



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
WinSystems Center Building  
711 Stadium Drive, Suite 252  
Arlington, Texas 76011

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August 8, 2005

Colonel John R. Minahan  
District Engineer  
U.S. Army Corps of Engineers  
(Attn: William Fickle, CESWF-PER)  
P.O. Box 17300  
Fort Worth, Texas 76102-0300

Re: Draft Fish and Wildlife Coordination Act Report for the Pecan Creek Flood Control Project, Gainesville, Texas.

Dear Colonel Minahan:

Enclosed for your information and review is a copy of our draft Fish and Wildlife Coordination Act (FWCA) report for the proposed project. Field investigations were conducted on June 2002, July 2003, April 2004, and August 2004 by the U.S. Fish and Wildlife Service Field Office in Arlington, Texas in cooperation with your Environmental Resources planning staff. Our final FWCA report will accompany your final Detailed Project Report. Please provide any review comments on our draft report at your earliest convenience so that we may finalize our report.

Please contact Mr. Sid Puder of my staff at the above address or telephone number (817) 277-1100 if you have any questions or require additional assistance.

Sincerely,

Thomas J. Cloud, Jr.  
Field Supervisor

Enclosure



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August 8, 2005

Colonel John R. Minahan  
District Engineer  
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P.O. Box 17300  
Fort Worth, Texas 76102-0300

Dear Colonel Minahan:

This letter constitutes the Secretary of the Interior's report on the Pecan Creek Local Flood Damage Reduction Feasibility Study. It is submitted by the U.S. Fish and Wildlife Service (Service) to the U.S. Army Corps of Engineers (Corps) under the authority, and in accordance with, Section 2(b) of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*) to accompany the Corps' final Detailed Project Report. The study was initiated by the Corps under authority of Section 205 of the 1948 Flood Control Act, as amended, to evaluate potential alternatives to reduce flood damage within the Pecan Creek watershed in Gainesville, Cooke County, Texas. Our report has been coordinated with the Texas Parks and Wildlife Department (TPWD), as noted in the attached letter, dated \_\_\_\_\_.

The purpose of this report is to identify and evaluate anticipated impacts of implementing the proposed project on fish and wildlife resources within the Pecan Creek watershed and to recommend conservation measures for resource protection. This report is based on data collected during field investigations conducted by the Service and your Environmental Resources planning staff in June 2002, July 2003, April 2004, and August 2004; information received from the Corps and the project sponsor, the City of Gainesville; and review comments from TPWD. A planning aid report has previously been submitted to the Corps regarding the existing environmental conditions within the project area.

### STUDY AREA

Cooke County is located in the Cross Timbers and Prairies Ecological Region of Texas. Total annual precipitation is approximately 37 inches, with an average low temperature of 40 degrees Fahrenheit (°F) in winter and an average high temperature of 87°F in summer. The terrain in

