United States Department of the Interior

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May 23, 2005

Mr. Wayne Lea
Chief, Regulatory Branch
Fort Worth District, U.S. Army Corps of Engineers
P.O. Box 17300
Fort Worth, Texas 76102-0300

2-15-2004-F-0155

Dear Mr. Lea:

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion (Opinion) based on our review of the proposed Corps of Engineers (Corps) authorization of stream impacts through section 404 of the Clean Water Act to facilitate the realignment of Greens Prairie Road and construction of an interchange between Greens Prairie Road and Arrington Road in College Station, Brazos County, Texas and its effects on the federally listed endangered Navasota ladies'-tresses (*Spiranthes parksii*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq*.). All construction will be funded and carried out by the City of College Station. Your April 4, 2005, request for formal consultation was received on April 5, 2005.

This Opinion is based on information provided in the March 30, 2005, CSC Engineering & Environmental Consultants, Inc. (CSC) report "Second Revised Study of Potential Ecological Constraints Associated with the Proposed Arrington Road-Greens Prairie Road Interchange Project; College Station, Texas.", and the March 31, 2005, CSC report "Second Revised Preconstruction Notification for Proposed Greens Prairie Road-Arrington Road Realignment Project; College Station, Texas". This Opinion is also based on correspondence, e-mails, and telephone conversations between individuals from CSC, the Corps, and the Service. A complete administrative record of this consultation is on file at this office.

Consultation History

The January 22, 2004, notification as required under general condition 11 of the Corps Nationwide Permit (NW)14 for linear transportation projects, was submitted by CSC and outlined project constraints due to "waters of the U.S." and an evaluation of ecological constraints, including presence of Navasota ladies'-tresses. A 13.1-acre (5.3-hectare) area was surveyed for the presence of Navasota ladies'-tresses, and 10 plants were identified. CSC determined that the project qualified for NW 14. The Corps called CSC and requested more information on the project description in a February 26, 2004, phone conversation. On March 4,

2004, the Service contacted CSC and explained the section 7 consultation procedures. The Corps requested additional information from CSC related to the project description in October 2004 and January 2005. The Service received the revised notification on April 2, 2005.

We received an updated Ecological Constraints document on February 4, 2005, and clarified the project area and how many plants were to be consulted on in a March 23, 2005, phone conversation. CSC determined that 4 of the 10 plants were located outside of the 9-acre (3.6-hectare) project area and would not be affected, directly or indirectly, by the proposed project. A second revised version of the Ecological Constraints document was received on April 1, 2005, and served as a biological assessment.

BIOLOGICAL OPINION

Description of the Proposed Action

The proposed action involves moving approximately 2,300 feet (701 meters) of Greens Prairie Road south to accommodate the construction of the State Highway (SH) 40 by the Texas Department of Transportation (TxDOT), south of College Station (Figure 1). This relocation includes construction generally centered in existing and new right-of-way (ROW), which varies from between 100-120 feet (30-36 meters) in width. In addition, approximately 550 feet (168 meters) of roadway, designated as the "new" Arrington Road, will be constructed in a northeasterly direction and intersect with Greens Prairie Road (Figure 1). This segment is entirely within new ROW. The intersection between the existing Greens Prairie Road and the "old" Arrington Road will be permanently closed due to the construction of SH 40. The closed roadway will be removed and the area allowed to naturally revegetate.

Existing utilities will be relocated to allow for the project construction. These utilities include: a natural gas pipeline, under-ground cable lines, above-ground electrical transmission lines, and water distribution lines. All relocations will be within the proposed project boundaries, and no new ROW will need to be acquired to allow for the utility relocations. All work will be done using medium-sized earth movers, such as graders and backhoes. Trenching may be necessary to slightly adjust the existing drainageways to accommodate the proposed culverts under the roadway.

The action area includes the proposed alignments of Greens Prairie Road and the "new" Arrington Road, as well as the existing and proposed ROW, which varies from between 100-120 feet (30-36 meters), the boundaries of which are on both sides of the road with the roadway generally being centered within the ROW boundaries (Figure 1). The total project area encompasses approximately 9 acres. All impacts to Navasota ladies'-tresses, both direct and indirect, are expected to be confined to the road alignment and ROW, due to construction management practices designed to reduce erosion and sedimentation into receiving streams.

Five existing drainage way crossings which contain "waters of the U.S." will be impacted by the proposed project. One of the crossings will be filled. Culverts with overhead fill will be

installed at two of the crossings, and the existing culverts will be replaced with extended culverts at the remaining two crossings. No future flooding is anticipated as a result of these crossings. Total proposed impact to "waters of the U.S." is 0.053 acres (0.021 hectares).

