DRAFT
SUPPLEMENTAL
ENVIRONMENTAL ASSESSMENT

Little Fossil Creek
Flood Damage Reduction Project

HALTOM CITY, TARRANT COUNTY, TX

Prepared
by

US Army Corps of Engineers
Fort Worth District

August 2011

Table of Contents

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
Section 205 Local Flood Protection Project
Little Fossil Creek, Haltom City, Texas

August 8, 2011

INTRODUCTION

Little Fossil Creek is a perennial stream located in central Tarrant County, in north central Texas. Little Fossil Creek originates near the northern city limits of Saginaw and flows southeasterly through Saginaw, Blue Mound, Fort Worth, and Haltom City before converging with Big Fossil Creek just north of the Trinity River. The creek has a total drainage area of 18.6 square miles. At the request of Haltom City, the U.S. Army Corps of Engineers (Corps) initiated studies under the authority of Section 205 of the Flood Control Act of 1948, as amended, to evaluate potential solutions to flooding problems associated with Little Fossil Creek within the city limits of Haltom City. Section 205 of the Flood Control Act approved 30 June 1948, as amended, states:

> *"The Secretary of the Army is authorized to allot from any appropriations heretofore by Congress, which come within the provisions of Section 1 of the Flood Control Act of 22 June 1936, when in the opinion of the Chief of Engineers such work is advisable. The amount allotted for a project shall be allotted under this section for a project at any single locality. The provisions of local cooperation specified in Section 3 of the Flood Control Act of 22 June 1936, as amended, shall apply. The work shall be completed in itself and not commit the United Sates except as may result from the normal procedure applying to projects authorized after submission of preliminary examination and survey reports."*

The Little Fossil Creek Detailed Project Report and Environmental Assessment (EA) was completed in August 2002. Based upon modifications required during advanced project design, it was determined that a new EA was needed to evaluate alternatives. This supplemental EA was prepared in accordance with 33 CFR Section 230, Procedures for Implementing NEPA (Engineering Regulation 200-2-2).

BACKGROUND

The EA evaluated structural and nonstructural alternatives for consideration including flood regulation, flood forecasting and warning, flood proofing, floodplain management, permanent relocation, detention ponds, levees, hydraulic channels, and bridge relocations. A 75-foot bottom width hydraulic channel alternative approximately 7,350 feet long was selected as the Recommended Plan.

The Recommended Plan as described in the 2002 EA consists primarily of a 75-foot average bottom width, combination grass- and concrete-lined trapezoidal channel with one-sided, alternating bank side slope cuts where possible. The downstream end of the channel would be located approximately 1,100 feet downstream of the Trinity Railway Express (TRE) bridge and

the upstream limit of the project is located just downstream of the Belknap bridge. The total project has an aggregate length of 7,350 linear feet channel widening and deepening and erosion control features where necessary. In order to provide the needed channel capacity to pass the 100-year storm event through the Carson Street/State Highway (S.H.) 121 bridge complex, while sustaining velocities up to 15 feet per second with minimal friction losses, a 45-foot bottom width concrete-lined, trapezoidal channel with 1.5:1 side slopes would be constructed. This channel configuration is the largest allowable without replacing the bridge structures, while still preventing the split flow to the east. The Recommended Plan also calls for a partial gabion lining to be used in the section just upstream of the Midway Road bridge.

The Recommended Plan includes a multipurpose trail designed to provide access for hiking, jogging, bicycling and nature study. The multipurpose trail would be approximately 6,250 linear feet of ten-foot wide concrete. An additional 6,000 linear feet of six to eight foot wide un-surfaced nature trail was proposed adjacent to a 19.9 acre lake within proposed environmental mitigation lands at the downstream end of the project. Four access areas were included in the recreation plan to facilitate use of recreational aspects of the project by residents that need to drive to the trail.

The Recommended Plan includes environmental mitigation that would fully offset adverse impacts to the terrestrial and aquatic ecosystem of Little Fossil Creek. It was estimated that the Recommended Plan would adversely impact 1.9 acres of old field and 17.9 acres of riparian forest. All aquatic habitat within the reaches of the creek that are proposed for construction would be modified as a result of the proposed project. Based upon agency comments during plan formulation and during the public comment period, plans to fully mitigate terrestrial and aquatic impacts were finalized. The terrestrial mitigation plan would be implemented in an area adjacent and downstream of the project construction site and would involve the acquisition and management of 65 acres of mitigation lands, consisting of 11.0 acres of existing low quality forested habitat and 54 acres of grassland or old field that would be intensively managed to convert into bottomland hardwood forest. These terrestrial mitigation features would provide average annual habitat values of 12.45 units determined necessary to fully compensate for terrestrial habitat losses. See **Figure 1**.

Losses of stream aquatic habitat would be mitigated primarily through restoration of pool and riffle complexes within the area modified by construction of the flood damage reduction feature of the project. The upper reach between Belknap and Midway would be restored to the existing condition of one meander wavelength that consists of three riffles, each occurring at the inflection points, and two pooled areas. The reach between Midway and the upstream end of the concrete channel, approximately 3,000 feet in length, would be designed to restore six meanders that would include 12 riffles and 12 pools. The southernmost reach from Carson to the downstream limit of the project would contain one meander including three riffles and three pools. Other instream techniques such as boulder clusters, rock check dams, and natural channel constrictors and deflectors would be included if beneficial within the newly constructed channel. In addition, starting one year after completion of construction of aquatic mitigation features, the project area would be monitored to evaluate success of the instream structures in mitigating impacted aquatic ecosystem functions. Monitoring would include use of a biotic integrity index methodology in coordination with the U.S. Fish and Wildlife Service (USFWS). Adaptive

management would be applied in response to the observed aquatic habitat recovery; and should biotic functions not be fully restored after three years, additional mitigation actions would be conducted as necessary to restore aquatic habitat function. Additional aquatic restoration would be conducted on 10 acres of vegetated shallow water habitat within the 19.9-acre open water area, an abandoned quarry, by resloping the edges of the waterbody and planting rooted aquatic plants. Wetland development within this waterbody would have been effective due to use of clean surplus material derived from the channel excavation.

During detailed development of plans and specifications and as a result of additional due-diligence inspections and evaluations of project lands, it was discovered that areas recommended to be used for environmental mitigation were encumbered by land use restrictions and for other issues made it unfavorable to continue with efforts to secure the lands for that project purpose.

Acquisition of project lands is an action required of the non-federal project sponsor. During evaluation of these proposed project lands prior to acquisition, several issues were identified that resulted in a determination by the non-federal sponsor that constraints were too significant to continue with acquisition of these lands. The originally proposed environmental mitigation lands were thought to have been disturbed lands with surface debris that could be removed at a reasonable cost and that no other limitations to successful development of these lands as riparian forest existed. However, during subsequent analysis the lands were found to be part of a closed regulated landfill. During follow-up investigations of the remainder of proposed mitigation lands and the lake substrate information indicated potential presence of regulated hazardous materials that could substantially effect project implementation. Corps policy requires that project lands acquired by the non-federal cost sharing partner be free of contaminants to a point that unrestricted use of the lands may occur.

During advanced design of the channel modification plan, it was also found that insufficient slope exists within the project reach to provide hydraulic conveyance needed for project benefits and to obtain the riffle-pool sequencing as described in the original mitigation plan. Only six riffle-run-pool sequences can be developed within the entire reach.

PROJECT PURPOSE AND SCOPE

The purpose of the Little Fossil Creek studies and approved project is to reduce flood damages on the lower segment of Little Fossil Creek within the city limits of Haltom City, Texas. The purpose of the project has not changed, however, sufficient modification was found to be necessary to the approved environmental mitigation plan during advanced design to warrant preparation of a Supplemental EA. This Supplemental EA addresses only the alternative mitigation development options and associated project implementation changes resulting from selection of an alternative mitigation plan.

