observation. Parking for the picnic areas will not be greater than 250 feet between the parking area and the picnic tables.

Hiking trails will link all the activities, allowing the user to travel between different use areas without being in conflict with vehicular circulation routes. Trails will be a natural surface material to reduce cost and give a natural feel to the site.

### 6.4.4 Utility Infrastructure

The utilities required for the operation of Cedar Hill Park include electrical, water, and wastewater handling for the park facilities and telephone link for the gate house. The detailed design and layout of the utility infrastructure will occur during the plans and specifications portion of the Project.

## 6.5 Design Elements

The following general design criteria have been established especially for the architects, engineers, and landscape architects who will be developing plans and specifications for construction.

### 6.5.1 Campsites

The primitive campsites should be sited and constructed in a way which minimizes cutting of any trees.

*Campsite Identification*

A campsite identification post with number should be visible from the hiking trail. A large map of the camping area showing the numbered sites should be installed at the information station.

*Trash Receptacles*

Trash receptacles should be provided near the entrance to the camping area. An alternate to individual trash cans would be to provide one or two dumpsters, one near the camping area and one at the other end of the park.

### 6.5.2 Playground

One playground is to be placed within the picnicking area. Safety is the most important factor to consider during the playground design. Since the age of the children determines playground design, zoning each playground area for different ages should be considered.

A number of playground equipment manufacturers such as Timberform, Landscape Structures, or Big Toys can be consulted for a design tailored to needs, space, and price range. All of these manufacturers provide colorful, well-designed, playground groupings.

### 6.5.3 Restroom

This building, approximately 30x60 feet (1800 square feet), should consist of separate men's and women's restrooms complete with toilets, sinks, mirrors, vent-type skylights, and dressing areas. The facility should have a floor surface, such as a rough relief glazed tile to prevent slick conditions, and a durable and easily cleaned material for the walls and ceilings. Heat should be provided for this building.

### 6.5.4 Observation Decks

Two observation decks are planned for wildlife observation. The decks should have a widened deck section (8x15 feet) at the end of the walkway section. The walkways and end deck should include handrails. The structure shall be firmly anchored and covered.

### 6.5.5 Picnic Tables

The picnic tables should be 12 feet long, permanently anchored, covered, and constructed of the same material as the benches.

### 6.5.6 Canoe Launching Facility

Two canoe launches will be located as shown on the facilities plan (Figure 6-7). Each canoe launch facility will consist of vehicle parking, floating docks with walkways, and restrooms. Vehicle parking will be large enough to accommodate vehicles with trailers. The floating docks will be used to load equipment and people into the canoe as well as ease launching.

### 6.5.7 Trash Receptacles

The trash receptacles should be concrete-anchored with center-steel pedestals and have 1x4- inch penta-treated or stained wood slats bolted to black painted steel rims. One 30-gallon receptacle will be available for each campsite or picnic site. It is assumed that trash receptacles will be emptied daily. A minimum walkway width of 6 feet should allow access by a small trash collection vehicle.

### 6.5.8 Drinking Fountains

The drinking fountains should be designed so that young children and those in wheelchairs have equal access. Drains should be connected to gray water gravel drain columns of sufficient size for the existing soil conditions.

### 6.5.9 Pedestrian Walkways

All main walkways should be step free to allow easy access for the handicapped. Walkway alignment should be sensitive to topography, existing trees, and reasonable walking slopes. It may be necessary to use steps for short secondary walkways along the shoreline.

### 6.5.10 Grill/Cookers

All picnic shelters should be provided with a permanent pedestal-style cylinder cooker. The cooker should be painted black, constructed of heavy gauge steel, swivel, include adjustable vent control, and feature a courtesy tray.

### 6.5.11 Facilities for the Handicapped

Day use facilities should incorporate measures listed below to accommodate the special needs of the elderly and handicapped. All designs should be built according to the most recent standards providing:

- Ramps or on-grade entrances for all visitor use buildings
- Wheelchair ramps at appropriate and convenient locations where curbs border parking areas
- Benches for the elderly in shaded areas adjacent to major parking facilities
- Restrooms and drinking fountains designed to accommodate use by handicapped individuals
- Path surfaces and widths that allow use by individuals confined to wheelchairs
- Unimpeded fishing access to the shoreline of Lake Charlotte
- Hand rails at steps, on bridges, and floating walkways and in restrooms.

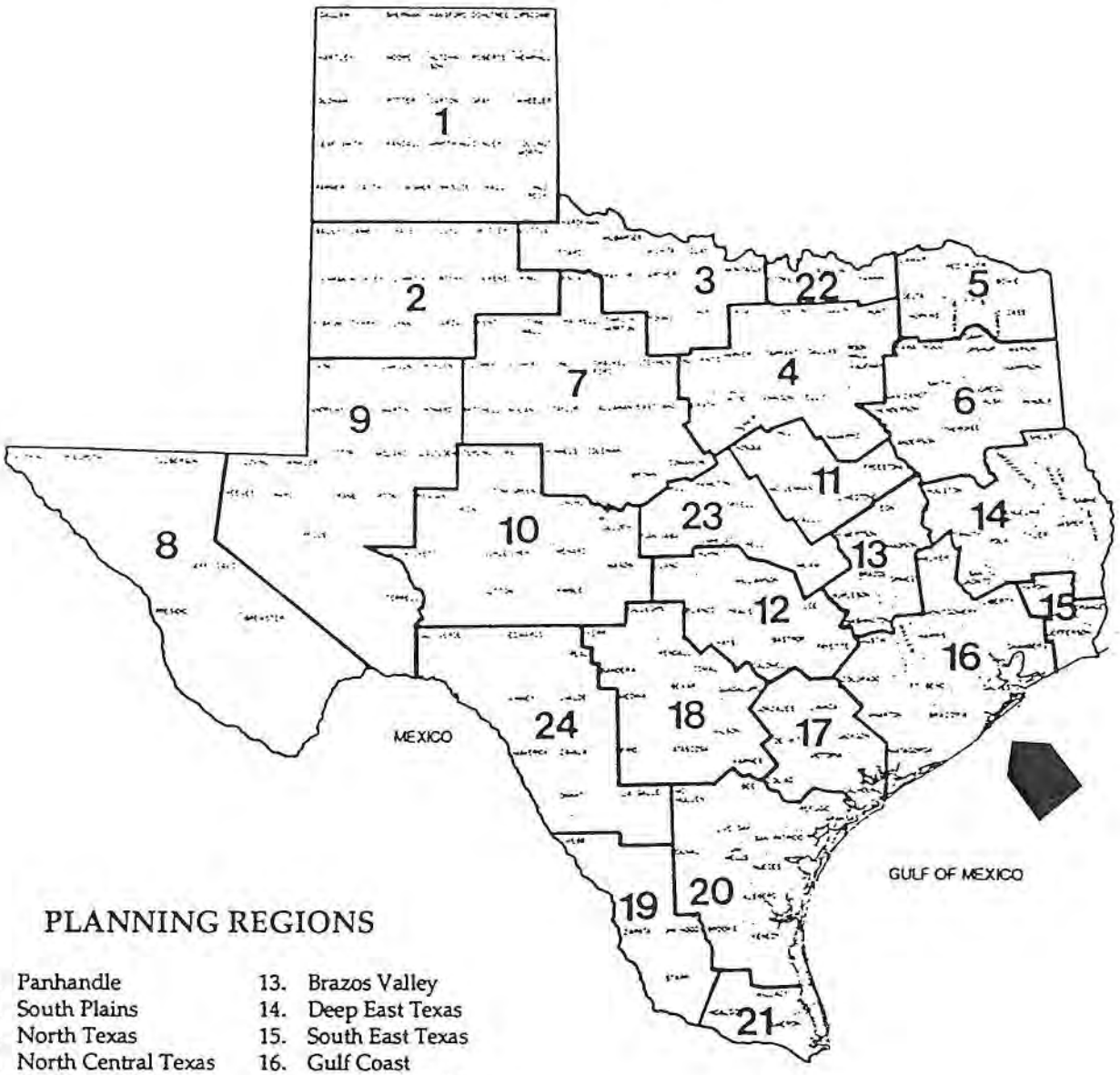
## 6.6 Economic Analysis

Among the elements included in the authorized Wallisville Lake Project is the development of Cedar Hill Park for recreation on the northeast shore of Lake Charlotte. The Project is wholly contained within State Planning Region 16 as shown in Figure 6-8.

The economic analysis focuses on the economic aspects of the Cedar Hill Park development. Annual visitation is estimated using the capacity method. The Unit Day Value method is used to assign a value to a recreation day. Annual benefits are calculated by multiplying annual visitation (in days) by the value assigned to a day of recreation.

These procedures are described in Engineering Regulation (ER) 1105-2-100 in Chapter 6, Section VIII: NED Benefit Evaluation Procedure. The recreation benefits are described in IWR report 86-R-4 *National Economic Development Procedures Manual--Recreation; Volume I.*

## 1990 TORP State Planning Regions




PLANNING REGIONS

1. Panhandle
2. South Plains
3. North Texas
4. North Central Texas
5. North East Texas
6. East Texas
7. West Central Texas
8. Upper Rio Grande
9. Permian Basin
10. Concho Valley
11. Heart of Texas
13. Brazos Valley
14. Deep East Texas
15. South East Texas
16. Gulf Coast
17. Golden Crescent
18. Alamo
19. South Texas
20. Coastal Bend
21. Lower Rio Grande Valley
22. Texoma
23. Central Texas

Source: 1990 Texas Outdoor Recreation Plan.

Figure 6-8

Region 16 Location Map

*Recreation Use and Benefit Estimation Techniques*, and in the 1990 Texas Outdoor Recreation Plan (TORP) by the Texas Parks and Wildlife Department (TPWD).

### 6.6.1 Proposed On-Site Recreation

The development of recreation facilities at Cedar Hill Park will provide opportunities for fishing, canoeing, primitive camping, wildlife observation, picnicking, and hiking. Development of Cedar Hill Park, as outlined in Section 6.4, is not expected to affect usage of existing Project facilities and lands nor adversely impact sensitive wetlands and endangered species. Proposed facilities will meet part of a regional deficit in recreational opportunities.

### 6.6.2 Existing Facilities and Future Needs in Planning Region 16

The TORP addresses the need for resource-based recreation facilities of the type to be provided by Cedar Hill Park (TORP, page 16-6). Selected facilities/resources supplies existing in 1986 and projected additional facilities needed through the year 2000 in Planning Region 16 are shown below in Table 6-3.

Future demand for all types of recreation facilities will continue to increase to at least the same extent as the population in the region increases. Population projections for Planning Region 16 are shown below through the year 2030.

| 1990 | 2000 | 2010 | 2020 | 2030 |
|---|---|---|---|---|
| 3,877,314 | 4,608,273 | 5,468,789 | 6,542,912 | 7,825,845 |

### 6.6.3 Proposed Facilities and Expected Annual Visitation

In this section, annual usage is estimated for the recreation development at Cedar Hill Park. The capacity method is used to generate usage estimates. The capacity method requires determining resource or facility capacities. Instantaneous rates of use, turnover rates, and weekly and seasonal patterns of use must be taken into consideration. Applications of this general method from two separate sources are used to estimate annual usage. One uses annual use multipliers to estimate usage. These multipliers have instantaneous capacity, turnover rate, and seasonality built-in. The other shows the calculation of design day capacities and assumptions of seasonality to estimate annual visitation.

TABLE 6-3

Existing Recreation Facilities and Projected Facility Needs

| Facility Resource | 1986 Facility Supply | Facilities Needed Above 1986 Supply | | |
|---|---|---|---|---|
| | | 1990 | 1995 | 2000 |
| Fresh Water Boat Ramp Lanes | 89 | 231 | 259 | 287 |
| Campsites | 5,793 | 473 | 975 | 1,478 |
| Fishing Structures Fresh Water Linear Yds | 1,249 | 5,916 | 6,549 | 7,183 |
| Hiking Trail Miles | 120 | 36 | 50 | 63 |
| Picnic Tables | 7,025 | * | * | * |

*No needs exist based on a regional analysis of supply and participation; however, needs may exist locally within the region due to inadequate distribution of existing facilities.

NOTE: There are 73 picnic tables listed for Chambers and Liberty Counties. Most are in town parks and some in commercial facilities. There are none in areas which offer the same opportunities in a setting like Cedar Hill Park.

Source: Extracted from Table 5, Page 16-10. *Additional Outdoor Recreation Facilities/Resources Needed in Region 16, 1990, 1995, 2000.* Texas Outdoor Recreation Plan, 1990.

*Estimated Annual Visitation - TORP Method*

The first method uses multipliers developed by the TPWD and presented in the TORP. These multipliers show the number of annual participation occasions per facility unit. They are based on use rates, turnover rates, and seasonal patterns assumed by TPWD planners in their regional and state models of recreation demand. The estimated annual visitation projections for Cedar Hill Park using the TORP approach are presented in Table 6-4.

TABLE 6-4

Estimated Annual Usage - TORP Method

| Facilities | Number of Facilities | Annual Occasions Per Facility | Total Visitor Days |
|---|---|---|---|
| Canoe Launch | 2 | 9,068/launch | 18,136 |
| Primitive Campsites | 30 | 537/site | 16,110 |
| Hiking Trail/Board Walks | 2 miles | 7,402/mile | 14,804 |
| Picnic Tables | 30 | 1,575/table | 47,250 |
| Estimated Total Annual Visitation | | | 96,300 |

Source: 1990 Texas Outdoor Recreation Plan; Section 16, Appendix B, Appendix C.

*Estimated Annual Visitation - IWR Method*

The IWR method follows the steps presented in Appendix E, "Capacity Approach for Use Estimation" in IWR Report 86-R-4. The following excerpt explains this approach.

Step 1. Calculate the Project Recreation Design Load.

With the IWR capacity method, the design day load is defined as the number of visitors that could be supported by specified resources or facilities on the design day. It is a function of the instantaneous capacity of a unit of a facility or resource, its daily turnover rate (i.e. how often it would be used by different visitors or different groups of visitors), and the number of units being considered.

Design Day Load = Instantaneous Capacity per Unit X Daily Turnover Rate X Number of Units.

Step 2. Convert Design Day Load to Estimated Annual Use.

The design day is usually considered an average weekend day during the peak season of use for the particular facility or resource being considered. The design day load can, therefore,

be converted to an annual use estimate by accounting for the number of weekend (usually including holiday) days during the peak season, the proportion of peak season use expected on weekend days, and the proportion of annual use expected during the peak season. The design day capacity calculations are shown in Table 6-5.

Use = Design Day Load X Average No. Weekend Days in Peak Season / Prop. Peak Season Use Expected on Weekends / Prop. Annual Use Expected During Peak Season.

Assumptions used for the IWR Report 86-R-4 formula to determine the annual use from design day load are:

Weekend Days = 35 (4 months plus 3 holidays--summer)
Proportion of Use on Weekends = 0.50
Peak Season Use = 0.50

Annual use estimates are: Total Development: 593 X 35 / 0.50 / 0.50 = 83,020 days.

TABLE 6-5

Facilities and Estimated Annual Usage - IWR Method

| Facilities | Number of Facilities | Capacity/Turnover Rate per Facility | Design Day Capacity |
|---|---|---|---|
| Canoe Launch | 2 (60 launches/12 hours) | 2.03/1.0 | 122 |
| Campsites | 30 Sites | 3.8/.9 | 103 |
| Hiking Trail/Board Walks | 2 miles | 13/4.6 | 120 |
| Picnic Tables | 30 Tables | 4.6/1.8 | 248 |
| Estimated Design Day Capacity | | | 593 |

NOTE: Capacities are from the U.S. Department of the Interior *Guidelines for Understanding and Determining Optimum Recreation Carrying Capacity*. G.E.C., Inc. 1990.

### 6.6.4 Calculation of Recreation Benefits

Recreation benefits for the Cedar Hill Park development are calculated by multiplying the estimated annual visitation by the value of a day of recreation. The product is the annual gross benefits. Without-Project usage or recreation opportunities lost because of developing facilities at Cedar Hill do not enter into these calculations because there is no negative effect expected for existing use, and no usage will be displaced by developing the facilities. Also, because of the excess demand for additional recreational opportunities, it is unlikely that usage of similar facilities at other venues will be diminished.

Use of the Unit Day Value method for assigning a value to a day of recreation requires making informed judgements on a number of aspects of the recreation facility and likely recreation experience. Guidance is provided in ER 1105-2-100, Chapter 6, Section VIII- *NED Benefit Evaluation Procedure: Recreation.* Criteria for assigning points to the type of general recreation opportunities that will be afforded by Cedar Hill are shown in Table 6-29 of that document. A copy of the table is attached in Appendix D for information purposes.

The points assigned to a day of recreation are then converted into a dollar value using a table updated by the Water Resources Council each fiscal year. A copy of the conversion table is also attached in Appendix D. Points assigned for Cedar Hill and the dollar value calculated for a day of recreation are shown in Table 6-6.

Using the TORP method for visitation estimates yields annual benefits for the park development of $476,685 (96,300 x $4.95). In comparison to the TORP method, the IWR method yields the average annual benefits of $410,949 (83,020 x $4.95).

### 6.6.5 Costs and Benefit-to-Cost Ratios

Cost estimates for development of Cedar Hill Park are provided in Table 6-7. Total Project first cost is $1,606,000 and annual Operations and Maintenance cost is estimated at $233,000. Other costs, such as interest during construction, are added and amortized over a Project life of 50 years at an annual interest rate of 7.625 percent. A summary of costs, annualized equivalent costs, benefits, and resulting benefit-to-cost ratios are presented in Table 6-8.

Benefit calculations using the TORP assumptions yield a benefit-to-cost ratio of 1.31. Using the IWR method of visitation estimates, the recreational aspects of the Project has a benefit-to-cost ratio of 1.13.

Therefore, whether based on the State's method of calculating recreation benefits (TORP) or the method commonly used by USACE nationwide (IWR), the benefit-to-cost ratio for the proposed recreational development at Cedar Hill Park is greater than one. This indicates the recreational aspects of the Project can be expected to provide a positive return on investments.

TABLE 6-6

Point Assignment and Unit Day Valuation for General Recreation at Cedar Hill Park

| Criteria | Points |
|---|---|
| Recreation Experience - Total Points: 30 | 11 |
| Availability of Opportunity - Total Points: 18 | 6 |
| Carrying Capacity - Total Points: 11 | 8 |
| Accessibility - Total Points: 16 | 10 |
| Environmental Quality - Total Points: 20 | 10 |
| Score: | 45 |
| Unit Day Value: | $4.95 |

NOTE: Table 6-29, Guidelines for Assigning Points for General Recreation, Chapter 6, Section VII - NED Benefit Evaluation Procedure: Recreation, ER 1105-2-100. Table 6-26 (FY 96) Conversion of Points to Dollar Values.

Source: G.E.C., Inc., 1990.

TABLE 6-7

Estimated Cost for Cedar Hill Park Development

| Item | Quantity | Cost ($1,000) |
|---|---|---|
| Roads | 172,713 sq. ft. | 389 |
| Parking Areas | 88,683 sq. ft. | 199.5 |
| Canoe Launch | 2 | 10 |
| Restroom | 2 | 40 |
| Picnic Table (Covered) | 30 | 30 |
| Benches | 10 | 8 |
| Barbecue Grill | 30 | 15 |
| Gate House | 1 | 50 |
| Playground | 1 | 35 |
| Primitive Campsites | 30 | 15 |
| Board walks | 2,800 ft. | 48 |
| Observation Decks (Covered) | 2 | 30 |
| Signage | As required | 7 |
| Lights and Electrical Line | 10 lights & 5,000 ft. | 57 |
| Fencing | 4,550 ft. | 54 |
| Water Line | 2,800 ft. | 22 |
| Landscaping and Cleanup | As required | 50 |
| Hiking Trail | 6,400 ft. | 25 |
| **Subtotal** | | 1,085 |
| Contingency (25%) | | 271 |
| Engineering & Design | | 200 |
| Supervision & Administration | | 50 |
| **Total** | | 1,606 |
| **Annual O&M Costs** | | 233 |

TABLE 6-8

Costs, Benefits, and Benefit-to-Cost Ratios

| Item | Total Park Development |
|---|---|
| First Cost | $1,606,000 |
| Annual Interest Rate | 0.07625 |
| Project Life | 50 years |
| Construction Life | 12 months |
| Interest During Construction | $60,100 |
| Investment Cost | $1,666,100 |
| Interest | $127,000 |
| Amortization | $3,300 |
| Operations & Maintenance | $233,000 |
| Total Annual Costs | $363,300 |
| **TORP Method** | |
| Average Annual Benefits | $476,685 |
| Average Annual Costs | $363,300 |
| **B/C Ratio** | 1.31 |
| Average Annual Net Benefits | $113,385 |
| **IWR Method** | |
| Average Annual Benefits | $410,949 |
| Average Annual Costs | $363,300 |
| **B/C Ratio** | 1.13 |
| Average Annual Net Benefits | $47,649 |

## 7.0 PUBLIC INVOLVEMENT AND COORDINATION

### 7.1 Policy

ER 1120-2-400 states, "During the investigation, planning, development, and operation and maintenance of all Civil Works projects, close and continuing coordination will be maintained with Federal, State, and local agencies with interests and responsibilities in the fields of public recreation, fish and wildlife, preservation of archeological and historical resources, and environmental quality." In accordance with this directive, extensive coordination has been accomplished by the Galveston District with Federal, State, and local agencies, and special interest groups. In addition, a Public Notice to Prepare a Master Plan was sent to all interested parties on November 22, 1994 to provide input to the Master Plan before it was prepared. Copies of the public notice and comments received from public, State and Federal agencies, and private citizens responding to the public notice are provided in Appendix C, Section 1.

A Notice to Prepare a Recreation Plan was mailed to the public on July 18, 1995 along with a questionnaire to determine the public's recreational desires for the Project Area. Copies of the notice, public comments, and USACE responses to the comments are enclosed in Appendix C, Section 2.

After reviewing the public input, a Draft Master Plan and Recreation Plan were prepared and a Notice of Availability was mailed to State, Federal, and local agencies, and the public on December 8, 1995 requesting comments on the plans before a final plan was prepared. Copies of the notice, comments received, and responses to the comments are enclosed in Appendix C, Section 2. A summary of the comments and responses is included in Section 7.8.

The following sections summarize the coordination efforts undertaken during the preparation of the Master Plan to date.

### 7.2 Federal Agencies

Several Federal agencies were contacted early in the planning process to solicit their concerns and suggestions for the Master Plan. Those Federal agencies that were contacted for input are listed below:

Department of Agriculture
Department of Housing and Urban Development

Bureau of Internal Revenue
National Park Service
Environmental Protection Agency
Department of Commerce
National Marine Fisheries Service
Department of the Interior
U.S. Fish and Wildlife Service
Anahuac National Wildlife Refuge
U.S. Coast Guard
Department of Transportation
Department of Energy
Bureau of Land Management

## 7.3 State Agencies

Representatives of several State agencies were contacted early in the planning process to obtain their input into the development of the Master Plan. The agencies contacted are listed below:

Galveston Bay National Estuary Program
Texas General Land Office
Texas State Historic Preservation Officer
Economic Development Board
Texas Parks and Wildlife Department
J.D. Murphree Wildlife Management Area
Texas Water Development Board
Texas Natural Resource Conservation Commission

## 7.4 Local Agencies And Representatives

Several local agencies and State and Federal Legislators representing the Project Area were notified to solicit their comments on the Master Plan, as shown below:

Senator Phil Gramm
Senator Kay Bailey Hutchison
Congressman Steve Stockman
Congressman Charles Wilson

Texas State Senators and Representatives
Chambers-Liberty Counties Navigation District
City of Houston- Department of Public Works & Engineering
Trinity River Authority

## 7.5 Public And Special Interest Groups

A public notice was sent out requesting input from the public for the Master Plan. In addition to the general public, the following environmental and resource organizations were contacted:

Houston Sierra Club
Galveston Bay Conservation & Preservation Association
Galveston Bay Foundation
Natural Resources Committee
Texas Coastal and Marine Council
Wallisville Heritage Park

## 7.6 Public Involvement Methods

Several approaches have been used to achieve an understanding of how the public views the recreational needs and opportunities of the Project. These methods have included:

- Personal discussions with special interest groups.
- On-going coordination with State and Federal agencies.
- A letter soliciting public input into the Recreation Plan (July 1995).

## 7.7 Current Public Input

The following is a summary of the majority opinions provided by the public, State, and Federal agencies to the notices to prepare a Master Plan and Recreation Plan:

- Develop and implement protective and recreational activities that will preserve and provide public benefits and enjoyment.

- Recreation should consist mostly of low-impact activities such as hiking, canoeing, fishing, nature photography, wildlife observation, nature study, and backpacking.

- Very primitive development of the park with few picnic tables at Cedar Hill Park.
- Develop nature trails and canoeing trails.
- Encourage bird watching and provide protection for the bird population.
- Focus on the restoration and rehabilitation of the park.
- Describe the regeneration scheme and monitoring program for the bald cypress.

## 7.8 Correspondence on the Draft Master Plan and Recreation Plan

The Draft Master Plan and Recreation Plan was released to State, Federal, and local agencies, and the public for review and comment on December 8, 1995. All comments by State, Federal, and local agencies, public environmental organizations, and the general public are enclosed in Appendix C, Section 2 along with the District's responses to the comments. Agencies, groups, and individuals who responded to the draft plans are listed below:

U.S. Fish and Wildlife Service
Galveston Bay Foundation
Chambers County Heritage Society
Houston Canoe Club
The Wallisville Heritage Park
Houston Audubon Society
Gulf Coast Rod, Reel and Gun Club, Inc.
Texas Committee on Natural Resources
McFarlane & Associates
Mr. Ted Eubanks
Mr. Jim Gregory
Mr. David A. Todd
Mr. David L. O'Banion
Mr. Dan McNamara
Mr. Kelly Haragan

All views and concerns were considered during preparation of the Master Plan and Recreation Plan. However, because of the diversity of (and frequently conflicting) concerns and

recommendations expressed during the review, it was not possible to incorporate all suggestions in this document. One of the main concerns of many respondents was the lack of detailed information on Project operation, recent studies on freshwater inflow needs of the estuary, benefit/cost updates on the entire Project, and mitigation plans for impacts. These subjects have been discussed in the 1981 EIS and subsequent EA's and Design Memoranda under the NEPA process. The Master Plan is not a NEPA document, nor is it a vehicle for revisiting these subjects. It is strictly a resource management document that is intended to be general in nature to allow for maximum flexibility with periodic review and revision, when needed, to adapt to changes in the Project or the area's natural resources.

