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Hunting Bayou Federal Flood Control Project Biological Assessment

Prepared for

Harris County Flood Control District

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Section 1 – Background

The Hunting Bayou Federal Flood Control Project is a general re-evaluation of the Hunting Bayou element of the U.S. Army Corps of Engineers (USACE) Buffalo Bayou and Tributaries, Texas Flood Risk Reduction Project. The general re-evaluation was initiated by Harris County Flood Control District (HCFCD), acting as the Local Sponsor, in partnership with the USACE pursuant to Section 211(f) of the Water Resources Development Act of 1996. The re-evaluation study has resulted in the current recommended project consisting of 3.8 miles of channel widening and deepening to provide a trapezoidal, grass-lined channel (*Exhibit 1*). The channel project extent is between U.S. Highway 59 (US 59) and Wayside Drive, including a 75-acre Offline Detention Area north of the main channel between Homestead Road and Interstate Highway 610 (IH 610). Two additional detention basins are under review: a 15-acre detention basin east of Wayside Drive, and an 11-acre detention basin north of Liberty Road. The project also requires three disposal tracts to accommodate excavated soil placement – Disposal Areas 3, 4, and 5, including a 78-acre tract adjacent to the proposed Offline Detention Area. The natural environment within the recommended project area generally consists of fragmented, undeveloped land surrounded by urban residential and industrial development.

This biological assessment discusses two federally listed species on the threatened and endangered list. Texas prairie dawn (*Hymenoxys texana*), is known to occur within Harris County, Texas, and was listed as endangered on March 6, 1985 (*Federal Register, Vol. 51, No. 49, March 13, 1986, pp. 8681 - 8683*). The other federally listed species is the Bald Eagle (*Haliaeetus leucocephalus*). The Bald Eagle is known to occur in Harris County, Texas; however, it has been delisted and is being monitored for five years for all of the lower 48 states (*Federal Register, Vol. 72, No. 130, July 9, 2007, pp. 37346 – 37372*), except for the Sonoran Desert area within Arizona where it is listed as threatened, according to the U.S. Fish and Wildlife Service (USFWS).

This biological assessment discusses the likelihood that these two species would occur or have historically occurred within the areas of the Hunting Bayou Federal Flood Control Project. A discussion of the general habitat needs for each species is presented, followed by the likelihood of occurrence of each species within the project area. For this assessment, the project area has been divided into six locations (*Exhibit 1*):

1. Main Channel (*Exhibit 2, Sheets 1 – 8, Exhibit 3, Sheets 1 - 8, Exhibit 4, Sheets 1 – 8, and Exhibit 5, Sheets 1 – 8*)
2. Offline Detention and the and the Union Pacific Rail Road (UPRR) Disposal Area (*Exhibit 6, Sheets 1 – 8*)
3. Disposal Area 3 (*Exhibit 7, Sheets 1 – 8*)
4. Disposal Area 4 and the Proposed Detention Area (*Exhibit 5, Sheets 1 – 8*)
5. Disposal Area 5 (*Exhibit 8, Sheets 1 – 8*)
6. Wayside Detention Area (*Exhibit 5, Sheets 1 – 8*)

Each of the six locations is discussed separately relative to the habitat potential for both the Bald Eagle and Texas prairie dawn. A table of the State of Texas' list of threatened, endangered, and rare species (*Table 1*) is included in this assessment, but these species are not discussed in the same detail as the two federally listed species.

Section 2 – Bald Eagle

General Habitat

Bald Eagles (*Haliaeetus leucocephalus*) are a North American species that historically occurred throughout the contiguous United States and Alaska. Males generally measure 3 feet from head to tail, weigh 7 to 10 pounds, and have a wingspan of 6 to 7 feet. Females are larger, some reaching 14 pounds, with a wingspan of up to 8 feet. Adults have a white head, neck, and tail and a large yellow bill. Immature Bald Eagles require 4 to 5 years to reach full adult plumage, with the distinctive head and tail feathers. During this time, immature Bald Eagles may be confused with immature Golden Eagles (*Aquila chrysaetos*) (Texas Parks and Wildlife Department [TPWD], 2010, *Habitat Management Guidelines for Bald Eagles in Texas* downloaded from <http://www.tpwd.state.tx.us/huntwild/wild/species/endang/animals/birds/index.phtml> on 1/27/10).

Between the 1870s and 1970s, the Bald Eagle population severely declined in the lower 48 states. However, the Bald Eagle population has rebounded and breeding territories have been re-established in each of the lower 48 states (USFWS, 2007, National Bald Eagle Management Guidelines downloaded from <http://www.fws.gov/pacific/eagle/NationalBaldEagleManagementGuidelines.pdf> on 1/27/10). In 2007, the USFWS removed the Bald Eagle from the list of threatened and endangered species under the Federal Endangered Species Act in all geographic areas except the Sonoran Desert Bald Eagle range, where it remains protected as a threatened species (*72 Federal Register* p. 37345, July 9, 2007). In Texas, the Bald and Golden Eagle Protection Act (Eagle Act) is the primary law protecting Bald Eagles.

Breeding Bald Eagles occupy “territories,” areas they will typically defend against intrusion by other eagles. In addition to the active nest, a territory may include one or more alternative nests (nests built or maintained by the eagles but not used for nesting). Bald eagles exhibit high nest site fidelity, and nesting territories are often used in consecutive years.

Nesting sites are generally near coastlines, rivers, large lakes, or streams that support an adequate food supply. Bald Eagles often nest in mature or old-growth trees, snags (dead trees), cliffs, rock promontories, rarely on the ground, and with increasing frequency on human-made structures such as power poles and communication towers. In forested areas, Bald Eagles often select the tallest trees with limbs strong enough to support a nest that can weigh more than 1,000 pounds. Nest sites typically include at least one perch with a clear view of the water where the eagles usually forage. Shoreline trees or snags located in reservoirs provide the visibility and accessibility needed to locate aquatic prey. Eagle nests are constructed with large sticks, and may be lined with moss, grass, plant stalks, lichens, seaweed, or sod. Nests are usually about 4 to 6 feet in diameter and 3 feet deep, although larger nests exist.

Nesting activity begins several months before egg-laying, which starts in the eastern half of Texas as early as the first part of October and can last until July with the fledging of the young (TPWD 2010). Young birds usually remain in the vicinity of the nest for several weeks after fledging, because they are almost completely dependent on their parents for food until they disperse from the nesting territory approximately 6 weeks later.

Bald Eagles are opportunistic feeders. Fish compose much of their diet, but they also eat waterfowl, shorebirds/colonial waterbirds, small mammals, turtles, and carrion. Because they are visual hunters, eagles typically locate their prey from a conspicuous perch, or soaring flight, then swoop down and strike.

During the breeding season, Bald Eagles are sensitive to a variety of human activities. However, not all Bald Eagle pairs react to human activities in the same way. Some pairs nest successfully just dozens of yards from human activity, while others abandon nest sites in response to activities much farther away. This variability may be related to a number of factors, including visibility, duration, noise levels, extent of the area affected by the activity, prior experiences with humans, and tolerance of the individual nesting pair. Bald eagles are most sensitive during courtship and the nest-building phase, and are moderately sensitive during the nesting period of their breeding season.

The TPWD has provided habitat management guidelines for Bald Eagles on their website <http://www.tpwd.state.tx.us/huntwild/wild/species/endang/animals/birds/index.phtml>. The guidelines reference two zones relative to a nest site. The primary zone is an area extending 750 to 1,500 feet from a nest site where specific activities should not occur, such as habitat alteration or change of land use, use of chemicals labeled as toxic to fish and wildlife, etc. A secondary management zone of an additional 750 feet to 1 mile is also established to protect the integrity of the primary zone and to protect important feeding areas.

Onsite Inspection and Historical Review

During the site visits for wetland delineation and habitat analysis, at each of the six locations no Bald Eagles were observed. No large mature or old growth trees that are large enough to support eagle nests were observed. No nearby water bodies large enough to support the aquatic prey that Bald Eagles require were observed. The closest large waterbody that clearly supports adequate aquatic prey is Lake Houston, which is located more than 10 miles to the northeast of the project area. Hunting Bayou in the project area is not large enough or deep enough to support the medium to large fish and other aquatic prey Bald Eagles require.

