Southeast Missouri Wetland Mitigation Bank

Prospectus

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Submitted to:
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U.S. Army Corps of Engineers, Little Rock District
Environmental Protection Agency, Region VII
United States Fish and Wildlife Service, Columbia Office

March 31, 2020

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Southeast Missouri Wetland Mitigation Bank

Prospectus

1. INTRODUCTION

A. Location

The objective of this Prospectus is the establishment of the Southeast Missouri Wetland and Stream Mitigation Bank (hereinafter, the "Bank"), located in Stoddard County, near Dexter, Missouri (Figure 1). The property owners are Davis and Bradley Minton and Minton Properties, LP. Davis and Bradley Minton are owners of Minton Environmental Consultants, LLC (MEC), hereinafter the "Sponsor". The Minton's own approximately 640 acres (more or less) of land, including the water rights, that can be used to develop the initial Bank site on Phase 2 and expand the Bank in Phases (Attachment 1), as needed. The proposed Service Area includes Ecological Drainage Units (EDU) in Missouri (Figure 2). This Prospectus discusses the ecological suitability of the prior-converted cropland site (Attachment 2) to restore and maintain the physical, chemical, and biological characteristics of the wetland restoration to achieve the objective of the proposed mitigation Bank, including how the site will support the planned types of wetland and stream resources and functions. The goal of the Prospectus is to obtain initial input from the Interagency Review Team (IRT) prior to submitting the Mitigation Banking Instrument (MBI).

The MBI will be submitted, after IRT review and Public Notice review period of this Prospectus, and will provide additional ecological information for the proposed site. The MBI will describe the plan to fully develop the site into a functioning and sustainable forested, scrub-shrub, and emergent wetland ecosystem, along with stream and associated stream channels. In addition, the MBI will finalize performance criteria and release schedules, and long-term management.

The Bank property was selected by the Sponsor because of its high likelihood to produce beneficial water quality and wildlife habitat improvements to the watershed. Since the Bank site is prior-converted cropland (Attachment 2), the restoration will ensure maximum wetland functional gains for mitigation.

The proposed mitigation Bank site is located in an area formerly known as the Glade Swamp in Sections 25/34, T25N, R9E (Figure 1) within the St. Francis basin and the Mississippi Alluvial Plain/St. Francis EDU (Figure 2). Historically, the entire site was a complex of forested, emergent, and scrub-shrub wetlands and stream channels and associated riparian cooridors (Attachment 3). Hardwood timber was present on the higher elevation areas of the site. The lower elevation areas were characterized as cypress-tupelo sloughs. The soils are primarily

Figure 1. Southeast Missouri Wetland Mitigation Bank - *Location Map*.