Other important concerns included retaining the scenic and primitive nature of the area while still providing for hunting, fishing, and wildlife observation, particularly at Cedar Hill Park. The District has attempted to strike a balance between the often conflicting needs of the low-impact and the high-use recreational visitors in the area when only one nature park and one heritage park have been authorized by Congress for development. The nature park will have both day use (picnic tables, canoe launches, and trails) and primitive overnight campsites available. The heritage park may be developed in the future, although no definite plans are available. Motorboats may not be launched at Cedar Hill Park, but there will be no restrictions on size, type, or horsepower on boats used in the Project Area. One exception to this policy is in the primary management zone for nesting eagles where entry is restricted, particularly during the nesting season. There are other boat launches available for motorboat use on the Trinity River inside the Project Area.

There was some concern over the lack of sufficient recreational opportunities for such a large area (20,000 acres), but the District was limited in developing these opportunities by Congressional authorization for the Project. However, some additional opportunities for wildlife observation in the marsh south of IH-10 is possible from the West Non-overflow Dam. Scenic overlooks will be provided along the dam's top for vehicles to stop and observe the wildlife. The dam may not be used, however, as a convenient parking lot and access point to enter the adjacent marsh.

There were only a few comments on the Master Plan's treatment of historic properties in the Project Area. The Wallisville Heritage Park Foundation (WHPF) was concerned about their proposal to develop a Heritage Park at the Old Wallisville Townsite. The District remains committed to facilitating development of a park at the townsite and is ready to assist the WHPF in processing a long-term lease application. Another respondent requested interpretive trails to historic sites on Project lands and greater participation with Scouts or other youth groups. While

no interpretive trails are planned, the District plans to produce informative brochures which may be used by the public to become familiar with Wallisville's historic properties. Two other respondents requested further historic properties investigations in advance of Project construction. Two reports, Feature Design Memorandum No. 10 and the 1995 EA, provide a complete discussion of the District's program to inventory, assess, and mitigate Wallisville's historic properties in advance of Project construction.

This Master Plan is available to the public upon request. The document is not intended as a final, unchanging product. It will be subjected to periodic reviews, and revisions will be incorporated when merited by Project or environmental changes. The public may submit comments or suggestions for consideration by the District at any time for future reviews of the Master Plan and Recreation Plan.

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# APPENDICES

# APPENDIX A

## Project and Area Description

# PROJECT AND AREA DESCRIPTION

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# PROJECT AND AREA DESCRIPTION

## 1.0 AREA DESCRIPTION

The Wallisville Project is located near the mouth of the Trinity River in Chambers and Liberty Counties, Texas (Figure 1-1 of the main report) between the major metropolitan areas of Houston, Beaumont, and Galveston (Figure 1-2 of the main report). An estimated 23,277 acres of bottomland delta and adjacent terrace margins were acquired for the original Project. These lands extend from approximately 2.5 miles north of the Chambers/Liberty County line southward through the lowland delta for approximately 6 miles. The southern margin of Federal property is approximately 2 miles from Trinity Bay, the northeastern lobe of the greater Galveston Bay estuary system. While the Project has changed and there is no longer a reservoir pool, the Project boundary has not changed.

The Trinity River delta is an integral part of Trinity Bay and Galveston Bay system, one of the largest and most productive estuaries on the Texas coast, and is the site of the mouth of the Trinity River, the major source of fresh water to the Galveston Bay system. The Project Area is typified by relatively flat terrain interspersed with numerous bayous, abandoned channels, ponds, and lakes. The land areas consist of marsh, swamps, bottomland hardwoods, upland pine and hardwoods, and prairies.

Trinity Bay, the eastern part of upper Galveston Bay, is about 15 miles long and 10 miles wide. The delta of the Trinity River lies in the northeast end of the Bay and is being extended into the bay by deposition of the sediment load of the Trinity River. The natural depth in the bay increases from one or two feet along the shoreline to a maximum of about 8 feet in the lower bay. A depth of 6 feet extends over a large portion of the bay. Trinity Bay comprises about 25 percent of the water area and about 19 percent of the emergent marsh of the Galveston Bay system. It has variable salinity levels because of the influence of Trinity River inflow and supports only a limited quantity of submerged aquatic vegetation because of generally high water turbidity.

The majority of the Trinity River floodplain in the Project Area is used for livestock grazing with secondary uses of fishing and waterfowl hunting. Several hunting and fishing camps and clubs are located along both banks of the Trinity River and in the delta marsh. Some fishing camps have facilities available for public use, but many are private and require membership for utilization of the facilities. The area along the west bank of the Old River contains tracts with numerous weekend cabins or permanent homes. The majority of the land east of the Trinity River

is used for livestock grazing or rural homesteads. Subdivisions containing permanent homes and weekend cabins are developing along the banks of the Trinity River 18 miles above the river mouth.

In recent years, industrial development in the Project vicinity has occurred in the Trinity River floodplain and coastal marshes and prairies. Texas Gulf Incorporated, employed about 100 persons, produced sulphur from deposits east of the Project Area, and had a barge dock on a channel tributary to the Trinity River near river mile 11. The barge dock had facilities for loading liquid sulphur, but is no longer in use. Dow Chemical Company has a storage facility located near Wallisville. Houston Lighting and Power Company has constructed two electric power generator units on Cedar Bayou, a coastal stream emptying into upper Galveston Bay about 12 miles southwest of the mouth of the Trinity River. In conjunction with the plant, the company constructed a 2,600-acre cooling pond in the delta marshlands below Cotton Lake and a six-mile long diversion channel to discharge cooling water effluent into Trinity Bay at a point about 5 miles west of the Trinity River mouth.

Chambers and Liberty Counties were the leading crude oil producers in the Trinity River Basin in 1974. Several oil and gas fields are located in the general Project vicinity. The Lost Lake Oil and Gas Field is located west of river mile 9 and in the lower portion of the delta and has experienced irregular production of oil since 1929. Oil fields have developed on the Pleistocene uplands at Moss Bluff and in the marshlands below Cotton Lake. Numerous oil and gas pipelines run across the Wallisville Project. These pipelines extend to terminals and refineries at Houston, Beaumont, and Port Arthur, and they serve the oil fields in the area.

The mining of sulphur at Moss Bluff east of the Wallisville Project constituted a large percentage of the mineral production in the area. Sulphur was produced by Texas Gulf, Inc. from wells drilled into the caprock of a shallow subsurface salt dome. In the area near the Project, sand of concrete and industrial quality is produced from several pits in Pleistocene and Holocene-Modern river deposits.

## 1.1 Climate

The lower Trinity River watershed lies in a humid subtropical region with hot summers and mild winters. The proximity of the area to the Gulf of Mexico and the Galveston Bay system, the prevalence of southerly winds, and the absence of marked relief result in high relative humidity and uniformity of climate. Average monthly temperatures in the Project Area range from 52 °F in January to about 82 °F in July and August. Freezing temperatures are infrequent

and of very short duration. Fog can occur in the area at any time of the year, but is most frequent in winter. The average growing season between frosts is about 300 days. The principal wind regimes dominating the Project Area are persistent southeasterly winds from March through November associated with marine tropical air masses. Short-lived but strong northerly winds can occur from December through February, generally in association with passage of polar fronts.

The mean annual precipitation in the Project Area is about 51 inches and the average annual lake evaporation rate is 46 to 47 inches. Precipitation in the Project Area occurs in the form of rainfall from intense local thunderstorms of short duration, general storms which extend over a period of several days, and torrential rainfall associated with tropical disturbances and hurricanes. The Wallisville area is subject to occasional periods of intense precipitation, occasionally reaching 10 to 14 inches in 24 hours. Such rains may occur at any time of the year but are commonly associated with tropical storms and hurricanes during the months of May through November

The frequency that any point on the Texas coast may be subjected to destructive wind forces of hurricane intensity is estimated to be once every ten years. Because of the proximity of the Wallisville area to the Gulf of Mexico, it would be subject to influence by tropical storms or hurricanes. A storm surge of +13.5 feet mean sea level (msl) near the City of Anahuac can be expected to occur about once in 100 years and a storm tide of +4 feet msl can be expected about once in 3.7 years.

## 1.2 Stratigraphy

The stratigraphic units in the Wallisville area consist of the Beaumont and Deweyville terrace deposits and the modern alluvial-deltaic plain of the Trinity River (Bureau of Economic Geology, 1968). The Beaumont terrace was deposited during one of the last interglacial episodes of the Pleistocene. The terrace occurs in the Project Area as high-level deposits, ranging from 20 to 30 feet above the Modern alluvial-deltaic plain, which flank the Trinity River. The Beaumont terrace deposits occur as relatively low relief surfaces with poorly preserved point bars, levees, and abandoned meander loops which reflect abandoned channel courses of the Pleistocene Trinity River. The Deweyville terrace deposits lie between the Beaumont and Modern alluvial-deltaic plain. They were formed during a period of constant sea level caused by minor stillstands or temporary readvances of glaciation during the last rise in sea level which occurred 18,000 to 4,500 years ago. The Deweyville deposits occur as two to three terraces east of the Trinity River and are generally less than 10 feet above the Modern alluvial-deltaic plain. The Deweyville deposits are characterized by filled abandoned channel courses, meander scars of large radii, and

well preserved point-bar ridges and swales. The Modern alluvial-deltaic plain of the Trinity River valley consists of meanderbelt sands and floodplain deposits flanking the present stream and a deltaic plain composed of distributary channels with associated marsh, pond, and lake environments. Pleistocene deposits underlie the delta plain at depths of about 8 feet at Lake Anahuac and depths of about 50 feet in the northern part of the delta.

## 1.3 Topography

The land surface of the Project Area dips gently seaward and has elevations ranging from sea level in the Trinity River delta to about 35 feet on the Pleistocene coastal prairie uplands. Uplifted salt domes have elevated the land surface at Barbers Hill near Mont Belvieu, at Moss Bluff north of Lake Charlotte, and at Lost Lake in the immediate Project Area. The modern Trinity River floodplain lies between river-cut scarps formed in Pleistocene deposits and ranges from 2 to 6 miles in width. Topographic features in the Trinity River floodplain include abandoned channel courses, oxbow lakes, point bars, and natural levees. Abandoned channel courses reflect ancestral meandering patterns of the Trinity River and form topographic lows on the river floodplain. Some abandoned channel courses have formed oxbow lakes such as Lake Charlotte, Lake Miller, and Lost Lake. Other oxbows support swamp or freshwater vegetation. Point bars along the Trinity River are a result of deposition of bedload material on the inside of curved loops or meanders. Natural levees, which result from overflow deposition of muds and silts during flood periods, have developed along the lower reaches of the Trinity River and along channels and bayous flowing through the valley marshlands. Numerous Indian mounds and shell middens attain heights of 6 to 8 feet in the Project Area and may extend for several hundred feet along beaches or natural levees. In addition, artificial levees have been constructed around the Lost Lake Oil and Gas Field and East and West Non-Overflow Dams have been constructed, or partially constructed, as part of the original Project.

## 1.4 Soils

Soils of the Trinity River delta include the Harris-Ijam, Kaufman, Vaiden-Lake Charles-McKamie, Morey-Frost, and Vaiden Associations (Soil Conservation Service, now the Natural Resources Conservation Service, 1976, 1991). The Harris-Ijam and the Kaufman Associations are the major soils in the Trinity delta and alluvial plain area. The Harris-Ijam soils occur in the lower Trinity delta marsh, are saline clays which are very poorly drained, and are used for wildlife habitat and livestock grazing. Kaufman soils have developed on the Trinity River floodplain and are deep alluvial clays which are somewhat poorly drained. These soils support freshwater marsh grasses and woodland vegetation and are utilized primarily as wildlife habitat.

Vaiden-Lake Charles-McKamie soils occur on steep slopes along the edge of the Trinity River valley. These soils have clay to sandy loam textures, good drainage, and rapid runoff and support prairie grasses to pine and hardwood trees. Other less extensive soils in the Project vicinity include Morey-Frost loams and Vaiden clays. Morey-Frost soils occur on the Pleistocene uplands in the Project vicinity, are poorly drained, and are capable of supporting rice, corn, and sorghum. The acidic clay soils of the Vaiden Association are poorly drained and support primarily forest vegetation.

## 2.0 PROJECT PURPOSE

The Wallisville Project was originally authorized to provide for five purposes: navigation, salinity control, water supply, fish and wildlife enhancement, and recreation. The primary function of the original Project was to prevent saltwater intrusion into the Trinity River and to improve the reliability of water supply and irrigation. The Project was also originally intended to operate in conjunction with the Lake Livingston Reservoir, located on the Trinity River about 125 miles upstream from the Wallisville site, for the efficient development of the water resources of the lower Trinity River Basin. An agreement with the local sponsors during construction of the Lake Livingston Reservoir allowed for a portion of the Wallisville Project to be used for water conservation storage during the first 25 years of operation. This agreement also provided for full use of the Project's storage capacity for system operation with Lake Livingston to develop maximum yields as Trinity River water demand increased.

The present plan, while not creating a permanent impoundment, still provides for all five Project purposes. Salinity control is still the primary function of the Project and is accomplished with a gated spillway adjacent to the navigation lock that will control water flow through the Project. While the Project will no longer function as a reservoir for water storage, it will still be part of the system operation with Lake Livingston to maximize water yields by conserving water releases from Lake Livingston that were previously needed to control salt water intrusion during drought conditions.

## 3.0 PROJECT DESCRIPTION

The Wallisville Lake, Texas Project was originally authorized by the River and Harbor Act of 1962. The original Project consisted of dams totaling approximately 39,000 feet in length, a navigation lock, a shallow freshwater impoundment of about 19,700 acres, and the various ancillary facilities needed for operation (Figure 1-3 of the main report). Since the low overflow dam at the southern boundary of the Project would be subject to periodic over-topping by storm

generated tides, a flushing system was incorporated in the salt water barrier design. The design water surface elevation of the original Project lake was +4.0-feet msl and a minimum pool elevation of +1.0-foot msl was needed for salinity control. The storage capacity between these two elevations totalled 45,600 acre-feet. The surface area of the lake was reduced from 19,700 acres at the design surface elevation to about 7,200 acres at the minimum operating level. About 4,900 acres of this area was existing water area.

Begun in 1966, construction was about 72-percent complete when an environmental lawsuit enjoined further work on the Project in 1973 because of deficiencies in the original EIS. In 1981, the Post-Authorization Change Report (PACR) and Environmental Impact Statement (EIS) recommended the adoption of a smaller, modified Project. Authorized by the Supplemental Act of 1983, the modified Project provided for a 5,600 acre reservoir on the east side of the Trinity River and associated water-control features (Figure 1-4 of the main report). In 1987, the Court of Appeals ruled in favor of the USACE and dismissed the law suit. The FY 90 Appropriations Act contained $4 million and directive language to resume construction and to award continuing contracts until construction was complete. Succeeding appropriation acts have contained funding and similar directive language.

After discovery of an endangered species in the Project Area, subsequent negotiations with the USFWS, under the Endangered Species Act, produced changes in the planned Project operations. The USACE agreed to develop a Project that would not impound water at more than +2-feet msl, requiring a reduced reservoir size of 3,800 acre-feet (Figure 1-5 of the main report). This agreement resulted in adoption of a new design philosophy for the remainder of the Project. Additional design studies were conducted to further reduce or eliminate Project impacts to the environment and to ensure survival of the cypress swamps. These studies revealed that a controlled spillway at the location of (and replacing) the river plug in coordinated operation with the navigation lock could closely mimic pre-Project river flow and would not require a continuous 2-foot pool for water storage or for prevention of salt water intrusion, even under low-flow conditions (Figure 1-6 of the main report).

## 4.0 HISTORY AND AUTHORIZATION

The following is a chronology of the Wallisville Lake, Texas Project.

1955 - The Trinity River Authority of Texas (TRA) was created by House Bill 20 of the 54th Legislature. The act passed the right to construct a large upstream reservoir (Lake

Livingston) to the TRA and gave the TRA the responsibility, financially and otherwise, to construct a saltwater barrier with a barge lock in the Trinity River (Wallisville Lake Project).

1962 - The Wallisville Lake Project was authorized as a Federal project by the River and Harbor Act of 1962 (House Document No. 215, 87th Congress). The authorization was for a reservoir consisting of 19,700 acres, a lock for barge traffic, four recreation facilities, a dam in the Trinity River for salt water intrusion, and fish and wildlife enhancement.

1966 - Construction and real estate acquisition for the Project was initiated.

1968 - A contract for water supply, salinity control, and recreation for the Project was signed by the USACE, the City of Houston, the TRA, and the Chambers-Liberty Counties Navigation District and was approved by the Secretary of the Army on 2 February (Contract No. DACW64-67-C-0108).

1969 - The National Environmental Policy Act (NEPA) was passed by the Congress. One portion of the Act required an EIS be prepared for all Federal projects. The Wallisville Lake Project was approximately 28-percent complete at this time.

1970 - The USACE circulated a draft EIS for the Project. The Final EIS (FEIS) was filed in January 1972.

1971 - A lawsuit against construction of the Project was filed in U.S. District Court in September by the Sierra Club *et al.* to enjoin the Project.

1973 - The U.S. District Court judge granted a summary judgement and enjoined construction for inadequacies in the FEIS in February. The Project was approximately 72 percent complete.

1974 to 1979 - The USACE undertook reevaluation studies and proposed modifications to the Project.

1979 - The USACE circulated a draft PACR and EIS that recommended the modified 5,600-acre Project in July. The USACE circulated the final PACR and EIS in July, 1980.

1981 - The Board of Engineers for Rivers and Harbors (BERH) sent the PACR and EIS to Office of Chief of Engineers (OCE) for resolution of policy issues in March. Also in March,

the OCE requested the Galveston District to prepare supplemental information to resolve policy issues raised by the BERH.

1982 - In July, the Galveston District prepared an internal document entitled Supplemental Information to Post-Authorization Change Report (SIPACR) and submitted it to the OCE.

1983 - Congress reauthorized construction of a modified Project (Public Law 98-63) in accordance with the 1981 PACR, the 1982 Supplement, and the 1968 contract between the Federal Government and the Local Sponsors in July. This reduced the Project to a reservoir of 5,600 acres with a pool elevation of 4 feet National Geodetic Vertical Datum (NGVD).

1983 - The SIPACR was attached to the PACR and released to the public and interested agencies for review and comment in September.

1985 - In November, Congress again reauthorized the modified Wallisville Project.

1986 - On April 22, the USACE appealed the court injunction with the Fifth Circuit Court of Appeals, New Orleans, LA.

1987 - In May, the Fifth Circuit Court of Appeals dismissed the lawsuit in favor of the Government and lifted the injunction against continuing Project construction.

1989 - In November, a pair of bald eagles, an endangered species, was discovered nesting in a cypress swamp within the Project boundary.

1990 - The USFWS prepared a Biological Opinion, in July, concerning potential Project impacts on the bald eagles and their habitat, the cypress swamps.

1990 - On September 14, an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) was signed by the USACE incorporating the biological opinion into the construction and operation of the Project. This current plan, which would maintain pre-Project conditions, further reduced the reservoir to 3,800 acres and the pool elevation to 2 feet NGVD.

1991 - The Energy and Water Development Appropriation Acts of 1990 and 1991 provided funding totalling $4.0 million and $9.2 million, respectively, and contained directive language for

resuming construction and completing the Project. In October, a construction contract was awarded to construct the West Non-Overflow Dam south of IH-10.

1993 - The West Non-Overflow Dam was completed in November.

1994 - In July, FDM No. 11 for Remaining Features (South Non-Overflow Dam, Controlled Spillway, Bridge, Control Structures A and C, and Completion of the Lock Access Road) was submitted to the USACE Southwestern Division (SWD).

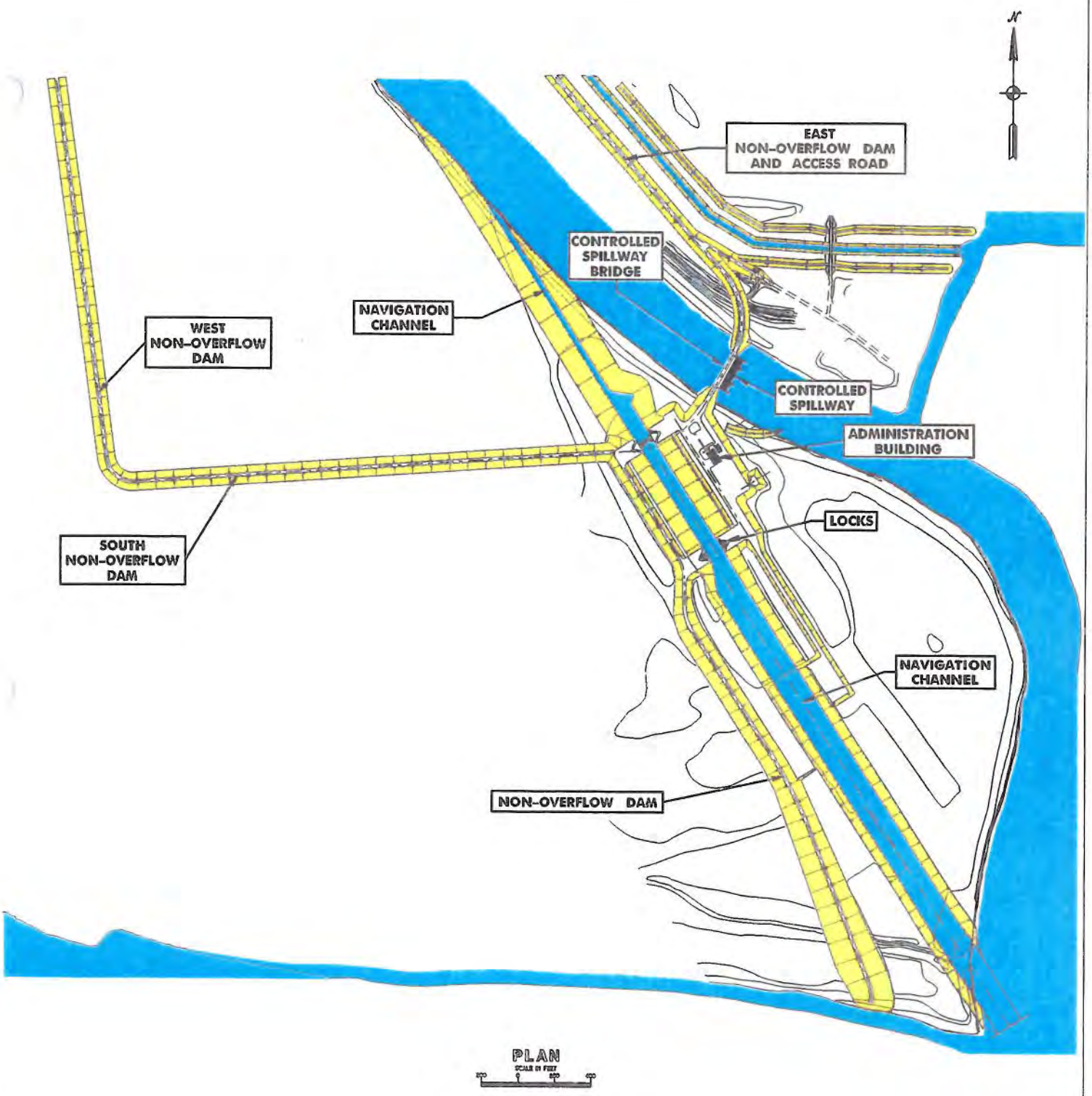
1995 - An Environmental Assessment on Changes in Project Features and Operation; an Environmental Review Guide for Operations; a Hazardous, Toxic, Radioactive Waste Preliminary Assessment; and a Draft Master Plan for the Project were prepared.

## 5.0 PROJECT OPERATION

The main function of the Project is to protect fresh water in the lower Trinity River from salinity intrusion. During low-flow periods, a salinity wedge moves up the river from Trinity Bay and threatens the fresh water supply. Salinity control is presently achieved by releasing water from Livingston Dam that flows down the river into Trinity Bay preventing upstream movement of the saltwater wedge. After completion of the Project, this release will be conserved.

The Project has been modified to prevent salinity intrusion without creating backwater conditions that could contribute to upstream flooding. Upstream flooding was eliminated as a result of an agreement between the USACE and the USFWS to protect cypress swamp areas in the Lake Charlotte area which provide nesting habitat for a resident pair of bald eagles.

By eliminating the reservoir feature of the Project, the USACE can operate the Project to maintain, as closely as possible, pre-Project conditions while preventing salt water intrusion. During normal river flow and flood conditions, the controlled spillway gates and the navigation lock (Figure A-1) will be completely open. During drought and low-flow conditions when saltwater moves upstream from the bay, the Project will be operated for salinity control. Currently, low flow is estimated at 1,000 cubic feet per second (cfs) or less at the navigation lock since, at this flow, saline water starts to move upstream into the Project Area. When saline water is detected at monitoring gages located below and above the navigation lock at the Project site, the controlled spillway and navigation lock will be adjusted to prevent salinity intrusion; i.e. the locks would be closed, except for operations to allow navigation traffic to pass through, and the gate outlets in the controlled spillway would be progressively closed to maintain a sufficient head




# WALLISVILLE LAKE, TEXAS

NAVIGATION CHANNEL AND LOCK, CONTROLLED SPILLWAY, ACCESS ROAD AND NON-OVERFLOW DAMS

Figure A-1

to prevent saltwater intrusion in the Trinity River Channel. This, in conjunction with the non-overflow dams, would prevent salinity intrusion into the Trinity River. However, the present Project does not prevent salinity intrusions into the Old and Lost Rivers, and therefore, water control structures are needed to prevent salinity intrusion from the Old and Lost Rivers into the Trinity River. The Control Structures are described more fully in Section 5.2 below.