Main Channel

The main channel of Hunting Bayou is located within a densely urbanized section of Houston. Review of historical aerial photographs (*Exhibit 2, Sheets 1 – 8, Exhibit 3, Sheets 1 – 8, Exhibit 4, Sheets 1 – 8, and Exhibit 5, Sheets 1 – 8*) show that Hunting Bayou was channelized before 1930, and subdivisions on both sides of the upper portion of the main channel were constructed during the 1940s. Today, the average width and depth of the main channel area ranges from less than 10 feet wide and less than 1 foot deep in the upper section of the project area, to less than 30 feet wide and an average of approximately 2 feet deep just downstream of Wayside Drive. There are a few pools over 4 feet deep scattered below IH 610, but are not large or numerous enough to support medium to large fish and other aquatic prey that Bald Eagles require. The majority of the Hunting Bayou stream banks, with the exception of a few sections within the downstream segment of the project area, are maintained by mowing. The few sections that are not mowed have few trees occurring near the water's edge. The trees include mulberry (*Morus rubra*), hackberry (*Celtis laevigata*), box elder (*Acer negundo*), and black willow (*Salix nigra*). Photographs of typical landscape features observed during the field investigations are presented in *Photographs 1, 2, and 3, in Appendix Photographs Page 1*.

The southern bank of the main channel area east of Homestead Road and between the southern top of bank of Hunting Bayou to the adjacent development, has mixed hardwood forest and open areas that are routinely mowed. None of this forested section has mature old growth trees. The north bank drainage along the eastern boundary of the existing Homestead Road was a natural channel in 1930 and was likely channelized in association with construction of the Homestead Road bridge, which occurred between 1930 and 1944 (*Exhibit 4, Sheets 2 and 3*). This drainage was moved to its present location (farther west) before 1976 and was probably associated with the landfill that was between the north bank of Hunting Bayou and the railroad tracks east of Homestead Road. The landfill was abandoned before 1978 (*Exhibit 4, Sheets 4a, 4b, 4c, and 5*).

The southern bank area east of Homestead Road was mostly forested until sometime between 1944 and 1950 (*Exhibit 4, Sheets 3 and 4*), when the majority of the trees were removed. A drainage ditch was added that crossed the eastern half of this area and appears to be associated with the construction of IH 610, the North Loop. A large pond created between 1979 and 1984 (*Exhibit 4, Sheets 4c and 5*) is probably associated with construction of the warehouses along the southern boundary of the southern bank area. This left a small group of trees along the southwestern boundary of the southern bank area, which was removed when a road was constructed that connected the warehouse area to Homestead Road before 1995 (*Exhibit 4, Sheet 6*). As previously stated, the section of Hunting Bayou that is east of Homestead Road is not large enough to support an adequate aquatic prey population that Bald Eagles require. No Bald Eagles were observed during site visits for wetland delineation or habitat analysis. Site visits to the main channel occurred June 4, 5, 9, and 10, 2008 for Stream Physical Habitat Assessment. The site visits for Fringe Wetland Survey occurred May 15 through May 17, 2007 and for Habitat Assessment occurred July 1 through July 15, 2008.

Offline Detention and the UPRR Disposal Area

The Offline Detention and UPRR Disposal Area is a mixture of mixed hardwoods and loblolly pine, scrub-shrub, overgrown prairie, and new detention area and disposal area that was constructed in 2009 and therefore is not shown in *Exhibit 6, Sheet 1*. A few mature oak trees were observed along the western section of the Offline Detention Area along a remnant swale. No Bald Eagles were observed within the Offline Detention or the UPRR Disposal Area during site visits for wetland delineation and habitat analysis. The 1930 aerial photograph (*Exhibit 6, Sheet 2*) shows both areas as open fields. The 1944 aerial photograph (*Exhibit 6, Sheet 3*) shows a few trees located along the remnant swale and the remainder of the area is open fields. The 1950, 1984, 1995, 2004, 2006, and 2008 aerial photographs (*Exhibit 6, Sheets 1 and 4 – 8*) show a progression over time from open fields to mixed forest, scrub-shrub, and overgrown prairie. Typical vegetation of this area is shown in *Photographs 4, 5, and 6* in the *Appendix Photographs, Pages 2 and 3*. Historically, this is not quality habitat for Bald Eagles. Site visits to the Offline Detention Area and the UPRR Disposal Area occurred between April 2 and April 21, 2008 for habitat review, and on November 13, 2006 by Dr. Larry Brown for Texas prairie dawn review.

Disposal Area 3

Disposal Area 3 is an open field (*Exhibit 7, Sheet 1*). Only the middle section around the existing radio towers is routinely mowed. The eastern half of the area is becoming overgrown by shrubs and other tall herbaceous species. The 1930, 1944, and 1950 aerial photographs (*Exhibit 7, Sheets 2, 3, and 4*) show the entire area as farmland, with an associated farm house and other buildings. The 1984 aerial photograph (*Exhibit 7, Sheet 5*) shows the radio towers constructed and the farmhouse and other buildings removed. The 1995, 2004, 2006, and 2008 aerial photographs (*Exhibit 7, Sheets 1 and 6 – 8*) show a progression over time from open fields to scrub-shrub, except around the radio towers. Open fields that do not have nearby tall trees or open water that is large enough to support an adequate aquatic prey population are not quality Bald Eagle habitat. Typical vegetation of this area is shown in *Photographs 7, 8, and 9* in the *Appendix Photographs Pages 3 and 4*. No Bald Eagles were observed within Disposal Area 3 during site visits for wetland delineation. Site visits to Disposal Area 3 occurred on June 14, 2006 for wetland review, and on May 9, 2010 by Dr. Larry Brown for Texas prairie dawn review.

Disposal Area 4 and the Proposed Detention Area

Disposal Area 4 is currently an open field that historically has been used as a soil disposal site (*Exhibit 5, Sheets 1 – 8*). There are no mature trees within the disposal site. The proposed detention

area is currently used by a concrete plant. Both areas have been used as disposal sites or as a concrete facility since 1995. Open fields that do not have nearby tall trees or open water that is large enough to support an adequate aquatic prey population are not quality Bald Eagle habitat. Typical vegetation of this area is shown in *Photographs 10 and 11* in the *Appendix Photographs, Page 5*. No Bald Eagles were observed within either area during site visits for wetland delineation and habitat analysis. Site visits to Disposal Area 4 and the Proposed Detention Area occurred during July 2008 for wetland review and habitat assessment, and on May 12, 2010 by Dr. Larry Brown for Texas prairie dawn.

Disposal Area 5

Disposal Area 5 is an open pasture (*Exhibit 8, Sheet 1*). A few trees are located just west of the corrals and other farm buildings located long the area's eastern boundary. The 1930, 1944, 1950, and 1984 aerial photographs show the area as open fields (*Exhibit 8, Sheets 2 – 5*). The 1995, 2004, 2006, and 2008 aerial photographs (*Exhibit 8, Sheets 1, and 6 – 8*) show a slow progression over time from open fields to fields with scrub-shrub. Typical vegetation of this area is shown in *Photograph 12* in the *Appendix Photographs, Page 6*. No Bald Eagles were observed within the area during site visits for wetland delineation and habitat analysis. Site visits to Disposal Area 5 occurred on June 14, 2006 for wetland review, and on May 12, 2010 by Dr. Larry Brown for Texas prairie dawn review.

Wayside Detention Area

The proposed Wayside Detention Area is adjacent to the Englewood rail yard and is currently owned by three entities: Southern Pacific Railroad, CenterPoint Energy, and Harris County (*Exhibit 5, Sheet 1*). Before 1950, the Wayside Detention Area was an undeveloped forest (*Exhibit 5, Sheets 2 and 3*). The 1950 aerial photograph shows the entire area as disturbed, and all of the trees removed (*Exhibit 5, Sheet 4*). Sometime before 1984, five ponds were constructed in the northern section of the proposed Wayside Detention Area. The 1984, 1995, 2004, 2006, and 2008 aerial photographs show a progression over time of the open areas changing to scrub-shrub to forest with some areas continuing to be disturbed (*Exhibit 5, Sheets 1, and 5 – 8*). Typical vegetation of this area is shown in *Photographs 13, 14, and 15* in the *Appendix Photographs, Pages 6 and 7*. No Bald Eagles were observed within the area during site visits for wetland delineation and habitat analysis. Site visits to the Wayside Detention Area occurred on August 19 and 20, 2009 for wetland review and habitat assessment, and on May 12, 2010 by Dr. Larry Brown for Texas prairie dawn review.

