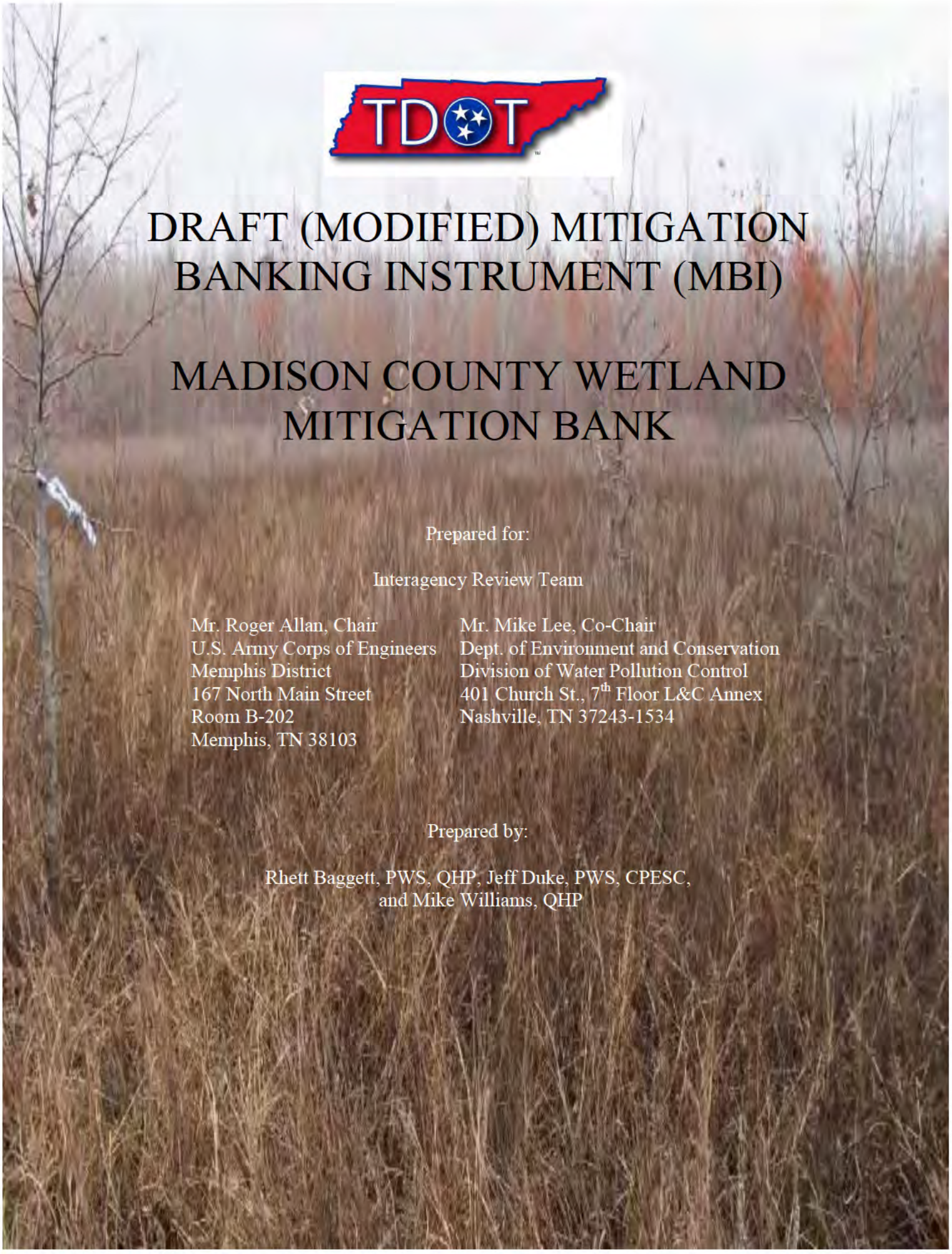

DRAFT (MODIFIED) MITIGATION BANKING INSTRUMENT (MBI)

MADISON COUNTY WETLAND MITIGATION BANK

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1. INTRODUCTION

1.1 BACKGROUND AND HISTORY

The Madison County Wetland Mitigation Bank (BANK) consists of 778.3 acres along the north bank of the South Fork Forked Deer River (SFFDR) (Appendix A, Figure 1). The site is comprised of 468 acres[1] of restoration, 243.9 acres of preserved bottomland hardwood forest, and 66.4 acres[1] of upland buffer. The BANK site is located in Jackson, TN within the SFFDR watershed (08010205 HUC). Prior to establishment of the site as a mitigation bank, the restoration areas were in agricultural production. The BANK site was purchased by TDOT in 1996 and later that same year was established as a wetland mitigation BANK with approval of the wetland bank site plan (TDOT, 1996). Restoration work began in 1997 with filling of drainage ditches and construction of a meandering stream channel through the site and was completed in 1998 with construction of levee breaches; however, a levee breach proposed in the southwest corner of the east field was not constructed. The site was initially planted in early spring 1998 (February & March), with an additional planting the following winter and spring (December 1998 - February 1999). The restoration areas were planted with bald cypress and/or a combination of the following oak species: willow oak, nuttall oak, swamp chestnut oak, cherrybark oak and pin oak.

Beaver activity, inadequate levee breaches and failure to construct the levee breach in the east field, in combination with inadequate maintenance, resulted in prolonged to year-round inundation of large portions of the site and likely high mortality of planted species prior to August 2006. Remedial work began in the fall of 2005 with complete removal of the remaining levee segments along the east, west and south sides of both the east field and west field. Levee removal was completed in August 2006. Supplemental planting took place in February and March 2008: 62,000+ trees were planted (bald cypress and water tupelo in the

[1] The 2010 site evaluation showed that approximately 6.4 acres (1.35%) of the restoration area is occupied by berms and a few upland areas not previously accounted for in the original site plan. The original restoration area was estimated to be 474.4 acres/credits, but has since been determined to be 468 acres. The original 60 acres of upland preservation is now estimated to be 66.4 acres.

wettest portions of the site with oaks planted in drier areas) on approximately 166 acres of the 468 acre restoration area.

1.2 PRIOR PERFORMANCE

Overall, the BANK site has developed a diversity of wetland habitats ranging from open water to densely forested areas, interspersed with areas dominated by aquatic and emergent vegetation; however, the site has been considered a failure when viewed in light of the vegetation planting performance standard listed in the original site plan. Of the 468 acres of restoration, 424.4 acres were to be planted in hard mast producing species and 50 acres in moist soil production; while trees have become established on much of the site, most of these forested areas have not met the minimum requirement of 300 trees per acre of hard mast producing species.

Prior to 2007, approximately half of the restoration areas were comprised of emergent, aquatic or shrub species and contained little tree cover. Factors likely contributing to poor survival of planted species were prolonged inundation of portions of the site and incompatibility of species with hydrology. Removal of the remaining levee segments at both the east field and west field in 2005 and 2006 has greatly reduced the extent of year-round open water and in 2008 facilitated planting 166 acres of the site.

In order to address the failure of meeting the vegetation performance standard for planted trees within the restoration area, a supplemental tree planting was conducted in March 2008. The wettest portions of the site were planted with a mixture of bald cypress and water tupelo. Nuttall oak and overcup oak were planted primarily in the western field and drier portions (levee removal areas) of the east field. Monitoring of the supplemental planting took place in November 2009. Survival of the supplemental planting was moderate to poor in some areas, most likely a result of inundation following planting; however, portions of the site that were once flooded and previously had no trees were now planted in cypress and tupelo. While the supplemental planting has established trees on portions of the site previously dominated by emergent species, target densities for planted species still had not been met for much of the site in 2009. Results of the 2009 monitoring revealed that for a majority of the bank site,

survival of planted species is below the specified 300 trees per acre of hard mast producing species. However, it was likely that several of the young saplings were not visible due to the prevalence of high density tall grasses at the time of this monitoring event.

Between October 19 - 21, 2010, TDOT and Civil and Environmental Consultants, Inc. (CEC) biologists completed a thorough site evaluation of the BANK site, including vegetation plot stem counts, transect surveys, and a delineation of all existing natural wetland communities. Field surveys were conducted in order to determine the type and size of existing natural wetland communities (and their progression) located within the BANK site. Field surveys indicated that levee removal in 2005 and 2006 had greatly reduced the extent of year-round open water on the site and had facilitated both the growth of supplemental plantings in 2008 and establishment of native volunteer species within these areas. Field data collected in October 2010 suggested that nearly 20% (108 acres) of the site previously considered emergent and open water wetlands was now progressing towards mixed hardwoods and/or cypress/mixed hardwood wetlands.

In November 2012, nearly two years following the 2010 site evaluation, stem count monitoring was once again conducted at 14 vegetation plots located within the 166-acre supplemental planting areas (previously inundated prior to 2005). Monitoring results revealed that most of these areas are continuing the trend towards mixed hardwoods and/or cypress/mixed hardwood wetlands. For example, several plot stem counts taken within the 166-acre supplemental planting areas revealed an average increase of 100 stems per acre from 2010 to 2012. Although some portions of the original 166-acre supplemental planting areas do not necessarily consist of dominant stands of oaks and cypress, reference vegetation plot data collected in 2010 within adjacent preservation areas indicate that the natural wetland community should not necessarily be dominated by oak species and cypress. Rather, preservation areas revealed a very diverse community of mixed hardwoods which included red maple, sweetgum, tupelo, box elder, river birch, silky dogwood, elm, hickory, possumhaw, and black willow in addition to cypress and oak species. Survey data collected in 2010 indicate that the composition planted species (19%) in restoration areas delineated as "forested" wetlands is consistent with that observed in preservation areas (14 - 34%). Finally,

the overall TRAM score of 107 taken in 2010 for the BANK indicates that the site is functioning as a very healthy, diverse, high-quality wetland.

2. WATERSHED APPROACH TO MITIGATION BANK

The BANK site is located in the SFFDR 8-Digit HUC (08010205), which is part of the greater Forked Deer River Watershed 6-Digit HUC (080102). Altogether, the Forked Deer River Watershed consists of the 08010204, 08010205, and 08010206 8 Digit HUC watersheds.

Currently the SFDR and several of its tributaries are on the 303(d) waters list for such pollutants and problem areas as high amounts of phosphorus, siltation of streams, loss of biological integrity, habitat alterations, *Escherichia coli*, and loss of littoral vegetative cover. Pollution and problems areas identified within the watershed are primarily due to agricultural practices such as land tillage, over fertilization of soils, ditching/drainage of wetlands, and historical channelization of streams.

Construction of the BANK in 1997 and recent site maintenance in 2005, 2006, and 2007 has resulted in a rich, complex diversity of wetland habitat to 778.3 acres along the north bank of the SFDR. Further, wetland restoration on 468 acres of former agricultural land, including the addition of upland buffer and preservation efforts has improved and continues to improve water quality contributing to the SFFDR and its downstream waters. Construction of the BANK has likely led to a reduction in sediment runoff and other site pollutants into the SFFDR, and the reestablishment of a functional riparian buffer comprised of native species. In addition, the complete removal of the levees that surrounded the site has reconnected nearly 800 acres of floodplain to the SFFDR.

3. SERVICE AREA FOR THE MITIGATION BANK

The original service area for the BANK included the entire Forked Deer River watershed (6-Digit HUC 080102) and all contiguous counties to Madison County. The new proposed service area includes only the Forked Deer Watershed (Appendix A, Figure 2). Ratios for specific projects will be established by the Corps and/or TDEC on a case-by-case basis.

Ratios inside and outside the Service Area may be adjusted at the discretion of the District Engineer (DE) in consultation with the IRT.

4. MITIGATION PLAN REQUIREMENTS FOR THE BANK SITE

4.1 OBJECTIVES

In October 1996, TDOT in consultation with the U.S. Army Corps of Engineers (USACE), the Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (USFWS), the Tennessee Wildlife Resources Agency (TWRA), the Tennessee Department of Environment and Conservation (TDEC) and the Federal Highway Administration (FHWA) purchased 778.3 acres of land in Madison County, locally known as the Hoyte Hayes property, for the development of a wetland bank. Except for the FHWA, each of the above agencies, including the Natural Resources Conservation Service (NRCS) comprise what is today referred to as the Interagency Review Team (IRT). The original site plan was developed by TWRA who will assume jurisdiction over the entire 778.3 acres upon completion of the BANK. Completion of the BANK is when all performance standards in the wetland mitigation plan have been met and all wetland credits have been exhausted. Please reference Appendix A for site figures.

As part of the modification of the original General Wetland Banking Memorandum of Agreement (MOA) dated June 12, 1995, TDOT will effectively begin to operate the BANK in accordance with the 2008 mitigation rule (Department of the Army, Corps of Engineers 33 CFR Parts 325 and 332 and Environmental Protection Agency 40 CFR Part 230, Compensatory Mitigation for Losses of Aquatic Resources; Final Rule, April 10, 2008) . The original objectives of the site plan, which have not changed as part of this modification document, were to: (1) Restore the natural drainage that was altered by ditches and levees, (2) Reforest approximately 424 acres in bottomland hardwoods, and (3) Establish approximately 50 acres of moist soil wetlands. To date objectives (1) and (3) have been successfully met. Objective (2) has been partially met resulting in the reforestation of approximately 233 acres of bottomland hardwood wetlands. It is estimated that an additional 108 acres of emergent and open water (moist soil) wetlands have been successfully converted into young stands of

cypress, tupelo, and mixed hardwood wetlands as result of levee removal in 2005 and 2006, supplemental tree plantings in 2008, and establishment of native volunteer hardwood species. However, due to continued extended levels of natural inundation in other areas throughout the restoration site and consideration of in-kind mitigation as discussed in Section 332.3, General Compensatory Mitigation Requirements of the 2008 Mitigation Rule, new site objectives were considered.. TDOT proposes to allow approximately 115 acres (or less) of the BANK to remain as a combination of herbaceous and scrub shrub wetlands and 11.5 acres (or less) as open water areas for waterfowl habitat.

Justification for the new proposed site objectives is based primarily on two historical studies of the South Fork Forked Deer Watershed performed by CEC. One study consisted of analyzing mapped National Land Cover Dataset 1992 (NLCD 1992) data within the watershed. A second study involved delineation of National Wetlands Inventory (NWI) data (1977) within the same watershed. Mapped NLCD data reveled that approximately 80% of the wetlands in the South Fork Forked Deer Watershed in 1992 was wooded, 12% was emergent, and 7.7% was open water. NWI wetland types delineated within the watershed showed similar results. In 1977, approximately 82% of the wetlands in the South Fork Forked Deer Watershed were forest dominated, 3.7% were shrub dominated, 5.0% were emergent herbaceous dominated, 2.0% were riverine open water dominated, and 7.1% were considered to be open water ponds and lakes. Similarly, the Madison County Wetland Bank Site consists of 82% forested dominated wetlands, 16% emergent/scrub shrub dominated wetlands, and 1.6% open water dominated wetlands. Please reference Appendix C for a summary of the methodology and results for the two historical watershed studies discussed above.

4.2 SITE SELECTION

All types of wetlands occur within the SFFDR watershed and its adjacent 8-Digit HUCs. As a result, proposed TDOT projects continue to impact wetlands in this part of the state. In the early 1990's, members of the TDOT Natural Resources Office were actively searching for a suitable wetland restoration site within watersheds of need, as is the case with TDOT today. For wetland mitigation needs in the SFFDR Watershed, there were several search criteria, the

primary being finding a potential wetland mitigation site that was large enough to mitigate for the large amount of estimated future TDOT projects.

The Hoyte Hayes farm was a prime candidate site for wetland restoration in 1996. It contained approximately 468± acres of farmed hydric soils available for wetland restoration. The site had historically been leveed-off from the river and then drained by an intricate drainage system consisting of subsurface drain tiles and open surface swales and ditches which were actively pumped of water during wet periods. This system of levees, drain tiles, swales, and ditches, combined with hydric soils, made this site an ideal candidate for wetland restoration. In addition to potential wetland restoration, the site also offered the potential to preserve approximately 244± acres of bottomland hardwood wetlands and 66± acres of upland hardwoods. Preservation of these areas not only offered additional buffer protection, but also provided an excellent seed source for volunteer species for proposed wetland restoration areas.

4.3 SITE PROTECTION INSTRUMENT

Please reference Appendix D for a copy of the original Madison County Wetland Mitigation Bank Site Plan, Section D for a summary of the perpetual protection of the BANK. Please reference Appendix E for a copy of the Land Deed and the MOA between TDOT and TWRA.

4.4 BASELINE CONDITIONS

The BANK site area was at one time valuable wetland habitat. Historically, this area was dominated by bottomland hardwoods (mixed hard wood species including oaks and cypress) with several natural drainage features meandering through the wetland system. The soil types in the area include Iuka fine sandy loam (Iu), Falaya silt loam (Fa), Grenada silt loam (GrB), Smithdale (SME), Waverly silt loam (Wa), and Ocklockonee fine sandy loam (Oc). The majority of the area is in Wa and Fa soils (Appendix A, Figure 3).

Prior to wetland restoration in 1997, a levee and series of drainage ditches were constructed on this site and with the use of large pumps, the area was effectively drained to allow the planting and harvesting of agricultural cash crops. The levees pushed floodwaters onto

neighboring lands and likely increased flooding upstream by "bottle-necking" natural overbank flooding. Aerial and contour mapping have been developed for this area. A major goal of the site plan is to recreate the natural drainage system in order to establish a functional wetland once again.

Prior to construction of the BANK site, approximately 244± acres were existing bottomland hardwood wetlands, 468± acres were prior converted wetland, and the remaining 66± acres were considered upland. Please reference Appendix E for a copy of the original land deed.

4.5 MITIGATION WORK PLAN

Site maintenance (i.e., levee removal and supplemental planting occurred in 2005, 2006 and 2007 and are discussed in detail in Sections 1.1 and 1.2. A summary of the modifications to the original Madison County Wetland Bank work plan is provided below:

Page 2: Section D – Site Specific Wetland Mitigation Plan

In part, currently reads:

Vegetative Plantings

"*A diversity of species will be planted, which will include, Swamp Chestnut Oak, Willow Oak, Nutall Oak, Pin Oak, Cherrybark Oak, and Cypress. The Cypress seedlings will be planted along the top and on either side of the main drain and west of the power lines. Cypress will also be planted south of the main drain in the field along the western boundary of the BANK site. The other species will be randomly mixed and planted east of the power line and north of the main drain as shown on the attached planting scheme. All species will be planted at the rate of 450 per acre.*"

Revised to read:

Vegetative Plantings and Habitat

"*A diversity of species will be planted including cypress and tupelo in previously inundated areas and oaks will be planted in along the levee removal areas of the east field and in the drier portions of the west field.*

Habitat Community types within the proposed 468 acres of wetland restoration will consist of the following:

1) *Open Water/ Mud Flats*
2) *Emergent/ Herbaceous, Occasionally Inundated*
3) *Scrub Shrub/ Emergent*
4) *Mixed Hardwoods*
5) *Cypress/ Tupelo/ Mix hardwoods*
6) *Cypress/ Tupelo*

No greater than 16.7 % (130 acres) of the total BANK site shall include Open water/ Mud Flats, Emergent/ Herbaceous, Occasionally Inundated, or Scrub Shrub/ Emergent as defined above.