Avoidance Measures:

Individual plants were found on three areas within the project. These are designated as areas A-1, A-2, and A-3 on Figure 2. These sites total 0.31 acres (0.13 hectares). A-1 and A-2 combined contain four plants; both areas are outside of the action area, but within the TxDOT SH 40 ROW. Impacts, both direct and indirect, from the proposed project to A-1 and A-2 will be avoided through several measures, including: (1) restricting construction vehicle access, (2) implementing a storm water pollution prevention plan, with provisions such as silt fencing and temporary vegetation seeding of disturbed soils to minimize erosion, and (3) planting permanent vegetation on all unpaved areas. The hydrology of A-1 and A-2 will remain unaffected by the construction because these sites are upgradient of the project and no stormwater will be diverted into the drainage ditch containing A-1 and A-2.

Conservation Measures:

The City of College Station proposes to transfer an undetermined amount of money to the City's Project No. SD 9903 Greenway Land Acquisition specifically for the acquisition of Navasota ladies'-tresses habitat in College Station. Ultimately, the City Council will determine where the funds will be spent, but it is anticipated that the money will be used to purchase habitat on property near Lick Creek Park, currently owned and managed by Paul Clarke of Clarke Wyndham Real Estate Investment Services. The amount transferred will be somewhat commensurate with the amount of habitat and the number of plants affected by the proposed project. Documentation of receipt of the funds and how those funds are spent by the City Greenways program will be sent to the Service.

Species Description and Status

Description:

The Navasota ladies'-tresses, an orchid known from 12 counties in central Texas, was federally listed as endangered on May 6, l982 (47 FR 19539), without critical habitat. This orchid is an erect, slender-stemmed perennial that grows 8-15 inches (20-38 centimeters) tall. The linear leaves form a rosette that is present in the early- to mid-spring and again in late fall and winter, but is absent at the time of flowering. The white flowers are about 0.25 inch (0.64 centimeter) long with rounded petals and are arranged spirally on the stalk. Each flower has a conspicuously white-tipped floral bract (leaf-like structure) at its base. The side petals, which extend past the central petal, have a distinct green stripe and the lower central petal is ragged. Buds appear in early to late October, and flowering usually occurs from mid-October to mid-November depending on local environmental conditions.

Life History:

Navasota ladies'-tresses occur in a variety of moist sandy soils near drainages, typically from the upper erodible drainage head, extending along the edges of temporary streams to the floodplain of permanent streams. Although the vast majority of the Navasota ladies'-tresses occur within approximately 600 feet (183 meters) of these drainages, Navasota ladies'-tresses have been found as far as 1,000 feet (305 meters) from any stream (James Thomas, HDR and Fred Smeins, Texas A&M University [TAMU], pers. comm. 2004).

Typical habitat consists of natural openings in upland post oak (*Quercus stellata*) savannah vegetation (Poole and Riskind l987, Service 1984, Wilson l993) but persistent individual plants have been found in a dense canopy of yaupon (*Ilex vomitoria*) (Thomas and Smeins, pers. comm. 2004). Navasota ladies'-tresses plants are believed to be situated where subsurface flow or seepage of water occurs seasonally, a common feature in other species of the genus (Arft and Ranker 1995). Claypans beneath the sandy or loamy soils in this area make them resistant to water percolation, and hence, water tends to travel toward the drainages, providing a relatively dependable moisture source for the orchids. This hydrology, as well as edaphic factors such as high aluminum soil content, may also limit competing vegetation (TPCC 2003).

Navasota ladies'-tresses occur in small, natural openings in the post oak woodlands. When such habitat is disturbed, Navasota ladies'-tresses may persist for some time. However, it is not a colonizing species, as it is usually found in well-developed woodlands. In addition, it is rarely found in floodplain forests or open, drier areas dominated by grasses (Wilson 1993). Associated species include blackjack oak (*Quercus marilandica*), yaupon, American beautyberry (*Callicarpa americana*), and little bluestem (*Schizachyrium scoparium*) (Poole and Riskind 1987).

Navasota ladies'-tresses are extremely slow-growing and long-lived, and individual plants depend on a symbiotic relationship with soil fungi that is established before the seed germinates. The seeds are microscopic and lack endosperm, so they are short-lived and the species does not maintain any appreciable soil seed bank. Rosette leaves support the formation of storage tubers between November and March that sequester resources in preparation for sending up a leafless bloom stalk at some future time. It is believed that plants often require more than one year of photosynthate storage to successfully send up a bloom stalk. Thus, if local conditions have not been favorable for forming sufficient below-ground reserves, the plant may not bloom (Wilson l993).

Navasota ladies'-tresses plants are very hard to discern vegetatively in their habitat, and therefore, surveys are not recommended except during the blooming season. In addition, this species is very similar to two other common orchid species that can occur in the same area, slender ladies'-tresses (*Spiranthes gracilis*) and nodding ladies'-tresses (*Spiranthes cernua*). Positive identification can only be made during its flowering period, and blooming is strongly dependent on adequate moisture the previous April/May and again in August/September (Wilson 1993, Service l984).