PROPOSED ACTION AND ALTERNATIVES

Construction of the flood damage reduction project would proceed as evaluated in the original project plan. However, several factors precluded development of the approved environmental mitigation plan that produced additional project implementation modifications. Disposal of

material removed from the project would not be placed within the 19.9 acre open water area, but would be placed at permitted municipal landfills and other sites that have prior environmental clearance. As no fill excavated from Little Fossil Creek would be placed in the open water area, the wetland restoration development originally proposed would be dropped from the plan as there is no longer the potential to dispose of the fill derived from the channel construction into the open water area.

Environmental Mitigation Alternatives

Alternative 1 - No Action

Little Fossil Project would cause adverse environmental impacts to adjacent important resources that requires compensatory mitigation. The impacts would be to riparian forest and waters of the United States. Therefore, the No Action alternative is not an acceptable option for this project.

Alternative 2 - Use established mitigation bank for compensatory stream impacts

Purchase credits from an established mitigation bank to accomplish compensatory mitigation for all stream and riparian forest impacts resulting from flood channel implementation. Public Law 110-114 Section 2036(c), November 2007 and Implementation Guidance for the Water Resources Development Act of 2007 – Section 2036 (c) Wetlands Mitigation, November 2008 established the requirement to consider use of mitigation banks to mitigate impacts resulting from Corps Civil Works projects. This alternative was dropped from further consideration following evaluation of mitigation bank potential credits and cost for stream habitat to meet project implementation schedule. In addition, mitigation bank lands remain under the ownership of others and precludes recreational and other compatible uses that the non-federal sponsor desires to maintain from use of their investment.

Alternative 3 - Combine onsite and offsite mitigation with mitigation bank as needed for compensatory mitigation

Utilize traditional environmental mitigation by: (a.) Developing project lands adjacent to Little Fossil Creek project area by planting riparian forest to provide some of the required environmental mitigation onsite while developing six riffle-pool complexes within Little Fossil Creek channel project; (b.) Conduct the bulk of the remaining mitigation on Whites Branch, a tributary to Big Fossil Creek which is at a location that is considered to be in the vicinity of the area where project impacts will occur; and (c.) Purchase credits from an existing mitigation bank as necessary to complete compensatory mitigation requirements for the project. Preservation of the 5,038 linear feet of Whites Branch would complete the aquatic mitigation requirements.

This alternative was selected as the recommended alternative because it incorporates similar mitigation concepts, including recreation and compatible uses, as the 2002 mitigation plan. The off-site mitigation would provide ecological benefits within the same watershed as the proposed construction of the channel plan, and this location adjoins an approximately 20 acre state-owned preservation area which would create a larger contiguous tract of preserved lands benefiting ecological resources within the urban area. The recommended alternative also includes an identified disposal site near East Loop 820 (See **Figure 1**) that was previously permitted for receiving fill material.

PROPOSED PROJECT INCLUDING ENVIRONMENTAL MITIGATION

The Little Fossil Creek project as currently proposed includes the construction of a channel plan as previously approved that is approximately 7,350 feet long with an overall 75 foot bottom width except under Carson Street bridge where the constraints require a 45 foot bottom width channel that is concrete lined. The project impacts 13.3 acres of riparian forest and the entire 7,350 linear feet of stream channel. See **Figure 2**. The proposed revised environmental mitigation plan includes 2.4 acres of riparian forest development on lands adjacent to Little Fossil Creek within the project area, 49 acres of riparian forest mitigation development on lands acquired within the Whites Branch floodplain near its confluence with Big Fossil Creek and acquisition of mitigation credits from a mitigation bank to compensate for the remaining impacts. Three mitigation banks have been approved by the Corps and resource agencies for use for impacts within Tarrant County. Based upon proportion of acres of impact not mitigated, the sponsor would acquire 2.64 acres for the proposed construction plan. Credits necessary to provide mitigation for the residual 2.64 acres would be 4.8, 5.3, or 7.1 credits to be acquired from the Bunker Sands, Trinity River, or South Fork mitigation banks, respectively. The non-federal sponsor would choose the bank of their preference depending on their needs to purchase the residual mitigation acres. Aquatic mitigation includes preservation of 5,038 linear feet of stream within the Whites Branch mitigation area, as well as the six pool and riffle complexes to be constructed as part of the Little Fossil channel plan. See **Figures 3a** and **3b**.

As the originally proposed mitigation lands would not be acquired for the federal project, the recreation plan would also be modified by reduction of the 6,000 feet of narrow un-surfaced nature trail and removal of one access site. The currently proposed project would include 5,050 feet of concrete trail and three access sites. The alternative mitigation lands are already accessible and a trail and low water channel crossing exists that would satisfy recreational needs for that area.

All surplus materials would be carried from the project area to permitted landfills or construction sites and no fill would be placed within the lake, thus eliminating the development of wetlands within the lake.

EXISTING ENVIRONMENT

The existing environment at the project construction site along Little Fossil Creek has experienced only minor changes from the descriptions provided in the Little Fossil Creek Detailed Project Report and Environmental Assessment prepared by the Corps in August 2002. The more notable changes to the existing environment have been as a result of implementation of land acquisitions and structure removals required by the non-federal sponsor in preparation of the channelization project. A drilling pad for natural gas extraction has been constructed adjacent to the project immediately upstream of S.H. 121, but few other changes were noted in the interim period between the year 2002 documented conditions and the present.

No additional habitat quality evaluation was done within the Little Fossil Creek construction area, however, some down cutting of the Little Fossil Creek and modifications to bed load were observed during recent onsite visits. Lengthy drought periods and intense rainfall events have

likely contributed to an overall degradation of the aquatic system during this period. Several locations during summer low flows have been observed during base flow conditions where the surface flow disappears below the sand and gravel and reappears several feet downstream.

Whites Branch Alternative Mitigation Site

Whites Branch is a tributary to Big Fossil Creek also, with the downstream reaches lying within the city limits of Haltom City. As soon as new information indicated that originally approved environmental mitigation land acquisition might be unreasonable to pursue, a review of other floodplain lands within the region that might have potential to meet compensatory mitigation needs for the Little Fossil project was initiated. Investigations that had been conducted for the Big Fossil Feasibility Study had identified the Whites Branch area as having moderate quality riparian forest and open fields and shrub land that could be improved through selective plantings and other management techniques to increase the value of the area for environmental purposes of either ecosystem restoration or environmental mitigation. Although several miles away from Little Fossil construction, both streams are tributaries to Big Fossil Creek, have similar vegetation and both sites are within Haltom City.

In addition, Whites Branch stream habitat appeared to be of sufficient quality for an urban stream to warrant consideration of preservation for maintenance of existing resource value.

Initial coordination with USFWS and Texas Parks and Wildlife Department (TPWD) indicated that Whites Branch would be appropriate for continuing evaluation for its suitability for mitigation for Little Fossil Creek impacts. A description of the existing environmental conditions of the Whites Branch is discussed in the following sections.

Current Land Use

The area proposed for alternative mitigation is urban floodplain lands that have been historically used for pasture or hay production on higher elevations away from the stream, while some residential use on the east side of the creek formerly encroached into the floodplain. As flash flooding has continued over the years, sufficient damage has occurred to some of the structures associated with a mobile home park, and injuries and a death have occurred. Haltom City has taken action to reduce future habitation of the floodplain. Some lands have been acquired and used as parkland. Other uses in the immediate area include gas exploration and a natural gas pipeline would run along the eastern edge of the floodplain. Approximately 14 acres of lands upstream of the proposed mitigation area have been acquired utilizing funds from State of Texas, Parks and Wildlife Department. The lands acquired using state funds have restrictions that emphasize preservation and development of the natural vegetation associated with the floodplain forest while fostering public access for enjoyment of the resources.