Please reference Appendix A, Figure 5 for the existing wetland communities. Reference Appendix D for a copy of the original (October 1996) Madison County Wetland Mitigation Bank Site Plan.

4.6 OPERATION AND MAINTENANCE PLAN

A primary goal of the restoration site is to create a self-sustaining natural wetland system that achieves the intended level of aquatic ecosystem functionality with minimal human intervention, including long-term site maintenance. TDOT will be responsible for site maintenance associated with the BANK, ensuring the continued function of the wetland ecological system and management measures once in place. Although minimal maintenance is anticipated beyond recent supplemental tree plantings and levee removal, periodic removal of invasive species and replanting of native hardwood species may be required in some of the remaining "troubled" areas. TDOT has demonstrated its commitment to the success of the BANK by spending in excess of $1 million on continued site maintenance since the BANK's construction in 1999. TDOT will remain committed to site maintenance of the BANK until the IRT grant's closure upon its final inspection.

4.7 ECOLOGICAL SUCCESS CRITERIA/PERFORMANCE STANDARDS

Efforts to alleviate significant ponding of water within the mitigation site and the replanting of previously inundated portions of the site were performed in 2005, 2006, and 2007. Following a comprehensive site evaluation by TDOT in 2010 and continued annual monitoring in November 2012, new ecological success criteria and performance standards were proposed. Performance standards of the original Mitigation Site Plan required survival of 300 trees per acre of hard mast producing species for the entire restoration site, excluding the 50 acre moist soil unit. The 2005 and 2006 levee removals eliminated from the BANK all remaining man-made impediments to the site naturally draining southward toward the SFDR. The only remaining option to eliminate standing water from the site would be to re-construct ditches that once actively drained the site. While a few areas of the mitigation site have failed to achieve success with regard to the criteria of 300 planted tree species per acre, it has met all other success criteria. Currently, all restoration areas do delineate as wetlands with a majority of the site observed as having greater than 300 trees per acre and several other areas as having greater than 200 trees per acre. Vegetation data collected in 2010 revealed that two vegetation plots (6A & 6B) located within the preservation forested wetland areas contained approximately 280 and 290 stems/acre, respectively, with approximately 70% of this total consisting of overstory (mature mixed hardwoods) and approximately 30 % consisting of understory (young mixed hardwood saplings). Mixed hardwood species in preservation (reference) plots consisted of shellbark hickory, red maple, river birch, tupelo, dogwood, water oak, willow oak, overcup oak, black willow, buttonbush, box elder, American elm, sweetgum, and possumhaw. In 2010, planted target hardwood species made up 14% and 34% of preservation (reference) plots, 6A and 6B, respectively. Reference wetland plot data indicates that performance standards for determining success criteria for *mixed hardwood* community types should consist of a variety of other hardwood species in addition to oak species. A summary of the modifications to the success criteria and performance standards for the BANK is provided below:

Page 4: Section F – <u>Performance Standards for Determining Success</u>

Currently reads

1. "*Minimum survival rates for vegetational plantings:*
   a. *At least 300 trees per acre shall be hard mast producing species which have been established on-site for five consecutive years.*
   b. *In established moist soil habitats, 75% coverage of approved species or other desired species as approved by the MBRT shall be maintained for five consecutive years."*
   c. *All plantings shall meet federal delineation specifications for hydrophytic vegetation."*

Revised to read

1. *"Minimum survival rates for vegetational plantings:*
   a) *An overall stem count of 200 trees per acre (including native volunteer hydrophytic tree species and buttonbush) as a gauge for determining vegetation success for restored hardwood bottomland wetlands. The large buffer of preservation wetland areas surrounding the site provides an abundant seed supply for regeneration of native hardwood species within the proposed restoration areas.*
   b) *In established moist soil (emergent wetland) habitats, 75% coverage of hydrophytic species as determined by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, November 2010.*
   c) *All plantings shall meet federal delineation specifications for hydrophytic vegetation as determined by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, November 2010."*
   d) Approximately 1.5% of the total Bank site will remain as open water areas for waterfowl habitat.

Please reference Appendix D for a copy of the original Madison County Wetland Mitigation Bank Site Plan.

4.8 MONITORING REQUIREMENTS

Annual monitoring of the BANK vegetation will continue to be performed to document the wetland characteristics of the site. Because the site has exceeded hydrologic success criteria documented in the previous years of monitoring, no future groundwater monitoring is proposed. Tree counts will be conducted in 15 - 17 0.1-acre (37.5-foot radius) circular vegetation plots located along transects within the supplemental planting areas (Appendix A). The center of each plot will be recorded using a GPS unit. All vegetation plots will be shown on GIS generated maps. Additional hydrologic indicators, vegetation and soils data will be collected at each of these plots. The success of the restoration will be measured through the interpretation of both hydrologic and vegetative data. Because previous monitoring in 2010 and 2012 have revealed site maintenance activities (2005 and 2006) and supplemental plantings (2008) have thus far been successful, vegetation, soils, and hydrological monitoring will be performed for a minimum of three more years or until success criteria has been met.

4.8.1 HYDROLOGIC MONITORING

Hydrologic indicators, hydroperiods, and sources of hydrology were previously identified and monitored for over 10 years. Hydrology at reference sites on adjacent forested wetlands was used as a comparison to determine performance success of this parameter. A minimum of 10 hydrology monitoring sites were also established and monitored. Previous years monitoring data at these sites, including a thorough site evaluation in 2010, revealed the BANK site has not only met all hydrological success criteria, but exceeded expectations. The revised MBI does not propose additional monitoring of the site's hydrology.

4.8.2 VEGETATION MONITORING

Nineteen randomly-selected vegetation plots were established in 2010 along existing established transects to monitor vegetative restoration efforts. Annual monitoring events will be conducted to document the survival rate of planted tree species as well as native volunteer hardwood species as established in previous reference wetland vegetative plots. Vegetation monitoring will be conducted in a minimum of 14 of the permanently established monitoring stations. Data to be collected from canopy and subcanopy strata (i.e., planted trees and volunteer seedlings, saplings, and shrubs) will include species composition and average height

of the planted and volunteer species. The indicator status assigned to each species (i.e., OBL, FACW, FAC, FACU and UPL) identified in the ground level stratum will be used to assess relative wetness. Documentation of the vegetative conditions of the restored wetland will be compared to the reference sites and original planted species.

4.8.3 SOIL MONITORING

Previous monitoring reports documented soils and any changes in soil indicators of hydrology. Sufficient documentation of hydric soils throughout the site has already been provided in previous monitoring years. TDOT does not propose any more documentation of the site's soils.

4.8.4 PHOTOGRAPHIC DOCUMENTATION

Photographic documentation will be conducted within each vegetation plot. These photographs will document the progression of the site and the success of the hydrologic and vegetative restoration effort.

4.8.5 MONITORING REPORT

Nine (9) annual monitoring reports were previously submitted to the IRT between 1997 and 2004. Each of these reports documented successful restoration of the site's soils and hydrology, including over 250 acres of planted bottomland hardwood wetlands. Following site maintenance in 2005 and 2006 and supplemental tree plantings in 2008, three additional annual monitoring reports were submitted to the IRT in 2009, 2010, and 2012 in order to document the success of 166 acres of supplemental tree planting areas (previously inundated and not meeting stem count success criteria). Each of these reports included tree stem counts for "planted" and native volunteer tree species (including buttonbush) at randomly selected vegetation plots throughout the site, and more importantly, in areas where supplemental tree planting had occurred. TDOT proposes to submit three additional annual monitoring reports for the year's 2013, 2014, and 2015. Annual monitoring reports will continue to document tree counts (both planted and native volunteer species) in previous "problem" areas where supplemental tree planting has occurred. A minimum of 14 vegetation plots located along existing transects within supplemental tree planting areas will be monitored annually

(Appendix A, Figure 4). In addition to vegetation plot stem counts within supplemental planting areas (2008), the final annual monitoring report will also include a comprehensive site evaluation similar to the 2010 report in order to determine final wetland communities' types and acreages. The final annual monitoring report methodology is described below.

Natural communities will be delineated using recently published aerial photography, vegetation survey plot data, and walking 1m-wide parallel transects, stretching north to south across the mitigation site. Transects will be spaced approximately 500 ft apart (Appendix A, Figure 4). Changes in vegetation and hydrogeomorphic features will be noted and used to determine variations in community types. Thirty-three (33) 0.1-acre (37.5-foot radius) circular plots will be randomly selected along transects within the 474.3-acre restoration area. Vegetation plots and transect data will be used to delineate natural wetland community types and sizes via interpolation methods and to determine the overall success of the BANK. Finally, a wetland functional assessment method (i.e., Rapid HGM or Tennessee Rapid Assessment Methodology (TRAM)) will be performed in each of the wetland habitat community types previously summarized in Section 4.5.

4.8.6 MONITORING SCEDHULE

TABLE 4
MONITORING SCHEDULE (INCLUDING PREVIOUS YEARS)

Year	Monitoring	Year
Year 1	1st growing season following tree planting - monitoring completed	1998
Year 2	2nd growing season following tree planting - monitoring completed	1999
Year 3	3rd growing season following tree planting - monitoring completed	2000
Year 4	4th growing season following tree planting - monitoring completed	2001
Year 5	5th growing season following tree planting - monitoring completed	2002
Year 6	6th growing season following tree planting - monitoring completed	2003
Year 7	7th growing season following tree planting - monitoring completed	2004

Year 8	*Site Maintenance – No monitoring*	*2005*
Year 9	*Site Maintenance – No monitoring*	*2006*
Year 10	*Site Maintenance – No monitoring*	*2007*
Year 11	*Supplemental Plantings – No monitoring*	*2008*
Year 12	12th growing season following tree planting - monitoring completed	2009
Year 13	13th growing season following tree planting - monitoring completed	2010
Year 14	*No monitoring*	*2011*
Year 15	15th growing season following tree planting - monitoring completed	2012
Year 16	16th growing season following tree planting	2013
Year 17	17th growing season following tree planting	2014
Year 18	18th growing season following tree planting	2015

5. OWNERSHIP AND LONG-TERM MANAGEMENT

5.1 OWNERSHIP

The state of Tennessee retains ownership of the 778.3-acre property. On August 28, 1998, TDOT and TWRA each signed a Memorandum of Agreement (MOA) which established the BANK as a Wildlife Refuge still owed and being developed by TDOT. The MOA further states that TWRA will manage the wildlife resources for the State of Tennessee and enforce all laws pertaining to its establishment as a Refuge. In addition to the establishment of the site as a wildlife refuge areas, TDOT will place more specific restrictive covenants on the property, which will protect the property in perpetuity, (Appendix E) that were adapted from the Tennessee Department of Environment and Conservation's Notice of Land Use Restrictions with additions as required by the Corps of Engineers. The restrictions will include, but are not limited to: future development, agricultural or silvicultural practices detrimental to the health of the restored wetland as well as any alteration to or manipulation intended to disrupt or otherwise impound or prolong the restored hydrologic regime of the restored wetland. Only non-invasive, low-impact public recreational purposes such as hiking,

wildlife viewing, hunting, or educational uses such as ecological research or outdoor classrooms will be allowed. TDOT will transfer the property to TWRA at the completion of the BANK. The BANK will not be closed and released until TWRA's ownership has been established and approved by the IRT.

5.2 LONG-TERM MANAGEMENT

After the required monitoring period has been successfully completed, TDOT will place more specific restrictive covenants on the property, which will protect the property in perpetuity, (Appendix E) that were adapted from the Tennessee Department of Environment and Conservation's Notice of Land Use Restrictions with additions as required by the Corps of Engineers. TWRA will continue to manage the 778.3-acre site as a wildlife refuge as stated in the original MOA attached (Appendix E). This organization will assume responsibility for the long-term management of the site. Future management goals and objectives for the property would be developed with consideration to the terms and conditions of its restrictive covenant, wildlife habitat, and public use.

5.3 ADAPTIVE MANAGEMENT PLAN

To date, TDOT has spent in excess of $1.6 million in adaptive management costs on the continued guaranteed success of the BANK. Beaver dam removal, levee breaches/repair, and supplemental planting to approximately 166 acres were completed between 2005, 2006, and 2008. In the event that future monitoring indicates that additional corrective actions are necessary to ensure the continued progression of these areas into native bottomland hardwood wetlands, then the IRT shall provide notice to the TDOT. TDOT shall prepare an analysis of the cause of the failure and determine the appropriate corrective action and a time-frame for implementing the corrective actions. If TDOT fails to implement the appropriate corrective actions or the corrective actions are unsuccessful, the IRT may recommend additional corrective actions. If TDOT fails to perform the required corrective actions, or the corrective actions continue to be unsuccessful, and the IRT determines that the BANK is operating at a deficit, debiting of the remaining 142.3 credits (30%) will cease. Following successful remedial actions, withdrawal of credits may be resumed. TDOT will continue to be responsible for financing, developing and implementing such a contingency plan until closure.

5.4 FINANCIAL ASSURANCES

While TWRA will ultimately take ownership of the BANK, the costs of construction and maintenance of the BANK is the responsibility of TDOT. As has been performed in previous successful restoration maintenance efforts, TDOT has adequate funding for operation and maintenance of the BANK during its operational life as well as for the long-term management of the restored wetlands.

6. DETERMINATION OF CREDITS

6.1 WETLAND IMPACTS SUITABLE FOR COMPENSATION

All types of unavoidable wetland impacts, including forested, emergent, and open water, may be mitigated at the BANK. The use of credits to mitigate wetland impacts dissimilar to the wetland types existing at the BANK may be allowed on a case-by-case basis after coordination between the appropriate regulatory agencies. However, it is the intent of the BANK to use future mitigation credits (released by IRT) for "in kind" TDOT wetland impacts only (i.e., open water wetland credits for open water wetland impacts). Decisions regarding out-of-kind wetland mitigation will consider the availability and practicability of in-kind mitigation as well as the existing condition and landscape function of the impacted and BANK wetlands.

6.2 CREDIT RATIOS / CREDITS GENERATED

Federal and state guidance establishes mitigation credit ratios based on wetland functions and values expected to be gained by the proposed treatment. Restoration of hydrologic functions and vegetation on hydric soils is typically credited at a 1:1 ratio. Using this guidance, a total of 468 wetland credits were to be generated through the successful restoration of the site. Credits for out-of-kind mitigation will be denoted as such in all reports. One acre of re-established (restored) wetland at the BANK will generate one credit. Credits are debited when a permit is issued allowing the use of the BANK credits as compensatory mitigation. An acre of impact to be mitigated will debit credits at a given ratio. For example, if a one acre

impact is mitigated at the BANK at a 2:1 ratio, 2 credits would be debited from the total number of available credits.

6.3 CREDIT RELEASE SCHEDULE

Upon submittal of all appropriate documentation by the Sponsor, and subsequent approval by the MBRT in 1996, the MBRT Chair provided in writing the release of 237.2 pre-credits for use by the Sponsor (TDOT) for TDOT ONLY projects. To date only 5.53 pre-credits remain from the original 50.7% credit release following construction in 1996. Following successful wetland restoration maintenance activities in 2005, 2006, and 2008, TDOT is requesting another 19.3% (90.4 credits) release of the original 468 credits. The remaining 30% (140.4 credits) will be released based upon the following schedule:

TABLE 5. CREDIT RELEASE SCHEDULE (FOR REMAINING 30%)

% Release	Release Schedule	Credits Released
10%	3rd Annual Monitoring Report (2013)	46.8
10%	4th Annual Monitoring Report (2014)	46.8
10%	5th Annual Monitoring Report (2015)	46.8
		140.4

6.4 DEBITING OF CREDITS

Mitigation ratios for specific projects will be established by the Corps and/or TDEC in consultation with the IRT on a case-by-case basis. Impacts to high quality wetlands within the service area may require a higher mitigation ratio as determined by the responsible regulatory agency. Projects occurring outside the service area will typically require a higher mitigation ratio as determined by the responsible regulatory agency. Additionally, all remaining 230.8 credits to be released by the IRT, shall be debited for "in-kind" mitigation use only or as agreed upon by the IRT. Micro-wetland community types previously summarized in Section 4.5 and in the 2010 Madison County Wetland Bank Site Evaluation have been categorized into three primary wetland community types based on the Cowardin

Wetland Classification System for the purpose of "in-kind" wetland mitigation for future TDOT wetland impacts as illustrated in Table 6.

Based on the findings from the October 2010 site evaluation, proposed modifications to success criteria, and consideration of in-kind mitigation for open water and herbaceous emergent wetlands (for both previously permitted TDOT projects and anticipated projects), TDOT has provided the IRT with a recalculation of mitigation credits (proposed) for the BANK and is summarized below.

TABLE 6.
RECALCULATION OF WETLAND MITIGATION CREDITS FOR THE MADISON COUNTY WETLAND MITIGATION BANK

Wetland Mitigation Type (Cowardin)	Existing Wetland Community Types (Defined in Sect 4.5)	Acres	Credits	Total Credits Debited to Date	Remaining Credits
Unconsolidated Bottom	1	11.5	11.5	0	11.50
Emergent and Scrub Shrub	2 and 3	115	115	16.89	98.10
Forested	4, 5, and 6	341.5	341.5	215.58	127.22
Total		**468 [1]**	**468 [1]**	**230.87 [2]**	**237.13[1]**

[1] The 2010 site evaluation showed that approximately 6.4 acres (1.35%) of the restoration area is occupied by berms and a few upland areas not previously accounted for in the original site plan. The original restoration area was estimated to be 474.4 acres/credits, but has since been determined to be 468 acres/credits.

[2] Reference Appendix F, Madison County Wetland Mitigation Bank Debit Sheet for remaining 6.33 credits from the original release of 237.2 credits (now recalculated to be a total of 468 acres/credits).

TDOT is asking the IRT to consider allowing 2.46% (11.5 acres/credit) of the site to remain as open water wetlands and 24.6% of the site (115 acres/credit) to remain as emergent scrub/shrub wetlands. Additionally, TDOT would like the IRT to consider an overall stem count of 200 trees per acre (including volunteer hydrophytic species and buttonbush) for

approximately 73% of the site (342 acres/credit) as a gauge for determining vegetation success for restored forested wetlands.

In addition TDOT is requesting consideration of in-kind mitigation for previously permitted and future TDOT impacts to wetlands. Following a thorough review of previous permitted projects dating back to May 2003, it was determined that a minimum of 16.89 mitigation acre-credits were permitted for emergent wetland impacts via the BANK (Appendix F, Madison County Wetland Mitigation Bank Debit Sheet). Prior to 2003, TDOT permit applications did not distinguish between emergent herbaceous/scrub shrub and forested wetland impacts; therefore, it was assumed that all impacts which occurred prior to this period were forested impacts. In-kind mitigation of emergent herbaceous/scrub shrub wetlands would more appropriately mitigate for previous impacts to emergent wetlands. The remaining 98.1 wetland credits for emergent herbaceous/scrub shrub and 11.5 wetland credits for open water wetlands would only be used towards in-kind mitigation of future TDOT impacts occurring to emergent and open water wetlands.

To date only 237.2 credits (50.6%) have been released from the BANK. If the proposed success criteria and in kind mitigation outlined in this Revised MBI is deemed acceptable, TDOT is respectfully asking the Corps and IRT to approve the release of the remaining as outlined above in Table 6.