Population Dynamics:

Pavlik (1996) proposed a method for estimating minimum population sizes needed for viable plant populations by evaluating nine important biological characteristics of the species of interest. Evaluating Navasota ladies'-tresses using this system, the biological characteristics would rank as needing moderate to high population sizes for three of the factors considered (breeding system, growth form, and individual plant production), moderate population sizes for three other factors (survivorship, seed duration, and environmental variation), and low population sizes based on three other characters (longevity, fecundity, and successional status). Ranking the factors on a six point scale from low population size (50) to high population size (2,500), Texas Parks and Wildlife Department botanists and the Service estimated that viable populations for this species may be in the range of 1,000 mature reproducing individuals. However, few known population areas approach this number of individuals even when factoring in the plants that are likely present but not blooming. In fact, less than one quarter of the known occurrences of Navasota ladies'-tresses ever documented more than 25 plants. Thus, because of the low numbers of reported individuals, the slow growing nature of the plants, their unique habitat requirements, and their sensitivity to disturbance and transplanting attempts, the species is not regarded as being very resilient, and, following any disturbance to mature individuals of a population, recovery is expected to be very slow.

Status and Distribution:

Status

At the time of listing, the primary threat to Navasota ladies'-tresses was destruction or modification of habitat from urbanization, clearing for agricultural production, and mining (47 FR 19539, Service 1984). These factors remain the leading cause of threats to the plants, although new threats have been identified since then as also having the potential to limit the long term viability of populations of these plants. Surveyors have noted destruction of plants by feral pigs (*Sus scrofa*) and grazing by white-tailed deer (*Odocoileus virginianus*) and rabbits (*Sylvilagus sp.*) on the flowering stalks (Texas Municipal Power Authority [TMPA] 2001 and Thomas, pers. comm.).

In the Navasota ladies'-tresses Recovery Plan (Service 1984), the Service's goals were to establish and maintain two safe sites through cooperative agreements, purchases, easements, or other means of obtaining management rights in order to recover the Navasota ladies'-tresses. Other needs of the species included the development of baseline ecological data and development of public awareness, appreciation, and support for protection and recovery of the Navasota ladies'-tresses (Service 1984).

Work on the baseline ecological data has not progressed much since the 1984 recovery plan although baseline genetics work is currently being conducted by TAMU and TMPA continues to monitor population numbers at their five safe sites. Additional populations have been found throughout the range of the species; however, most of these are small and isolated. Several small

populations have been protected, but most of these sites do not have any management plans and the protections do not generally address potential impacts from off-site land use changes. In addition, some of these areas are not protected in perpetuity.

In the areas mined by TMPA, the individual Navasota ladies'-tresses plants were transplanted to sites not scheduled to be mined. These plants apparently did not transplant well. Plant survival was low at most sites (TMPA l996). Similarly, in an experiment in Lick Creek Park near College Station, Dr. Hugh Wilson planted some seedlings which survived into their second season, but died prior to the third growing season (Wilson l993). Some of this work was hampered by lack of a good means of permanently marking individual plants and dry weather patterns. Thus, additional studies on this means of preserving plants, particularly those that would otherwise be destroyed, are likely still warranted.

Distribution:

Navasota ladies'-tresses occur in Bastrop, Brazos, Burleson, Freestone, Fayette, Grimes, Jasper, Leon, Madison, Milam, Robertson, and Washington counties (TXBCD 2001). Currently, approximately 142 sites have been recorded, predominantly concentrated around southern Brazos County and central Grimes County (TXBCD 2001, HDR 2004). Between 5,000 and 6,000 plants have been documented at these sites over the past 20 years, however, between 700 and 1,000 of these plants are known to have been destroyed in the intervening years and over 200 others were transplanted from areas scheduled to be destroyed.

Of the approximately 142 known sites, as many as 41 have been destroyed, the plants have been transplanted from them, or no population information was ever recorded. In addition, plants occurring on at least 118 of the documented sites have not been relocated in the last ten years and 21 of those have not been relocated in the last twenty.

Utilizing the highest counts recorded for each occurrence of Navasota ladies'-tresses, where plants have been seen in the last ten years and are not known to have been extirpated, the following table summarizes the likely number of extant plants:

County	Number of extant plants	Number of Locations	Plant Numbers per location (highest counts)
Bastrop	3	1	3
Brazos	894	6	45, 70, 99, 100, 100, 480
Fayette	1	1	1
Grimes	1,885	11	3, 9, 12, 23, 31, 31, 216, 227, 229, 330, 774
Jasper	10	1	10
Robertson	21	5	1, 1, 3, 5, 11
Total	2,814	25	

The following summarizes the occurrence information for the 12 counties in which Navasota ladies'-tresses occurs (all information is from the TxBCD 2001 unless otherwise noted):

Brazos and Grimes counties: Over 85 percent of the approximately 142 total known Navasota ladies'-tresses occurrences were recorded from locations in either Brazos or Grimes counties. Twenty-eight occurrences of Navasota ladies'-tresses have been reported from Brazos County alone and, with the exception of seven sites that occur in the northeastern corner of the county, these occur mostly in the southern and central portions of the county.

