DRAFT ENVIRONMENTAL ASSESSMENT

AQUATIC PLANT CONTROL PROGRAM
STATE OF TEXAS
INCORPORTATING ADDITIONAL WATER BODIES AND INVASIVE AQUATIC PLANTS INTO THE AQUATIC PLANT CONTROL PROGRAM OF TEXAS

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MARCH 16, 2006

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1.0 Introduction

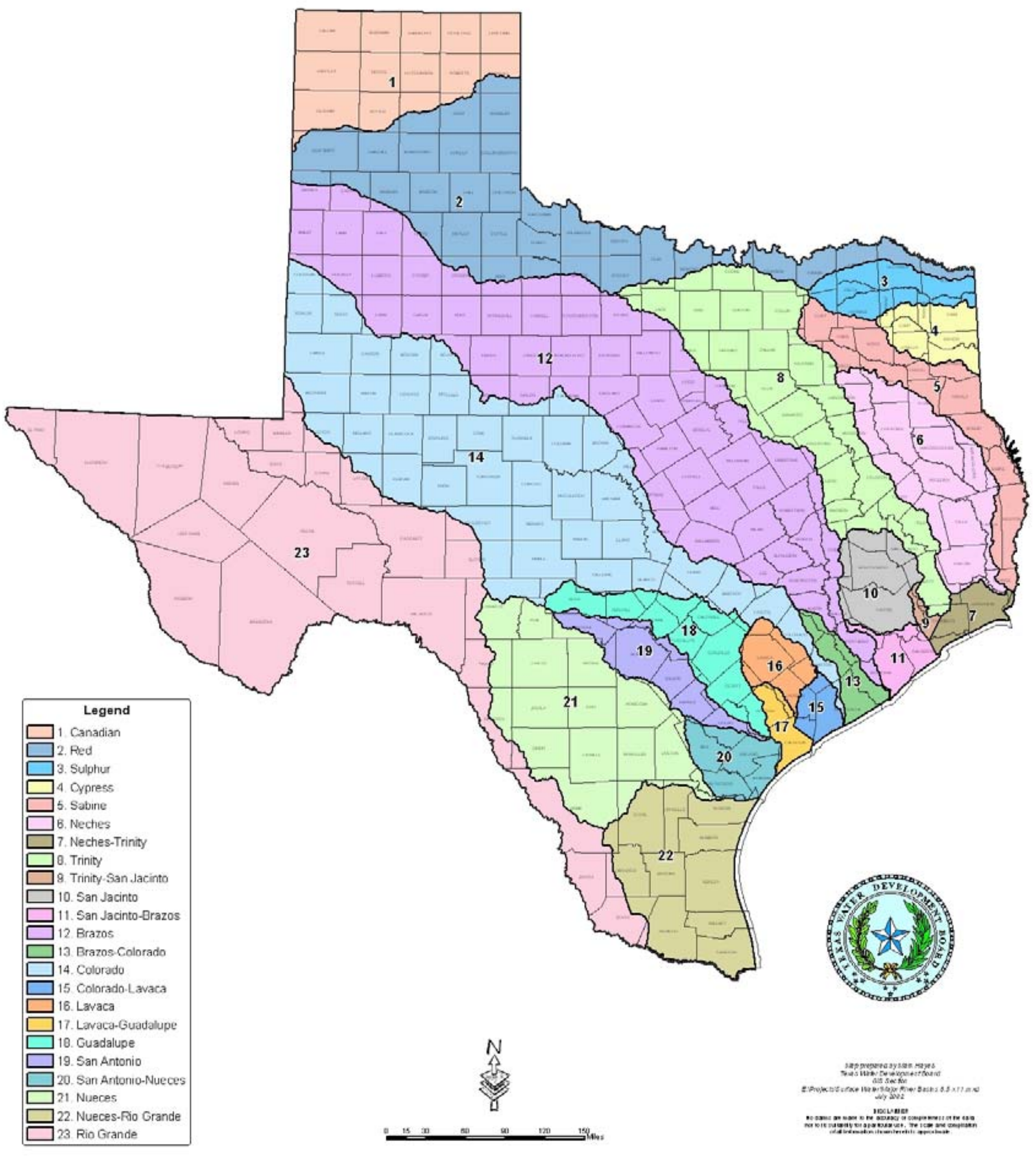
The purpose of this Environmental Assessment (EA) is to determine the environmental consequences of incorporating all 23 river basins of Texas into the U.S. Army Corps of Engineers (USACE) Aquatic Plant Control Program (APCP) of Texas for the control of 11 invasive aquatic plant species.

The APCP was authorized by Section 302 of Public Law 89-298 to provide for control and progressive eradication of waterhyacinth (*Eichhornia crassipes*), alligatorweed (*Alternanthera philoxeroides*), Eurasian milfoil (*Myriophyllum spicatum*), and other noxious aquatic vegetation from navigable waters, and for flood control, drainage, agriculture, fish and wildlife conservation, recreation, public health and related purposes. In addition, continued research for the development of the most effective, economical and environmentally friendly control measures is also included.

The APCP for the state of Texas is described in detail in the General Design Memorandum (GDM), dated September 1971, and in Supplement No.1 to the GDM, dated June 1985. The Final Environmental Statement for the statewide program was filed with the Council on Environmental Quality (CEQ) in November 1972 (USACE, 1972). It reflected coordination with various Federal, State and local agencies and involved concerned citizens and interested environmental, civic, and business groups. An EA and Finding of No Significant Impact (FONSI), was prepared for the inclusion of additional lakes into the APC Program of Texas in May 1991 (USACE, 1991). An EA was filed in July 1995 to include additional sites into the APCP (USACE, 1995*)*, and to include the control of hydrilla and Eurasian watermilfoil within 55 water bodies in Texas, with additional water bodies to be determined on a site-by-site basis. Treatment measures associated with this program are in compliance with applicable laws and regulations for aquatic plant control.

This EA will expand the range of control which will consist of a total of 11 invasive aquatic plants within all 23 river basins of Texas, which can be found in Figure 1 below. In addition to the three invasive aquatic plant species previously authorized under the APCP, the following 8 invasive aquatic plants will be included: hydrilla (*Hydrilla verticillata*), giant salvina (*Salvina molesta*), giant reed (*Arundo donax*), torpedo grass (*Panicum repens L.*), water spinach (*Lpomoea aquatica*), giant duckweed (*Spirodela punctata*), paperbark (*Melaleuca quinquenervia*) and watertrumpet (*Cryptocoryne beckettii*). The control of these invasive aquatic plants will be authorized in all 23 river basins of Texas. The Texas Parks and Wildlife Department (TPWD) will administer control methods set forth in this EA before the infestation of these aquatic plants reaches an uncontrollable level.

Figure 1. The River Basins of Texas



Source: Map Prepared by Mark Hayes, Texas Water Development Board, GIS Section; http://www.twdb.state.tx.us/mapping/maps/jpg/mrb_8x11.jpg

2.0 Purpose and Need for Proposed Action

The proposed action involves the control of invasive aquatic plants in all 23 river basins of Texas. Table 1 presents the entire list of invasive aquatic plants that will be controlled and eradicated under the APCP of Texas.

Table 1. Plants Authorized for Control Under the APCP of Texas

Scientific Name	**Common Name**
Hydrilla verticillata	hydrilla
Myriophyllum spicatum	eurasian watermilfoil
Salvina molesta	giant salvinia
Arundo donax	giant reed
Panicum repens L.	torpedo grass
Lpomoea aquatica	water spinach
Spirodela punctata	giant duckweed
Melaleuca quinquenervia	paperbark
Cryptocoryne beckettii.	watertrumpet
Alternanthera philoxeroides	alligatorweed
Eichhornia crassipes	waterhyacinth

Control of these invasive plants will maintain access to boating, fishing, and swimming areas where water resource activities are restricted or may become restricted in the near future because of unchecked growth of invasive aquatic vegetation. In addition to the impacts on recreational benefits, invasive aquatic plants can also have negative impacts on human life and wildlife. All 23 river basins are included in this EA because invasive aquatic plants have either been found in the watershed or in small quantities in the water bodies where a problem is anticipated in the near future.

For example, the state of Texas has experienced problems with hydrilla. It has spread to at least 95 water bodies, and its rapid growth creates a variety of problems such as reduced plant and animal diversity (Barnett and Schneider 1974), changes in water quality (Bowes et al. 1979), and reduced flow rates in canals and rivers. By restricting water flow, hydrilla can artificially raise water levels, which can increase the risk of flooding during heavy rain. Also, a reduction in the flow rates can significantly affect distribution of water for irrigation, as well as to municipalities (Chilton 2002).

Infestations generally begin around boat launching areas where plant fragments are accidentally introduced by boats from other infected areas. These fragments become attached to the soil and form new plant colonies. Once established, the plant may then grow underground propagules, which sprout when the plant is stressed. When the extent and location of the infestation restricts access to a lake or, otherwise inhibits use of a public water body, the infestation is considered to be at a problem level.

This EA will allow the state of Texas to treat these invasive plants in all 23 river basins as necessary in order to maintain a proactive approach with invasive aquatic plant control. Invasive aquatic plants grow at such a rapid rate that if treatment is not applied soon after the discovery of the infestation, the results can be disastrous.

The following are the plants to be added to the APCP:

Hydrilla (*Hydrilla verticillata*) grows submersed, and are mostly perennial but sometimes annual, and have horizontal stems in the substrate forming tubers under certain conditions. Stems are ascending and usually are sparsely branched until the plants near the water surface and then become profusely branched. Hydrilla has also shown the ability to out compete the native plant species that offer valuable fish and wildlife habitat. Infestations generally begin around boat launching areas where plant fragments are accidentally introduced by boats from other infected areas. Management methods include chemical treatment and mechanical harvesting.

Giant Salvinia *(Salvina molesta),* commonly known as kariba weed, is a free floating fern native to southeastern Brazil that has rapidly spread to other tropical countries around the world as well as the United States. It has been found in 10 states including Texas and has become extremely problematic. Based on its rapid growth rate and dense growth habit, this plant has the potential to restrict irrigation systems and water bodies which would reduce water supply, as well as affect navigation. The thick mats that are formed reduce oxygen content and degrade water quality for aquatic organisms. Giant salvinia can be transmitted over land by anything entering infested waters (USGS,2001). Management methods include chemical treatment and mechanical harvesting.

Giant Reed *(Arundo donax),* also known as wild cane, is described as a tall perennial grass that can grow to over twenty feet in height. This plant is native to countries surrounding the Mediterranean Sea. It was first introduced to the United States in the 1800's as an ornamental plant. Giant reed can grow in a wide range of conditions from moist to well-drained soils to those with a water table at or near the surface. It is found along roadsides, in ditches and along banks of streams and rivers. Giant reed is considered threatening because it can outcompete and suppress native vegetation in wetland habitats, interfere with flood control and increase wild fire potential. This plant is also difficult to control due to its vigorous growth and ability to survive in a variety of environmental conditions. Management methods include chemical treatment and mechanical harvesting. Systemic herbicides and prescribed burning are also possible methods for controlling this plant.

Torpedo Grass *(Panicum repens L.),* is a perennial grass that frequently forms dense colonies. The genus *Panicum* is the largest in the grass family, and can be difficult to identify. Torpedo grass grows in moist, often sandy soil along beaches and dunes, and marshy shorelines of lakes and ponds. The rhizomes often extend several feet out into the water, and the plant frequently forms dense floating mats (Tarver et al. 1986). These mats impede water flow in ditches and canals and restrict recreational use of shoreline areas of lakes and ponds.

Water-Spinach *(Lpomoea aquatica)* is described as a creeping, herbaceous vine and is recognized as a member of the “morning-glory” family. Due to its aggressive growth rate, water-spinach has great potential to invade moist cultivated areas, such as rice fields, and wet areas such as natural lakes, rivers, drainage canals, and ditches. A single water-spinach plant can branch profusely with stems growing to over 70 feet long. This fast growth rate creates impenetrable masses of tangled vegetation and represents a significant threat to flood damage reduction projects and native plant habitats.

Paperbark *(Melaleuca quinquenervia),* also called Melaleuca, is described as a large evergreen tree about *65* feet in height with brownish white, many-layered papery bark. This tree is native to Australia and Malaysia. Melaleuca trees grow quickly, typically 3 to 6 feet per year in disturbed wet pine flatwoods, marshes and swamps. This tree tolerates most subtropical ecosystems, preferring wet to intermittently wet sites. Melaleuca forms dense stands resulting in the almost total displacement of native plants that are important to wildlife. Herbicides are usually needed for extensive infestations and mature paperbark trees. The Australian snout beetle is being evaluated as a biological control by the U.S. Department of Agriculture. The beetles are specific to Melaleuca and feed on its shoots, reducing the plants ability to reproduce.

Giant Duckweed *(Spirodela punctata),* also called dotted duckweed, is a tiny free-floating aquatic plant compromised of individual fronds that produce fine roots. Fronds are narrowly egg-shaped to slightly kidney-shaped and intensely green in color. The roots number from 2 to 4 and can range up to 7. This plant is native to Australia and Southeast Asia. Noted by many as expanding in range in North America, most populations are overlooked because of its superficial resemblance to native duckweeds. Giant duckweed is found in small, quiet, nutrient-rich waters such as ponds, ditches, swamps, and backwaters (USGS 1999).

Watertrumpet *(Cryptocoryne beckettii)* is native to Sri Lanka, India (Muhlberg 1982). It is a valued aquarium plant collected in the wild and widely exported (Nicolson 1987). Watertrumpet was collected in 1996 in the San Marcos River in Hays County, Texas. The upper San Marcos River supports the greatest known diversity of aquatic organisms in Texas and provides critical habitat for endangered species including the fountain darter *(Etheostoma fonticola),* the San Marcos blind salamander *(Typhiomolge rathbuni)* and Texas wildrice *(Zizania texana)* (Doyle 2001). Watertrumpet poses a threat to the endangered rice by occupying habitat that might otherwise be re-colonized by the rebounding *Z. texana* (Doyle 2001).

3.0 Alternatives Considered

Alternatives considered for the control of invasive aquatic plants includes the no-action alternatives and various techniques employing biological, chemical, mechanical, and/or environmental manipulation. These treatment measures are discussed in detail in Supplement No. 1 to the General Design Memorandum for this project. Also contained in Supplement No. 1 is the plan of operations for the APCP and details concerning the work accomplished by TPWD, including field surveys and work, personnel requirements, federal supervision and inspections, and equipment used as part of the APCP.

Each year hundreds of acres of invasive aquatic plants are treated throughout Texas. In 2002 there were eight water bodies and 760 acres that were treated. In 2003, eleven water bodies and 1,500 acres were treated. In 2004, there were six water bodies and 650 acres treated for invasive aquatic plants.

3.1 No Action

The “no action” alternative would preclude Federal participation in the APCP within the 23 River Basins of Texas and would preclude participation to control additional invasive aquatic plants proposed above.

In the past, localized efforts resulted in haphazard control of invasive aquatic vegetation. Due to financial feasibility, localized efforts treated problem areas only, instead of the entire community of species throughout a water body. This effort does not eliminate the plant community. After the herbicide is diluted, the community repopulates itself. The APCP is successful in eliminating the spread of infestations and maintaining recreational resources on a water body or water shed for the public. The no action alternative would allow the continuation of invasive aquatic plants to out compete native habitat, and negatively impact aquatic recreation and flood damage reduction projects. Therefore, this alternative is not the environmentally preferred alternative.

3.2 Chemical Control

This method consists of applying herbicides in areas that are overgrown with invasive aquatic plants. Control of submersed species requires application of the herbicides directly into the water. The use of slow release carriers and restricting the points of application effectively kills the target species with minimal effects to the water. Due to the fact that the herbicides do not have a long residence time in water, persisting for approximately 1 to 3 weeks (WSSA, 1983), and that the herbicides do not have a high bioaccumulation factor (Westerdahl and Getsinger, 1988), the herbicides are described in literature as generally safe or non toxic to wildlife and fish (Westerdahl and Getsinger,1988 and WSSA, 1983).

Careful selection of herbicide concentration level and application method is necessary to ensure safety for the applicator and non-target organisms. Herbicides used in the APCP are registered with, and have labels approved by, the U.S Environmental Protection Agency. The regulations pertaining to areas and concentrations at which specific chemicals can be applied will be followed for all APCP operations

The chemicals used by TPWD under the APCP are as follows:

2, 4-D. 2, 4-dichlorophenoxy, acetic acid. Formulations of this chemical that have been used on waterhyacinth and hydrilla are Weeder 64 (38.9% acid equivalent (ae), dimethylamine or n-alkylamine salt of 2,4-D, liquid). Applications are liquid, granular, and ester formulations. The maximum water concentrations should not exceed 0.1 milligrams per liter (mg/l) parts per million (ppm). Additionally the use of treated irrigation water should be suspended for three weeks unless an approved assay shows water does not contain more than 0.1 mg/l (ppm) 2, 4-D acid. 2, 4-D will be restricted to liquid formulations that are registered for use solely on floating (e.g. waterhyacinth) and emergent vegetation control. 2, 4-D should not be sprayed during high wind conditions to minimize spray drift to nontarget vegetation.