7. ACCOUNTING PROCEDURES FOR MITIGATION BANK SITE

TDOT shall be responsible for credit balance accounting and reporting for the BANK. A ledger shall be maintained by the TDOT BANK manager. Annual credit balance reports will be submitted to the IRT until all credits are debited. An annual report summarizing all transactions and the site monitoring reports will be submitted to the IRT by November 30 each year. Additionally, information regarding any and/or all transactions must be provided to any IRT member upon written request.

8. DEFAULT AND CLOSURE PROVISIONS

8.1 DEFAULT PROVISIONS

If the Corps determines that the BANK is not meeting performance standards or complying with the terms of the instrument, appropriate action will be taken. Such actions may include, but are not limited to, suspending credit release, adaptive management, decreasing available credits, using financial assurances, and/or terminating the instrument.

8.2 CLOSURE PROVISIONS

BANK closure will occur when the terms and conditions of the Modified Mitigation Banking Instrument have been determined by the Corps, in consultation with the IRT, to be fully satisfied or until all credits have been debited, whichever is later. Subsequent to BANK closure, management will become the responsibility of TWRA.

If adaptive management strategies are unsuccessful and performance standards are unattainable, TDOT may request early closure of the BANK and forfeiture of remaining anticipated credits if it is determined that the performance standards are unattainable.

8.3 NATURAL DISASTERS/POST-COMPLETION FAILURES

After BANK closure, the TDOT is not responsible for BANK failure as a result of natural disasters that the IRT determines are beyond its control to prevent or mitigate.

9. AGENCY ROLES AND COORDINATION

9.1 OVERSIGHT

The IRT is comprised of 6 individuals representing four federal agencies and two state agencies. The Corps of Engineers (Corps) representative will serve as the IRT Chair and the TDEC representative will serve as Co-Chair. The primary responsibility of the IRT is to provide oversight during the development, construction and operation of the BANK. IRT members agree to the following oversight responsibilities as well as all other responsibilities as charged by the 1995 Federal Mitigation Banking Guidance and Part 332—Compensatory

Mitigation For Losses of Aquatic Resources (2008):

- The agencies represented on the IRT agree to provide appropriate oversight in carrying out the provisions of this MBI.
- The agencies represented agree to review and provide comments on all project plans, monitoring reports, credit release requests, contingency plans, etc. for the BANK in a timely manner. Comments will be reviewed and transmitted to the Sponsor within 30 calendar days from the date of a complete submittal (except for good cause).
- The agencies represented on the IRT agree to review and confirm reports on the evaluation of success criteria prior to approving credit releases from the BANK.
- The agencies represented on the IRT will conduct compliance inspections, as necessary, as determined by the Corps in consultation with the Sponsor, to verify credits available in the BANK and recommend corrective measures, if any.

The IRT will have full access to the BANK site to perform inspections, provided that reasonable notice is given. Regular inspections should be scheduled, at a minimum following completion of targeted milestones (i.e., tree planting, earthwork, etc.) and before credit releases occur.

IRT members will make a good faith effort, within 30 calendar days (except for good cause), to return comments regarding submitted reports to the IRT Chair(s). In some circumstances, the IRT member may request an extension of the comment period.

When a written request for success determination and/or credit release is submitted, the IRT Chair will make a good faith effort (except for good cause) to either approve the success determination and/or credit release or provide the Sponsor with a written explanation as to why the determination has been denied.

Modification to this agreement may be proposed by TDOT or any IRT member. The proposed modification shall be made in writing and submitted to the IRT. The agreed upon and amended instrument must be signed by the appropriate management official (signatory)

for each agency represented on the IRT.

9.2 DECISION MAKING PROCESS

Due to the different authorities and responsibilities of each agency represented on the IRT, there is a benefit in achieving agreement on decisions. Therefore, the IRT will strive to reach a consensus on all its decisions and/or actions. Where a consensus cannot be reached, it will be the responsibility of the IRT Chair(s) to make the final decision.

10. ADJACENT LANDOWNERS

Efforts will be made to develop, construct and operate this BANK in recognition of the interests of adjacent landowners. This MBI does not authorize any injury to the property or rights of others. TDOT is solely liable for any such injuries or damages caused by the establishment and/or operation of the BANK.

11. AUTHORIZATION

This agreement shall not undermine or supersede the permit authority of the Corps or TDEC. Nor shall it undermine or supersede the authority of the EPA under the CWA Section 404(c), (i.e., veto authority), elevation procedures under the Memorandum of Agreement between the USACE and EPA, and the same between the FWS and the Corps [Section 404 (q) of the Clean Water Act, 33 U.S.C. 1344].

The establishment and use of this mitigation bank shall be in accordance with the following applicable statutes, regulations, policies, and any subsequent revisions:

- Clean Water Act (33 U.S.C. 1251 et seq.)
- Rivers and Harbors Act of 1899 (33 U.S.C. 403)
- Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.)
- Endangered Species Act (16 U.S.C. 1531 et seq.)
- National Environmental Policy Act (42 U.S.C. 4321 et seq.)
- Tennessee Water Quality Control Act of 1977
- Part 332—Compensatory Mitigation For Losses of Aquatic Resources (2008)

12. IMPLEMENTATION

In recognition of well-established mitigation policy, all projects shall occur in a clear sequence of: avoidance of wetland impacts through the evaluation of practicable alternatives, minimization of wetland impacts as the second step in the sequence, and lastly, compensation of unavoidable impacts through restoration, creation, enhancement, preservation, and/or a combination of these, as outlined in the Mitigation MOA between the Corps and EPA.

13. OTHER PROVISIONS

13.1 FORCE MAJEURE

Nothing herein shall be construed to authorize proceedings against the Sponsor for any damages to the BANK property caused by acts of Nature such as earthquake, fire, flood, storm, war, civil disturbance or similar causes. In the event of a *force majeure* event, the Sponsor will notify the District Engineer (DE) in writing and work with the ~~District Engineer (~~DE~~)~~ and IRT members to resolve damages, if any, caused by the event. However, if the acts of Nature do not preclude the Sponsor from resuming BANK operations without unreasonable expense, then it shall not be relieved of its obligations under this document. Any impact to future credit releases or numbers of credits available for sale shall be discussed and determined by the ~~District Engineer (~~DE~~),~~ in consultation with the IRT at that time.

13.2 DISPUTE RESOLUTION

Resolution of disputes regarding the application of this MBI will be accomplished in accordance with those stated in the Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (60 FR. 58605 et seq., November, 1995) and Part 332—Compensatory Mitigation For Losses of Aquatic Resources (2008).

13.3 VALIDITY, MODIFICATION AND TERMINATION OF THE INSTRUMENT

This Modified MBI will become valid upon execution (signature) by the IRT agencies. The remaining credit release is authorized following the recordation of the restrictive covenant. This Modified MBI may be amended, altered, released or revoked only by written agreement

among all parties hereto or their heirs, assigns or successors-in-interest. Any of the IRT members may terminate their participation upon written notification to all signatory parties. Participation of the IRT members will terminate 30 days after written notification.

13.4 CONTROLLING LANGUAGE

To the extent that specific language in this document changes, modifies or deletes terms and conditions contained in those documents that are incorporated into the MBI by reference, and that are not legally binding, the specific language within the MBI shall be controlling.

14. DEFINITIONS

Closure:	occurs when the required monitoring period has successfully completed and all credits have been debited from the BANK.
Complete:	occurs when all monitoring requirements and performance standards have been met as specified in the INSTRUMENT.
Credit:	a unit of measure (e.g., a functional or area measure) representing the accrual or attainment of wetland functions at a compensatory mitigation site.
Preservation:	the removal of a threat to, or preventing the decline of, wetland conditions by an action in or near a wetland.
Reestablishment/(Restoration):	the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former wetland.
Service Area:	the designated area (e.g., watershed) wherein the BANK may reasonably be expected to provide appropriate compensation for impacts to wetlands.

15. SIGNATURE PAGE

Department of the Army, Corps of Engineers, Memphis District

By:_____ _____
Date

Tennessee Department of Environment and Conservation

By:_____ _____
Date

Tennessee Wildlife Resources Agency

By:_____ _____
Date

U.S. Fish and Wildlife Service

By:_____ _____
Date

U.S. Environmental Protection Agency

By:_____ _____
Date

USDA Natural Resource Conservation Service

By:_____ _____
Date

Tennessee Department of Transportation

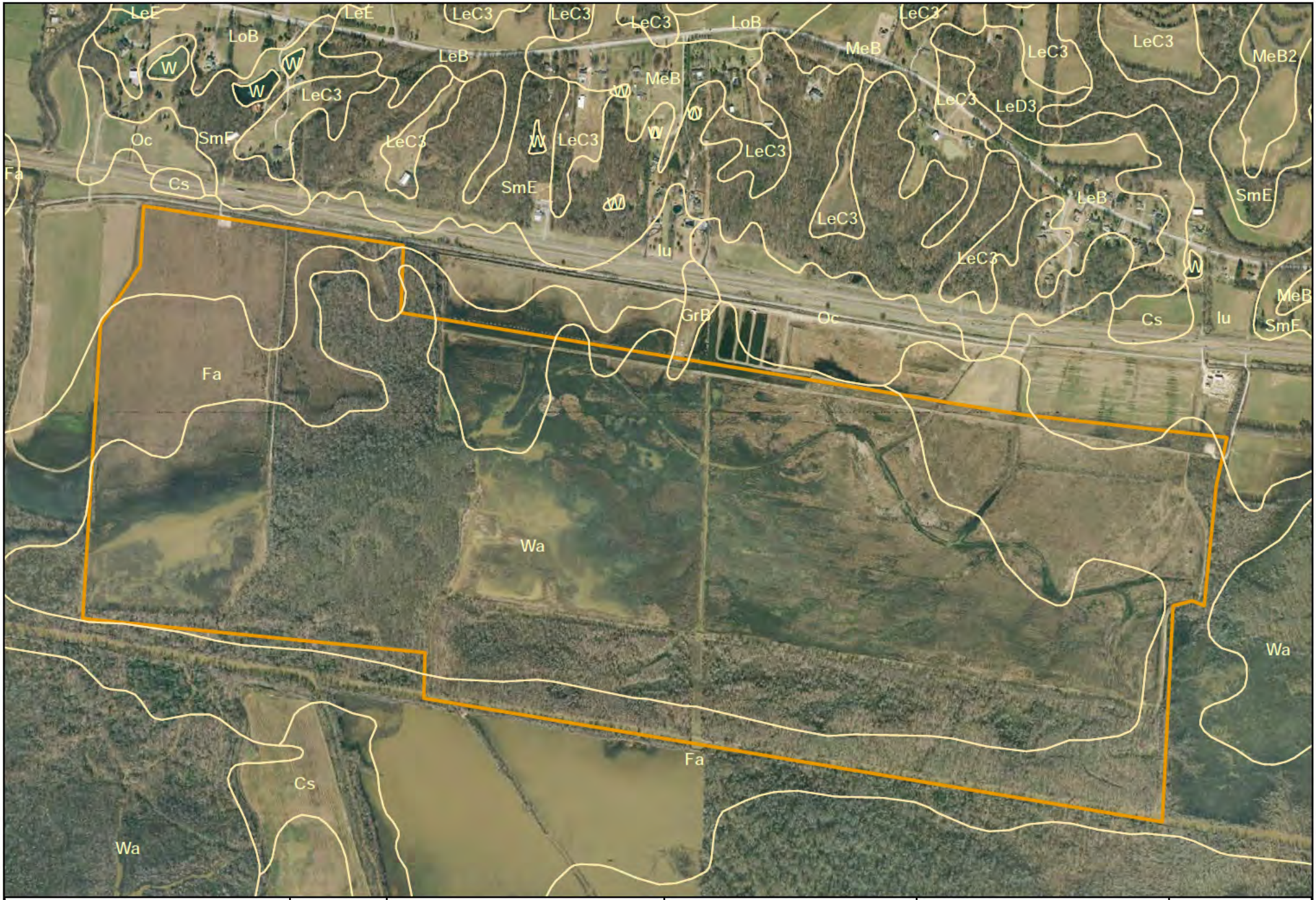
By:_____ _____
Date

APPENDIX A

FIGURES

TDOT	Created by JRB June 7, 2012	Madison County Wetland Mitigation Bank	Figure 1 Location Map


08010201
06040006
N
Obion
08010202
08010100
Lake
Weakley
Henry
Dyer
08010203
Gibson
08010206
Carroll
08010204
06040005
08010100
Lauderdale
Crockett
Madison County Wetland
Mitigation Bank
Forked Deer
River Watershed
08010205
Henderson
Haywood
Madison
Tipton
08010208
Chester
Shelby
08010209
06040001
Hardeman
Hardin
McNairy
08010207
Legend
HUC 8-Digit
Counties
Service Area
0 5 10 20
Miles
Created by JRB
November 14, 2012
Madison County Wetland
Mitigation Bank
Figure 2
Service Area



TDOT

N

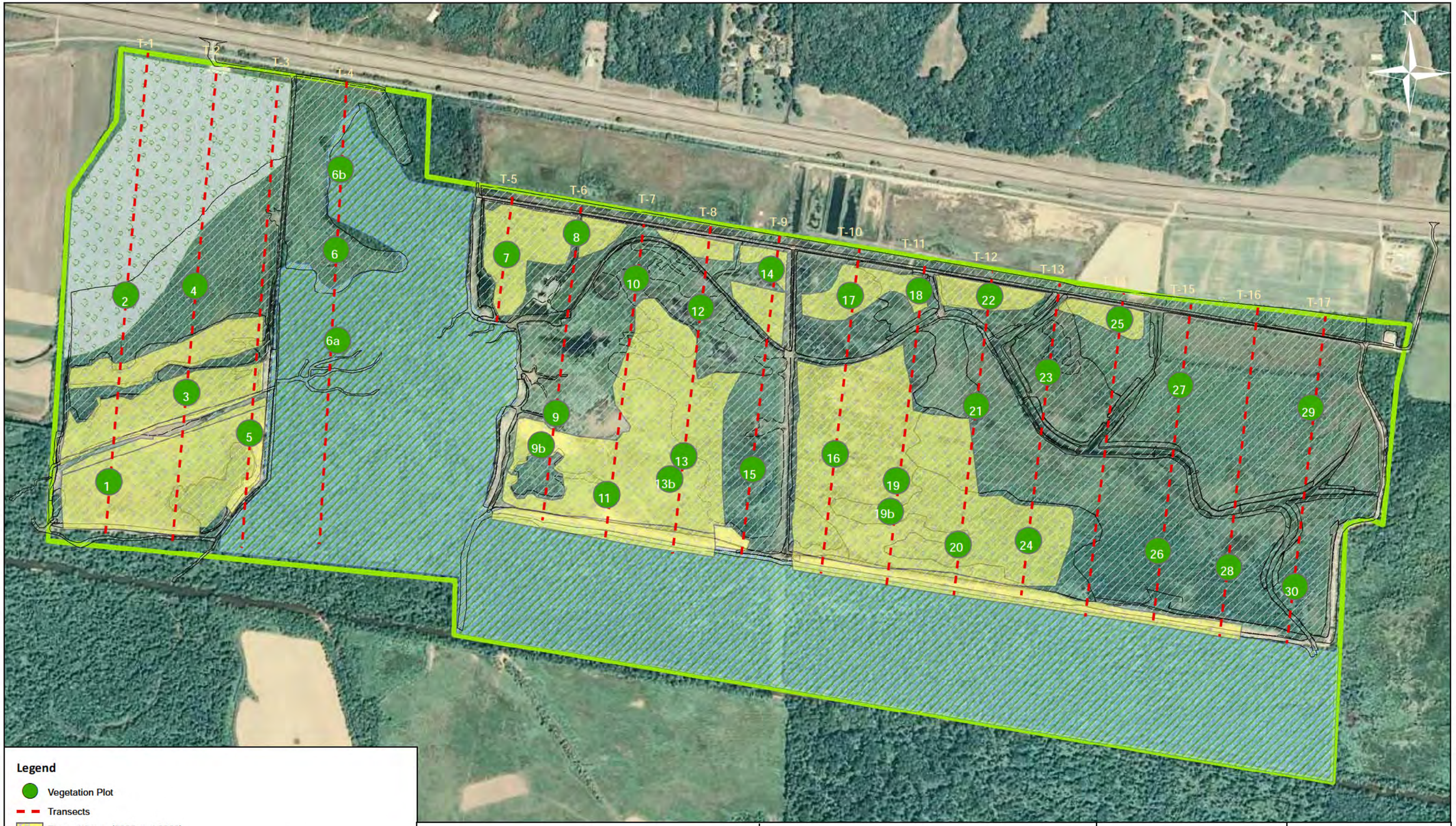
0 500 1,000 2,000
Feet

Drawn By: JRB
Checked By: JTD

Project No. 57946-3214-04
PIN 045781.00

Madison County Wetland Mitigation Bank Site

Soils Map
Figure 3



Legend

- Vegetation Plot
- Transects
- Planted Areas (2008 and 2009)
- Restoration Areas
- Preservation - 60 Acres of Upland Buffer / Originally Proposed as Wetland Creation
- Preservation - 244 Acres of Bottomland Hardwood Wetlands
- Property Boundary

TDOT

0 500 1,000 2,000

Feet

Madison County Wetland Mitigation Bank Site

P.E. 57946-3214-04
PIN 045781.00

Figure 4

2010 Final Site Evaluation / Delineation Over 2012 Aerial

N

0 1,000 2,000

Feet

DWN. BY: CEC | CHK. BY: JTD

DATE: 4/18/2011

TDOT Go.

ISSUED FOR: TDOT ENVIRONMENTAL DIVISION, NATURAL RESOURCES OFFICE

ISSUED BY:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
405 Duke Drive, Suite 270
Franklin, TN 37067
615-333-7797
Columbus, OH * Cincinnati, OH * Indianapolis, IN * Chicago, IL * St. Louis, MO * Pittsburg, PA * Detriot, MI * Phoenix, AZ

2010 MONITORING COMMUNITY MAP
MADISON COUNTY WETLAND BANK
MADISON COUNTY, TENNESSEE

TDOT PROJECT NO. 99104-1260-04
PIN 048103.00

PROJECT NO.: 101-911

FIGURE: 2

APPENDIX B

MEETING MINUTES

IRT Meeting - Madison County and Millington Wetland Mitigation Banks

MINUTES FEBRUARY 15, 2012 10:00 AM – 12:30 PM NASHVILLE DISTRICT CORPS OFFICE

MEETING CALLED BY	Roger Allen (Memphis Corps District and IRT Chair)
TYPE OF MEETING	Meeting to discuss status and futures of the Madison County and Millington Wetland Mitigation Banks
FACILITATOR	
NOTE TAKER	Jeff Duke, Mike Williams, and Rhett Baggett
TIMEKEEPER	
ATTENDEES	

Agenda topics

10:00 – 11:30 MADISION COUNTY WETLAND MITIGATION BANK MIKE WILLIAMS, TDOT

DISCUSSION	IRT members collectively agreed that modifications to the original Mitigation Banking Instrument, as proposed in *Section VIII of the 2010 Site Evaluation of the Madison County Wetland Mitigation Bank* prepared by TDOT, would be considered; however, proposed modifications needed to be included as part of a "Major" Revision to the original MBI submitted by TDOT and approved by the MBRT in 1996. Other items discussed by the IRT are outlined below:
	• Need to state that performance standards are not being "dumb down" in, but instead changes reflect a more "realistic" goal of the overall wetland system. • Roger wanted us to see if there were any sources that may offer a standard for natural wetland conditions "typical" of the South Fork Deer Watershed • Consider using functional assessment model (i.e., Rapid HGM) as supporting documentation for new section on success criteria in the new MBI • IRT collectively agreed with Table 4 proposed in *Section VIII of the 2010 Site Evaluation of the Madison County Wetland Mitigation Bank* and needed to be included in the revised MBI. • New MBI may not need a "long/new" discussion for each new section, but need to address all sections in a new MBI – some may just include one simple sentence • Need to use emergent and open water areas for "in-kind" mitigation for future similar impacts.