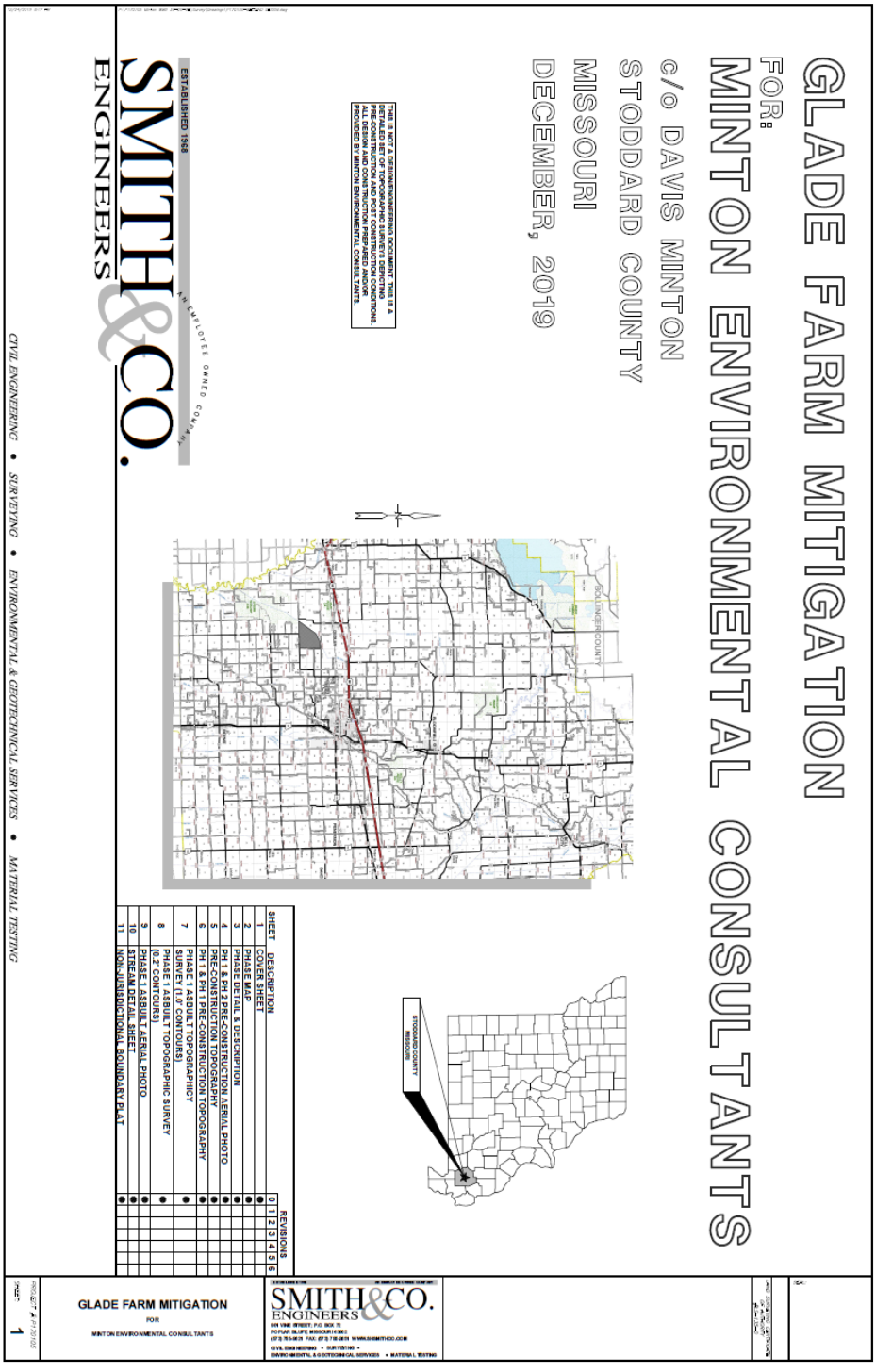


Figure 2. Southeast Missouri Wetland and Stream Mitigation Bank – Proposed Service Area.

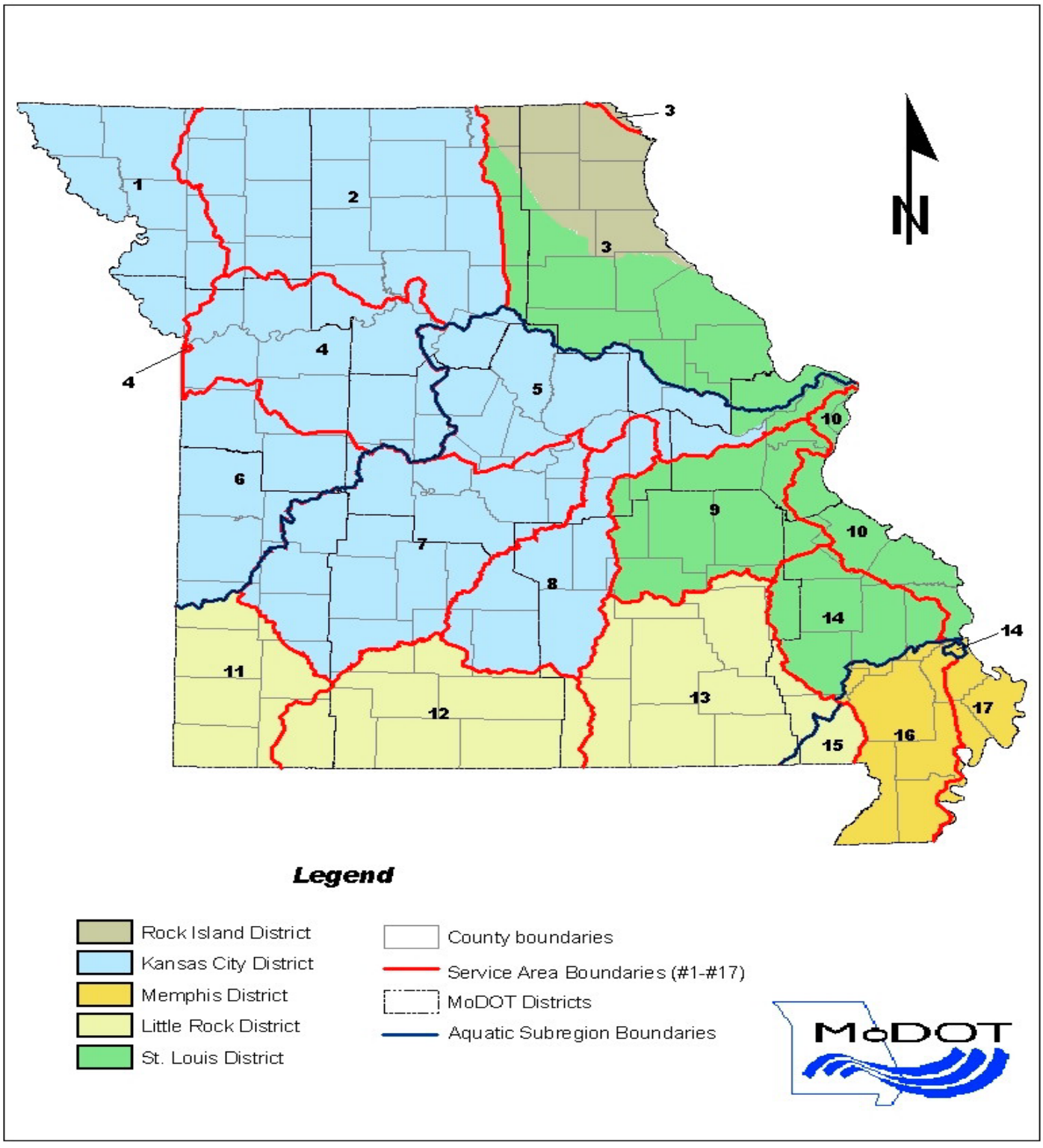


Figure 2 Legend Cont.