Five known occurrences of Navasota ladies'-tresses in Brazos County have either been extirpated or no plant numbers were ever recorded. Four sites have at least some degree of protection; however, only one of these is currently being actively managed for the Navasota ladies'-tresses. The protected areas include a 30-acre (12-hectare) conservation easement in the Indian Lakes residential subdivision south of College Station (100+ plants in 2003), a 71-acre (29-hectare) combination of deed restricted natural area and a TxDOT conservation easement in a residential/commercial development just northwest of the SH 40 / SH 6 intersection, an eight acre site permanently protected by TxDOT as a result of a section 7 consultation on SH 6 south of College Station (a high count of 1,000 plants in 1993; no plants seen since then), and Lick Creek Park (70 plants in 1986).

The site known to support the largest population of Navasota ladies'-tresses currently in Brazos County (400+ plants in 2003), occurs on an area planned for residential development. The landowner is currently working with the Service, the City of College Station, and others to determine if areas of the property containing the majority of the plants can be preserved.

Of the remaining 19 sites only two have been surveyed in the last ten years and at least ten have not been surveyed in the last twenty years. Only two sites were surveyed more than once. Survey information for these sites is summarized in the following table:

Year	Number of Sites Surveyed	Number of Plants found
1983	11	299
1984-1985	0	0
1986	1	2
1987	2	198
1988-1992	0	0
1993	5	287
1994-2002	0	0
2003	1	5

Ninety-two occurrences of Navasota ladies'-tresses have been reported from Grimes County. With one exception, 5 plants found in the northwest corner of the county in 1983, all of these occurrences are located within an approximately 12 mile square area in the Navasota River watershed in the central portion of Grimes County. Only five sites, which occur in the central portion of the county, have some degree of protection. During a section 7 consultation, TMPA agreed to protect these five sites for the life of their Gibbons Creek Station lignite mine. The protected sites encompass a total of 175 acres and the numbers of Navasota ladies'-tresses on the five sites range from a total high of 955 plants on five of the sites in 1995 to a low of 17 plants

throughout four of the five sites in 2000. Surveys in 2003 found a total of 500 plants on the five sites. These numbers include both transplanted plants and those originally found on these sites. A portion of one of the protected sites has reverted back to the original ownership and is scheduled to be developed.

Of the remaining 86 occurrences, 33 were destroyed and/or all plants were transplanted from the site as a result of TMPA mining activities. Of the rest, only nine have been surveyed within the last ten years. One, located north of SH 30 and east of the mined areas, was surveyed in 1994 (3 plants). Another occurs just west of the proposed Brazos Valley Solid Waste Management Agency (BVSWMA) landfill permit boundary. It was originally found in 1983 (12 plants) but surveys in 2003 did not find any Navasota ladies'-tresses plants. Four others occur south of the mined area and were surveyed in 2003 (23, 9, 31, and 12 plants) (HDR 2004). The other three sites occur within the permit boundaries of the proposed BVSWMA landfill and were originally surveyed in 1984 (16 plants total). Plant numbers from the 2000 and 2001 surveys on the landfill site totaled 32 and 774 plants, respectively, throughout the project site.

Bastrop County: There are no historical records of occurrence in Bastrop County. However in 2003, a population of approximately 11 individual Navasota ladies'-tresses was located at the University of Texas Stengl "Lost Pines" Biology Station, just north of Smithville, Texas. Photos were sent to experts who confirmed identification of at least one individual. In fall of 2004, the U.S. Fish and Wildlife Service collected a voucher specimen and identified it as Navasota ladies'-tresses. The same specimen was also identified by Dr. Charles Sheviak, Curator of Botany at New York State Museum and author of the species.

Burleson County: Two occurrences of Navasota ladies'-tresses have been recorded from the southern portion of this county. One occurrence was reported to have 80 plants in 1983 and 35 in 1986. The other record represents a population of 73 plants that were transplanted to the area in 1986. While eight plants were observed at this site in 1987, none were found in 1988, 1991, or 1997 surveys. This site was subject to flooding from Lake Somerville in 1992 and possibly in 1998, as well.

Fayette County: The only known location of Navasota ladies'-tresses was documented in a 1994 transmission line survey and has not been relocated since then. One flowering Navasota ladies'-tresses and three flowers that were intermediate between Navasota ladies'-tresses and nodding ladies'-tresses were present.

Freestone County: Navasota ladies'-tresses found in this county represent the northernmost extent of the known range for this species. TxBCD documented one occurrence of 28 plants that was observed in Freestone County in 1991. Survey data from the Jewett Mine indicated this occurrence consisted of five subpopulations of Navasota ladies'-tresses. However, all of these that were not extirpated during the earlier mining activities will be destroyed as a result of the proposed mining operations in the Permit 47 Area of the Jewett Mine (Service Consultation # 2-15-02-F-0214).

Leon County: Only two known occurrences of Navasota ladies'-tresses have been recorded in this county. One from 1986 was never verified as Navasota ladies'-tresses, and one from a roadside population of 13 plants last seen in 1987. These sites have not recently been surveyed.