Surface Water

Surface water within the mitigation area is restricted to waters of Whites Branch. No ponds or other standing waters have been observed. Following thunderstorms in the contributing drainage, the creek can overflow the narrow channel quickly but generally recedes back into the channel with one to two days.

Biological Resources

Vegetation

A recent aerial image of the proposed mitigation site, served as a basis for delineating existing vegetation types within the area. Additional investigations were conducted onsite by the USFWS and Corps to document the existing habitat conditions in the riparian environment. **Figure 3a** shows the areas identified for management of existing vegetation within the mitigation area. Those areas identified for riparian woodland improvement (27.1 acres) are currently low to moderate quality forest. Areas identified for conversion to riparian woodland (22.6 acres) are currently classified as grasslands or grasslands with shrublands. Within the existing riparian forest, mature pecan, American elm, cedar elm, hackberry and green ash were observed. Mid-story tree canopy consists of willow, redbud, bois d' arc, Chinaberry, younger elm, and other trees common to the urban floodplains. Within the understory, dense growth of invasive Chinese privet and Chinaberry trees have displaced the grain producing grasses and fruit producing shrubs that would be expected. Some inland sea oats, green brier and poison ivy were also documented.

Within the shrublands, young cedar elm, hackberry, pecans and scattered invaders were observed. Grasslands are remnant old fields that are maintained by mowing.

Wildlife

Typical mammal species that would be expected to be encountered within the proposed mitigation area include various rodents, fox squirrel, cotton tail rabbit, opossum, raccoon, and possibly occasional skunk or red fox. At least 125 species of birds have been observed utilizing Big Fossil Creek floodplain habit within the general proximity to this site. Based upon similarities of vegetation and adjacent residential land uses, it is anticipated that numerous bird species would be found within the proposed mitigation site. The Corps and USFWS conducted an assessment of habitat quality within the proposed mitigation area using the Services Habitat Evaluation Procedures (See Appendix A). Four species, determined to be representative of the area were modeled to determine existing habitat quality. The species utilized were barred owl, wood duck, fox squirrel and downy woodpecker. Four sampling sites were evaluated with some differences found between sites, however, the overall habitat quality was determined to be below average with an overall average habitat suitability score of 0.41. The low score is due to lack of mature trees in some sites, lack of mast trees in others and encroachment of non-native invasive species in other sites.

Threatened and Endangered Species

USFWS records indicate that the following, endangered (E), species have been documented, or are known to occur in Tarrant County: There is no designated critical habitat for listed species in Tarrant County.

Interior least tern (*Sterna antillarum*) - E
Whooping crane (*Grus americana*) - E

The endangered interior least tern (*Sterna antillarum*) 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. A colony has nested for several years at the Southside Wastewater Treatment Plant in Dallas. 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 Metroplex area with small colonies being established in highly developed areas. Ground disturbance related to construction activities near the project site may incidentally create areas that are attractive to least terns for use as potential nesting sites.

During migration, endangered whooping cranes (*Grus americana*) may be encountered in Tarrant 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. Food usually includes frogs, fish, plant tubers, crayfish, insects, and waste grains in harvested fields.

Based upon information available, additional consideration of possible effect to Interior least tern was made. The species has not been specifically found in area but could possibly migrate through Whites Branch or adjacent areas in search of feeding habitat or nesting habitat. The lack of sand bars or other disturbed soils reduce the possibility of this species from more than just passing through the area.

Cultural Resources

A cultural resources survey of the overall project area indicates no known cultural resources exist within the project area of potential effect. According to the Texas Archeological Sites Atlas, a cultural resources survey conducted by the TPWD in early 2010 indicates that no cultural resources are located within the newly identified mitigation area along Whites Branch.

Wetlands and Other Waters of the United States

Whites Branch is a perennial stream and has been identified as waters of the United States. Wetlands are generally defined as areas that meet criteria of having hydric soils, water saturation or inundation during part of the growing season and are vegetated by plants adapted to living within these wet conditions. Fringes adjacent to the Whites Branch channel were identified that could meet the definition of wetlands. These areas would be regulated and protected under the Clean Water Act. No adjacent wetland or shallow water wetlands were identified within the alternative mitigation site.

A baseline survey of Whites Branch fisheries was conducted by the USFWS with assistance from the Corps on June 30, 2011 (See Appendix A). Two sample sites representative of the stream were selected. From the two sites a total of 659 fish were collected that included five families and 11 species. Results from both sites independently or when combined for a composite evaluation indicates that the Regional Index of Biotic Integrity scores is high. Of a possible score of 55, site one had a score of 41 and site 2 had a score of 45. Previous surveys conducted upstream of this site and at the Little Fossil Creek project site found similar scores.

Floodplains

Executive Order (EO) 11988 – Floodplain Management and Corps of Engineers implementing policy direct the Corps to consider values of the base or 100-year floodplain and to protect these values during project implementation where possible. All lands within the boundaries of the proposed alternative mitigation site are within the 100-year floodplain of Whites Branch.

Air Quality

The General Conformity Rule (GCR) was promulgated by the U.S. Environmental Protection Agency (EPA). The GCR rule mandates that the Federal government not engage in, support, or provide financial assistance for licensing or permitting, or approving any activity not conforming to an approved State Implementation Plan. In Texas, the applicable plan is the Texas State Implementation Plan (SIP), an EPA-approved plan for the regulation and enforcement of the National Ambient Air Quality Standards (NAAQS) in each air quality region within the state (TCEQ 2010). The GCR is applicable only to non-attainment and maintenance areas (TCEQ 2010).

A nine-county Dallas/Fort Worth area was originally designated a moderate non-attainment area under the 1997 eight-hour ozone NAAQS and was subsequently reclassified as a serious nonattainment area in January 2011. Counties included are Dallas, Denton, Collin, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant. Based on monitoring data from 2007 through 2009, Dallas/Fort Worth did not attain the 1997 eight-hour ozone standard by its deadline of June 15, 2010. As a result, the Dallas/Fort Worth area was reclassified from moderate to serious, with a new attainment deadline of June 15, 2013, and the state is required to submit new attainment demonstration and reasonable further progress SIP revisions for the area and implement the previously adopted contingency measures for the area. Texas Commission on Environmental Quality (TCEQ) staff has begun working on these SIP revisions.

The project site is located within the Dallas/Fort Worth non-attainment area (that is now classified as “serious” nonattainment area under the 8-hour ozone standard). In the new “serious” ozone nonattainment area, a General Conformity Determination would be required if emissions exceed the threshold level of 50 tons per year (tpy) for either NOx or VOC for the project.

A general analysis of the project emissions was done to determine if the project construction would exceed the 50 tpy de minimis limits. The analysis includes the project options. The information that is used to determine the air quality impacts from the project construction comes from supplied data on the construction equipment usage and the projected quantities of the material to be handled as developed from the construction plans. Fugitive dust emissions were not considered in this report due to the fact that the Dallas/Fort Worth area is in attainment for $PM_{2.5}$.

Noise

Noise levels within the environmental mitigation area are generally low. Existing vegetation and the isolation within the floodplain reduce noise coming from adjacent residential areas and from a nearby public school. Occasional noise level increases occur from mowing of some of the maintained grasslands within the proposed mitigation area.

Socioeconomic Conditions

Census information for the areas immediately adjoining the proposed mitigation site indicates that the area has a well mixed population and is not economically depressed. Construction and the actual implementation of an environmental mitigation area would not generate environmental justice issues.