11:30 – 12:30 MILLINGTON WETLAND MITIGATION BANK MIKE WILLIAMS, TDOT

DISCUSSION	Current MBI needs to be re-written and started at the Prospectus stage. Major items covered in the meeting are outlined below:
	• Have to get clearance from FAA - FAA requires 10,000 of clearance from runway. • Credit for Restoration at a 1:1 is unlikely. Credit for preservation may be a 10:1 ratio and enhancement 4:1 •

APPENDIX C

HISTORICAL WATERSHED DATA

A Historical Delineation of Wetlands within the Deer Forked Watershed

Land Cover Datasets Methodology

The National Land Cover Datasets (NLCD), maintained by the Multi-Resolution Land Characteristics Consortium (MRLC) were queried in an attempt to identify historical land cover data for the South Fork Forked Deer Watershed. Specifically, efforts were focused on identifying available data from which land cover percentages of the various wetland habitat types present today at the Madison Wetland Bank could be calculated for the watershed as a whole at or near the time of the banks construction. The purpose was to show that the relative percentages of the different cover types present at the bank site closely mimic historical natural conditions within the watershed in which it was constructed. MRLC data is generated by several different federal agencies making up the consortium including EPA, NOAA, USGS, BLM, NASS, NPS, NASA, USFWS, and the US Army Corps of Engineers.

From the data available, CEC selected the National Land Cover Dataset 1992 (NLCD 1992) dataset as the most appropriate with which to make a comparison. The NLCD 1992 data is a 21-class land cover classification scheme based primarily on Landsat Thematic Mapper^{tm} satellite data which is available by state or in user defined coverage areas at http://www.mrlc.gov/viewerjs/. The data product consists of a Geo-reference Tiff image. Individual colors within the image color-map represent 1 of the 21 land cover classifications shown at the right.

To analyze the data, the Tiff image was first imported to ESRI ArcView^{tm} software. The image was then converted to a shapefile format which allowed each of the individual color-mapped areas to be represented as an individual polygon. Each of the over 1 million polygons generated in the new shapefile was automatically grid coded during the conversion process to match one of the 21 land cover classifications. The shapefile was then clipped to the North Fork Forked Deer watershed boundaries and polygons were grouped by grid code (land cover type) and merged with like polygons. Total acreages of each land cover type present were then calculated using the XTools Pro^{tm} plug-in for ArcGIS. Finally, the shapefile data table containing the acreages was exported out of ArcMap as a text file and imported into Microsoft Excel for further analysis.

To substantiate the above mapped land cover types, CEC compared the total calculated acreages of all landcover types within the shapefile (679,133.4 acres) to the calculated acreage of the watershed (679,077. 9acres). Given the large size of the watershed, a difference of only 55.5 acres (0.008%) was deemed negligible.

National Wetlands Inventory Methodology

The US Fish and Wildlife Service 1977 Statewide National Wetland Inventory (NWI) data was also evaluated in an attempt to quantify historical wetland coverage area and the relative percentage of the various mapped wetland types within the South Fork Forked Deer Watershed. CEC performed its analysis in much the same way as was done with the NLCD data.

The seamless Tennessee NWI GIS layer developed by the USFWS and based on its original 1977 NWI mapping effort was imported into ESRI ArcGis[tm] software. The layer was then clipped to the Watershed boundaries. All polygons with identical NWI Codes were then merged and acreages were calculated for each of the merged polygons. The resulting data table was exported to Excel for summarization and analysis. Analysis involved grouping the mapped wetlands into major wetland types, calculating total acreages by type, and then comparing the total acreages of each major wetland type to total watershed acreage and to total wetland acreage within the watershed.

Results

NLCD (1992) Cover Types for South Fork Forked Deer Watershed

ID	GRIDCODE	Acres	Land Cover Type
103344	81	150,055	Pasture/Hay
105015	82	237,863	Row Crops
105312	41	150,865	Deciduous Forest
105573	42	20,898	Evergreen Forest
105574	43	34,851	Mixed Forest
107513	11	4,978	Open Water
108340	23	2,856	Commercial/Industrial/Transporation
109991	21	10,830	Low Intensity Residential
115642	85	2,019	Urban/Recreational Grasses
120068	22	2,172	High Intensity Residential
122014	91	51,900	Woody Wetlands
124800	33	904	Transitional Barren
329791	83	1,016	Small Grains
340704	31	13	Bare Rock/Sand/Clay
434566	92	7,889	Emergent Herbaceous Wetlands
531502	32	24	Quarries/Strip Mines/Gravel Pits
	Total Acres	**679,133**	

NLCD (1992) Percent Wetland Cover Types within for South Fork Forked Deer Watershed

Cover Type	Cover Type Total Area (Acres)	% Type of Wetlands within Watershed	% of Total Watershed Area
Woody Wetlands	51,900	80	7.6
Emergent Wetlands	7,889	12	1.2
Open Water	4,978	7.7	0.73
Total	**64,767**	**100**	**10**

NWI (1977) Percent Wetland Cover Types within South Fork Forked Deer Watershed

Cover Type	Cover Type Total Area (Acres)	% Type of Wetlands within Watershed	% of Total Watershed Area
Forested Dominated Wetlands	55,607	82	8.2
Shrub Dominated Wetlands	2,471	3.7	0.36
Emergent Dominated Wetlands	3,373	5.0	0.50
Riverine Open Water	1,321	2.0	0.20
Lake and Pond Open Water	4,791	7.1	0.70
Total	**67,563**	**100**	**10**

SUBMITTAL & REVISION RECORD		
NO	DATE	DESCRIPTION
--	--	--

Dyer
Gibson
Carroll
Benton
Crockett
Lauderdale
Haywood
Madison
Henderson
Decatur
Tipton
Hardeman
Chester
McNairy
Hardin

Legend

South Fork Forked Deer 8 Digit HUC Watershed Boundary

Land Cover Type

- Open Water
- Low Intensity Residential
- High Intensity Residential
- Commercial/Industrial/Transporation
- Bare Rock/Sand/Clay
- Quarries/Strip Mines/Gravel Pits
- Transitional Barren
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Pasture/Hay
- Row Crops
- Small Grains
- Urban/Recreational Grasses
- Woody Wetlands
- Emergent Herbaceous Wetlands

REFERENCE

Multi-Resolution Land Characteristics Consortium (MRLC) at http://www.mrlc.gov/viewerjs/
Accessed 3/21/2013

Imagery Converted to Shape Format in ESRI ArcView Software for Area Calculations

N

0 10 20
Miles

DWN. BY: CEC | CHK. BY: JTD

DATE: 03/21/2013

ISSUED FOR: TDOT ENVIRONMENTAL DIVISION, NATURAL RESOURCES OFFICE

ISSUED BY:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
405 Duke Drive, Suite 270
Franklin, TN 37067
615-333-7797

National Land Cover Dataset 1992 (1992 NLCD) For South Fork Forked Deer River Watershed Madison County Wetland Bank Madison County, Tennessee TDOT Project NO. 99104-1260-04 PIN 048103.00

PROJECT NO.: 122-076

FIGURE: 2

SUBMITTAL & REVISION RECORD		
NO	DATE	DESCRIPTION
–	–	–

Legend

South Fork Forked Deer 8 Digit HUC Watershed Boundary

NWI_Clipped_to_Watershed

<all other values>

ATTRIBUTE

L1UBH
L1UBHh
L1UBHx
L2UBHh
PAB1H
PAB5F
PEM1A
PEM1Ad
PEM1Ah
PEM1C
PEM1Cd
PEM1Ch
PEM1F
PEM1Fd
PEM1Fh
PEM1Fx
PEM1G
PEM1Gh
PEM1H
PEM1Hx
PEM1N
PFO/SS1C
PFO1/EM1A
PFO1/EM1C
PFO1/SS1A
PFO1/SS1C
PFO1A
PFO1Ad
PFO1Ah
PFO1Ax
PFO1C
PFO1Ch
PFO1F
PFO1Fb
PFO1Fh
PFO1G
PFO2/UBG
PFO2C
PFO2G
PFO5F
PFO5Fh
PFO5G
PFO6C
PFO6Cd
PFO6F
PFO6Fh
PFO6G
PFOG
PSS1/EM1C
PSS1/FO1C
PSS1A
PSS1C
PSS1Ch
PSS1F
PSS1Fh
PSS1G
PSS1Gh
PSS1Hh
PSS6C
PSS6F
PUB/FO2G
PUB1H
PUBF
PUBFh
PUBG
PUBGh
PUBH
PUBHh
PUBHr
PUBHx
PUB3Ch
PUB3Cx
PUSAh
PUSCh
PUSCx
R2UB3H
R2UB3Hx
R2UBH
R2UBHx
R4SBC
R4SBCx
R4USCx

Dyer
Gibson
Carroll
Benton
Crockett
Lauderdale
Haywood
Madison
Henderson
Decatur
Tipton
Chester
Hardeman
McNairy
Hardin

REFERENCE

NWI

U.S. FISH & WILDLIFE SERVICE
NATIONAL WETLANDS INVENTORY (NWI) MAP
STATEWIDE, TENNESSEE

N

0 10 20
Miles

DWN. BY: CEC | CHK. BY: JTD

DATE: 03/21/2013

ISSUED FOR: TDOT ENVIRONMENTAL DIVISION, NATURAL RESOURCES OFFICE

ISSUED BY:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
405 Duke Drive, Suite 270
Franklin, TN 37067
615-333-7797

US Fish and Wildlife Service National Wetland Inventory (NWI) Map For South Fork Forked Deer River Watershed Madison County Wetland Bank Madison County, Tennessee TDOT Project No. 99104-1260-04 PIN 048103.00

PROJECT NO.: 122-076

FIGURE: 3

Clipped and Merged 1977 NWI Data for Huck 08010205			Percentages by Individual NWI Wetland Types		Percentages by Major Wetland Type		Percentages by Major Wetland Type with Open Water Types Grouped	
NWI Code	Wetland Type	ACRES	% of Total Watershed Acerage	% of Mapped Wetland Acerage Within Watershed	% of Total Watershed Acerage	% of Mapped Wetland Acerage Within Watershed	% of Total Watershed Acerage	% of Mapped Wetland Acerage Within Watershed
HUC-8 (08010205) South Fork Forked Deer River Area		679,077						
NWI Mapped Wetland Acerage within Watershed		67,563						
Emergent Dominated								
PEM1A	Freshwater Emergent Wetland	1,882.10	0.27716	2.79				
PEM1Ad	Freshwater Emergent Wetland	1.27	0.00019	0.00				
PEM1Ah	Freshwater Emergent Wetland	2.38	0.00035	0.00				
PEM1C	Freshwater Emergent Wetland	1,167.17	0.17188	1.73				
PEM1Cd	Freshwater Emergent Wetland	14.01	0.00206	0.02				
PEM1Ch	Freshwater Emergent Wetland	6.31	0.00093	0.01				
PEM1F	Freshwater Emergent Wetland	199.29	0.02935	0.29				
PEM1Fd	Freshwater Emergent Wetland	15.53	0.00229	0.02				
PEM1Fh	Freshwater Emergent Wetland	32.90	0.00484	0.05				
PEM1Fx	Freshwater Emergent Wetland	0.45	0.00007	0.00				
PEM1G	Freshwater Emergent Wetland	13.78	0.00203	0.02				
PEM1Gh	Freshwater Emergent Wetland	11.84	0.00174	0.02				
PEM1H	Freshwater Emergent Wetland	12.65	0.00186	0.02				
PEM1Hx	Freshwater Emergent Wetland	7.54	0.00111	0.01				
PEM1N	Freshwater Emergent Wetland	6.03	0.00089	0.01	0.50	4.99	0.50	4.99
Total		3,373.26						
Forested Dominated								
PFO/SS1C	Freshwater Forested/Shrub Wetland	1.15	0.00017	0.00				
PFO1/EM1A	Freshwater Forested/Shrub Wetland	4.10	0.00060	0.01				
PFO1/EM1C	Freshwater Forested/Shrub Wetland	10.86	0.00160	0.02				
PFO1/SS1A	Freshwater Forested/Shrub Wetland	5.75	0.00085	0.01				
PFO1/SS1C	Freshwater Forested/Shrub Wetland	14.70	0.00217	0.02				
PFO1A	Freshwater Forested/Shrub Wetland	25,748.38	3.79167	38.11				
PFO1Ad	Freshwater Forested/Shrub Wetland	1.52	0.00022	0.00				
PFO1Ah	Freshwater Forested/Shrub Wetland	3.22	0.00047	0.00				
PFO1Ax	Freshwater Forested/Shrub Wetland	0.88	0.00013	0.00				
PFO1C	Freshwater Forested/Shrub Wetland	17,202.37	2.53320	25.46				
PFO1Ch	Freshwater Forested/Shrub Wetland	43.27	0.00637	0.06				
PFO1F	Freshwater Forested/Shrub Wetland	2,855.92	0.42056	4.23				
PFO1Fb	Freshwater Forested/Shrub Wetland	7.03	0.00103	0.01				
PFO1Fh	Freshwater Forested/Shrub Wetland	3.80	0.00056	0.01				
PFO1G	Freshwater Forested/Shrub Wetland	343.69	0.05061	0.51				
PFO2/UBG	Freshwater Forested/Shrub Wetland	7.23	0.00106	0.01				
PFO2G	Freshwater Forested/Shrub Wetland	64.12	0.00944	0.09				

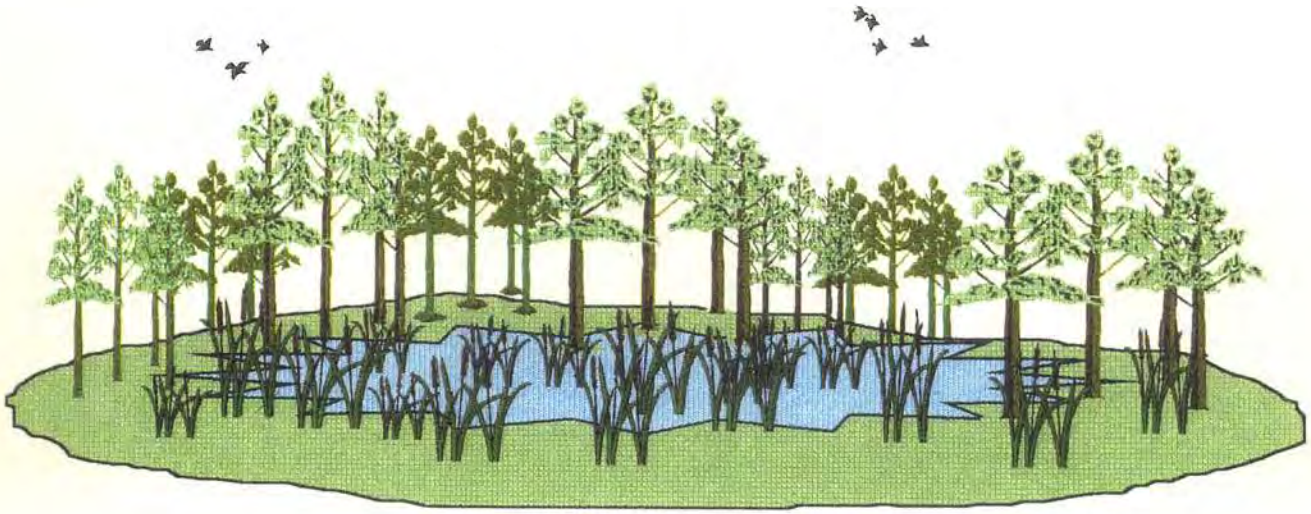
PFO5F	Freshwater Forested/Shrub Wetland	1,022.59	0.15059	1.51				
PFO5Fh	Freshwater Forested/Shrub Wetland	9.23	0.00136	0.01				
PFO5G	Freshwater Forested/Shrub Wetland	242.51	0.03571	0.36				
PFO6C	Freshwater Forested/Shrub Wetland	1,115.13	0.16421	1.65				
PFO6Cd	Freshwater Forested/Shrub Wetland	6.76	0.00100	0.01				
PFO6F	Freshwater Forested/Shrub Wetland	6,758.93	0.99531	10.00				
PFO6Fh	Freshwater Forested/Shrub Wetland	14.05	0.00207	0.02				
PFO6G	Freshwater Forested/Shrub Wetland	114.78	0.01690	0.17				
PFOG	Freshwater Forested/Shrub Wetland	4.66	0.00069	0.01	8.19	82.30	8.19	**82.30**
Total		**55,606.64**						
Scrub Shrub Dominated								
PSS1/EM1C	Freshwater Forested/Shrub Wetland	18.61	0.00274	0.03				
PSS1/FO1C	Freshwater Forested/Shrub Wetland	14.84	0.00219	0.02				
PSS1A	Freshwater Forested/Shrub Wetland	581.61	0.08565	0.86				
PSS1C	Freshwater Forested/Shrub Wetland	1,044.52	0.15381	1.55				
PSS1Ch	Freshwater Forested/Shrub Wetland	19.53	0.00288	0.03				
PSS1F	Freshwater Forested/Shrub Wetland	666.34	0.09812	0.99				
PSS1Fh	Freshwater Forested/Shrub Wetland	2.29	0.00034	0.00				
PSS1G	Freshwater Forested/Shrub Wetland	90.05	0.01326	0.13				
PSS1Gh	Freshwater Forested/Shrub Wetland	22.71	0.00334	0.03				
PSS1Hh	Freshwater Forested/Shrub Wetland	2.34	0.00034	0.00				
PSS6C	Freshwater Forested/Shrub Wetland	3.11	0.00046	0.00				
PSS6F	Freshwater Forested/Shrub Wetland	4.81	0.00071	0.01	0.36	3.66	0.36	**3.66**
Total		**2,470.77**						
Open Water								
Ponds								
PAB1H	Freshwater Pond	1.40	0.00021	0.00				
PAB6F	Freshwater Pond	64.36	0.00948	0.10				
PUB/FO2G	Freshwater Pond	104.98	0.01546	0.16				
PUB1H	Freshwater Pond	1.93	0.00028	0.00				
PUBF	Freshwater Pond	74.79	0.01101	0.11				
PUBFh	Freshwater Pond	2.96	0.00044	0.00				
PUBG	Freshwater Pond	567.30	0.08354	0.84				
PUBGh	Freshwater Pond	0.20	0.00003	0.00				
PUBGh	Freshwater Pond	0.28	0.00004	0.00				
PUBGh	Freshwater Pond	0.29	0.00004	0.00				
PUBGh	Freshwater Pond	1.80	0.00027	0.00				
PUBH	Freshwater Pond	45.65	0.00672	0.07				
PUBHh	Freshwater Pond	3,124.88	0.46017	4.63				
PUBHr	Freshwater Pond	28.66	0.00422	0.04				
PUBHx	Freshwater Pond	307.38	0.04526	0.45				
PUS3Ch	Freshwater Pond	14.32	0.00211	0.02				
PUS3Cx	Freshwater Pond	2.69	0.00040	0.00				
PUSAh	Freshwater Pond	1.88	0.00028	0.00				
PUSCh	Freshwater Pond	11.66	0.00172	0.02				