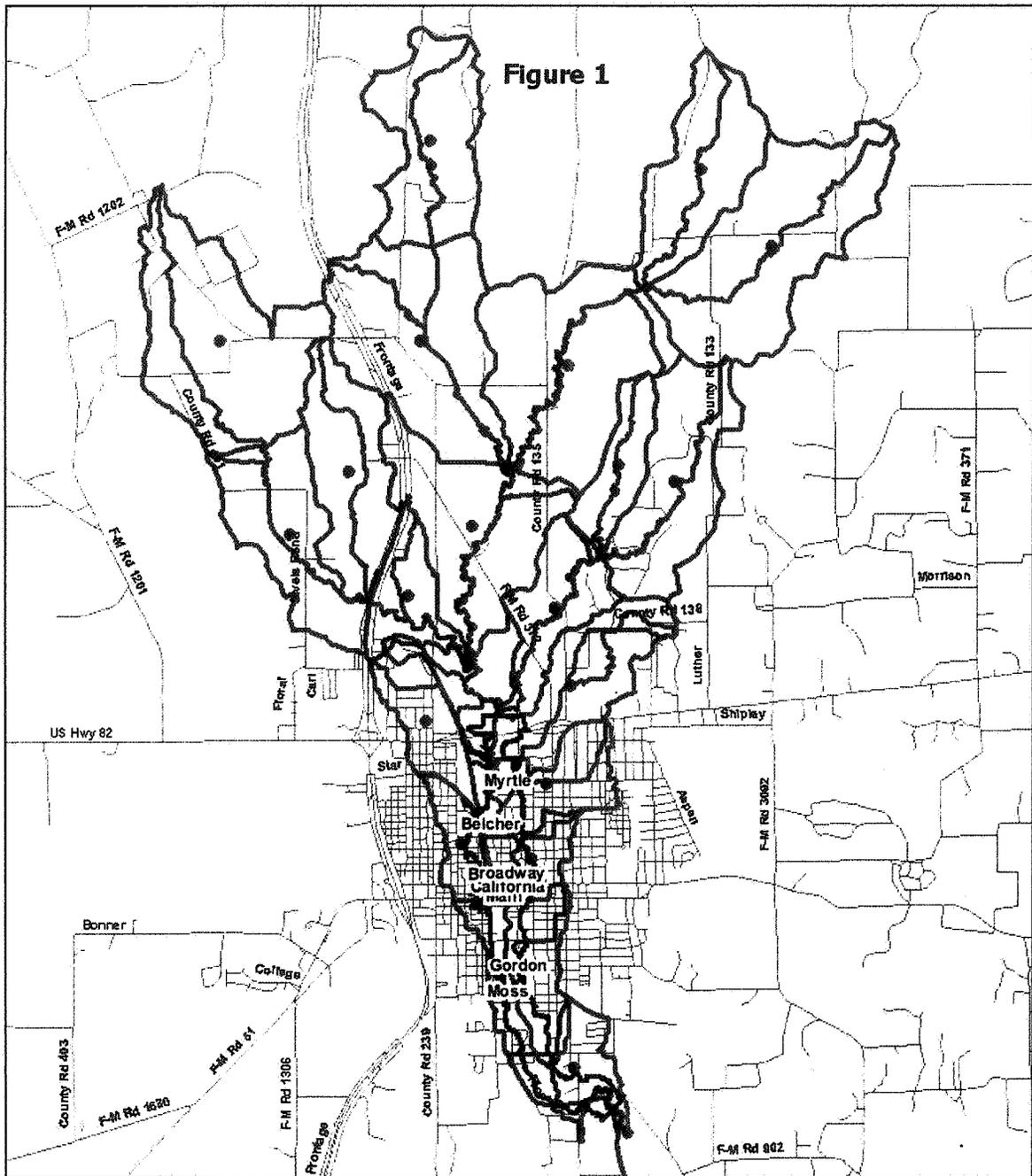
most of this region is hilly. Major drainage systems in Cooke County include the Elm Fork of the Trinity River, in the southern portion of the county, and the Red River, in the northern part of the county. Pecan Creek is a tributary of the Elm Fork of the Trinity River and drains an area of approximately 15.4 square miles. The headwaters of this stream originate three miles north of Gainesville in the northern part of Cooke County and flow south through the city and eventually into the Elm Fork. For the purposes of this report, the study area is comprised of the Pecan Creek watershed within the 100-year floodplain, 8,000 feet downstream of U.S. Highway 82 (US 82) (Figure 1).

Soils along Pecan Creek belong to the Normangee-Wilson-Crockett series, which are characterized as nearly level and gently sloping, stony, clay loams. The climax plant communities associated with these soils are tall grass prairies in the upland areas and elm (*Ulmus* spp.), pecan (*Carya illinoensis*), and hackberry (*Celtis occidentalis*) in riparian areas where deeper soils have developed in floodplain deposits or where the underlying clays have been exposed by Lower Cretaceous limestone erosion. Upland native grasses are dominated by little bluestem (*Schizachyrium scoparium*), hairy grama (*Bouteloua hirsuta*), Texas wintergrass (*Stipa leucotricha*), sideoats grama (*Bouteloua curtipendula*), Texas cupgrass (*Eriochloa sericea*), indiagrass (*Sorghastrum nutans*), and big bluestem (*Andropogon gerardii*).