Flushing will not be required, except following the infrequent passage of storms or hurricanes. At these times, saline water pushed upstream by the storm must be flushed out of the Project Area with fresh water releases from Lake Livingston.

## 5.1 Constructed/Partially Constructed Features

The following features were constructed or partially constructed under the originally authorized +4-feet msl, 19,700-acre Project (Figure 1-3 of the main report).

The access road/east non-overflow dam, is approximately 10,000 feet in length and is the only land access to the lock and administration area. It was begun in 1966 and was completed from near the IH-10 service road to the east bank of the Trinity River across from the lock in October 1968. Although originally intended to hold water in a reservoir, it now prevents saltwater intrusion into the Trinity River from the east and provides access to the lock and administration area during flood conditions.

The navigation channel is complete, except for the earth plug at each end. The basic lock structure is approximately 75-percent complete. The west non-overflow dam was completed in 1993 and extends from near the IH-10 service road south along the west bank of the Trinity River for about 17,000 feet. The earthen dam will connect with the west end of the new south non-overflow dam to form the western side of the new Project's salt water barrier. The crest elevations of the dam vary from elevation +13 feet NGVD at IH-10 to elevation +11 feet NGVD at the lock site.

Control Structure B was originally designed as a simple box culvert with a flap gate to act as a check valve and allow one-way flow from the Cutoff to the Lost River. However, this structure is no longer part of the Project. It was replaced by a low-head earthen dam located on an unnamed water passage between the Cutoff and the Lost River. This structure was constructed under permit by the Coastal Water Authority (CWA) in 1980. The earthen dam remains an integral feature of the current saltwater barrier Project. The dam will prevent saltwater from flowing into the Cutoff from the Lost River.

The freshwater diversion works, consisting of a gated control structure and a canal parallel to the Lock Access Road, channels freshwater from the Trinity River into Big Hog Bayou and to a pumping station at Lake Anahuac.

The uncompleted non-overflow dam adjacent to the south navigation channel was to provide containment of the original 19,700-acre pool. This non-overflow dam is no longer part of the Project, and is scheduled to be scavenged for fill material for the other structures. The low overflow dam, running through the marsh south of Old River Lake, was to contain the 19,700-acre pool at an elevation of +4 feet NGVD along the pool's southern boundary. However, this structure is no longer part of the Project and may be breached at several locations to restore flow to the southern marsh of the delta. Work on removing sections of the dam can proceed only after coordination with the resource agencies is completed, full NEPA documentation is completed, and funds are procured.

## 5.2 Remaining Features

The following features are those that are not yet complete, but are required to provide a functional salt water barrier. Several of the features were part of the original Project, several are altered features of the original Project, and some are new features.

All of the previous Project configurations included an earthen dam in the Trinity River adjacent to the Lock. Under the current plan, the controlled spillway occupies the location of the former earthen dam and a bridge will be required to maintain access to the lock, administration building, visitor center, and adjacent vehicle storage areas. The controlled spillway (Figure 1-6 of the main report) is required to prevent saltwater intrusion while maintaining the area as nearly as possible in pre-Project conditions. A south non-overflow dam, extending west from the navigation lock to the southern end of the west non-overflow dam will complete the saltwater barrier for the Project, except for water control structures.

Control Structure A will be located in the Cutoff between the Trinity River and Picketts Bayou. The original function of this structure was to maintain the 4-foot pool, control flood flows, and release fresh water down the Cutoff to west side marshes along the Trinity River delta and to the CWA pumping station on Old River. In the current plan, the structure will function only to prevent saltwater from passing through the Cutoff into the Trinity River. It will remain fully open to allow normal passage of water and small boats, except during low-flow conditions when salinity intrusion is imminent.

Another water control structure, Control Structure C, was originally designed to prevent salinity intrusion to the CWA pumping station (now non-operational) located upstream on Old River. In the current plan, Control Structure C consists of a temporary sheet pile wall with a break-away section that will be placed only when, and if, the CWA pumping station on Old River again becomes operational.

The only other features and/or products remaining to be completed subsequent to this Master Plan are the recreation facilities at Cedar Hill Park (see Section 6.0 of the main report) and the Operation Plan.

## 6.0 LITERATURE CITED


Bureau of Economic Geology. 1968. Geologic Atlas of Texas, Houston Sheet, 1:250,000. February 1968.

Soil Conservation Service. 1976. Soil Survey of Chambers County, Texas. U.S. Dept. of Ag., Soil conservation Service in cooperation with the Texas Agriculture Experimental Station. 53 pp. plus plates.

_____. 1991. General Soil Map, Liberty County, Texas. U.S. Dept. of Agric., Soil Conservation Service in cooperation with the Texas Agriculture Extension Service and Texas Agriculture Experiment Station.

# APPENDIX B

**Memorandum of Agreement with the**

**Texas State Historical Preservation Officer**

**and the**

**Advisory Council on Historic Preservation**

Advisory
Council On
Historic
Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

NOV 14 1984

Colonel Alan L. Laubscher
District Engineer
Galveston District
Corps of Engineers
P.O. Box 1229
Galveston, TX 77553

Dear Colonel Laubscher:

The enclosed Memorandum of Agreement has been ratified by the Chairman of the Council. This document constitutes the comments of the Council required by Section 106 of the National Historic Preservation Act and the Council's regulations. A copy of the ratified Agreement has also been sent to the Texas State Historic Preservation Officer.

On behalf of the Chairman, we commend your efforts in developing this project and appreciate the responsive manner in which your agency has planned for historic values. We look forward to working with you on future project.

Sincerely,

Thomas F. King
Director, Office of Cultural
Resource Preservation

PROPOSAL FOR
MEMORANDUM OF AGREEMENT

WHEREAS, the Corps of Engineers (COE), Galveston District, has determined that the proposed construction, operation and maintenance of Wallisville Lake, Chambers and Liberty Counties, Texas, will have an effect upon properties included in or eligible for inclusion in the National Register of Historic Places (National Register) and has requested the comments of the Advisory Council on Historic Places (Council) pursuant to Section 106 of the National Historic Preservation Act (16 U.S.C. 470) and its implementing regulations, "Protection of Historic and Cultural Properties" (36 CFR 800);

NOW, THEREFORE, the COE, the Texas State Historic Preservation Officer (SHPO), and the Council agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

Stipulations

The COE will insure that the following measures are carried out:

STIPULATION 1:

A. Prior to the sale or transfer of any lands acquired for the Wallisville Lake Project by the COE and prior to any construction or land disturbing activities by the COE or its licensees, lessees, or permittees, the COE will conduct or cause to be conducted a cultural resource survey of previously unsurveyed lands or cultural resource assessments of previously identified properties. These investigations will be designed in accordance with guidelines established in consultation with the SHPO to identify historic and cultural properties included in or eligible for the National Register that may be affected by the undertaking and in accordance with "Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines" 48 Federal Register, pp. 44716-44742 (September 29, 1983), and Sections I and II of Part III of "Treatment of Archeological Properties: A Handbook" (Advisory Council 1980) (Handbook), and professional standards identified in the Council's current Manual of Mitigation Measures. Should the SHPO and the COE fail to agree on guidelines for these studies, the COE shall provide the Council with copies of the proposed guidelines, together with the SHPO's comments. The Council shall provide the COE with comments and recommendations within 30 days of receipt of the materials.

B. All identified historic and cultural properties on lands acquired for the Wallisville Lake Project will be evaluated in consultation with SHPO to identify those properties that appear to meet National Register criteria for evaluation. The COE will seek determinations of eligibility or nominations from the Secretary of the Interior for all sites which either the COE and/or the SHPO feels may be eligible in accordance with National Register procedures (36 CFR 63.3 and 36 CFR 60.9).

C. For those properties on lands acquired for the Wallisville Lake Project included in or eligible for the National Register, the COE will evaluate, in consultation with the SHPO, the proposed undertaking to determine effect pursuant to 36 CFR 800.4(b). If it is determined that the undertaking will not diminish those characteristics of the property that qualify it for inclusion in the National Register (that is, will have "no effect"), the property need not be considered further during this stage of the undertaking.

D. Those properties acquired for the Wallisville Lake Project, listed or eligible for listing in the National Register, that will be adversely affected by the undertaking will be treated in accordance with stipulations 2 and 3 below.

STIPULATION 2:

When it is not prudent or feasible to avoid an adverse effect to a National Register or eligible property on lands acquired for the Wallisville Lake Project, the COE will consult with the SHPO and:

A. If the affected property is included in or eligible for the National Register primarily because it may be likely to yield information important in prehistory or history, and it and the proposed undertaking meet the criteria of Section X of Part II of the Handbook, the COE will implement a data recovery program in consultation with the SHPO which considers the guidance of Part III of the Handbook and "Archaeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines" 48 Federal Register, pp. 44716-44742 (September 29, 1983).

B. If the affected property is eligible for or included in the National Register primarily for criteria other than the important information it may be likely to yield, the COE will develop and implement measures acceptable to the SHPO to mitigate the adverse effect.

C. The COE shall develop, in consultation with the SHPO, a Mitigation Program (Program) which is consistent with the standards, principles, and guidelines contained in the Council's "Treatment of Archeological Properties: A Handbook," Parts I and III that details the treatment of the historic properties that will be affected by the construction phase of the Wallisville Lake project. The program shall specify: 1) which properties or portions of properties shall be subject to data recovery, 2) which need not be subject to data recovery, 3) what research questions shall be addressed by the data recovery effort, and 4) what methods will be employed to articulate the data recovery with the research goals of the Program.

D. If the COE and the SHPO cannot agree on a satisfactory data recovery program under (A) above or cannot agree on appropriate mitigation measures under (B) and (C) above, the COE shall provide the Council with copies of the proposed data recovery plan and/or mitigation measures, together with the SHPO's comments. The Council shall provide the COE with recommendations within 30 days of receipt of the materials.

STIPULATION 3:

A. Cultural resource surveys, assessments, and data recovery programs conducted by the COE on lands acquired for the Wallisville Lake Project will be administered by a COE staff archeologist. Surveys, assessments, and data recovery programs conducted by other parties will be closely monitored and approved by the COE staff archeologist, who will review scopes of work, proposals, field work in progress, and resulting technical reports.

B. All final archeological reports resulting from actions pursuant to this Memorandum of Agreement will be provided to all signatories and to the National Park Service for possible submission to the National Technical Information Service (NTIS). All such reports shall be responsive to the contemporary professional standards identified in the Council's current Manual of Mitigative Measures. Precise locational data may be provided only in a separate appendix if it appears that its release could jeopardize archeological sites.

STIPULATION 4:

During activities covered by this Agreement and after the cultural resource surveys required by Stipulation 1 have been completed, should previously unknown historic or cultural properties be discovered on lands acquired for the Wallisville Lake Project, the COE will cause potentially damaging activities to be delayed until it has had an opportunity to consult with the SHPO and has complied with Section 800.7 of the Council's regulations (36 CFR 800).

STIPULATION 5:

In order to insure appropriate long term management of historic properties on lands acquired for the Wallisville Lake Project, the COE shall develop a long term management plan (Plan). Within 5 years from the date of ratification of this Agreement the COE will determine in consultation with the Texas SHPO the efficacy of developing, during this time period, a long-range management plan for historic and cultural properties contained within project lands or portions of such lands on an incremental basis. The Plan will establish procedures and priorities for orienting future investigations to identify, assess, and manage historic and cultural properties. A schedule for regular review of the Plan by the COE and the SHPO shall be established to insure incorporation of necessary revisions. The Plan will demonstrate consideration of the guidance contained in the Handbook or other guidance more current at that time, as well as preservation management techniques and methods generally expected by the historic preservation profession and pertinent to the area. If the COE determines preparation of the Plan is not appropriate at that time, the available information will be evaluated at intervals no longer than 3 years and a determination made in consultation with the Texas SHPO about the appropriateness of such a Plan, and its preparation. In any case, the Plan shall be completed and implemented before initiation of project operation. The Plan will be incorporated into COE Master Plans and other planning documents and by reference into any lease of transfer agreements in the Wallisville Project area.

STIPULATION 6:

Failure to carry out the terms of this Agreement requires that the COE again request the Council's comments in accordance with 36 CFR 800. If the COE cannot carry out the terms of the Agreement, it shall not take or sanction any action or make any irreversible commitment that would foreclose the Council's consideration of modifications or alternatives to the proposed action that could avoid or mitigate the adverse effect until the commenting process has been completed.

STIPULATION 7:

If any of the signatories to this Agreement in consultation with other parties in interest, determine that the terms of the Agreement cannot be met or believe a change is necessary, that signatory shall immediately request the consulting parties to consider an amendment or addendum to the Agreement. Such an amendment or addendum shall be executed in the same manner as the original Agreement.

5 Sep 84

District Engineer (date)
Corps of Engineers, Galveston District

24 Sept. 1984

Texas State Historic (date)
Preservation Officer

Nov 6, 1984

Executive Director (date)
Advisory Council on Historic Preservation

11/9/84

Chairman (date)
Advisory Council on Historic Preservation

ADVISORY COUNCIL ON HISTORIC PRESERVATION
NOV 13 11 44 AM '84

# APPENDIX C

## Public Correspondence

# APPENDIX C

## Section 1

## Public Notice to Prepare Master Plan and Public Comments

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

PLAN FORMULATION BRANCH

November 22, 1994

# PUBLIC NOTICE

# PREPARATION OF MASTER PLAN FOR WALLISVILLE LAKE, TEXAS

## INTRODUCTION

The purposes of this notice are to inform the public about the development of a master plan, and to solicit public input for consideration and incorporation into the master plan. The master plan will be used to preserve, conserve, restore, maintain, manage, and develop the project lands, waters, and associated resources of Wallisville Lake.

## PROJECT DESCRIPTION

The Wallisville Lake project is located near the mouth of the Trinity River in Chambers and Liberty Counties, Texas, roughly 40 miles east of Houston on Interstate Highway 10(IH 10). Approximately 22,000 acres of bottomland delta and adjacent terrace margins were acquired for the original project. These lands extend from approximately 2.5 miles north of the Chambers/Liberty County line southward through the lowland delta for approximately 6 miles. The southern margin of Federal property is approximately 2 miles from Trinity Bay.

The authorized project is a 3,800-acre lake with a pool elevation of 2 feet above mean sea level (msl). The general layout of the project is shown on Figure 1 and the main individual project features are described in the appendix to this notice. The East, South, and West Non-Overflow Dams will function with the controlled spillway and navigation lock to form a closure to prevent salinity intrusion. The closure will prevent upstream movement of salt water and prevent tides up to 4 feet above msl from back flowing into the project area.

Upstream of IH 10, the salinity closure is formed along the west bank of the Trinity River by the natural high bank that varies from 4 and 6 feet msl. Control Structures A, B, and C will prevent water from backing up Old River and Lost River. The controlled spillway and the lock chamber provide the primary outlet capacity from the salinity closure.

## THE MASTER PLAN

The master plan is a continuing and dynamic plan which will assure the wise use of natural resources at Wallisville Lake. The master plan will address all resources including but not limited to fish and wildlife, vegetation, cultural, aesthetic, recreational, mineral, commercial, pipeline or utility easements, and water. The master planning process will encompass an examination and analysis of the past, present, and forecasted future environmental and socio-economic conditions and trends. The planning process will focus on three primary components: (1) expressed public interests and desires, (2) the capabilities and suitabilities of the project's natural resources to meet design goals, and (3) regional needs. Existing commitments, such as completed structures or endangered species needs, will also be considered.

## COORDINATION AND PUBLIC INVOLVEMENT

If you have any questions or comments concerning the development of the master plan for Wallisvile Lake, or if you wish to be on the mailing list to obtain a copy of the master plan please write to the address shown on the first page of this notice. We anticipate holding a public meeting on the master plan in January 1995. Further information can also be obtained from the U.S. Army Corps of Engineers in Galveston, Texas, by calling Mr. Carl Anderson at (409) 766-3132 or Mr. Mike Morris at (409) 766-3069.

Robert B. Gatlin
Colonel, Corps of Engineers
District Engineer

SHOW THIS NOTICE TO OTHERS WHO MIGHT BE INTERESTED

# APPENDIX

## PROJECT HISTORY AND DESCRIPTION

The Wallisville Lake project was originally authorized by the River and Harbor Act of 1962. The original project would have created a 19,700-acre lake with a design pool elevation of 4-feet above msl. However, in 1973 an environmental lawsuit enjoined further work on the 72-percent completed project because of deficiencies in the original Environmental Impact Statement (EIS). In 1981, the Post Authorization Change Report (PACR) and EIS recommended the adoption of a smaller, modified project. Authorized by the Supplemental Appropriation Act of 1983, the modified project provided for a 5,600-acre lake on the east side of the Trinity River and associated water-control features. The authorized modified project was submitted to the District Court in 1985 with a request to remove the injunction. In 1987, the Court of Appeals ruled in favor of the Government and dismissed the suit. The 1990 Fiscal Year Appropriations Act contained $4 million for the project and language directing the Corps to resume construction and to continue until the project was complete.

In 1989, the endangered bald eagle was discovered nesting in the project area. Under provisions of the Endangered Species Act, the U.S. Fish and Wildlife Service (USFWS), prepared a Biological Opinion dated July 20, 1990, which specified certain prudent measures to assure the survival and reproductive success of the eagles. These measures are to maintain the normal level of the lake at no more than 2 feet above msl, ensure that current levels of cypress tree mortality and vigor are not altered, provide a regeneration scheme for the bald cypress stand, provide for protection of the bald eagle nest area, and explore and implement an environmentally safe method to control large infestations of aquatic weeds.

The Corps of Engineers has adopted the USFWS's measures into the original project goals and initially developed a new design philosophy which provided for a continuous 2-foot pool (msl) in a 3,800-acre lake. Subsequent engineering designs and analyses have modified the need for a continuous 2-foot msl pool to control salinity intrusion by adding a controlled (gated) spillway in the river next to the navigation lock. The controlled spillway will permit a reduction in the pool level during low-flow conditions to closely mimic downstream tidal heights, thus foregoing the need for a continuous 2-foot msl pool. This new plan essentially maintains pre-project conditions while preventing salt water intrusion to the Trinity River and enhances the survivability of the bald eagle nesting site (see Figure 1).

## OPERATION PLAN

The operation plan seeks to minimize project-related pool fluctuations above the normal river levels through the utilization of a navigation lock and gated water control spillway. The gate and lock which closely approximate the river cross section would normally be open to pass river flows, while the lock and gated spillway would be partially to completely closed during low flow periods to prevent saltwater intrusion. When water is needed by the water rights holders during low-flow periods, releases will be made from Lake Livingston to meet the withdrawal needs. The Lake Livingston releases are varied to make up whatever is lacking from natural flows into the Wallisville Lake for withdrawal needs. If the annual monitoring of the cypress stand in the pool area indicates that project-caused stress or increased mortality is occurring, then additional periods of drawdown will be implemented whenever opportunities occur to do so without jeopardizing salinity control.

## EXISTING FEATURES

The following features were constructed or partially constructed under the originally authorized 4-foot msl, 19,700-acre project.

East Non-Overflow Dam or Lock Access Road. Provides access from the IH 10 service road to the lock.

Freshwater Diversion Works. This consists of a gated control structure and a canal parallel to the Lock Access Road. The purpose of the diversion works is to channel freshwater from the Trinity River into the Big Hog Bayou which leads to a pumping station at Lake Anahuac.

Partially Complete Navigation Lock. The basic lock structure is complete.

Navigation Channel. The navigation channel immediately adjacent to the north and south ends of the lock is approximately 75% complete.

Non-Overflow Dam Adjacent to South Navigation Channel. This non-overflow dam is in place, except for the reach that would cross and close the Old River channel south of the Lock. The purpose of the dam was to provide containment of the original 19,700-acre pool. It is no longer part of the project.

The Low Overflow Dam. This dam is about 85% complete. Its original purpose was to contain the 19,700-acre pool at an elevation of 4 feet msl along the pool's southern boundary. However, it is no longer part of the project.

West Non-Overflow Dam. The west non-overflow dam was completed in 1993 and extends from IH 10 south along the west bank of the Trinity River for about 17,000 feet. The earthen dam will connect with the west end of the new south non-overflow dam to form the western side of the Wallisville project.

Control Structure B. Control structure B, located on an unnamed water passage between the Cutoff and the Lost River, consists of a low-head earthen dam, and is an integral feature of the current project. The purpose of this dam is to prevent saltwater from the Lost River from flowing into the Cutoff. This structure was constructed by the Coastal Water Authority under a permit in 1980. The earth plug will not be replaced by this project.

## REMAINING PROJECT FEATURES

The following features are those that are not yet complete. Several of the features were part of the original project, several are altered features of the original project, and some are new features.

Repair and Completion of the Lock Access Road/East Non-Overflow Dam. After completion of the controlled spillway and lock, the access road will be repaved, which will ensure access to the lock and administration area during flood conditions.

Controlled Spillway in the Trinity River Channel. The controlled spillway is required to minimize water retention for the Wallisville project and maintains the area as nearly as possible in pre-project conditions. The controlled spillway gates and the lock gates will remain open except during low flow periods to maintain pre-project conditions.

Cofferdam for Controlled Spillway Structure. A temporary cofferdam will be constructed around the controlled spillway site to allow for dewatering the area.

Two Lane Bridge for Controlled Spillway Structure. Under the current plan, a bridge will be required to maintain access to the lock and administration building. The bridge will have three 108-foot spans, totalling 324 feet, and a roadway width of 24 feet.

Administration Building/Visitor Center/Vehicle Storage. Plans and specifications for an approximately 4,000-square-foot administration building/visitor center and an adjacent vehicle storage area began in 1994 and are scheduled for completion in April 1995.

Navigation Lock. Plans and specifications for rehabilitating and completing the lock are scheduled for completion in April 1995.

Navigation Channel. Plans and specifications for completion of the navigation channel are scheduled for completion in April 1995.

South Non-Overflow Dam. This component consists of approximately 2,900 feet of earthen dam adjacent to and west of the existing lock. The purpose of the dam is to provide a salt water barrier on the south side of the project. The dam will continue from the south end of the recently completed west non-overflow dam to the lock.

Salinity Control for the Cutoff. Control structures A, B, and C will prevent saltwater from intruding into the Trinity River from the Cutoff. Structure A will prevent back-flow saltwater from moving through the Cutoff into the Trinity River up to +4 feet msl. Structures B and C will provide protection from saltwater tides, up to approximately +3.5 feet and +2 feet msl, respectively, which will move north through the marshes on the western side of the project from the Cutoff.

*Control Structure A.* This structure will be located on the Cutoff near its confluence with the Trinity River. The design and function of control structure A have changed. The 1981 PACR originally referred to this component as diversion structure A. This structure was to maintain the 4-foot pool, control flood flows, and release fresh water down the Cutoff to west side marshes along the Trinity River delta and to the CIWA pumping station on Old River. In the current plan, the primary function of control structure A is to prevent saltwater from flowing through the Cutoff into the Trinity River. The current plan calls for a single gate closure structure.

*Control Structure C.* The primary purpose of control structure C is to prevent salinity intrusion in the Old River and the Cutoff for the CIWA pumping station located upstream on Old River. In the current plan, control structure C will consist of a sheet pile wall, approximately 150 feet in length. The sheet pile wall will be placed to provide a positive closure for this portion of the project only when saltwater intrusion is imminent. It will be removed when the threat of saltwater intrusion has passed.

Recreation Facilities and Other Products. Other features and products remaining to be completed subsequent to the master plan include a Recreation Area, Gage Plan, and Operation and Maintenance Plan. The Cedar Hill Park recreation area will be included in an Feature Design Memorandum currently scheduled for approval in July 1995.