Service Area	*Corps District*	*EDU Service Area Location Description*
1	Kansas City	Plains/Missouri Tributaries between Nishnbotna and Platte Drainages
2	Kansas City	Plains/Grand/Chariton
3	St. Louis	Plains/ Mississippi Tributaries between the Des Moines and Missouri Rivers
	Rock Island	Plains/Des Moines
4	Kansas City	Plains/Missouri Tributaries between Blue and Lamine Drainages
		Plains/Kansas
5	Kansas City	Ozark/Moreau/Loutre
	St. Louis	
6	Kansas City	Plains/Osage
7	Kansas City	Ozark/Osage
8	Kansas City	Ozark/Gasconade
9	St. Louis	Ozark/Meramec*
10	St. Louis	Ozark/Mississippi Tributaries between Missouri and Ohio Rivers*
11	Little Rock	Ozark/Elk/Spring
12	Little Rock	Ozark/White
13	Little Rock	Ozark/Current/Black
14	St. Louis	Ozark/Upper St. Francis/Castor*
15	Little Rock	Mississippi Alluvial Plain/White/Black*
16	Memphis	Mississippi Alluvial Plain/St. Francis*
17	Memphis	Mississippi Alluvial Lower Mississippi/St. John's Bayou*

*

The proposed Service Area includes EDUs highlighted in yellow.

Amagon, which are poorly drained and nearly level and are typically found in former drainageways of delta streams and basins (Attachment 4).

B. Establishment and Operation

The MBI will serve as a binding agreement regarding the establishment, use, operation, and maintenance of the Bank and is made and entered into, by, and among the Sponsor and the members of the Interagency Review Team (IRT). The members of the IRT include the Memphis District of the U.S. Army Corps of Engineers (USACE), the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS), the Missouri Department of Conservation (MDC), and the Missouri Department of Natural Resources (MDNR). It consists of the "Basic Agreement" establishing the central obligations assumed and consideration provided by each Party, as well as an Appendix that establishes the detailed Bank implementation plan, including site-specific conditions, standards, and procedural requirements applicable to the Bank.

The MBI will become valid on the date of the last signatory's signature. The MBI may be amended or modified with the written approval of all signatory parties as described in 33 CFR Part 332.8(d). 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.

The Sponsor shall create the wetland and stream habitats as described in the Wetland and Stream Restoration Site Plan (Attachment 5) and the Wetland and Stream Restoration Site Plan -Typical Drawings (Attachment 6) and shall operate the Bank in accordance with the provisions of the MBI. The Sponsor shall receive wetland credits and stream credits upon satisfaction of the ecological performance standards and according to the credit release schedule. After all ecological performance standards have been met and after all credits have been released to the Sponsor, the Bank will have received a total amount of wetland and stream credits as determined in the Final MBI to use as compensatory mitigation for impacts to waters of the U.S, including wetlands, in accordance with all applicable requirements. However, if the post-construction As-Built Figure differs from the Wetland and Stream Restoration Site Plan (Attachment 5), the total amount of wetland credits or stream credits available to the Sponsor may have to be adjusted. Similarly, if monitoring results show a lesser or greater amount of wetland or stream habitat types, the total amount of amount of wetland credits or stream credits released to the Bank may be altered. Credits will be sold to third parties at an appropriate market rate to be determined by the Sponsor. Per 33 CFR 332.3(j)(1)(ii), proposed restoration activities may address requirements of multiple regulatory programs and authorities for the same activity.

To the extent that specific language in the MBI changes, is modified, or terms and conditions deleted and that are not legally binding, the specific language within the MBI shall be controlling. The Bank is projected to, among other purposes, restore various wetland and stream types in multiple phases (Attachment 1) based upon demand and Service Area size.

C. Ownership

The Sponsor owns approximately 640 acres which will contain the Bank, in Stoddard County, Missouri (Figure 1). The Sponsor has developed a preliminary mitigation plan (Section 4) to establish, enhance, and maintain wetlands, streams, and riparian corridors within the boundaries of the Bank. The Sponsor will manage the Bank and be responsible for determining the transaction costs, identification and acquisition of the Bank site conservation easement deed (Attachment 7), and coordinating the restoration, monitoring,

and long-term management of the Bank site.