Bald Eagle Summary

The onsite review and historical review indicate that there is no Bald Eagle habitat available within the Hunting Bayou Federal Flood Control Project area. The main channel of Hunting Bayou, the Offline Detention Area, and UPRR Disposal Area are located within a densely urbanized section of Houston. Disposal Area 3 is an open field with part maintained by mowing and part becoming overgrown by shrubs and other tall herbaceous plants. Disposal Area 4 has no mature old growth trees and the proposed detention area is currently used by a concrete plant. Disposal Area 5 is an open pasture. The Wayside Detention Area is adjacent to the Englewood rail yard that continues to exhibit indications of disturbance. No Bald Eagles or mature old growth trees were observed during any of the site visits. Without the presence of Bald Eagles the proposed Hunting Bayou Federal Flood Control Project would not affect this species.

Section 3 – Texas Prairie Dawn

General Habitat

Texas prairie dawn (*Hymenoxys texana*) is a small taprooted annual plant that is only 2 to 8 inches tall. Its basal leaves are spoon-shaped and may have toothed margins. The smaller alternate leaves on the branching stem are narrow and untoothed. On March 6, 1985 (*Federal Register*, 1985, Vol. 50, No. 44, March 6, 1985, pp. 9095 – 9097), Texas prairie dawn was proposed for listing as an endangered species. The proposed rule stated that the main threat to prairie dawn is habitat destruction, and that it is especially vulnerable to accidental disturbance. Therefore, without proper protection planning, this species is subject to possible elimination. Commercial trade of Texas prairie dawn is not known to exist; however, the potential exists for uncontrolled collecting and vandalism. The proposed rule stated that the preferred action is to list Texas prairie dawn as endangered without critical habitat. At the time of the proposed rule, Texas prairie dawn was not known to exist on federal lands. The final rule was published in the *Federal Register* on March 13, 1986 (*Federal Register*, 1986, Vol. 51, No. 49, March 13, 1986, pp. 8681 – 8683).

The USFWS published the recovery plan for Texas prairie dawn in 1989 (*USFWS*, 1989, *Hymenoxys texana* Recovery Plan, pp 53.) and approved the plan on April 13, 1990. The recovery criteria for Texas prairie dawn are the following:

“*Hymenoxys texana* can be downlisted to threatened when at least 50 separate populations, each occupying at least 1 hectare (2.47 acres) of suitable habitat are discovered or established, and when these 50 populations are protected from land use practices or land use changes that could destroy the populations. *Hymenoxys texana* can be delisted when management practices are established that ensure the numbers of plants at protected populations will remain stable. Since many questions about the biology and habitat requirements of *Hymenoxys texana* remain unanswered, it may be necessary to modify the downlisting and delisting criteria as additional information is obtained.”

The recovery plan states the following major steps are needed for Texas prairie dawn to recover:

- Maintaining present populations on public lands through effective agency planning and habitat management
- Maintaining present populations on private land through landowner cooperation and habitat management
- Studying propagation and establishing a botanical garden population
- Searching for additional populations in natural habitat, if needed
- Obtaining biological information needed for effective management
- Developing public support of preservation of Texas prairie dawn

The recovery plan states that the Texas prairie dawn has been found on Houston Community College property on a site that was used as a football field, and this site is maintained by mowing. The recovery plan states that the USACE has found 11 sites in two federally-owned reservoirs—Addicks and Barker Reservoirs—located in western Harris County, Texas. The recovery plan states that Harris County’s Mercer Arboretum and Botanic Gardens has successfully propagated Texas prairie dawn from seed. Anita Tiller, botanist with Mercer Arboretum and Botanic Gardens, stated that they have routinely grown prairie dawn in their greenhouses to maintain the seed viability and for public education (Anita Tiller, telephone interview, January 28, 2004).

Texas prairie dawn has been associated with a specific type of saline, sandy mound. These mounds have been called by various names, including "mima mounds" or "pimple mounds." The mounds are typically barren areas that are sparsely vegetated. The soil chemistry, morphology, and taxonomy of these mounds have not been well determined. Discussions with local soil specialists (Glen Chervenka, telephone interview January 28, 2004; Gerald W. Crenwelge, telephone interview February 24, 2004) indicated the best information on these types of mounds is a master's thesis by S. M. Starowitz (Starowitz, S.M. 1994. *A Study of Aquic Conditions in a Microtoposequence of Seasonally Wet Soils on the Texas Coast Prairie*, M.S. Thesis, Texas A&M.). Starowitz reviewed the soils and hydrology of small mounds that appear to be similar to the mounds that are associated with Texas prairie dawn. The mounds studied are located on uncultivated pasture in western Harris County, Texas, and represent an area that has not been previously drained or cultivated. This site is 8 to 15 miles north of existing populations of Texas prairie dawn in Addicks and Barker Reservoirs. The area of study was chosen for the following reasons:

1. Minimum disturbance
2. Presence of microtopographic landforms
3. Existence of soil bodies that are extensive on the Texas Coast Prairie

Starowitz's conclusions indicate that the differences in the soil profile and chemistry among the mounds, intermounds, and depressions have caused differences in rates of water flow through and between these areas of different soils. The flow rates also reverse during the year as the ratio between precipitation and evapotranspiration changes (*Exhibits 9 and 10*). When precipitation exceeds evapotranspiration (*Exhibit 9*), the water flow is away from the mounds to the underlying water table, which is connected to the perched water table of the intermound and depression areas. When evapotranspiration is higher than precipitation, the water flow is away from the depression area down to the perched water table, across the intermound area to the mound area and lower water table. This hydrological system causes the intermound zone to have elevated levels of sodium and soluble salts since the evapotranspiration within the intermound concentrates them. Starowitz's work used a series of open pipes to monitor water levels (piezometers); tensiometers that measure water saturation within the soil column; and platinum electrodes to measure redox potential, or the amount of reduction/lack of oxygen in the soil column. Starowitz summarizes:

...the mound is the driving force for hydric changes of the microtoposequence, since it has a continuous water table (endosaturation) to about 4.5 m. Both the intermound and depression have perched water tables (episaturation). Water flows from areas of upper elevation to lower areas via surface flow and groundwater flow in the direction of the depression during the portions of the year when precipitation exceeds evapotranspiration (*Exhibit 9*). Discharge is therefore depression focused. When evapotranspiration exceeds precipitation the movement of water is focused in the opposite direction, where recharge moves in the direction of the mound (from highest to lowest soil water potential). The latter explains the elevated sodium levels and soluble salts found in intermound subsoils (*Exhibit 10*) (Thesis, pp 96 and 100).

Both the intermound and depression sites have low permeability in the subsoil due to moderately fine textures. The intermound and depression sites also have low permeability, due to the high exchangeable sodium levels (sodium absorption ratios and exchangeable sodium percentages above 13 and 15 percent, respectively) that caused dispersed clays to clog pores and limit throughflow. All soils had coarser textures in the lower portions of the horizons (below 350 cm), which caused an occluded aquifer in the intermound and depression areas where the water flow was confined by a slowly permeable aquitard at the upper contact and below by stratified coarse, fine sequence of parent materials.

Gerald W. Crenwelge, retired soil scientist with the Natural Resources Conservation Service (NRCS), (telephone interview, February 24, 2004), stated this is a reasonable explanation of how saline intermounds occur, and is probably how the mima or pimple mounds that are associated with Texas prairie dawn hydrologically function; however, specific research on mounds associated with Texas prairie dawn has not been conducted.