Potential Hazardous, Toxic, and Radiological Wastes

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR, Inc.) for a section of Whites Branch, a tributary to Big Fossil Creek, at the request of the Corps. The purpose of the environmental records search was to identify any sites where hazardous substances or petroleum products have been released or are likely to have been released to soil, groundwater, or surface water, and to assess their potential impact to the proposed development of the proposed environmental mitigation on property within the search area. A report listing all such sites along with existing water and gas well locations found in federal, state, and local records was prepared. Additionally, historical U.S. Geological Survey quadrangle maps and aerial photography were submitted by EDR, Inc. which along with the environmental records search report is available in project files.

Review of the historical topographic maps and aerial photographs that include the proposed project indicate no prior land use that would have been likely to negatively impact proposed development of the mitigation on this site.

Aesthetics

The existing visual conditions associated with Whites Branch are generally favorable to those that enjoy open space with forest and grassland interspersion. The area provides a visual and sound buffer to surrounding residential development and activities.

Recreational Resources

The floodplain corridor occupied by the proposed mitigation lands is crossed by a narrow concrete trail with linkages to residential communities on both sides of the floodplain. A low water bridge crossing is incorporated into this trail Additional recreational opportunities nearby include the newly acquired lands near Mid-Cities Blvd and recreational trails along Big Fossil Creek and adjacent to Haltom High School.

ENVIRONMENTAL CONSEQUENCES

The environmental consequences discussed in the following sections discuss impacts, positive or negative on the resource category identified for the proposed changes to the Little Fossil Creek project. Primary differences are the change in location of environmental mitigation from the area downstream of the Little Fossil construction project to the floodplain lands adjacent to and including Whites Branch. Other differences are the changed location of disposal site and the reduction of 6000 linear feet of unsurfaced nature trail.

Land Use Change

Land use in the originally proposed environmental mitigation area would remain unchanged. Changes in Whites Branch floodplain would result in the grouping of lands under public ownership that emphasize protection of resources that benefit the nation's fish and wildlife resources. The lands would be open to non-intrusive use by the public. Low density recreational pursuits would continue.

Surface Water

Surface water within the original mitigation area consists of a man made excavated lake which receives runoff from upstream business park. The original plan included modification of this open water to a combination of open water and wetlands. Under the new plan, the open water area would not be in the project lands and would not be modified.

Within the newly proposed mitigation lands, surface water is restricted to that within the creek itself. No modifications would be made to the surface water within the new mitigation area.

Biological Resources

Vegetation

As a result of project modifications, impacts to riparian vegetation have been reduced to 13.3 acres as compared to original project analysis that showed adverse impacts to 17.9 acres. However, the original project proposal agreements to provide 65 acres of riparian forest environmental mitigation are being proposed to ensure compensatory compliance. The project as proposed relocates the vegetation management and forest development from the area south of the channel project to the Whites Branch floodplain and onto approximately 2.4 acres of Little Fossil overbank adjacent to constructed channel. Improved riparian forest habitat would be developed on approximately 49.7 acres of floodplain within the Whites Branch area. Vegetation management at each of the three existing mitigation banks that serve Tarrant County for riparian forest mitigation would not change but credits would be purchased based upon need to complete compensatory environmental mitigation. Credits necessary to provide mitigation for the residual 2.64 acres of unmitigated impacts varies from 4.8 to 7.1 depending which bank is utilized.

Wildlife

Beneficial wildlife habitat would be developed to provide compensatory mitigation for the Little Fossil project. Although the site is not as near to the source of impacts as the originally proposed mitigation, both sites are within the Big Fossil Creek watershed. Benefits to mobile species of wildlife such as birds should be similar to that which would be experienced in the original site. In addition, providing the mitigation in the new location would not provide an enticement to attract wildlife into somewhat contaminated conditions. The environmental mitigation plan which includes acquisition in fee of lands in Whites Branch and Little Fossil Creek and purchase of mitigation credits from one of three banks would fully compensate impacts to riparian forest and wildlife that utilize those areas.

Threatened and Endangered Species

The project as proposed is not likely to adversely affect any federally listed threatened or endangered species.

Cultural Resources

No negative consequences to cultural resources are anticipated as a result of the modifications to the project. A cultural resources survey of the proposed mitigation lands indicate that no known cultural resources are within the area of potential effect of the project.

Wetlands and Other Waters of the United States

The modifications to the project reduce impacts to waters of the United States by elimination of fill to the excavated lake. No fill to waters of the United States would occur within Whites Branch mitigation site. In addition, the development of riparian forest adjacent to 5,038 linear feet of perennially flowing stream would provide future benefits by providing buffer from sun and nutrients or other substances that enter the stream through surface runoff originating lateral to the stream. The project including modifications would have less impacts to water quality that would have occurred with implementation of the original project plan due to the reduction in fill at the 19.9 acre lake.

Air Quality

The project modifications associated with environmental mitigation would not induce any additional air quality impacts over what would occur at the originally proposed site. However, the relocation of disposal site and elimination of extensive construction within the 19.9 acre open water conversion to wetland results in changes to the number of construction vehicles and hours of use. An analysis was conducted and since the construction would occur during two separate calendar years, the ozone precursors produced would not prohibit the State of Texas from meeting its SIP for attaining compliance with federal air quality standards. This analysis was coordinated with TCEQ and the project report is available for review in project files. Short term increased dust levels would occur. Best Management Practices would be in place to help prevent fugitive dust emissions during construction.

Noise

There would be increases in noise levels at the environmental mitigation site from equipment used to clear non-native vegetation, preparatory mowing, carry plant and other materials, plant and maintain the newly established trees and shrubs. Equipment used would be small and engine exhaust would be muffled. Construction related to land preparation for vegetation control and planting of new plants would be conducted during daylight time frames. Existing vegetation and distance to nearby residences would dampen noise levels to a level that should be similar to that which currently occurs from mowing of open areas within the mitigation tract.

Socioeconomic Conditions

All project lands to be acquired for environmental mitigation are already within the base floodplain and most of these areas have land use restrictions that preclude development for residential use. The inclusion of the lands into an environmental mitigation plan establishes a requirement to develop a riparian forest that would emphasize maintaining fish and wildlife resource values into the future. Establishing the lands as environmental mitigation lands would not negatively impact socioeconomic conditions.

Potential Hazardous, Toxic and Radiological Wastes

A Phase 1 review of the project site and surrounding areas indicate that the alternative mitigation site within Whites Branch does not likely contain any hazardous, toxic and radiological wastes (HTRW) of concern. Construction related activities during implementation of mitigation features would not likely impact HTRW.

Aesthetics

Aesthetics interpretation is highly variable upon the individuals judging the scenic beauty or overall quality of experience of being in or adjacent to an area brings to that individual. Within the mitigation site in Whites Branch, there would be changes in view shed as trees planted in what are now open fields or open fields with some shrubs begin to grow. However, many open spaces adjacent to the floodplain would likely be maintained as open space thus limiting potential impact to the aesthetic environment. Many others may also enjoy the aesthetics of forest surrounding the recreational trail that transects the mitigation area.

Recreational Resources

Change in location of the environmental mitigation eliminated the opportunity to develop an unsurfaced nature trail downstream of Little Fossil channel construction. However, significant trail access is still being added in conjunction with the Little Fossil project. Sufficient access and trails already exist within the alternative mitigation site. Short term inconvenience to trail use may occur during establishment of riparian forest mitigation activities. No significant impacts to organized recreational pursuits would result from the project modifications.