Current land use in the upper reaches of the watershed is a mixture of open pasture and cropland. Upstream of US 82 and immediately west of I-35, the creek flows through the site of the former Empire Oil refinery. Residual contamination associated with this site does not appear to have significantly impaired the creek. Oxy Petroleum Inc. has assumed responsibility for the site and entered into an agreement with the Texas Commission on Environmental Quality voluntary clean up program to remediate and ecologically restore the site. South of US 82, Pecan Creek flows through highly urbanized areas with residential structures bounding both banks. The creek has been channelized in numerous places within the proposed project area with historical flagstone-lined sections as well as more modern concrete-lining.

## PLAN OF DEVELOPMENT

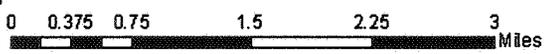
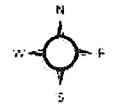
Numerous flood control plans have been evaluated by the Corps for Pecan Creek in the Gainesville area since the 1970s, including both non-structural and structural alternatives. Current non-structural flood control alternatives evaluated include the purchasing of flood prone properties; active floodplain management; flood forecasting and warning; floodplain evacuation; raising flood prone structures in-place; and flood proofing structures within the floodplain. None of these alternatives would require physical modification of the floodplain, whereas structural alternatives would entail construction activities that would physically modify the floodplain.



**Legend**

- 100 year (existing)
- Streets
- Pecan Creek
- Watershed

**Pecan Creek, Gainesville Tx.**  
 Watershed -Study Area



Structural alternatives currently evaluated consist of physical modification of the stream channel and/or bridges that cross the stream to eliminate choke points in the channel during flood conditions. The National Economic Development (NED) plan alternative, which is also the locally preferred plan (LPP) alternative, incorporates facets from both the non-structural and structural alternatives. It entails (1) the replacement of seven existing bridges: Garnett, Main, Broadway, California, Scott, and Belcher Streets and a foot-bridge; (2) the channelization and realignment of the creek beginning 400 feet south of Olive Street, continuing for 5,635 feet, and ending 360 feet south of Gordon Street; (3) relocation of water, gas, electric, telephone, and sewer utility lines; (4) acquisition of approximately 25-acres of project construction, operation, and maintenance lands; and (5) ecological mitigation between US 82 and 400 feet south of Olive Street, with approximately 22 acres of riparian and grassland/oldfield habitat (Figure 2).