Elevated sodium and soluble salts appear to be an important criterion for the long-term survival of Texas prairie dawn, because this endangered plant is typically found growing either on top or along the base of these saline dense sandy mounds. Discussions with Dr. Larry Brown, a local plant taxonomist, indicate that in areas that are not barren, Texas prairie dawn has a difficult time competing with other vegetation (Personal interview, January 27, 2004). Dr. Brown, Jackie M. Poole (1988 Texas Natural Heritage Program review letter to USFWS [USFWS 1989]), and Charles Travis (1988 TPWD review letter to USFWS [USFWS 1989]) state that Texas prairie dawn appears to tolerate the elevated sodium and soluble salts that are associated with these mounds. Therefore, if the elevated sodium and soluble salts are important, then the surface and subsurface hydrology is also an important factor that needs to be preserved for the long-term survival of Texas prairie dawn. Disturbance of the surface and subsurface hydrology of the mima mound areas would probably remove the elevated sodium and soluble salts and therefore remove the available Texas prairie dawn habitat.

Onsite Inspection and Historical Review

During the site visits to each of the six locations for wetland delineation and habitat analysis, no Texas prairie dawn, associated species such as *Sporobolus pyramidatus*, *Willkommia texana* var. *texana*, *Chloris texensis*, *Rayjacksonia aurea*, and *Thurovia triflora*, or Texas prairie dawn's typical habitat, mima mounds, were observed. Dr. Larry Brown, a local plant taxonomist and co-author of the Texas prairie dawn recovery plan, also conducted site visits on November 11 and 12, 2006 to the Offline Detention and UPRR Disposal Area, and on May 9 and 12, 2010 to Disposal Areas 3, 4 and Proposed Detention, Area 5, and the proposed Wayside Detention Area (*Exhibit 11*).

Historically, only two areas, Disposal Area 4 (*Exhibit 5, Sheets 2 and 3*), and the Offline Detention and UPRR Disposal Area (*Exhibit 6, Sheets 2 and 3*) had small white photographic signatures that may indicate that mima mounds may have been present. However, both of these sites have been altered to such an extent that there is no indication, i.e., no white photographic signatures, and no field expression of mima mounds or typical Texas prairie dawn habitat. Field visits revealed that these sites do not exhibit typical Texas prairie dawn habitat. Disposal Area 4 has been used as a fill area and industrial site, leaving no original natural areas. The Offline Detention and UPRR Disposal Area has become overgrown with mixed forest, scrub-shrub, and overgrown prairie.

Main Channel

The main channel appears to have been channelized before 1930 (*Exhibit 2, Sheet 2, Exhibit 3, Sheet 2, Exhibit 4, Sheet 2, and Exhibit 5, Sheet 2*). Review of the 1930, 1944, 1950, 1984, 1995, 2004, 2006, and 2008 aerial photographs does not indicate any mima mounds within the main channel area (*Exhibit 2, Sheets 1 – 8, Exhibit 3, Sheets 1 -8, Exhibit 4, Sheet 1 – 8, and Exhibit 5, Sheets 1 – 8*). No Texas prairie dawn or its typical habitat was observed within the area during site visits for wetland delineation and habitat analysis. Site visits to the main channel occurred June 4, 5, 9, and 10, 2008 for Stream Physical Habitat Assessment and May 15 through May 17, 2007 for Fringe Wetland Survey. Site visits to the channel east of Homestead Road occurred July 1 through July 15, 2008 for Habitat Assessment.

Offline Detention and the UPRR Disposal Area

The 1930 and 1944 aerial photographs show a large number of white circular to semi-circular areas, which may have indicated mima mounds (*Exhibit 6, Sheets 2 and 3*). These white areas are faded in the 1950 aerial photograph and have disappeared in the 1984 aerial photograph (*Exhibit 6, Sheets 4 and 5*). The area was altered by construction of a wastewater treatment facility that has since been removed, an unimproved road with drainage ditches near the center of the area, and an abandoned unimproved road and its drainage ditches approximately 400 feet from the eastern property boundary. The 1950, 1984, 1995, 2004, 2006, and 2008 aerial photographs (*Exhibit 6, Sheets 1, and 4 – 8*) show a progression over time from open fields to mixed forest, scrub-shrub, and overgrown prairie. None of these are typical habitat for Texas prairie dawn. No Texas prairie dawn or its typical habitat was observed within the areas during site visits for wetland delineation and habitat analysis. Site visits to the Offline Detention Area and the UPRR Disposal Area occurred between April 2 and April 21, 2008 for wetland and habitat review, and on November 13, 2006 by Dr. Larry Brown for Texas prairie dawn review. Dr. Brown confirmed that Texas prairie dawn was not present (*Exhibit 11*).

Disposal Area 3

The 1930, 1944, and 1950 aerial photographs show that the entire Disposal Area 3 was an active farm (*Exhibit 7, Sheets 2, 3, and 4*). Long-term plowing alters the natural soil profiles and destroys any mima mounds that may have existed. The 1930, 1944, and 1950 aerial photographs do not show any photographic signatures (white spots) of possible mima mounds. The 1984, 1995, 2004, 2006, and 2008 aerial photographs (*Exhibit 7, Sheets 1, and 4 – 8*) show a progression over time from open fields to scrub-shrub, except around the radio towers that appear to have been constructed sometime before 1984. No Texas prairie dawn or its typical habitat was observed within the area during site visits for wetland delineation. Site visits to Disposal Area 3 occurred on June 14, 2006 for wetland review, and on May 9, 2010 by Dr. Larry Brown for Texas prairie dawn review. Dr. Brown confirmed that Texas prairie dawn was not present (*Exhibit 11*).

Disposal Area 4 and the Proposed Detention Area

Disposal Area 4 is currently an open field that historically has been used as a soil disposal site; the proposed detention area is currently a concrete plant. The 1930 and 1944 aerial photographs (*Exhibit 5, Sheets 2 and 3*) show photographic signatures (white spots) that may have been mima mounds within the southwestern one-third of the area. Since before 1950, this area has been used as an earthen fill site that included the entire area, as shown in the 1995 photograph (*Exhibit 5, Sheet 6*). Disturbance or burial of the original soil profiles typically destroys the habitat of Texas prairie dawn. No Texas prairie dawn or its typical habitat was observed within the area during site visits for wetland delineation and habitat analysis. Site visits to Disposal Area 4 and the Proposed Detention Area occurred during July 2008 for wetland review and habitat assessment and on May 12, 2010 by Dr. Larry Brown for Texas prairie dawn review. Dr. Brown confirmed that Texas prairie dawn was not present (*Exhibit 11*).

Disposal Area 5

Disposal Area 5 is an open pasture with corrals and other farm buildings located on the eastern end of the area. The 1930, 1944, and 1950 aerial photographs (*Exhibit 8, Sheets 2, 3, and 4*) do not indicate any photographic signatures (white spots) that are typical for mima mounds. The 1995, 2004, 2006, and 2008 aerial photographs (*Exhibit 8, Sheets 1, and 6 – 8*) show a slow progression over time from open fields to fields with scrub-shrub. No Texas prairie dawn or its typical habitat was observed within the area during site visits for wetland delineation and habitat analysis. Site visits to Disposal Area 5 occurred on June 14, 2006 for wetland review, and on May 12, 2010 by Dr. Larry

Brown for Texas prairie dawn review. Dr. Brown confirmed that Texas prairie dawn was not present (*Exhibit 11*).

Wayside Detention Area

The proposed Wayside Detention Area is adjacent to the Englewood rail yard and is currently owned by three entities: Southern Pacific Railroad, CenterPoint Energy, and Harris County. Before 1950, the Wayside area was an undeveloped forest with no indication of photographic signatures (white spots) that are typical for mima mounds (*Exhibit 5, Sheets 2 and 3*). The 1950 aerial photograph (*Exhibit 5, Sheet 4*) shows the entire area was disturbed and all of the trees removed. Disturbance or burial of the original soil profiles typically destroys the habitat of Texas prairie dawn. No Texas prairie dawn or its typical habitat was observed within the area during site visits for wetland delineation and habitat analysis. Site visits to the Wayside Detention Area occurred on August 19 and 20, 2009 for wetland review and habitat assessment, and on May 12, 2010 by Dr. Larry Brown for Texas prairie dawn review. Dr. Brown confirmed that Texas prairie dawn was not present (*Exhibit 11*).