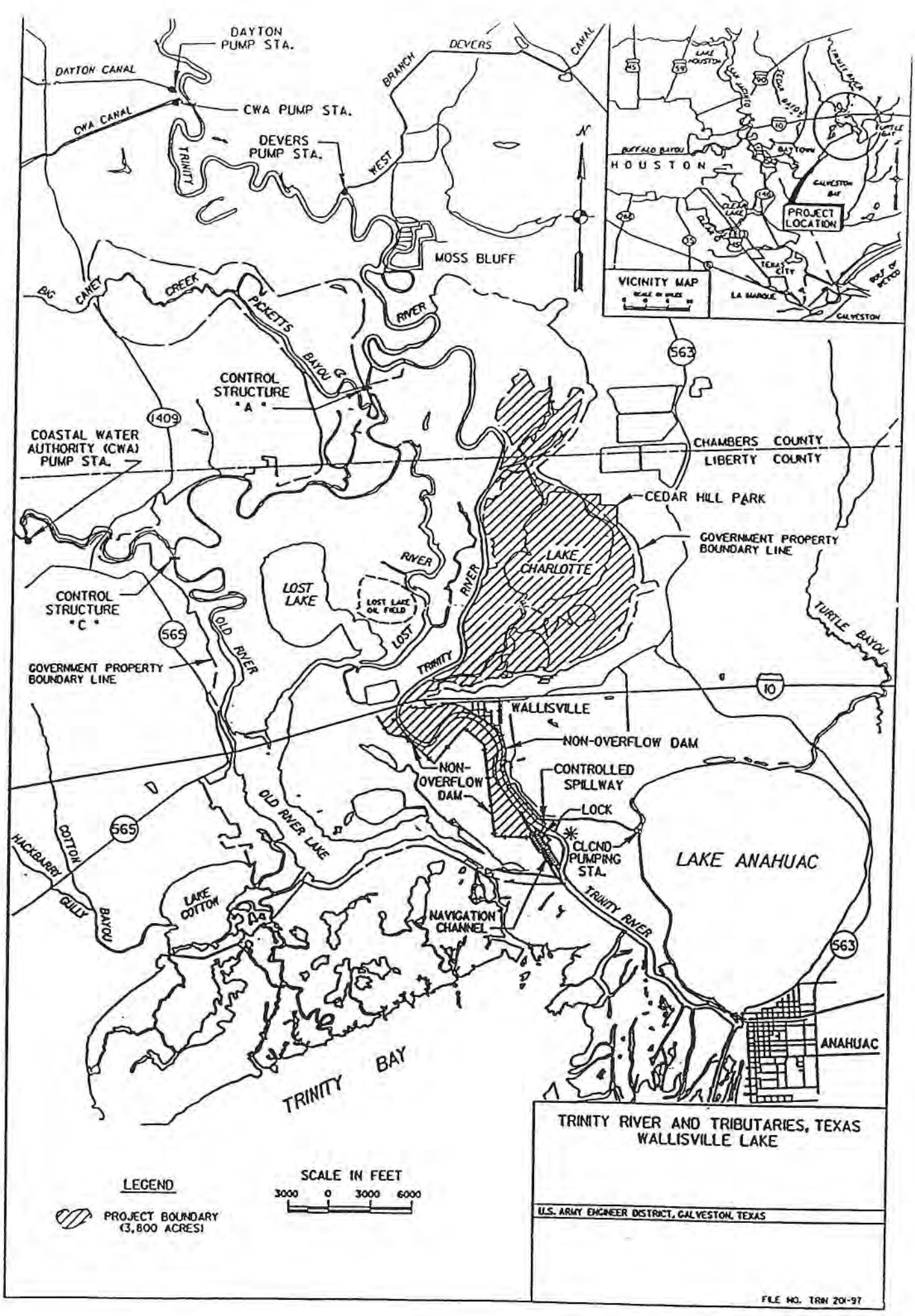

DAYTON PUMP STA.
DAYTON CANAL
CWA CANAL
CWA PUMP STA.
DEVERS PUMP STA.
TRINITY
WEST
DEVERS CANAL
BRANCH
MOSS BLUFF
BIG CANEY CREEK
PICKETTS BAYOU
RIVER
CONTROL STRUCTURE "A"
1409
COASTAL WATER AUTHORITY (CWA) PUMP STA.
563
CHAMBERS COUNTY
LIBERTY COUNTY
CEDAR HILL PARK
GOVERNMENT PROPERTY BOUNDARY LINE
LAKE CHARLOTTE
LOST LAKE
LOST LAKE OIL FIELD
LOST TRINITY RIVER
CONTROL STRUCTURE "C"
565
OLD RIVER
TURTLE BAYOU
10
WALLISVILLE
NON-OVERFLOW DAM
CONTROLLED SPILLWAY
LOCK
CLCND PUMPING STA.
LAKE ANAHUAC
OLD RIVER LAKE
HACKBARRY COTTON GULLY BAYOU
LAKE COTTON
NAVIGATION CHANNEL
TRINITY RIVER
ANAHUAC
TRINITY BAY
VICINITY MAP
HOUSTON
PROJECT LOCATION
TEXAS CITY
LA MARQUE
GALVESTON
LEGEND
PROJECT BOUNDARY (3,800 ACRES)
SCALE IN FEET
3000 0 3000 6000
TRINITY RIVER AND TRIBUTARIES, TEXAS
WALLISVILLE LAKE
U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS
FILE NO. TRIN 201-97

FIGURE 1

Houston Audubon Society

440 Wilchester, Houston, Texas 77079, (713) 932-1639, 461-2911 (fax)



519 Pine Edge Drive
The Woodlands, Texas 77380
December 30, 1994

Colonel Robert B. Gatlin
Department of the Army
Galveston District, Corps of Engineers
Post Office Box 1229
Galveston, Texas 77553-1229

Dear Colonel Gatlin:

I have just received a copy of your November 22, 1994 Public Notice on the Preparation of Master Plan for Wallisville Lake, Texas. I would like to be placed on the mailing list for receipt of this master plan when it is released. I would also like to be notified of the public meeting for January 1995 that you indicated you anticipated holding.

Please address me at my home address given under the letterhead as I live 35 miles from the Houston Audubon Society headquarters and go there about once a month.

Thank you.

Sincerely yours,

James R. Stewart

James R. Stewart
Vice President, Science and Research

*Board of Advisors* Win Campbell, Victor Emanuel, Ted Eubanks, William Graber, Ann Hamilton, Terry Hershey, Robert McFarlane, Wick Rowland, Jane Scheidler, Lucie Wray Todd, John L. Whitmire, Astatkie Zikarge

GALVESTON
BAY
FOUNDATION

6 January 1995

Robert B. Gatlin
Colonel, Corps of Engineers
District Engineer
P. O. Box 1229
Galveston, TX 77553-1229

Dear Colonel Gatlin:

Thank you for joining us at our Holiday Reception in December. We very much appreciated having the opportunity to meet and visit with you in an informal setting.

Thank you also for your notice regarding the proposed master plan for the Wallisville Project. Today I am writing to request that we be sent any available information on the proposed plan. We have appreciated the information provided last year regarding the new design for the project and the draft operating plan. We would be interested in any additional information on evaluation of the impacts of the project in regards to reduced freshwater inflows to Galveston Bay and on the plans for the 17,900 acres that will not be part of the revised project.

Thank you for your kind attention.

Very truly yours,

Linda Shead

Linda R. Shead, P.E.
Executive Director

17324-A HIGHWAY 3 • WEBSTER, TX 77598 • (713) 332-3381

January 18, 1995

Mike Morris
U.S. Army Corps of Engineers
Galveston District
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Mike,

I have a few more comments regarding the master plan for Wallisville that I would like to transmit to you.

Several features that were part of the original project design are no longer features of the new project design. These include the non-overflow dam adjacent to south navigation channel, and the low overflow dam. Since these features are no longer needed and since their continued existence has negative impacts on the Trinity River Delta and marsh system and Galveston Bay a restoration portion of this project should address how to remove or modify these hard structures so that environmental impacts are lessened. This could include selective breaching to ensure freshwater, organic matter, nutrients, and animal exchange occurs below these structures and with this entire area.

The Cove Park Borrow Area is mentioned a number of times but is never explained. What is this? How large will it be? What are the environmental impacts? Can other less damaging ways of getting fill material be found? Why is not an uplands area used for fill? This entire issue needs to be thoroughly addressed in the master plan.

When current levels of mortality or tree vigor are mentioned regarding the cypress swamp how will this be determined? What will be the regeneration scheme for bald cypress? What will your monitoring consist of to determine if conditions are acceptable? Also how will you determine what the preproject conditions were so that these can be maintained as closely as possible?

I did not realize that there was a proposal for a 6 mile road right through the middle of the Wallisville project for access to control structure A. I am opposed to this due to the damage that will be done (destruction is a better word) to riparian, bottomland, hardwoods and other wetlands. These forested wetlands need to be protected by the Corps because we have lost over 63% of them in the entire state according to Texas Parks and Wildlife Department estimates. Use a boat to access this facility since access will not be needed except once or twice each decade. Let us not destroy more forested wetlands.

Finally, will you send me one complete compy of the Wallisville Lake Feature Design Memorandum. I did not know this document existed and want to read it totally so I know what is proposed. Thank you.

Sincerely, Brandt Mannchen

Brandt Mannchen, 1301 Richmond T-2, Houston, Texas 77006
H713-521-9534, W713-640-4313

# APPENDIX C

## Section 2

## Notice of Availability, Notice to Prepare Recreation Plan,

## Public Comments, and Responses

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

COASTAL PLANNING BRANCH

December 8, 1995

# NOTICE OF AVAILABILITY

# COMPLETION OF DRAFT MASTER PLAN FOR WALLISVILLE LAKE, TEXAS

## INTRODUCTION

The purpose of this notice is to inform the public about the completion of a draft Master Plan, and to solicit public input for consideration and incorporation into the final Master Plan. The Master Plan will serve as a guide to preserve, conserve, restore, maintain, manage, and develop the project lands, waters, and associated resources of Wallisville Lake.

## THE MASTER PLAN

The Master Plan is a continuing and dynamic plan which assures the wise use of natural resources at Wallisville Lake. The Master Plan addresses all resources including but not limited to fish and wildlife, vegetation, historical, recreational, mineral, commercial, pipeline or utility easements, and water. The development of the Master Plan encompassed an examination and analysis of the past, present, and forecasted future environmental and socio-economic conditions and trends. The development process focused on three primary components:
(1) expressed public interests and desires, (2) the capabilities and suitabilities of the project's natural resources to meet design goals, and (3) regional needs.

## COORDINATION AND PUBLIC INVOLVEMENT

If you have any questions or comments concerning the completion of the final Master Plan for Wallisville Lake, or if you wish to obtain a copy of the draft Master Plan please write to the address shown above. Comments on the Master Plan should be sent to the above address, Attention: PL-C, by January 8, 1996. Further information can also be obtained by calling Mr. Mike Morris at (409) 766-3069 at the Galveston District Office.

James M. Kieslich

James M. Kieslich
Chief, Planning and
Environmental Division

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

COASTAL PLANNING BRANCH

July 18, 1995

# PREPARATION OF RECREATION PLAN FOR WALLISVILLE LAKE, TEXAS

The purpose of this letter is to solicit your input for consideration and incorporation into the recreation plan for Wallisville Lake, Texas. The recreation plan will be part of the master plan that will be used to manage the project lands, waters, and associated resources of Wallisville Lake.

Your response and comments are very important to us. We need your input in order to develop a recreation plan that incorporates public views.

If you have any questions or comments concerning the recreation plan and master plan for Wallisville Lake, or if you wish to be on the mailing list to obtain a copy of the master plan please write to U.S. Army Corps of Engineers, Galveston District, P.O. Box 1229, Galveston, Texas 77553, ATTN: CESWG-PL-C. Further information can also be obtained by calling Mr. Mike McClenan at (409) 766-3163 or Mr. Mike Morris at (409) 766-3069.

Encl

James M Kieslich

JAMES M. KIESLICH
Chief, Planning &
Environmental Division

# WALLISVILLE LAKE RECREATIONAL PREFERENCES

Please rate the following alternative recreation opportunities at the Wallisville Lake project. You may add more opportunities.

| Facility | Very Important 5 | 4 | 3 | Not Important 2 | 1 | No Preference 0 |
|---|---|---|---|---|---|---|
| Tent campsites (w/ water only) | ____ | ____ | ____ | ____ | ____ | ____ |
| Trailer campsites (w/water & elec.) | ____ | ____ | ____ | ____ | ____ | ____ |
| Picnic sites | ____ | ____ | ____ | ____ | ____ | ____ |
| Boat launch site | ____ | ____ | ____ | ____ | ____ | ____ |
| Canoe launch site | ____ | ____ | ____ | ____ | ____ | ____ |
| Hiking trails | ____ | ____ | ____ | ____ | ____ | ____ |
| Primitive camping sites | ____ | ____ | ____ | ____ | ____ | ____ |
| Group pavilions | ____ | ____ | ____ | ____ | ____ | ____ |
| Wildlife observation sites | ____ | ____ | ____ | ____ | ____ | ____ |
| Swimming beaches | ____ | ____ | ____ | ____ | ____ | ____ |
| Horseback riding trails | ____ | ____ | ____ | ____ | ____ | ____ |
| Amphitheater | ____ | ____ | ____ | ____ | ____ | ____ |
| Fishing piers | ____ | ____ | ____ | ____ | ____ | ____ |
| Restrooms | ____ | ____ | ____ | ____ | ____ | ____ |
| Shower Sites | ____ | ____ | ____ | ____ | ____ | ____ |
| _____ | ____ | ____ | ____ | ____ | ____ | ____ |
| _____ | ____ | ____ | ____ | ____ | ____ | ____ |

Comments: _____

_____

NOTE: Please return in the enclosed envelope.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Division of Ecological Services
17629 El Camino Real, Suite 211
Houston, Texas 77058

January 17, 1996

Richard Medina, Chief
Environmental Resources Branch
Corps of Engineers, U. S. Army
P. O. Box 1229
Galveston, Texas 77553-1229

Dear Mr. Medina:

Please refer to the ***Draft Master Plan: Wallisville Lake, Texas Project*** of November 1995 which was provided to this office for review and comment.

We have reviewed the draft plan and generally agree with its content. With respect to the recreation plan discussed in the document, we note the statement on page 5-1 of Appendix B that "The final or full development of the [Cedar Hill] park will occur only after clearance through formal consultation with the USFWS, the bald eagle is delisted, or it abandons the nest site for at least five consecutive years". In view of the sensitive habitats and animal populations in the project area which could be affected by the park's development and/or the intensity and types of recreational use made of the area in the future, we are interested in close coordination of these plans between our respective agencies for the benefit of all natural resources and populations in the area. 1

Please let us know if we may be of assistance to you in the implementation of the plan or its future modification as needed.

Sincerely yours,

B.D. King III
Chief, Federal Projects Branch

RESPONSE TO COMMENTS

Mr. B.D. King III
Chief, Federal Projects Branch
U.S. Fish and Wildlife Service
17629 El Camino Real, Suite 211
Houston, Texas 77058

| Comment No. | Response |
|---|---|
| 1 | Thank you for your comments. The Galveston District will closely coordinate any changes in the Recreation Plan for Cedar Hill Park or other areas in the project boundaries with your agency. |

GALVESTON
BAY
FOUNDATION

24 September 1995

Mr. James M. Kieslich
Chief, Planning & Environmental Division
Corps of Engineers
Galveston District
P. O. Box 1229
Galveston, TX 77553-1992

Re: Wallisville Recreation Plan

Dear Mr. Keislich:

Enclosed is a response to your preference poll on the recreation plan for the Wallisville Lake project. This site is a significant natural area for the greater Houston region which will require diligence to maintain its value if public use is increased. In general, the items marked as of least importance (#1) are considered to be inappropriate for this area.

The Executive Committee of the Galveston Bay Foundation also believes that motorized boats should be limited in horsepower, to 10 or 25 HP. Jet skis should be specifically prohibited. The value of the area for the wildlife that currently uses it will be significantly reduced if more motorized boat traffic is allowed. This would then also decrease the area's value for ecotourism. 1

Picnic sites, primitive camping or a pier should be included in the plan only if a fee is charged for maintenance and trash pick-up. Restrooms should be provided only if they are open air, i.e. no roofs or doors. (The Quintana Park facilities should be used as an example.) Trash pick-up should be a high priority in any plan. 2

Thank you very much for the opportunity to provide this comment. Please include the Galveston Bay Foundation on the mailing list for the draft recreation plan.

Very truly yours,

Linda Shead

Linda R. Shead, P.E.
Executive Director

Enclosure

17324-A HIGHWAY 3 • WEBSTER, TX 77598 • (713) 332-3381

RESPONSE TO COMMENTS

Linda R. Shead, P.E.
Executive Director
Galveston Bay Foundation
17324-A Highway 3
Webster, Texas 77598

24 September 1995

| Comment No. | Response |
|---|---|
| 1 | Only canoe launches will be provided at Cedar Hill Park, the only site for easy access to Lake Charlotte. No motorized vessels will be allowed to launch at the Park. However, motorized vessels may still enter Lake Charlotte through Mac Bayou and Lake Pass when water levels permit, as in the past. Because of manpower requirements and enforcement difficulties, there will be no restrictions on vessel size, type, or horsepower entering the lake from outside the Park. A lack of restrictions has not adversely affected wildlife use of the area in the past, probably because of the difficulty in entering the lake from the river. These conditions will likely continue in the future. |
| 2 | These requirements are considered and discussed in Section 6.0. |

GALVESTON
BAY
FOUNDATION

17 January 1996

Colonel Robert Gatlin
District Engineers
Corps of Engineers
P. O. Box 1229
Galveston, TX 77553-1229

Re: Draft Master Plan for Wallisville Lake, Texas

Dear Colonel Gatlin:

The accompanying comments from the Galveston Bay Foundation address the above referenced document. The key point in our evaluation is the missed opportunity to simultaneously protect the unique character of the project lands and contribute to the fastest growing sector of outdoor recreation use -- nature tourism -- and thus to the local economy.

We would be especially happy to work with you and your staff to enhance the plan, and appreciate your attention to these comments.

Very truly yours,

Linda Shead

Linda R. Shead, P.E.
Executive Director

Enclosure

GALVESTON
BAY
FOUNDATION

COMMENTS OF THE GALVESTON BAY FOUNDATION
ON THE DRAFT MASTER PLAN FOR THE
WALLISVILLE LAKE, TEXAS PROJECT

January 1996

Introduction

As noted in the Draft Master Plan, the Wallisville Lake, Texas Project has a "high scenic quality," due in large part to its "overall uniqueness" and "low degree of development" (p 3-28, Draft Master Plan). It does not have the physical characteristics of many reservoir projects, e.g. B.A. Steinhagen Lake (p. 4-6, Recreation Master Plan).

The project area is the largest cypress swamp on the Texas coast and part of the largest marsh wetland system feeding Galveston Bay (which is in turn the most productive estuary on the Texas coast). Its unique character has attracted thousands of visitors, even with its current limited access, publicity and interpretive information. It has been favorably compared with the Atchafalaya Swamp and the Everglades.

With development of Cedar Hill Park and other sites within the project area, an opportunity exists to simultaneously protect the unique character of the area and enhance its economic value through development of its nature tourism potential. In fact, the current public input summarized in the Draft Master Plan focuses on protecting the nature of the area and its resources, and on limiting development, primarily to nonconsumptive uses (p. 5-4). The current recreation plan for the project represents a major missed opportunity. Nor is it consistent with the plan's goals of incorporating the natural and historic features of the Project into the recreational opportunities and providing an effective and site-sensitive design. 1 2

Specific comments/suggestions follow.

Economic Analysis

The chapter on economic analysis in the Recreation Master Plan fails to take into consideration the growing body of knowledge regarding nature tourism, which is the fastest growing segment of outdoor recreation use. The user survey was mailed to 1,000 duck hunters. This is only one component of the current or potential user population. In fact, while 11 percent of the U.S. population participates in hunting activities, 14 percent are bird watchers. A recent comparison of the economic impact of members of Ducks Unlimited (DU) and the Texas Ornithological Society (TOS) found that members of TOS spent twice the dollars 3 4

on their outdoor recreation that members of DU spent. Well-developed nature tourism sites in other areas could also be consulted, e.g. Corkscrew Swamp in Florida, Okeefenokee Swamp in Georgia, Everglades National Park in Florida, to name just a few. In fact, of the 43 bird species in a guide to common birds of the Everglades, only 3 could not be found in the Wallisville project area.

The master plan need not eliminate any of the traditional consumptive uses of the area (hunting and fishing), but has a much greater potential for economic impact if it enhances opportunities for nature tourism. The current plan caters to fishing and waterfowl hunting, the latter of which is, in particular, already promoted in the area. In so doing, the plan will be inclined to have the opposite effect of depressing nature tourism. For example, increasing use of motorboats is incompatible with nature observation and appreciation. 5

Protection of the Fish & Wildlife Resources

While the plan rightfully acknowledges the importance of protecting the habitat of the threatened bald eagles that utilize the area, this species is only one member of the wildlife community which contributes to the value of the area. The recreation plan, and particularly the full development plan, does not consider the impacts of increased motorboat use on that wildlife community. Birdlife in particular would be less likely to utilize the area if motorboat usage increased or jetskis were used. Personal watercraft (jetskis) should be prohibited, and motorboats should be specifically restricted from some areas, such as the smaller bayous and lakes (with limited exceptions during duck hunting season), and speed and/or horse power rating limits should be established (not just "recommended"). The current boat ramps on the Trinity River and permitted hunting use of the area would not significantly interfere with development of nature tourism opportunities. The fishing decks are also compatible. 6

Project Design Components

The recreation master plan does, however, include a number of features which are not compatible with developing the nature tourism potential of the area, such as the boat launches. Furthermore, general overdevelopment of Cedar Hill Park is both undesirable and unnecessary. This includes the large number of campsites with electricity, the multiple bath houses, the playground, the dump station. The hiking trail around the intensively developed campgrounds is of very limited value. The characteristics of the area, particularly the mosquito population, do not support extensive overnight camping. 7

Also, the Recreation Master Plan does not include a number of features which would greatly enhance its value for nature tourism, such as observation platforms, board walks, and 8

interpretive information and/or center. A board walk and observation deck near the bird rookery south of I-10 would also be extremely valuable and popular. The use of recycled plastic construction materials should be encouraged for all of the facilities in the area, for its longevity as well as its general ecological value.

Public Input

The Corps sent a user survey to 1,000 duck hunters. As noted above, there is a much larger community of past and potential nonconsumptive users of the area which could have been consulted for input. The results of the general public input (p. 5-4, Draft Master Plan) reflect many differences with the results of the duck hunter survey (p. 4-2, Recreation Master Plan). The Galveston Bay Foundation would be happy to work with the Corps to increase input and to identify other sources of information on nature tourism, such as the Governor's Task Force and the entities working on the Texas Coastal Birding Trail, the next segment of which will go through the project area. 9

Summary

The current Master Plan for the Wallisville Lake, Texas Project represents an incredible missed economic opportunity for this unique habitat setting. A well-designed nature tourism facility could bring much needed economic development to Chambers County, while preserving the characteristics which make the area unique. The Galveston Bay Foundation would be happy to work with the Corps to develop design components for Cedar Hill Park that will enhance the area, aesthetically, economically, and naturally.

December 21, 1994

Mike Morris
U.S. Army Corps of Engineers
Galveston District
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Mike,

Enclosed are my personal comments and input regarding the November 22, 1994 letter asking for input for the preparation of a Master Plan for the Wallisville Dam project.

My comments are as follows:

1) I would like to see the Corps develop projects that can be carried out by volunteers so that the public can actively participate. You need to contact organizations like the Galveston Bay Foundation, Houston Sierra Club, Houston Audubon Society, Outdoor Nature Club, and others to help you implement protective and recreational activities that will preserve and provide public benefits and enjoyment.

2) The Corps needs to focus on low impact, dispersed recreational type of activities like hiking, canoeing, fishing, nature photography, wildlife observation, nature study, backpacking, and other similar activities.

3) The one area that will have picnic tables, Cedar Hill Park, should not be overdeveloped but should stress the naturalness of the area and its environmental importance. It is important that this area and other areas have adequate law enforcement presence and litter control.

4) There is also a need for environmental education and nature interpretation. I would like to several nature trails put in and have materials that are distributed to the local area and others who are interested that talk about why the area is so important environmentally and how people can protect it. I would like to see the Corps get involved with the National Outdoor Leadership School and have you emphasize the environmental ethic of Leave No Trace outdoor skills and ethics. This would help ensure that the area would be protected by those that use it.

5) I would support the development of several canoeing trails in the project area. I recommend you contact Tom Douglas of the Houston Sierra Club. He has canoed the Lake Charlette area for years. Trails to Lake Charlette and Mac Lake and other areas would provide wonderful low impact recreation for the Houston Area.

6) I also want the Corps to focus on restoration and rehabilitation at Wallisville. Any of the old Wallisville Project that is not being used should be removed or walls breached. In particular the Western Marshes need more freshwater flows to provide nutrients, organic material, and sediments so they do not continue to disappear and be replaced by open water areas. In addition you need to work with the Trinity River Authority so that seasonal floods and instream flows and inflows to Trinity Bay can be reestablished. This will ensure that Cypress swamps and bottomland hardwood areas are renewed and refreshed each year and that the natural hydrologic regime is reestablished as much as possible. This will ensure that terrestrial vegetation cannot encroach on and degrade or destroy bottomland habitats.

7) You need a really good archeological protection program as well as research. Further you need to ensure that people taught about the history of the area so they will get interested in it, develop a sense of ownership, and protect the area.

8) There is a need to emphasize eduational and scientific endeavors. There should be a research plan that lays out what information is needed to protect the area and then is implemented. Further, as part of this program you need an ongoing monitoring program, with feedback, and input from the public (for both monitoring and research) which will tell you what the status of the natural environment is and what trends are and when you need to trigger more resource management and protection to stop environmental degradation.

9) Because the area is such a mecca for birds you should encourage birding and protection of the bird popultion here. In particular you should determine how the present Bald Eagles can be protected (buffer zones to protect their nests if necessary) and how more Bald Eagles can be encouraged to live here.

10) All state, federal, the Texas Organization for Endangered Species (TOES) listed species that live in the area must be protected and studied and plans developed for their perpetuation and increase.

11) On page 3 of the Appendix, it talks about the project being so operated so that it "ensure that current levels of cypress tree mortality and vigor are not altered". Is this sufficient? If current mortality and vigor what it should be or want it to be? You need to discuss this.

12) I am concerned about the need for a two lane bridge to access the spillway. You can access the spillway by boat or barge and do not need to build such a structure in the area. I am opposed to this part of the proposal.

13) If instream flows and inflows to Trinity Bay are threatened by total use of water in Lake Livingston then the Corps should buy some of these flows to guarantee a historical level of flow and seasonality in the Trinity River and Bay.

I appreciate this opportunity to comment and look forward to participating in public meetings and hearings about this master plan. You need to keep the public involved throughout not only this process but also after the plan has been developed and is being implemented. The plan needs to be reviewed with public comments every 5 years and each year there needs to be a document that assesses the progress of protecting the area and request public comment. As stated earlier all research and monitoring needs to have public input before implemented and then as it is conducted and completed so the public can affect how its resources are protected.

Thank you.

Sincerely,

Brandt Mannchen

Brandt Mannchen
1301 Richmond Ave. T-2
Houston, Texas 77006
H713-521-9534, W713-640-4313



November 7, 1994

Colonel Robert B. Gatlin
District Engineer
Department of the Army
Galveston District, Corps of Engineers
Post Office Box 1229
Galveston, Texas 77553-1229

Re: Master plan development for the Wallisville Lake, Texas project

Dear Colonel Gatlin:

We are in receipt of your letter announcing the development of a master plan for the Wallisville Lake, Texas project. The Texas General Land Office is interested in providing input into this project and I request that we be included in the planning effort.