## **FISH AND WILDLIFE RESOURCES WITHOUT THE PROJECT**

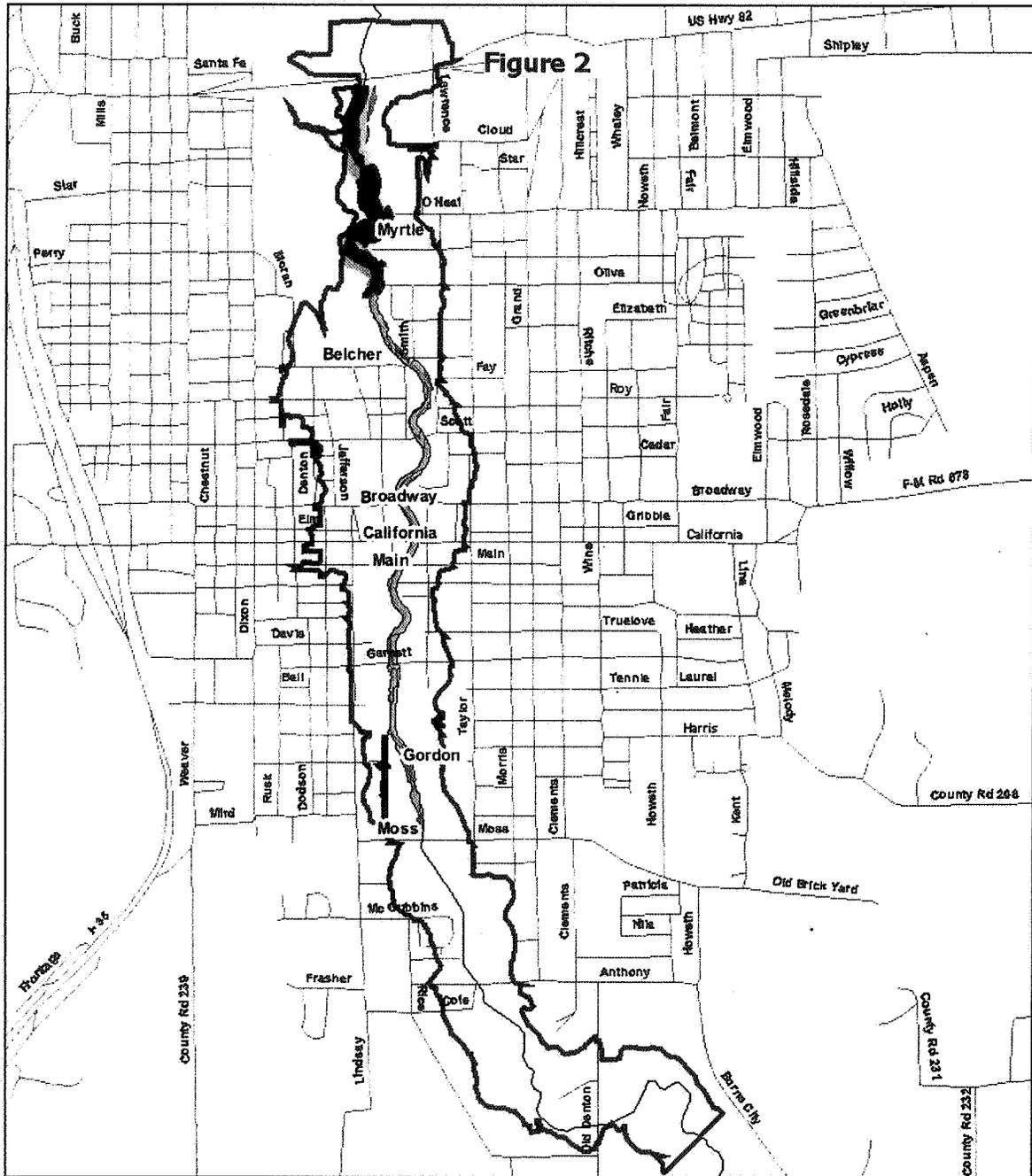
### **Aquatic Resources**

Due to the ephemeral nature of Pecan Creek, there is not an abundant amount of surface water in the watershed. The stream channel varies from wide and flat to narrow with steep banks.

The creek has already been channelized in various places within the proposed project area. The northern reach (north of I-35 extending downstream of US 82) of the project area contains most of the viable habitat. The substrate in this area of the creek ranges from bedrock to small gravel and fine sediment. In addition, this reach contains moderate to heavy forested creek banks that provide shade, habitat, and contribute to the productivity of aquatic organisms in the stream.

The middle reach of the study area is the most heavily disturbed primarily due to past channelization, removal of vegetation from the stream banks, and the lining of the channel bottom and sides to facilitate storm water runoff. Historical flagstone-lined sections, as well as more modern concrete-lined sections, are located within this reach. Water in this reach is often less than 2 inches in depth; direct sunlight and the lack of physical structure preclude the development of aquatic biota within this reach.

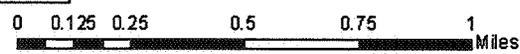
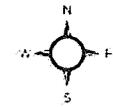
Channel depth varies from 2 to 4 feet. The average depth at the time of site visits was 2 feet. Downstream of Garnet Street, Pecan Creek has been straightened. However, it has not been lined or trees removed from the bank. The channel is wider than the reach near US 82. In addition, the channel has deeper pools and zones of high siltation.