PUSCx	Freshwater Pond	3.66	0.00054	0.01	0.64	6.45	0.642	6.45
Total		**4,361.06**						
Riverine Open Water Wetlands								
R2UB3H	Riverine	85.46	0.01258	0.13				
R2UB3Hx	Riverine	482.13	0.07100	0.71				
R2UBH	Riverine	14.95	0.00220	0.02				
R2UBHx	Riverine	730.45	0.10756	1.08				
R4SBC	Riverine	0.16	0.00002	0.00				
R4SBCx	Riverine	0.04	0.00001	0.00				
R4USCx	Riverine	8.18	0.00120	0.01	0.19	1.96	0.195	1.96
Total		**1,321.37**						
Lakes								
L1UBH	Lake	50.78	0.00748	0.08				
L1UBHh	Lake	231.85	0.03414	0.34				
L1UBHx	Lake	118.49	0.01745	0.18				
L2UBHh	Lake	28.49	0.00420	0.04	0.06	0.64	0.06	0.64
Total		**429.61**						

APPENDIX D

ORIGINAL MADISON COUNTY WETLAND BANK MITIGATION PLAN

MADISON COUNTY
WETLAND BANK SITE PLAN



PREPARED BY
TENNESSEE DEPARTMENT OF TRANSPORTATION
IN COOPERATION WITH
TENNESSEE WILDLIFE RESOURCES AGENCY

OCTOBER 1996

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1. **USGS Topographical Map**
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4. **USDA Soil Survey Map**
5. **Hydrologic Features**
6. **Field Layout and Vegetation**
7. **Mitigation Bank Service Area Map**
8. **National Wetlands Inventory**
9. **Deed to Property**
10. **Restrictive Covenant**
11. **General Monitoring Design**

WETLAND BANK SITE PLAN
MADISON COUNTY, TENNESSEE

A. BANK GOALS AND OBJECTIVES

The Tennessee Department of Transportation (TDOT) in consultation with the U. S. Army Corps of Engineers (USACE), the Environmental Protection Agency (EPA), the U. S. Fish and Wildlife Service (USFWS), the Tennessee Wildlife Resources Agency (TWRA), the Tennessee Department of Environment and Conservation (TDEC) and the Federal Highway Administration (FHWA) has purchased 778.30 acres of land in Madison County, locally known as the Hoyte Hayes property for the development of a wetland bank (BANK). The site plan has been developed by TWRA who will assume jurisdiction over the entire 778.3 acres upon completion of the bank site. Completion of the bank is when all performance standards in this site specific wetland bank plan have been met and all wetland credits have been exhausted (See Topographic Map and Aerial Picture).

TDOT will operate the BANK in accordance with the approved General Wetland Banking Memorandum of Agreement (dated June 12, 1995).

The objective of the site plan is to: (1) Restore natural drainage that has been altered by ditches and levees, (2) Reforest approximately 424 acres in bottomland hardwoods, (3) Establish approximately 50 acres of moist soil plants. These objectives will result in the restoration of approximately 474.4 acres of jurisdictional wetlands.

B. TYPES OF WETLANDS AND PROJECTS PROPOSED FOR INCLUSION IN THE BANK

All types of wetlands that occur in West Tennessee and all types of development projects are perceived as potential candidates for the BANK.

C. DESCRIPTION OF BASELINE FEATURES

The BANK site area was at one time a valuable wetland. Historically, this area was dominated by bottomland hardwoods (oaks and cypress) with several natural drains meandering throughout the timber. The soil types in this area include Iuka fine sandy loam (Iu), Falaya silt loam (Fa), Grenada silt loam (GrB), Smithdale (SME), Waverly silt loam (Wa), and Ocklockonee fine sandy loam, (Oc). The majority of the area is in Wa and Fa soils (See Soils Map).

A levee and series of drainage ditches have been constructed on this site and with the use of large pumps, the area has been effectively drained to allow the planting and harvesting of cash crops. The levees have pushed floodwaters on neighboring lands and increased catastrophic flooding upstream by "bottle-necking" natural overbank flooding. Aerial and contour mapping have been developed for this area. A major goal of the site plan is to recreate the natural drain system in order to establish a functional wetland once again.

At the present time, approximately 243.9 acres is in existing bottomland hardwoods, 474.4 acres is prior converted wetland and the remaining 60± acres is considered upland. A copy of the deed is attached.

D. SITE SPECIFIC WETLAND MITIGATION PLAN

The Department of Transportation purchased a 20' easement on the northeast corner of the Hoyte Hayes property to provide access to the wetland bank site from State Route 20. Since the initial negotiations, Mr. Hayes has constructed a large ditch along the eastern property line. In order to gain access at this point, the ditch will have to be filled and relocated adjacent to the access road.

Hydrological Restoration

After completion of the access road, the cultivated areas within the bank site will be mowed and disked. The numerous cross drains that presently exist will be filled and the area leveled. The natural drainage way that once existed through this area will be restored (See Hydrologic Features Map). The drainage way will be approximately 45' wide at the top and approximately 2' deep. A 4' high levee will be constructed in the large field along the northern boundary of the wetland bank site. The levee will be 20' wide at the top. Pipes with downstream flap gates will be installed at appropriate locations to insure adequate drainage on private property. The levee will also serve as an east/west access road around the bank site. The main levee will be breached at eleven (11) locations as shown on the attached drawing. The breaches will be a minimum of 300' long. The material will be used to fill the existing ditch in front of the levee and may also be used to construct the 4' levee along the northern boundary. The breaches in the levee will allow overbank flooding from the river to saturate the entire bank site area during periods of high flow and also allow the water to recede naturally.

Vegetative Plantings

After the bank site is leveled and the natural drainage way restored and the 4' levee is constructed along the northern boundary tree planting will begin. A diversity of species will be planted, which will include, *Swamp Chestnut Oak* (Quercus michauxii). *Willow Oak* (Quercus phellos), *Nuttall Oak* (Quercus nuttallii), *Pin Oak* (Quercus palustris), *Cherry Bark Oak* (Quercus pagoda) and *Cypress* (Taxodium distichum). The Cypress seedlings will be planted along the top and on either side of the main drain and west of the power lines. Cypress will also be planted south of the main drain in the field along the western boundary of the bank site. The other species will be randomly mixed and planted east of the powerline and north of the main drain as shown on the attached planting scheme. All species will be planted at the rate of 450 per acre. Planting will be accomplished during the appropriate seasons (See Field Layout and Vegetation Map).

The natural colonization of other native species that surround the site is anticipated. The objective is to have at least 300 stems per acre of hard mast producing trees within five years of planting.

In the area north of the restored drainage way in the western part of the large field a 50 acre site of moist soil plants will be established (See Field Layout and Vegetation Map). This area will be allowed to revegetate naturally. Unwanted species will be eliminated by controlled burning. TWRA will determine what species are acceptable and when controlled burning should take place.

In addition to revegetating the main field, two other smaller areas will be restored. On the west end of the bank site is a 134 acre field. The lower portion of this field, approximately 73 acres, will be revegetated. The second area is located immediately east of this field, just south of the railroad and is approximately 20 acres in size. Both areas will be planted in bottomland hardwoods.

The goal is to generally replicate historical bottomland hardwoods. The planting of the seedlings will be implemented under the guidance of TWRA Wildlife Foresters.

Wetland Creation

In the upper section of the field located along the western boundary is 60 acres of land that may be developed into jurisdictional wetlands. This would involve constructing two low level terraces with drop-log structures. The soils in this area are Iuka. Since this is the only area that involves construction of wetlands, it will not be included in calculating pre-credits. If after further evaluation it is determined that this area is not suitable for wetland creation and credit cannot be given as an upland site, it will be withdrawn from the bank site (See Field Layout and Vegetation Map).

Construction Sequencing

TARGET DATES		
Phase I	Bush hog bank site.	Fall 1996
Phase II	Secure any needed permits to construct a 4' levee, fill ditches and install drainage pipes. Prepare preliminary monitoring proposal.	Winter 1996
Phase III	Construct access road, disk and level site, fill in ditches, construct 4' levee and restore natural drainage.	Summer 1997
Phase IV	Plant trees.	Winter 1997/ Spring 1998
Phase V	After all trees have been planted, breach levee and fill in sections of large canal in front of levee.	Summer 1998
Phase VI	Establish soil, hydrology and plant test plots and begin monitoring.	Summer/Fall 1998

These dates are tentative and are dependent upon receiving needed permits, state contractual requirements and mother nature.

Methodology for Perpetual Protection

The wetland bank site will be developed under the supervision of TWRA. When the Mitigation Bank Review Team (MBRT) determines the bank to be complete, TDOT will transfer jurisdiction to TWRA. It is TWRA's intent to develop this site into a Wildlife Management Area

and eventually into a Wildlife Refuge if they are successful in acquiring additional lands adjacent to the bank site. Since TWRA is recognized as the agency having jurisdiction over the States wetlands, this bank site will be subject to TWRA rules and regulations.

TWRA will manage this site in perpetuity as a wetland. TWRA will manage the site in such a manner that wetland functions are not purposely altered from those established at the time of completion of the bank.

TWRA will provide adequate wildlife protection for the proper enforcement of the game and fish laws, rules and regulations made pursuant to the game and fish laws of the State of Tennessee.

TWRA will post the area with appropriate wildlife management signs and assume all responsibility with regard to any hunts, or hunting conducted within the project area.

The wetland mitigation site shall be protected and placed under deed restrictions. These restrictions shall be attached to a deed to protect, in perpetuity, the aesthetic, educational, or ecological values of the mitigation site and shall contain covenants prohibiting certain uses such as, but not limited to: removal, alteration, or destruction of any vegetation or natural habitat; (except for the area that is being developed as a moist soil habitat) agricultural, commercial, or industrial activity; any filling, excavating, or dredging; any construction or placing of buildings or structures; any disruption of any free-flowing waters, or alteration of natural watercourses. The MBRT, after the BANK is complete, will be responsible for determining the appropriate language for the final deed restriction. A copy of the Restrictive Covenant is attached and if approved by the MBRT, will be executed upon completion of the BANK.

E. SERVICE AREA DESCRIPTION

The service area for the BANK includes the entire Forked Deer River watershed and all contiguous counties to Madison County. The mitigation ratio inside the Service Area is 2:1, impacts outside the Service Area is 4:1. Under special circumstances the ratios inside and outside the Service Area may be adjusted at the discretion of the MBRT (See Mitigation Bank Service Area Map).

F. PERFORMANCE STANDARDS FOR DETERMINING SUCCESS

1. Minimal survival rates for vegetational plantings:

   a.) At least 300 trees per acre shall be hard mast producing species which have been established on-site for five consecutive years.

   b.) In established moist soil habitats a 75% coverage of approved species or other desirable species as approved by the TWRA shall be maintained for five consecutive years.

c.) All plantings shall meet federal delineation manual specifications for hydrophytic vegetation.

2. Annual monitoring reports:

a.) Vegetation - Reports will document the survival rate described in #1 above. Invasive species will be documented, as well as, target (planted) species. Relative dominance of species by stratum will be presented. Herbaceous layer variations may be used as an indicator of hydrologic conditions. Vegetative monitoring will initially take place in early summer and fall. Vegetation will be monitored twice a year for the first two years. The MBRT will be notified when tree planting is completed.

b.) Soils - Reports will document any changes in soil indicators of hydrology. Prior to commencing monitoring, an MBRT approved soil monitoring plan will be established.

c.) Hydrology - Reports will document the restoration of hydrology. Hydrologic indicators, hydroperiods, and sources of hydrology will be identified. Hydrology at reference sites on adjacent forested wetlands will be used as a comparison to determine performance success of this parameter. Monitoring devices will be installed to monitor hydrology. A minimum of 10 hydrology sites will be established. Prior to commencing monitoring, an MBRT approved hydrological monitoring plan will be established.

d.) Monitoring - Reports will begin when the MBRT determines that sufficient work has taken place on-site to begin monitoring. All monitoring reports will be submitted to the members of the MBRT. Changes in monitoring frequency will be determined by the MBRT. Monitoring will include an assessment of site conditions at the reference site including the minimum parameters assessed at the banksite. Successful attainment of wetland functions will be determined by the MBRT. The MBRT will discuss the need for remediation based on site visits and information supplied in the annual monitoring reports.

3. Remedial actions and responsibilities:

Minimal survival rates (stated in #1 above) will be maintained by replanting when minimum standards are not achieved. Where restoration of hydrology fails, minimal design or re-design of hydrological features will be implemented.

If mitigation measures fail and jurisdictional wetlands do not develop and credit cannot be given as either an upland site or buffer zone, the affected acres will be withdrawn from the bank site.

4. Assurance from TDOT of financial responsibility for remedial actions:

TDOT is responsible for the planning, funding development and management of the BANK until jurisdiction is relinquished to TWRA.

5. After the MBRT has determined the BANK to be complete, a final wetland delineation that meets the approval of the USACE and TDEC will be conducted.

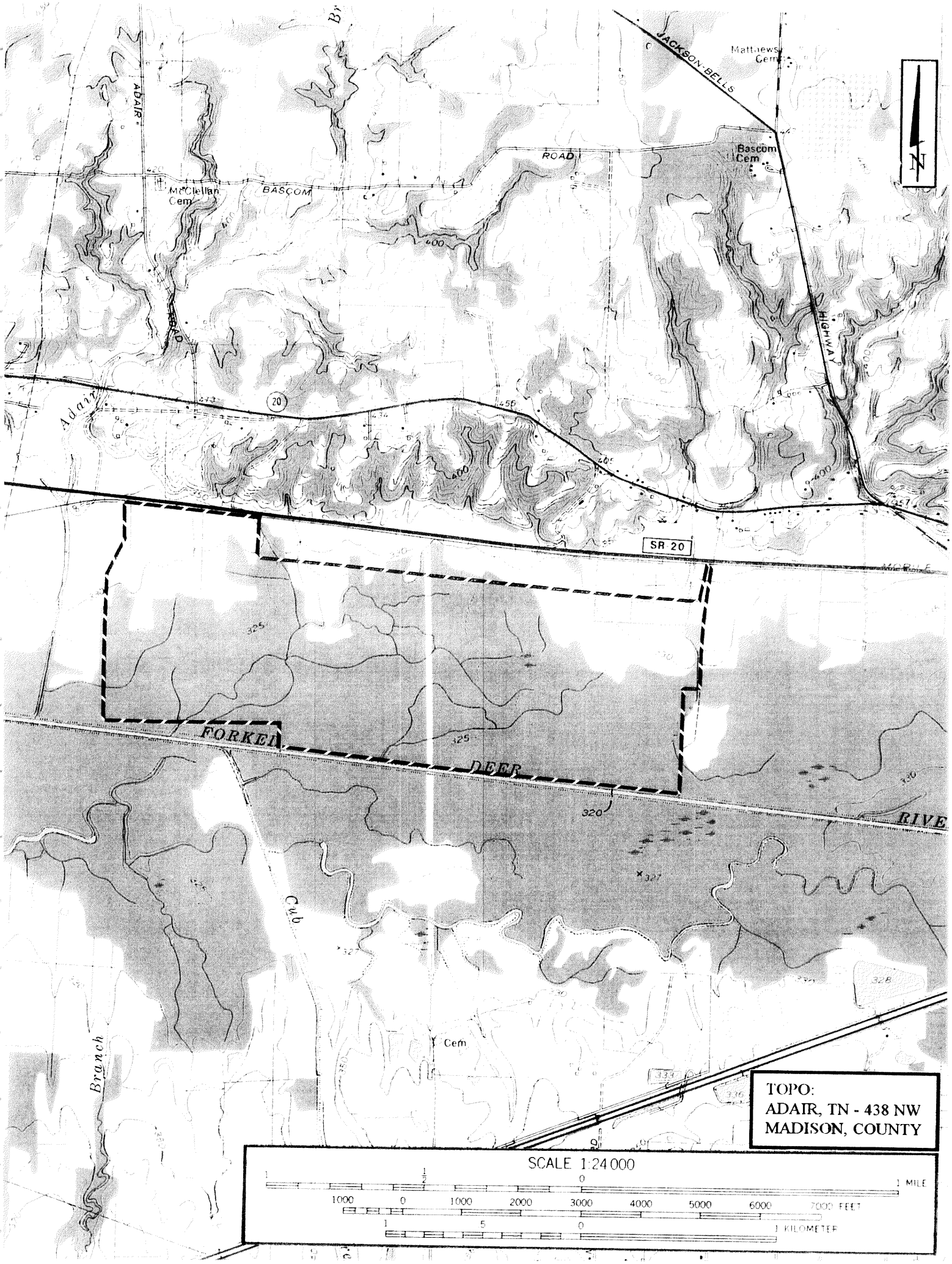
G. PRECREDITS

The BANK site encompasses an area of 778.3 acres. Approximately 243.9 acres are existing wetlands, 424.4 acres are being restored to bottomland hardwoods, 50 acres are being restored to a moist soil habitat, and 60 acres involve wetland creation.