I have designated William Grimes of the Coastal Division in Austin and Doug Myers, Supervisor of the LaPorte Field Operations, as General Land Office points of contact for this study. Please direct any future notices or requests to Mr. Grimes and Mr. Myers at the following address:

Texas General Land Office
Stephen F. Austin Bldg.
1700 N. Congress Ave. Rm. 617
Austin, Texas 78701-1495

Attn: Wm. D. Grimes
(512) 475-1464

Texas General Land Office
La Porte Field Office
118 South 5th Street
La Porte, Texas 77571-5048

Attn: Doug Myers
(713) 470-1191

**Garry Mauro**
Commissioner
Texas General Land Office

Stephen F. Austin Building
1700 North Congress Avenue
Austin, Texas 78701-1495
(512) 463-5256

Printed on recycled paper with soybean ink

We look forward to working closely with the Corps of Engineers and other agencies on this project.

Sincerely,

Garry Mauro

Garry Mauro
Texas Land Commissioner

GM/SD/wdg

THE STATE OF TEXAS

CURTIS TUNNELL
EXECUTIVE DIRECTOR

TEXAS HISTORICAL COMMISSION

P.O. BOX 12276 AUSTIN, TEXAS 78711-2276 (TELEPHONE) 512-463-6096 (FAX) 512-463-6095 (RELAY TX) 1-800-735-2989 (TDD

DEPARTMENT OF ANTIQUITIES PROTECTION

2 December 1994

Robert B. Gatlin
Colonel, Corps of Engineers
Corps of Engineers–Galveston District
P.O. Box 1229
Galveston, TX 77553-1229

attn: Plan Formulation Branch

Re: Development of Wallisville Lake Master Plan (COE-VD, F2, F31)

Dear Col. Gatlin:

Thank you for the opportunity to comment on the project referenced above.

Stipulation 5 of the Memorandum of Agreement for the Wallisville Lake Project states that a plan for managing cultural resources shall be incorporated into the master plan for the project. The Corps of Engineers has made substantial progress in its cultural resources program for this project. In our opinion, it would be worthwhile at this juncture to have a meeting to review that progress and to discuss the means by which the results of previous efforts can be incorporated into the mater plan.

Please contact Lain Ellis of our staff at 512/463-5419 so we can make appropriate arrangements.

Sincerely,

James E. Bruseth, Ph.D.
Deputy State Historic Preservation Officer

Timothy K. Perttula, Ph.D.
Assistant Director for Antiquities Review

JEB/TKP/gle

Houston-Galveston Area Council
PO Box 22777 • 3555 Timmons • Houston, Texas 77227-2777 • 713/627-3200

December 5, 1994

Mr. Mike Morris
Plan Formulation Branch
Dept. of the Army
Galveston Dist., Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

RE: Master Plan for Wallisville Lake, Texas

Dear Mr. Morris:

I am contacting you according to the public notice of November 22, 1994 to request a copy of the master plan for Wallisville Lake. I also, wish to be notified of the date of the public hearing to be held in January, 1995.

Thank you for your cooperation in this matter.

Sincerely,

Carl E. Masterson
Environmental Program Coordinator
Community & Environmental Planning Dept.

Recycled

John Hall, *Chairman*
Pam Reed, *Commissioner*
Peggy Garner, *Commissioner*
Anthony Grigsby, *Executive Director*

# TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

*Protecting Texas by Reducing and Preventing Pollution*

December 19, 1994

Colonel Robert B. Gatlin
Corps of Engineers
District Engineer
P.O. Box 1229
Galveston, Texas 77553-1229

Re: Wallisville Lake

Dear Colonel Gatlin:

In response to your recent notice of a proposed master plan for Wallisville Lake, this is to request a copy of the proposed plan and any further information regarding the submission of comments and a public hearing. As you may know, a proceeding to amend the water right for this project is currently pending before this agency.

If you have any questions, please contact Bruce Moulton, Water Policy & Regulations Division, at (512) 239-4809.

Sincerely,

Mark Jordan, Director
Water Policy & Regulations Division

MJ:ag

cc: Bruce Moulton

**TEXAS COMMITTEE ON NATURAL RESOURCES**
**601 WESTLAKE DRIVE**
**AUSTIN, TEXAS 78746**
**(512) 327-4119**

December 20, 1994

Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

Dear Mr. Anderson, Mr. Morris, et.al.:

Texas Committee on Natural Resources requests a copy of the draft master plan for Wallisville Lake, sent to the address on this letterhead. Please include information regarding hearings and comment deadlines.

Thank you for your assistance.

Sincerely,

Janice Bezanson
Issues Coordinator

RESPONSE TO COMMENTS

Linda R. Shead, P.E.
Executive Director
Galveston Bay Foundation
17324-A Highway 3
Webster, Texas 77598

17 January 1996

| Comment No. | Response |
|---|---|
| 1 | Comment noted. |
| 2 | The Recreation Plan has been revised with a great deal of help from the Galveston Bay Foundation. |
| 3 | The economic analysis was updated and revised (see Section 6.0). |
| 4 | The user survey was mailed to the entire mail list for Wallisville at the Galveston District. It was unfortunate that it was called the "Duck Hunters" mail list. See the previous letter from Galveston Bay Foundation which is a non-duck hunter response to the survey. |
| 5 | The Recreation Plan has been revised (see Section 6.0) with a view toward preserving the area's natural resources and enhancing nature tourism. |
| 6 | As described in Section 6.0, only canoes or other non-motorized craft may be launched at Cedar Hill Park. The water bodies in the project area will retain their current use with no aids to motorboat access to smaller bodies of water (or into or out of Lake Charlotte) provided by the Corps. Because of the numerous obstacles now in place (windfalls, snags, shallow water), motorboat use in the area is not expected to increase significantly in Lake Charlotte or many of the other lakes and ponds connected to the river by small bayous or sloughs. |
| 7 | Please see Section 6.0 for a discussion of the modified Recreation Plan. Many of the changes you recommend have been adopted. |
| 8 | Please see the response to Comment No. 7 above. |

RESPONSE TO COMMENTS

Linda R. Shead, P.E.
Executive Director
Galveston Bay Foundation
17324-A Highway 3
Webster, Texas 77598

17 January 1996

| Comment No. | Response |
|---|---|
| 9 | Please see the response to Comment No. 2, 4, and 5 above. |

**Fermata Inc.**
**2200 Parkway, Austin Texas 78703**
**Office: (512) 477-7411 Fax: (512) 477-8033 E-Mail: eubanks@io.com**

Monday, April 15, 1996

Mr. Terry Roberts
U.S. Army Corps of Engineers
2000 Fort Point Road
Galveston, Texas 77550

Dear Mr. Roberts,

Attached is my written review of the draft recreation plan for Wallisville Lake. I appreciate being offered the opportunity to furnish these comments. Thank you again for allowing me the necessary time to complete this critique, and I look forward to seeing a revised document.

Sincerely,

Ted Eubanks
President

cc: Ms. Linda Shead, Galveston Bay Foundation

★ MADE FROM 100% RECOVERED COTTON DENIM ★

13 April, 1996

Mr. Terry Roberts
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Mr. Roberts,

Thank you for the opportunity to comment on the Wallisville Lake draft recreation plan. If I understand correctly, the entire economic analysis (Section 4) contained within this draft has been replaced. As of this date I have not reviewed the amended section. Therefore my comments are based upon the November 1995 draft of the master plan for Wallisville Lake without revisions.

According to the document, an estimated "23,277 acres of bottomland delta and adjacent terrace margins were acquired for the original project." The recreational development being proposed is restricted to one 83.4 acre park - Cedar Hill Park. I am aware that there exists the potential for the creation of a Wallisville Townsite Park when a suitable local sponsor has been located. As of this draft none had been found, and therefore I must presume that only Cedar Hill Park, less than three-tenths of one percent of the total original project property, will be improved for multi-use recreation (contrasting, for example, with the 10,865 acres in 22 contracts that are presently leased for cattle grazing).

These facts alone lead me to conclude that there is virtually no recreational value (real or potential) being attributed to the Wallisville Lake project beyond baseline use. However, the economic analysis within this draft at least attempts to quantify the potential recreational significance of the project. Unfortunately, the analysis is flawed. Let me explain the reasoning behind this opinion. 1 2

According to the draft plan (Section 1), "a survey was mailed out to 1,000 duck hunters desiring to hunt at Wallisville Lake." Table 4-1: Wallisville Lake Recreational Preferences, is based upon the data collected in this survey and is the basis for the assumption that "the recreation facilities most desired are tent sites, picnic sites, boat launch site, canoe launch site, wildlife observation sites, fishing piers, restrooms, and shower sites."

However, in a discussion with you I learned that the complete Wallisville Lake project mailing list received the survey (a list predominated by the one user group, but also including organizations and agencies). In this survey each recipient was assumed to represent one user. The survey does not distinguish between respondents representing themselves and those representing thousands of present or potential users (such as leaders of organizations or public officials). Despite this critical design flaw, the unweighted results are

presented as representative of the desires of users as a whole. Obviously, this result is not supportable and is blind to potential usage (since the results do not represent a sample of the public as a whole). Simply put, the results are invalid and should not be used in Wallisville Lake recreational planning. 3

The flaw in such a survey appears when attempting to span the gap between the survey sample (duck hunters) and the general public (Table 4.2). An analogy would be to sample bars to obtain an estimate of drinkers in the general population. No estimate of general population participation rates or demand exist within the draft document. The relevance of Tables 4.3 and 4.4 escapes me. Is this an attempt to somehow relate future outdoor recreation demand to per capita income levels in the general area? 4

A second key table is Table 4-5: Annual Participation Rates. These recreational usage rates are based upon a study of visitors to B.A. Steinhagen Lake (with the report being issued in 1981, so I assume that visitors were surveyed in the late 1970's). As admitted in the report, the proposed Wallisville Lake project "will not be the typical Corps of Engineers reservoir and is no longer similar to Steinhagen." For this reason alone the participation rates are inapplicable. More important, however, consumer preferences shift over time, and the dated nature of these results diminishes their worth. 5

The draft report states that "the annual participation rates in Table 4-5 reflect the optimum visitation for Wallisville Lake." Why? Nothing in the data would lead me to this conclusion. I imagine that certain activities that are popular at Steinhagen (fishing, camping) might be optimum estimates at Wallisville (even over estimates), while other activities (nature study, hiking) might well be underestimated. Boat ramp lanes (generally associated with the use of motorized boats) are assessed, yet canoe and other non-motorized boat usage go unquantified. This participation rate estimate ignores the unique character of Wallisville Lake (and its distinctive recreational values) as well as the most current trends in outdoor recreation. As with Table 4-1, this table is invalid for use in the recreational planning at Wallisville Lake. 6

The draft recreation plan culminates with this conclusion:

*Wallisville Lake is a unique project for the USACE that can serve as a guidepost for further projects of this type. The park will provide environmentally sensitive recreational activities, such as canoeing, fishing, camping, hunting, wildlife observation, etc. A property designed, constructed, and managed recreation site that provides access to a natural site of this size, diversity, and uniqueness will have a positive impact on the public.*

In this aspiration we are in agreement, but I am afraid that the draft plan falls far short of this goal. To what extent does the 83.4 acre Cedar Park site provide

"environmentally sensitive recreational activities?" How much "access" is actually being offered to Wallisville Lake in its entirety? What recreational values should be attributed to the less than 1% of the project site being developed for recreation? 7

For example, what amenities are being planned which would allow for easier or more extensive opportunities for wildlife observation? Except for access by boat, little is being offered the nature or wildlife watcher (among the most significant outdoor recreation groups in the country). With the exception of a single .5 mile nature trail, I see no additional access points or routes (by foot or by car). 8

What about boardwalk access into the cypress woodlands around Lake Charlotte? Boardwalks are simple improvements for site enhancement that attract high levels of usage. An appropriate model boardwalk for Wallisville Lake would be the National Audubon Society's Corkscrew Swamp in Florida (with over 80,000 visitors annually). What about observation platforms? These relatively inexpensive structures offer elevated vantage points for wildlife observation. The observation platform on Pilant Lake at Brazos Bend State Park (Texas) serves as an excellent example of the potential for such amenities. 9

Are there no plans for interpretation? I realize that an interpretive center might be years in the development (although I would advise beginning negotiations with those agencies and organizations that might be interested in developing such a facility in concert with the USACE). However, interpretive signs are relatively inexpensive to install and simple to maintain, and they greatly enhance the nature experience by furnishing important information to the uninitiated. 10

In short, I see little evidence of "environmentally sensitive recreational activities" being promoted in this draft plan. The usage projections are based upon flawed data, and the facilities and amenities are remarkably unimaginative. If I may, let me make a few suggestions as to how this recreation plan might be improved. 11

<u>Know your user</u> (present, but more importantly potential). The projected participation rates should be based upon the unique characteristics of the project site as well as upon current trends in outdoor recreation (for example, among urban dwellers). A user survey of a comparable site would be helpful. In addition, use the survey data that exist within the public domain. For example consider the following: 12

- U.S. and international travelers directly spent $24.5 billion in Texas during 1994, a 5.3 percent increase over 1993. Domestic travelers in Texas spent nearly $21.5 billion, while international travelers spent $3.0 billion.

- Texas ranked fourth in direct travel expenditures among all 50 states and the District of Columbia.

- Travel expenditures directly generated 435,000 jobs within Texas in 1994, 5.6 percent of the total state non-agricultural employment of 7.7 million jobs. Travel-generated employment in Texas grew 1.8 percent from 427,500 jobs in 1993.

- Travel-generated employees directly earned over $8.0 billion in wage and salary income during 1994, 2.7 percent more than in 1993.

- Travel spending in Texas directly generated $3.9 billion in tax revenue for federal, state, and local governments in 1994.

- Without the tax revenue generated by travel and tourism spending, each Texas household would have faced an average of $615 in additional taxes to maintain existing government services.

- On the average, every $56,250 spent in Texas by U.S. and international travelers generated one job in 1994.

## NATURE TOURISM

- Nature tourism is the fastest growing segment of the travel industry, averaging a 30 percent annual increase each year since 1987. Worldwide, nature tourism sales totaled $238 billion in 1994.

- Studies conducted by the National Trust for Historic Preservation have found that travelers that experience cultural, historical, and natural history sites spend an average of $62 per day more than the average traveler.

- According to the U.S. Departments of Interior and Commerce, 108.7 million U.S. residents 16 years old and older participated in some form of wildlife-related recreation activity in 1991. During that year, 35.6 million people in the United States fished, 14.1 million hunted, and 76.1 million enjoyed at least one type of nonconsumptive recreation activity for which enjoying wildlife was the primary purpose.

- Expenditures associated with wildlife-related recreation totaled $59.0 billion in 1991. Trip-related costs totaled $22.2 billion, while $28.5 billion was spent on equipment, and $7.8 billion was spent on other items.

- Observing, feeding, or photographing wildlife was enjoyed by 76.1 million people 16 years old or older in 1991. Among this group, 30 million people took trips for the primary purpose of enjoying wildlife.

- In 1991, nonconsumptive participants spent $18.1 billion. Trip-related expenses, including food, lodging, and transportation, totaled $7.5 billion, 41 percent of the total expenditures. Anglers spent $24 billion, and hunters $12 billion (with an unspecified $5 billion additionally spent).

- In 1991, many types of wildlife were enjoyed by the 30 million people who took trips for the primary purpose of observing, feeding, or photographing fish and wildlife in the United States. Birds attracted the attention of the largest number of people, 24.7 million individuals, 82 percent of all nonresidential participants 16 years old or older. Land mammals such as deer, bear, and coyotes drew almost as much attention as birds. Twenty-two and a half million participants, 75 percent of all nonresidential participants, observed, fed, or photographed land mammals.

- In 1991, 4 million Texas residents 16 years old and older participated in nonconsumptive activities such as observing, feeding, or photographing wildlife. Some state residents enjoyed their activities close to home and are called "residential" participants. Those whose primary purpose was to enjoy wildlife at least 1 mile from home are called "nonresidential" participants. In 1991, 1.4 million Texas residents 16 years old and older enjoyed primary nonresidential nonconsumptive recreation activities within their state of residence. Of this group, 1.3 million participants observed wildlife, 739,000 fed wildlife, and 494,000 photographed wildlife. An additional 2.8 million observed wildlife, 3.3 million fed wildlife, and 516,000 photographed wildlife around their homes.

- In 1991, expenditures for primary nonconsumptive activities in Texas (based on residence) were $877,749,000, $1,475,470,000 for fishing, and $1,006,433,000 for hunting. Trip-related expenditures in Texas in 1991 were $423,218,000 for nonconsumptive activities, $910,717,000 for fishing, and $265,479,000 for hunting.

- What do Americans do out of doors? The following list represents the percentage of Americans who said they participated in various outdoor activities in 1994. Roper Starch Worldwide conducted the survey for the Recreation Roundtable April 16-23, 1994. The results of this survey were first published in the New York Times April 2, 1995.

  40% Driving for pleasure
  34% Swimming
  33% Picnicking
  26% Fishing
  21% Bicycling (on-road)
  19% Running/jogging

18% Hiking
18% Wildlife viewing
16% Tent camping/campground
15% Photography
14% Birdwatching
13% Backpacking/wilderness camping
11% Golf
10% Motorboating
9% Tennis
8% Recreational vehicle camping
8% Hunting
8% Target shooting
7% Motorcycling
6% Water-skiing
6% Canoeing/kayaking
6% Downhill skiing
6% Horseback riding
5% Mountain biking
5% Off-road vehicle driving

## National Wildlife Refuges

According to the U.S. Fish and Wildlife Service, over 500 national wildlife refuges attract some 30 million visitors annually. In Texas, for example, over 75,000 tourists annually visit Aransas National Wildlife Refuge. For wildlife-related recreation including wildlife viewing, fishing, and hunting, visitors spend some $11 billion each year. More than half of this is spent on food and lodging while pursuing recreation activities in refuges.

**Santa Ana National Wildlife Refuge** (Kerlinger, Eubanks and Payne 1995)

Total annual visitors: 167,808; 99,000 avitourists

A study of the economic impact of ecotourism and the demographics of ecotourists was conducted at Santa Ana National Wildlife Refuge, Texas, from November 1993 through October 1994. Birders who visited Santa Ana tended to be middle aged (50's-60's; 70.2 percent), well educated (76.9 percent had attended some college), had incomes that were well above the national family average (49.5 percent had incomes in excess of $50,000 per year), and men (61.5 percent) outnumbered women. A majority did not fish (63 percent) or hunt (89.1 percent).

Respondents came from 50 states including Texas and Washington, D.C., and 6 foreign countries. Over 70 percent of visitors were from out of state (only 3.9 percent were from the Lower Rio Grande Valley) and 97 percent stayed more than one day in the area. Visitors averaged 5.8 days in the area.

The average amount spent by these visitors on their entire trips to and from Santa Ana averaged about $347 per person and totaled approximately $34.5 million. The direct expenditures in the local communities was estimated to be nearly $14.42 million, with $6.16 million spent on lodging, $2.18 million spent on meals, $0.44 million for fuel, and $5.64 million for other purchases. The average visitor contributed between $88 and $145 to the local economy.

Accommodation types were provided by 94 percent of the respondents. Of this sample, 27.3 percent camped, 52.3 percent stayed in a hotel or motel, 7.3 percent stayed in RV parks, 9.3 percent stayed in private homes, and 3.8 percent stayed in condos. A total of 43 different hotels or motels were listed by the respondents, as well as 5 campsites, 22 RV parks, and 5 condos.

A large majority (84.7 percent) of all respondents purchased at least one meal in the immediate Santa Ana area. An average of 6.5 meals was purchased by this group (4.8 for the entire sample). Of these respondents, 33.5 percent purchased 4-6 meals, 31.9 percent purchased 1-3 meals, and 34.6 percent purchased more than 7 meals during their stay. A total of 92 restaurants was listed by respondents.

**Laguna Atascosa National Wildlife Refuge** (Kerlinger, Eubanks and Payne 1995)

Total annual visitors: 82,000; 48,000 avitourists

Birders who visited Laguna Atascosa during the study period (1993-1994) tended to be middle aged (40's-60's; 72.8 percent), well educated (84.4 percent had attended some college), had incomes that were well above the national average (44.8 percent had incomes in excess of $50,000 per year), and women and men were equally represented. A majority did not fish (66.5 percent) or hunt (89.4 percent). Respondents came from 39 states including Texas, 4 foreign countries, and only 2 counties in the Lower Rio Grande Valley of Texas.

Seventy-nine percent of visitors were from out of state, and virtually all stayed more than one day in the area. Visitors averaged 7.1 days in the vicinity. The average amount spent by birder tourists (avitourists) to and

from Laguna Atascosa averaged about $400 and totaled nearly $20 million.

The direct expenditures in the local communities were estimated to be $5.63 million with $2.74 million spent on lodging, $1.05 million spent on meals, $0.20 million spent on fuel, and $1.64 million spent on miscellaneous purchases. The average visitor contributed between $83 and $117 to the local economy.

**Sabal Palm Grove Sanctuary** (Kerlinger, Eubanks and Payne 1995)

Total annual visitors: 8,850 avitourists

Birders who visited Sabal Palm tended to be middle aged (average 48-49 years), well educated (86.3 percent had attended some college), had incomes that were well above the national family average (39.6 percent had incomes in excess of $50,000 per year), and men slightly outnumbered women (61 percent of respondents were male). A majority did not fish (68.1 percent) or hunt (85 percent).

Respondents came from 36 states including Texas and the District of Columbia, as well as 4 foreign countries. Nearly 78 percent of visitors were from out of state, and 95.7 percent stayed more than one night in the vicinity. Visitors averaged 7.0 days in the area (5.6 nights at campsites, 5.0 nights in hotels, or 6.0 nights in condos).

The average amount spent by avitourists on their entire trips to and from Sabal Palm averaged about $780 and totaled approximately $6.90 million. Direct expenditures in the local communities were estimated to be nearly $1.13 million, with $0.61 million spent on lodging, $0.21 spent on meals, $37,000 for fuel, and $0.28 million for other purchases. The average visitor contributed between $96 and $127 in the local economy.

## NATURE CENTERS AND SANCTUARIES

**High Island Audubon Sanctuaries** (Eubanks, Kerlinger and Payne 1993)

Total seasonal visitors: 6,000 avitourists

In general, High Island avitourists appeared to be similar to birders surveyed at other locations. The typical High Island avitourist was a middle-aged, well-educated, financially successful male. The mean age of 51 was comparable to the mean ages of 47 (Wiedner and Kerlinger 1990), 46 (Kerlinger and Wiedner 1991), 50.6 (Wauer 1991), and 54.8

(Payne 1991). Not surprisingly, 35.6 percent of the respondents were retired.

Male tourists at High Island outnumbered females (58.7 percent male, 41.3 percent female). Birding, however, is an emancipated avocation when compared to hunting (92 percent male) and fishing (69 percent male). Perhaps the characteristics that so dramatically contrasted High Island with the general population were education and income. Nearly 80 percent of the High island respondents had attended college; almost 50 percent had graduate school experience. More than 85 percent earned at least $25,000 annually, and 14.3 percent had incomes of more than $100,000.

The average expense of an avitourism trip to High Island was proportionate to the distance traveled. The local-resident visitor to High Island (42.4 percent) averaged a trip expense of $46. Only 9.7 percent of this group stayed overnight in the High Island area, but 55.2 percent purchased meals. In comparison, nonresident American tourists (51.2 percent) estimated a trip expense of $693, and foreign visitors (6.4 percent) spent an average of $1,881 on their ventures to Texas.

Travel represented a significant percentage of the nonresident tourist's trip expense. More than 35 percent arrived by air, and 33.8 percent rented automobiles. This finding corresponded with that of Shaw and Mangun, who found that 48 percent of wildlife travel expense related to transportation.

Approximately 6000 avitourists visited High Island during the spring 1992. If the respondents to this survey represented only 10 percent of the total estimated spring 1992 visitorship, *and* the ratio of local residents to nonresident birders was consistent, then the total expenditures of birders traveling to and staying in the region exceeded $2.5 million. Of this total, $2.4 million was contributed by nonresident avitourists, and $120,000 by local residents.

Based upon a revised participation projection, design facilities that allow for low density / low impact resource-based recreation over a fairly broad area and selection of terrains / habitats. To devote less than 1% of the total project site to developed recreation would appear, on the surface, to be a half-hearted attempt at developing outdoor recreation. As of this draft, the master plan's cost / benefit analysis is based upon the invalid Table 4-5. Therefore I suggest that a revisiting of the recreation plan allows for the opportunity to enhance the benefit side of the equation without a proportionate increase in cost (since these low impact recreational uses require relatively simple and inexpensive infrastructural improvements). 13

Recreation is among the five purposes for which the Wallisville Reservoir was originally authorized. The benefits from recreation contributed to Congressional approval of the project and its continued funding. A stated objective of the Wallisville master plan is "to present an integrated plan for recreation and other purposed with the ability to move through design, construction, and into operation with little change in purpose, appearance, or utility." Yet in the end, the draft plan offers only one 83.4 acre park with (at full development) 200 camp sites, 37 picnic tables, 1 mile of hiking trail, 2 boat launches, 2 canoe launches, and a group pavilion.

I remind you of the words of the report : *A property designed, constructed, and managed recreation site that provides access to a natural site of this size, diversity, and uniqueness will have a positive impact on the public.* As presently proposed, I fear that the Wallisville Lake recreation plan underestimates the project's recreational potential. Without an accurate user profile or demand estimate, the failure is understandable. Yet I urge the USACE to revisit the recreation plan and develop an alternative that takes advantage of the site's potential for low-intensity / low-density resource-based recreation. Only through such a redesign will be recreational benefits of Wallisville Lake, in my estimate, be measurable. 14

I have also enclosed a copy of *Nature Tourism in the Lone Star State*, a report of the State Task Force on Nature Tourism. As you will see, resource-based tourism is important to the Texas economy. In this sense "public benefit" derived from Wallisville Lake may be the economic expansion and diversification in the area that comes from expanded nature tourism opportunities. For example, the Great Texas Coastal Birding Trail will be continuing its development along the Texas coast, and the upper coast is among the next sections to be considered. The Wallisville Lake site would be an exceptional site along the Trail (see the enclosed article). 15

Thank you again for the opportunity to comment, and I look forward to seeing a revised recreation plan for Wallisville Lake in the near future.