Endothall. 7-oxabicyclo [2,2,1] heptane-2, 3-dicarboxylic acid. Formulations of this chemical that have been used on hydrilla are AQUATHOL K (40.3% active ingredient (ai), dipotassium salt of endothall, liquid). Applications are liquid and granules. The recommended water concentration for quiescent water is 0.5 to 2.5 mg/l. The concentration of Endothall is restricted to no more than 1 mg/l within a maxium of 10% of the water body.

Fluridone. 1-methyl-3-ph enyl-5-{-3(trifluoromethyl)phenyl] -4(1~)-pyridinone. The formulation of this chemical that has been used on hydrilla is SONAR SRP *(5%* ai, fluridone, slow-release pellet). Applications are in the form of liquid and pellets. The use of pellets are restricted to quiescent lakes and ponds, with little water movement. There is no specification for maximum water concentration, however, the initial water concentration of 0.1 mg/l is recommended. Floridone use should not be applied within 0.25 mile of any potable water intake.

Glyphosate. N-(phosphonomethyl)glycine. The formulation for this chemical that has been used on waterhyacinth is RODEO (53.5% ai, isopropylamine salt of glyphosate, liquid). Applications are in the form of a liquid. There is no specification for maximum water concentration and it is approved for use at all aquatic sites. The recommended concentration is 0.2 mg/l. Glyphosate should not be applied within 0.5 mile upstream of potable water intakes.

Additional information about these chemicals can be found at http://libweb.wes.army.mil/Archimages/9863.PDF.

3.3 Mechanical Control

Mechanical control involves cutting aquatic vegetation from 3 to 8 feet below the water surface and removing the cut vegetation from the water. There are several types of mechanical harvesters, ranging from large units which both cut and remove the plants from the water to small cutter boats, which require manual pickup operations. Because some plants are spread by fragmentation, mechanical control is generally limited to sites in a closed system where infestation into new areas would not be a problem.

3.4 Biological Control

This method uses biological agents to control target species. Generally, a host-specific organism is introduced to an area to stress the problem aquatic species. Plant pathogens and insects, which are host-specific, are safe for the applicator and the environment, although herbivorous fish, snails, or other animals may not be selective. Even though biological control may be the most economical and the least environmentally disruptive control method available, no biological control is possible on a state-wide basis until it has been quarantined, tested for possible effects, and approved for use. In addition, triploid grass carp will not be funded by USACE Galveston District as a means of biological control under the APCP of Texas.

3.5 Environmental Manipulation

The common method of environmental manipulation to control invasive aquatic plants is water level fluctuation, a common practice in fishery management. The water is lowered, leaving submersed plants to desiccate in exposed areas. Only those portions of plants exposed above the soil are affected by this treatment. Water level manipulation is infeasible in areas where the water level cannot be regulated because of physical or political considerations.

Another environmental manipulation technique is the use of bottom screens. By installing light filtering material, sunlight penetration is decreased and the growth of submersed plants is curtailed. However, screening is feasible only in calm waters because bottom screens can be dislodged by the turbulence created in boat launching areas.

3.6 Recommended Plan

The recommended alternative, within this EA, to control the eleven invasive aquatic plants within the 23 river basins of Texas is a combination of environmentally sensitive control methods, with consideration for cost and effectiveness. After considering the available alternatives, it was concluded that the recommended plan would obtain the most effective results in the shortest time with the least detrimental effect on the environment.

4.0 Affected Environment

4.1 General Environmental Setting

The invasive aquatic plants identified for control in Table 1 in this EA are found throughout Texas and will be controlled based on the level of infestation, which will be determined in coordination with the TPWD. The 23 river basins that may be treated for the control of these plants were previously characterized in the 1972 Environmental Impact Statement (EIS) (USACE 1972), and the 1991 & 1995 EA's (USACE 1991 &1995*).* Figure 1 shows the 23 river basins of Texas.

Aquatic vegetation occurs naturally in most inland water bodies and provides beneficial functions and values for fish and wildlife and their respective habitats. Aquatic vegetation provides protection from predators and can act as feeding and spawning areas for certain species. However, under certain conditions, some species of non-native aquatic plants out compete native species and are considered invasive aquatic plants. Generally these invasive aquatic plants are introduced into the United States from other countries by ornamental plant trade, ballast water and bird migration. The proliferation of these plants results from the lack of natural predators or diseases that reduce their growth rate. The invasive aquatic plants listed previously in Table 1 are non-native aquatic plants. If these invasive aquatic plants are not controlled or eliminated in Texas they could inhibit economic growth, aquatic recreation, water supply and fish and wildlife resources.

4.1.1 Climate

According to Orton (1969), much of Texas lies in a warm-temperature subtropical zone. Proximity to the Gulf of Mexico, a persistent southerly and southeasterly flow of warm tropical maritime air into Texas, and adequate rainfall, all combine to produce a humid subtropical climate with hot summers across the eastern third of the state. Since the gulf moisture supply gradually decreases westward and is cut off more frequently during the colder months by intrusions of drier polar air from the north and west, central Texas has a subtropical climate with dry winters and humid summers. This region is semi-arid. As the distance from the gulf increases westward, the summer moisture supply continues to decrease gradually, producing subtropical steppe climate across a broad section along the Rio Grande Valley that extends as far west as the Pecos Valley.

Rainfall in Texas is not evenly distributed over the state and varies greatly from year to year. Average annual rainfall along the Louisiana border exceeds 56 inches and is less than 8 inches in the western extremity of the state. Rains along the Edwards Plateau and in north central and south central Texas occur most frequently in the spring. Rainfall in most of southern Texas, the Lower Rio Grande Valley, and in the coastal section peaks in September with a secondary peak in May. Surges of cold air from the north are frequent from November through March. These cold fronts are fast moving and are followed by rapid warming, resulting in frequent and pronounced temperature changes from day to day, and sometimes from hour to hour during the colder months of the year. Extended periods of subfreezing temperatures are rare. In summer, the temperature contrast is much less pronounced from north to south, with daily highs generally in the 90's. August is the hottest month of the year.

4.1.2 Geology

As described in the Texas Almanac (DMN1991), Precambrian rocks, which formed over 600 million years ago, underlie all of Texas. Over geologic time, the state was inundated by shallow seas several times, plate tectonics with collisions and separations formed mountains and faulted basins, and there was extensive seaward building by broad deltas, marshy lagoons, sandy barrier islands, and embayments, forming coastal plains under the same processes at work today. During the latter part of the Cenozoic Era, a great Ice Age occurred. Although the glaciers of this Ice Age never reached Texas, the state's climate and sea level underwent major changes with each period of glacial advance and retreat. Sea level during times of glacial advance was 300 to 450 feet lower than during the warmer interglacial periods. Approximately 3,000 years ago, sea level reached its modern position, and the modern rivers, deltas, lagoons, beaches, and barrier islands that we know as coastal Texas have formed since that time.

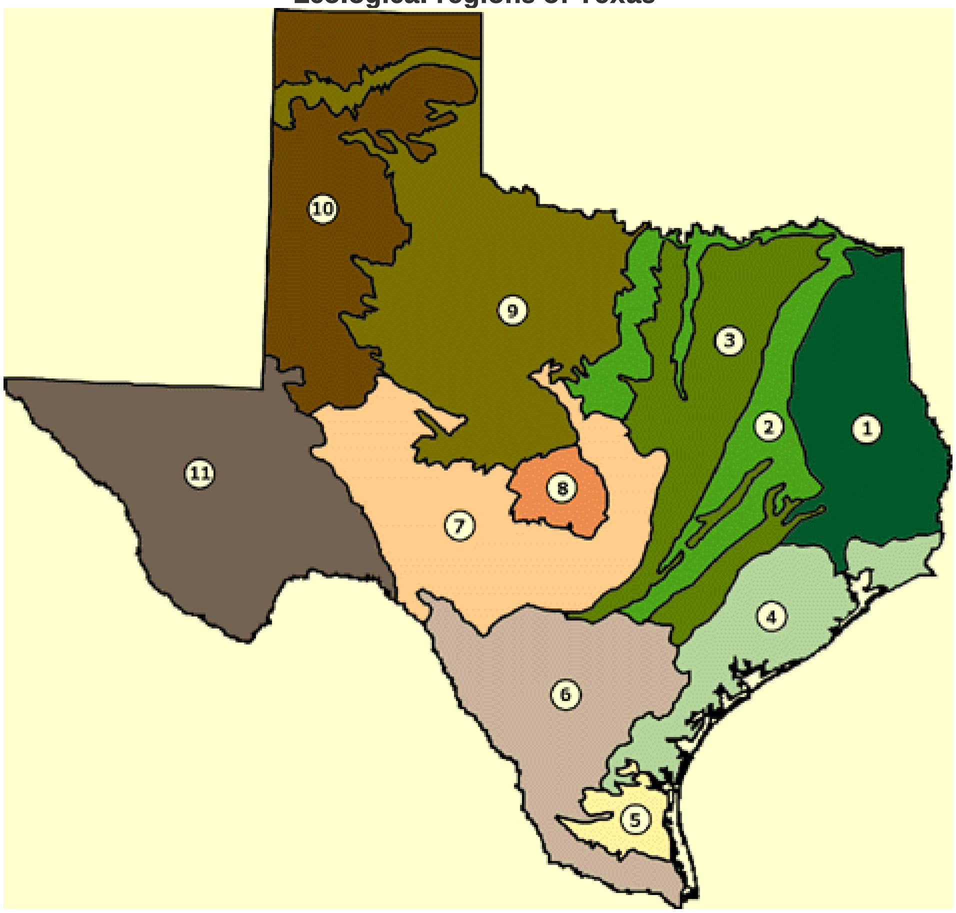
4.2 Biological Resources

Terrestrial Habitat. There are 11 different ecological regions in Texas that account for the climatic and geographic diversity. The regions range from the forests of East Texas to the deserts of West Texas and from the grassy plains of North Texas to the semi-arid brushlands of South Texas. Figure 2 shown below illustrates the 11 ecological regions of Texas which are:

Piney Woods, Oak Woods & Prairies, Blackland Prairies, Gulf Coast Prairies & Marshes, Coastal Sand Plains, South Texas Brush Country, Edwards Plateau, Llano Uplift, Rolling Plains, High Plains, and Trans Pecos (TPWD 1997) .

Figure 2

Ecological regions of Texas



Source: Texas Parks and Wildlife Department. Texas Outdoor Recreation Plan, 1995 (1997), 38.

1) The Piney Woods region is located in eastern Texas, with a large amount of the commercial timber in Texas being produced in this region. The soils of the region are characterized as deep loamy or sandy soils. The majority of national forests and other forestland located in Texas are found in this region, as is Texas's only natural lake, Caddo Lake. Dogwoods and red and white oaks are plentiful throughout the area. Though rapidly diminishing, the bottomland hardwood forests of oak-hickory, elm, sweetgum, sugarberry, and ash—the most diverse and richest wildlife habitats left in Texas—are located in the piney woods (TPWD 1997).

2) The Oak Woods and Prairies region consists of an area that can be divided into two sections, with one section to the east of the Blackland Prairie and the other to the west. The bottomland soils range from sandy loam to clay, while the prairies have sandy loam or sands. Flora include post oaks, oak-hickory forest, plateau live oak, and tallgrass and mid-grass prairies. Most of the

flora and fauna have ranges that extend northward into the Great Plains or eastward into the forests. Cattle ranching is a major agricultural industry in parts of the region (TPWD 1997).

3) The Blackland Prairie region is named for the rich, deep, fertile black soils that once supported the original tallgrass prairie communities. The grassland communities that make these prairies unique are, the big bluestem, little bluestem, switchgrass, and sideoats and associated herbaceous flora. Agriculture and development have caused this region to be extensively cultivated, and due to land-use change, the region now supports crop production and cattle ranching (TPWD 1997).

4) The Gulf Coast Prairies and Marshes region borders the Gulf of Mexico from the Sabine River to Corpus Christi Bay. The soils of the area range from acidic sands to sandy loams, with clays occurring in the river bottoms. The flora include tallgrasss and mid-grass prairies, cordgrass marshes, mesquite, and acacia. This region includes the barrier islands that protect the coastline from adverse weather conditions such as high wind and waves. The marshes along the bays and estuaries are important habitat for estuarine and marine species including finfish and shellfish. Rare and near-extinct plants and animals include the slender rush-pea, Attwater's prairie chicken, and the ocelot (TPWD 1997).

5) The Coastal Sand Plains region can be described as grasslands with coastal oak motts, mesquite granjeno, and salt marshes. The Laguna Madre is adjacent to the coastal counties of this region, and from Corpus Christi to Port Isabel. The Laguna Madre is the only coastal, hypersaline lagoon system on the North American continent and one of only three in the world. This is an extremely rich habitat and the breeding ground for most of the shrimp caught in the Gulf of Mexico (TPWD 1997).

6) The South Texas Brush Country region that was once covered with open grasslands and scattered with trees is now considered shrubland due to overgrazing. Today the area is characterized by thorny shrubs (such as mesquite, acacia, and prickly pear) and patches of palms and subtropical woodlands and riparian corridors. It’s biologically diverse habitat is to many wild and rare species of plants and animals, including the ocelot and jaguarundi. The natural resources of this region, contribute to the local economy, where bird watching and game hunting have become a source of revenue for the region (TPWD 1997).

7) The Edwards Plateau region is dominated by limestone terrain but includes a wide variety of soil types, topography, and ecological conditions. Plateau live oak savanna and other oak woodlands and limestone glades occur throughout this region. Ranching is the primary agricultural industry, but the natural beauty and opportunities for wildlife viewing and hunting have created a growing tourist industry in the region as well. The Balcones Escarpment—marked by a sharp topographic relief along the Balcones Fault Zone—borders the southeastern edge of the region and marks the transition zone between the plateau and the plains country on the south and east. The Balcones Escarpment runs from Del Rio to San Antonio and then northeast through Austin (TPWD 1997).

8) The Llano Uplift region is known as the central mineral region and is characterized by large granite domes like Enchanted Rock in Gillespie County. The area is surrounded by the Edwards Plateau and provides for a unique geological formation. The vegetation consists of oak-hickory,

oak juniper, mesquite, and grasslands. Ranching is the dominant agricultural industry, and tourism is emerging as an important economic activity for the region (TPWD 1997).

9) The Rolling Plains region is located in North-Central Texas and this area, along with the High Plains, is the southern end of the Great Plains of the central United States. Four Texas rivers run through the Rolling Plains: the Canadian, the Colorado, the Concho, and the Red. The soils are soft prairie sands and clays, and flora include juniper woodlands and prairie mid-grasses. Crop and livestock production are the major agricultural industries of this region (TPWD 1997).

10) The High Plains region was once called the Llano Estacado, or Staked Plains, by the early Spaniards. Like the Rolling Plains, the High Plains is the southern extension of the Great Plains of the central United States. This region is home to the sandhill crane, the kit fox, and the lesser prairie chicken, as well as prairie dogs and coyotes. The flora include blue gama and buffalo grass and cottonwoods and willows are found along the rivers and tributaries. Mesquite, sandsage, and Harvard shin oak also occur in this region. Cotton farming and cattle ranching are the major agricultural industries (TPWD 1997).

11) The Trans-Pecos region is the northern portion of the Chihuahua desert. This region is considered to be the most complex region of the state, with plateaus, desert valleys, and wooded mountains that are home to many rare species. The only true mountain ranges in Texas are in the Trans-Pecos: the Guadalupe, Franklin, Chisos, and Davis ranges. The flora of the region include desert scrub, such as the creosote bush, desert grasslands, pinyon-oak juniper woodlands, yuccas, and agaves. The Rio Grande River creates the region's southern border, separating Texas from Mexico (TPWD 1997).

Wildlife. According to the Texas Almanac (DMN, 1991), the Texas Ornithological Society has documented 570 species of birds in Texas and acknowledges that another 34 species might be in the state. Of this number a total of 485 species of birds have been recorded from the Lower Rio Grande Valley. Each region has its own distinct bird life, in both seasonal visitors and year-round residents. One reason for this diversity is that Texas spans the division between species of the eastern United States and those of the western United States. In addition to the birds that nest in the state, a great many other species migrate through in the spring and fall. All species of North American warblers have been seen during the migrations and numerous species of waterfowl follow the Central Flyway through Texas.