**Legend**

100 year (existing)	Environmental Mitigation Area
Streets	Frequently Flooded Riparian
Pecan Creek	Riparian
	Grassland/Oldfield
	Urban
	Channel 30BW

**Pecan Creek, Gainesville Tx.**  
 Detailed Project Report - Project Features  
 For use by: Fish and Wildlife Service



The fish community within the proposed project area was assessed by the Service and the Corps on April 29, 2004. This assessment consisted of conducting field sampling at two sites on Pecan Creek (above and below the channelized reach) and evaluating the resulting data with an index of biotic integrity (IBI). An IBI provides a means to assess aquatic life use within a given water body using multiple metrics. The statewide IBI incorporates 12 metrics to define species richness, trophic composition, and abundance. Each one of these metrics is scored with values ranging from low (1) to high (5). In turn, aquatic life use values are determined by adding each metric score for a total score. These overall scores can range from limited to exceptional. The channelized middle reach of the stream was not sampled due to the lack of visually observable fish habitat.

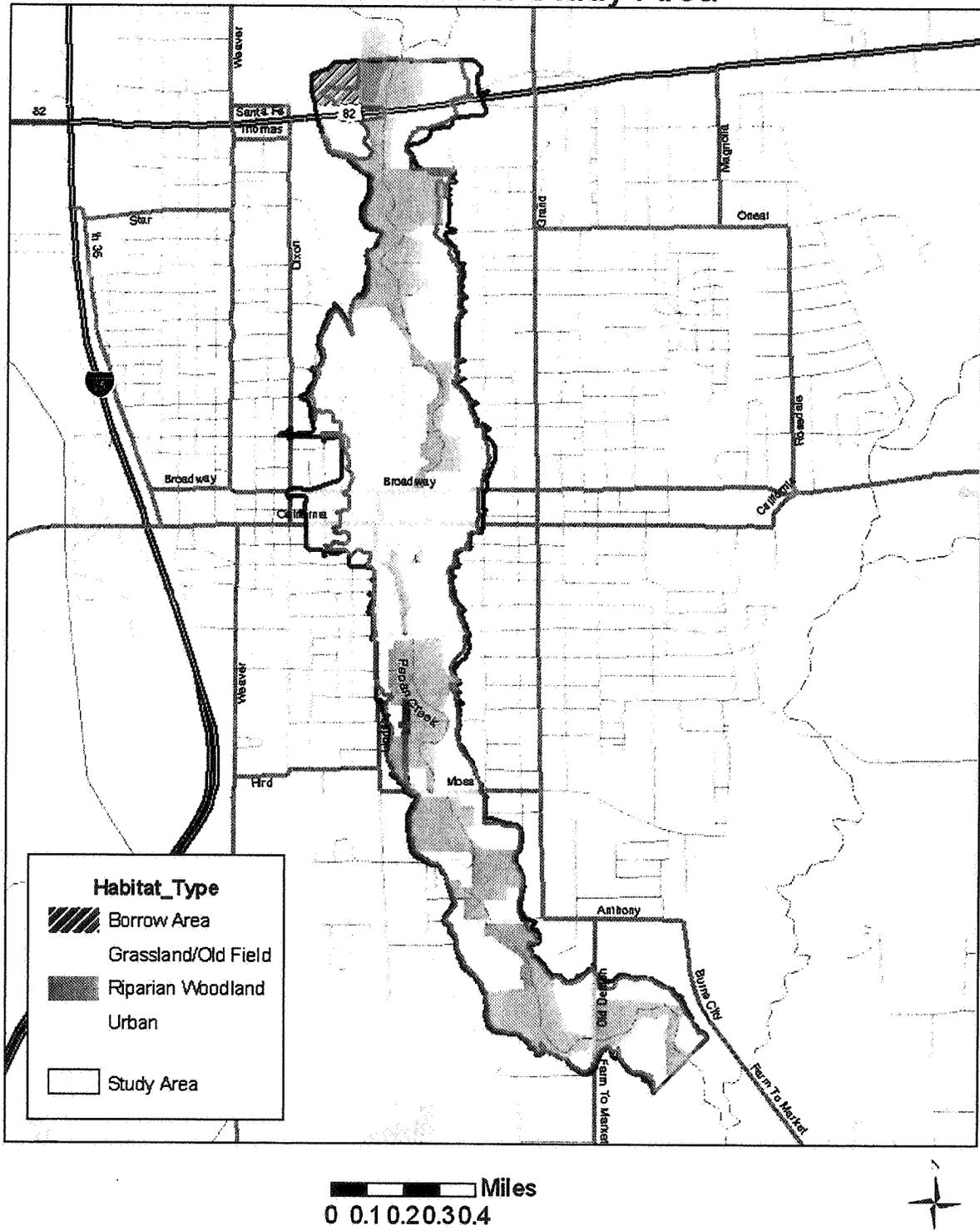
Results of the baseline fisheries survey characterized the fish assemblage within Pecan Creek as intermediate. A total of 362 fish comprising 8 species from 4 families were collected during this survey. Western mosquitofish (*Gambusia affinis*) accounted for 50 per cent of the total individuals collected, followed by green sunfish (*Lepomis cyanellus*) (35 per cent), bluegill (*Lepomis macrochirus*) (11 per cent), black bullhead (*Ameiurus melas*) (2 per cent), and central stonerollers (*Campostoma anomalum*) (1 per cent). The fish community was dominated by tolerant individuals and lacked any intolerant species. This can likely be attributed to limited in-stream flow. Overall, results of this survey indicate that protection of the stream is warranted.