Sincerely,

*Ted Lee Eubanks* (facsimile)

Ted Lee Eubanks, President
Fermata Inc.

RESPONSE TO COMMENTS

Ted Eubanks
President
Fermata Inc.
2200 Parkway
Austin, Texas 78703

| Comment No. | Response |
|---|---|
| 1 | Although the entire project area has recreational value, the Galveston District is limited to developing only one park (Cedar Hill Park) and the Wallisville Townsite by Congressional authorization. |
| 2 | The economic analysis has been revised and can be found in Section 6.0. |
| 3 | The Recreation Plan was revised based primarily on your input and that of other public environmental groups. |
| 4 | The tables you refer to have been dropped from the revised economic analysis. |
| 5 | This table has been revised and is based on different assumptions and multipliers. Please see Section 6.0 for further details. |
| 6 | Please see the response to Comment No. 5 above. |
| 7 | Please see the response to Comment No. 1 above. |
| 8 | Development of areas for wildlife observation is limited because of Congressional authorization; however, there are trails, boardwalks, and observation decks planned for Cedar Hill Park. Additionally, there are pull-outs planned on the West Non-overflow Dam to allow the public viewing access to the marsh below IH-10. |
| 9 | Please see the response to Comment No. 8 above. |
| 10 | An interpretive center at Cedar Hill Park is being considered. |

## RESPONSE TO COMMENTS

Ted Eubanks
President
Fermata Inc.
2200 Parkway
Austin, Texas 78703

| Comment No. | Response |
|---|---|
| 11 | The Recreation Plan has been revised (Section 6.0), using some of your suggestions, to the extent project authorization allows. |
| 12 | Comment noted. These data have been considered while revising the Recreation Plan. |
| 13 | Please see the responses to Comment Nos. 1, 2, 3, and 5. |
| 14 | Please see the responses to Comment Nos. 1, 2, 3, and 5. |
| 15 | We appreciate the donation of the report. |

Chambers County Heritage Society
P.O. Box 870
Mont Belvieu, Texas 77580

November 5, 1995

Mr. James M. Kieslich, Chief
Planning & Environmental Division
US Army Corps of Engineers
Galveston District Office
P. O. Box 1229
Galveston, Texas 77553

Dear Sir:

Please find enclosed my survey form for local input on the recreation plan for Wallisville Lake here in Chambers County.

I did not see an item that exactly corresponded with my own opinions, so I decided to briefly explain my thoughts in this letter. I think the Wallisville Lake Project offers the Corps a great opportunity to work with Scouting groups on an interpretive basis. If the area was set up with walkways or pathways to historic sites, this would be a great opportunity for Scouting groups to visit the areas. It would also be wonderful to have some sort of access when archeological digs are being conducted, so these Scouting groups could get a first-hand look at these activities. 1 2

Thank you for the opportunity to present my opinions.

Sincerely yours,

Harry G. Daves, Jr.

Harry G. Daves, Jr.
President

RESPONSE TO COMMENTS

Harry G. Daves, Jr.
President
Chambers County Heritage Society
P.O. Box 870
Mont Belvieu, Texas 77580

| Comment No. | Response |
|---|---|
| 1 | This Recreation Plan represents a baseline plan that will be reviewed and revised as needed every few years. If there is a need demonstrated for additional pathways, interpretive centers, etc. for boy scouts, they can be provided during the periodic reviews of the Recreation Plan. |
| 2 | The Galveston District plans to produce informative brochures regarding historic and prehistoric properties in the Wallisville Lake Project. Although no specific interpretive trails are envisioned, all visitors will be able to view the remains of a prehistoric archeological site along the lake bluff at Cedar Hill Park. Scout troops or other youth groups will be able to study the site using the brochures discussed above, while also learning about the historic period homesites and settlements that once populated the north shore of Lake Charlotte.<br><br>No archeological investigations are planned in the near future in conjunction with construction of the Wallisville Lake Project. However, youth groups may contact the Galveston District office at any time to inquire if investigations are underway that would be appropriate for visitation. We will do our best to accommodate such requests. |

# Houston Canoe Club

September 14, 1995

Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

K 9/18

Attention: James M. Kieslich, Chief, Planning & Environmental Division

Dear Mr. Kieslich,

Thank you for soliciting the publics' comments regarding the recreation plan for Wallisville Lake, Texas.

Houston Canoe Club members have been avid users of the Trinity delta area since the clubs' formation in 1964. During our many visits to the area we have come to appreciate the unique qualities of the ecosystem and we would like to see that preserved.

Toward that end, the Houston Canoe Club membership voted at the General meeting of September 13, 1995, to recommend the following:

1. Use of these sensitive areas by jet skis and water-skiers should be banned. 1
2. Primitive campsites would be acceptable only if funds and personnel were provided to keep the sites maintained. 2
3. Canoe launch areas and secure parking are important to us as canoeists. 3
4. Motor boat ramps are not important to us. 4
5. Restrooms and showers should only be provided if they will be maintained and kept clean. 5

Please keep our group of progress on the recreation plan and other developments regarding the Wallisville project.

Very truly yours,

Donna Grimes

Donna Grimes
Commodore

Houston Canoe Club, Inc. • P.O. Box 925516 • Houston, TX 77292-5516

RESPONSE TO COMMENTS

Donna Grimes
Commodore
Houston Canoe Club, Inc.
P.O. Box 925516
Houston, Texas 77292-5516

14 September 1995

| Comment No. | Response |
|---|---|
| 1 | Please see the response to Comment No. 1 of the 24 September 1995 letter from the Galveston Bay Foundation. |
| 2 | Please see the response to Comment No. 2 of the 24 September 1995 letter from the Galveston Bay Foundation. |
| 3 | Comment noted. |
| 4 | Comment noted. |
| 5 | Comment noted. |

# Houston Canoe Club

January 2, 1996

Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Attention: James M. Kieslich, Chief, Planning & Environmental Division
PL-C

Dear Mr. Kieslich,

Thank you for soliciting our comments regarding the Draft Master Plan for Wallisville Lake, Texas. We particularly appreciate any effort to acquire the comments of all users of the area and not just 1000 duck hunters. (ref. Economic Analysis 4-1) Many other types of recreational users would also be interested in providing input for the Plan. 1

The Plan proposes that there be a speed limit on Lake Charlotte to prevent damage from and danger to jet skiers and water skiers. We endorse this idea and ask that it include Lake Pass, Miller Lake and Mud Lake. We also feel that some speed restriction be made permanent without regard to the existence of Bald Eagles in the area. The unique nature of the Wallisville area includes its diverse habitat and supersedes any particular endangered species.

Having separate canoe and motor boat launches is a good idea. As avid paddlers, we would like the opportunity to consult with designers prior to final design of the actual canoe launch and dock. I believe that we may be able to provide valuable insight regarding real life use of the canoe launch. 3

Lastly, we would suggest that camping areas which provide electricity and those more primitive be isolated from each other. Usually tent campers would prefer not to have to listen to air conditioners, etc. from trailer campers. 4

Please keep our group informed of progress on the Plan and other developments regarding the Wallisville project.

Very truly yours,

Jim Barton

Jim Barton
Commodore

RESPONSE TO COMMENTS

Jim Barton
Commodore
Houston Canoe Club, Inc.
P.O. Box 925516
Houston, Texas 77292-5516

2 January 1996

| Comment No. | Response |
|---|---|
| 1 | The user survey was mailed to the entire mail list for Wallisville at the Galveston District. It was unfortunate that it was called the "Duck Hunters" mail list. See the previous letter from the Houston Canoe Club which is a non-duck hunter response to the survey. |
| 2 | Motor boats may not be launched at Cedar Hill Park because of restrictions coordinated during Section 7 consultation under the Endangered Species Act for a pair of bald eagles nesting nearby. These restrictions may be removed if the eagles abandon the nest site or are removed from the endangered species list. Speed limits are not anticipated for Mud Lake, Lake Miller, Lake Charlotte, and Lake Pass because of the difficulty in getting a motor boat into these areas, the number of obstructions, and the shallow nature of the water bodies which preclude safe motoring at high speeds. Also, it would be difficult to regulate speeds in the project area because of the manpower requirements and size of the area to be patrolled. |
| 3 | Comment noted. Coordination with your group on launch design will be considered. |
| 4 | Comment noted and taken into consideration. |

ATTACHMENT A

August 3, 1995

ATTN PL-C (Morris)
CORPS OF ENGINEERS
US ARMY ENGINEERING DISTRICT OF GALVESTON
PO BOX 1229
GALVESTON TX 77553-9933

Re: Wallisville Lake Recreational Preferences

Ladies and Gentlemen:

Thank you for the opportunity to comment on the Wallisville Lake Project Recreational Program. I have been a user since I was 13 years old; I just turned 32 in July. To give you a little background, I am a professional wildlife biologist, privately employed. I have a B.S. and M.S. in Forest Game Management from Stephen F. Austin St. Univ. I actively work with wetlands, wildlife, and coastal issues on a daily basis.

The Wallisville Project has and continues to provide a substantial recreational opportunity for people located in the Houston-Beaumont area. I feel that Wallisville is more important to Houstonians because it is the beginning of the chenier plains and offers a diversity of habitats, plants and critters. What has been listed on the "preference sheet" is far beyond what I ever envisioned the project would offer. In fact I would say that it is overkill. I would encourage you to visit any of the launch sites at the I-10 bridge (Trinity and Old & Lost), Fort Anahuac or Cotton Lake (Gou Hole) and try to imagine upgrading the usage of the area. Now obviously not all of these hunters are using the Project but a significant number are.

I feel very strongly that the marsh should maintain its present status. Its current condition does not prevent anyone from using the site. To insinuate that an amphitheater constitutes a multiple use is ludicrous; why not build a domed stadium. My point is, that the current condition of the marsh including access and useability is as good as it needs to be. There are plenty of areas for people to ride horses, swim and go to plays within 30 minutes of the Project area. What is wrong with having an area that retains some of its natural beauty and heritage without exposing it to some "higher and better use." In my opinion, the area is at its highest and best use - you can fish, hunt and trap to your heart's content. 2

I would like for the following comments to be gravely considered in formulating your plan. The items relate to the preference ranking sheet.

*Tent campsites (w/ water only)* - this would be fine except for the fact that you couldn't leave your camping gear unattended. The stories of vehicle vandalisms and break-ins at the boat ramps are well known. I realize that Ranger Craddock does an excellent job, but he can't be everywhere at once. The people who commit these crimes know that all too well. Current enforcement efforts can't even effectively patrol existing facilities, much less if new ones were 3

added. I believe you would suffer considerable vandalism to any above ground structures such as pipes, faucets, picnic tables, etc.

- *Trailer campsites (w/ water & elec.)* - same song second verse although you can lock up some of your stuff. Still a ripe target for vandals.

- *Picnic sites* - not a bad idea. You would have to install lots of trashcans and empty them on a regular basis because of use by local people to dispose of household trash. 4

- *Boat launch site* - got one. 5

- *Canoe launch site* - is there a difference?

- *Hiking trails* - to construct trails through the marsh will require filling wetlands. Since the west retaining wall has already impacted a considerable amount of the area I frequent, I will not support any more fill activities. I suggest if you want people to see the marsh, give them a compass on a hot August afternoon and go rescue them two hours later. I think access on the levees should be severely restricted to authorized personnel; certainly no personal motorized vehicles should be allowed access on the levees. The deeper and more mobile people become in the marsh, the more impacts and use it will get (e.g., trash, habitat impacts, over-crowding, etc.). Again, go visit on a November Saturday morning about 0500. 6

- *Primitive camping sites* - If accessible by boat in areas that do not require fill, OK. 7

- *Group pavilions* - This is a substantial structure that would impact the project beyond what it needs to be to offer significant recreational opportunity. Facilities are available in Houston, Baytown, Beaumont, etc., that offer similar amenities. 8

- *Wildlife observation sites* - if you can't see wildlife at the Wallisville Project at any time of the year, day, night with what is available there, you are either blind or sleeping. 9

- *Swimming beaches* - not a good idea with the alligator population at present and on the increase. 10

- *Horseback riding trails* - horses make it difficult for other people to use the area for obvious reasons. Not so obvious reasons include increased impacts to the marsh area by compaction, grazing, stomping holes in the mud making it difficult to walk. I don't know if you are aware, but at present there is a real feral hog problem on the project area. The pigs have this area so trashed and rooted-up, it's difficult to walk. Horses would be worse even if you have trails; there will be someone that ruins it for everyone else. 11

- *Amphitheater* - get a grip. Starring mosquitos, snakes and alligators? If you want to see a show go to Houston, Baytown or Beaumont. 12

- *Fishing piers* - not necessary; waste of taxpayers' money.

- *Restrooms* - somewhat dependent on what you decide on from the above list. I will tell you that they will be heavily vandalized, extremely dirty and appear unmaintained. I'll take the woods anytime. 1

- *Shower Sites* - not necessary. Most users are only an hour or so from home. If you want one that bad, there are a couple of truck stops in the area with $1.99 showers. 1

I hope you take these comments to heart and don't take offense. But all too often, because of my chosen career, I see areas used for something which common sense did not intend. Common sense should tell us that the best use for the Wallisville Project is as a waterfowl hunting area, habitat reserve (without so many of the human trappings), fishing area, and wildlife viewing area. It is not intended as a picnic area, camping area, horseback riding area, party site, and certainly not as a theater district. 16

Furthermore, I am strongly against increasing access opportunities within the project area. Current access is by foot or boat. The "new levees" should not be open to anything other than foot traffic. I would like to at least see size limitations on airboats similar to the National Wildlife Refuges around Port Arthur. Airboats have an incredible impact on the bird use in the marsh, especially when used improperly (i.e., for running birds). I wouldn't lose any sleep if the Corps restricted airboats altogether in the project area. They have ruined more than one of my hunts. I do think that the ranger should use an airboat because there is not a better way to get around the marsh. I know from years of hunting out there that Ranger Craddock is a responsible airboater, unlike some of my "fellow hunters." 17

I hope you don't consider this letter so much a "rant and rave" as an effort to candidly portray reality. Please don't make this wonderful wild area into something it's not.

Thank you for your time and consideration.

Sincerely,

Jim Gregory

713-781-8800 day
242-2186 nite

c:\jfg\wallsrec.ltr

P.S. Please send a Rec Plan to me @ your earliest convenience. 411 S. Bellenop
Sugar Land, Tx 77478.

Mike,
Thx for your time last Thursday. Sorry I got this to you so late. If you have any Q's, please call.

Best,

Jim Gregory

# WALLISVILLE LAKE RECREATIONAL PREFERENCES

Please rate the following alternative recreation opportunities at the Wallisville Lake project. You may add more opportunities.

| Facility | Very Important 5 | 4 | 3 | Not Important 2 | 1 | No Preference 0 |
|---|---|---|---|---|---|---|
| Tent campsites (w/ water only) | | | | | | ✓ |
| Trailer campsites (w/water & elec.) | | | | | | ✓ |
| Picnic sites | | | | | | ✓ |
| Boat launch site | | | | | | ✓ |
| Canoe launch site | | | | | | ✓ |
| Hiking trails | | | | | | ✓ |
| Primitive camping sites | | | | | | ✓ |
| Group pavilions | | | | | | ✓ |
| Wildlife observation sites | | | | | | ✓ |
| Swimming beaches | | | | | | ✓ |
| Horseback riding trails | | | | | | ✓ |
| Amphitheater | | | | | | ✓ |
| Fishing piers | | | | | | ✓ |
| Restrooms | | | | | | ✓ |
| Shower Sites | | | | | | ✓ |
| No Airboats | X | | | | | |
| No ~~Internal~~ Levee Access | X | | | | | |

Comments: "0" column should read "Veto." "No preference" infers that one ~~se~~ could care less whether or not we had Amphitheaters.

NOTE: Please return in the enclosed envelope. SEE ATTACHMENT A.

# RESPONSE TO COMMENTS

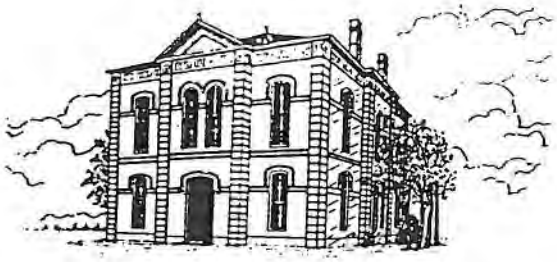
Jim Gregory
411 S. Bellinop
Sugarland, Texas 77478

| Comment No. | Response |
|---|---|
| 1 | Comment noted. |
| 2 | The recreational preferences form that you filled out and returned is a standard form used by the Corps of Engineers. It is used to establish the recreational features most wanted by the public. Obviously, not all features on the form can be provided or are appropriate for every park built and maintained by the Corps. The Recreation Plan (Section 6.0) does not include this feature. |
| 3 | Cedar Hill Park will have an attendant on duty during the day to collect fees and a "host" on 24-hour duty to control entry into the park, especially at night. |
| 4 | Comment noted. |
| 5 | Please see the Recreation Plan (Section 6.0). |
| 6 | The only hiking trails envisioned at this time are around Cedar Hill Park. However, the Recreation Plan will be reviewed periodically to see if there is a need to modify the plan. |
| 7 | Only a few primitive camping sites will be provided at Cedar Hill Park under the present Recreation Plan. |
| 8 | Comment noted. |
| 9 | Comment noted. |
| 10 | Comment noted. |

RESPONSE TO COMMENTS

Jim Gregory
411 S. Bellinop
Sugarland, Texas 77478

| Comment No. | Response |
|---|---|
| 11 | Please see the Recreation Plan described in Section 6.0. This feature is not planned at this time. |
| 12 | Comment noted. Please see the response to Comment No. 2 above. |
| 13 | Comment noted. |
| 14 | Comment noted. |
| 15 | Comment noted. |
| 16 | Comment noted. Please see the response to Comment No. 2 above. |
| 17 | Access to the project area is very limited. The public will be allowed to drive out on the West Non-overflow Dam and use pull-outs to view the wildlife in the surrounding marsh. However, this wildlife viewing opportunity is not designed to facilitate access to the marsh from the dam. Only sightseeing will be allowed. Restrictions on boat size, type, or horsepower are not planned anywhere in the project area at this time, with the exception of Cedar Hill Park where motorized vessels will not be allowed and in the primary management zone for the nesting eagles. Manpower requirements and the size of the area to be regulated prohibit these restrictions. |



# THE WALLISVILLE HERITAGE PARK

*WALLISVILLE, TEXAS*

January 5, 1996

Mr. James M. Kieslich, Chief
Planning & Environmental Design
Department of the Army
Galveston District, Corps of Engineers
Post Office Box 1229
Galveston, Texas 77553-1229

RE: MASTER PLAN FOR WALLISVILLE LAKE, TEXAS

Dear Mr. Kieslich:

We have been working on a project since 1979 to create a Wallisville Heritage Park that would enclose both the El Orcoquisac Archeological District and the Wallisville Townsite. The University of Houston has expressed an interest in setting up an archeological field school here to study the 1754 French Trading Post, the 1756 Mission and Presidio complex, and the 1825 Wallisville Townsite. The Heritage Park also proposes to rebuild the 1886 Courthouse, the 1895 Jail and Hanging Tower, and move former residences and public buildings back onto the townsite.

Over the years with changes in command at the Galveston District and the nebulous requirements for our own Master Plan, which in itself was a very expensive project, along with our proposed leases being in only 25 year increments, it was difficult to raise funds for the projects. We were also told that we would have to set up a contingency account with adequate funds to provide for the removal and/or demolition of all structures at the termination of the lease. 1

The concept of the Heritage Park provides a wonderful opportunity for the public to study the history of this area and to recognize the importance of historical preservation.

[CONTINUED NEXT PAGE]

P.O. BOX 16 - WALLISVILLE, TEXAS 77597 - PHONE (409) 389-2252

Because of the difficulties we have encountered over the last 16 years and the uncertainty of the project, along with the constant changes, we have put these aside; however, we are still interested but need better assurance as to our position before pursuing this matter further.

Yours truly,

John Middleton

John Middleton
President

RESPONSE TO COMMENTS

John Middleton
President
The Wallisville Heritage Park
P.O. Box 16
Wallisville, Texas 77597

| Comment No. | Response |
|---|---|
| 1 | The Galveston District remains committed to facilitating the development of a Heritage Park at the Old Wallisville Townsite. Requirements for development of the townsite under a 25-year lease have remained essentially the same for several years. The nonprofit Wallisville Heritage Park Foundation (WHPF) must submit a formal application which includes a master plan for park development. WHPF submitted a draft master plan on July 31, 1989 which requires some revisions. The master plan must include proposals to assess and mitigate, if necessary, impacts to environmental and historic resources which may be impacted by park development. WHPF must also provide evidence of its financial and management capability to develop, operate, and maintain this facility.<br><br>The current project authorization provides for recreational development at only two sites: the Wallisville Townsite south of IH-10 and at Cedar Hill Park. Park development in the Orcoquisac District north of IH-10 near the Old Wallisville Townsite is not authorized. Also, given the rare and significant nature of these sites, the District prefers long-term preservation of the El Orcoquisac properties unless they become endangered by natural forces or vandalism. |

DAVID A. TODD
709 EAST MONROE STREET
AUSTIN, TEXAS 78704-3131
512-442-3130*tel* • 512-442-1630*fax*

8 January 1996

Mike Morris
Department of the Army
Galveston District, Corps of Engineers
Coastal Planning Branch
Post Office Box 1229
Galveston, TX 77553-1229

RE: Draft Master Plan
Wallisville, Texas Project

Dear Mr. Morris:

Thank you for providing me with a copy of the Draft Master Plan for the Wallisville, Texas Project. I appreciate the opportunity to comment on the Plan and hope that you find my remarks helpful and productive.

At the outset, I'd like to say how pleased I am that the latest design for the Project is so much smaller and less intrusive than earlier versions. I'd like to commend the Corps for its effort to reduce the fiscal and environmental impact of the Project.

However, I still have serious misgivings about the need for and the remaining impacts from the Project. I hope that revisions to the Plan can help document the need for the Project, and if the Project is truly merited, show how the Project's impacts can be mitigated. 1

***Resource Analysis***

The Resource Analysis section of the Plan would benefit from being expanded. With the critical historical resources, wetlands, bottomland hardwoods at stake, the dynamism of the river and estuary, and the threat of a major change in the hydrologic regime, it seems essential to have a thorough and recent baseline analysis done. As it stands, the Plan falls short in this area.

Flora and fauna: Much of the aquatic organism data cited from pages 3-1 through 3-26 date from the early to late 1970s. Similarly, the last extensive, multi-visit bird surveys in the area were conducted in 1975 and 1976. Also, the most recent reptile and amphibian surveys are 15 years old or more, dating to 1975-76 and 1981. The Plan also relies on quite dated vegetation information, with the most site-focused, plant-specific surveys (other than TPWD Heritage Program compilations and vegetation type delineations) coming from 1972 and 1974. 2

Hydrology: Some of the information presented in the Plan is more current, but still incomplete. For instance, I was unable to find any flow, tide, surge, or salinity records or analysis in the Plan. Considering that the Project is premised on the need to protect against saline wedge intrusions, I had hoped that there would be documentation of historical experiences with such wedges, such as the saline concentrations at different depths and points in the delta, bayous, and river, as well as at defined pump stations, proposed control structures and dam. These salinity data should be cross-referenced with climatic, tidal, and riverflow information, and statistically analyzed to determine mean and worst-case conditions. With this information in hand, it would be much easier to understand the need for the Project and know the frequency of dam closures and ensuing impact on 3

*recycled paper, including 25% post-consumer waste*

the estuary. It is possible that the Texas Parks and Wildlife freshwater inflow study report due out later this year will have some relevant data that could be included in Plan revisions.