D. Qualifications of the Sponsor

Services related to project planning and design, as well as construction oversight and monitoring of the Bank, will be contracted by MEC. MEC is an environmental consulting company located in Dexter, Missouri. The firm has significant experience with compensatory mitigation projects and extensive expertise in the planning, design, and construction of large-scale wetland mitigation projects. MEC has designed and overseen construction of three wetland mitigation banks and multiple wetland restoration projects. The location of current and future proposed mitigation bank phases are shown in Attachment 1.

The Sponsors are uniquely qualified to develop the Bank having begun their wetland mitigation banking experiences in 1998 and 2016 working with NRCS to develop two Missouri Agricultural Wetland Mitigation Banks (MO AG Banks) in southeast Missouri. This was the first wetland mitigation bank specifically designed for farming activities. The Sponsor worked in consultation with signature authorities of USACE, EPA, USFWS, MDC, DNR, and NRCS to develop the MO AG Banks and associated MBIs. These mitigation efforts resulted in the restoration of 73-acre and 25-acre wetland complexes on lands that were once wetlands. Both MO AG Banks have been very successful with the 1998 MO AG Bank, established in 2000 with all credits sold by 2005. The 2016 MO AG Bank in selling credits readily and the site has been sucessfully restored.

In 2002, working with the Missouri Department of Transportation (MoDOT), the Sponsor established a wetland bank that was used for the sole purpose of mitigating for the adverse impacts of highway construction activities. This bank is 160 acres in size. The Sponsor is presently managing approximately 260 acres of wetlands established for wetland mitigation banks.

The Sponsor has designed and constructed wetlands on properties for MDC, as well as, successfully designed and constructed approximately 500 acres of wetlands on their land as part of the NRCS's Wetlands Reserve Program. They have also designed and constructed wetlands for various private landowners throughout southeast Missouri.
The wetland banks developed by the Sponsor required monitoring to determine if successful benchmarks were being reached. As the bank sites matured, adaptive management was instrumental to accommodate the growth of different plant and animal communities.

The Sponsor has worked directly with NRCS, USACE, and MoDOT to assure the wetland mitigation banks Plans of Operation were implemented correctly and that the deed restrictions had been secured and recorded. This established the Sponsor's authority to build and maintain the wetland mitigation banks. The Sponsor also implemented accounting measures on the wetland mitigation banks to document the purchase of credits and running ledgers were maintained to record and track the amount of credits sold, acreage impacts, and mitigation ratios.

The restoration of these wetland mitigation banks included restoration of site hydrology and restoration of native vegetation through plantings and site management. Site development included berms that restore site hydrology. The berms were constructed to maintain a variety of habitats that included emergent, scrub-shrub, and forested wetlands. Macro- and micro-topographic features were excavated to restore a wetland complex, throughout the sites. The objective of developing these features was to assure the establishment and development of self-sustaining, native wetland plant communities to produce a wetland mosaic of emergent, scrub-

shrub, and forest plant communities.

E. Legal Responsibility

Once an Department of the Army permit applicant has purchased credits from the Sponsor and the USACE has recorded the purchase of those credits from the Bank, as satisfying all or a portion of the mitigation responsibilities of the permit applicant, the legal responsibilities for providing compensatory mitigation for any project impacts to jurisdictional waters of the U.S. is transferred from the permit applicant to the Sponsor. The Sponsor shall remain responsible for complying with the provisions of the MBI throughout the operational life of the Bank, regardless of the ownership status of the underlying real property, unless those responsibilities have been assigned pursuant to the provisions of the MBI. The Sponsor shall provide written notice at least 60 days in advance of any transfer of ownership of all or a portion of the Bank real property or rights to another party, by any owners of real property comprising the Bank sites, or their successors or assigns.

2. WATERSHED APPROACH TO MITIGATION BANK

A. Watershed Boundary

The watershed boundary considered by the Sponsor in the location and establishment of the Bank (Figure 3). The Service Area of the Bank, includes Ecological Drainage Units (EDU) in Missouri (Attachment 3). The Bank site is within the St. Francis basin and the Mississippi Alluvial Plain/St. Francis and the Sponsor has used a watershed selection process as part of the siting of this Bank in order to maintain and improve the quality and quantity of aquatic resources within the Bank's geographical Service Area. Through the establishment and use of this mitigation bank the Sponsor seeks to provide a wide variety of landscape, resource and habitat types to restore and protect aquatic resource functions to improve water quality and wildlife habitat within the Bank's watershed and Service Area.

The Bank has a landscape position within the watershed that will allow it to provide significant water quality benefits (Figure 3). The Bank site's location along Lick Creek (Drainage Ditch 12) and Dexter Main Ditch will create important benefits for the watershed as agricultural runoff will be filtered as it flows through the Bank property (Figure 3). Additionally, flood waters from Lick Creek (Drainage Ditch 12) and Dexter Main Ditch will be stored and filtered through the Bank site, providing substantial water quality and wildlife benefits.