### **Terrestrial Resources**

The Service's *Habitat Evaluation Procedures* (HEP) were used to evaluate the existing terrestrial habitats in the project area. An HEP requires the use of Habitat Suitability Index (HSI) models developed for indicator species which best represent groups of species that use existing habitat types. During the summers of 2002 and 2003 an interagency team comprised of Service and Corps personnel cooperated in collecting the habitat field data necessary for completing the HEP. A complete description of this habitat analysis can be found in the Service's March 10, 2004 planning aid report.

Based on existing conditions within the Pecan Creek watershed, two habitat types were characterized within the study area, riparian woodlands and grassland/oldfield (Figure 3). An additional cover-type (Urban) was mapped but not evaluated as a viable wildlife habitat type. Eight wildlife indicator species were selected to represent the wildlife communities that use the habitat types. The raccoon (*Procyon lotor*), fox squirrel (*Sciurus niger*), Carolina chickadee (*Parus carolinensis*), wood duck (*Aix sponsa*), barred owl (*Strix varia*), and red-tailed hawk (*Buteo jamaicensis*) were selected to represent those species that use riparian woodlands, while eastern meadowlark (*Sturnella magna*), eastern cottontail (*Sylvilagus floridanus*), and red-tailed hawk were selected to represent the wildlife community in the grassland/oldfield habitat type.

Figure 3: Habitat Types within the Pecan Creek Study Area



In HEP, baseline habitat conditions are expressed as a numeric function, Habitat Suitability Index (HSI) value, ranging from 0.0 to 1.0, where 0.0 represents no suitable habitat for an indicator species and 1.0 represents optimum conditions for the selected species. In general, HSI values ranging from 0.99 to 0.75 represent good habitat, HSI values ranging from 0.74 to 0.50 are considered average, HSI values ranging from 0.49 to 0.25 represent habitats considered below average, and HSI values ranging from 0.24 to 0.01 are considered poor quality.

Multiplying the numeric HSI values by the acreage of habitat available will yield the available habitat units (HU) of a given habitat type within the project area.

The riparian woodlands consist of wooded corridors along the northern and southern portions of Pecan Creek. This habitat type provides food, cover, nesting habitat, and living space for forest dependant species. Large mast producing trees and shrubs can provide food for small mammals, while brush piles and snags provide necessary food, cover, and shelter for passerines and other animals. Vegetation in riparian corridors can also improve water quality by acting as a filter, trapping sediment, organics, nutrients, and pesticides from surface runoff in urban areas. The average HSI value calculated for the riparian woodlands within the study area was 0.41, which is considered below average valued habitat for the relevant indicator species.

Grassland/oldfield habitat is scattered throughout the study area. This habitat consists of fields or other grassy areas comprised of native and introduced grasses and forbs and sometimes scattered trees. The average HSI value calculated for this habitat type within the study area was 0.27, which is considered below average.

The Urban cover-type consists of houses with manicured lawns and ornamental plants, vacant lots, unpaved driveways, and paved areas. Urban areas provide limited wildlife values and were not evaluated as a wildlife habitat in our study.