Historic resources: I also hope that revisions in the Plan will more completely review the location and contents of historic properties in the Project site. Considering the many sites (190 recorded), the recognition of the Wallisville Townsite as an Archeological District within the National Register, and the long record of settlement (back to 3500 BC), it would seem that the Project area deserves more comprehensive historic survey. I understand that only 28% of the site has been surveyed for historic remains. 4

Recreational data: The cost/benefit information provided in the Plan for recreation is helpful; however, it would be useful to expand this kind of data to offsetting uses and to other Project purposes. For instance, cost/benefit analysis of recreational improvements within the Project is incomplete without comparison to the value of Galveston Bay's recreational fisheries and other uses put at risk by the Project. While the $3.38 million in annual benefits expected from the Project's recreational work is impressive, such figures are dwarfed by the $75 to $100 million generated annually in the recreational fishery of Galveston Bay. 5

Commercial uses: The Plan notes that 10,685 acres, about 43%, of the Project site are leased for cattle grazing. It would be useful to know what the animal unit lease rates are for these properties, the bidding process (particularly if it comprehends leases to the Nature Conservancy or other conservation organizations for restoration purposes), the lease conditions regarding stocking, management, and ownership of improvements, and to whom lease revenues are credited. If such a large portion of the Project site is to be leased out to private interests, it is important that those lands be managed properly and that whatever revenues are generated be reinvested in Project site mitigation. 6

Navigational use data: Since they are listed as the primary Corps development in Figure 3-1, revisions of the Plan could include cost/benefit analysis of the navigational uses of the Project. This kind of cost-effectiveness study is merited considering the expense of the various channel and lock improvements and the very slight usage of the Trinity channel. Past traffic is estimated at 1.6 barges per year and maintenance dredging of preexisting Trinity canal segments, exclusive of those proposed in the Project, costs $453,298 annually. Fuller, F., "Subsidized Destruction: 'The Wallisville Lake Project and Galveston Bay", Texas Center for Policy Studies, October 1995, p.31. I believe that other districts of the Corps that have recently investigated the merits of the Trinity barge canal have also questioned its value. 7

Water supply data: Finally, the Plan should include cost/benefit analysis of the water supply functions of the Project. While this may appear to have been covered in earlier reviews of the Project, it seems that the Project has changed dramatically since those earlier reviews and it would be timely to revisit the issue. In fact, considering the fact that "the Wallisville Lake Project does not include any reservoir", its original water rights permit, which contemplated a very different set of structures and impoundment, should be reopened to allow such a thorough look at the whole water supply question. Lastly, in these times of federal deficits, we all need to do our part to make sure that government funds are spent prudently. 8

Such a review might look at the costs and benefits of the saltwater barrier and compare it with purchasing additional waters from TRA, the Gulf Coast Water Authority or other senior water rights holders, undergoing a water conservation program, or other feasible options. It would be best if the analysis discounted the benefits to account for the 15 or more year delay until Houston will need the water. Also, to compare apples and apples, total costs, not just those accruing to the local sponsors, should be included in the calculations. Consistent finance interest rates and payback terms should also be used in these comparisons. 9

*Operational Plans*

Flora and fauna: Future editions of the Plan would benefit from a more thorough plan for monitoring and mitigating impacts from the Project. For instance, it would be helpful if the Plan included a study program for monitoring changes in the area and composition of site wetlands, bottomland hardwoods, anadromous fish migrations, and specific endangered or threatened plant and animal species. This would be particularly useful because of the wide operational latitude that the Project's operable gates would have - much broader than the typical fixed water control structure. Historical records indicate from Romayor indicate that Trinity river flows fall below the 1000 cfs criteria only 12% of the time, and even then it is unclear that saline wedges are of concern, allowing a good deal of flexibility in operations to respond to concerns about flora and fauna. 10

Commercial uses: The Plan should detail the conditions under which Project lands are leased for grazing. The lease agreements should include criteria and incentives for improving the soil and grasses and restoring the prairie ecosystem once found here. Lands subject to commercial use such as grazing should also be subject to lease for non-consumptive uses such as ecotourism. 11

Mining: The Plan discussion of mining considers oil and gas issues but does not touch on other extractive questions. It is important that the Plan clearly show that strip mining and dredging for sand, gravel, lignite and coal are not allowed on Project lands and waters. 12

Recreational uses: It is important that every effort be made to insure multiple, non-exclusive use of Project lands for all kinds of pastimes. However, much of the recreational sections of the Plan appear to be based on a survey sent to 1000 hunters. This may skew the results away from what the bulk of the population would like to see at Wallisville (only 1.9% of projected visitation is expected to be for hunting). 13

Structure construction: I understand that contracts were let for $26 million in work on Wallisville during December 1995. I have not been able to determine the sequence, kinds of work involved, or other aspects of the construction so far. However, I would urge that the least damaging portions of the Wallisville Project be undertaken first. For instance, the recreational improvements or the dismantling of the west non-overflow dam should be completed first. In view of the fact that water is not needed for Houston until 2010 or later, there seems no rush to proceed with construction of the channel dam and other structures at this early date, since that will only increase unnecessary environmental damage and maintenance costs in the interim. Also, given the uncertainty of federal appropriations, it would be misleading to undertake some more damaging portions of the Project first, with little prospect for completing other, more benign aspects, such as the recreational and fish and wildlife improvements. If construction on the channel dam must be pursued, I urge the Corps to consider using the obsolete structures as borrow sites, avoiding wetland dredging and contributing to the removal of the old structures at the same time. 14

Thank you very much for considering my comments. I look forward to seeing future revisions of the Plan and hearing of any other public hearings, publications, or construction or study proposals regarding Wallisville.

Sincerely,

David Todd

RESPONSE TO COMMENTS

David A. Todd
709 E. Monroe St.
Austin, Texas 78704-3131

| Comment No. | Response |
|---|---|
| 1 | Comment noted. The Master Plan is not a National Environmental Policy Act (NEPA) document, such as an Environmental Impact Statement (EIS) or Environmental Assessment (EA) document. Therefore, it will not be used to revise the Project, update impacts, or discuss mitigation. |
| 2 | Comment noted. This document is not an EIS or EA, and is not intended to have the same detail as the latter documents. |
| 3 | Comments relating to project design, authorized project operations and functions, coordination over environmental impacts, need for the Project, and other features handled under NEPA are not relevant to a Master Plan. Please refer to the Wallisville EIS and subsequent EA's for responses to project needs, functions, impacts, etc. |
| 4 | Properties acquired for the Wallisville Lake Project are among the most exhaustively researched and surveyed lands on the Texas coast. No additional investigations are required prior to construction because historic properties in all affected areas have been thoroughly inventoried and assessed. All high probability areas have been surveyed as part of investigations which have covered 44% of emergent lands in the project area. Unsurveyed lands which may be impacted by future real estate actions such as leases, licenses, and excessing of property will be thoroughly investigated before they are impacted. |
| 5 | The Recreation Plan's cost/benefit analysis has been revised (see Section 6.0). However, a comparison of the benefits of the Recreation Plan to the value of Galveston Bay is beyond the scope of the Master Plan. |

RESPONSE TO COMMENTS

David A. Todd
709 E. Monroe St.
Austin, Texas 78704-3131

| Comment No. | Response |
|---|---|

6 Sealed bids are solicited from the public (anyone can bid and schedules are published in a Notice of Availability) and leases awarded to the highest bidder (including the Nature Conservancy if they win the bid) if it exceeds a confidential government appraised annual rental value. Leases are written for a 5-year term, subject to cancellation by the Government if the land is required for a higher priority. The lease stipulates a stocking rate of one animal unit per 10 acres on a year long basis. However, the ranger periodically checks the pastures for overgrazing and asks the leaseholder to reduce the number of cattle if the vegetation needs some recovery time. Any improvements to be constructed by the lessee must first be approved by the Corps and must be removed upon expiration of the lease. Seventy five per cent of the revenues collected from the leases are returned to the applicable county and the remaining 25% is deposited in the U.S. Treasury.

7 This figure has been deleted and the Recreation Plan revised. Please see the response to Comment No. 3 above.

8 Please see the response to Comment No. 3 above.

9 Please see the response to Comment No. 3 above.

10 Future reviews of the Master Plan will consider additional or revised management methods for project features. The Corps is currently monitoring the health of the cypress trees to determine whether the project is having a negative impact on tree vigor. However, there are no plans for mitigating other impacts you mention since there is no mitigation associated with the authorized project. The Corps will continue to monitor the area for threatened or endangered species as required by the Endangered Species Act.

RESPONSE TO COMMENTS

David A. Todd
709 E. Monroe St.
Austin, Texas 78704-3131

| Comment No. | Response |
|---|---|
| 11 | Comment noted. Please see the response to Comment No. 6 above. |
| 12 | Minerals which must be mined by dredging or excavating from the surface, such as sand, gravel, shell, and coal, belong to the United States. While this mining is not prohibited in the project area, the action is subject to prior written approval of the Corps and must undergo the permit approval process and the NEPA process (environment impact assessment and mitigation, if needed). |
| 13 | The user survey was mailed to the entire mail list for Wallisville at the Galveston District. It was unfortunate that it was called the "Duck Hunters" mail list which just happened to be the most numerous component of the list. |
| 14 | Please see the response to Comment No. 3 above. |

*McFarlane & Associates*

*Robert W. McFarlane, Ph.D.*
*Consulting Ecologist*

*Telephone 713-772-8294* *9503 Sharpview Drive Houston Texas 77036-5921* *Facsimile 713-772-6025*

January 5, 1996

Coastal Planning Branch
US Army Corps of Engineers - Galveston District
P.O. Box 1229
Galveston, Texas 77553-1229
Attention: PL-C

RE: Draft Master Plan, Wallisville Lake, Texas

Gentlemen:

I am submitting my comments of the draft Master Plan for Wallisville Lake. This plan perpetuates several myths regarding this project, as noted below.

p.1-2, ¶1.1.3 Foremost amongst these myths is the claim that the present project retains all five of the project purposes. Certainly there are no navigation benefits from a project where navigation does not exist. In recent years commercial barge traffic has averaged 1.6 barges per year, and this project will neither facilitate that traffic nor increase it. Thus only an unknown number of recreational boats currently traverse the river at this point and they will suffer a major inconvenience by having to pass through the navigation lock. 1

The water supply benefit of this project has been greatly exaggerated. No one at the Galveston District of the Corps, the Trinity River Authority, the City of houston, or the Chambers-Liberty Counties Navigation District has any idea whatsoever (1) how often salinity intrusion occurs at the dam site, (2) how long it persists, (3) how much water flow is needed to prevent salinity intrusion, or (4) historically, how much water has been released to overcome such intrusion. Therefore the amount of water actually saved, if any, is totally unknown. 2

Overall, this project will have a major negative impact on fish and wildlife of this delta; there will be no net benefit for fish and wildlife. Likewise, there will be no net benefit to recreation. Thus salinity control has been, and will continue to be, the sole project benefit and this has not been quantified. 3

p.1-13, ¶1.2.2 The statement that "The present plan, while not creating a permanent impoundment, still provides for all five Project purposes" is absolutely false (see above). 4

p.1-18, ¶1.2.5 The text is notably non-specific about operation of the Project for salinity control. First of all, "low flow is estimated at 1,000 cfs". Both the U.S. Fish & Wildlife Service and myself have independently concluded that salt water intrusion will not occur until flow declines to approximately 500 cfs. The Corps should undertake studies to determine when salinity intrusion becomes a reality. How will flow be measured? Will closure of the spillway gates and navigation lock be determined by flow level or actual salinity measurement? Will salinity be measured at the bottom of the river? At what location? 5

p.1-20, ¶1.2.5.1 "The low overflow dam...may be breached to restore sheet flow". Will it or will it not? This is an important action that should be taken, not just left to circumstance. 6

p.2-1, ¶2.1 The environmental consequences of this project have never been adequately revealed. Thus the first two resource objectives will be impossible to attain: "develop...plan which will maintain or enhance native fish and wildlife resources" and "manage...native fisheries...will remain in a state as near ambient as is possible." The great majority of native fishes in the project area are estuarine or marine species. The dam and the navigation lock are going to preclude these transitory fishes from immigrating into their upstream foraging habitats and emigrating back to the bay at a later stage of growth. Both the biomass and the fish community structure will change and "ambient" energy pathways will be altered. Nowhere does the Corps indicate that they, another agency, or a contractor will sample the ambient fish and wildlife resources to determine what "ambient" means or sample to detect any changes that may occur. How will the Corps meet these resource objectives? How will the Corps differentiate between natural variation and project effects? All of the biological studies cited are more than 20 years old. 7

p.2-2, ¶2.2 I have always had the distinct impression that the cypress swamp forest was composed of very few year-class cohorts; that is to say, cypress reproduction had occurred at rare, lengthy intervals. The Corps should sample these cohorts with a core-borer to determine their ages and plan their management to allow other age-classes to develop. 8

p. 3-21, ¶3.2.4 I recently completed a study of remnant coastal prairies for the U.S. Fish & Wildlife Service (Upland Coastal Prairie of Texas and Louisiana: decription, human impacts, and management options. R.W. McFarlane, March 1995, for the Houston Audubon Society and USFWS). I can verify that native tallgrass prairie has virtually disappeared from Chambers and Liberty counties, with only 3 remnants known from Chambers County and one from Liberty County. I can also verify that, in some instances, where grazing cattle are removed from grasslands, even those where exotic species are prominent, native prairie grasses can return. The native species are preferentially grazed by the cattle and persist as low ground-hugging tufts and rhizomatous stock that seldom achieve sufficient height to flower. When cattle are removed, these plants are able to propagate by seeds and quickly regain prominence.

Therefore I urge the Corps to experimentally remove cattle from some grasslands to determine if native prairie grasses will return. Among the five tallgrass dominants that formerly occured in this area, eastern gamagrass is now the rarest species and the most likely to have been found in the wet prairies of the project area. Little bluestem, big bluestem, indiangrass and switchgrass can also be expected. 9

p.4-2, last line. The wooded area of Cedar Hill Park is described as "old southern yellowpine". Several pine species fall in this category. If this is loblolly pine, it should be so stated. Is there any possibility that it is longleaf pine? 10

P.7-1, ¶7.1.1 "When river flows drop below 1,000 cfs, the spillway gates will be closed or partially closed to prevent saltwater encroachment." This statement again implies that the closure decision will be based on water flow rather than actual salinity measurement. The Plan should be based on actual salinity, not water flow, to avoid unnecessarily interupting movement of the biota. 11

p.7-2, ¶7.1.2 I applaud the switch from continual grazing to rotational grazing but the option of no grazing at all should also be considered. 12

p.7-5, 1st ¶ At no point in this document is "rotational grazing" defined. It is merely a concept mentioned as an option. The Plan should specify the rotation periods to be used, the density of 13

cattle to be allowed, and a specific vegetation removal goal to be achieved. For example, no more than 50% of the plant biomass to be removed by grazing before cattle are rotated off.

2nd ¶ Prescribed burning should be encouraged but specific burning criteria should be established.

There has been no mention of active protection of the two colonial-nesting waterbird rookeries. These are the only persistent rookeries in the Trinity Delta area. They are worthy of protection from boaters during the nesting season. Discrepancies between the mapped locations (Figure 6-1) and the colony names, colony numbers, and location coordinates of the Texas Colonial Waterbird data base should be resolved. The colony on the river south of I-10 appears to be the Trinity River Mouth colony, 600-120, correctly plotted as 29°50' N, 94°45' W. The colony north of I-10, east of the river and west of Lake Charlotte appears to be the East of Lost Lake colony, 600-140 but located at 29°52' N, 94°45' W instead of at 29°50' N, 94°42' W as indicated in the colonial waterbird data. The Corps should plan to monitor these colonies, with several counts during the nesting season, to ensure that their productivity continues. 1

I am not sure that the Recreation Master Plan (Appendix B) is open for comment at this time but I do wish to make several points regarding it. The one-third open space (Fig. 3-2) described as "a grazed, open field" (p.3-7) should be considered for restoration and maintenance as a remnant coastal prairie featuring native prairie grasses (listed above). This goal would be quite compatible with other planned uses in the park. It would also provide a wonderful educational opportunity for visitors. I find Section 4 - Economic Analysis (page 4-1ff) to be an astounding revelation. Questionnaires were mailed to 1,000 duck hunters and only 25 of the 167 respondents indicated that duck hunting was important to them. That appears to be a significant statement. 1 1

The Corps usually manages to shoot itself in the foot in every document it produces, and this plan is no exception. Here we have a plan that will not impound a lake but on page 4-12 is found the statement that "the entire 19,700 acre Wallisville Lake project is capable of supporting 32,400 people per day for fishing." Now if that does not confuse people into thinking that the original project is alive and well, I don't know what will. 1

Thank you for the opportunity to comment on this plan. I hope that the Corps will take advantage of this opportunity to restore native prairie and protect colonial waterbirds in addition to its other stated purposes.

Sincerely yours,

Robert W McFarlane

Robert W. McFarlane, Ph.D.

RESPONSE TO COMMENTS

Robert W. McFarlane, Ph.D.
McFarlane & Associates
9503 Sharpview Drive
Houston, Texas 77036-5921

| Comment No. | Response |
|---|---|
| 1 | Comment noted. Comments relating to project design, authorized project operations and functions, coordination over environmental impacts, need for the Project, and other features handled under NEPA are not relevant to a Master Plan. Please refer to the Wallisville EIS and subsequent EA's for responses to project needs, functions, impacts, etc. |
| 2 | Please see the response to Comment No. 1 above. |
| 3 | Please see the response to Comment No. 1 above. |
| 4 | Please see the response to Comment No. 1 above. |
| 5 | Please see the response to Comment No. 1 above. |
| 6 | Please see the response to Comment No. 1 above. |
| 7 | Please see the response to Comment No. 1 above. |
| 8 | The Corps is currently monitoring the health and vigor of cypress trees in the project area in order to determine whether project operations are affecting the trees. If the trees are determined to be affected by the project, project operations or other remedial measures will be reviewed in coordination with the U.S. Fish and Wildlife Service (USFWS) to determine the most effective method to reduce or eliminate the impacts. |
| 9 | Comment noted. No grazing is a viable option that will be considered in future plans. |

RESPONSE TO COMMENTS

Robert W. McFarlane, Ph.D.
McFarlane & Associates
9503 Sharpview Drive
Houston, Texas 77036-5921

| Comment No. | Response |
|---|---|
| 10 | The Master Plan gives a general overview of wildlife and vegetation that can be found in the project area. A more detailed species list of vegetation at Cedar Hill Park can be obtained and included in a revised version of the Master Plan during one of the periodic reviews, if deemed necessary. |
| 11 | Please see the 1995 EA and the 1994 FDM No. 11 for more details on spillway operation under threat of salinity intrusion. |
| 12 | No grazing is a viable option that will be considered in future plans. |
| 13 | Grazing rotation is one of the options that is under consideration and will be developed further under future reviews and revisions of the Master Plan. |
| 14 | Prescribed burning criteria will be considered in future plans. |
| 15 | Protection of colonial-nesting waterbird colonies may be considered in the future if there is a demonstrated need for it. However, it will be undertaken only through coordination with the USFWS and Texas Parks and Wildlife Department. Any discrepancies in coordinates for the sites can be corrected in the future. Active monitoring of the sites by the Corps is not anticipated at this time. |
| 16 | There are no plans for using this open field at this time. However, maintenance of the field as coastal prairie will be considered in future revisions of the Master Plan. |

RESPONSE TO COMMENTS

Robert W. McFarlane, Ph.D.
McFarlane & Associates
9503 Sharpview Drive
Houston, Texas 77036-5921

| Comment No. | Response |
|---|---|
| 17 | The user survey was mailed to the entire mail list for Wallisville at the Galveston District. It was unfortunate that it was called the "Duck Hunters" mail list just because that happened to be the largest group on the list. |
| 18 | The entire Recreation Plan has been revised and the confusing reference you note has been removed. |



# Houston Audubon Society

440 Wilchester, Houston, Texas 77079, (713) 932-1639, 461-2911 (fax)
e-mail address: 71634,52@compuserve.com

January 8, 1996

Mr. Mike Morris
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston TX 77553-1229

Dear Mr. Morris,

Enclosed are comments on the Draft Master Plan for Wallisville Lake as requested by the December 8, 1995 Notice of Availability. The Master Plan states that its purpose is to provide a "comprehensive guide to the sensitive, wise, and orderly use, development and management of the natural and anthropogentic resources of the "Project" (p. 1-1). ON the contrary, however, I find that the plan is narrow in its scope and shallow in its analysis. The plan fails to address the most significant issues regarding Wallisville. 1

I. **Project Benefits and Alternatives**

The Plan states that the five authorized purposes for the original Wallisville's 19,700 acre reservoir will be met by the current Wallisville's gated spillway and navigation lock. The Plan does not explain how this will be accomplished. Nor does it explore other options for accomplishing these goals in a less costly and environmentally damaging manner. 2

Section 1.2.5 of the Plan is entitled Project Operation. It states that Lake Livingston's current releases for saltwater intrusion would be conserved once the Wallisville project is built. It does not explain, however, how much water would actually be saved, nor does it reveal to whom this water currently belongs. Without knowing how much water will be "saved" and who will be saving, it is impossible to evaluate whether the Corps is making sensitive and wise use of the project area resources. 3

Additionally, the Plan still lists navigation as one of its purposes. The Plan will

Board of Advisors Caroline Callery, Steve Carroll, Gary Clark, Ted Eubanks, Mary-Floye Federer, Terry Hershey, Ray Johnson, George McAfee, Robert McFarlane, Ellen Red, Lucie Wray Todd, John L. Whitmire

include rehabilitation of a previously built, moth-balled navigation lock which will be necessary to allow continued barge traffic once the Corps constructs a spillway structure across the Trinity River. Currently, the Corps spends approximately $453,298 per year to maintain the barge channel up the Trinity River from the center of Galveston Bay to the town of Liberty. The dredging of the channel exacerbates the problem of saltwater intrusion up the Trinity River and, on average, only 1.6 barges use the channel per year[1] It therefore does not seem like a wise use of resources for the Corps to spend money rehabilitating a lock and maintenance dredging a channel that increases the likelihood of saltwater intrusion and will be used by only 1-2 barges a year. 4

**II. Resource Analysis**

The Plan's analysis of the project's impacts on natural resources is utterly inadequate. The Plan's method of examining only impacts to resources within the specified project boundary is illogical. The effects of the project on the entire Trinity Basin and Galveston Bay System must be included in the Resource Analysis. 5

A. Freshwater Inflows - A loss of freshwater inflows to Galveston Bay is the most important issue associated with the Wallisville project. Galveston Bay receives 54% of its freshwater inflows from the Trinity River Basin.[2] The Texas Parks and Wildlife Department and the Texas Water Development Board are currently conducting a detailed study of Galveston Bay's freshwater inflow needs. The results of these studies are expected early this year and should be included in the Plan's Resource Analysis. Losses in freshwater inflows or disturbances in seasonal inflow patterns could drastically affect Galveston Bay's ecology. No further construction on Wallisville should be contemplated until these studies are completed and we have a better understanding of the Bay's needs. 6

B. Wetlands - The Plan does not address the impact of the abandoned low overflow dam and the non-overflow dam adjacent to the south navigation channel. These structures block sediment and may have caused wetlands destruction. The removal of these structures should be the first priority. They are no longer a part of the project and serve only to harm the project's natural resources. 7

C. Migration of Marine Organisms - The Plan needs to address the problem of impeding the migration of anadromous fishes. It also needs to investigate the anecdotal information that lakes upstream of the spillway are nursery areas for shrimp and other marine species.[3] 8

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[1]Frank Fuller, "Subsidized Destruction: The Wallisville Lake Project and Galveston Bay," Texas Center for Policy Studies, October 1995, p.31.

[2]GBNEP, "The State of the Bay," p. 84

[3]Andrew Sansom, (letter) Texas Parks & Wildlife Department, April 28, 1995.

**III. Public Involvement**

The Master Plan cites ER 1120-2-400 as stating, "During the investigation, planning, development, and operation and maintenance of all Civil Works projects, close and continuing coordination will be maintained with Federal, State, and local agencies..." (p. 5-1). It then states that extensive coordination has been accomplished with the Wallisville project. On the contrary, while the state natural resource agencies have been notified of actions on Wallisville, they are fairly uniform in their reservations regarding the project. The Texas Parks & Wildlife Department's letter of April 28, 1995 voices numerous concerns about the project's effects on the areas natural resources and states that "[t]he resources of Galveston Bay are at risk and as deserving of protection as the conservation storage of Lake Livingston."[4] The Texas Natural Resource Conservation Commission (formerly the Texas Water Commission) has delayed consideration of a permit extension for Wallisville's sponsors citing concern that the project's environmental impacts had not been thoroughly examined.[5] Wallisville's sponsors, therefore, do not currently have a valid state permit in contradiction with existing application permit guidelines. 9

In addition to the $35.4 million already spent on Wallisville, the Corps estimates needing $31.5 million to complete the project, and $300,000-400,000 to operate the project.[6] While the City of Houston's water needs are not immediate, the potential crisis for the Galveston Bay system is. The Galvston Bay National Estuary Program estimates the value of the commercial and recreational fisheries in Galveston Bay to be $338 million per year.[7] A more complete analysis of the Wallisville project's potential impacts on the Galveston Bay system, the precise water savings to be obtained by the project and the alternatives for achieving those savings is essential. Without this information, it is impossible for the Corps Master Plan to provide for the "sensitive, wise, and orderly use" of the Wallisville project's resources. 10

Thank you.