Texas Prairie Dawn Summary

Review of historical aerial photographs indicated only two areas had small white photographic signatures that may indicate that mima mounds may have been present. However, both Disposal Area 4 and the Offline Detention Area and the UPRR Disposal Area have been altered to such an extent that no white photographic signatures are present in the recent aerial photographs. No Texas prairie dawn or its typical habitat was observed during site visits for wetland review and habitat assessment within the proposed Hunting Bayou Federal Control Project. Dr. Brown confirmed that Texas prairie dawn is not present within these areas. Since Texas prairie dawn is not present, the proposed Hunting Bayou Federal Flood Control Project would not affect the continued existence of this species.

Section 4 – State Listed Threatened, Endangered, and Rare Species

Table 1 shows the state listed threatened, endangered, and rare species within Harris County, Texas. The table includes vertebrates, invertebrates, and vascular plants identified as being of conservation concern by TPWD. These special species lists compiled by TPWD are composed of species, subspecies, and varieties that are federally listed; proposed to be federally listed; have federal candidate status; are state listed; or carry a global conservation status indicating a species is critically imperiled, very rare, vulnerable to extirpation, or uncommon.

TPWD does not include Natural Plant Communities such as Little Bluestem-Indiangrass Series (native prairie remnant), Water Oak-Willow Oak Series (bottomland hardwood community), Saltgrass-Cordgrass Series (salt or brackish marsh), or Sphagnum-Beakrush Series (seepage bog) in the Harris County list. Nor does TPWD include Other Significant Features such as bird rookeries, migratory songbird fallout areas, comprehensive migratory bird information, bat roosts, bat caves, invertebrate caves, and prairie dog towns in the list.

The list is not inclusive of all rare species distributions. The list was compiled, developed, and updated based on field guides, staff expertise, scientific publications, and the TPWD Texas Natural Diversity Database (TXNDD) (formerly the Biological and Conservation Data System) occurrence data. Historic ranges for some state listed extirpated species, full historic distributions for some extant species, accidentals and irregularly appearing species, and portions of migratory routes for particular species are not necessarily included. Species that appear on the county list do not all share the same probability of occurrence within the county. Some species are migrants or wintering residents only. Additionally, a few species may be historic or considered extirpated within the county.

TPWD makes every attempt to keep the information current and correct. However, the USFWS is the responsible authority for federal listing status. Review of the TPWD list does not substitute contact with the USFWS, and federally listed species county ranges may vary from the USFWS county-level species lists because of the inexact nature of range map development and use.

The Harris County list is periodically revised. The TPWD website would present updated lists for review.

**Table 1. Harris County Vertebrates, Invertebrates, and Vascular Plants
of Conservation Concern**

Common Name	Scientific Name	State Status*
Amphibians		
Houston toad	<i>Bufo houstonensis</i>	E
Birds		
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	T
Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	R
Bald Eagle	<i>Haliaeetus leucocephalus</i>	T
Black Rail	<i>Laterallus jamaicensis</i>	R
Brown Pelican	<i>Pelecanus occidentalis</i>	E
Henslow's Sparrow	<i>Ammodramus henslowii</i>	R
Mountain Plover	<i>Charadrius montanus</i>	R
Peregrine Falcon	<i>Falco peregrinus</i>	T
Red-cockaded Woodpecker	<i>Picooides borealis</i>	E
Snowy Plover	<i>Charadrius alexandrinus</i>	R
Southeastern Snowy Plover	<i>Charadrius alexandrinus tenuirostris</i>	R
White-faced Ibis	<i>Plegadis chihi</i>	T
White-tailed Hawk	<i>Buteo albicaudatus</i>	T
Whooping Crane	<i>Grus americana</i>	E
Wood Stork	<i>Mycteria americana</i>	T
Fishes		
American eel	<i>Anguilla rostrata</i>	R
Creek chubsucker	<i>Erimyzon oblongus</i>	T
Smalltooth sawfish	<i>Pristis pectinata</i>	E
Mammals		
Louisiana black bear	<i>Ursus americanus luteolus</i>	T
Plains spotted skunk	<i>Spilogale putorius interrupta</i>	R
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	T
Red wolf	<i>Canis rufus</i>	E
Southeastern myotis bat	<i>Myotis austroriparius</i>	R
Mollusks		
Little spectaclecase	<i>Villosa lienosa</i>	R
Louisiana pigtoe	<i>Pleurobema riddellii</i>	T
Pistolgrip	<i>Tritogonia verrucosa</i>	R
Rock pocketbook	<i>Arcidens confragosus</i>	R
Sandbank pocketbook	<i>Lampsilis satura</i>	T
Texas pigtoe	<i>Fusconaia askewi</i>	T
Wabash pigtoe	<i>Fusconaia flava</i>	R

Table continued

Common Name	Scientific Name	State Status*
Reptiles		
Alligator snapping turtle	<i>Macrochelys temminckii</i>	T
Green sea turtle	<i>Chelonia mydas</i>	T
Gulf Saltmarsh snake	<i>Nerodia clarkii</i>	R
Kemp's Ridley sea turtle	<i>Lepidochelys kempii</i>	E
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E
Loggerhead sea turtle	<i>Caretta caretta</i>	T
Smooth green snake	<i>Liochlorophis vernalis</i>	T
Texas horned lizard	<i>Phrynosoma cornutum</i>	T
Timber/Canebrake rattlesnake	<i>Crotalus horridus</i>	T
Plants		
Coastal gay-feather	<i>Liatris bracteata</i>	R
Giant sharpstem umbrella-sedge	<i>Cyperus cephalanthus</i>	R
Houston daisy	<i>Rayjacksonia aurea</i>	R
Texas meadow-rue	<i>Thalictrum texanum</i>	R
Texas prairie dawn	<i>Hymenoxys texana</i>	E
Texas windmill-grass	<i>Chloris texensis</i>	R
Threeflower broomweed	<i>Thurovia triflora</i>	R

Source: Adapted from <http://gis.tpwd.state.tx.us/TpwEndangeredSpecies/DesktopDefault.aspx>.

Last revised Jan. 15, 2010:

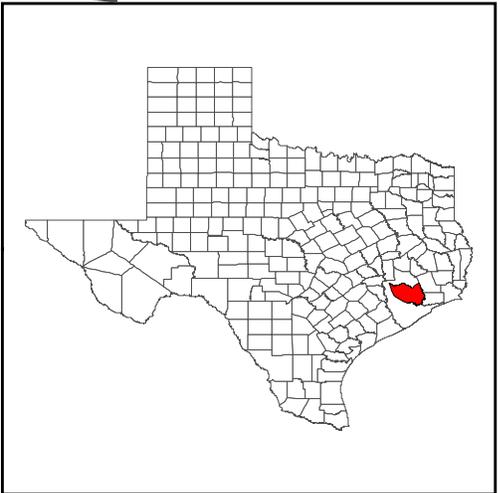
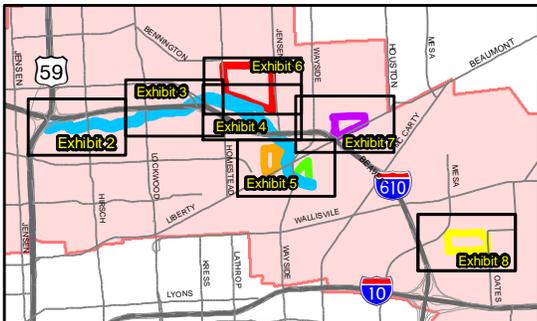
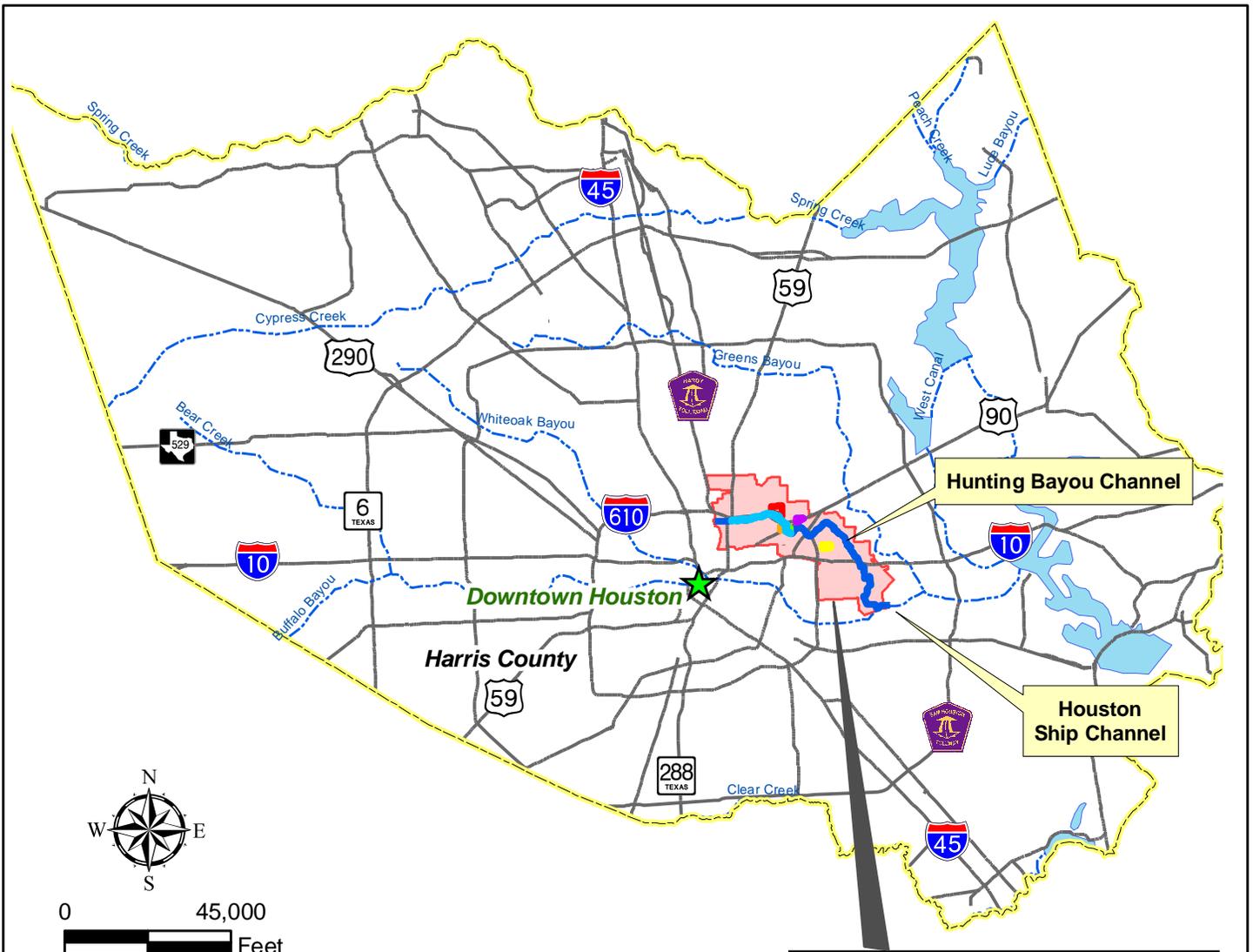
*Status Key:

E, T State Listed Endangered/Threatened
R Rare, but with no regulatory listing status

Section 5 – Determination of Effects

During the site visits and historical review of the Hunting Bayou Federal Flood Control Project, no appropriate habitat was observed for the Bald Eagle or for Texas prairie dawn. No Bald Eagle nests or Bald Eagles were observed. Dr. Brown did not observe Texas prairie dawn (or its typical habitat) and concluded that Texas prairie dawn is not present within the sites reviewed. Without appropriate habitat for the Bald Eagle or for Texas prairie dawn, there is no effect of the Hunting Bayou Federal Flood Control Project on these two federally listed species.

EXHIBITS



Legend

- Hunting Bayou Watershed
- Main Channel
- Offsite Detention and UPRR Disposal Area
- Disposal Area 3
- Disposal Area 4 and Proposed Detention
- Disposal Area 5
- Proposed Wayside Detention Area

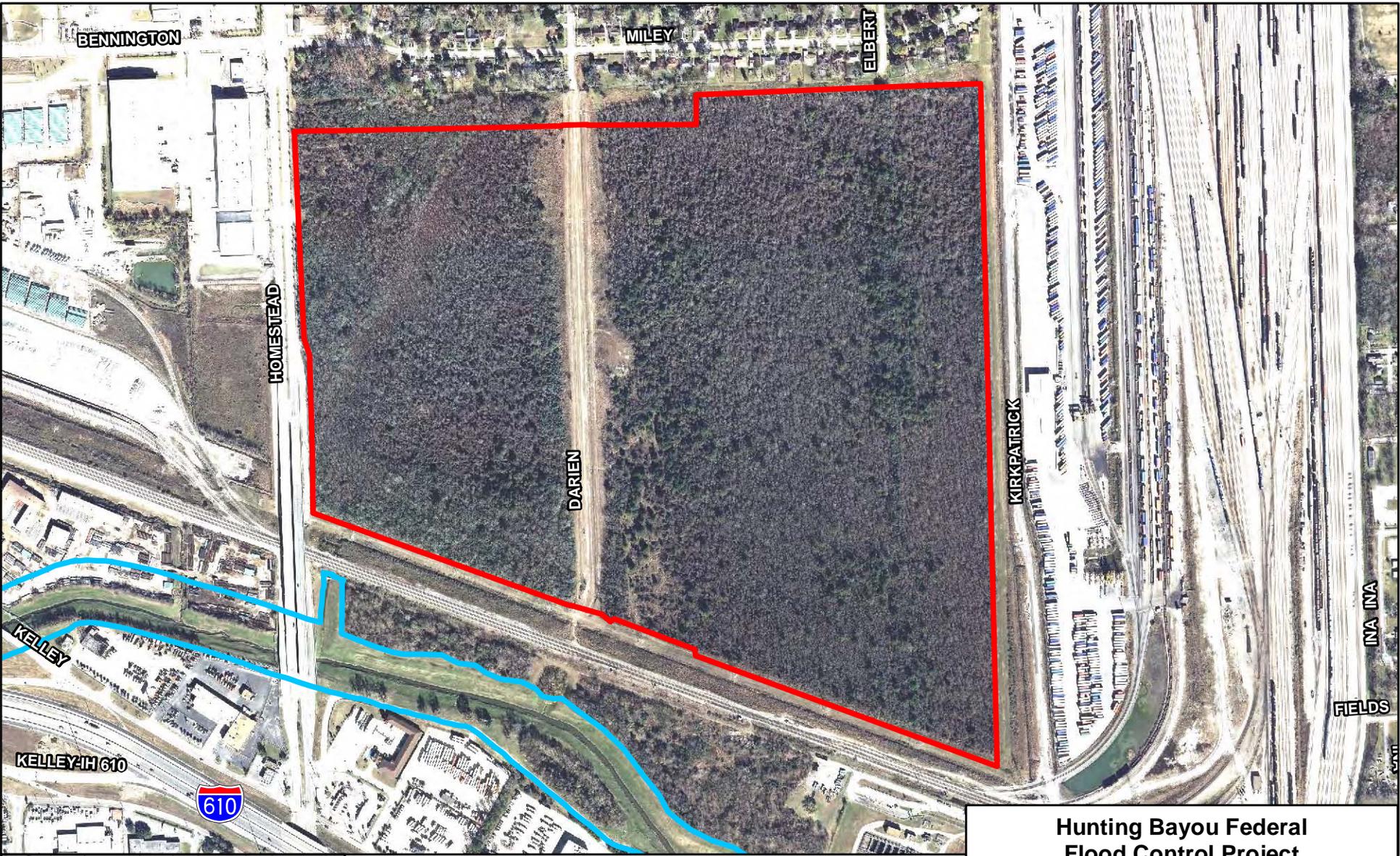
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**Biological Assessment
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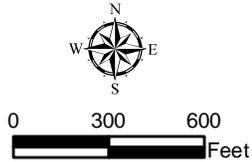


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- Legend**
- ▭ Main Channel
 - ▭ Offline Detention and UPRR Disposal Area
 - ▭ Disposal Area 3
 - ▭ Disposal Area 4 and Proposed Detention
 - ▭ Disposal Area 5
 - ▭ Proposed Wayside Detention Area