### **Resource Category Determination**

Our evaluations of the aquatic and terrestrial habitats of Pecan Creek were used to assign them resource categories in accordance with the Service's Mitigation Policy. Resource categories are utilized by the Service to identify the level of mitigation required to offset the adverse impacts of a development action on fish and wildlife resources. Resource categories are usually based on the overall value of the habitat to representative evaluation species and the relative abundance of the habitat on a national or ecoregion basis.

Resource category designations are provided for the three major habitat types evaluated within the Pecan Creek watershed: aquatic habitat, riparian woodlands, and grasslands/oldfields. Our field assessments of these habitat types within the watershed indicate that they are all low value for the evaluation species. Therefore, they are classified as a Resource Category 4 under our Mitigation Policy. The mitigation planning goal for this category is to minimize loss of habitat value within the project area.

## Endangered and Threatened Species

The only federally listed threatened or endangered species known to occur in Cooke County are the endangered whooping crane (*Grus americana*), endangered interior least tern (*Sterna antillarum*), and threatened bald eagle (*Haliaeetus leucocephalus*).

Endangered whooping cranes may be encountered in any county in north central Texas during migration, including Cooke County. Autumn migration normally begins in mid-September, with most birds arriving on the wintering grounds at Aransas National Wildlife Refuge between late October and mid-November. Spring migration occurs during March and April. Whooping cranes prefer isolated areas away from human activity for feeding and roosting, with vegetated wetlands and wetlands adjacent to cropland being utilized along the migration route. Foods consumed usually include frogs, fish, plant tubers, crayfish, insects, and waste grains in harvested fields. Due to the lack of suitable habitat and its urbanized nature, it is highly unlikely that this species would utilize any of the study area.

The endangered interior least tern nests in colonies on bare to sparsely vegetated sandbars along rivers and streams in Texas from May through August. Nesting areas are ephemeral, changing as sandbars form, move and become vegetated. Because natural nesting sites have become sparse, interior least terns have nested in atypical/non-natural areas, which provide similar habitat requirements. For example, one colony has been nesting for several years at the Southside Wastewater Treatment Plant in Dallas, downstream of the project area. Non-natural nesting sites include sandpits, exposed areas near reservoirs, gravel levee roads, dredged islands, gravel rooftops, and dike-fields. In recent years, terns have been utilizing artificial habitat more frequently within the Dallas-Fort Worth area with small colonies being established in highly developed areas. Ground disturbance related to construction activities near the Trinity River may incidentally create areas that are attractive to least terns for use as potential nesting sites. Should least terns arrive at any of the project areas during the breeding season, construction activities should cease immediately and the Service should be notified to discuss alternative development plans or the need for consultation under Section 7 of the Endangered Species Act.

Bald eagles are considered winter and possible spring residents of Cooke County. Bald eagles nest, roost, and perch in tall trees near water and feed primarily on fish and waterfowl. Winter habitat includes reservoirs, lakes, playas, rivers, and marshes. The project areas and/or adjacent lands contain large trees suitable for perching and nesting by bald eagles. Wintering bald eagles have been documented at Lake Ray Roberts, an impoundment on the Elm Fork of the Trinity River, located downstream from the project area. Most wintering bald eagles migrate north February through March and migrate late in the summer. Due to the development and disturbance in the study area, it is also unlikely that this area would be used by eagles.

Since our March 10, 2004, planning aid letter on this project, the black-tailed prairie dog (*Cynomys ludovicianus*) has been removed as a candidate species under the Endangered Species Act. Therefore, there are no candidate species in the project area which require consideration during planning activities.

## FISH AND WILDLIFE RESOURCES WITH THE PROJECT

### Aquatic Resources

The LPP, which is also the NED plan, includes purchasing single family residential properties within the Pecan Creek floodplain subject to flooding by the 20 per cent Corps fully developed watershed flood. In addition, approximately 5,635 feet of stream between 400-feet south of Olive Street and 360-feet south of Gordon Street would be channelized using a grass lined trapezoidal channel with a 30 foot bottom width and a 1 vertical on 3.5 horizontal side slope. A proposed mitigation area located between US 82 and Smith Street, north of the channelized area, would be comprised of 22 acres of riparian area set aside in perpetuity.