Essential Fish Habitat

Essential Fish Habitat (EFH) is defined by the Gulf of Mexico Fishery Management Council (GMFMC) as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Detailed information on red drum, shrimp, and other Federally managed fisheries and their EFH is provided in the 1998 amendment of the Fishery Management Plans for the Gulf of Mexico prepared by the GMFMC. The 1998 EFH amendment was prepared as required by the Magnuson-Stevens Fishery Conservation and Management Act as amended (MSFCMA) (P.L. 104 – 297).

River basins within the coastal region do support fisheries and their prey species as indicated in the Magnuson-Stevens Fishery Conservation and Management Act. Those species under federal management exist in saline or brackish water environments.

4.3 Threatened and Endangered Species

Threatened and Endangered species that exist throughout the entire State of Texas are presented in Table 2.

Table 2
Threatened and Endangered Species of Potential Occurrence in the state of Texas

Common Name	Scientific Name	FWS
PLANTS		
Sand-verbena, large fruit	*Abronia macrocarpa*	E
Ambrosia, south Texas	*Ambrosia cheiranthifolia*	E
Cactus, Tobusch fishhook	*Ancistrocactus tobuschi*	E
Cactus, star	*Astrophytum asterias*	E
Ayenia, Texas	*Ayenia limtaris*	E
Poppy-mallow, Texas	*Calirhoe scabriuscula*	E
Cactus, Nellie cory	*Coryphantha minima*	E
Cory cactus, bunched	*Coryphantha ramillosa*	T
Cactus, Sneed pincushion	*Coryphantha sneedii*	E
Cat's -eye, Terlingua Creek	*Cryptatha crassipes*	E
Cactus, Chisos Mountain hedgehog	*Echinocereus chisoensis*	T
Cactus, black lace	*Echinocereus reichenbachii*	E
Pitaya, Davis' green	*Echinocereus viriduirus*	E
Cactus, Lloyd's Mariposa	*Echinomastus mariposensis*	T
Frankenia, Johnston's	*Frankenia johnstonii*	E
Sunflower, Pecos	*Helianthus paradoxus*	T
Rush-pea, slender	*Hoffmannseggia tenella*	E
Dawn-Flower, Texas prairie	*Hymenoxys texana*	E
Bladderpod, white	*Lesguerdella pallida*	E
Bladderpod, Zapata	*Lesguerdella thamnophila*	E
Manioc, Walker's	*Manihot wallcerae*	E
Phlox, Texas trailing	*Phlox nivalis spp. Texensis*	E
Pondweed, Little Aguja	*Potamogeton clystocarpus*	E
Oak, Hinckley	*Quercus hinckleyi*	T
Ladies'-tresses, Navasota	*Spiranthes parksii*	E
Snowbells, Texas	*Styrax texanus*	E
Dogweed, ashy	*Thymophylla tephroleuca*	E
Wild-rice, Texas	*Zizania texana*	E
ANIMALS		
Alligator, American	*Alligator mississippiensis*	T
Amphipod, Peck's cave	*Stygobromus pecki*	E
Bat, Mexican long-nosed	*Leptonycteris nivalis*	E
Bear, American black	*Ursus americanus*	T
Bear, Louisiana black	*Ursus americanus luteolus*	T
Beetle, Coffin Cave mold	*Batrisodes texanus*	E
Beetle, Comal Springs dryopid	*Stygoparnus comalensis*	E
Beetle, Coma! Springs riffle	*Heterelmis comalensis*	E
Beetle, Helotes mold	*Batrisodes venyivi*	E
Beetle, Kretschmarr Cave mold	*Texamaurops reddelli*	E
Beetle, Tooth Cave ground	*Rhadine Persephone*	E
Crane, whooping	*Grus Americana*	E
Curlew, Eskimo	*Numenius borealis*	E
Darter, fountain	*Btheostoma fonticola*	E
Eagle, bald	*Haliaeetus leucocephalus*	T

Common Name	Scientific Name	FWS
Falcon, northern aplomado	*Falco femoralis septentrionalis*	E
Flycatcher, southwestern willow	*Empidonax trailli extimus*	E
Gambusia, Big Bend	*Gambusia gaigei*	E
Gambusia, Clear Creek	*Gambusia heterochir*	E
Gambusia, Pecos	*Gambusia nobilis*	E
Gambusia, San Marcos	*Gambusia georgei*	E
Ground beetle, (unnamed)	*Rhadine exilis*	E
Ground beetle, (unnamed)	*Rhadine infernalis*	E
Harvestman, Bee Creek Cave	*Texella reddelli*	E
Harvestman, Bone Cave	*Texella reyesi*	E
Harvestman, Cokendolpher Cave	*Texella cokendolpheri*	E
Jaguar	*Panthera onca*	E
Jaguarundi, Gulf Coast	*Herpailurus yagouaroundi cacomitli*	E
Meshweaver, Braken Bat Cave	*Cicurina venii*	E
Meshweaver, Canyon Bat Cave	*Cicurina vespera*	E
Meshweaver, Madla's Cave	*Cicurina madla*	E
Meshweaver, Robber Baron Cave	*Cicurina baronia*	E
Minnow, Devils River	*Dionda diaboli*	T
Minnow, Rio Grande silvery	*Hybognathus amarus*	E
Ocelot	*Leopardus pardalis*	E
Owl, Mexican spotted	*Strix occidentalis lucida*	T
Pelican, brown	*Pelecanus occidentalis*	E
Plover, piping	*Charadrius meslodus*	T
Prairie-chicken, Attwater's greater	*Tympanuchus cupido attwateri*	E
Pseudoscorpion, Tooth Cave	*Tartarocreagris texana*	E
Pupfish, Comanche Springs	*Cyprinodon elegans*	E
Pupfish, Leon Springs	*Cyprinodon bovines*	E
Salamander, Barton Springs	*Burycea sosorum*	E
Salamander, San Marcos	*Eurycea nana*	T
Salamander, Texas blind	*Typhiomolge rathbuni*	E
Sea turtle, green	*Chelonia mydas*	T
Sea turtle, hawksbill	*Eretmochelys imbricata*	E
Sea turtle, Kemp's ridley	*Lepidochelys kempii*	E
Sea turtle, leatherback	*Demochelys*	E
Sea turtle, loggerhead	*Caretta caretta*	T
Shiner, Arkansas River	*Notropis girardi*	T
Snake, Concho water	*Nerodia paucimaculata*	T
Spider, Canyon Bat Cave	*Neoleptoneta microps*	E
Spider, Tooth Cave	*Neoleptoneta myopica*	E
Tern, least	*Sterna antillarum*	E
Toad, Houston	*Bufo houstonensis*	E
Vireo, black-capped	*Vireo atricapilla*	E
Warbler, golden-cheeked	*Dendroica chrysoparia*	E
Whale, finback	*Balaenoptera physalus*	E
Whale, humpback	*Megaptera novaeangliae*	E
Wolf, gray	*Canis lupus*	E
Woodpecker, red-cockaded	*Picoides borealis*	E

Source: USFWS, 2006.

Endangered Species concerns have been addressed for the control of water hyacinth and alligator weed in all river basins, and the control of hydrilla and Eurasian watermilfoil for select water bodies in the previous EA's (USACE, 1985, 1989, 1991, 1995).

Most of the listed species are unlikely to occur in the areas of proposed treatment. All threatened and endangered species and their habitat will be avoided and will not result in an adverse impact. Determining the potential effects for the proposed action and steps to ensure the protection of wildlife have been an integral part of the coordination on environmental documents associated with the APCP (USACE 1989).

4.4 Water Quality

Invasive aquatic plants can restrict waterways and degrade water quality, resulting in an adverse impact on water supply, navigation and recreation. They also seriously congest or completely blanket natural streams and drainage canals, thus reducing their discharge capacities. In addition, these invasive aquatic plants are a serious detriment to fish and wildlife resources. Masses of floating plants cover small waterways and ponds, rendering the areas unsuitable for fish habitat by depleting the dissolved oxygen in the water, by blocking sunlight that is essential for basic food production, by restricting movement and by rendering shallow water spawning areas unsuitable. The drifting mats of floating invasive aquatic plants may destroy beds of submerged plants that are desirable as food for waterfowl. Control of invasive aquatic plants has become a critical issue in many parts of the state because of their indirect impact on the quality and accessibility of water. Removal of the plants can also impact water quality. According to the EPA (1974), there could be a potential affect on water quality through the death and decay of the invasive aquatic plants after the use of herbicides. The decay of organic matter and the attendant low levels of oxygen may result in the suffocation of fish and other aquatic animal life. These undesirable effects are experienced only in impounded water or in sluggish moving streams. Treatments of potable water supplies are of concern, since surface water has gained importance as a source of drinking water, especially for major metropolitan areas. In this case, careful consideration shall be given to the areas concerning chemical control methods, and only chemicals that have been deemed not harmful to human health by the EPA will be used.

4.5 Historic Resources

Thousands of archeological sites and historic structures have been recorded in Texas, a state whose prehistory extends back at least 11,200 years. Although the entire state has not been surveyed for cultural resources, archeologists have a clear idea of what constitutes a high probability area for archeological deposits, including well drained areas marked by the presence of sand or sandy loam deposits on banks of existing or relict rivers, creeks, streams, lakes, bays and the coastal shoreline; all of which are present in APCP project areas. Historic properties which could be impacted by APCP undertakings include prehistoric sites such as campsites, quarries or lithic processing areas, mound sites, burned rock middens, shell middens and burial locales; and historic sites including historic farmhouses, forts, missions and cemeteries. The identification of historic properties in specific APCP project areas will be the responsibility of TPWD under a proposed Programmatic Agreement included as Appendix C of this document.

4.6 Hazardous, Toxic and Radioactive Waste (HTRW)

There are known and unknown HTRW sites that exist within the river basins of Texas. The proper applications of treatment measures, which include herbicide use, are not expected to create or impact any HTRW sites.

4.7 Air Quality and Ambient Noise

Ambient air quality is a function of the size, distribution, and activities directly related with population in association with the resulting economic development, transportation, and energy policies of the region.

The effects of climate and topography results in meteorological conditions, which concentrate, disperse, and distribute air pollutants. Air quality in the state of Texas varies dramatically from region to region. Ambient noise might also be described as a function of size, distribution, and activities directly related with population in association with the resulting economic development, transportation, and energy policies of the region. Traditionally, noise is defined as any unwanted sound (FBP 1994). Additionally, it is more objectionable at night (FBP 1994). However, the sound level varies with time over a wide range, e.g. noise from vehicular traffic (FBP 1994). The method of mechanical harvesting for removal of invasive aquatic plants would result in some transient noise impacts during cutting operations. Mechanical harvesting involves the use of machines that would cut and remove excessive vegetation to clear the waterways for transportation and recreation. In the past three years mechanical harvesting has been used to treat approximately 10 acres out of 3,000 total acres. Therefore the method of mechanical harvesting results in minor and temporary air and noise impacts

Urban lakes are expected to have the highest ambient noise levels due not only to their developed surroundings but also their higher use. Proposed sites with the next highest ambient noise levels would be those non-urban sites with the greatest shoreline development, followed by non-urban sites with high use.

4.8 Prime and Unique Farmlands

According to the Texas Almanac (Dallas Morning News, 1981), some 1,100 different soil series are recognized in the state. Most authorities divide Texas into 20 major subdivisions that have, among other characteristics, similar or related soils. About 21 percent of all land in Texas is “prime farmland”. The disposal areas that would be needed for mechanical harvesting could affect prime and unique farmlands, which would be taken into consideration before disposal areas are designated and used.

4.9 Socioeconomics

The proposed action involves control of invasive aquatic plants in all 23 river basins of Texas. This control will maintain access to boating, fishing, and swimming areas where water resource activities are restricted or may become restricted in the future due to growth of invasive aquatic vegetation. The treatment of invasive aquatic plants is expected to have a positive impact on recreation and tourism throughout Texas. Based on the economic evaluation that is provided in Appendix A, benefits creditable to the control of invasive aquatic plants in Texas waters can be derived primarily from restoration of aquatic recreation areas to their former uninfested condition.

In addition to recreation, there are other socioeconomic losses that could occur if invasive aquatic plants are not controlled. These losses include loss of life through drowning, loss of drinking water due to degraded water quality and water capacity, and loss of irrigation water for agriculture. The control and elimination of invasive aquatic plants through treatment defined in this EA will provide a clear socioeconomic benefit.

The economic analysis provided in Appendix A illustrates the average annual benefits and costs that are associated with the various treatment methods for the invasive aquatic plants. Table 3 shows the average benefits and costs and resultant benefit: cost ratios for locations used primarily for recreation, as well as other areas throughout Texas that are used for agriculture purposes.

Table 3
Comparison of Benefits and Costs

		Recreational	Agricultural
BENEFITS		$3,200	$1,200
	Average		
COSTS	Cost/Acre	B/C RATIOS	
Chemical	$986	3.2:1	1.2:1
Mechanical	$1,434	2.2:1	0.8:1
Biological (Insects)	$152	21.1:1	7.9:1

4.10 Environmental Justice

In compliance with Executive Order (EO) 12898, Federal Action to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations, an evaluation has been performed to determine whether the proposed project will have disproportionate adverse impacts on minority or low-income population groups within the project area. The EO requires that minority and low-income populations do not receive disproportionately adverse human health or environmental impacts, and requires that representatives from minority or low-income populations who could be affected by the project, be involved in the community participation and public involvement process.

The data used in this study to determine potential for disproportionate impacts to low income and/or minority populations throughout the State of Texas is based on the 2001 U.S. Bureau of the Census (USBOC). The demographics for Texas are provided below in Table 4.

Table 4
Demographics for the state of Texas

Subject	**Percent**
White persons, 2000	71.0%
Black or African American persons, 2000	11.5%
American Indian and Alaska Native persons, 2000	0.6%
Asian persons, 2000	2.7%

Native Hawaiian and Other Pacific Islander, 2000	0.1%
Persons reporting some other race, 2000	11.7%
Persons reporting two or more races, 2000	2.5%
Persons of Hispanic or Latino origin, 2000	32.0%
White persons, not of Hispanic or Latino origin, 2000	*52.4%*
Total Population of Texas, 2001 estimate	21,325,018

Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, 2000 Census of Population and Housing, 1990 Census of Population and Housing, Small Area Income and Poverty Estimates, County Business Patterns, 1997 Economic Census, Minority- and Women-Owned Business, Building Permits, Consolidated Federal Funds Report, 1997 Census of Governments

5.0 Environmental Effects

5.1 General

The goal of the APCP in Texas is to develop an integrated control methodology by selecting the most suitable technique for each area in order to restore a balanced ecosystem containing a diversity of freshwater aquatic plant species for the benefit of fish and wildlife and human use of those resources.

Future control of invasive aquatic plants may include any combination of the alternative treatment measures identified in Section 3.0. Potential impacts resulting from these measures are described below.

5.2 Biological Resources

The aquatic herbicides currently being used are organic in origin and are not persistent in the aquatic environment. According to the EPA (1974) and Grover (1988), herbicides are less persistent, as a group, than organochlorine insecticides. They do not “biomagnify”as readily in food chain organisms or cause high residues in fish because they have a different partition coefficient or fat solubility (EPA 1974).

Fish populations do not appear to have been adversely affected, in the long term, by aquatic herbicide treatments, except in areas where very toxic chemicals (e.g. acrolein) are still used (Pieterse and Murphy 1990). As stated by the EPA (1974), herbicide residues are seldom found in fish collected from the wild, but very few analyses have been specifically directed toward their detection. In the most severe cases of herbicide residue accumulations in fish, the levels are usually quite comparable to the concentration in the water and they dissipate rapidly as the source diminishes (Pieterse and Murphy 1990). Fish can hydrolyze or metabolize most herbicides. The metabolites, conjugates, and broken down products are readily excreted through the organism (EPA 1974). The hazard of biological accumulation of herbicides is lower now than it was 10 or more years ago because most of the existing herbicides have relatively short half-lives and possess properties indicative of low bioconcentration factors (Grover 1988). When appropriately used herbicides seldom cause extensive or lasting injury to nontarget organisms in fish habitats (EPA 1974). The majority of data on side-effects suggest that they are transient and sometimes occur only at herbicide concentrations well above those needed to control weeds (Pieterse and Murphy 1990).

EPA (1974) states that, as with fish and other nontarget organisms in fish habitat, the toxicity of herbicides to wildlife is not direct but is related to the indirect effects of habitat modification. There is insufficient data with respect to residues and their biological significance, but residues would be expected to follow patterns similar to those observed in livestock and poultry. Most herbicides ingested by livestock are excreted in a short time. Most recommended uses of herbicides produce residues in water at concentrations so small that it is virtually impossible for livestock to consume large enough volumes of water to accumulate residues.