Source: HGAC 2008

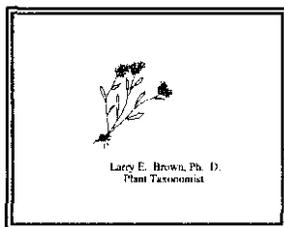


Hunting Bayou Federal Flood Control Project

Biological Assessment Site Map - Aerial 2008

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From the Office of
Larry E. Brown, Plant Taxonomist
6223 Henniker Drive

Houston, Texas 77041 - 5844



Home Phone Number: 832 - 467 - 3348

Cell Phone Number: 832 -515 - 8174

E-mail Address: Larry_theplantman@netzero.com

Alternate E-mail Address: Ruby_in_Houston@netzero.com

**A Survey for *Hymenoxys texana* (Prairie Dawn) and the presence of the orchid *Platanthera flava* on H500-01-00-E001 a 160 acre square section of land between Homestead and Kirkpatrick, south of Miley, and north of the I- 610 north loop road.
Key Map 454 R V and 455 N S
Harris County, Texas
November 13, 2006**

This site is dominated by a dense woodland but there are open areas around the edge and a wide open area down the center along adjacent drainage ditches that carry water from the northern housing tract south through the subject area. During the field survey, I was able to walk and drive the open areas around the edge and to drive and walk down the central drainage ditch. I also entered a section of the woodland off of homestead to examine the site where *Platanthera flava* was found growing in 2002. Visits to the subject site were on Saturday November 11, 2006 and Sunday November 12, 2006.

Prairie dawn flowers only from late February through March into early April. The plants grow in full sun as small colonies on sparsely vegetated areas of fine-sandy compacted soil. These sites are in undisturbed prairies where they are sometimes at the base of mima (pimple) mounds. Prairie Dawn, a heliophyte, does not occur in the shade of a dense forest nor in bottom lands subject to flooding. At the time of the field survey, the possible presence of Prairie Dawn would be the discovery of suitable sites with some of the associated species that are visible during the warmer months. The nearest known prairie dawn sites are to the northwest off of W Little York and to the northwest to the west of Lake Houston.

PRAIRIE DAWN

As indicated above, Prairie Dawn occurs only in open areas of undisturbed soils and not in the shade of forest trees. Therefore, I paid special attention to the open areas. The dominant plants in the open areas along the north/south drainage ditch were: *Andropogon glomeratus*, *Andropogon virginicus*, *Iva angustifolia*, *Bothriochloa longipaniculata*, *Tridens strictus*, *Muhlenbergia capillaris*, *Baccharis halimifolia*, *Heterotheca subaxillaris*, *Solidago altissima*, and *Bothriochloa ischaemum*.

The dense woodland, by far covers 95 + percent of the area and the dominant here were: *Populus deltoides*, *Celtis laevigata*, *Salix nigra*, *Sapium sebiferum*, *Ligustrum lucidum*, and *Ligustrum sinense*.

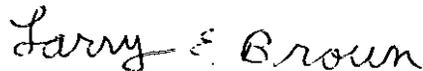
The vegetation of the north/south open area along Kirkpatrick Street seems to be that of a remnant prairie. The common plants here were: *Gaura lindheimeri*, *Euthamia gymnospermoides*, *Tridens strictus*, *Schizachyrium scoparium*, *Euthamia leptcephala*, *Baccharis halmifolia*, *Axonopus fissifolia*, *Helianthus angustifolia*, and *Sorghastrum nutans*. Because of the prairie vegetation along the edges and some areas of *Muhlenbergia* dominating some small open sites in the forested areas, it is conceivable that at least a part of the forest has invaded and replaced a prairie vegetation. In any case, I saw no Prairie Dawn habitat nor any of the associated species typical of a Prairie Dawn habitat.

PLATANThERA FLAVA

This is a rare species in Harris County for there are only 3 Harris records. The first was in the early 1900's . The second record was in June 1994 in Pasadena. The third record was from the subject site in May of 2002. Although not recognized as an endangered or threatened species, it is a very rare plant in Harris County and rare in 5 northeast Texas counties.

On the subject site, it was found in a north/south depression that is now marked as a wetland. The coordinates to the Homestead Road entrance to this depression are 29°48'54"N; 95°18'07"W where there is a pull off on Homestead Road.

In summary, it is my professional opinion that Prairie Dawn plants are absent from the subject site and the habitat to support Prairie Dawn is also absent. The subject area is the third Harris County record for *Platanthera flava*. The photographs of the site will also help in understanding the characteristics of the subject area.



Larry E. Brown
Plant Taxonomist and
Environmental Consultant



Photo 1. The largest open area was this north/south drainage ditch was constructed to carry runoff water from the housing tracts to the north of the subject site. View to the north.



Photo 2. View of the south end of the drainage ditches. The southern border of the subject site is the railroad tract in the distance, I-610 is beyond the distant woody vegetation.



Photo 3. Highest point on the subject site. This is a hill of fill-dirt from the excavation of the north/south drainage ditch. The grasses are the introduced K-R Bluestem.



Photo 4. An area of native prairie grasses on the west edge of the north/south drainage ditch. The dominant grasses were *Andropogon glomeratus*, *Schizachyrium scoparium*, and *Tridens strictus*.



Photo 5. View of open area on east side of subject site along Kirkpatrick Street. View to the north showing some remnant prairie vegetation to the east.



Photo 6. Close up view of remnant prairie vegetation adjacent to Kirkpatrick Street. Prairie dominated by *Gaura lindheimeri*, *Euthamia gymnospermoides*, *Tridens strictus*, *Schizachyrium scoparium*, *Euthamia leptcephala*, *Baccharis halmifolia*, *Axonopus fissifolia*, *Helianthus angustifolia*, and *Sorghastrum nutans*



Photo 7. View of dark clay soil on the Kirkpatrick Street side of the subject site. The soil is not suitable for the growth of Prairie Dawn.



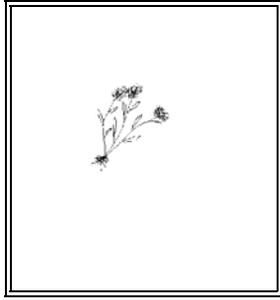
Photo 8. View of the forested depression off of Homestead Road. The red flag in the distance marks this depression as a wetland. *Platanthera flava* habitat.



Photo 9. View of ground of wetland depression off of Homestead Road. This is the habitat of *Platanthera flava*.



Photo 10. Vegetation of wetland depression off of Homestead Road. *Platanthera flava* habitat.



From the Office of
Larry E. Brown, Plant Taxonomist
6223 Henniker Drive
Houston, Texas 77041 - 5844

* * * * *

Home Phone Number: 832 - 467 - 3348

Cell Phone Number: 832 -515 - 8174

E-mail Address: Larry-theplantman@att.net

Alternate E-mail Address: Ruby.brown@att.net

* *

May 13, 2010

**A Survey for *Hymenoxys texana* (Prairie Dawn) on HCFC Project ID H100-00-00-Y001
Hunting Bayou Federal Flood Control Project
Harris County, Texas**

To whom it may concern, I was hired by the Harris County Flood Control District under the direction of Ms. Denise Wade to survey 4 sites for the presence of the federal endangered species *Hymenoxys texana* whose common name is Prairie Dawn. I surveyed Disposal Area 3 on Sunday, May 9, 2010 and the 3 other areas involved in flood control along Hunting Bayou on Wednesday May 12, 2010. The included pictures will help to understand the conditions on each site and thus the absence of *Hymenoxys texana* from the subject sites. .

Prairie dawn only flowers from late February through March into early to late April. However, its presence may still be determined because some stalks of dead plants are present on prairie dawn sites from May through June. The plants only grow in full sun as small colonies on sparsely vegetated areas of fine-sandy compacted soil mostly in undisturbed prairie vegetation. These sites are sometimes at the base of mima (pimple) mounds in prairies. Prairie Dawn is a heliophyte and does not occur in the shade of a dense forest especially one in a bottomland where periodic floods would wash away any seeds that might be present. At the time of the field survey, suitable sites should lack flowering stems but old dead stems of Prairie Dawn should be present. The nearest known Prairie Dawn sites are to the northeast on the west side of Lake Houston near the intersection of Beltway 8 and Lockwood. These Lake Houston sites are open sandy areas of pale exposed soil surrounded by a growth of pine woodlands.