Sincerely,

Gretchen Mueller
Executive Director

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[4]Andrew Sansom, (letter) attachment p.2

[5]Texas Water Commission, (agenda hearing,audio cassette), Jan. 28, 1992

[6]Frank Fuller, "Subsidized Destruction: The Wallisville Lake Project and Galveston Bay," p. i

[7]R. Allison, "Galveston Bay: An Economic Resource." GBNEP Bayline, p.3

RESPONSE TO COMMENTS

Gretchen Mueller
Executive Director
Houston Audubon Society
440 Wilchester
Houston, Texas 77079

| Comment No. | Response |
|---|---|
| 1 | Comment noted. |
| 2 | Comments relating to project design, authorized project operations and functions, coordination over environmental impacts, need for the Project, and other features handled under NEPA are not relevant to a Master Plan. Please refer to the Wallisville EIS and subsequent EA's for responses to project needs, functions, impacts, etc. |
| 3 | Please see the response to Comment No. 2 above. |
| 4 | Comment noted. |
| 5 | Please see the response to Comment No. 2 above. |
| 6 | Please see the response to Comment No. 2 above. |
| 7 | Please see the response to Comment No. 2 above. |
| 8 | Please see the response to Comment No. 2 above. |
| 9 | Please see the response to Comment No. 2 above. |
| 10 | Please see the response to Comment No. 2 above. |

1113 South 3rd Street
Austin, TX 78704

January 5, 1996

Mr. Mike Morris
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

Dear Mr. Morris,

Enclosed are comments on the Draft Master Plan for Wallisville Lake as requested by the December 8, 1995 Notice of Availability. The Master Plan states that its purpose is to provide a "comprehensive guide to the sensitive, wise, and orderly use, development, and management of the natural and anthropogenic resources of the Project" (p. 1-1). On the contrary, however, I find that the plan is narrow in its scope and shallow in its analysis. The plan fails to address the most significant issues regarding Wallisville. 1

**I. Project Benefits and Alternatives**

The Plan states that the five authorized purposes for the original Wallisville's 19,700 acre reservoir will be met by the current Wallisville's gated spillway and navigation lock. The Plan does not, however, provide an analysis of the benefits accruing from the actual navigation lock and spillway. The project's fish and wildlife enhancement and recreation benefits are due to the use of the acreage around the spillway and lock as parkland. The benefits of the lock and spillway - navigation, salinity control, and water supply - are not adequately explained. Nor does the Plan explore other options for accomplishing the purposes of the lock and spillway in a less costly and environmentally damaging manner. 2

Section 1.2.5 of the Plan is entitled Project Operation. It states that Lake Livingston's current releases for saltwater intrusion would be conserved once the Wallisville project is built. It does not explain, however, how much water would actually be saved, nor does it reveal to whom this water currently belongs. Without knowing how much water will be 'saved' and who will be saving, it is impossible to evaluate whether the Corps is making sensitive and wise use of the project area resources by building the lock and spillway. 3

Additionally, the Plan still lists navigation as one of its purposes. The Plan will include rehabilitation of a previously built, moth-balled navigation lock which will be necessary to allow continued barge traffic once the Corps constructs a spillway structure across the Trinity. Currently, the Corps spends approximately $453,298 per year to maintain the barge channel up the Trinity River from the center of Galveston Bay to the town of Liberty. The dredging of this channel exacerbates the problem of saltwater intrusion up the Trinity River and, on average, only 1.6 barges use the channel per year.[1] It therefore does not seem like a wise use of resources for the Corps to spend money rehabilitating a lock and maintenance dredging a channel that increases the likelihood of saltwater intrusion and will be used by only 1-2 barges a year. 4

## II. Resource Analysis

The Plan's analysis of the project's impacts on natural resources is utterly inadequate. The Plan's method of examining only impacts to resources within the specified project boundary is illogical. The effects of the project on the entire Trinity Basin and Galveston Bay System must be included in the Resource Analysis. 5

A. Freshwater Inflows - A loss of freshwater inflows to Galveston Bay is the most important issue associated with the Wallisville project. Galveston Bay receives 54% of its freshwater inflows from the Trinity River Basin.[2] The Texas Parks and Wildlife Department and the Texas Water Development Board are currently conducting a detailed study of Galveston Bay's freshwater inflow needs. The results of these studies are expected early this year and should be included in the Plan's Resource Analysis. Losses in freshwater inflows or disturbances in seasonal inflow patterns could drastically affect Galveston Bay's ecology. No further construction on Wallisville should be contemplated until these studies are completed and we have a better understanding of the Bay's needs. 6

B. Wetlands - The Plan does not address the impact of the abandoned low over flow dam and the non-overflow dam adjacent to the south navigation channel. These structures block sediment and may have caused wetlands destruction. The removal of these structures should be the first priority. They are no longer a part of the project and serve only to harm the project's natural resources. 7

C. Migration of Marine Organisms - The Plan needs to address the problem of impeding the migration of anadromous fishes. It also needs to investigate the anecdotal information that lakes upstream of the spillway are nursery areas for shrimp and other marine species.[3] 8

## III. Public Involvement

The Master Plan cites ER 1120-2-400 as stating, "During the investigation, planning, development, and operation and maintenance of all Civil Works projects, close

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[1] Frank Fuller, "Subsidized Destruction: "The Wallisville Lake Project and Galveston Bay," Texas Center for Policy Studies, October 1995, P. 31.

[2] GBNEP, "The State of the Bay," p.84.

[3] Andrew Sansom, (letter) Texas Parks and Wildlife Department, April 28, 1995.

and continuing coordination will be maintained with Federal, State, and local agencies ... " (p. 5-1). It then states that extensive coordination has been accomplished with the Wallisville project. On the contrary, while the state natural resource agencies have been notified of actions on Wallisville, they are fairly uniform in their reservations regarding the project. The Texas Parks and Wildlife Department's letter of April 28, 1995 voices numerous concerns about the projects effects on the areas natural resources and states that "[t]he resources of Galveston Bay are at risk and as deserving of protection as the conservation storage of Lake Livingston."[4] The Texas Natural Resource Conservation Commission (formerly the Texas Water Commission) has delayed consideration of a permit extension for Wallisville's sponsors citing concern that the project's environmental impacts had not been thoroughly examined.[5] Wallisville's sponsors, therefore, do not currently have a valid state permit in contradiction with existing application permit guidelines. 9

In addition to the $35.4 million already spent on Wallisville, the Corps estimates needing $31.5 million to complete the project, and $300,00-400,00 to operate the project.[6] While the City of Houston's water needs are not immediate, the potential crisis for the Galveston Bay system is. The Galveston Bay National Estuary Program estimates the value of the commercial and recreational fisheries in Galveston Bay to be $338 million per year.[7] A more complete analysis of the Wallisville project's potential impacts on the Galveston Bay system, the precise water savings to be obtained by the project and the alternatives for achieving those savings is essential. Without this information, it is impossible for the Corps Master Plan to provide for the "sensitive, wise, and orderly use" of the Wallisville project's resources. 10

Thank you.

Sincerely,

Kelly Haragan

[4] Andrew Sansom, (letter), attachment p.2.
[5] Texas Water Commission, (agenda hearing, audio cassette), Jan. 28, 1992.
[6] Frank Fuller, "Subsidized Destruction: The Wallisville Lake Project and Galveston Bay," p.i.
[7] R. Allison, "Galveston Bay: An Economic Resource," GBNEP Bayline, p.3.

RESPONSE TO COMMENTS

Kelly Haragan
1113 South 3rd Street
Austin, Texas 78704

| Comment No. | Response |
|---|---|
| 1 | Please see the response to Comment No. 1 of the letter from the Houston Audubon Society. |
| 2 | Please see the response to Comment No. 2 of the letter from the Houston Audubon Society. |
| 3 | Please see the response to Comment No. 3 of the letter from the Houston Audubon Society. |
| 4 | Please see the response to Comment No. 4 of the letter from the Houston Audubon Society. |
| 5 | Please see the response to Comment No. 5 of the letter from the Houston Audubon Society. |
| 6 | Please see the response to Comment No. 6 of the letter from the Houston Audubon Society. |
| 7 | Please see the response to Comment No. 7 of the letter from the Houston Audubon Society. |
| 8 | Please see the response to Comment No. 8 of the letter from the Houston Audubon Society. |
| 9 | Please see the response to Comment No. 9 of the letter from the Houston Audubon Society. |
| 10 | Please see the response to Comment No. 10 of the letter from the Houston Audubon Society. |

# *Gulf Coast Rod, Reel and Gun Club, Inc.*

148 South Dowlen # 704
Beaumont, Texas 77707

January 8, 1996

James M. Kieslich
Chief, Planning and Environmental Division
US Army Corps of Engineers
Galveston District
PO Box 1229
Galveston, TX. 77553

Dear James,

The Gulf Coast Rod, Reel and Gun Club wishes to comment on the Master Plan for Wallisville Lake. The Gulf Coast Rod, Reel and Gun Club has been interested in preserving our natural resources for almost 60 years. For this reason we have been opposed to the Wallisville project since it's conception. Unfortunately, we still must oppose this latest reincarnation of the project. We must also compliment the Corps of Engineers on the excellent recreational planning in this Master Plan. With decreasing hunting and fishing opportunities, we appreciate the Corps planning to allow as much hunting and fishing as possible. We hope that no matter what happens to the salt water barrier that these recreational plans are maintained. 1

The Gulf Coast Rod, Reel and Gun Club must oppose the Wallisville project because of the impact of cutting all fresh water flow into the Trinity delta during droughts. Since a complete study by State and Federal entities of Galveston Bay water requirements for long term heath is being implemented at least a delay this project is warranted. This data would be crucial in determining long term effects of this project on the Trinity Delta and Galveston bay. A natural resource as valuable as the Trinity Delta and Galveston Bay should be protected at the expense of all other factors. For these reasons the Gulf Coast Rod, Reel and Gun Club must oppose the Wallisville Lake Project in its present form and until all studies of the delta and bay are complete. 2

Sincerely,

Wane Stupka, DVM
President

RESPONSE TO COMMENTS

Wayne Stupka, DVM
President
Gulf Coast Rod, Reel and Gun Club, Inc.
148 South Dowlen, #704
Beaumont, Texas 77707

| Comment No. | Response |
|---|---|
| 1 | Comment noted. |
| 2 | Comment noted. Comments relating to project design, authorized project operations and functions, coordination over environmental impacts, need for the Project, and other features handled under NEPA are not relevant to a Master Plan. Please refer to the Wallisville EIS and subsequent EA's for responses to project needs, functions, impacts, etc. |

206 Staples
Baytown,Tx. 77520

Gentleman, August 2, 1995

I would like you to consider my comments on the proposed recreational 'opportunities' in the area of the 'proposed' Wallisville Lake Project.

First, let state what I feel qualifies me to comment with authority on this subject. I am a life-long resident of this area. I am an avid outdoorsman and both fish and duck hunt this area. I own a cabin near the mouth of the Trinity River and spend most of my recreational time on the river. Due to the coastal marsh enviornment of the Wallisville Project it is a poor choice for most 'passive' recreational activities.

From my experience, the lake will rarely be used by anyone other than fishermen or hunters. You must understand that to camp, hike, horseback ride, swim, or picnic on the edge of a Texas coastal marsh ranges from risky to hellish circumstances. In all but the coldest of weather(approx. 6-8 weeks a year),this area is hot, humid, and home to hordes of mosquitos, knats, flies, and fire ants. Have any of your experts ever spent a night outside down here? Ask your resident rangers how they like being outside after sunset! 1

As for hiking, add all of the above plus water moccasins, alligators, and nutria along a muddy path and I have to ask why would anyone consider this 'recreation.' Oh yes, we must not forget swimming. Who among you would care to hop in the dark turbid water with all the aforementioned vermin? (Note: the snakes and alligators present such a threat that we have to watch our dogs constantly, and the nutria routinely bite the dogs so severly that they can bleed to death before being sewn up.) You've ask for comments, I've given the truth. 2 3

In conclusion, if we the people or to have the overwhelmingly unpopular Wallisville Project forced on us by pork-barrel politics, please build a good boat ramp with restrooms and use the rest to retire the national debt ! 4

Sincerely, David L. O'Banion

RESPONSE TO COMMENTS

David L. O'Banion
206 Staples
Baytown, Texas 77520

| Comment No. | Response |
|---|---|
| 1 | Comment noted. Campers in the area will most likely be experienced nature lovers or else quickly learn to adapt to local conditions in order to survive. |
| 2 | Comment noted. |
| 3 | Comment noted. |
| 4 | Comment noted. |

TEXAS COMMITTEE ON NATURAL RESOURCES
601 WESTLAKE DRIVE
AUSTIN, TEXAS 78746
(512) 327-4119

MK 1/8

January 8, 1996

To: Galveston District, U.S. Army Corps of Engineers

Attn: James M. Kieslich, Chief of the Planning and Environmental Division

Fr: Janice Bezanson, Issues Coordinator
Fax 512-328-3399

TEXAS COMMITTEE ON NATURAL RESOURCES
601 WESTLAKE DRIVE
AUSTIN, TEXAS 78746
(512) 327-4119

January 8, 1996

COMMENTS ON THE DRAFT MASTER PLAN FOR WALLISVILLE RESERVOIR

Texas Committee on Natural Resources (TCONR) appreciates the opportunity to comment on the Draft Master Plan for Wallisville Reservoir.

According to the Draft Plan, Wallisville is authorized to provide for five purposes: navigation, salinity control, water supply, fish and wildlife enhancement, and recreation.

Use of the Trinity River for navigation is so minor as to make including it as a purpose highly dubious. With the exception of 1989 when the river was used to carry crushed limestone to the site of the I 10 bridge reconstruction, only a few tankers have used the Trinity River Channel. In some years there is no use at all. 1

Although the reservoir was first conceived as primarily for water supply, the only water to be "developed" under the current plan is freeing up the freshwater instream flow releases from Lake Livingston by creating a salinity barrier. This could be accomplished by a less expensive "balloon" type barrier. TCONR is concerned that, although it is the Corps' intent not to impound water for water supply storage, that this situation could change in the future. The Corps does not hold the diversion rights to water from the Trinity at Wallisville -- these are held by the City of Houston and Trinity River Authority. The Houston Water Master Plan recommends permanent impoundment of water at Wallisville as a water source for Houston and for small cities in the area that Houston supplies. Although Houston has never formally adopted the Master Plan, they do continue to use it as their planning document. Completing construction of the Wallisville dam could lead to eventual impoundment of water for storage -- with major environmental and economic impacts. 2

TCONR joins the widespread concern that eliminating the freshwater releases from Lake Livingston to prevent saltwater intrusion will have negative impacts on the Galveston Bay estuary system. The shrimp, commercial fisheries, and recreational uses of the Bay are an enormous economic resource for Texas citizens, making this concern critical for both environmental and economic 3

reasons. In addition, there is concern that the dam will prevent upstream travel of anadromous organisms dependent on that mobility, that it will impact marine organisms that use fresh and brackish marshes during certain stages of their life cycle, and that reduced sediment and nutrient flow will damage the Bay substrate and nutrient cycles. As a minimum, the Corps should delay construction on the dam until the instream flow study being conducted by Texas Parks and Wildlife Department and the Texas Water Development Board is completed.

The acreage already acquired by the Corps of Engineers is a high-quality fish and wildlife and recreational resource. TCONR commends the Corps for their plans to protect these lands and make them available for low-impact recreation, but we see no need for completing a $67 million structure to accomplish the fish and wildlife and recreational uses. 4

Salinity control is listed as the primary function of the Wallisville structure. Yet data seems to be lacking as to the necessity for salinity control and the frequency at which saltwater intrusion occurs. TCONR would like to see further studies done (over time) of the salinity impacts before the federal taxpayer spends an additional $31.5 million on this project. 5

Texas Parks and Wildlife Department opposes Wallisville because of its consequences on the natural resources of the lower Trinity and Galveston Bay estuary, Texas Natural Resource Conservation Commission has voiced concern that the project's environmental impacts have not been thoroughly examined, and numerous citizens' groups have expressed the opinion that Wallisville could have major environmental and economic impacts. TCONR opposes construction activities on the Wallisville Dam until the above issues and others raised by concerned citizens are resolved. We do not feel that the Draft Master Plan adequately addresses them. 6

There are many actions which the Corps could be taking while the above issues are being addressed. Current funding could go to removing obsolete protions of the west non-overflow dam and other structure currently blocking sediment, nutrient, and water flows. Recreational access and fish and wildlife enhancement plans could go forward. Studies could be conducted to resolve the many controversies surrounding Wallisville and to access lower-impact, lower-cost alternatives, including non-structural approaches, to accomplishing the purposes of the reservoir. 7

Comments on specific elements of the Draft Master Plan

The land purchased for Wallisville, now managed for fish and wildlife and recreation, is of very high quality as wildlife habitat and should be protected in as near as possible to its native state. Ecosystems should be allowed to proceed through their natural sucession and not be artificially managed to maintain an abundance of early-succesional species. 8

Ten thousand acres seems a very high number for the acres to be grazed by cattle. Much of the area is cypress swamp and other hardwood bottomland types, where cattle should be excluded. Even the upland grasslands and marsh communities can be negatively impacted by grazing, particularly if land managers fail to rest the vegetation communities at prescribed seasons. The Draft Master Plan gives no details, such as where there will be fencing to exclude cattle. TCONR urges that other management tools be used and that cattle grazing be eliminated or greatly reduced. We also recommend that if cattle are present, they be excluded from forested areas. 9

The Resource Objectives listed in Chapter 2 seem a bit sketchy. For example, managing vegetation or fish and wildlife to maintain its current state or enhance it is fine, but mention should also be made of restoration of disturbed areas. 10

With forested wetlands disappearing at a staggering rate, management of such a special wetland site to maintain native biodiversity is of paramount importance. Management decisions by the Corps or contractual arrangements between the Corps and other agencies should carefully spell out management strategies that maintain the area in as natural a state as possible while allowing low-impact recreational use. 11

RESPONSE TO COMMENTS

Janice Bezanson
Texas Committee on Natural Resources
601 Westlake Drive
Austin, Texas 78746

| Comment No. | Response |
|---|---|
| 1 | Comments relating to project design, authorized project operations and functions, coordination over environmental impacts, need for the Project, and other features handled under NEPA are not relevant to a Master Plan. Please refer to the Wallisville EIS and subsequent EA's for responses to project needs, functions, impacts, etc. |
| 2 | Please see the response to Comment No. 1 above. |
| 3 | Please see the response to Comment No. 1 above. |
| 4 | Please see the response to Comment No. 1 above. |
| 5 | Please see the response to Comment No. 1 above. |
| 6 | Please see the response to Comment No. 1 above. |
| 7 | Please see the response to Comment No. 1 above. |
| 8 | Comment noted. |
| 9 | Several options are being considered for land management in future revisions of the Master Plan. Please see responses to Comment No. 9, 12, 13, and 14 of the letter from Robert McFarlane. |
| 10 | Management plans will be reviewed and revised as needed during periodic updates of the Master Plan. |
| 11 | Please see the response to Comment No. 10 above. |

Dan McNamara
ATTORNEY AND COUNSELOR AT LAW
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512·477 1712 · FAX 477·3316

January 8, 1996

Department of the Army
Galveston District, Corps of Engineers
Coastal Planning Branch
Attention: PL-C
P.O. Box 1229
Galveston, Texas 77553-1229

Re: Wallisville Lake("Reservoir"), Texas/Draft Master Plan

Dear Corps.:

While it is indeed reassuring to see the Corps continue to take the initiative to downsize the Wallisville Reservoir from the 1962 version of 19,700 surface acres to the 1979 version of 5,600 surface acres to the current(1990 version) of 3,800 acre surface acres, the ironies, the lack of coordinated planning, the fiscal irresponsibility, and the potential problems associated with channeling, dredging and impounding the Trinity River at the Trinity delta, the major source of freshwater in-flows and nutrients for the Galveston-Trinity Bay Estuarine System, continue to haunt this flawed and dangerous Project in spite of the superficial luster that the Master Plan gives the Project. I do not mean to minimize the importance of the role of the Corps in mitigating the size and scope of the Project, but I believe that the Corps owes the tax-payers, Congress and the residents and users of the Galveston Bay System a more thorough and comprehensive analysis of the Project goals and impacts and a more creative and less intrusive response to achieving those goals. I believe that this is especially important in light of the Galveston Bay National Estuary Program and the Trinity River Flood Control Management Study - both federal programs that are profoundly connected to the Wallisville Project area. 1

Allow me to list some of my concerns with the Project and the Master Plan as follows:

* While the Project Purposes admits that the Project will no longer function as a reservoir for water storage and that the primary and original function of the Project is and has been to control salinity intrusion during drought conditions, no discussion has ever been given to non-structural means of accomplishing this goal. 2

* While the Corps has downsized the surface acre area of the Project, the local sponsors, TRA and the City of Houston, still maintain before the TNRCC that they are entitled to construct a 19,700 surface acre impoundment at the Project site in accordance with their Certificate of Adjudication granted to them in 1960. 3

* Although authorized almost 25 years prior to the Texas Legislature codifying the importance of freshwater in-flows for the health and maintenance of our coastal estuarine system, and although it has been over ten years since it has been law, and in spite of a five year planning process associated with GBNEP, no provisions or assurances have been made for ensuring sufficient in-flows for the maintenance of the Galveston Bay System as effected by the Project. 4

* The development of a Master Plan for Wallisville without consideration for the goals of GBNEP, the needs for the Galveston Bay System, the issue of flood control management for the Lower Trinity River and the issue of need and impact of channel dredging in Trinity Bay and the Trinity River show a lack of coordination and a lack of sound comprehensive approach to managing all of these federal programs and activities. 5

* In the face of the restated Project Purposes not being an impoundment for water supply, and with the likely ability to address obligations associated with the threat of salinity intrusion by non-structural means, the remaining project purposes are questionable indeed. Without the necessity of a dam, navigation locks are unnecessary; questionable dredging activities for sporadic barge traffic up the Trinity River exacerbates salt-water intrusion up the Trinity River; fish and wildlife enhancement associated with the Project is only a product of downsizing the Project from its original size - impacts from concrete embankments, channelization, increase in hydrological gradients in the river course, impeding sheet flow and the lack of addressing freshwater in-flows can hardly be seen as fish and wildlife enhancement, especially for the larger habitat area of the Galveston Bay System. 6

* Because the state of Texas is not designated under the CZMA, the Corps is not bound to address goals of the State for our coastal areas. Still, other than notification, their seems to be little coordination with either state or federal natural resource agencies to determine the needs of the Galveston bay System, the impacts of the Project or alternatives to the authorized Project. I would include TPWD, TxGLO, GBNEP, USFWS and the Natl. Marine Fisheries Service amongst these "neglected" agencies. 7

While I am prepared to address issues of operation and need in more depth, for purposes of comments associated with your Master Plan notice, I believe that what I have submitted is sufficient to alert you to my general concerns. I am certainly prepared to assist the Corps in exploring and resolving some of the issues I have raised. I believe that you would also find numerous entities, agencies and individuals, as well as within your own agency, the willingness and expertise to approach these matters as well. 8

I know that the Corps is already painfully aware of the cost of having to remediate past projects that while well intentioned have caused significant problems, such as Lake Okeechobee in Florida. The history of Wallisville underscores the mistakes and the costs that have already been made at this Project. We now have the opportunity to prevent rather than further exacerbate impacts associated with completing construction of the

Wallisville Dam. I respectfully encourage you to use those recently appropriated funds to remediate existing problems by removing the existing low-flow dams from the old project area and allow yourself and others the opportunity to explore a comprehensive and workable solution to the remaining issues confronting the Wallisville Project. Thank you for the opportunity to address you on these matters. 9

Sincerely yours,

Daniel G. McNamara, Jr.

RESPONSE TO COMMENTS

Dan McNamara
P.O. Box 50271
Austin, Texas 78763

| Comment No. | Response |
|---|---|
| 1 | Comment noted. |
| 2 | Comments relating to project design, authorized project operations and functions, coordination over environmental impacts, need for the Project, and other features handled under NEPA are not relevant to a Master Plan. Please refer to the Wallisville EIS and subsequent EA's for responses to project needs, functions, impacts, etc. |
| 3 | Please see the response to Comment No. 2 above. |
| 4 | Please see the response to Comment No. 2 above. |
| 5 | Please see the response to Comment No. 2 above. |
| 6 | Please see the response to Comment No. 2 above. |
| 7 | Please see the response to Comment No. 2 above. |
| 8 | Comment noted. However, the Master Plan is not the proper document to address these NEPA-related issues. The concerns you raise have already been addressed in previous NEPA documents. |
| 9 | Please see the response to Comment No. 2 above. |

# APPENDIX D

## Economics Guidelines

Table 6-29
Guidelines for Assigning Points for General Recreation

| Criteria | Judgement factors | | | | |
|---|---|---|---|---|---|
| (a) Recreation experience[1] | Two general activities[2] | Several general activities | Several general activities; one high quality value activity[3] | Several general activities; more than one high quality high activity | Numerous high quality value activities; some general activities |
| Total Points: 30<br>Point value: | 0-4 | 5-10 | 11-16 | 17-23 | 24-30 |
| (b) Availability of opportunity[4] | Several within 1 hr. travel time; a few within 30 min. travel time | Several within 1 hr. travel time; none within 30 min. travel time | One or two within 1 hr. time; none within 45 min. travel time | None within 1 hr. travel time | None within 2 hr. travel time |
| Total points: 18<br>Point value: | 0-3 | 4-6 | 7-10 | 11-14 | 15-18 |
| (c) Carrying capacity[5] | Minimum facility for development for public health and safety | Basic facility to conduct activity(ies) | Adequate facilities to conduct without deterioration of the resource or activity experience | Optimum facilities to conduct activity at site potential | Ultimate facilities to achieve intent of selected alternative |
| Total points: 14<br>Point value: | 0-2 | 3-5 | 6-8 | 9-11 | 12-14 |
| (d) Accessibility | Limited access by any means to site or within site | Fair access, poor quality roads to site; limited access within site | Fair access, fair road to site; fair access; good roads within site | Good access, good roads to site; fair access, good roads within site | Good access, high standard road to site; good access within site |
| Total points: 18<br>Point value: | 0-3 | 4-6 | 7-10 | 11-14 | 15-18 |
| (e) Environmental | Low esthetic factors[6] that that significantly lower quality[7] | Average esthetic quality; factors exist that lower quality to minor degree | Above average esthetic quality; any limiting factors can be reasonably rectified | High esthetic quality; no factors exist that lower quality | Outstanding esthetic quality; no factors exist that lower quality |
| Total points: 20<br>Point value: | 0-2 | 3-6 | 7-10 | 11-15 | 16-20 |

[1] Value for water-oriented activities should be adjusted if significant seasonal water level changes occur.
[2] General activities include those that are common to the region and that are usually of normal quality. This includes picnicking, camping, hiking, riding, cycling, and fishing and hunting of normal quality.
[3] High quality value activities include those that are not common to the region and/or Nation and that are usually of high quality.
[4] Likelihood of success at fishing and hunting.
[5] Value should be adjusted for overuse.
[6] Major esthetic qualities to be considered include geology and topography, water, and vegetation.
[7] Factors to be considered to lowering quality include air and water pollution, pests, poor climate, and unsightly adjacent areas.

REVISED TABLE 6-28 (FY 96)
Conversion of Points to Dollar Values
(See ER 1105-2-100, Chapter 6,
Section VIII, for Table 6-29 and 6-30)

| Point Values | General Recreation Values (1) | General Fishing& Hunting Values (1) | Specialized Fishing & Hunting Values (2) | Specialized Recreation Values Other Than Fishing & Hunting (2) |
|---|---|---|---|---|
| 0 | 2.50 | 3.67 | 17.55 | 10.04 |
| 10 | 2.92 | 4.07 | 17.99 | 10.88 |
| 20 | 3.37 | 4.45 | 18.44 | 11.70 |
| 30 | 3.93 | 4.84 | 18.91 | 12.54 |
| 40 | 4.52 | 5.34 | 19.35 | 13.38 |
| 50 | 5.38 | 5.87 | 21.13 | 15.07 |
| 60 | 5.80 | 6.39 | 22.93 | 16.97 |
| 70 | 6.25 | 6.88 | 24.74 | 20.08 |
| 80 | 6.67 | 7.16 | 26.54 | 23.42 |
| 90 | 7.11 | 7.42 | 28.31 | 26.77 |
| 100 | 7.53 | 7.49 | 30.12 | 30.12 |

(1) Points from Table 6-29
(2) Points from Table 6-30