Jasper County: Two occurrences of Navasota ladies'-tresses have been recorded on Angelina National Forest. One of these records represents two plants observed in 1996, while the other represents one flowering plant and six sterile plants observed in 1997. Both sitings occur in close proximity to each other. In 2003, a total of 10 plants were observed in this same general area.

Madison County: Two records have been reported from this county. Both of these occurrences were reported in 1987 (5 plants and no plant numbers recorded). TMPA (2001) describes this as only one site, however, that was found while conducting a survey for the Bureau of Land Management for the Bedias Creek Reservoir Project. This location has not been resurveyed since 1987.

Milam County: Two occurrences of Navasota ladies'-tresses have been recorded in the southeastern portion of Milam County. These records are very close together and they both list three plants located in 1993 by Kathy Parker while surveying for the Texas High Speed Rail Project (TMPA 2001). They may represent the same occurrence. Nothing else has been documented regarding these sites in the last 10 years. Surveys for a proposed electric transmission line in 2003 discovered another potential Navasota ladies'-tresses occurrence approximately 10 miles east of Rockdale, however, no population information for this location is available and the plant species has not as yet been confirmed by a species expert.

Robertson County: A total of 8 occurrences have been documented in Robertson County. One location was surveyed in 1983 (3 plants), three were surveyed in 1987 (1, 3, and an unknown number of plants), three were surveyed in 1997 (3, 1, and 11 plants) and one was surveyed in 1999 (5 plants). One of those surveyed in 1987 was relocated in 2002 (1 plant). Several of these sites have been disturbed by bulldozer work and road construction activities (HDR 2004).

Washington County: Two sightings of Navasota ladies'-tresses have been recorded, however, one of these records has no survey data associated with it, and the other represents a population of 19 plants that were transplanted to the area in 1986. Two plants were observed at the transplant site in 1988 and none were found in surveys conducted between 1991 and 1997. The transplant area was flooded in 1992-1993 and again in 1998 by Lake Somerville.

Environmental Baseline

Status of the Species Within the Action Area:

The Service considers the action area to be the proposed alignments of Greens Prairie Road and the "new" Arrington Road and the ROW. The total area encompasses approximately 9 acres, which contains approximately 4 acres (1.6 hectares) of grassy area between the edge of the

existing Greens Prairie Road and the proposed Greens Prairie Road and "new" Arrington Road alignments and the ROW boundary.

Surveys for Navasota ladies'-tresses were conducted on September 26, October 19, and November 2, 2003, by CSC. The Service believes that environmental factors, including locally sufficient, periodic rainfall to facilitate appropriate soil moisture conditions, were suitable in 2003 for adequate results from surveys for this species. A total of 32 acres was surveyed, which includes the road alignments, ROW, and surrounding areas to determine the likelihood of Navasota ladies'-tresses habitat existing in the area. Areas that were adjacent to drainages and where breaks in the canopy allowed sunlight to reach the surface were most intensively surveyed.

Avoidance measures for the four plants in the A-1 and A-2 areas (Figure 2) are outlined in the "Description of the Proposed Action" section. Four plants located in A-3 are in the action area, and 2 plants are located directly adjacent outside of the ROW. The total area of A-3 is 0.21 acres (0.08 hectares) in an area described as partially open along minor drainages. For the purposes of this consultation, all 6 plants will be considered affected by the proposed project.

Factors Affecting Species Environment Within the Action Area:

Navasota ladies'-tresses habitat often occurs along margins in post oak woodlands in soils that are moderately to well-drained and have a loamy fine sand or fine sandy loam topsoil over a claypan subsoil. The project is located in the Post Oak Woods/Forest portion of the Post Oak Savannah vegetational area of Texas (McMahan, Frye, and Brown, 1984). The natural vegetation is characterized by a mosaic of upland and dense post oak woodland interspersed with open, grassy savannah. Much of the Post Oaks are threatened by clearing for residential and commercial development, and agricultural practices. Vegetation in the area consisted of water oak (*Quercus nigra*), post oak, winged elm (*Ulmus alata*), farkleberry (*Vaccinium arboretum*), yaupon, American beauty berry, and little bluestem. Species associated with Navasota ladies'-tresses that were found during the surveys included nodding ladies'-tresses and slender ladies'-tresses. Predominant soils in the project area include those of the Burlewash, Koether, Shiro, and Singleton series. All of these soils are characterized as moderately deep and well drained. Navasota ladies'-tresses have been found on a variety of soils, including Burlewash and Singleton.

The primary threats to Navasota ladies'-tresses throughout its range are destruction or modification of habitat from urbanization, clearing for agricultural production, or mining (47 FR 19539, Service 1995 and 1984). Almost 30 known sites have been lost in the last ten years to lignite mining and many others fragmented or otherwise impacted by residential and commercial development and road construction. Post oak savannah in the counties occupied by the Navasota ladies'-tresses continues to be impacted by conversion to Bermuda grass pastures and fire suppression.