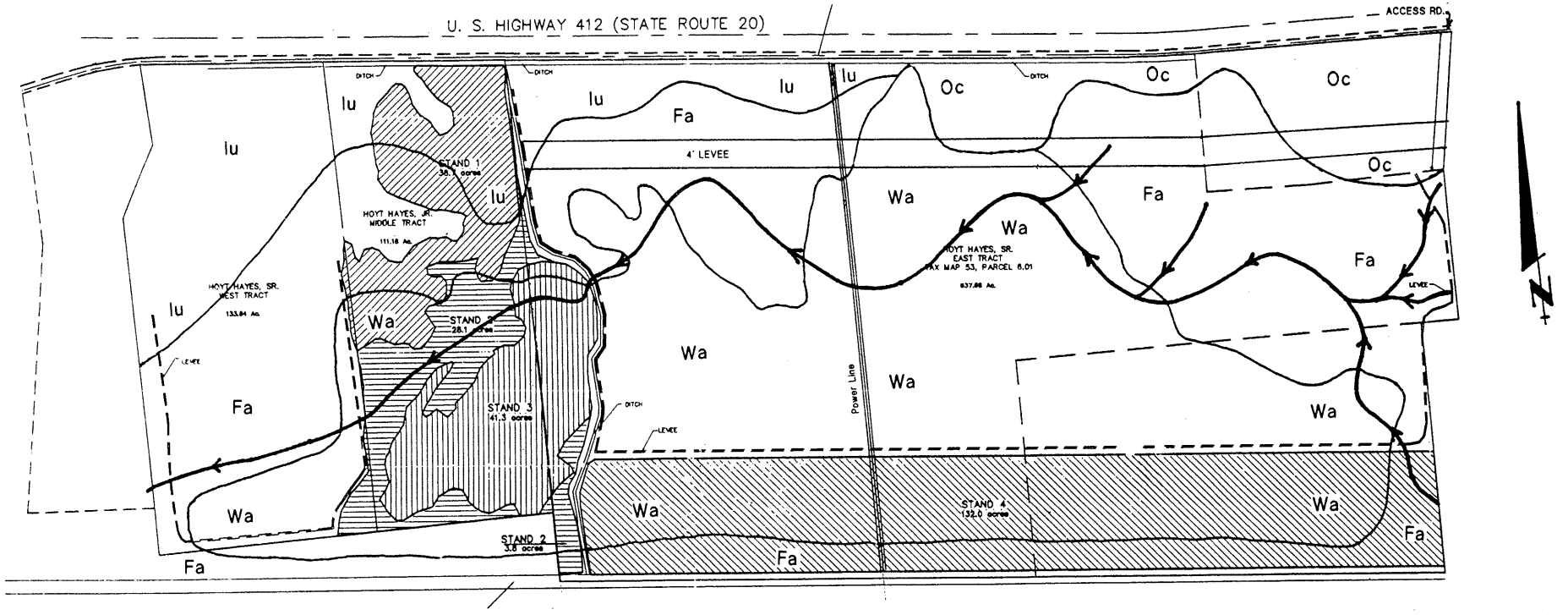
Credits generated by varying habitat types will be accounted for separately. Varying types of impact site acres can be banked against banksite habitat types in the following ways: There are 424.4 credit acres of forested wetlands that can be used as mitigation for all types of wetland impacts which include forested, emergent and open water wetlands. There are 50 credit acres of emergent and open water wetlands that can be used as mitigation for emergent and open water wetlands.

The BANK has the potential for restoration of 474.4 acres and preservation of 243.9 acres. The established pre-credits determined by the MBRT at this BANK is 237.2 acres.

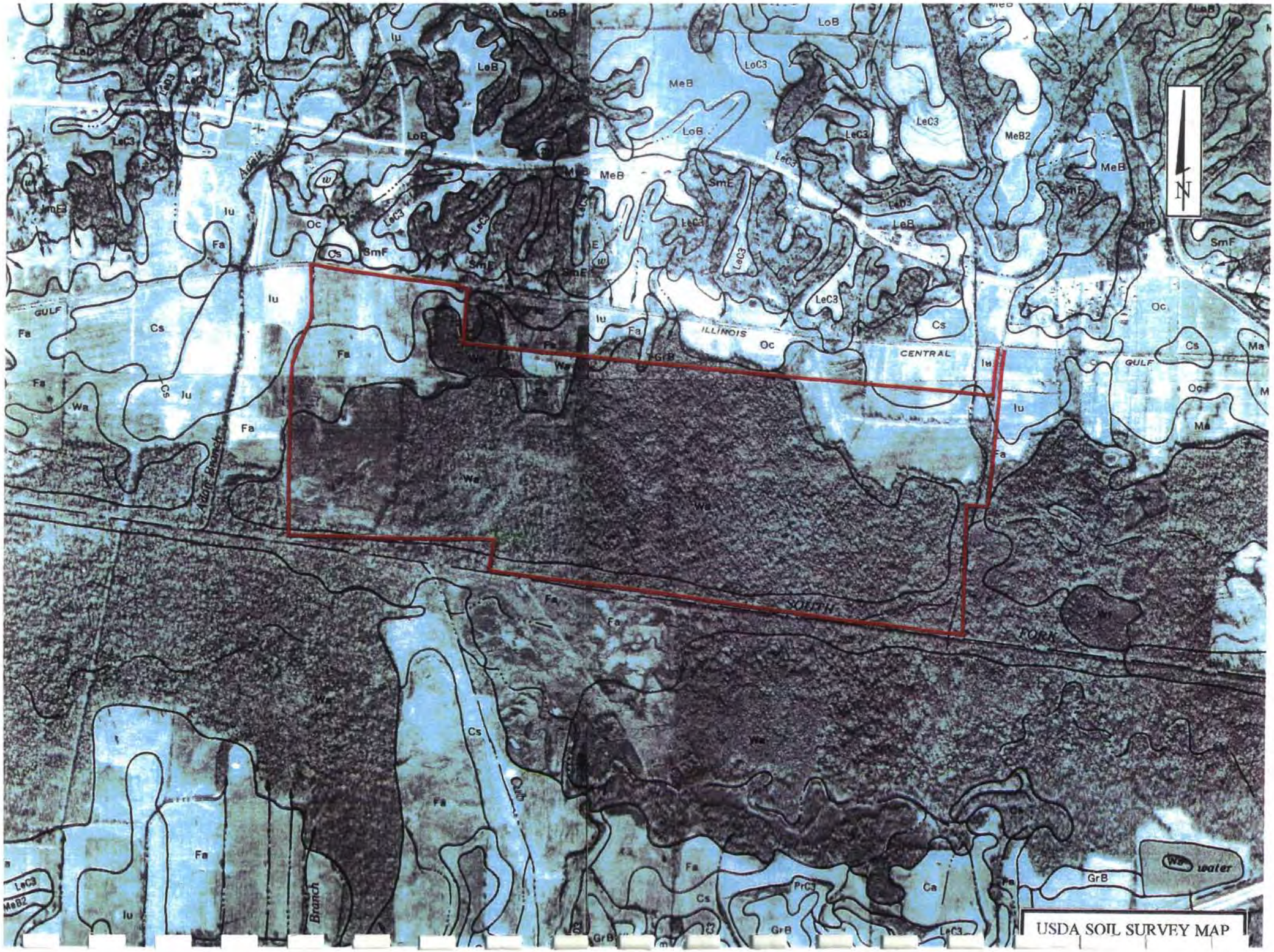
Approximately 243.9 acres of preservation is immediately available at the BANK and may only be used under exceptional circumstances to be determined by the MBRT. These acres are not considered pre-credits. The 60 acre creation site is not considered in calculating pre-credits.


JACKSON-BELLS
Matthews Cem
ROAD
Bascom Cem
ADAIR
McClellan Cem
BASCOM
HIGHWAY
Adair
20
SR 20
FORKED
DEER
RIVE
Cub
Branch
Cem
N
TOPO:
ADAIR, TN - 438 NW
MADISON, COUNTY
SCALE 1:24 000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

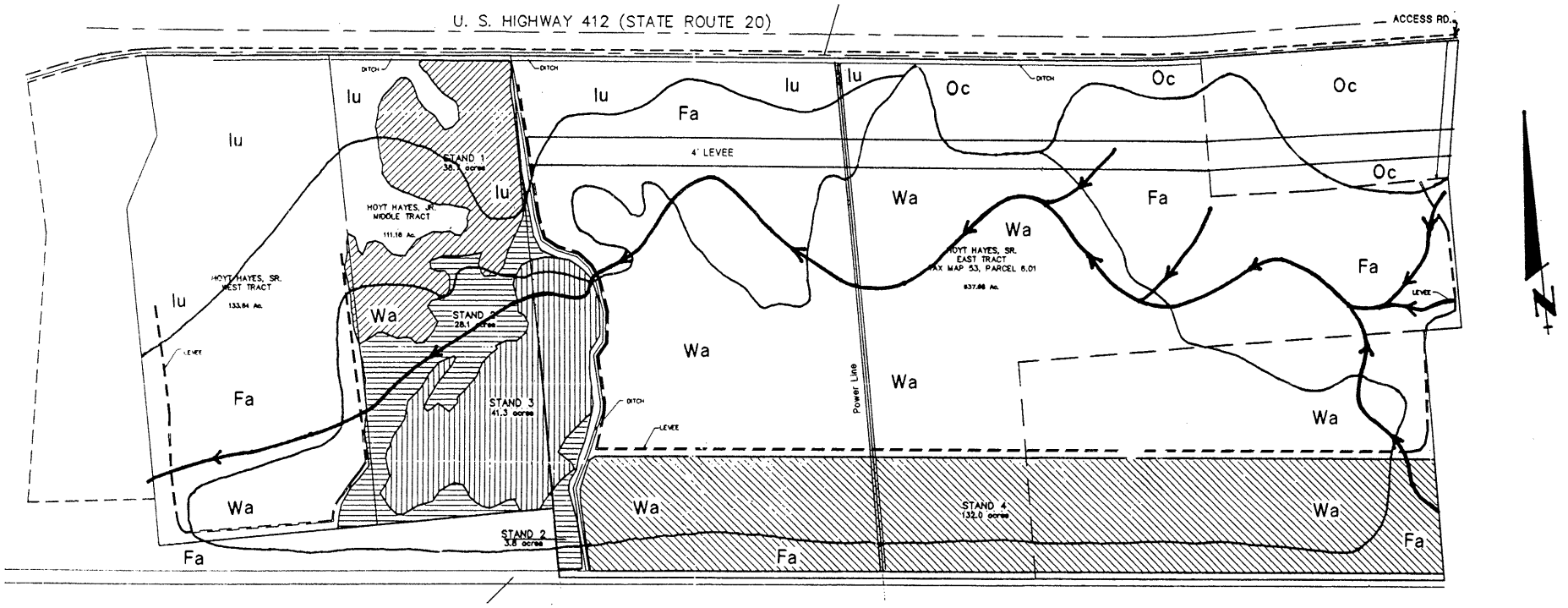
SOILS MAP



Wa -Waverly silt loam
Fa, - Falaya silt loam
Oc - Ochlockonee fine sandy loam
Iu - Iuka fine sandy loam

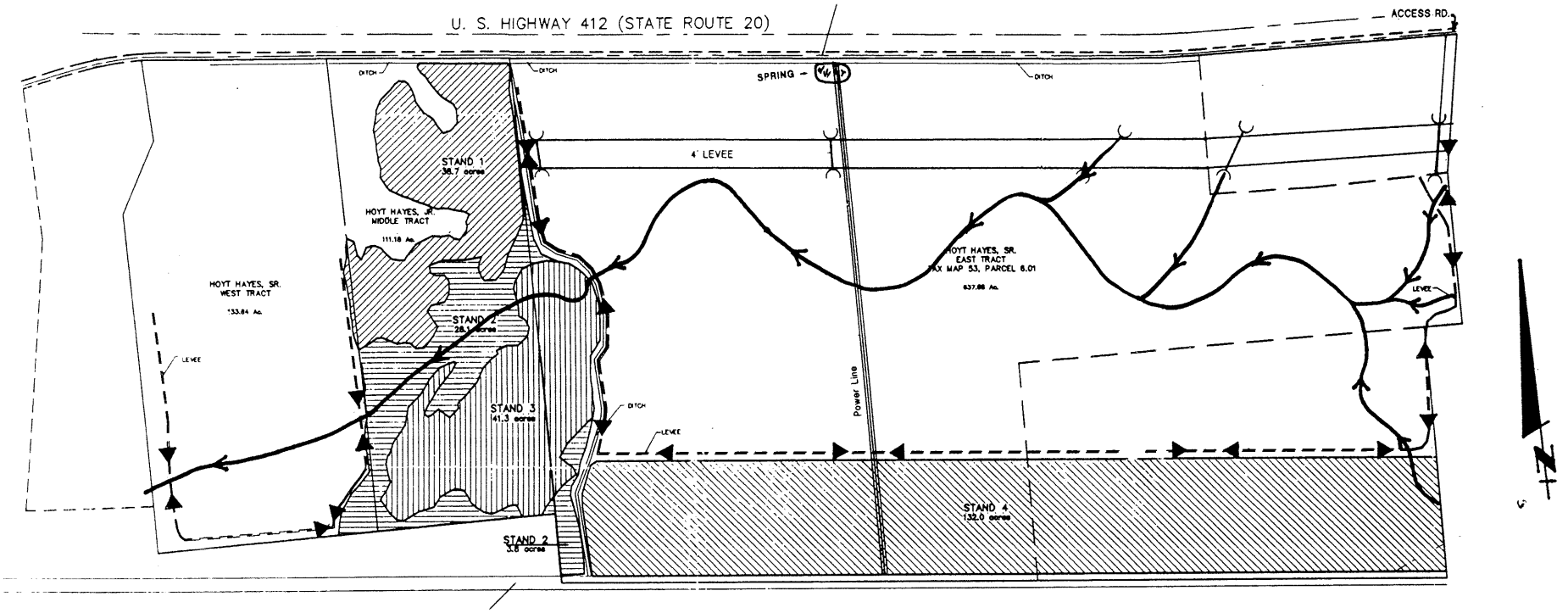

LoB
LeC3
MeB
MeB2
SmE
SmF
LeD3
Oc
Cs
Fa
Wa
Ma
GrB
PrC3
Ca
Ln
GULF
ILLINOIS
CENTRAL
SOUTH
FORK
Adair Branch
Water
N
USDA SOIL SURVEY MAP

SOILS MAP

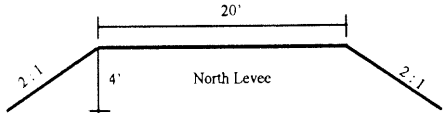


Wa -Waverly silt loam
Fa, - Falaya silt loam
Oc - Ochlockonee fine sandy loam
Iu - Iuka fine sandy loam

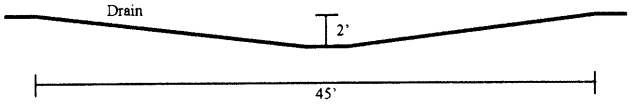
HYDROLOGIC FEATURES



CROSS - SECTION OF 4' NORTHERN LEVEE



CROSS - SECTION OF RESTORED DRAINAGE



-EXISTING WETLANDS

-RESTORED DRAINAGE SYSTEM

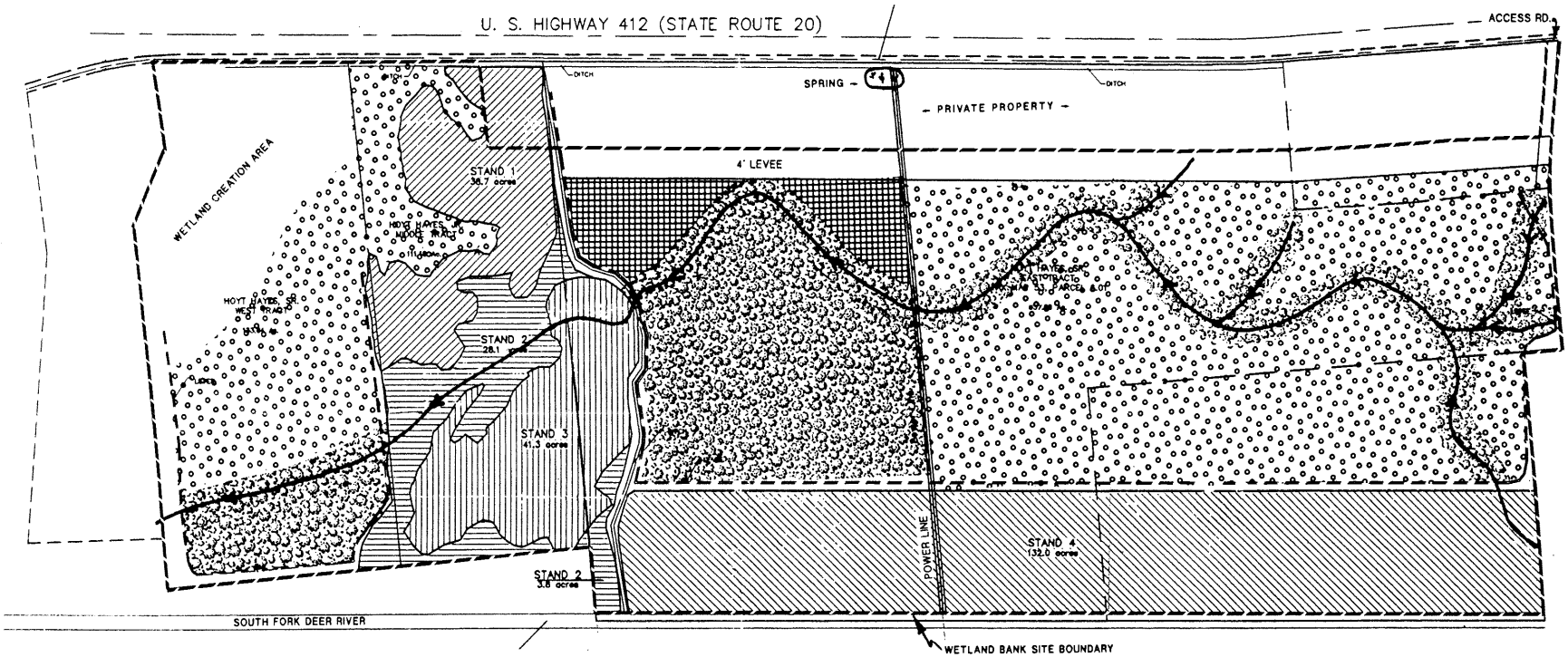
-LEVEE BREECH

-DRAINAGE STRUCTURE

FIELD LAYOUT

AND

VEGETATION



-CYPRESS

-MIXED OAKS- Swamp Chestnut Oak, Willow Oak, Nuttall Oak, Cherry Bark Oak, Pin Oak