CUMULATIVE IMPACTS

According to the President's Council on Environmental Quality, cumulative impacts "result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually but collectively significant actions taking place over a period of time."

Review of aerial photography for the period beginning with 1968 indicates the area around Whites Branch has transformed from agricultural uses, primarily grasslands to essentially being fully developed with residential housing with associated streets, schools, churches and light commercial buildings adjacent to major streets by 2004. Between 2004 and 2010 some reduction of housing had occurred within the Skyline Mobile home park as a result of devastating floods and action by Haltom City to acquire 124 flood-prone properties along Whites Branch. Other identified actions within the area being considered for cumulative impact assessment include:

- Modification of Big Fossil Creek floodway within the immediate vicinity upstream of Whites Branch to improve flood flowage passage and to reduce floodplain has led to extensive residential development and location of major public education facility in area.

• Interstate Highway 820 Corridor major improvements just to the south of the proposed environmental mitigation area that is forecast to relieve existing traffic, and pave the way for future growth within the study area is currently under construction.

• Cotton Belt passenger rail corridor with proposed access near project area is being planned for implementation at an accelerated pace to assist with traffic congestion and provide alternative transportation for local citizens.

• Street and utility construction in Haltom City that has provided updates to 15,000 linear feet of water and sewer mains and 7,000 linear feet of streets since 2002.

• Natural gas drilling pads adjacent to Whites Branch floodplain and Little Fossil Creek project area.

• Acquisition of Buffalo Ridge Park lands within Big Fossil Creek and Whites Branch Park lands near Western Center Blvd. utilizing matching funds provided by State of Texas.

• Construction of a gabion wall on Big Fossil Creek upstream of confluence of Whites Branch reduces erosion and protects several houses along several hundred feet segment of steep channel bank.

• Reconstruction of Carson Street bridge by Texas Department of Public Transportation changes channel configuration by raising deck.

• Studies underway by the Corps include potential future projects on Big Fossil Creek that include flood risk management, ecosystem restoration and recreation. No projects have yet been recommended for approval for construction as a result of these studies.

Cumulative impacts resulting from past, present and future activities including the establishment of the environmental mitigation plan proposed would occur to the following resources as discussed by section.

Land Use

Past land use changes in the region include the conversion of farm and rangeland to a highly urbanized area. Currently, there are no significant on-going land use changes in and adjacent to the environmental mitigation study area. Reasonably foreseeable future changes to land use within the region would include intensification of residential and commercial development within the few developable areas remaining. The cumulative effects of land use changes associated with this project, including development of Park lands with State funding assistance when added to past, on-going, and future activities, would be minor as these lands are floodplain lands and are not readily developable for other uses.

Biological Resources

Vegetation Communities

Past, on-going, and future residential and commercial development in the Haltom City coupled with road construction and flood damage reduction projects results in cumulative loss or conversion of agricultural and riparian forested resources. The proposed environmental mitigation plan would accelerate conversion of floodplain grasslands and shrublands to riparian forest. Cumulative impacts to vegetation communities resulting from the proposed project would be mitigated by the forest conversion, and therefore be insignificant compared to the other past, present, and reasonably foreseeable future development in the region.

Wildlife

Cumulative impacts to wildlife on grasslands and non-floodplain lands would result from additional loss and fragmentation of habitats due to land clearing and construction activities for future residential and commercial development projects. Dedication and management of lands within Whites Branch as environmental mitigation land would improve low quality wildlife habitat in forested riparian areas along existing waters of the U.S. and these areas would be provided long-term protection. Therefore, cumulative impacts to wildlife in the region would continue as a result from urbanization, however, the cumulative effect on wildlife resulting from the proposed Corps project including environmental mitigation would be minimal.

Threatened and Endangered Species

Given that no impacts to USFWS or TPWD listed threatened or endangered species are expected from the proposed action, no cumulative effects on threatened and endangered species would be expected.

Wetlands and Other Waters of United States

The environmental project cumulatively adds to protection of waters of the United States. The adjacent park lands coupled with the preservation of over 5000 linear feet of perennial stream is a cumulative benefit. The modified plan also results in lack of impacts to the 19.9 acre lake as described in the original project plan, but at the same time cumulatively decreases the development of wetlands acres and associated wetland values that were previously proposed.

Air Quality

Although short term direct impacts to air quality would occur during project construction, the Corps analysis indicates that the construction activities would not impair State's ability to implement their air quality control plans. There would be no long-term cumulative impacts to air quality from project implementation.

Recreational Resources

Urbanization without provision of open space cumulatively impacts leisure recreational activities. The study area in and around Whites Branch has more open space than is generally found in metropolitan areas. As indicated two large areas have been acquired for park lands and the immediate location of the proposed environmental mitigation area cumulatively adds to the availability of access to open space recreation. The mitigation area would be managed similarly to the park lands with emphasis on developing and maintaining native vegetation with trails that

would be compatible with natural resource uses thus providing positive cumulative urban outdoor recreational impacts.

ENVIRONMENTAL COMPLIANCE

Invasive Species, Executive Order 13112

The EO establishes the concerns for widespread introduction of non-native plants and wildlife species to the United States and the potential for economic and environmental harm associated with those that have ability to spread relatively unchecked. This EO establishes processes to deal with this issue and among other items establishes that Federal agencies "will not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions."

Invasive plants have been identified as being established within the study area and are detrimental to the proposed mitigation area. The recommended mitigation plan would assist in the removal of invasive Ligustrum plants and chinaberry within the riparian woodlands. Required operation and maintenance of the mitigation area by the non-federal sponsor during long-term management of that area would keep the negative influence of non-native invasive plants at a minimum. No project feature would directly promote the spread of invasive species.

Section 404 of the Clean Water Act

The Corps under direction of Congress regulates the discharge of dredged and fill material into all waters of the United States, including wetlands. Although the Corps does not issue itself permits for construction activities that would affect waters of the United States, the Corps must meet the legal requirement of the Act. Section 401 water quality certification was received from TCEQ for the original project. The modified project has less impact to impacts to waters of the United States than was originally approved in 2002, less impacts to riparian vegetation, and the project modifications, including the revised mitigation proposal, does not introduce any additional fills to waters of the United States. The complete project is in compliance with Section 404 of the Clean Water Act.

Section 402 of the Clean Water Act

The construction activities that disturb upland areas (land above Section 404 jurisdictional waters) are subject to National Pollutant Discharge Elimination System (NPDES) requirements of Section 402(p) of the Clean Water Act (CWA). Within Texas, TCEQ is the permitting authority and administers the federal NPDES program through its Texas Pollutant Discharge Elimination System (TPDES) program. Construction activities that disturb one or more acres are subject to complying with TPDES requirements. Operators of construction activities that disturb 5 or greater acres must prepare a Storm Water Pollution Prevention Plan (SWPPP), submit a Notice of Intent to TCEQ, conducting onsite posting and periodic self-inspection, and accordingly follow and maintain the requirements of the SWPPP. During construction, the operator shall assure that measures are taken to control erosion, reduce litter and sediment carried offsite (silt fences, hay bales, sediment retention ponds, litter pick-up, etc.), promptly

clean-up accidental spills, utilize best management practices onsite, and stabilize site against erosion before completion.

Section 176 (c) Clean Air Act

Federal agencies are required by this Act to review all air emissions resulting from Federal funded projects or permits to insure conformity with the SIPs in non-attainment areas. The Corps analysis was conducted for the entire Little Fossil Creek construction plan in reference to revised standards and it was determined that the project would not interfere with SIPs for this area.

Advisory Circular – Hazardous Wildlife Attractants on or Near Airports

The advisory circular provides guidance on locating certain land uses having the potential to attract hazardous wildlife to or in the vicinity of public-use airports. The circular provides guidance on wetlands in and around airports and establishes notification procedures if reasonably foreseeable projects either attract or may attract wildlife.