Purchasing of the single family residential properties within the floodplain of Pecan Creek is a non-structural flood control measure and consequently no mitigation would be required. However, construction activities during channelization of the stream would displace an already limited fish population as well as alter existing in-stream aquatic habitat. Therefore, mitigation is warranted to minimize the loss of in-stream habitat.

### Terrestrial Resources

Purchasing of single family residential properties within the floodplain of Pecan Creek under the LPP is a non-structural flood control measure that would have no adverse impacts to terrestrial resources. Therefore, no wildlife mitigation measures would be required. In addition, no riparian woodlands or grassland/oldfield habitat are expected to be impacted by construction operations associated with the channelization component of the LPP. However, construction activities during channelization of the stream, operation, and maintenance would adversely impact 25 acres of land off site, and as previously stated, no habitat restoration has been proposed under this plan. Consequently, mitigation is warranted to minimize the loss of these habitat types within the proposed project area.

## DISCUSSION AND RECOMMENDATIONS

Based on our habitat analysis and stream assessment, the following recommendations are provided to minimize the loss of habitat within the Pecan Creek watershed from the proposed flood control project.

All grassland/oldfield areas disturbed by construction activities should be revegetated with a variety of native grasses and forbs which provide wildlife food and cover benefits, reduce maintenance, and offer aesthetic qualities. Recommended vegetation includes native species such as buffalograss (*Buchloe dactyloides*), bluestems (*Andropogon* spp. or *Schizachyrium* spp.), bluebonnet (*Lupinus* spp.), and prairie clover (*Dalea* spp.). Mowing frequency should be reduced in sites adjacent to the channel and other grassland areas to encourage seed production and propagation of more desirable native, herbaceous grasses and forbs. Non-mow zones can

also be established along the creek channel to stabilize channel banks, provide filtering of runoff, and shading of the water surface.

There should be some sort of engineered buffer installed on the upstream end of the project possibly consisting of either gabion mats or riprap to prevent undercutting of the concrete stream liner and prevent headstream erosion into the preserved mitigation area south of US 82.

Any mature trees which are removed during construction activities should be replaced by trees of equal or greater value for wildlife species on a 3:1 (replacement:removed) basis. Replaced trees should be native species that produce hard and soft mast and provide shelter for wildlife. Native trees and shrubs such as pecan (*Carya illinoensis*), red oak (*Quercus falcata*), black walnut (*Juglans nigra*), mexican plum (*Prunus mexicana*), sumac (*Rhus* spp.), hawthorn (*Crataegus* spp), and coralberry (*Symphoricarpos orbiculatus*) should be planted in the existing portion of the riparian woodland to improve canopy cover and food base. Approximately 70 per cent of the stems planted should be trees and 30 per cent shrubs. No more than 25 per cent of the trees should be soft mast producers. The planting should be done in a random pattern leaving a few areas with open space for wildlife movement. In addition, standing snags should remain or be created in the existing forested areas to provide habitat for cavity-nesters.

Consideration should be given to the purchase of additional properties within the floodplain for the establishment and/or enhancement of riparian woodlands on these properties. This measure could improve water quality, reduce erosion of the stream bank, and reduce sedimentation within the stream by providing a vegetative buffer. We also recommend widening the existing riparian corridor along the portion of Pecan Creek south of US 82 (up to 150 feet on each side) where needed by planting native mast producing trees and shrubs to improve habitat and water quality conditions.

In summary, we believe the implementation of these recommended mitigation measures would serve to minimize the adverse impacts associated with the proposed flood control project. We appreciate the opportunity to provide our evaluation and recommendations on this project. Please contact Mr. Sid Puder of my staff at (817) 277-1100 if you have any questions or require additional assistance.

Sincerely,

Thomas J. Cloud, Jr.  
Field Supervisor

cc: Executive Director, TPWD, Austin, Texas (Attn: Danny Allen, Wildlife Division)