Native submerged aquatic vegetation that occurs coincidentally with the invasive aquatic plants could be impacted. However, these effects would be localized and would not constitute adverse ecosystem-scale effects on the environment, provided treatment is done in accordance with the approved plan. Another factor to be considered in this program is that the herbicide applications will be conducted by trained, licensed professional crews with experience in handling herbicides.

No adverse impacts are expected from treatment of invasive aquatic plants. The incorporation of the invasive aquatic plants listed in this EA within all 23 River Basins of Texas under the APCP will provide a safer, better coordinated alternative to the treatment of submerged aquatic plants rather than the practice of random application of unidentified herbicides by local residents and water users. In addition, the control of the invasive aquatic plants will allow successful growth of the native aquatic vegetation. All practical measures will be incorporated into the APCP to minimize possible adverse effects, and treatment shall be coordinated by the office of TPWD.

Essential Fish Habitat

No species or their prey associated with the Magnuson-Stevens Fishery Conservation and Management Act are known to exist in areas that will be treated for invasive aquatic plants. The treatment areas for the invasive aquatic plants that are listed in Table 1 of this EA primarily exist in bodies of freshwater.

In addition, treatment methods are not expected to adversely impact the river basins that are within the coastal region.

5.3 Threatened and Endangered Species

Considerations for threatened and/or endangered species are an integral part of the present and proposed action. The factors considered in evaluating effects to these species include the small size of the area to be treated, the rapid biodegradable nature of the chemicals, the EPA and state approval of herbicides, and the expertise of personnel involved in the APCP. None of the endangered species listed are expected to be affected by the APCP treatment methods, which include the following:

Chemical Control. No appreciable reduction in the prey base (aquatic fauna) for any endangered species is likely to occur at any specific treatment site because of the rapid biodegradable nature of the chemicals, and the expertise of personnel involved in the APCP. Chemical control is the most commonly used of the four treatment methods. The different herbicides are used to treat sites from one acre in size up to five hundred acres, and the average size of an area is approximately thirty acres. In addition, most treatment sites consist of areas such as boat ramps, boat access lanes, and swimming areas, which many endangered species would tend to avoid.

Biological Control. This method uses biological agents to control target species. Generally a host-specific organism is introduced into an area to stress the problem aquatic species. Plant pathogens and insects, are host-specific, and do not target endangered species. The method of biological control is not used that often and has not been used in the past several years. No impacts to endangered species are expected.

Mechanical Control. The use of this method is limited. In 2002, no areas were treated mechanically; in 2003, two hundred and eighty-five acres were treated and in 2004 only ten acres were treated by this method. Endangered species would avoid these limited project areas and would not be impacted by this method of invasive plant control.

Environmental Manipulation. The most common method uses water level fluctuation to effectively control invasive aquatic plants. The water is lowered, leaving submersed plants to desiccate in exposed areas. This will have no affect on endangered species due to avoidance. If it is determined that an endangered species might be affected by this method then a different treatment method will be used.

All treatment methods used, whether chemical, mechanical, or biological will avoid impacts to threatened and endangered species and their habitat, through avoidance. Also, no significant reduction in aquatic fauna for any endangered species will occur. In addition to the treatment methods, another consideration is that most treatment sites are located in areas highly used by the public and endangered species would tend to avoid those areas.

5.4 Water Quality

The total treated acreage at any one site is minimal relative to the overall water body containing the treatment area. The average treatment site for the past several years has been approximately 20 to 30 acres per water body. However, the treatment size is dependent on the degree of infestation. The use of chemical agents would restrict water contact and recreational activities for varying lengths of time after treatment. Overall, water quality problems are not expected to occur because of the small scale of the treatments.

Only herbicides specified for use in potable water are applied at sites denoted as municipal water supplies, which takes into account the proximity of treatments to water intakes and the number of days after treatment before the withdraw of the water resumes for human consumtion. It is probable that no detectable increase over background residue levels in potable water supplies could be attributed to aquatic herbicide usage in a typical natural water body (Pieterse and Murphy 1990). Significant impacts to water quality are not expected as a result of the APCP because the EPA regulations concerning herbicide application will be strictly adhered to.

5.5 Historic Resources

TPWD will use mechanical, biological, and chemical methods to control plant populations under the APCP. It is assumed that the chemical and biological agents proposed to be used in the APCP will not have an affect on historic properties. The chemical agents will be restricted to use in water, and will be so diluted they will not contaminate inundated archeological sites. Biological methods include the introduction of host- specific organisms, such as insect species which consume or stress the invasive vegetation. These organisms will not affect historic properties.

It is assumed that most plant removal activities involving mechanical methods such as shredding, harvesting, and letting plants dry on the shoreline, as well as the use of existing roads and boat docks will not have an impact on historic properties. However, if new access roads to remove vegetation, new dock areas to offload vegetation from the water, and new disposal areas for the removed vegetation are necessary, TPWD will review these actions on a case-by-case basis to ensure avoidance of historic properties.

Because potential impacts to historic properties from the APCP have been identified, a Programmatic Agreement (PA) identifying procedures to be followed for Section 106 compliance of individual actions will be negotiated. A copy of this draft agreement is provided in Appendix B.

5.6 Hazardous, Toxic, and Radioactive Waste (HTRW)

In terms of the overall program, hazardous material does not become problematic unless it is improperly discharged or spilled. Herbicide containers being used to store the product are regulated by the EPA under the Federal Insecticide, Fungicide and Rodenticide Act.
Herbicides must be transported in their original containers or in other approved, labeled containers. The empty containers may become hazardous waste unless disposal procedures are followed exactly as shown on the label. In addition, unused chemicals must be properly disposed of. Disposal directions on the label are strictly adhered to in so that the APCP does not generate hazardous waste. The hazardous materials management plan for the APCP is provided in the Aquatic Plant Control Procedures Manual (TPWD 1989).

5.7 Air Quality and Ambient Noise

According to the EPA (1974), herbicide residues in air may be from three sources: 1) Spray and dust drift at the time of application; 2) Dispersal of herbicides on particles due to wind erosion after application; and 3) Volatilization from treated areas (soil, water, plants, etc.) or areas contaminated by herbicide residues in air. On entry into the atmosphere, herbicides are transported in air in the form of vapor or particulates, as a mist or aerosol of small droplets, or associated with airborne dust (Grover 1998). The data on herbicides have indicated transport is only on a regional scale (Grover 1998). The regional residence times for airborne herbicides appear to be seasonal, with continual removal via dilution, degradation, and redeposition (Grover 1998). There are non-attainment areas in the state of Texas, however an air conformity analysis will not be required. The chemicals involved in the control of the invasive aquatic plants are not expected to have an appreciable affect on air quality because of the rapid dilution of herbicides in the air. Unless herbicides are used on a large scale, it is unlikely that they will be detected as atmospheric contaminants in a general air-monitoring program (Grover, 1988). Because of the small size of the areas treated and the rapid dilution of herbicides in air, the treatment of the proposed sites is not expected to have an appreciable effect on air quality.

Most proposed treatment sites are subject to recreational use and its attendant noise from vehicular traffic (land based and water based) and social interaction. The operation of air boats and boats with outboard motors to apply chemical or biological controls, or the use of mechanical harvesters, would emit noise equivalent to that already experienced during recreational use. The noise would last only for the duration of treatment, during daylight hours, and would occur at any particular site for only one or two days during the growing season. The duration of most treatments is measured in hours. Rarely does a treatment extend beyond a two-day period. None of the measures proposed in this EA will have long-term noise impacts.

5.8 Prime and Unique Farmland

Treatments occur at aquatic sites that would not be considered prime and unique farmlands because of their inundation. Treatment performed under the APCP will not result in farmland conversion.

5.9 Socioeconomics

The treatment of invasive aquatic plants under the APCP will have a positive impact on socioeconomic resources. The treatment of invasive plants could provide economic benefits to surrounding regions because of its positive impact on recreation.

The proposed action involves the control of invasive aquatic plants in all 23 river basins in Texas. This control will maintain access to boating, fishing, and swimming areas where water resource activities are restricted, or may become restricted in the future, due to the growth rate of invasive aquatic plants. Based on the economic evaluation in Appendix A, benefits creditable to the control of invasive aquatic plants in Texas waters are derived primarily from restoration of fishing areas to their former uninfested condition. The treatment of invasive aquatic plants is economically justified and is expected to have a positive impact on recreation and tourism throughout Texas.

5.10 Environmental Justice

The proposed action involves the control of the invasive aquatic plants (listed in this EA-Table 1) within the 23 river basins of Texas. Control of these plants will provide an overall benefit and will not displace or affect minority or low-income populations. There will be no environmental justice impacts as a result of the APCP.

5.11 Cumulative Impacts

The CEQ’s regulations for implementing NEPA define cumulative impacts as the effects on the environment that result from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions, regardless of the agency (Federal or non-Federal) or person undertaking such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. Effects include both direct and indirect effects, which are caused by an action and occur at the same time and place as the action, and indirect effects, which are caused by the action and occur later in time and are farther removed in distance but are still reasonably foreseeable. Ecological effects refer to effects on natural resources and on the components, structures, and functioning of affected ecosystems, whether direct, indirect, or cumulative. Identifying major cumulative effects involves defining the direct and indirect effects of the proposed action on the resources, ecosystems, and human communities affected and determining which of these effects are important from a cumulative effect perspective.

In assessing cumulative effect, consideration is given to 1) the degree to which the proposed action affects public health or safety; 2) the unique characteristics of the geographic area; 3) the degree to which the effects on the quality of the human environment are likely to be highly controversial; 4) the degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks; and 5) whether the action is related to other actions with individually insignificant but cumulatively significant impacts on the environment.

The areas of influence identified under the APCP are the water bodies that exist within the 23 river basins of Texas.

Invasive aquatic plants can restrict waterways and degrade water quality, resulting in an adverse impact on water supply, navigation, and recreation. In addition, these invasive aquatic plants are a serious detriment to fish and wildlife resources. Masses of floating plants can cover small waterways and ponds, rendering the areas unsuitable for fish habitat. The drifting mats of floating invasive plants may also destroy beds of submerged plants that are desirable as food for waterfowl.

The control of invasive aquatic plants has become a critical issue in many parts of Texas because of the indirect impact on the quality and accessibility of water. Removal of invasive aquatic plants have an affect on water quality through the death and decay of the plants after treatment. The decay of organic matter and low levels of oxygen may result in the suffocation of fish and other aquatic animal life. These undesirable effects are experienced only in impounded water or in sluggish moving streams. Since surface water is an important source of drinking water, treatment in potable water supplies can present a concern. In this case, careful consideration shall be given to the areas with regard to chemical control methods, and only chemicals that have been deemed not harmful to human health by the EPA will be used.

The cumulative environmental impacts related to the APCP are expected to be beneficial for the enhancement of native aquatic plants and for a healthier ecosystem on a state-wide basis.

6.0 Relationship of the Program to Environmental Requirements

This document has been prepared to satisfy the requirements of all applicable environmental laws and regulations. The USACE regulation ER 200-2-2 (Environmental Quality: Policy & Procedures for Implementing NEPA) and the CEQ National Environmental Policy Act regulations (4OCFR Part 1500) have been guidelines followed during the writing of this EA. The following section presents a summary of environmental laws, regulations, and coordination requirements applicable to this EA.

National Environmental Policy Act. This EA has been prepared in accordance with CEQ regulations in compliance with NEPA provisions. All significant impacts to terrestrial and aquatic resources will been avoided.

National Historic Preservation Act of 1966, as amended. Compliance with the NHPA of 1966, as amended, requires identification of all NRHP-listed or NRHP-eligible properties in the Project area and development of mitigation measures for those adversely affected in coordination with State Historical Preservation Office and the Advisory Council on Historic Preservation. Negotiation of a Programmatic Agreement will insure compliance with this Act.

Endangered Species Act of 1973, as amended. Interagency consultation procedures have been undertaken. A list of Federally listed endangered or threatened species has been requested from all U.S. Fish and Wildlife Service (USFWS) field offices in Texas and from the National Marine Fisheries Service (NMFS) and potential impacts on these listed species will be sent to USFWS and NMFS for review. The results of the assessment and agency comments will be included in Appendix D, of this EA.

Essential Fish Habitat (EFH) is defined by the Gulf of Mexico Fishery Management Council (GMFMC) as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” This draft EA initiates EFH consultation in accordance with the Magnuson-Stevens Fishery Conservation and Management Act.

Clean Water Act of 1977, as amended. The Program is in compliance with the Clean Water Act and a State Water Quality Certification is not required.

Executive Order 11988, Floodplain Management, May 24, 1977. This Executive Order directs Federal agencies to evaluate the potential effects of proposed actions on floodplains. Such actions should not be undertaken that directly or indirectly induce growth in the floodplain unless there is no practical alternative. The APCP will cause no adverse impacts on floodplains.

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, January 10, 2001. This Executive Order directs Federal agencies to increase their efforts under the Migratory Bird Treaty Act, Bald and Golden Eagle Protection Acts, the Fish and Wildlife Coordination Act, the Endangered Species Act of 1973, NEPA of 1969, and other pertinent statutes as they pertain to migratory birds to avoid measurably negative take of migratory bird populations. The APCP is in compliance with this executive order because the control methods authorized under the APCP will not result in any adverse impact to migratory birds.

Farmland Protection Policy Act of 1981. The purpose of this Act is to minimize the extent to which Federal programs contribute to unnecessary and irreversible conversion of farmland to nonagricultural uses. There will be no impacts to prime and unique farmlands caused by the APCP.

Executive Order 12898, Environmental Justice. This Executive Order directs Federal agencies to determine whether the preferred alternative would have a disproportionate adverse impact on minority or low-income population groups within the project area. The APCP will not disproportionately affect any low-income or minority populations.

Clean Air Act of 1972. This Act is intended to protect and enhance the quality of the nation's air resources, to initiate and accelerate research and development to prevent and control air pollution, to provide technical and financial assistance for air pollution prevention and control programs, and to encourage and assist regional air pollution prevention and control programs. The APCP is in compliance with this Act.

7.0 Coordination

In accordance with Section 7 of the Endangered Species Act, as amended, a list of threatened and endangered species which could be affected by the APCP was requested from USFWS and NMFS. Threatened and/or endangered species and their habitat will not be affected because of avoidance.

The APCP is being coordinated with the SHPO concerning historic properties in Texas and a programmatic agreement has been negotiated.

8.0 Conclusions

Based on the environmental considerations presented in this document and the plan of operations presented in Supplement No. 1 to the General Design Memorandum for the Aquatic Plant Control Program, the proposed action will not cause significant environmental effects in the proposed treatment areas because of the following:

a. The minimal amount of area being treated during plant growing season;

b. The use of herbicides registered for use by the EPA; and

c. The designation of treatment areas and methods that are used by the TPWD biologists, environmental specialists, and water managers familiar with the specific site conditions.

The control of invasive aquatic vegetation is vital to maintaining the long-term productivity of natural systems, protecting water supplies for municipal and agricultural use, and facilitating recreational use of the state's water. In addition, this program has been in effect since the 1970's, and to date there have been no adverse environmental impacts documented.

9.0 References

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APPENDIX A
AQUATIC PLANT CONTROL PROGRAM
Economic Evaluation
September 2003

1.0 Introduction

The purpose of this economic analysis is to provide a methodology with which to determine feasibility of control of a variety of invasive aquatic plants throughout the state of Texas. The purpose of this environmental assessment is to determine the environmental consequences of incorporating all river basins within Texas into the Aquatic Plant Control Program (APCP) for the control of 9 additional invasive aquatic plant species, for a total of 11 plants to be treated. However this economic evaluation will include a method to determine whether any area is likely to be feasible from an economic standpoint, using cost/benefit analysis. The methodology can be applied for future studies and will reduce the time between discovery of problems areas and their subsequent treatment.

2.0 Previous Studies

The "Aquatic Plant Control and Eradication Program, State of Texas, General Design Memorandum," (GDM) dated September 1971, established benefits for control of aquatic plants in ten different work areas within the state. Benefits were based upon restored recreation activities, restored land values, restoration of drainage, elimination of extra costs of operating water supply systems, and reduction of existing aquatic plant control costs by using a comprehensive control program rather than sporadic measures. The overall benefit/cost ratio for that study was 6.7.

Supplement no.1 to the GDM was completed in June 1985. This document added eleven lakes to the Texas program. Benefits were based upon restoration of recreation activities at the lakes. Benefits to treatment of boating lanes and boating ramps were evaluated separately. The resultant b/c ratios ranged from an average of 1:3 to: 72:7, depending upon the location and type of treatment.