In response to the Advisory Circular, the United States Army as well as other Federal agencies, signed a Memorandum of Agreement (MOA) with the Federal Aviation Administration to address aircraft-wildlife strikes. The MOA establishes procedures necessary to coordinate their missions to more effectively address existing and future environmental conditions contributing to aircraft-wildlife strikes throughout the United States. The project location including the recommended modification to the environmental mitigation plan does not increase the potential to attract hazardous wildlife into any flight zone of local airports.

Executive Order 11988 - Floodplain Management

EO 11988 was enacted May 24, 1977, in furtherance of the National Environment Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), the National Flood Insurance Act of 1968, as amended (42 U.S.C. 4001 et seq.), and the Flood Disaster Protection Act of 1973 (Public Law 93-234, 87 Star. 975). The purpose of the EO was to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

The order states that each agency shall provide and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities. The Recommended plan would remain in compliance with EO 11988 by protecting the values of the Little Fossil and Whites Branch floodplains.

PUBLIC INVOLVEMENT

This section discusses consultation and coordination that would occur during preparation of this document. The purpose of this environmental assessment is to disclose the project modifications

that have resulted from refinement of information available during detailed plans and specifications, which resulted in need to determine an alternative environmental mitigation plan and therefore, the primary agencies coordinated during development of the plan included the non-federal sponsor, the USFWS, and TPWD. Their views have been included in the development of the revised compensatory mitigation plan.

A Notice of Availability will be sent out for public notification of the review and comment period. The Supplemental EA will be sent to the following resource agencies (Appendix B) for review and comment in accordance with coordination requirements as set forth by the NEPA: TPWD; USFWS; EPA, Region 6; the State Historical Preservation Office; and the TCEQ.

In accordance with NEPA, a 30-day review period of the Supplemental EA will be provided via a Notice of Availability (Appendix C), posting of the document on the Fort Worth District Website www.swf.usace.army.mil, and a local mailing to known interested individuals.

CONCLUSIONS

The Little Fossil Flood Damage Reduction project approved in 2002, required compensatory environmental mitigation for stream and riparian forest resources. The plan had been coordinated with appropriate public, state and federal agencies and was in compliance with Corps policies and other statutes.

During development of detailed plans and specifications, it was discovered that the environmental mitigation plan needed to be modified. This assessment discloses the alternatives evaluated and the coordination with resource agencies and the non-federal sponsor in the development of a recommended alternative mitigation plan that meets the intent of the original plan. This assessment also serves as the document for further public review and comment.

REFERENCES

Clean Water Act of 1977, 33 U.S.C. § 1251 et seq.

"Compensatory Mitigation for Losses of Aquatic Resources," 73 Federal Register 70 (10 April 2008), pp. 19594 – 19670.

"Compensatory Mitigation for Losses of Aquatic Resources," Title 33 Code of Federal Regulations, Pt. 332, 2008.

Endangered Species Act of 1973, 16 U.S.C § 1531 et seq.

"Mitigation for Fish and Wildlife and Wetlands Losses," Water Resources Development Act 2007, Section 2036 (November 8, 2007). Public Law 110-114.

National Environmental Policy Act of 1969, 42 U.S.C. § 4321 et seq.

President. Proclamation. "Protection of Wetlands." EO 11990. 42 FR 26961. May 25, 1977.

Texas Commission on Environmental Quality. Updated October 22, 2010. Texas State Implementation Plan. Retrieved February 8, 2011. From http://www.tceq.texas.gov/implementation/air/sip/texas-sip

Texas Commission on Environmental Quality. Updated June 24, 2010. Understanding General Conformity in Texas. Retrieved February 8, 2011. From http://www.tceq.texas.gov/implementation/air/sip/gc.html

U.S. Army Corps of Engineers. Little Fossil Creek, Tarrant County, Texas, Flood Damage Reduction, Air Emission Report. August 2011.

U.S. Army Corps of Engineers. "Implementation Guidance for the Water Resources Development Act of 2007 – Section 2036(c) Wetlands Mitigation," November 6, 2008.

United States Fish and Wildlife Service. "Whites Branch Alternate Mitigation Area Terrestrial Habitat Evaluation". August 3, 2011.

United States Fish and Wildlife Service. "Baseline Fisheries Survey of Whites Branch within the Proposed Whites Branch Alternate Mitigation Area, Tarrant County, Texas". August 3, 2011.

DRAFT

FINDING OF NO SIGNIFICANT IMPACT
SUPPLEMENTAL
ENVIRONMENTAL ASSESSMENT
Little Fossil Creek
Flood Damage Reduction Project
Haltom City, Tarrant County, Texas

Little Fossil Creek is a perennial stream located in central Tarrant County, in north central Texas and flows southeasterly through several cities before converging with Big Fossil Creek just north of the Trinity River. The U.S. Army Corps of Engineers (Corps) under the authority of Section 205 of the Flood Control Act of 1948, as amended, conducted studies and recommended solutions to flooding problems associated with Little Fossil Creek within the city limits of Haltom City. A detailed project report detailing channel plans, recreation and environmental mitigation was completed in August 2002. A Finding of No Significant Impact was signed January 22, 2003. During advanced planning, due-diligence inspections and evaluations of project lands, it was discovered that areas recommended to be used for environmental mitigation were encumbered by land use restrictions and other issues made it unfavorable to continue with efforts to secure the lands for that project purpose. Other project changes include reduction of riffle-pool sequences in the Little Fossil aquatic plan from 12 to six due to channel slope limitations and relocation of the disposal site from a 19.9 acre open water area to a previously permitted fill location.

An alternative riparian forest mitigation plan was developed that includes acquisition and dedication of approximately 49.7 acres of lands with Whites Branch, a tributary to Big Fossil Creek. Within this area, approximately 27.1 acres of existing riparian forest would be managed by removal of non-native invasive species and addition of native trees and shrubs conducive to wildlife utilization. An additional 22.6 acres of shrubland and grassland would be converted to riparian forest by intensive plantings of seedlings, shrubs and young trees. The plan also includes development of approximately 2.4 acres of riparian forest integrated into the banks of the Little Fossil Creek construction project. The benefits of the mitigation plan provide mitigation for all impacts except 12.9 acres of riparian forest. The non-federal sponsor, Haltom City has agreed to acquire mitigation credits from one of three banks that provide service for impacts to riparian forest/low quality wetlands within Tarrant County Texas. Based upon proportion of acres of impact that can be mitigated in Whites Branch and Little Fossil Creek project area, there are 2.64 acres of impacted acres that are not mitigated for by the proposed traditional mitigation plan. Credits necessary to provide mitigation for the residual 2.64 acres varies from 4.8 to 7.1 depending which bank is utilized.

The Whites Branch mitigation area provides preservation of 5,038 linear feet of stream that has been evaluated by U.S. Fish and Wildlife Service and found to contain a fish population producing an aquatic index of biotic score similar to the score identified in existing Little Fossil Creek. Construction of six riffle-pool sequences on Little Fossil coupled with preservation of Whites Branch stream fisheries habitat would meet compensatory aquatic mitigation requirements.

As a result of modifying the original mitigation plan to not acquire lands downstream of the channel project, there is no longer an opportunity to develop the nature trail. The current proposed alternative mitigation lands are currently served by sufficient parking access and recreational trails to support compatible use of the proposed mitigation area.