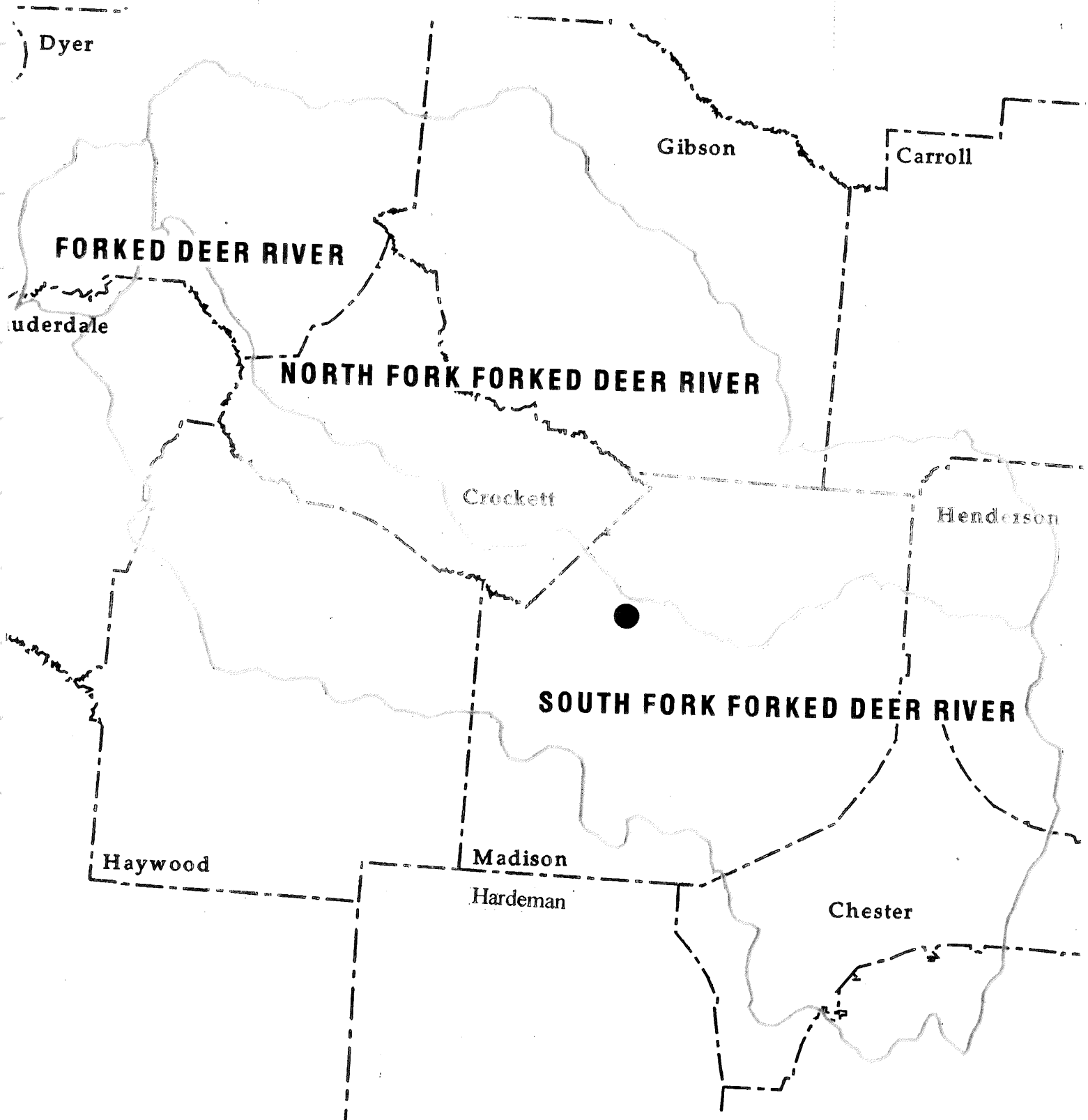
-MOIST SOIL HABITAT

-EXISTING WETLANDS

-RESTORED DRAINAGE SYSTEM

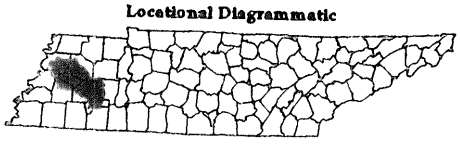
FORKED DEER RIVER BASIN

Mitigation Bank Service Area



N

Locational Diagrammatic



LEGEND

Scale: 1 inch = 8.29 miles

Forked Deer River Basin

County Boundaries

RESTRICTIVE COVENANT

THIS RESTRICTIVE COVENANT ("Covenant") is hereby made this _____ day of _____, 1996, by the undersigned owner of a certain tract of real property in Madison County, Tennessee, which includes the property more specifically described in the attached deed and by this reference made a part hereof (the "Property").

WHEREAS, the State of Tennessee, herein referred to as the Owner, is developing the Madison County Mitigation Bank, hereinafter referred to as the Bank.

WHEREAS, the Bank is being developed within the framework of the General Wetland Banking Memorandum of Agreement dated June 12, 1995, (the "Memorandum of Agreement" including any amendments hereafter adopted) and the site specific Madison County Wetland Bank Site Plan. Copies of the Memorandum of Agreement are available from the Memphis District Office of the United States Army Corps of Engineers.

NOW, THEREFORE, in consideration of the premises and the benefits obtained by the Owner from the institution of this mitigation bank and for other consideration the receipt and adequacy of which are hereby acknowledged, the Owner does hereby covenant and agree to restrict, and does by this instrument intend to restrict, the future use of the property as set forth below, by establishment of this Covenant running with the Property:

1.

The intent of the Owner in placing these restrictions upon the use of the property is to insure that the property shall remain as developed under the Madison County Wetland Bank Site Plan in perpetuity for the purpose of conservation and protection of wetlands and wildlife habitat and shall not be altered from that state by human intervention.

2.

Upon completion of the restoration of wetland systems defined by differing vegetative community types, the property shall be managed in a manner that will insure the intent of the Madison County Wetland Bank Site Plan, and preserve the types, functional values, quality of wetlands and wildlife habitat developed under the Madison County Wetland Bank Site Plan. At no time may the hydrologic parameters of the wetlands at the site be altered in a manner that will change their jurisdictional status from the statutory definition in effect as of the date of the original Memorandum of Agreement.

The actions encompassed as prohibited by this Covenant shall include but shall not be limited to the following: forestry activities and hydrological alteration that would be inconsistent with the requirements, goals and objectives of the Madison County Wetland Bank Site Plan, cultivation, filling, placement of refuse, waste, sewage, other debris or any hazardous substances on the property, grazing of domesticated animals, or the raising of any structure on the property, whether temporary or permanent, except minimal structures for the observation of wildlife and wetlands with the prior approval of the U. S. Army Corps of Engineers (U.S.A.C.E.) and the Tennessee Department of Environment and Conservation (T.D.E.C.).

3.

The Owner, its successors and assigns, shall retain all other customary rights of ownership, including but not limited to the exclusive possession of the Property, the right to use the Property in any manner not prohibited by this Covenant and which would not defeat or diminish the purposes of this Covenant. The restrictions and covenants contained in this constitutes a perpetual servitude upon and run with the Property. Owner hereby expressly grants the Environmental Protection Agency (E.P.A.), the U.S.A.C.E. and the T.D.E.C. authority to enforce the provisions of this Covenant. This authority to enforce granted to the U.S.A.C.E., E.P.A. and the T.D.E.C. shall not preclude or diminish the rights of any other parties at law or equity to enforce the provisions of this Covenant.

4.

It is recognized that there exists within the implementation procedures outlined in the General Wetland Banking Agreement a potential for modification to the General Wetland Banking Agreement, as well as the Wetland Bank Site Plan , and that this could affect, for example the prescribed management activities at the Madison County Wetland Bank Site.

5.

If this Covenant is terminated by operation of law, owner, its successors and assigns, shall renew this Covenant or, if necessary, execute and record an appropriate, effective and enforceable substitute instrument and shall provide a copy thereof to the Memphis District Office U.S.A.C.E., E.P.A., T.D.E.C., U.S.F.W.S. and T.W.R.A.

IN WITNESS WHEREOF, Owner, by its duly designated representative, has hereto set its hand and seal of the date first above written.

OWNER:

The State of Tennessee

By: _____

Title: _____

Date: _____

Witness: _____

Witness: _____

STATE OF: _____

COUNTY OF: _____

Sworn to before me and subscribed in my presence this _____ day of _____, 19_____.

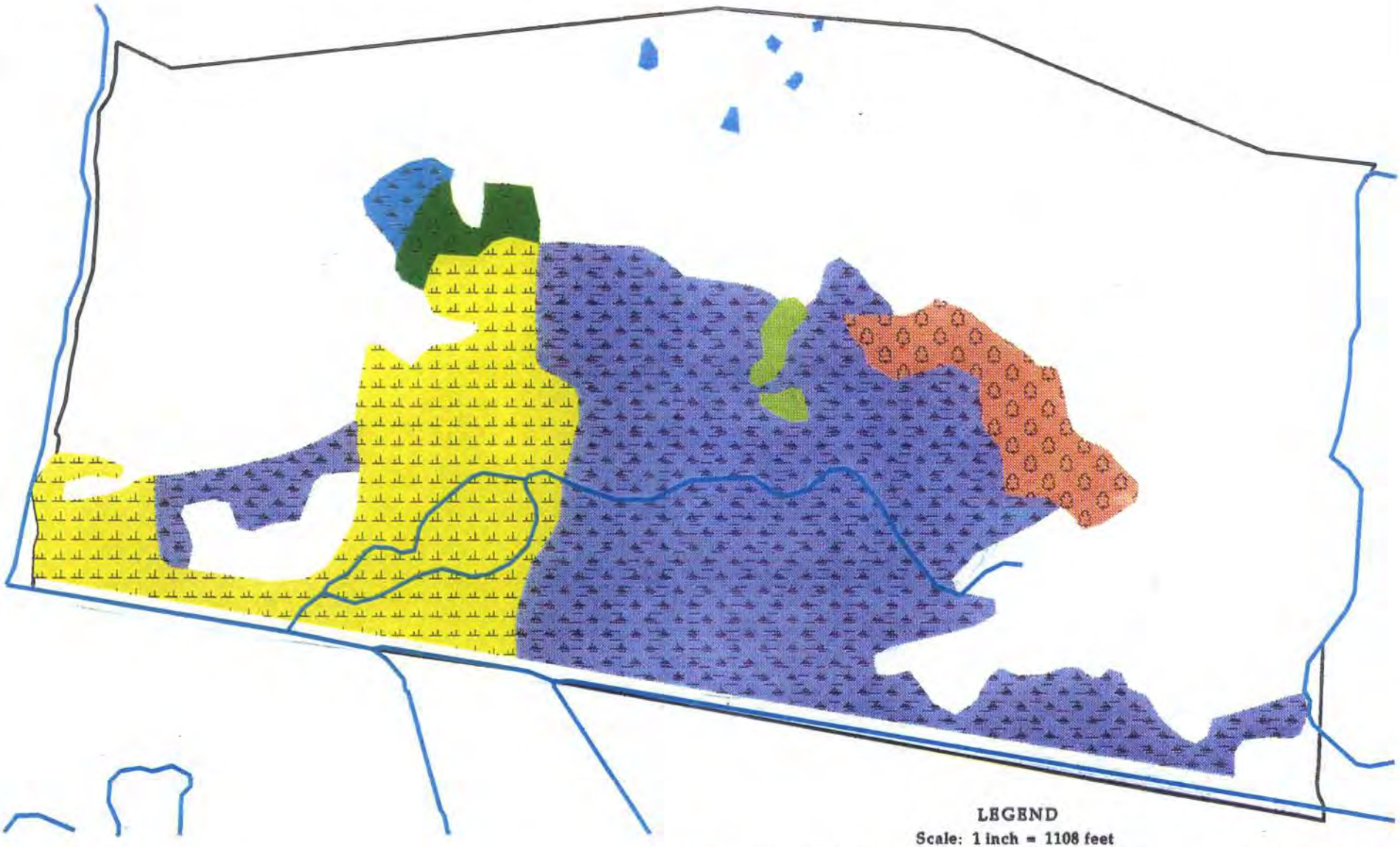
_____

Notary Public

My commission expires: _____

NATIONAL WETLANDS INVENTORY

Portion of Adair, TN Quadrangle

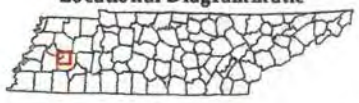


LEGEND

Scale: 1 inch = 1108 feet

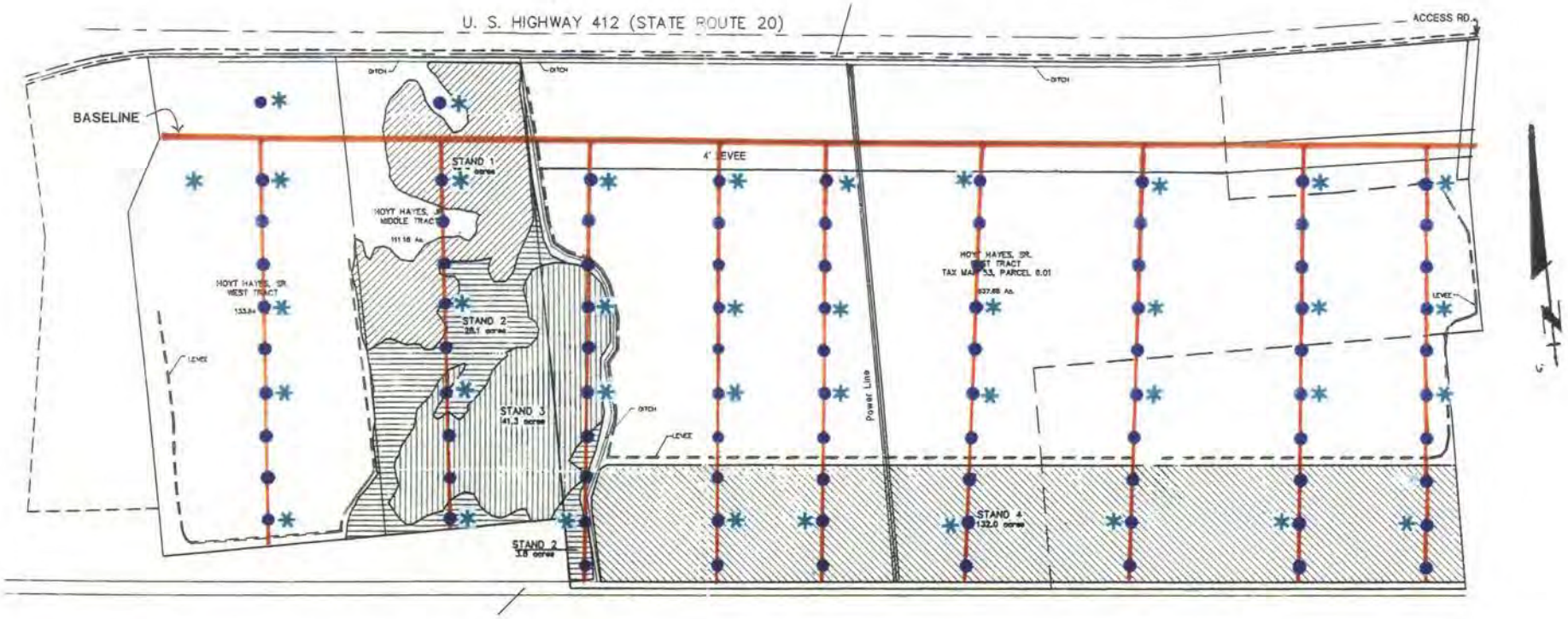
- Diked/Impounded Open Water
- Temporary Persistent Emergent Wetland
- Seasonal Persistent Emergent Wetland
- Temporary Broad-leaved Deciduous Wetland
- Seasonal Broad-leaved Deciduous Wetland
- Semipermanent Deciduous Wetland
- Seasonal Scrub/Shrub Wetland
- Streams
- Project Area Boundary

Locational Diagrammatic



GENERATED BY THE TVA GEOGRAPHIC INFORMATION SYSTEM, JULY 1996.

GENERAL MONITORING DESIGN



- TRANSECTS

● - REPRESENTATIVE WETLAND OBSERVATION POINTS (MINIMUM 10 PER TRANSECT)

✱ - GENERAL MONITORING WELL LOCATIONS

Location and Number of Transects and Observation Points Will Be Adjusted Based on Field Condition.

APPENDIX E

SITE PROTECTION AND TWRA MOA

TENNESSEE WILDLIFE RESOURCES AGENCY

Region I
200 Lowell Thomas Drive
Jackson, Tennessee 38301

MEMO

To: Ray Brisson
From: Robert N. Smith, Wildlife Manager 2 RNS
Subject: Madison County Wetland Bank Agreement
Date: August 28, 1998

Here is the signed agreement for the Madison County Wetland Bank (South Fork Refuge). If you need any further information let me know.

Copy

MEMORANDUM OF AGREEMENT ESTABLISHING THE DOT MITIGATION BANK REFUGE

This agreement between the Tennessee Department of Transportation(TDOT) and Tennessee Wildlife Resources Agency(TWRA) establishes a Refuge on land owned and being developed by the TDOT as a wetland mitigation bank and TWRA who manages the wildlife resource for the State of Tennessee to enforce all laws pertaining to its establishment as a Refuge.

The land is located northwest of Jackson, Tennessee on Highway 412 approximately 3 miles north of Interstate 40 exit 79. The land is approximately 780 acres in size, with the majority of the area planted to oak and cypress seedlings.

This agreement allows the TWRA to declare and establish a Refuge on this land, but does not restrict the TDOT from doing any development or maintenance work toward establishment of the area as a mitigation bank. This agreement also allows the TDOT to enter onto the property at any time and do any work they deem necessary toward development of the area as a mitigation bank.

TENNESSEE DEPARTMENT OF TRANSPORTATION
REPRESENTATIVE:

TENNESSEE WILDLIFE RESOURCES AGENCY
REPRESENTATIVE:

This instrument was prepared by:
Tennessee Department of Transporation

STATE OF TENNESSEE
COUNTY OF MADISON

NOTICE OF LAND USE RESTRICTIONS
("MADISON COUNTY WETLAND MITIGATION BANK")

Notice is hereby given that pursuant to their respective authorities found at Tennessee Code Annotated (T.C.A.) Section 68-212-225 and 33 Code of Federal Regulations (CFR) Section 332.7(a), the Commissioner of the Tennessee Department of Environment and Conservation ("TDEC") and the Nashville District Engineer of the United States Corps of Engineers ("USACE") have determined that land use restrictions are an appropriate remedial action at the below-described property. Pursuant to T.C.A. Section 68-212-225(d) the register of deeds shall record this Notice and index it in the grantor index under the names of the owners of the property.

WITNESSETH:

WHEREAS, Tennessee Department of Transportation (Grantor), is the owner of approximately 778.3 acres of real property described in a Deed of record with the Madison County Tennessee Register of Deeds, Tract Number _____, herein after referred to as the "Property"; and,

WHEREAS, the Property is shown on a survey drawn by _____ dated _____, attached hereto as **Exhibit A** and incorporated herein by reference; and,

WHEREAS, the Property possesses natural resources with significant aquatic, ecological and habitat values ("Conservation Values"). These natural resources are of aesthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people. These values include Waters of the U.S., as defined in 40 C.F.R § 122.2 (Oct. 1, 2009), including streams, wetlands and the adjacent uplands, and other native vegetation and wildlife. These natural resources are of great importance to both TDEC, the Grantor, and the United States Army Corps of Engineers ("USACE");

WHEREAS, the Property has been approved by USACE for use as mitigation pursuant to and as defined in 33 C.F.R. Part 332 (April 10, 2008);

WHEREAS, the Property has been identified as being occupied by, or as being potential habitat for species of native plants and wildlife which Grantor desires to establish, preserve, protect, restore and enhance;

WHEREAS, on or about _____, the Commissioner of the Department of Environment and Conservation (TDEC) issued Aquatic Resource Alteration Permit **(ARAP) Number _____** to Grantor; and,

WHEREAS, on or about _____, the Nashville District Engineer of the USACE issued an **Individual Permit (IP) [OR "verified Nationwide Permit (NWP)" or "General Permit (GP)"] Number _____** pursuant to Section 404 of the Clean Water Act (CWA) to Grantor; and,

WHEREAS, the referenced ARAP and CWA permits and approval of the Property for use as mitigation under 33 C.F.R. Part 332 require that certain uses of the Property be restricted.

WHEREAS, it is the purpose of this Notice to ensure that the Property will be retained forever in an open space condition and to prevent any use of the Property that will impair or interfere with the Conservation Values of the Property. Grantor intends that this Notice (i) will assure that the Property will be used for such activities that are consistent with the purposes of this Notice and (ii) shall be implemented consistently with the referenced ARAP and CWA Permits.