Another economic analysis for control of invasive aquatic plants in Texas was prepared in June 1989, adding nine lakes to the program. Benefits were based upon restoration of recreation. The b/c ratios ranged from 11:3 to 142:1 with the extremely high b/c due to restoration of boat ramps at a highly utilized lake.

An economic analysis was again prepared in March 1991 to add nine additional lakes to the control program in Texas. Once again, benefits were based upon restoration of recreation benefits, namely fishing. The resultant b/c ratios ranged from 12:2 to 14:8.

An economic analysis was prepared for an additional 21 sites in 1995. However, the July 1995 EA did not include an economic analysis section. The files for economic analysis estimated b/c ratios ranging from 2:26 to 773:11.

Two studies prepared outside the Galveston District were also reviewed. An EA and FONSI prepared by Jacksonville District in January 1996 supported integrated control of melaleuca for the state of Florida. A specific estimate of the costs and benefits of the APCP were not provided in that study.

Brief review of a study prepared by Mobile District COE was also conducted. The 1998 study was prepared for Lake Seminole, Fl-GA-Al for control of hydrilla. A detailed analysis of benefits and costs was prepared using multivariate analysis. The resultant b/c ratio was 30:1. In all of the studies reviewed, the treatment of aquatic plants was easily justified.

3.0 Benefits

Benefits creditable to the control of invasive aquatic plants in Texas waters can be derived primarily from restoration of fishing areas to their former uninfested condition. However, the Rio Grande River does not attract a significant amount of water-related recreation, with water being utilized primarily for irrigation for the valley agricultural crops. Therefore, benefits for the Rio Grande were estimated based upon restoration of irrigation operations to pre-infestation conditions.

3.1 Recreation Benefits

The methodology for evaluating benefits for restoring fishing areas to their former uninfested condition involves a set of assumptions. Fishermen do not prefer that all of the aquatic plants be eradicated; many believe that some of the best fishing areas located next to the area with heavy growth of aquatic plants. However, the constraint caused by inadequate boat access during peak days lessens the fishing pressure and keeps the lakes from being fully utilized. The pressure on the lakes would be increased if aquatic plant growth significantly reduced fishing areas. Since excessive amounts of treatment would be necessary to restore the lakes to the previously uninfested condition, the U.S. Army Corps of Engineers and the Texas Parks and Wildlife Department representatives must use discretion in selecting which small portion of a lake to allow access to for known areas of good fishing. Another example would be to ensure adequate access by clearing boat ramps. The clearing measures will only be exercised when the pressure for a fishing area justifies it.

A conservative method of determining benefits for generic water bodies for restoration of fishing areas was prepared. This methodology will allow decision makers the ability to apply general knowledge of a water body and the infestation to determine economic feasibility of control. In order for an area to be considered to be feasible, it must have public access. A privately owned and controlled location does not provide benefits on a national level and, therefore, there is no government interest in treating such an area.

The unit day value method for evaluating the recreational benefits is appropriate for this project. Even though many lakes accommodate over 750,000 visitors per year, only a small part of each lake is impacted by aquatic plant problems, thereby reducing the universe of benefit analyses to a much smaller component. This qualifies all the fishing locations for use of the unit day value method of benefit estimation. The unit day value approach in recreation benefit analysis consists of two parts: estimating visitation (recreation use) and determining value per visit.

Estimated visitation/recreation use: in order to develop a measure of estimated recreation use for statewide application, data from the 1990 Texas Outdoor Recreation Plan (TORP) was utilized to develop a lower limit on estimated use. The 1990 conversion factor for lake fishing for the entire state was applied. Although the 1990 TORP is somewhat out of date, a conversion factor is a stable number that is unlikely to change significantly over time. In addition, "optimum recreation carrying capacity", 1977 rates for boat fishing were used to develop an upper limit on estimated use.

The TORP conversion factor is the average number of participation occasions that can be provided by one unit of a specified outdoor recreation facility per year. They are specific to each of the types of facilities, in this instance, lake acres, and specific to particular regions in the state. They take into account the current participation patterns and preferences of outdoor recreationists in Texas.

The formula used to calculate the conversion factor takes into account seasonal (monthly) variations in participation, weekday versus weekend participation, and the time of day that participation occurs. The formula estimates the average number of annual activity occasions that are typically provided by a single unit of a recreation facility or resource. The conversion factor formula is:

$$cf= \{wd(j)p+we(p)\}\ ef$$

Where:

Cf = average number of participation occasions which can be provided by one unit of a specific outdoor recreation facility per year, given the current participation patterns and preferences of outdoor recreationists.

Wd = number of weekday days during peak use months of facility utilization.

We = number of weekend days during peak use months of facility utilization.

J = number of activity occasions occurring on an average peak weekday + number of activity occasions occurring on an average peak weekend day.

P = number of activity occasion opportunities provided by a unit of facility during a peak use day.

Ef = total annual participation occasions + participation occasions occurring during peak use months.

The average conversion factor for the state of Texas is 360, representing the average number of visitor occasions per acre per year. This equates to approximately 1 person per acre per day. For this analysis, this number will be used as the lower limit for estimating recreation use statewide.

In comparison, the capacity method of estimating use has been used in many of the previous studies and equates to approximately 6.5 persons per acre per day. This is calculated using the following assumptions: average density per acre of 1.8 boats, 2 fishermen per boat and a turnover rate of 1.8 (1.8 x 2 x 1.8=6.5). Assuming an average of approximately 90 peak user-days per year, the average number of visitor occasions per acre per year would be 585 (6.5 persons/acre/day x 90 peak-use days). This number will be used as the upper limit for estimating recreation use statewide.

The average for the range of values of 360 to 585 is 473. This average estimated recreation use may be applied for most locations but should be used only as a guide. Knowledge of a specific site should be employed whenever possible. In many instances, the average value for estimated recreation use may underestimate visitation, particularly for locations with greater population density or popularity of a particular location. Another example where the use of the average value of estimated recreation use underestimates the importance of a particular site is at boat ramps. Boat ramps provide access to an entire lake. Therefore, the benefit of treating a boat ramp that is inaccessible due to aquatic plant growth is much higher than an open lake acre.

Unit day values: the second step in determination of recreation benefits is to determine a value per visit. Unit day values used for determining benefits per acre of fishing are based on a point value system. Unit day values represent an attempt to approximate the average willingness to pay of recreationists for a day of recreation activity. By applying a carefully thought-out and adjusted unit day value to estimated use, an approximation of recreation benefits can be made. Table 1 illustrates “guidelines for assigning points for general recreation”. This table is excerpted from ER 1105-2-40 and EGM 03-04, unit day values for recreation, FY 2003. Points should be assigned based upon knowledge of a specific site’s recreation experience.

Table 2 shows the current, FY 2003 unit day values from EGM 03-04, “conversion of points to dollar values.” These values are updated annually. The values for general fishing and hunting range from $4.23 (0 points) to $8.82 (100 points). The average unit day value, or the value corresponding to 50 points, is $6.80. By applying the average unit day value to the average recreation use per acre per year, an approximation of benefits can be determined on an average statewide basis. The average annual benefit of restoring recreation at an aquatic site is 473 (avg. Recreation use per acre) x $6.80 (avg. Unit day value for fishing), or $3,200 per acre.

Table 1: Guidelines for Assigning Points for Geneal Recreation

Criteria	Judgment factors				
Recreation experience 1 Total points: 30 Point value:	Two general activities2 0-4	Several general activities 5-10	Several general activities: one high quality value activity3 11-16	Several general activities; more than one high quality high activity 17-23	Numerous high quality value activities; some general activities 24-30
Availability of opportunity4 Total points 18 Point value:	Several within 1 hr Travel time, a few within 30 mm. Travel time 0-3	Several within 1 hr Travel time none within 30 min. Travel time 4-6	One or two within 1 hr. Travel time none within 45 min. Travel time 7-10	None within 1 hr. Travel time 11-14	None within 2 hr Travel time 15-18
Carrying capacity5 Total points: 14 Point value:	Minimum facility for development for public health and safety 0-2	Basic facility to conduct activity(ies) 3-5	Adequate facilities to conduct without deterioration of the resource or activity experience 6-8	Optimum facilities to conduct activity at site potential 9-11	Ultimate facilities to achieve intent of selected alternative 12-14
Accessibility Total points: 18 Point value:	Limited access by any means to site or within site 0-3	Fair access, poor quality roads to site; limited access within site 4-6	Fair access, fair road to site; fair access, good roads within site 7-10	Good access, good roads to site; fair access, good roads within site 11-14	Good access, high standard road to site; good access within site 15-18
Environmental	Low esthetic factors6 that significantly lower quality7	Average esthetic quality; factors exist that	Above average esthetic quality;	High esthetic quality; no factors	Outstandi ng esthetic quality; no factors

Total points: 20		lower quality to a minor degree	any limiting factors can be reasonably rectified	exist that lower quality	exist that lower quality
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.

Table 2: Conversion of Points to Dollar Values

Point values	General fishing and hunting values’
0	$4.23
10	$4.78
20	$5.15
30	$5.70
40	$6.25
50	$6.80
60	$7.53
70	$7.90
80	$8.45
90	$8.64
100	$8.82

[1]points from table 1.
Source: EGM 03-04, FY 2003

3.2 Irrigation Benefits

As stated previously, the Rio Grande Valley has been impacted by aquatic plant infestation. Damages, however, are related primarily to crop irrigation, rather than recreation benefits diminished. Invasive aquatic plant infestation reduces the amount of water available via transpiration (the amount of water the plants require to grow), by restricting the amount of water that irrigation districts can pump, and by inducing damages to irrigation intake structures (i.e. Periodic cleanup). In addition, potential damages can be incurred during flood events due to congestion of channels and the resulting inability of channels to drain (i.e. Raised flood waters equate to increased flood damages). Due to lack of information, an estimate of increased flood damages from aquatic plants is not included in this analysis. Average benefits for treating a foot-acre of water infested with aquatic plants were calculated based upon consultation with two Texas A&M economists/researchers familiar with the effects of aquatic plants and the Texas agricultural industry.

The average value of one acre of irrigation water in the Rio Grande Valley is $318. The average crop in the valley requires approximately 3 acre-feet of irrigation water per acre per year for production, assuming average rain conditions. The average acre of agricultural land has one to two growing seasons. The impact of the number of seasons is factored into the average value of an acre of irrigation water ($318). Therefore, annual damages due to loss of agricultural irrigation from aquatic plants can be estimated to be approximately $954 ($318/acre x 3 acres).

In addition, damages are incurred due to required clean up of intake structures. Assuming one intake structure supports approximately 10-acres of water and costs of clean up are approximately $2,000 per year, damages on an annual basis per acre of water are estimated at $200 In summary, the total expected benefit of treating an acre of water infested with aquatic plants in the Rio Grande Valley is $1,154, or $1,209/(rounded).
Table 3 below shows estimated benefits from aquatic plant control for both categories of benefits analyzed, namely restoration of recreation and agricultural damages reduced.

Table 3: Annual Benefits of Treatment

Benefit category	Average annual benefit (per acre)
Restoration of recreation	$3,200
Irrigation/agricultural damages reduced	$1,200

4.0 Costs

The per-acre treatment costs (shown below in table 4) are the rates currently being used in the aquatic plant control program. Costs vary depending on the method of treatment and the aquatic plant to be treated. The average cost per acre for the various treatment methods is shown on the last row of table 4. The assumption is made, as established in supplement no. 1 to the GDM (dated June 1985), that chemical treatment requires two applications per acre and mechanical harvesting treatment requires four treatments per acre. In addition, it is assumed that four treatments are required for biological methods.

Table 4: Estimated Treatment Costs Per Acre

Aquatic plant	Chemical (2 treatments)	Mechanical (4 treatments)	Biological (insects) (4 treatments)
Hydrilla	$2,044	$1,104	$352
Waterhyacinth	$176	$1,764	$60
Eurasion watermilfoil	$1,222	N/a	N/a
Alligatorweed	$500	N/a	$44
Average costper acre	$986	$1,434	$152

5.0 Comparison of Costs and Benefits

The average annual benefits for each of the benefit categories are shown in table 3 above. Costs associated with the various treatment methods of associated plants are shown in table 4 above. An average cost per treatment type is used for deve1oprment of the benefit to cost ratios The results are presented in table 5, comparison of benefits and costs. Benefits for both recreational sites and agricultural sites are shown separately. The table is somewhat complex, because there are two separate benefit categories, as well as four different treatment types. This results in a matrix of six different b/c ratios. The cell that corresponds to "recreational" column and "chemical" row is 3.2. This cell can be interpreted as follows: chemical treatment of an average fishing location is economically justifiable with b/c ratio of 3.2.

Table 5: Comparison of Benefits and Costs

		Recreational	Agricultural
Benefits		$3,200	$1,200
	Average		
Costs	Cost/acre	B/c ratios	
chemical	$986	3.2	1.2
mechanical	$1,434	2.2	0.8
biological (insects)	$152	21.1	7.9

6.0 Summary

This analysis was prepared in order to allow decision makers the ability to use their knowledge of a particular site to determine economic feasibility of aquatic plant treatment. Table *5* shows average benefits and costs and resultant b/c ratios for locations used primarily for recreation (namely, fishing), as well as locations along the Rio Grande Valley used for agricultural purposes. Knowledge of site-specific variables such as visitation, location of infestation and cost of treatment can be incorporated and applied using the methodology outlined. Additional analysis should be conducted in cases where benefits or costs vary significantly from the average, however, the b/c ratios from table 5 should provide a good guideline for determining feasibility of treatment of average sites.

APPENDIX B

PROGRAMMATIC AGREEMENT (PA) REGARDING COMPLIANCE WITH SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT FOR THE AQUATIC PLANT CONTROL PROGRAM IN TEXAS AMONG THE TEXAS PARKS AND WILDLIFE DEPARTMENT, THE U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT, AND THE TEXAS STATE HISTORIC PRESERVATION OFFICER

WHEREAS, the U. S. Army Engineer District, Galveston (Corps) provides federal funds to the Texas Parks and Wildlife Department (TPWD) in support of the TPWD Aquatic Plant Control Program (APCP) for the eradication of non-native invasive plant species on public lands in the 18 river basins of Texas by mechanical, biological and chemical methods ; and

WHEREAS, the day-to-day administration of the APCP is managed entirely by TPWD; and

WHEREAS, compliance with the National Historic Preservation Act of 1966 (NHPA), as amended, and its implementing regulations (36 CFR 800) is required because the APCP receives federal funds; and

WHEREAS, the Corps has determined that the APCP is a federal undertaking carried out by TPWD on lands owned by the State of Texas and its subdivisions; and

WHEREAS, the Corps and TPWD recognize that certain of those undertakings may have an effect upon historic properties included in or eligible for inclusion in the National Register of Historic Places (NRHP); and

WHEREAS, TPWD, the Corps and the Texas State Historic Preservation Officer (SHPO) have agreed that alternative procedures to streamline the process for compliance with Section 106 of the NHPA is appropriate; and

WHEREAS, TPWD and the Corps have agreed upon a process for compliance with Section 106 of the NHPA in which TPWD has the primary responsibility for compliance actions and coordination; and

WHEREAS, the Corps has consulted with the Advisory Council on Historic Preservation (Council) to determine whether the Council wishes to enter into the Section 106 process; and

NOW, THEREFORE, the Corps, TPWD, and the SHPO agree that the APCP in the State of Texas shall be administered pursuant to the following stipulations, exercising reasonable judgments and good faith, to satisfy the Corps responsibilities under Section 106 of the NHPA for all individual undertakings of the program.

STIPULATIONS

I. CULTURAL RESOURCE PROGRAM PERSONNEL

A. The District Engineer (DE） is the responsible Federal Agency Official.

B. The Corps District Engineer (DE) delegates responsibility for the consultation process to the TPWD Executive Director (ED).

C. The TPWD ED is the signatory agent that will be accountable for TPWD's compliance with the APCP PA in Texas.

D. The ED may delegate responsibility for the consultation process and for carrying out activities agreed to herein to the TPWD Preservation Officer (TPO) and other TPWD personnel consistent with the provisions of this subsection.

E. The TPO and TPWD archeologists shall meet the standards for archeology as described in "Professional Qualifications Standards", Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, U.S. Department of the Interior, National Park Service, 1983 (FR Vol. 48, No. 190, p 4473 8-44739).

II. TRIBAL CONSULTATION AND PUBLIC PARTICIPATION

A. TRIBAL CONSULTATION. The Corps has identified and solicited the views of federally recognized Indian Tribes pursuant to 36 CFR 800.3 (c) and 36 CFR 800.3 (1) (2), with regard to the identification and evaluation of properties and the assessment of adverse effects on historic properties and traditional cultural properties, under the APCP program.