Five drainages which contain "waters of the U.S." cross the project area and collectively, along with other drainages, form Tributary B of Spring Creek. This creek flows into Lick Creek, which is a tributary of the Navasota River. No other section 7 consultations have occurred within the action area. However, two formal consultations were done adjacent to the north of the action area (both Service Consultation # 2-15-96-F-0117): TxDOT consulted on the construction of SH 40, and the Corps consulted on the mixed-use development on Tim Crowley's tract. Twenty-two plants were expected to be impacted by SH 40, and 14 plants by the Crowley development.

Effects of the Action

Analysis of the Species/Critical Habitat to be Affected:

The proposed project would occur within the central Brazos/Grimes County populations of Navasota ladies'-tresses. It is located adjacent to and south of the future SH 40, which affected a total of 56 plants, of which 26 were protected by an on-site conservation easement and a ROW management plan. Seven plants were protected by vegetation management and habitat restoration activities on the SH 40 project site. Eleven plants were directly affected by the road construction. The project area is approximately 200-300 feet (61-91 meters) and across SH 40 from the protected areas on the residential/commercial development near the SH 40/H 6 intersection.

Ten Navasota ladies'-tresses were identified during a 2003 survey of a 32-acre (13-hectare) area encompassing and surrounding the proposed project area (Figure 2). This project is expected to affect 6 of these plants. The other 4 plants are located within the TxDOT SH 40 ROW and are not expected to be impacted directly or indirectly by the proposed realignment project. The 6 plants represent approximately 0.21 percent of the approximately 2,814 extant plants currently known to exist. There is no critical habitat designated for Navasota ladies'-tresses.

The project will eliminate 0.21 acres of Navasota ladies'-tresses habitat through road construction and ground disturbance. Four plants will be directly destroyed by these activities, and 2 plants indirectly affected. Additional effects from changes in surface and subsurface hydrology may occur, such as diverting stormwater runoff or subsurface flow away from or toward areas that contain Navasota ladies'-tresses.

Cumulative Effects

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

New road construction is expected to promote commercial and residential development south of Greens Prairie Road and west of SH 6 along Greens Prairie Road. Due to the fact that the "new"

Arrington Road will not connect with the "old" Arrington Road, increased development as a result of access between the two is not expected to occur. In addition, the College Station Independent School District is constructing an elementary school along Greens Prairie Road west of the project area.

Habitat loss continues, particularly in and around Bryan/College Station, where most development is occurring in Brazos County. The population of the county as of 2000 was 152,415 people, a 25.1 percent increase from 1990 (U.S. Census Bureau 2005). The City of College Station grew by about 28.1 percent in the same time frame. The estimated 2003 population of Brazos County was 159,830, a 4.9 percent increase in 3 years.

Several commercial and residential developments exist in the area, and more are expected to occur as a result of the construction of SH 40. Business development exists on Greens Prairie Road near SH 6, as well as along South Graham Road and FM 2154. Scattered residential development exist along Barron Road and South Graham Road, and the "Castle Gate" and "Sweetwater" subdivisions exist along Greens Prairie Road west of the project area.

According to the 2002 U.S. Agricultural Census, agriculture continues to be a vital part of the economy of the Brazos Valley. Approximately 82 percent of the land area in Brazos County is devoted to agriculture (U.S. Census Bureau 2005, U.S.D.A. 2002). Primary crops include cow/calf production, cotton, poultry, corn, hay, sorghum, and milk (Bryan-College Station Economic Development Corporation 2001). Livestock and hay production activities are expected to cause continuation of a current trend to clear post oak woodlands and convert them to Bermuda grass pastures. Various climatic driven market conditions, such as drought, support the conversion of additional woodland to hayfields and/or pastures, as well as the increased use of herbicides and seeding with exotic species. These practices aggravate habitat fragmentation and cause detrimental changes in community structure for Navasota ladies'-tresses (Navasota ladies'-tresses monitoring data, Kathryn Kennedy, Service, pers. comm.).

CONCLUSION

After reviewing the current status of the Navasota ladies'-tresses, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the Navasota ladies'-tresses. No critical habitat has been designated for the Navasota ladies'-tresses, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act, and Federal regulations pursuant to section 4(d) of the Act prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or

sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

As discussed above, sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants is provided to the extent that the Act prohibits the removal and reduction to possession of Federal listed endangered plants or the malicious damage of such plants on areas under Federal jurisdiction, or the removal, cutting, digging, damage, or destruction of endangered plants on non-Federal areas in violation of any State law or regulation or in the course of any violation of a State criminal trespass law.

Amount or Extent of Take Anticipated

The Service does not anticipate the proposed action will incidentally take any listed animal species.