NOW, THEREFORE, in consideration of the foregoing, Grantor hereby declares that the Property should be held, sold, and conveyed subject to the following land use restrictions. Said land use restrictions shall run with the land and shall be binding on all parties having any right, title, or interest in the Property or any part thereof, their heirs, successors, successors-in-title, and assigns, and shall inure to the benefit of each owner thereof and to TDEC and the respective successors and assigns of such parties:

Land Use Restrictions:

A. **Uses**. There shall be no commercial or industrial activity undertaken or allowed; nor shall any right of passage across or upon the Protected Property be allowed or granted if that right of passage is used in conjunction with commercial or industrial activity.

B. **Vegetation**. There shall be no removal, destruction, cutting, or spraying with biocides of any vegetation, nor any disturbance or change in the natural habitat in any manner, excepting activities (*e.g.*, invasive species eradication and access road upkeep) that are essential to the maintenance of the Property as a protected natural area. There shall be no planting or introduction of any vegetation except as described in the Aquatic Resource Alteration Permit NRS # _____, the CWA Permit, or in the final mitigation plan attached hereto as **Exhibit B.**

C. **Topography**. Except as permitted under the referenced ARAP and CWA Permits or as described in the final mitigation plan, there shall be no filling, excavating, dredging, mining, or drilling, no removal of topsoil, sand, gravel, rock, minerals or other materials, nor any dumping of ashes, garbage, or of any other material not required for the Property's maintenance as a protected natural area, and no changing of the topography of the land in any manner, excepting activities (*e.g.*, wetland restoration, restorative streambank grading) that are essential for the management of the Property as a protected natural area.

D. **Building**. There shall be no construction or placing of buildings, mobile homes, advertising signs, billboards, or other structures, excepting notice signs as required by the referenced ARAP or CWA Permits.

E. **Roads**. Except as permitted under the referenced ARAP and CWA Permits there shall be no building of new roads or any other rights of way, nor widening of existing roads, excepting access routes and trails required for the management of the Property as a natural area.

F. **Waters**. Except as permitted under the referenced ARAP and CWA Permits or as described in the approved mitigation plan, there shall be no draining, ditching, diking, dredging, channelizing, damming, pumping, or impounding; no changing the grade or elevation, impairing or diverting the flow or circulation of waters, or reducing the reach of waters; and no other discharge or activity requiring a permit under applicable clean water or water pollution control laws and regulations, as amended.

G. **Vehicles**. There shall be no operation of dune buggies, motorcycles, or any recreational all-terrain vehicles, or any other types of motorized vehicles, excepting work vehicles (*e.g*., tractors, backhoes, work trucks) required to maintain the Property as a protected natural area.

H. **Non-Native/Exotic Species.** There shall be no introduction of non-native or exotic species to the Property.

I. **General.** There shall be no use of the Property which may adversely affect the purpose of this Notice.

Other Provisions:

A. **Entrance and Inspection.** Any owner of a portion of the Property and USACE and TDEC shall have the right to enter and inspect the Property and may enforce this Notice of Land Use Restrictions by means of a civil action.

B. **Enforcement.** The grantor grants USACE and TDEC, as third party beneficiaries hereof, a discretionary right to enforce these restrictive covenants in a judicial action against any person or other entity violating or attempting to violate these restrictive covenants; provided, however, that no violation of these restrictive covenants shall result in forfeiture or reversion of title. In any enforcement action, an enforcing agency shall be entitled to complete restoration for any violation, as well as any other remedy available under law or equity, such as injunctive relief and administrative, civil or criminal penalties. No omission or delay in acting by USACE and/or TDEC shall bar subsequent enforcement rights or constitute a waiver of any enforcement right. These enforcement rights are in addition to, and shall not limit, enforcement rights available under other provisions of law or equity, or under any applicable permit or certification. Nothing herein shall limit the right of the USACE to modify, suspend, or revoke the referenced CWA Permit. Nothing herein shall be construed to authorize the USACE or TDEC to institute proceedings

against the owner for changes to the Property due to acts of God, natural disasters, or unauthorized acts of third parties outside the control of the grantor so long as the compensatory mitigation is completed and determined by the USACE and TDEC to be successful in accordance with the Mitigation Plan.

C. **Term.** This Notice of Land Use Restrictions shall run with and bind the Property in perpetuity unless/until this Declaration shall be made less stringent or canceled as set forth under the paragraph entitled "Amendment and Termination."

D. **Amendment and Termination.** This Notice of Land Use Restrictions may be waived, amended, modified, or terminated at any time for cause by and upon the agreement of both the Commissioner of TDEC and USACE. No amendment to this Notice of Land Use Restrictions shall be effective until such amendment or instrument terminating this Notice of Land Use Restrictions is recorded in the Register's Office for Madision County, Tennessee.

E. **Modifications**. Grantor must provide 60 (sixty) days notice to TDEC and USACE prior to any action being taken that serves to void, modify, amend, or terminate this Notice of Land Use Restrictions.. Any permit application, or request for certification or modification, which may affect the Property made to any government entity with authority over wetlands or other waters of the United States, shall expressly reference and include a copy (with the recording stamp) of this Land Use Restriction.

The grantor shall provide the USACE and TDEC with written notice of any legal action affecting this Land Use Restriction, including but not limited to foreclosure proceedings, tax sales, bankruptcy proceedings, zoning changes, adverse possession, abandonment, condemnation proceedings, and the exercise of the power of eminent domain. For any action that might result in this Land Use Restriction being voided or modified, such notice shall be provided at least 60 days before such action would be taken.

E. **Severability.** Invalidation of any of these covenants or restrictions by judgment or court order shall in no way affect any other provisions, which shall remain in full force and effect.

F. **Title**. Grantor represents and warrants that Grantor is lawfully seized of the Property, including the mineral rights thereto, that Grantor has a good right to enter into this Notice of Land Use Restrictions, that the title to the Property is clear and unencumbered, and Grantor will forever warrant and defend the title to the Property to TDEC and USACE against the lawful claims and demands of all persons whomsoever, except as listed on **Exhibit C,** attached hereto and hereby incorporated by reference.

Grantor has identified all other parties that hold any interest (e.g. encumbrances) in the Property and has notified such parties of the Grantor's intent to grant this Land Use Restriction.

G. **Transfer and Assignment.** The Grantor shall include the following notice on all deeds, mortgages, plats, or any other legal instrument used to convey any interest in the Property:

> NOTICE: This Property is subject to a Land Use Restriction dated [*insert date of Declaration*], recorded in the [*insert County name*] County Clerk's Office on [*insert date recorded*] in Deed Book [*insert number*], Page [*insert number*] and enforceable by the U.S. Army Corps of Engineers and Tennessee Department of Environment and Conservation.

The grantor shall provide the USACE and TDEC with written notice of any transfer 60 days prior to such transfer. The notice shall include the name, address, and telephone number of the prospective transferee, a copy of the proposed deed or other documentation evidencing the conveyance, and a survey map that shows the boundaries of the Mitigation Property being transferred. Failure to comply with this paragraph does not impair the validity or enforceability of this Land Use Restriction.

H. **Notification.** Any notice, request for approval, or other communication require by these restrictive covenants shall be sent by registered mail, pre-paid postage, to the following addresses (or such addresses as may be hereinafter specified by notice pursuant to this paragraph):

To Grantor _____
_____
_____

To USACE: _____
_____
_____

To TDEC: _____
_____
_____

IN WITNESS WHEREOF, Grantor has caused this instrument to be executed by its duly authorized representative on this the _____ day of _____, 20__.

Grantor –
By: _____
Name: _____
Title: _____

STATE OF TENNESSEE

Personally appeared before me, the undersigned, a Notary Public having authority within the State aforesaid, _____with whom I am personally acquitted, and who acknowledged that he executed this instrument for the purposes herein contained, and that he is authorized to execute this instrument.

WITNESS my hand, at office, this _____day of _____, 20___.

_____
Notary Public

My Commission Expires: _____

Exhibits should be on separate pages attached to this document.

EXHIBIT A – SURVEY OF PROPERTY

EXHIBIT B – APPROVED MITIGATION BANKING INSTRUMENT

EXHIBIT C - TITLE EXCEPTIONS
(example: property easements, if any)

APPENDIX F

MADISON COUNTY WETLAND MITIGATION BANK
DEBIT SHEET

DEBIT SHEET

MADISON COUNTY WETLAND MITIGATION BANK

DATE	DESCRIPTION OF PROJECT TO BE MITIGATED	COUNTY	PERMIT NUMBER	RESOURCE TYPE	RESOURCE TYPE IMPACT AMOUNT (AC)	TOTAL ACREAGE IMPACTED	CREDITS DEBITED	REMAINING CREDITS
Credit for 237.2 acres (50%) of total 474.4 acres of wetland restoration								
10/11/1996	SR-54 ov M.F. Forked Deer River & Overflows @ LM 12.61, 12.93, 13.04	Crockett	MFFDR 96-054	Unknown	Unknown	1.55	3.1	234.1
11/5/1996	SR-223, Bridge over Cub Creek @ LM 8.65	Madison	96-870	Unknown	Unknown	0.11	0.22	233.88
11/5/1996	Roberts Station Rd, Bridges over Overflows, LM 1.28, 1.42, & 1.60	Madison	96-871	Unknown	Unknown	0.23	0.46	233.42
11/25/1996	Old Medina Rd, Bridge over M. F. Forked Deer Riv, LM 7.53	Madison	96-900	Unknown	Unknown	0.195	0.39	233.03
4/2/1997	SR-43, from Martin Bypass to Brundige Rd	Weakley	NFOR 96-053	Unknown	Unknown	5.5	22	211.03
9/15/1997	Good Luck-Keely Mill Road over Overflow @ LM 2.96	Gibson	97-725	Unknown	Unknown	0.381	0.76	210.27
1/9/1998	SR-54 ov M.F. Forked Deer River Overflows @ LM 0.23 & 12.31	Gibson, Crockett	MFFDR-15	Unknown	Unknown	0.3	1.5	208.77
1/9/1998	SR-54 boat ramp @ M..F..F. Deer Riv & Overflows @ LM 12.61, 12.93	Crockett	MFFDR 96-054	Unknown	Unknown	0.3	0.6	208.17
3/17/1998	SR-188 over M. F. Forked Deer River @ Mile 4.87 (issued to Corps)	Crockett, Gibson	98-023	Unknown	Unknown	0.3	0.6	207.57
6/29/1998	Riverside Dr over SFFDR @ LM 6.09, 6.15, 6.25, 6.58, & 6.76	Madison	SFFDR-45	Unknown	Unknown	1	1	206.57
6/29/1998	SR-5 over SFFDR Overflows @ LM 9.96, 10.52, 10.79, & 11.15	Madison	SFFDR-42	Unknown	Unknown	3	3	203.57
9/18/1998	SR-104, from Milligan/ Gumwoods Rd to SR-5 in Trenton	Gibson	Cain Creek 98-050 [tf]	Unknown	Unknown	2.33	4.66	198.91
12/16/1998	SR-22 over Reelfoot Cr @ LM 20.21 & Overflow @ LM 20.39	Obion	Reelfoot Lake 99-066	Unknown	Unknown	4.9	19.6	179.31
1/8/1999	St. John's Rd over Cypress Creek @ LM 0.37	Madison	99-021	Unknown	Unknown	0.091	0.18	179.13
2/5/1999	SR-100, Bridge scour repairs @ LM 7.78, 8.06, 8.39, & 8.84	Hardeman	99-059	Unknown	Unknown	1.358	2.72	176.41

DEBIT SHEET

MADISON COUNTY WETLAND MITIGATION BANK

DATE	DESCRIPTION OF PROJECT TO BE MITIGATED	COUNTY	PERMIT NUMBER	RESOURCE TYPE	RESOURCE TYPE IMPACT AMOUNT (AC)	TOTAL ACREAGE IMPACTED	CREDITS DEBITED	REMAINING CREDITS
2/11/1999	SR-188, Bridge scour repair @ LM 5.60	Gibson	99-075	Unknown	Unknown	0.04	0.08	176.33
5/7/1999	SR-76, from west of Routon to SR-69 in Paris	Henry	M. F. Obion Riv 99-168	Unknown	Unknown	2.869	11.48	164.85
6/17/1999	SR-1, scour repair at Hatchie River @ LM 9.42	Haywood	99-270	Unknown	Unknown	0.03	0.12	164.73
8/5/1999	SR-445 over Overflow of S. F. Obion River @ LM 6.22	Gibson	99-351	Unknown	Unknown	0.39	0.78	163.95
8/17/1999	SR-198 over Overflow of N. F. of S. F. Forked Deer River @ 11.56	Madison	99-358	Unknown	Unknown	0.06	0.12	163.83
9/7/1999	SR-5 over Meridian Creek @ 7.72 & Overflow @ 7.78	Madison	99-375	Unknown	Unknown	1.06	2.12	161.71
9/24/1999	SR-218, from SR-76 to SR-54 in Paris	Henry	M. F. Obion Riv 99-169	Unknown	Unknown	1.472	5.89	155.82
1/3/2000	SR-22, from end of N Fork Obion River Bridge to SR-3 (US 51)	Obion	N. F. Obion Riv 00-003	Unknown	Unknown	3.3	13.2	142.62
1/6/2000	SR-22, from Longsought Rd to 0.1 mile north of I-40	Henderson	200000326	Unknown	Unknown	6.26	25.04	117.58
4/5/2000	SR-22 over Reelfoot Cr @ LM 20.21 & Overflow @ LM 20.39	Obion	00-110	Unknown	Unknown	1.49	5.96	111.62
6/8/2000	TDF&A: Mitigation for wetland impacts from old TDOT Jackson HQ	Madison	N/A	Unknown	Unknown	2.36	4.72	106.9
3/30/2001	SR-1, Replace Bridge over Overflow of M F Forked Deer River @ LM 1.88	Carroll	200116005	Unknown	Unknown	1.11	2.22	104.68
8/27/2001	SR-105, Bridge over White Creek @ LM 8.25	Carroll	01-306	Unknown	Unknown	0.269	0.54	104.14
9/5/2001	SR-13, Bridge over Duck River @ LM 7.72	Humphreys		Unknown	Unknown	0.245	0.98	103.16
11/28/2001	SR-128, Bridge over Overflow @ LM 14.77	Hardin	01-411	Unknown	Unknown	0.04	0.16	103
4/30/2002	Garland Rd, replace Bridges over Overflows @ LM 1.55, 1.80, 2.27, & 2.38, & SFFDR @ 1.92	Chester	200200179	Unknown	Unknown	4.64	*8.59	94.41

DEBIT SHEET

MADISON COUNTY WETLAND MITIGATION BANK

DATE	DESCRIPTION OF PROJECT TO BE MITIGATED	COUNTY	PERMIT NUMBER	RESOURCE TYPE	RESOURCE TYPE IMPACT AMOUNT (AC)	TOTAL ACREAGE IMPACTED	CREDITS DEBITED	REMAINING CREDITS
7/8/2002	SR-15, from Hornsby Loop Road to McClintock Road	Hardeman	200200461	Unknown	Unknown	3.16	12.64	81.77
10/28/2002	SR-125, Replace Bridges over Porters Cr. Overflow @ LM 7.32 & Dry Bh. @ LM 7.95	Hardeman	2.434	Unknown	Unknown	0.04	0.16	81.61
11/8/2002	Lake Hardeman Rd, Bridge over Spring Cr. Overflow @ LM 19.13	Hardeman	2.45	Unknown	Unknown	0.12	0.48	81.13
5/28/2003	Sturdivant Crossing Rd, replace Bridge over Pennycost Creek @ LM 0.49	Madison	3.214	Unknown	Unknown	0.04	0.08	81.05
6/17/2003	SR-125, Replace Bridges @ LM 12.28, 12.40, 14.27, 15.53, & 16.88	Hardeman	3.236	ESS	0.299 @4:1	0.299	1.2	79.85
7/17/2003	SR-100, from E of Montezuma Rd to W of S Fork Forked Deer River (Henderson Bypass)	Chester	MVM-2003-417-RSA	ESS	1.65 @2:1	16.914	33.83	46.02
				F	15.264 @2:1		Add'l mitig shown on 7-2-04.	
9/2/2003	SR-210, replace Bridge over Pond Cr @ LM 4.81	Dyer	3.319	F	0.035 @ 2:1	0.035	0.14	45.88
10/2/2003	SR-188, Replace Bridges over Squirt Cr & 4 Overflows @ LM 4.93, 4.99, 5.18, 5.45, & 5.60	Gibson	200300614	F	2.22 @ 2:1	2.22	4.44	41.44
10/9/2003	SR-200, Bridges over S F Forked Deer River Overflow @ 2.59 & 2.88; Clarks Creek @ 2.97 & Overflow @ 3.04	Chester	200300617	F	2.884 @2:1	2.884	5.77	35.67
11/10/2003	SR-114, Bridges over Overflows @ LM 9.27, 9.45, 9.72, Beech River @ 9.58, & Branch @ 9.83	Henderson	200301958	Unknown	Unknown	1.068	4.27	31.4
11/12/2003	SR-57, replace Bridges over Saulsbury Cr @ LM 6.80 and East Fork Spring Cr @ LM 9.47	Hardeman	3.385	ESS	0.16 @4:1	0.16	0.64	30.76
1/15/2004	SR-5, widen from 4-lane section near Old Pinson Rd to SR-18	Madison	4.025	Unknown	Unknown	0.466	0.93	29.83

DEBIT SHEET

MADISON COUNTY WETLAND MITIGATION BANK

DATE	DESCRIPTION OF PROJECT TO BE MITIGATED	COUNTY	PERMIT NUMBER	RESOURCE TYPE	RESOURCE TYPE IMPACT AMOUNT (AC)	TOTAL ACREAGE IMPACTED	CREDITS DEBITED	REMAINING CREDITS
7/2/2004	SR-100, from E of Montezuma Rd to W of S Fork Forked Deer River (Henderson Bypass)	Chester	MVM-2003-417-RSA	Unknown	Unknown	Shown above	6.53	23.3
Revision 7-17-03							Add'l mitig.	
10/29/2004	SR-223, replace Bridges over Overflow @ LM 3.03 & Chisholm Creek @ LM 3.10	Madison	4.388	F	0.343 @2:1	0.343	0.69	22.61
11/4/2004	SR-198, replace Bridge over Harris Creek Overflow @ LM 6.13	Madison	MVM-2004-813-RSA	ESS	0.549 @2:1	0.549	1.1	21.51
1/26/2005	SR-200, Bridges over S F Forked Deer River Overflow @ 2.59 & 2.88; Clarks Creek @ 2.97 & Overflow @ 3.04	Chester	MVM-2003-617	Unknown	Unknown	0.09	0.18	21.33
2/28/2005	Jamestown Rd, replace Bridge over Hurricane Cr @ LM 1.70	Tipton	5.017	Unknown	Unknown	0.063	0.25	21.08
2-29-08 Revision 5-2-08	SR-20, Widen from Madison County Line to west of Crucifer Rd in Lexington	Henderson		ESS	5.427 @ 2:1	7.376	14.75	6.33
				F	1.949			

**Reduced by credit for 0.69 acre of on-site mitigation.*

(OW) Open Water Wetland

(ESS) Emergent / Scrub-Shrub Wetland

(F) Forested Wetland