The Texas State Historic Preservation Officer has concurred with our assessment that no significant archeological sites or historic properties would be affected by activities at the alternative mitigation site. The modifications to the project reduce impacts to waters of the United States and the revised environmental mitigation plan has been considered in accordance with Sections 404 and 401 of the Clean Water Act and the U.S Fish and Wildlife Coordination Act. Texas Commission on Environmental Quality (TCEQ) has reviewed the project proposal and indicated that the original plan with incorporated terrestrial and aquatic mitigation is in compliance with Section 401 of the Clean Water Act. The new plan continues to incorporate compensatory environmental mitigation and aquatic mitigation that will be monitored for three years to assure compliance with TCEQ terms. The recommended plan is in compliance with the Endangered Species Act and the Executive Order 11988, Floodplain Management. The construction activities required to implement the project are in compliance with the Texas State Implementation Plan, an Environmental Protection Agency (EPA) approved plan for the regulation and enforcement of the National Ambient Air Quality Standards.

Based upon the Supplemental Environmental Assessment and results of coordination, the Corps has concluded that the proposed action would not have a significant adverse effect on the human or natural environment. Consequently, construction of the proposed project with modifications discussed in this supplemental Environmental Assessment would not constitute a major Federal action of sufficient magnitude to warrant the preparation of an Environmental Impact Statement.

_____ _____

Richard J. Muraski, Jr. Date
Colonel, US Army
District Engineer

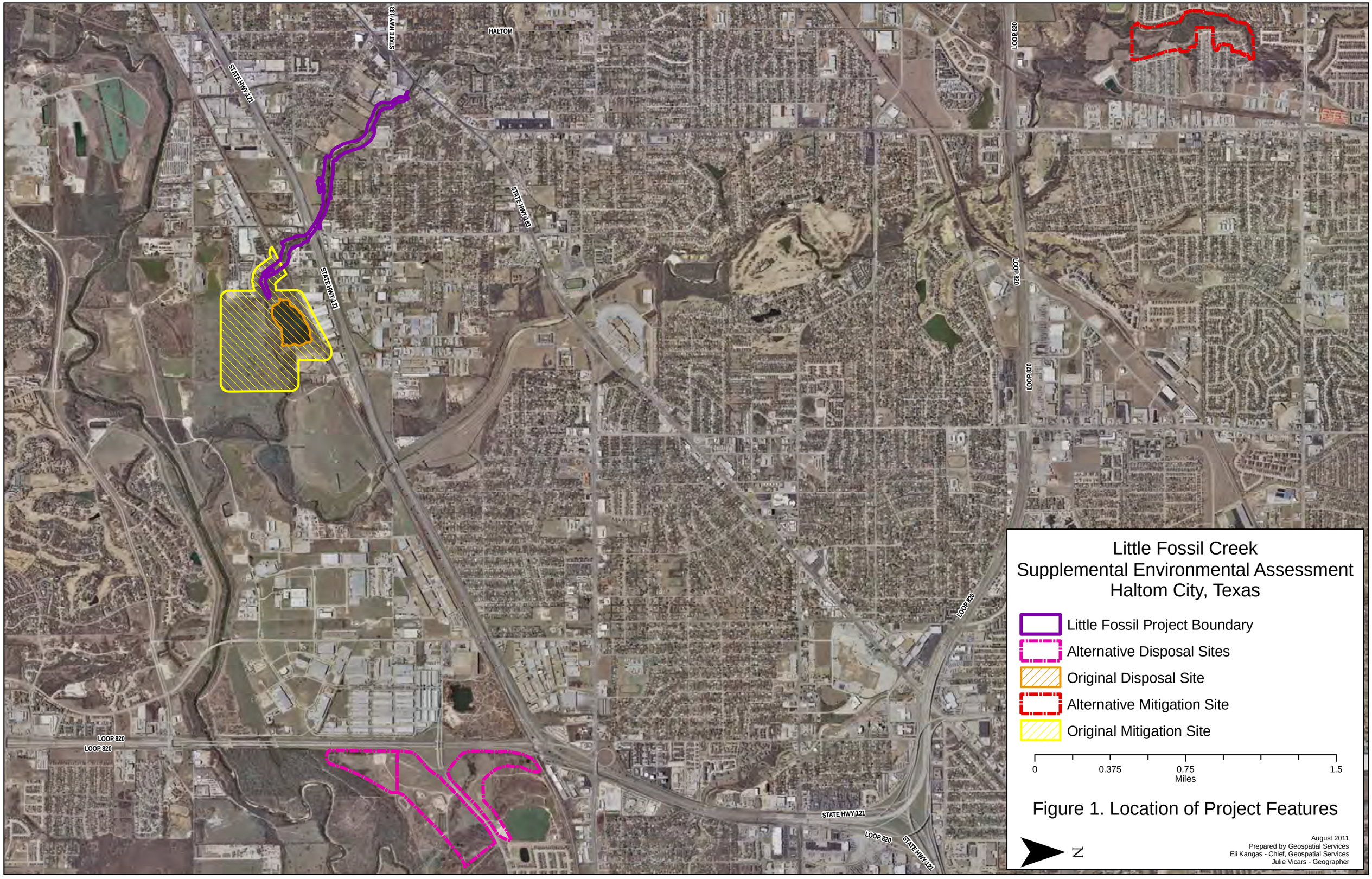
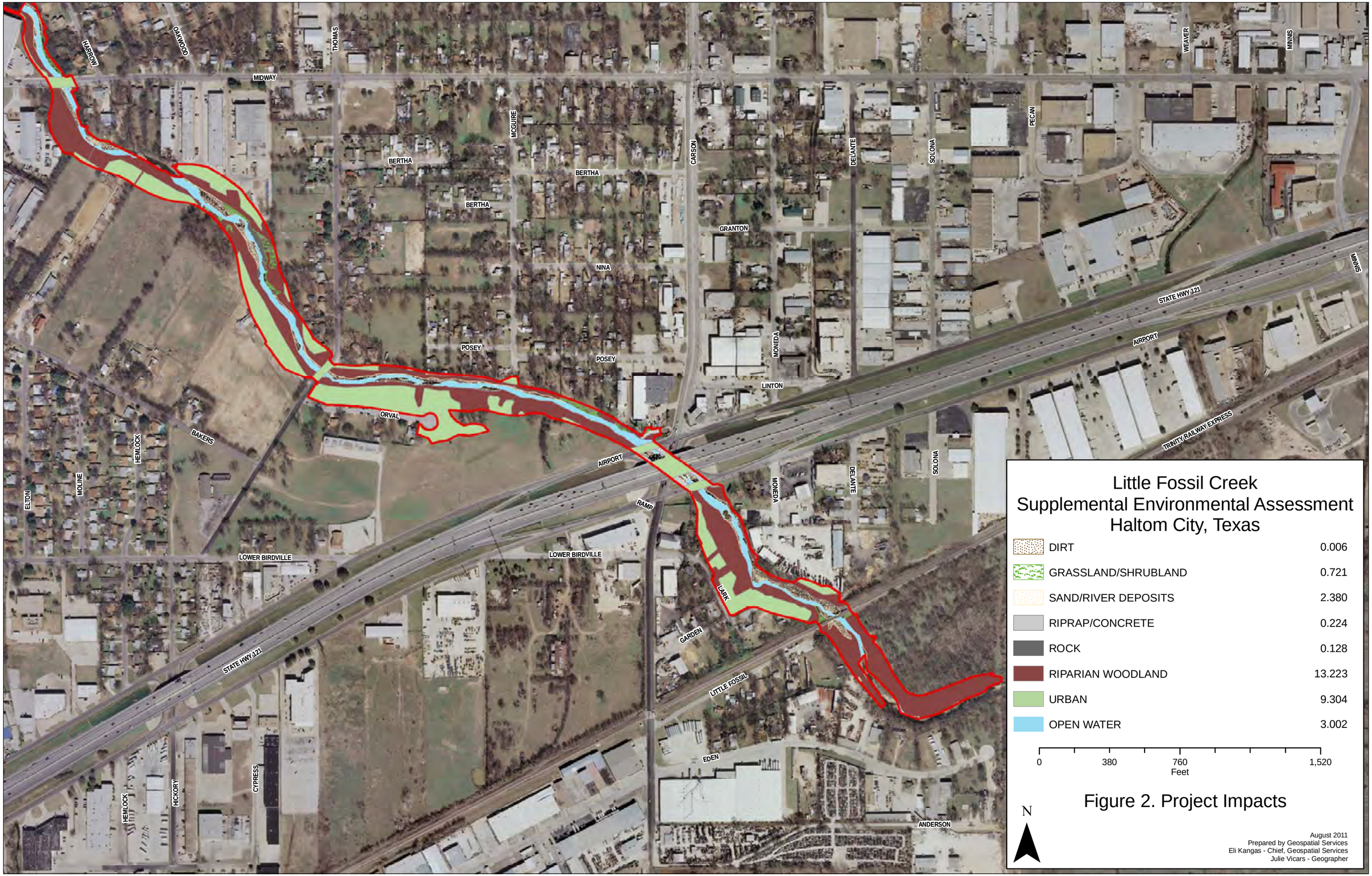