B. PUBLIC PARTICIPATION. Pursuant to 36 CFR 800.3 (e), TPWD shall consider the views of the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties, the likely interest of the public in the effects on historic properties, and confidentiality concerns of private individuals and businesses. Public comment is being obtained through public coordination of the Environmental Assessment (EA) for the APCP.

III. CONSULTATION PROCEDURES

A. DETERMINING IF AN UNDERTAKING IS SUBJECT TO CONSULTATION WITH THE SHPO. When an undertaking is planned, the TPWD archeologist shall review categories of activities described in Attachment A of this document to determine if SHPO consultation is required. Attachment A identifies examples of general categories of agency actions that require survey (List 1), and activities that do not require survey so long as they are completed as described (List 2). If a clear determination cannot be reached to exclude the project from survey, the project shall be surveyed in accordance with Stipulation III. B. of this PA.

B. IDENTIFICATION AND EVALUATION OF HISTORIC PROPERTIES.
If the TPWD archeologist determines that the undertaking requires survey pursuant to Stipulation III. A. of this PA, TPWD shall:

1. Determine the Area of Potential Effect (APE) for the activity pursuant to the definition in 36 CFR Section 800.16 (d).

2. Determine the appropriate level of survey required to identify historic properties, and document with the following information:

a. A detailed project description;

b. A section of a 7.5' topographic map and/or a specific project map documenting the APE;

c. A description of how the APE was determined;

d. Inventory and location of existing archeological sites and other historic resources within the APE; and

e. Locales/areas with a high probability for the occurrence of historic properties.

3. The TPWD archeologists perform the survey in accordance with the plan described under Stipulation III. B. 2. of this PA.

4. Negative Survey Results: When a survey report indicates no historic properties are located within the APE, the undertaking may proceed without consultation with the SHPO. The TPO shall be responsible for the review of all surveys and completion of reports.

5. Positive Survey Results: If a survey results in the identification of historic properties, TPWD shall notify the SHPO and consult in accordance with Stipulation III. C. of this PA.

C. DETERMINATION OF EFFECT AND RESOLUTION OF ADVERSE EFFECT

1. If historic properties are located within the project APE, the TPO shall consult with the SHPO to determine eligibility in accordance with 36 CFR 800.4 (c). If the property is determined to be eligible for inclusion in the NRHP, TPWD shall:

a. Modify the project to receive a determination of no adverse effect in accordance with 36 CFR 800.5 (b), or design and implement a mitigation plan in consultation with the SHPO in accordance with 36 CFR 800.6 (b) (1) or;

b. If agreement cannot be reached between TPWD and the SHPO, TPWD shall consult with the Council in accordance with 36 CFR 800.6 (b) (2) and provide copies of correspondence to the Corps.

2. All actions related to historic properties, including conditions to ensure that historic properties will not be adversely affected, measures to minimize or mitigate adverse effects, and treatment plans shall be developed and implemented in accordance with the standards and guidelines contained in the Secretary of the Interior's Standards and Guidelines for Archeology - and Historic Preservation, U.S. Department of the Interior, National Park Service, 1983 (FR Vol. 48, No. 190).

IV. DOCUMENTATION AND REPORTING REQUIREMENTS

A. By December 1 of each year following the execution of this PA, TPWD shall provide an annual report to the Corps and the SHPO that contains the following information:

1. A county list and description of all undertakings under the APCP carried out during the previous fiscal year (October i through September 31);

2. For each undertaking, a notation of whether consultation was required with the SHPO under the terms of this PA, and the status of any required consultation (completed, ongoing, etc.);

3. For each undertaking, a summary of the results of efforts to identify and evaluate historic properties, including a description of historic properties identified;

4. For each undertaking, a description of the determination of project effects on historic properties;

5. For each undertaking that identified historic properties, include a description of the consultation process and a summary of the resolution; and

6. A description of benefits and problems encountered in the implementation of this PA and suggestions on how to remedy such problems.

B. Documentation prepared under the terms of this PA shall be retained by TPWD for two years.

C. Information specifying the location of historic properties shall not be released to the public. The TPO may at his/her discretion release limited portions of location data to field offices to ensure proper consideration of currently recorded historic properties during the planning phase.

VI. DISCOVERY SITUATIONS. If previously unidentified historic properties are encountered during the implementation of a project, work in the area of the discovery shall cease until consultation with the SHPO has been completed by the TPO pursuant to 36 CFR 800.13 (a) (2) and this PA:

A. TPWD must provide the following information to the SHPO:

1. A copy of the complete project description;

2. A section of a 7.5' topographic map and/or a specific project map showing the location of the unanticipated discovery in relation to project impact areas; and

3. A description of how the APE was determined.

B. Consultation with SHPO shall be conducted and coordination shall be completed before work resumes in the area of the discovery. Work may continue in other areas. The SHPO shall expedite the review of the discovery and shall respond to the request for comments within 5 working days from the date of receipt of the request.

C. If TPWD determines that the unanticipated discovery is likely eligible for the NRHP, the TPO shall consult with the SHPO regarding this eligibility determination and proposed treatment of the historic property, and follow the procedure as laid out in Section III C of this PA.

VII. CURATION AND DISPOSITION OF RECOVERED MATERIALS AND RECORDS. TPWD shall ensure that all cultural materials and associated records resulting from identification, evaluation, and treatment efforts conducted under this PA are accessioned into a curational facility meeting the standards of 36 CFR 79.

VIII. TREATMENT OF HUMAN REMAINS

A. If TPWD's historic property investigations indicate a high likelihood that human remains may be encountered, TPWD shall avoid impacts to those areas under the APCP.

B. Immediately upon the inadvertent discovery of human remains during historic property investigations or program activities conducted pursuant to this PA, TPWD shall ensure that all ground disturbing activities cease in the vicinity of the human remains and any associated grave goods. Within 48 hours of the discovery, TPWD shall initiate consultation with the SHPO and Indian Tribes that might attach religious and cultural significance to identified historic properties. TPWD shall consult with the SHPO and Indian Tribes which have expressed an interest in the undertaking in an effort to develop a plan for resolving the adverse effects in accordance with Section III. C. of this PA.

IX. COUNCIL PARTICIPATION

A. The Corps, TPWD, the SHPO, and Indian Tribes or other consulting parties may request the Council to consult on any undertaking covered by the PA.

B. TPWD shall afford the Council an opportunity to comment under the following conditions:

1. When the SHPO and TPWD do not agree, or there is a question as to whether an undertaking requires consultation with the SHPO or meets List 1 or List 2 of the Attachment to this PA;

2. When the SHPO and TPWD do not agree or there is a question as to the need for, or adequacy of, efforts to identify and evaluate historic properties;

3. When the SHPO and TPWD do not agree as to the nature of the effect of an undertaking on a historic property; or

4. When the SHPO and TPWD do not agree regarding the adequacy or scope of measures to avoid, minimize, or mitigate adverse effects on historic properties, or regarding measures to ensure that historic properties will not be adversely affected.

X. DISPUTE RESOLUTION. Disputes regarding the completion of these terms of agreement shall be resolved by the signatories. If the signatories cannot agree regarding a dispute, any one of these signatories mat request the participation of the Council to assist in resolving the dispute.

XI. MONITORING, AMENDMENTS AND TERMINATION

A. The Corps and the SHPO may monitor activities carried out pursuant to this PA to determine the accuracy of the field inspections in identifying historic properties and the success with which identified historic properties are avoided during implementation of the APCP. TPWD shall cooperate with the Corps and the SHPO in carrying out their monitoring and reviewing responsibilities.

B. Any party to this PA may request that it be amended, whereupon the parties shall consult in accordance with 36 CFR 800.6 (c) (7) to consider such an amendment.

C. PA Duration: This PA shall be in effect from the date of final signature for a period of 10 years.

D. Termination: This PA may be terminated at any time by any signatory party, provided that at least 60 days notice of intent to terminate is given to all other signatories, and the reasons for considering termination are given to all concerned parties. The parties shall consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. Should TPWD not carry out the terms of this PA or should the PA be terminated, the Corps and TPWD shall comply with Section 106 of the NHPA in accordance with 36 CFR 800 for all individual undertakings covered by this PA.

XII. LIMITATIONS

A. Each provision of this PA is subject to the laws and regulations of the State of Texas and of the United States of America.

B. Execution and implementation of this PA evidences that the Corps has satisfied its Section 106 requirement for all TPWD undertakings that fall under the terms of the PA. This PA becomes effective on the date of the last signature below.

DISTRICT ENGINEER, U.S. ARMY CORPS OF ENGINEERS, GALVESTON

Colonel Steven P. Haustein, District Engineer Date

EXECUTIVE DIRECTOR, TEXAS PARKS AND WILDLIFE DEPARTMENT

Robert L. Cook, Executive Directory Date

TEXAS STATE HISTORIC PRESERVATION OFFICER

F. Lawrence Oaks, Texas State Historic Preservation Officer

ATTACHMENT A

List 1: Examples of general categories of agency actions that require survey to identify historic properties.
Note that these are examples of general categories; this is not an all-inclusive list.

A. Construction of new access road construction for off-site transport.

B. Clearing or construction of new dock area construction to offload and remove vegetation from the water.

C. Staging areas for placements of cranes or other large vegetation removal equipment in water.

D. Vegetation removal and root plowing/raking that penetrates below the depth of previous ground/soil preparation or otherwise causes new ground disturbance.

E. Creation of new disposal areas for the removed vegetation.

List 2: Activities that do not require survey so long as they are completed as described.

Note that activities not meeting the prescribed conditions below will require consultation with the SHPO to determine if an identification effort is necessary in accordance with the PA.

A. Mechanical methods of vegetation removal are limited to shredding, harvesting, and letting plants dry on the shoreline.

B. Use of existing access roads for transport.

C. Use of existing boat docks for offloading vegetation and removal.

D. Removal of vegetation by use of chemical means, such as herbicides.

E. Removal of vegetation by biological means such as the introduction of host specific organisms.

F. Removal of vegetation by hand implements.

APPENDIX C
Current Aquatic Plant Control Program Coverage in Texas, 2005

APPENDIX E

Current Aquatic Plant Control Program Coverage in Texas, 2005

		Targeted Plants										
	Treated Water Bodies	**Water Hyacinth**	**Alligator Weed**	**Hydrilla**	**Eurasian Watermilfoil**	**Giant Salvinia**	**Giant Reed**	**Torpedo Grass**	**Water Spinach**	**Giant Duckweed**	**Paperbark**	**Water Trumpet**
		Echorinia crassipes	*Alternanthera philoxeroides*	*Hydrilla verticillata*	*Myriophyllum spicatum*	*Salvinia molesta*	*Arundo donax*	*Panicum repens L.*	*Ipomoea aquatica*	*Spirodela punctata*	*Melaleuca quinquenervia*	*Cryptocoryne beckettii*
No. 1	**Nueces River Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Choke Canyon Res	1965	1965	1991	1991							
No. 2	**Guadalupe River Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Lake Dunlop	1965	1965	1995	1995							
	H-4 Res	1965	1965	1995	1995							
	H-5 Res	1965	1965	1995	1995							
	Lake McQueeny	1965	1965	1995	1995							
	Lake Placid	1965	1965	1995	1995							
No. 3	**North Coastal Area**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Big Hill Bayou	1965	1965	1995	1995							
	Hillebrandt Bayou	1965	1965	1995	1995							
	Murphree WMA	1965	1965	1995	1995							
	Taylor's Bayou	1965	1965	1995	1995							
No. 4	**Sabine River Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Toledo Bend Res	1965	1965	1985	1985							
	Martin Creek	1965	1965	1989	1989							
	Lake Murvaul	1965	1965	1989	1989							
	Brandy Branch Res	1965	1965	1991	1991							
	Lake Hawkins	1965	1965	1995	1995							
	Lake Fork	1965	1965	1995	1995							
No. 5	**Trinity River Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Houston Co Lake	1965	1965	1985	1985							
	Lake Livingston	1965	1965	1985	1985							
	Lake Fairfield	1965	1965	1985	1985							
	Cedar Creek Res	1965	1965	1985	1985							

	Treated Water Bodies	Targeted Plants Water Hyacinth	Alligator Weed	Hydrilla	Eurasian Watermilfoil	Giant Salvinia	Giant Reed	Torpedo Grass	Water Spinach	Giant Duckweed	Paperbark	Water Trumpet
		Echorinia crassipes	*Alternanthera philoxeroides*	*Hydrilla verticillata*	*Myriophyllum spicatum*	*Salvinia molesta*	*Arundo donax*	*Panicum repens L.*	*Ipomoea aquatica*	*Spirodela punctata*	*Melaleuca quinquenervia*	*Cryptocoryne beckettii*
	Lake Weatherford	1965	1965	1989	1989							
	Lake Raven	1965	1965	1989	1989							
	Lake Marvin	1965	1965	1991	1991							
	Purtis Creek State Park	1965	1965	1991	1991							
	Arlington Lake	1965	1965	1995	1995							
	Madisonville Lake*	1965	1965	1995	1995							
	Marine Creek	1965	1965	1995	1995							
	North Lake	1965	1965	1995	1995							
	Richland-Chambers Res	1965	1965	1995	1995							
No. 6	**Neches River Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Lake Palestine	1965	1965	1985	1985							
	Lake Jacksonville	1965	1965	1985	1985							
	Lake Nacogdoches	1965	1965	1989	1989							
	Bellwood Lake	1965	1965	1995	1995							
	Striker Creek	1965	1965	1995	1995							
	Tyler State Park	1965	1965	1995	1995							
	Pinkston Reservoir	1965	1965	1995	1995							
No. 7	**Cypress Creek Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Caddo Lake			1989	1989							
	Lake Bob Sandlin	1965	1965	1989	1989							
	Cypress Springs	1965	1965	1989	1989							
No. 8	**South Coastal Area**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
No. 9	**San Jacinto River Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Lake Conroe	1965	1965	1985	1985							
	Sheldon Res	1965	1965	1991	1991							
	Lewis Creek Reservoir	1965	1965	1989	1989							
No. 10	**Rio Grande Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Falcon Res	1965	1965	1995	1995							

	Treated Water Bodies	Targeted Plants										
		Water Hyacinth	**Alligator Weed**	**Hydrilla**	**Eurasian Watermilfoil**	**Giant Salvinia**	**Giant Reed**	**Torpedo Grass**	**Water Spinach**	**Giant Duckweed**	**Paperbark**	**Water Trumpet**
		Echorinia crassipes	*Alternanthera philoxeroides*	*Hydrilla verticillata*	*Myriophyllum spicatum*	*Salvinia molesta*	*Arundo donax*	*Panicum repens L.*	*Ipomoea aquatica*	*Spirodela punctata*	*Melaleuca quinquenervia*	*Cryptocoryne beckettii*
No. 11	**Colorado River Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Cedar Creek Res	1965	1965	1985	1985							
	Walter E. Long Lake	1965	1965	1989	1989							
	Lake Bastrop	1965	1965	1989	1989							
	Town Lake	1965	1965	1991	1991							
	Inks Lake	1965	1965	1991	1991							
	Buescher State Park	1965	1965	1991	1991							
	Lake Austin	1965	1965	1995	1995							
No. 12	**Brazos River Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Lake Limestone	1965	1965	1985	1985							
	Gibbons Creek Res	1965	1965	1991	1991							
No. 13	**Central Coastal Area**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Lake Texana	1965	1965	1985	1985							
	Coleto Creek Res	1965	1965	1990	1990							
No. 14	**San Antonio River Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Calaveras Lake			1989	1989							
No. 15	**Lavaca River Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
No. 16	**Sulfur River Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
No. 17	**Red River Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed
	Lake Nocona	1965	1965	1995	1995							
No. 18	**Canadian River Basin**	1965	1965	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed	Proposed

APPENDIX D
Agency Coordination

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

March 15, 2006

Mr. David Bernhart
Assistant RA for Protected Resources
Southeast Regional Office
National Marine Fisheries Service
263 13th Avenue South
St. Petersburg, Florida 33701

Dear Mr. Bernhart:

As part of the U.S. Army Corps of Engineers (USACE) Aquatic Plant Control Program (APCP), the Galveston District and the Texas Parks and Wildlife Department (TPWD) are planning to add to the list of invasive aquatic plants to be controlled in all the river basins in Texas. The invasive aquatic plants to be added to the APCP include hydrilla, giant salvinia, giant reed, torpedo grass, water spinach, giant duckweed, paperbark, and watertrumpet. In the past, invasive aquatic plants like hydrilla and Eurasian watermilfoil were treated on a site-by-site basis. The Environmental Assessment (EA) that the USACE is drafting now would allow TPWD to treat the invasive aquatic plants listed above for all 23 river basins within the State of Texas (map enclosed).