1. Historic Losses and Current Trends of Losses of Wetlands

Since European settlement, there has been significant loss and alteration of wetland habitats throughout Missouri. Approximately 87% of Missouri's original 4.8 million acres of wetlands have been lost over the past 200 years as a result of conversion to agriculture, levee construction, river management and navigation programs, urban development activities and other actions (Dahl, 1991).

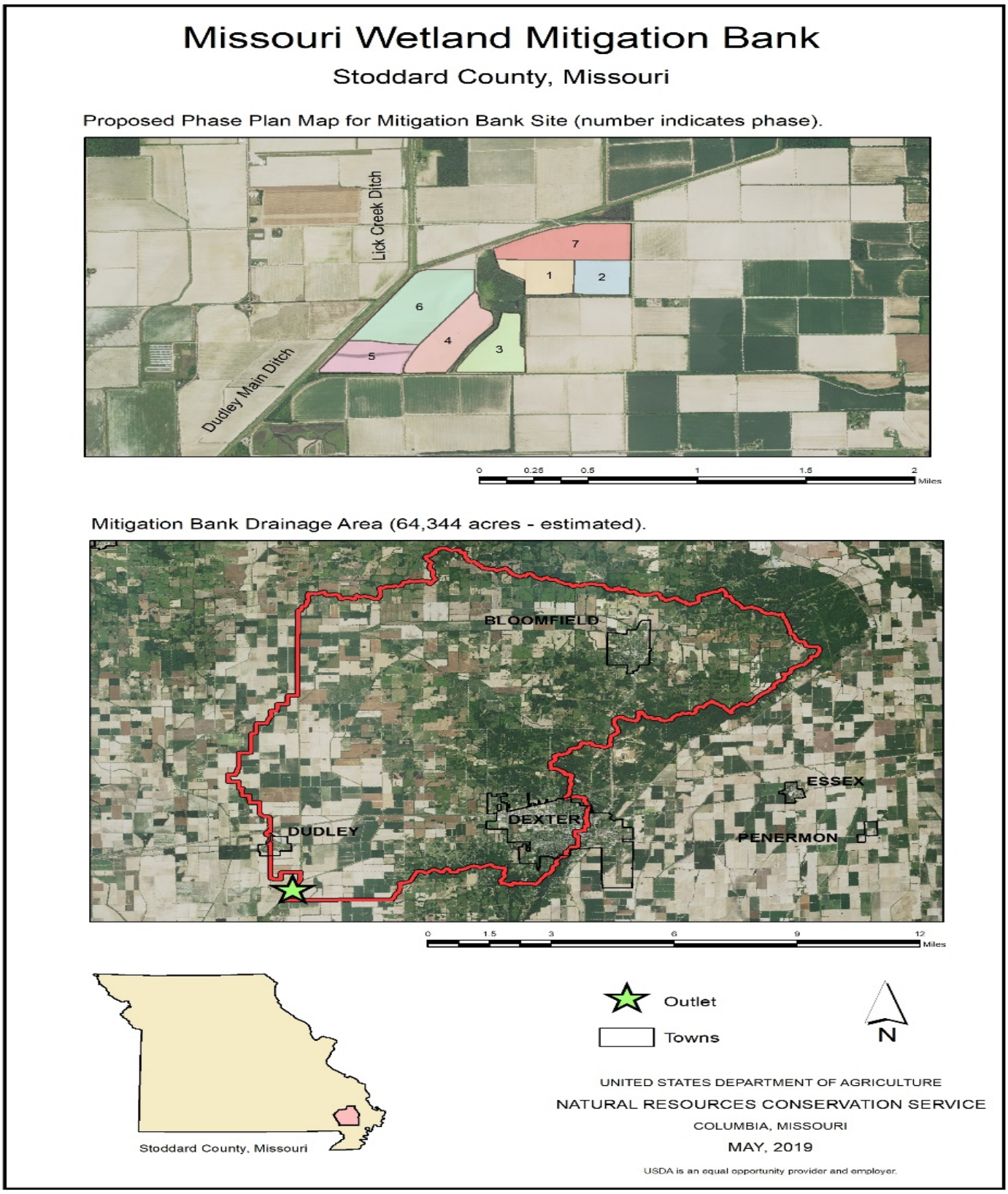
In particular, the basin is a major wintering and stopover point in the Mississippi River Flyway for waterfowl. The basin's losses of bottomland hardwood wetlands have been extensive due to agricultural clearing and other drainage efforts. The estimated total loss between 1935

(167,897 hectares) to 1975 (60,749 hectares) indicates about a 65% reduction in this historic habitat. Overall, in the lower Mississippi alluvial valley, about 75% of the bottomland hardwood wetland habitat has been lost (Heitmeyer 2010).

Causes of historic wetland and wildlife habitat loss within the Bank's watershed include agricultural conversion, urbanization, and sedimentation caused by detrimental land use practices. The resulting deforestation and soil erosion have changed soil infiltration rates and amounts of surface runoff.