Effect of the Take

No take of any listed animal species is anticipated as a result of this proposed action.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends implementing the following actions:

I. Minimize the risk of destruction or harm to Navasota ladies'-tresses plants from direct application of herbicides, herbicide drift into adjacent areas, or through reduction in available insects that pollinate. This would be accomplished by avoiding use of herbicides and pesticides in habitats which could potentially support Navasota ladies'-tresses and during time periods when the Navasota ladies'-tresses are above ground. In addition, in areas where herbicide use cannot be avoided, direct application techniques should be used to minimize amount of application and the total area of impacted habitat.

II. Encourage and participate in additional Navasota ladies'-tresses research and recovery activities. One example is supporting on-going genetic research being conducted by Drs. Jim

Manhart and Alan Pepper, Texas A&M University, Biology Department to help genetically differentiate between different *Spiranthes* species and hybrids, and map their true range.

In order for the Austin Ecological Services Office to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

Re-initiation-Closing Statement

This concludes formal consultation on the action outlined in the request. As provided in 50 CFR Sec. 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation.

If you have any questions regarding this opinion, please contact Jana Milliken at (512) 490-0057, extension 243.

Sincerely,

/s/ Robert T. Pine

Robert T. Pine
Supervisor

cc: Rick Conlin, CSC Engineering and Environmental Consultants, Inc.
Kristan Clann, City of College Station

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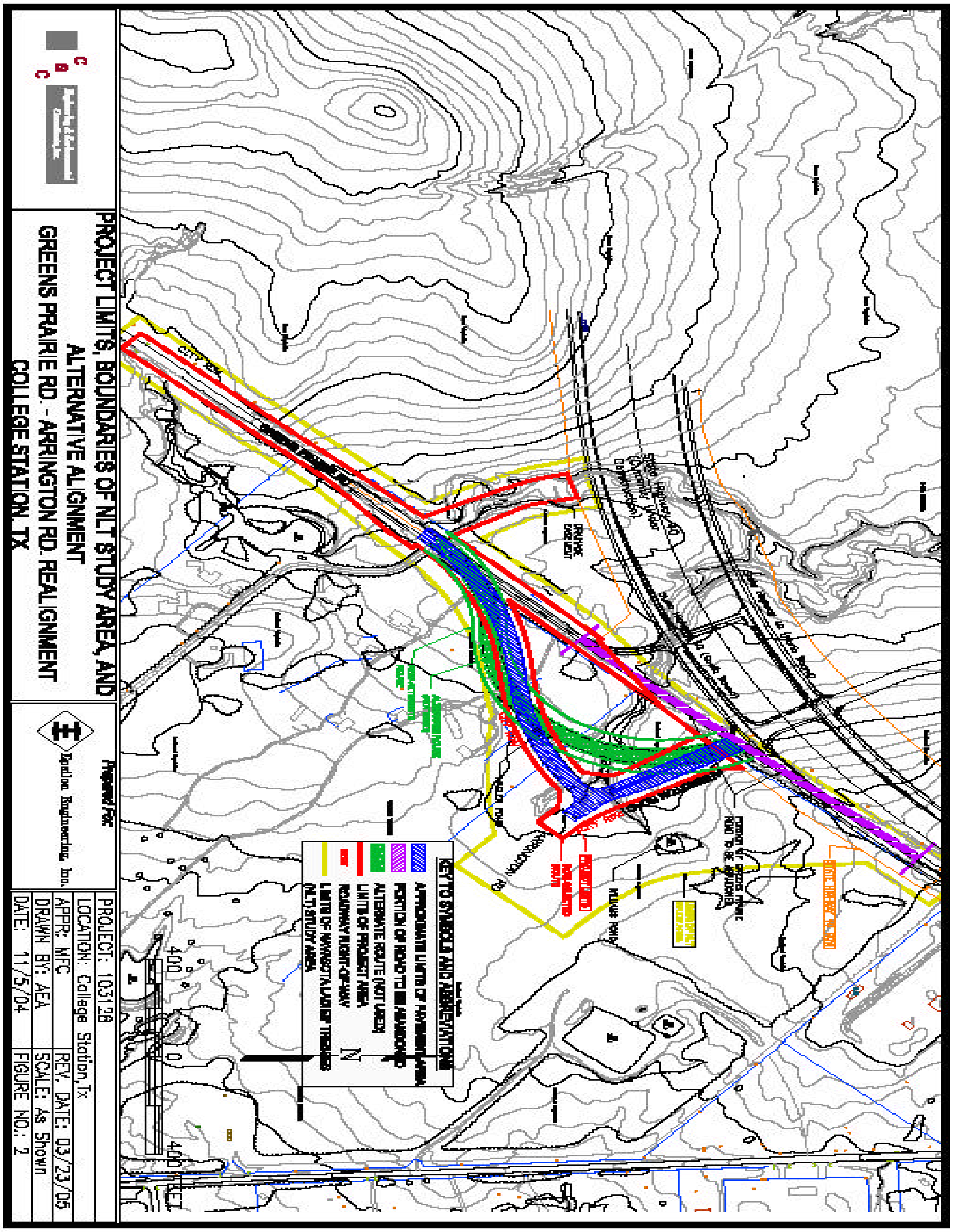
PROJECT LIMITS, BOUNDARIES OF NLT STUDY AREA, AND
ALTERNATIVE ALIGNMENT
GREENS PRAIRIE RD. - ARRINGTON RD. REALIGNMENT
COLLEGE STATION, TX
KEY TO SYMBOLS AND ABBREVIATIONS
PROJECT: 103128
LOCATION: College Station, Tx
APPR: MFC
REV. DATE: 03/23/05
DRAWN BY: AEA
SCALE: As Shown
DATE: 11/5/04
FIGURE NO.: 2