To ensure compliance with the requirements of Section 7 of the Endangered Species Act, a list is requested of any species that are listed or proposed to be listed as threatened or endangered within your jurisdiction of the 23 river basins, and has the potential to be affected by the implementation of the APCP measures described below.

The treatment measures that were included in the APCP through a previous EA written in 1995 were chemical, mechanical, biological, and environmental manipulation. The methods that have been used over the past few years are mainly chemical and mechanical, even though environmental manipulation and biological control are options. Biological control consists of plant pathogens and insects, which are host-specific and are safe for the applicator and the environment. The use of triploid grass carp is not included in the current APCP and will not be included in the EA. The chemicals currently being used include 2, 4-D (Weeder 64), Endothall (Aquathol K), Fluridone (Sonar SRP), and Glyphosate (Rodeo). Additional information concerning herbicides used in the APCP can be found on the following website: http://libweb.wes.army.mil/Archimages/9863.PDF, and this web address is case sensitive.

Your assistance with our coordination responsibilities is appreciated. If you have any questions, please contact Ms. Natalie Rund by phone at 409-766-6384 or by e-mail at Natalie.A.Rund@swg02.usace.army.mil.

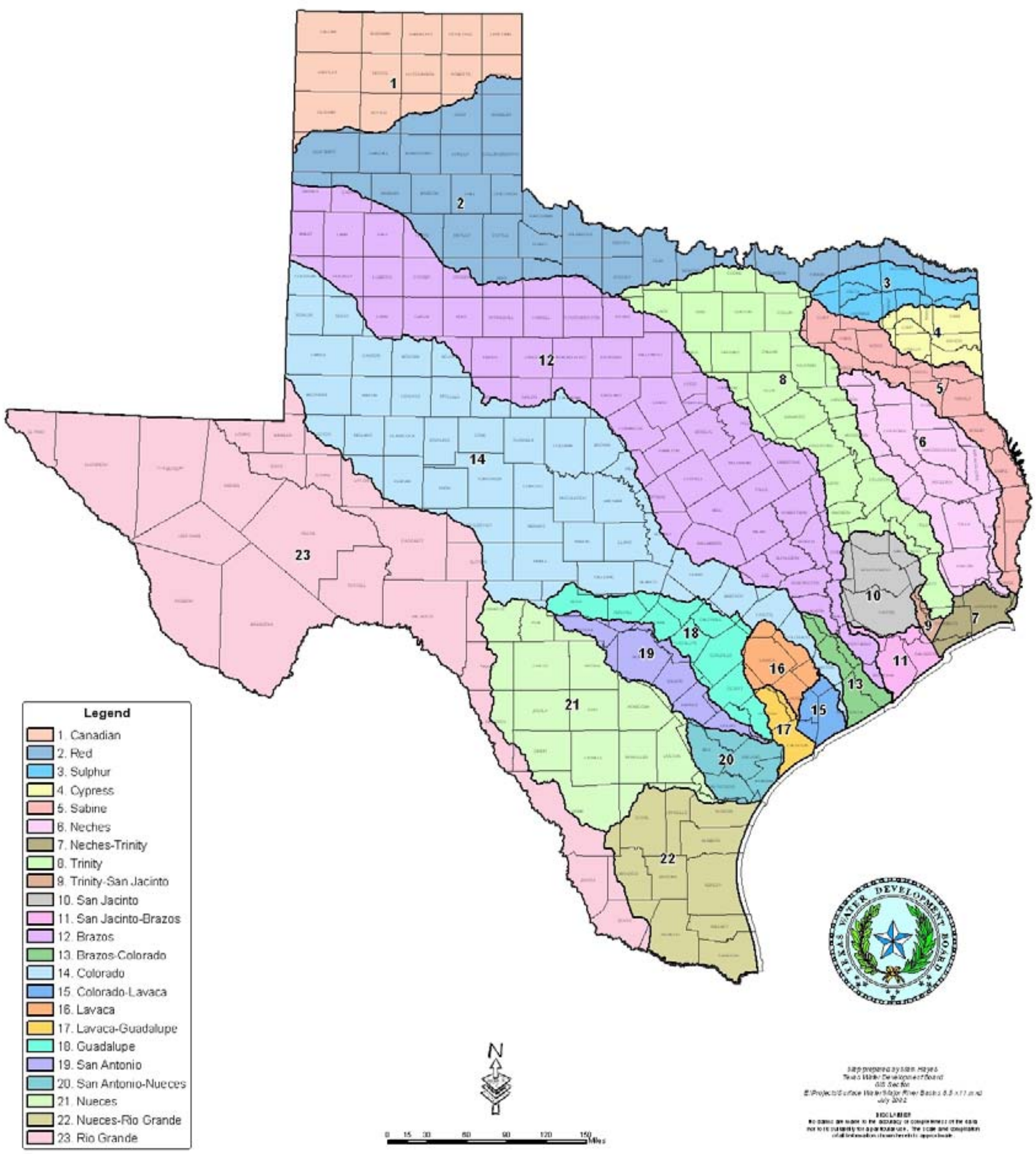
Sincerely,

Carolyn Murphy
Chief, Environmental Branch

Enclosure

CF:

Mr. Rusty Swafford
National Marine Fisheries Service
Habitat Conservation Division
4700 Avenue U
Galveston, Texas 77551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1. Canadian
2. Red
3. Sulphur
4. Cypress
5. Sabine
6. Neches
7. Neches-Trinity
8. Trinity
9. Trinity-San Jacinto
10. San Jacinto
11. San Jacinto-Brazos
12. Brazos
13. Brazos-Colorado
14. Colorado
15. Colorado-Lavaca
16. Lavaca
17. Lavaca-Guadalupe
18. Guadalupe
19. San Antonio
20. San Antonio-Nueces
21. Nueces
22. Nueces-Rio Grande
23. Rio Grande
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TEXAS WATER DEVELOPMENT BOARD

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

February 13, 2004

REPLY TO THE ATTENTION OF

Environmental Section

Mr. Robert Pine
Field Supervisor
U.S. Fish & Wildlife Service
Ecological Services
10711 Burnet Road, Suite 200
Austin, Texas 78758

Dear Mr. Pine,

As part of the U.S. Army Corps of Engineers (USACE) Aquatic Plant Control Program (APCP), the Galveston District and the Texas Parks and Wildlife Department (TPWD) are planning to add to the list of invasive aquatic plants and expand coverage in the state of Texas by determining the eligibility of an additional water body, the Rio Grande River, for treatment of hydrilla. The main channel of the Rio Grande River has experienced an increase in growth of hydrilla. In addition, there are a number of invasive aquatic plants that need to be added to the APCP. These plants include giant salvinia, giant reed, torpedo grass, water spinach, giant duckweed, paperbark, and watertrumpet. In the past, some plants like hydrilla were treated on a site-by-site basis. The Environmental Assessment (EA) that the USACE is drafting now would allow TPWD to treat state-listed invasive aquatic plants on a statewide basis in the water bodies that have been already included in the Program.

The purpose of this letter is to solicit from your office a listing of threatened and endangered species, which have the potential to be affected by the implementation of the aquatic plant control measures described below, and are in the river basins that appear to be within your jurisdiction.

The enclosed information includes a map of all 18 river basins in Texas that have been identified as problem areas for the invasive aquatic plants recommended for inclusion to the Program, and a list of water bodies that are already included in the APCP. We are promoting the inclusion of the above-listed plants for all 18 river basins because noxious aquatic plants have been found either in the watershed or in small quantities in the lakes, and we anticipate there may be a problem in the near future. Their inclusion in the Program now would make it much easier for us to respond to the problems as they arise.

The treatment measures that were included in the Program through a previous EA written in 1995 were chemical, mechanical, biological, and environmental manipulation. The methods that have been employed over the past few years are mainly chemical and mechanical, even though environmental manipulation and biological control are options. Biological control consists of plant pathogens and insects, which are host-specific and are safe for the applicator and the environment. The use of triploid grass carp is not included in the current Program and will not be included in the new EA. The chemicals used have been 2, 4-D (Weeder 64), Endothall (Aquathol K), Fluridone (Sonar SRP), and Glyphosate (Rodeo). Additional information concerning herbicide used in the Program can be found on the following website: http://libweb.wes.army.mil/Archimages/9863.PDF, and this web address is case sensitive. The treatment sites are restricted to boat ramps, boat access lanes, swimming areas, since access for public use, not eradication, is the purpose of treatment.

If there is additional information on herbicides and impacts to endangered species or there are additional threatened or endangered species that should be considered for any of these water bodies, please send the information, species name and water body to Ms. Natalie Rund, Environmental Branch, P.O Box 1229 Galveston, TX 77553-1229 or phone 409-766-6384.

Sincerely,

Carolyn Murphy
Chief, Environmental Branch

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

February 13, 2004

REPLY TO THE ATTENTION OF

Environmental Section

Mr. Allen M. Strand
Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services
TAMU-CC, Campus Box338
6300 Ocean Drive
Corpus Christi, TX 78412

Dear Mr. Strand:

As part of the U.S. Army Corps of Engineers (USACE) Aquatic Plant Control Program (APCP), the Galveston District and the Texas Parks and Wildlife Department (TPWD) are planning to add to the list of invasive aquatic plants and expand coverage in the state of Texas by determining the eligibility of an additional water body, the Rio Grande River, for treatment of hydrilla. The main channel of the Rio Grande River has experienced an increase in growth of hydrilla. In addition, there are a number of invasive aquatic plants that need to be added to the APCP. These plants include giant salvinia, giant reed, torpedo grass, water spinach, giant duckweed, paperbark, and watertrumpet. In the past, some plants like hydrilla were treated on a site-by-site basis. The Environmental Assessment (EA) that the USACE is drafting now would allow TPWD to treat state-listed invasive aquatic plants on a statewide basis in the water bodies that have been already included in the Program.

The purpose of this letter is to solicit from your office a listing of threatened and endangered species, which have the potential to be affected by the implementation of the aquatic plant control measures described below, and are in the river basins that appear to be within your jurisdiction. Past correspondence (2002) with your office requested a threatened and endangered list for Hidalgo, Cameron, Starr, and Zapata Counties. Since that time the USACE has added to the list of invasive aquatic plants to be treated under the APCP. Since these plants will be treated on a statewide basis, the USACE is requesting a threatened and endangered species list for the river basins that appear to be within your jurisdiction.

The enclosed information includes a map of all 18 river basins in Texas that have been identified as problem areas for the invasive aquatic plants recommended for inclusion to the Program, and a list of water bodies that are already included in the APCP. We are promoting the inclusion of the above-listed plants for all 18 river basins because noxious aquatic plants have been found either in the watershed or in s mall quantities in the lakes, and we anticipate there may be a problem in the near future. Their inclusion in the Program now would make it much easier for us to respond to the problems as they arise.

The treatment measures that were included in the Program through a previous EA written in 1995 were chemical, mechanical, biological, and environmental manipulation. The methods that have been employed over the past few years are mainly chemical and mechanical, even though environmental manipulation and biological control are options. Biological control consists of plant pathogens and insects, which are host-specific and are safe for the applicator and the environment. The use of triploid grass carp is not included in the current Program and will not be included in the new EA. The chemicals used have been 2, 4-D (Weeder 64), Endothall (Aquathol K), Fluridone (Sonar SRP), and Glyphosate (Rodeo). Additional information concerning herbicide used in the Program can be found on the following website: http://libweb.wes.army.mil/Archimages/9863.PDF, and this web address is case sensitive. The treatment sites are restricted to boat ramps, boat access lanes, swimming areas, since access for public use, not eradication, is the purpose of treatment.

If there is additional information on herbicides and impacts to endangered species or there are additional threatened or endangered species that should be considered for any of these water bodies, please send the information, species name and water body to Ms. Natalie Rund, Environmental Branch, P.O Box 1229 Galveston, TX 77553-1229 or phone 409-766-6384.

Sincerely,

Carolyn Murphy
Chief, Environmental Branch

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

February 13, 2004

REPLY TO THE ATTENTION OF

Environmental Section

Mr. Thomas Cloud
Field Supervisor
U.S. Fish & Wildlife Service
Ecological Services
711 Stadium Dr. Suite 252
Arlington, TX 76011

Dear Mr. Cloud,

As part of the U.S. Army Corps of Engineers (USACE) Aquatic Plant Control Program (APCP), the Galveston District and the Texas Parks and Wildlife Department (TPWD) are planning to add to the list of invasive aquatic plants and expand coverage in the state of Texas by determining the eligibility of an additional water body, the Rio Grande River, for treatment of hydrilla. The main channel of the Rio Grande River has experienced an increase in growth of hydrilla. In addition, there are a number of invasive aquatic plants that need to be added to the APCP. These plants include giant salvinia, giant reed, torpedo grass, water spinach, giant duckweed, paperbark, and watertrumpet. In the past, some plants like hydrilla were treated on a site-by-site basis. The Environmental Assessment (EA) that the USACE is drafting now would allow TPWD to treat state-listed invasive aquatic plants on a statewide basis in the water bodies that have been already included in the Program.

The purpose of this letter is to solicit from your office a listing of threatened and endangered species, which have the potential to be affected by the implementation of the aquatic plant control measures described below, and are in the river basins that appear to be within your jurisdiction.

The enclosed information includes a map of all 18 river basins in Texas that have been identified as problem areas for the invasive aquatic plants recommended for inclusion to the Program, and a list of water bodies that are already included in the APCP. We are promoting the inclusion of the above-listed plants for all 18 river basins because noxious aquatic plants have been found either in the watershed or in small quantities in the lakes, and we anticipate there may be a problem in the near future. Their inclusion in the Program now would make it much easier for us to respond to the problems as they arise.

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If there is additional information on herbicides and impacts to endangered species or there are additional threatened or endangered species that should be considered for any of these water bodies, please send the information, species name and water body to Ms. Natalie Rund, Environmental Branch, P.O Box 1229 Galveston, TX 77553-1229 or phone 409-766-6384.

Sincerely,

Carolyn Murphy
Chief, Environmental Branch

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
WinSystems Center Building
711 Stadium Drive, Suite 252
Arlington, Texas 76011

2-12-04-I-243

March 4, 2004

Ms. Carolyn Murphy
U.S. Army Corps of Engineers, Galveston District
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Ms. Murphy:

This responds to your February 13, 2004, letter requesting a list of federally threatened and endangered species that may be affected by the proposed modifications to the U.S. Army Corps of Engineers' Aquatic Plant Control Program (APCP). Treatment measures in the APCP include chemical, mechanical, biological, and environmental manipulation for the control of invasive aquatic plants.

The following is a list of the threatened (T), endangered (E), and candidate (C) species, within this office's area of responsibility, that may be affected by aquatic plant control through the methods included in the APCP:

interior least tern *(Sterna antillarum*) - E
whooping crane (*Grus americana*) - E
Arkansas River shiner (*Notropis girardi*) - T
bald eagle (*Haliaeetus leucocephalus*) - T
piping plover (*Charadrius melodus*) - T
Neches River rose-mallow (*Hibiscus dasycalyx*) - C
sharpnose shiner (*Notropis oxyrhynchus*) - C
smalleye shiner (*Notropis buccula*) - C

This list was generated based on the knowledge of species that may depend, directly or indirectly, on aquatic resources and the information included with your letter identifying control areas, which indicated all the river basins within our area. Candidate species are not afforded federal protection under the Endangered Species Act; however, we recommend that potential impacts to these species be considered during project planning.

To assist you in your evaluation of potential effects to these species, we have enclosed our current county by county listing of threatened and endangered species. This list should be useful in identifying the species' potential occurrence within each river basin.

Thank you for the opportunity to provide information on the proposed project. If you have any questions, please contact Omar Bocanegra of my staff at (817) 277-1100.

Sincerely,

Tom Cloud

Thomas J. Cloud, Jr.
Field Supervisor

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
WinSystems Center Building
711 Stadium Drive, Suite 252
Arlington, Texas 76011
(817) 277-1100

ENDANGERED, THREATENED, AND CANDIDATE SPECIES LISTED BY COUNTY FOR THE ARLINGTON FIELD OFFICE'S AREA OF RESPONSIBILITY

DISCLAIMER

This County by County list is based on information available to the U.S. Fish and Wildlife Service at the date of preparation. This list is subject to change, without notice, as new biological information is gathered and should not be used as the sole source for identifying species that may be impacted by a project. Note that some counties are purposely left blank because no listed or candidate species (other than migratory species) are known to occur in that county.