Historically, the Bank site was a complex of forested, emergent, and open water wetlands as seen historic imagery from 1959 (Attachment 3). Hardwood timber was present on the higher elevation areas of the sites and lower elevation areas were characterized as cypress-tupelo sloughs. The soils are primarily Amagon and Overcup, which are poorly drained and nearly level and are typically found in former drainageways of delta streams and basins (Attachment 4).

Figure 3. Southeast Missouri Wetland and Stream Mitigation Bank – Drainage Area Map.



The land was initially cleared in the early 1960's and has been actively farmed since that time. During the 1970's, the sites were graded and levees were established. During the 1980's, the sites was precision graded and additional levee work was conducted. Throughout the period of agricultural use, the sites have been planted to corn, soybeans, or rice.

2. Water Quality Issues

There is a necessary and continuing need to address immediate and long-term issues to improve water quality within the proposed Service Area (Figure 2) and the Wetland and Stream Restoration Site Plan (Attachment 5) also includes measures to improve water quality. The Bank site was selected because it is ecologically suitable and contains the hydrological conditions and other physical attributes of lands within the Service Area to make the Bank site restoration a success. The features of the Bank are to enhance the aquatic habitat diversity, habitat connectivity, and habitat for threatened or endangered species.

The immediate needs of the watersheds within the Service Area are to reduce the amount of nonpoint source nutrient inputs and restore wetland habitat. Over the long term, improving water quality will be achieved by achieving the above goals. The Bank will help accomplish these goals by establishing wetland communities, improving aquatic habitat, and allowing runoff from adjacent fields to flow through the Bank.

According to MDNR, there are no listed impaired streams within the Bank watershed boundary (Figure 3), but there is one nearby. Lateral #2 Main Ditch WBID 3105 is within 1.8 miles from the nearest point of the boundary. It is listed for ammonia and dissolved oxygen and the source of the pollutant is listed as unknown. All the proposed restoration activities will address the water quality needs of the watershed as they are proven to prevent onsite erosion, capture sediment that originated offsite, absorb nutrients and otherwise improve water quality by filtering surface and subsurface water that drains across the property or floods the site when Lick Creek (Drainage Ditch 12) and Dexter Main Ditch overflow their banks (Figure 3).

3. Immediate and Long-term Needs

The immediate needs of the watershed are increasing wetland, stream, and riparian habitat and to reduce the amount of nonpoint source nutrient inputs. Over the long term, improving water quality will be achieved by achieving the above goals. The Bank would help accomplish these goals by establishing wetland communities, improving aquatic habitat, and allowing runoff from adjacent fields to flow through the Bank. Additionally, the conversion of the Bank site from prior-converted cropland (Attachment 3) to a protected restoration site will provide historical wetland functions.

Management needs pertinent to the Bank that were identified for the watershed included improving wetland resource and water quality to support native aquatic organisms and protect and improve riparian and aquatic habitat by reducing erosion and sediment in streams and increasing forested corridors. The Bank would help accomplish these goals by establishing wetland habitat and riparian corridors adjacent to Lick Creek (Drainage Ditch 12) and Dexter Main Ditch. Additionally, the conversion of the Bank site from prior-converted cropland (Attachment 2) to a protected wetland and stream restoration site will reduce the amount of agricultural runoff entering Lick Creek (Drainage Ditch 12) and Dexter Main Ditch.

In addition to being ecologically beneficial, the restoration activities shown in the Wetland and Stream Restoration Site Plan (Attachment 5) are also technically feasible. The restoration with native trees will create a diverse riparian and wetland habitat that will improve water quality

and wetland and stream habitat. Grading and shaping of the Bank site, along with tree and shrub plantings (Table 1), will provide a successful wetland and stream restoration because of sufficient hydrology from Lick Creek (Drainage Ditch 12) and Dexter Main Ditch by occasionally flooding the site and rainfall that will provide additional hydrology.

Restoration of the stream channels is technically feasible because of site connectivity to Lick Creek (Drainage Ditch 12) and Dexter Main Ditch and through ungrading the field to restore channel paths. The stream geomorphology of the restored channel will closely mimic the sinuosity, slope, and channel cross-section of historic stream channels in the area. Grade control structures will not be necessary and the slopes of the stream banks will be stabilized using only native seed as the slopes will range from 3 Horizontal : 1 Vertical to 5 Horizontal : 1 Vertical. A typical detail of this stream restoration is included in Wetland and Stream Restoration Site Plan - Typical Drawings (Attachment 6).

There is a critical need for a wetland and stream mitigation bank in this region. There are currently no active wetland or stream mitigation banks to offset wetland and stream impacts as authorized by a §404/401 Permit within the Bank's Service Area (Figure 2). The demand for wetland and stream mitigation banks will continue to increase within the proposed Service Area because of urbanization, infrastructure projects, and impacts from agriculture activities. This Bank will provide permittees with a ecologically sound alternative to on-site mitigation.