This discussion will be divided into the 4 sections. The included photos show the environment present in each section.

Disposal Area 3. Harris County Key Map 455 block T. 29°48.411'N; 95°16.672'W near center of site.

The site is composed of a mowed field and a dense secondary woodland. The plants species in the field were dominated by *Rumex crispus*, *Limnoscadium pumilum*, *Lolium perenne*, *Sporobolus indicus*, *Cirsium horridulum*, *Juncus marginatus*, *Paspalum plicatulum*, *Hypochaeris microcephala*, *Paspalum urvillei*, and *Sonchus asper*. The woodland is dominated by *Triadica sebiferum*, *Rudbeckia texana*, *Lythrum alatum*, *Ulmus americana*, *Rubus trivialis*, *Carex tetrastachya*, *Carex cherokeeensis*, and *Rubus trivialis*.

The included photographs show the soil as a heavy black clay which is not suitable for the growth of Prairie Dawn. In addition there are no Prairie Dawn associated species and no areas with pale sandy soil exposed. I saw no Prairie Dawn sites here and thus the habitat for Prairie Dawn is absent.

Disposal Area 4 and Proposed Detention. Harris County Key Map 455 block W. 29°47.936'N; 95°17.414'W at Liberty Road bridge over Hunting Bayou.

This was the most disturbed unit of all of those examined. An active business was on the site, the soil was absent of vegetation and/or mostly covered with small pieces of broken concrete, and the vegetation, when present, was a mixture of native and introduced weeds. Needless to say, there were no Prairie Dawn plants or sites here. In areas of vegetation, the plants were *Helianthus annuus*, *Campsis radicans*, *Monarda citriodora*, *Baccharis halimifolia*, *Coreopsis tinctoria*, and *Morus alba*.

Proposed Wayside Detention Area. Harris County Key Map 455 block W. 29°47.81'N; 95°17.21'W in middle of site.

This site was difficult to access but I was able to cross a narrow section of the Englewood Railroad Yard and enter the section. Again little, if any, undisturbed soil was present here. A pale area on Google Earth and on the aerial photo provided by HCFC district proved to be a road into a waste area where some active work was in progress during my visit. Apparently the only native vegetation was along Hunting Bayou and the major plants there were *Celtis laevigata*, *Fraxinus pennsylvanica*, and *Diospyros virginiana*. Heavily wooded bottomlands are not suitable for Prairie Dawn and they have never been found there. The small areas lacking trees were a mixture of native and introduced weeds such as *Melilotus indica*, *Helianthus annua*, *Campsis radicans*, *Paspalum notatum*, and *Paspalum plicatulum*. These are not the species of a native undisturbed prairie and thus not suitable for Prairie Dawn plants and none were found here.

Disposal Area 5. Harris County Key Map 495 block D. 29°47.00'N; 95°15.32'W near center of site.

This section has the most undisturbed vegetation. However, there is grazing by horses and cattle and thus the vegetation was short. The photos show open areas between the unpalatable stands of the thorny *Rosa bracteata*. In addition the photos also show the soil to be a heavy black clay soil. The weedy plants between the Macartney Rose shrubs were *Cynodon dactylon*, *Sesbania drummondii*, *Ranunculus sardous*, *Cirsium horridulum*, *Cyperus entrerianus*, *Sisyrinchium rosulatum*, and *Axonopus fissifolius*. I saw no Prairie Dawn habitat here and thus saw no Prairie Dawn plants.

In summary, the Prairie Dawn habitat is absent from all sections and thus prairie dawn plants were also absent from the site.

Larry E. Brown
Plant Taxonomist and
Environmental Consultant

APPENDIX

PHOTOGRAPHS



Photo 1 - Upper Hunting Bayou looking downstream approximately 500 feet east of US 59.

Photo 2 - Hunting Bayou looking upstream approximately 1,000 feet west of Wayside.



Photo 3 - Hunting Bayou looking downstream at eastern end of the Project Area.

**Hunting Bayou Federal
Flood Control Project**

**Biological Assessment
Site Photographs**

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Photo 4 - Typical forest vegetation within the proposed Offline Detention Basin and UPRR disposal area.



Photo 5 - Typical scrub-shrub vegetation within the proposed Offline Detention Basin and UPRR disposal area.

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Photo 6 - Typical forest vegetation within the western side of the proposed Offline Detention Basin area.



Photo Source: Crouch Environmental Services, Inc.

Photo 7 - Looking east at the scrub-shrub area within Disposal Area 3.

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Hunting Bayou Federal Flood Control Project		
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Date	May 2010	Job No. 60073177
		Appendix Page 3 of 7

Photo Source: Crouch Environmental Services, Inc.



Photo 8 - Looking northwest at typical uplands within Disposal Area 3.

Photo Source: Crouch Environmental Services, Inc.



Photo 9 - Looking northward at the regularly mowed grasslands within Disposal Area 3.

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Photo Source: Crouch Environmental Services, Inc.



Photo 10 - Disposal Area 4 open disturbed fields.

Photo Source: Crouch Environmental Services, Inc.



Photo 11 - Disposal Area 4 disturbed upland fields.

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Photo Source: Crouch Environmental Services, Inc.



Photo 12 - Disposal Area 5 upland pasture.



Photo 13 - Proposed Wayside Detention Area disturbed upland area looking south.

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Photo 14 - Proposed Wayside Detention Area disturbed open field looking west.



Photo 15 - Proposed Wayside Detention Area disturbed forest looking southeast approximately 60 feet southeast of the ponds.

P:\301390_001_002_Hunting_Bayou_SEIS\Biological_Assessment\Exhibits\Photos8.mxd

Hunting Bayou Federal Flood Control Project		
Biological Assessment Site Photographs		
<small>AECOM USA Group, Inc. 5757 Woodway Drive, Suite 101W Houston, Texas 77057-1599 www.aecom.com</small>		
Date	May 2010	Appendix Page 7 of 7
Job No.	60073177	

From: Donna_Anderson@fws.gov
Sent: Tuesday, February 15, 2011 12:58 PM
To: George, Eddie (Flood Control)
Subject: Re: FW: Hunting Bayou BA

Hello Eddie,

Thank you for forwarding the link for the Hunting Bayou BA. It appears that Harris County Flood Control District has determined that the proposed project will not affect any federally listed species or critical habitat. No coordination or contact with the Service is necessary.

However, if the project changes or additional information on the distribution of listed or proposed species becomes available, the project should be reanalyzed for effects not previously considered.

The Service recommends that you maintain a complete record of the evaluation, including steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and other related articles.

The Service's Consultation Handbook is available on-line to assist you with further information on definitions, process, and fulfilling Endangered Species Act requirements for your projects at <http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm>.

If I can further assist you, please feel free to contact me.

Thank you,

Donna Anderson
Wildlife Biologist
USFWS Ecological Services Office
17629 El Camino Real, Suite 211
Houston, Texas 77058
Cell: 713-542-0389
Office: 281/286-8282
Fax: 281/488-5882

"George, Eddie (Flood Control)"
<EddieL.George@hcfcd.org>

To <Donna_Anderson@fws.gov>

cc

Subject FW: Hunting Bayou BA

02/14/2011 09:44 AM

Donna

Do you know if you have had a chance to review this? I have a meeting with Glenn on status updates for our federal projects this week. If you can provide a status report before Thursday, that would be great.

Thanks and I hope all is well.

Eddie

From: fcdp@hcfcd.net [<mailto:fcdp@hcfcd.net>]
Sent: Wednesday, May 26, 2010 11:02 AM
To: George, Eddie (Flood Control)
Subject: Hunting Bayou BA

PLEASE DO NOT REPLY TO THIS E-MAIL.

New files have been added to your FC FileShare inbox by:

eddie.george@hcfcd.org

Donna

Attached is the Electronic version of the updated Hunting Bayou BA. Once you finish your review, can you please email/fax a statement indicating what USFWS stance is on the BA and its findings?

Thanks

Eddie

[Hunting Bayou Biological Assessment May Final.pdf](#)

*Files in your inbox will be automatically deleted after 120 days.

These files were shared with the following users:

Donna Anderson | donna_anderson@fws.gov