Figure 1. Location of Project Features



Little Fossil Creek
Supplemental Environmental Assessment
Haltom City, Texas

DIRT	0.006
GRASSLAND/SHRUBLAND	0.721
SAND/RIVER DEPOSITS	2.380
RIPRAP/CONCRETE	0.224
ROCK	0.128
RIPARIAN WOODLAND	13.223
URBAN	9.304
OPEN WATER	3.002

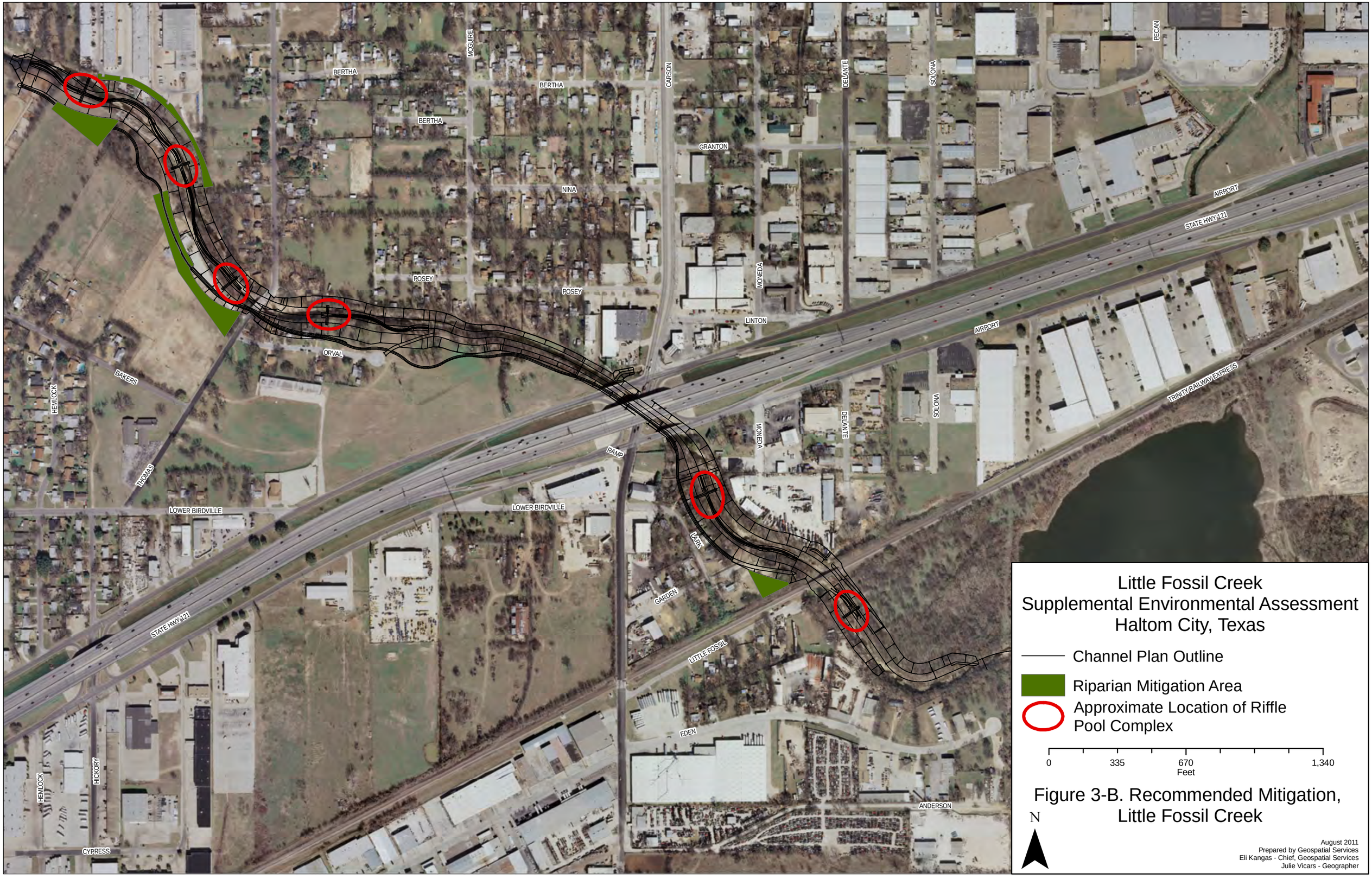
0 380 760 1,520
Feet

Figure 2. Project Impacts

N

August 2011
Prepared by Geospatial Services
Eli Kangas - Chief, Geospatial Services
Julie Vicars - Geographer


Haltom, City Of
Richey, Don L & Janis
Haltom, City Of
Soudmaniphanh, Sengkham Etux M
Caanan Dev
Martin, Doris Ann
Little Fossil Creek
Supplemental Environmental Assessment
Haltom City, Texas
Alternative Mitigation Site
Carizzo Pipeline
Riparian Woodland Improvement 27.1
Conversion to Riparian Woodland 22.6
Sand/River Deposits 0.4
Open Water 2.2
Concrete/Rock 0.6
0
250
500
1,000
Feet
Figure 3-A. Recommended Mitigation
Whites Branch
N
August 2011
Prepared by Geospatial Services
Eli Kangas - Chief, Geospatial Services
Julie Vicars - Geographer


BERTHA
MCGUIRE
BERTHA
BERTHA
CARSON
DELANTE
SOLONA
PECAN
GRANTON
NINA
AIRPORT
STATE HWY 121
POSEY
POSEY
MONEDA
LINTON
AIRPORT
ORVAL
BAKERS
HEMLOCK
SOLONA
TRINITY RAILWAY EXPRESS
DELANTE
MONEDA
RAMP
THOMAS
LOWER BIRDVILLE
LOWER BIRDVILLE
LARK
GARDEN
STATE HWY 121
LITTLE FOSSIL
EDEN
HEMLOCK
HICKORY
ANDERSON
CYPRESS
Little Fossil Creek
Supplemental Environmental Assessment
Haltom City, Texas
Channel Plan Outline
Riparian Mitigation Area
Approximate Location of Riffle Pool Complex
0
335
670
1,340
Feet
Figure 3-B. Recommended Mitigation, Little Fossil Creek
N
August 2011
Prepared by Geospatial Services
Eli Kangas - Chief, Geospatial Services
Julie Vicars - Geographer