4. Historic and Current State of the Bank Site

The Bank site is located in Section 34, T25N, R9E, Stoddard County, in the southeast portion of Missouri, commonly referred to as the Bootheel Region (Figure 1). The Bank site is bounded by actively farmed prior converted cropland, wooded wetlands, and MDC's Otter Sough Wetland Conservation Area. The Bank site was selected based on the percentage of restorable prior- converted cropland (Attachment 2), the type of wetlands to be restored (scrub-shrub, and forested), and location.

The stream banks along Lick Creek (Drainage Ditch 12) and Dexter Main Ditch are partially vegetated and have erosion problems which are widening the stream and washing the resulting sediment downstream. These streams also have minimal riparian corridor widths for a streams of their size.

Historically, the Bank site was a complex of forested and emergent wetlands and sloughs and stream channels (Attachment 3). Hardwood timber was present on the higher elevation areas of the Bank site and was characterized by species such as cherrybark oak (*Quercus pagoda*), pin oak (*Quercus palustris*), shellbark hickory (Carya laciniosa), and Swamp Chestnut Oak (*Quercus michauxii*). Lower elevation areas were characterized as cypress *(Taxodium distichum)* and tupelo (*Nyssa aquatica*) sloughs. The soils are primarily Amagon and Overcup, which are poorly drained and nearly level and are typically found in former drainageways of delta streams and basins (Attachment 4). Therefore, Bank site is ecologically suitable for wetland, stream, and riparian corridor restoration and the entire site has great potential for increasing riparian corridor width along the stream restorations.

The land was initially cleared in the early 1960's and has been actively farmed since that time. During the 1970's, the sites were was graded and levees were established. During the 1980's, the sites was precision graded and additional levee work was conducted. Throughout the period of agricultural use, the sites have been planted to corn, soybeans, or rice.

The site is classified as prior-converted cropland (Attachment 2) and is currently in soybean

production. Prior-converted croplands are wetlands that were drained, dredged, filled, leveled, otherwise manipulated, including the removal of woody vegetation, before December 23, 1985, to make production of an agricultural commodity possible and have had an agricultural commodity planted or produced at least once prior to December 23, 1985, and have not since been abandoned.

The Natural Resources Conservation Service (NRCS) has conducted a Certified Wetland Determination of all Phases of the Bank site and determined that the entire area of 640 acres is prior-converted cropland (Attachment 2). Archeological and historic concerns were coordinated with the State Historic Preservation Officer (SHPO). A cultural resources survey of the Bank site was completed and no cultural resources are discovered during the pedestrian survey of the Area of Potential Effect. The findings were documented through an environmental evaluation (NRCS-CPA-52) and Cultural Resources Worksheet (MO-CR-1) per the Prototype Programmatic Agreement with SHPO (Attachment 8). The IRT also evaluated the Bank site in 2017 and approved it for a wetland mitigation bank.

5. Short-Term and Long-Term Off-site Threats

There are no short-term or long-term threats to the Bank site. The Bank site's remote location removes urbanization as a potential threat for the foreseeable future. Additionally, the surrounding properties are rural and agricultural in nature so there are no anticipated hazards to the site caused by incompatible surrounding land uses.

As described above, the site was historically a complex of forested, emergent, and open water wetlands (Attachment 2). Therefore, restoration of the wetland functions will be highly sucessful, and once restored and protected by an easement there will be minimal long-term off-site threats.

3. PROPOSED SERVICE AREA

The proposed mitigation Bank site is within the St. Francis basin and the Mississippi Alluvial Plain/St. Francis EDU (Figure 2). The proposed Service Area (Figure 2) includes the following EDUs: Mississippi Alluvial Plain/St. Francis EDU (Service Area 16 and proposed Bank location); Mississippi Alluvial Lower Mississippi/St. John's Bayou (Service Area 17); Mississippi Alluvial Plain/White/Black (Service Area 15); Ozark/Upper St. Francis/Castor (Service Area 14); Ozark/Mississippi Tributaries between Missouri and Ohio Rivers (Service Area 10); and Ozark/Meramec (Service Area 9).

The need to establish a wetland and stream mitigation bank in the proposed Service Area is based the historic losses and current trends of loss of wetlands, streams, and wildlife habitat within in the proposed Service Area (Figure 2). There is a necessary and continuing need to address immediate and long-term issues to improve water quality and the Wetland and Stream Restoration Site Plan (Attachment 5) also includes measures to improve water quality. The Bank site was selected because it is ecologically suitable and contains the hydrological conditions and other physical attributes of lands within the Service Area to make the Bank a success.

This Service Area has great potential for mitigating for the impacted wetland and stream functions by providing various wetland and stream habitat types through restoration of historical landscape features (Attachment 5). This will result in improved water quality and wetland, stream, and wildlife habitat, adequately mitigating for wetland and stream impacts. Additional criteria for selection of the Service Area includes an area large enough to support

the Bank, while adequately mitigating for the wetland and stream functions of the impacted wetlands and streams.