ENDANGERED SPECIES

black-capped vireo *(Vireo atricapillus)* Endangered, Oct 6, 1987
golden-cheeked warbler *(Dendroica chrysoparia)* Endangered, Dec. 27, 1990
interior least tern *(Sterna antillarum)* Endangered, May 28, 1985
red-cockaded woodpecker *(Picoides borealis)* Endangered, June, 2, 1970
whooping crane *(Grus americana)* Endangered, May 15, 1978

THREATENED SPECIES

Louisiana black bear *(Ursus americanus luteolus)* Threatened, Jan. 7, 1992
bald eagle *(Haliaeetus leucocephalus)* downlisted to Threatened, Aug. 11, 1995
piping plover *(Charadrius melodus)* Threatened, Dec. 11, 1985
Arkansas River shiner *(Notropis girardi)* Threatened, Nov. 23, 1998; designated Critical Habitat May 4, 2001

CANDIDATE SPECIES

Neches River rose-mallow *(Hibiscus dasycalyx)*
lesser prairie chicken *(Tympanuchus pallidicinctus)*
black-tailed prairie dog *(Cynomys ludovicianus)*
Louisiana pine snake *(Pituophis ruthveni)*
smalleye shiner *(Notropis buccula)*
sharpnose shiner *(Notropis oxyrhynchus)*

County	Common Name	Scientific Name	Status
All	All	*All*	All
Anderson	Louisiana black bear	*Ursus americanus*	Threatened
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	Neches River rose mallow	*Hibiscus dasycalyx*	Candidate
Archer	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	whooping crane	*Grus americana*	Endangered
Armstrong	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	whooping crane	*Grus americana*	Endangered
Bailey	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Baylor	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	smalleye shiner	*Notropis buccula*	Candidate
	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
	whooping crane	*Grus americana*	Endangered
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Borden	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Bosque	black-capped vireo	*Vireo atricapilla*	Endangered
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	whooping crane	*Grus americana*	Endangered
	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
	smalleye shiner	*Notropis buccula*	Candidate
	golden-cheeked warbler	*Dendroica chrysoparia*	Endangered
Bowie	Louisiana black bear	*Ursus americanus*	Threatened
	interior least tern	*Sterna antillarum*	Endangered
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Briscoe	interior least tern	*Sterna antillarum*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Camp	bald eagle	*Haliaeetus leucocephalus*	Threatened
Carson	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	whooping crane	*Grus americana*	Endangered
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Cass	bald eagle	*Haliaeetus leucocephalus*	Threatened
	Louisiana black bear	*Ursus americanus*	Threatened
Castro	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate

County	Common Name	Scientific Name	Status
Cherokee	Louisiana black bear	*Ursus americanus*	Threatened
	Neches River rose-mallow	*Hibiscus dasycalyx*	Candidate
	Louisiana pine snake	*Pituophis ruthveni*	Candidate
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	red-cockaded woodpecker	*Picoides borealis*	Endangered
Childress	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	interior least tern	*Sterna antillarum*	Endangered
	whooping crane	*Grus americana*	Endangered
Clay	whooping crane	*Grus americana*	Endangered
	interior least tern	*Sterna antillarum*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Cochran	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Collin	whooping crane	*Grus americana*	Endangered
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Collingsworth	interior least tern	*Sterna antillarum*	Endangered
	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
	whooping crane	*Grus americana*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Cooke	interior least tern	*Sterna antillarum*	Endangered
	whooping crane	*Grus americana*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Cottle	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Crosby	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	whooping crane	*Grus americana*	Endangered
Dallam	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Dallas	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-capped vireo	*Vireo atricapilla*	Endangered
	interior least tern	*Sterna antillarum*	Endangered
	piping plover	*Charadrius melodus*	Threatened
	golden-cheeked warbler	*Dendroica chrysoparia*	Endangered
Dawson	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Deaf Smith	bald eagle	*Haliaeetus leucocephalus*	Threatened
	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Delta	bald eagle	*Haliaeetus leucocephalus*	Threatened
	interior least tern	*Sterna antillarum*	Endangered
	Louisiana black bear	*Ursus americanus*	Threatened
	piping plover	*Charadrius melodus*	Threatened

County	Common Name	Scientific Name	Status
Denton	whooping crane	*Grus americana*	Endangered
	piping plover	*Charadrius melodus*	Threatened
	interior least tern	*Sterna antillarum*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Dickens	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Donley	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	interior least tern	*Sterna antillarum*	Endangered
	whooping crane	*Grus americana*	Endangered
Eastland	whooping crane	*Grus americana*	Endangered
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-capped vireo	*Vireo atricapilla*	Endangered
	golden-cheeked warbler	*Dendroica chrysoparia*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Ellis	bald eagle	*Haliaeetus leucocephalus*	Threatened
	whooping crane	*Grus americana*	Endangered
Erath	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-capped vireo	*Vireo atricapilla*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	golden-cheeked warbler	*Dendroica chrysoparia*	Endangered
	whooping crane	*Grus americana*	Endangered
Fannin	Louisiana black bear	*Ursus americanus*	Threatened
	interior least tern	*Sterna antillarum*	Endangered
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Fisher	smalleye shiner	*Notropis buccula*	Candidate
	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Floyd	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Foard	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Franklin	bald eagle	*Haliaeetus leucocephalus*	Threatened
Gaines	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
Garza	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
	smalleye shiner	*Notropis buccula*	Candidate
	whooping crane	*Grus americana*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Gray	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
	whooping crane	*Grus americana*	Endangered
	interior least tern	*Sterna antillarum*	Endangered

County	Common Name	Scientific Name	Status
Grayson	interior least tern	*Sterna antillarum*	Endangered
	piping plover	*Charadrius melodus*	Threatened
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Gregg	interior least tern	*Sterna antillarum*	Endangered
	Louisiana black bear	*Ursus americanus*	Threatened
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Hale	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Hall	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	interior least tern	*Sterna antillarum*	Endangered
	whooping crane	*Grus americana*	Endangered
Hansford	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Hardeman	interior least tern	*Sterna antillarum*	Endangered
	whooping crane	*Grus americana*	Endangered
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Harrison	bald eagle	*Haliaeetus leucocephalus*	Threatened
	Louisiana black bear	*Ursus americanus*	Threatened
Hartley	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Haskell	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	whooping crane	*Grus americana*	Endangered
	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
	smalleye shiner	*Notropis buccula*	Candidate
Hemphill	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	interior least tern	*Sterna antillarum*	Endangered
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	Arkansas River Shiner	*Notropis girardi*	Threatened with Critical Habitat
	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
Henderson	bald eagle	*Haliaeetus leucocephalus*	Threatened
Hill	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-capped vireo	*Vireo atricapilla*	Endangered
	golden-cheeked warbler	*Dendroica chrysoparia*	Endangered
	whooping crane	*Grus americana*	Endangered
	smalleye shiner	*Notropis buccula*	Candidate
	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
Hockley	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
Hood	golden-cheeked warbler	*Dendroica chrysoparia*	Endangered
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	black-capped vireo	*Vireo atricapilla*	Endangered

County	Common Name	Scientific Name	Status
Hopkins	bald eagle	*Haliaeetus leucocephalus*	Threatened
	interior least tern	*Sterna antillarum*	Endangered
	Louisiana black bear	*Ursus americanus*	Threatened
Hunt	bald eagle	*Haliaeetus leucocephalus*	Threatened
Hutchinson	interior least tern	*Sterna antillarum*	Endangered
	Arkansas River Shiner	*Notropis girardi*	Threatened with Critical Habitat
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Jack	whooping crane	*Grus americana*	Endangered
	black-capped vireo	*Vireo atricapilla*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Johnson	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-capped vireo	*Vireo atricapilla*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	golden-cheeked warbler	*Dendroica chrysoparia*	Endangered
	whooping crane	*Grus americana*	Endangered
Jones	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Kaufman	bald eagle	*Haliaeetus leucocephalus*	Threatened
Kent	smalleye shiner	*Notropis buccula*	Candidate
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
King	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	whooping crane	*Grus americana*	Endangered
	smalleye shiner	*Notropis buccula*	Candidate
	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
Knox	smalleye shiner	*Notropis buccula*	Candidate
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	whooping crane	*Grus americana*	Endangered
	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
Lamar	whooping crane	*Grus americana*	Endangered
	Louisiana black bear	*Ursus americanus*	Threatened
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	interior least tern	*Sterna antillarum*	Endangered
Lamb	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Lipscomb	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
Lubbock	whooping crane	*Grus americana*	Endangered
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Lynn	whooping crane	*Grus americana*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Marion	bald eagle	*Haliaeetus leucocephalus*	Threatened
	Louisiana black bear	*Ursus americanus*	Threatened

County	Common Name	Scientific Name	Status
Montague	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-capped vireo	*Vireo atricapilla*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	interior least tern	*Sterna antillarum*	Endangered
	whooping crane	*Grus americana*	Endangered
Moore	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Morris	Louisiana black bear	*Ursus americanus*	Threatened
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Motley	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Nacogdoches	bald eagle	*Haliaeetus leucocephalus*	Threatened
	Louisiana pine snake	*Pituophis ruthveni*	Candidate
	Louisiana black bear	*Ursus americanus*	Threatened
	red-cockaded woodpecker	*Picoides borealis*	Endangered
Navarro	bald eagle	*Haliaeetus leucocephalus*	Threatened
Ochiltree	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Oldham	Arkansas River Shiner	*Notropis girardi*	Threatened with Critical Habitat
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Palo Pinto	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-capped vireo	*Vireo atricapilla*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	golden-cheeked warbler	*Dendroica chrysoparia*	Endangered
	smalleye shiner	*Notropis buccula*	Candidate
	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
Panola	Louisiana black bear	*Ursus americanus*	Threatened
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Parker	whooping crane	*Grus americana*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-capped vireo	*Vireo atricapilla*	Endangered
Parmer	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Potter	Arkansas River Shiner	*Notropis girardi*	Threatened with Critical Habitat
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	whooping crane	*Grus americana*	Endangered
Rains	bald eagle	*Haliaeetus leucocephalus*	Threatened
	interior least tern	*Sterna antillarum*	Endangered
Randall	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	interior least tern	*Sterna antillarum*	Endangered
	whooping crane	*Grus americana*	Endangered
	bald eagle	*Haliaeetus leucocephalus*	Threatened

County	Common Name	Scientific Name	Status
Red River	bald eagle	*Haliaeetus leucocephalus*	Threatened
	interior least tern	*Sterna antillarum*	Endangered
Roberts	Arkansas River Shiner	*Notropis girardi*	Threatened with Critical Habitat
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	interior least tern	*Sterna antillarum*	Endangered
	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
Rockwall			
Rusk	bald eagle	*Haliaeetus leucocephalus*	Threatened
	Louisiana black bear	*Ursus americanus*	Threatened
Scurry	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Shackelford	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-capped vireo	*Vireo atricapilla*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Shelby	bald eagle	*Haliaeetus leucocephalus*	Threatened
	Louisiana pine snake	*Pituophis ruthveni*	Candidate
	Louisiana black bear	*Ursus americanus*	Threatened
	red-cockaded woodpecker	*Picoides borealis*	Endangered
Sherman	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Smith	Louisiana black bear	*Ursus americanus*	Threatened
	bald eagle	*Haliaeetus leucocephalus*	Threatened
Somervell	black-capped vireo	*Vireo atricapilla*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	golden-cheeked warbler	*Dendroica chrysoparia*	Endangered
	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
Stephens	black-capped vireo	*Vireo atricapilla*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	golden-cheeked warbler	*Dendroica chrysoparia*	Endangered
Stonewall	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
	smalleye shiner	*Notropis buccula*	Candidate
Swisher	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Tarrant	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	interior least tern	*Sterna antillarum*	Endangered
	whooping crane	*Grus americana*	Endangered
Terry	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	whooping crane	*Grus americana*	Endangered

County	Common Name	Scientific Name	Status
Throckmorton	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	interior least tern	*Sterna antillarum*	Endangered
	piping plover	*Charadrius melodus*	Threatened
	smalleye shiner	*Notropis buccula*	Candidate
	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
Titus	bald eagle	*Haliaeetus leucocephalus*	Threatened
Upshur	bald eagle	*Haliaeetus leucocephalus*	Threatened
	Louisiana black bear	*Ursus americanus*	Threatened
Van Zandt	bald eagle	*Haliaeetus leucocephalus*	Threatened
Wheeler	whooping crane	*Grus americana*	Endangered
	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	interior least tern	*Sterna antillarum*	Endangered
Wichita	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	interior least tern	*Sterna antillarum*	Endangered
	whooping crane	*Grus americana*	Endangered
Wilbarger	whooping crane	*Grus americana*	Endangered
	interior least tern	*Sterna antillarum*	Endangered
	bald eagle	*Haliaeetus leucocephalus*	Threatened
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
Wise	black-capped vireo	*Vireo atricapilla*	Endangered
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	whooping crane	*Grus americana*	Endangered
Wood	bald eagle	*Haliaeetus leucocephalus*	Threatened
	interior least tern	*Sterna antillarum*	Endangered
	Louisiana pine snake	*Pituophis ruthveni*	Candidate
Yoakum	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate
	lesser prairie chicken	*Tympanuchus pallidicinctus*	Candidate
Young	golden-cheeked warbler	*Dendroica chrysoparia*	Endangered
	whooping crane	*Grus americana*	Endangered
	sharpnose shiner	*Notropis oxyrhynchus*	Candidate
	smalleye shiner	*Notropis buccula*	Candidate
	black-tailed prairie dog	*Cynomys ludovicianus*	Candidate

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229
MARCH 17, 2006

Environmental Section

James E. Bruseth, Ph.D.
Deputy State Historic
Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711

Dear Dr. Bruseth:

The Galveston District, Corps of Engineers (Corps), proposes to initiate a Programmatic Agreement (PA) to address impacts associated with control of non-native, invasive vegetation under the Aquatic Plant Control Program (APCP). The APCP program will be implemented statewide and the area of potential effects covers all 18 major Texas river basins as shown as Figure 1 in the enclosed Environmental Assessment (EA) (Enclosure 1). As these river basins are considered high probability areas for archeological sites as well as historic sites and structures, the Corps and TPWD have determined that the program could potentially affect historic properties. Day-to-day implementation of the APCP is conducted by Texas Parks and Wildlife (TPWD), but the program is supported in part by federal funds administered by the Corps. The Corps has prepared a Draft Environmental Assessment for the APCP which will be coordinated for public comment in the fall of 2005.

There are three forms of vegetation control proposed in the APCP. These methods are chemical, biological and mechanical. Chemical agents will be restricted to use in water, where their elements will no longer be in concentrated form. Although many of the plant control chemicals are carbon based, the use of the chemicals in water will render them to such a diluted form that they will no longer be a threat to archeological sites. Biological methods include the introduction of host- specific organisms, such as insect species which consume or stress the invasive vegetation. The chemical and biological agents proposed to be used in the APCP will not have an affect on historic properties.

Mechanical activities of vegetation removal require that machinery be moved into the area of potential effect (APE) to shred, harvest, and spread removed vegetation for drying. Most of these activities involve the use of existing roads and boat docks and will not have an impact on historic properties. However, other activities associated with the use of mechanized vegetation clearing must be reviewed on a case by case basis because of their potential to adversely affect historic properties. These may include activities such as the creation of new access roads to remove vegetation, new dock areas to offload vegetation from the water and new disposal areas for the removed vegetation.

The Corps proposes negotiation of a three-party PA which outlines procedures to be followed for Section 106 compliance of individual actions as per 36 CFR 800.6 (c), to address potential impacts to historic properties identified in APCP activities. Attached, as Enclosure 2, is a draft PA which was prepared by the Corps and which has been informally coordinated with the TPWD. The PA stipulates TPWD review of proposed APCP activities such as the creation of new roads, off-loading sites or disposal areas for their potential to affect historic properties, and establishes a process for the avoidance of all historic properties as the primary methodology under the APCP. The intent of the PA is to avoid impacts to historic properties by review of each action by TPWD archeologists; the PA deliberately does not cover situations where impacts to historic properties cannot be avoided. In those instances, the specific actions will be coordinated separately by TPWD with the SHPO and copies of the coordination will be provided to the Corps.

In summary, Galveston District requests your review of the enclosed PA. Upon receipt of your comments and finalization of the draft PA in consultation with TPWD, the Corps will coordinate a final draft PA with interested Native American Indian tribes in accordance with 36 CFR 800.3 (f)(2). Public coordination required by 800.3 (a) will be accomplished by inclusion of the final draft PA in the Draft Environmental Assessment, which will be made available for public review and comment. If you have any questions, please don't hesitate to call Ms. Nicole Minnichbach at 409-766-3878.

Sincerely,

Carolyn Murphy
Chief, Environmental Section

Enclosures:
1 Draft EA
2 Draft PA

CC w/Enclosures
Mr. Michael Strutt
TPWD Cultural Resource Director

CC w/o Enclosures
Dr. Earl Chilton
TPWD APCP POC

Ms. Rund
CESWG-PE-PR