Figure 1

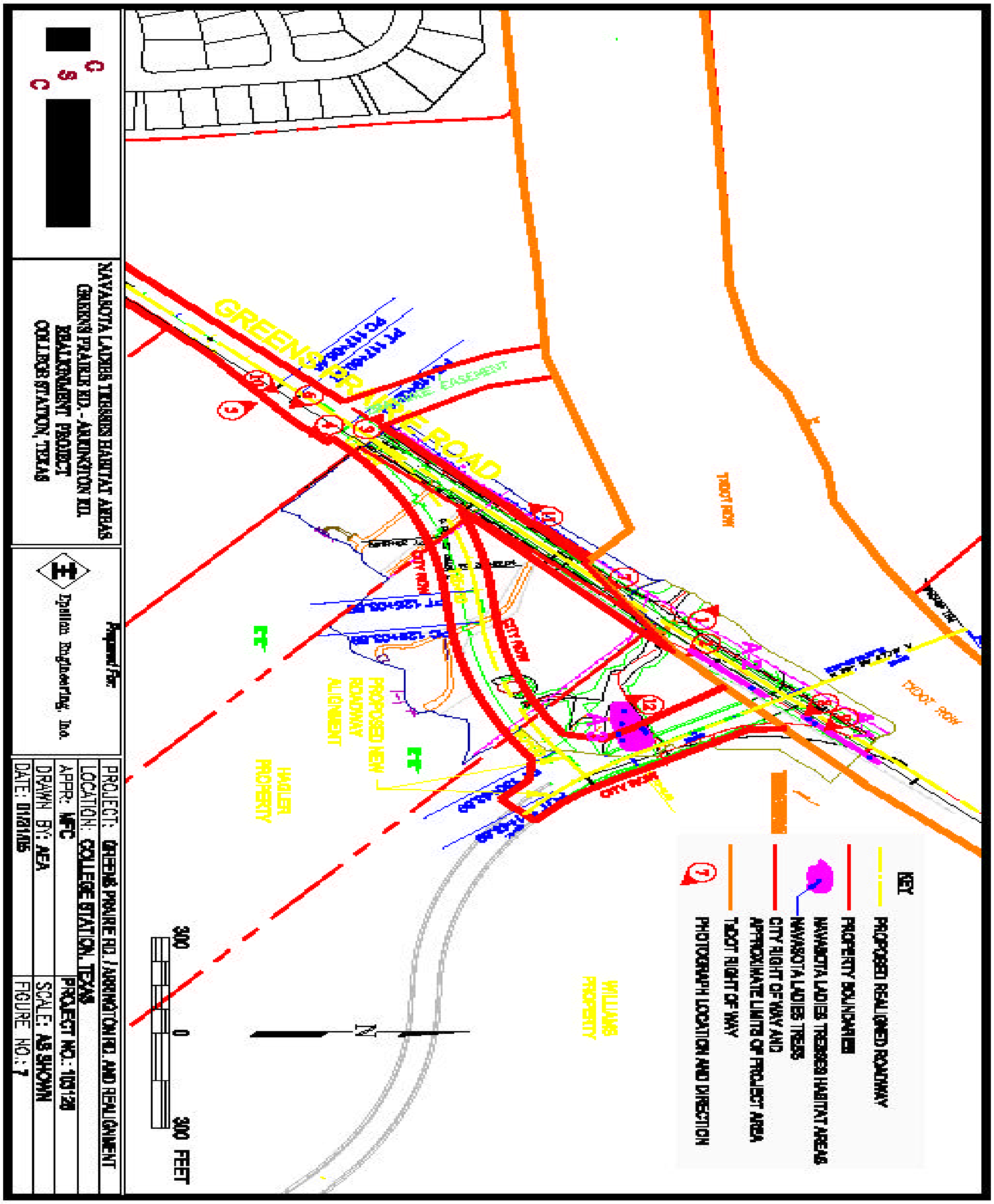
KEY
PROPOSED REALIGNED ROADWAY
PROPERTY BOUNDARIES
NAVASOTA LADIES TRESSES HABITAT AREAS
NAVASOTA LADIES TRESS
CITY RIGHT OF WAY AND APPROXIMATE LIMITS OF PROJECT AREA
TXDOT RIGHT OF WAY
PHOTOGRAPH LOCATION AND DIRECTION
NAVASOTA LADIES TRESSES HABITAT AREAS
COLLEGE STATION, TEXAS
300 0 300 FEET

Figure 2