The Sponsor's experience of developing the service areas for the MO AG Banks and the MoDOT Bank in southeast Missouri has provided the experience and ability to develop the Service Area proposal for this Bank (Figure 2). The selection of the Bank Service Area (Figure 2) is critical to the success of the Bank and was developed by considering the hydrological and biotic criteria to appropriately compensate for desired wetland and stream functions.

4. MITIGATION PLAN REQUIREMENTS

A. Objectives

The Bank will offer mitigation through the sale of wetland credits as compensation for unavoidable impacts to waters of the United States associated with Department of the Army Section 404 permits and/or USACE Civil Works Projects. The wetland and stream mitigation implemented at the Bank will be protected by a conservation easement in perpetuity (Attachment 6). The Sponsor will also fund financial assurances to ensure that the mitigation will be constructed and monitored in accordance with the 2008 Mitigation Rule and the Bank's MBI.

The overall goal of the Bank is to re-establish and restore wetland functions and values associated with historic ecological functions that existed on the site prior to agricultural disturbances and levee construction (Attachment 3). The proposed objectives are to restore forested, emergent, and scrub-shrub wetland habitat and streams and associated riparian corridors on the prior-converted cropland site (Attachment 2) which is the most ecologically sound restoration plan, as the site was degraded, formerly drained wetlands.

This wetland mitigation plan objective is to replace the hydrologic, biogeochemical, plant community, and habitat functions impacted by the wetland and stream conversions within the Service Area. These include flood attenuation, groundwater recharge and discharge, sediment retention, nutrient and contaminant removal, plant community structure and function, and wildlife habitat. Therefore, the Bank site was selected by the Sponsor because of its pre-settlement condition, which will assure a successful and excellent wetland and steam restoration with beneficial water quality and wildlife habitat improvements.

The Sponsor will maintain the Bank in perpetuity. The aquatic resources provided by the wetlands and streams restore on the Bank site will address the loss of such habitats within the Service Area. All the proposed restoration activities will address the needs of the watershed by preventing on-site erosion, capturing sediment that originated offsite, absorbing nutrients, and otherwise improving water quality by filtering surface and subsurface water that drains across the property or floods the site when Lick Creek (Drainage Ditch 12) and Dexter Main Ditch overflow their banks (Figure 3).

Hydrologic functions of wetlands are viewed primarily in the context of modified flow regimes. Increased contact and residence time increases groundwater recharge and storage, which in turn augment baseflows. Complex plant community structure also promotes the slowing and infiltration of overland flows. During the selection of the Bank site, the historical plant and animal communities and the types of remediation needed to replicate those environments were studied and incorporated into the Wetland and Stream Restoration Site Plan (Attachment 5). In addition, the history of the floodplain was evaluated to develop an

understanding of the alterations that impacted the watershed. By understanding the interrelations between soils, hydrology, flora, and fauna, the Sponsor will be able to modify and adjust the landscape from the theoretical to the actual, resulting in large scale success of wetland mitigation banking.

A detailed topographic survey utilizing a satelite was conducted and the site hydrology will be restored by altering the site elevations to achieve maxium enviromental lift at locations deterimined through the Wetland and Stream Restoration Site Plan (Attachment 5). The berms, along with land grading and shaping, will be used to produce a temporary, semi-permanent, and permanent wetland mosaic of sloughs, emergent, scrub-shrub, and bottomland forested plant communities.

B. Site Selection

The need to establish the Bank site in the proposed Service Area is based on several points. 1) There are no wetland or stream banks in the Bank's watershed Service Area. 2) The historic losses and current trends of loss of wetlands and wildlife habitat within in the proposed Service Area (Figure 2). 3) Additionally, water quality concerns are an integral part of wetland restoration. The IRT also evaluated the Bank site in 2017 and approved the site for a wetland mitigation bank.

It is necessary to select ecologically suitable bank sites that contain the hydrological conditions and other physical attributes of lands within the Service Area to make bank a success. The Bank site was selected because of its location in the St. Francis basin, in an area formerly known as the Glade Swamp and was a complex of forested, emergent, and scrub-shrub wetlands and stream channels and riparian corridors (Attachment 2). It is ecologically suitable and contains the hydrological conditions and other physical attributes of lands within the Service Area to make the Bank a success. The Bank site will provide a restoration that will enhance the aquatic habitat diversity, habitat connectivity, and habitat for threatened or endangered species.

The Bank's landscape position within the watershed will provide significant water quality benefits (Figure 3). The property's location along Lick Creek (Drainage Ditch 12) and Dexter Main Ditch will create important benefits for the watershed as agricultural runoff will be filtered as it flows across the Bank property. Additionally, occasional flood waters from Lick Creek (Drainage Ditch 12) and Dexter Main Ditch will be filtered in the proposed wetlands which would also store flood waters and provide substantial wildlife benefits (Figure 1).

The NRCS has conducted a Certified Wetland Determination of all Phases of the Bank site and determined that the entire area of 640 acres is prior-converted cropland (Attachment 2). Archeological and historic concerns were coordinated with the State Historic Preservation Officer (SHPO). A cultural resources survey of the Bank site was completed and no cultural resources are discovered during the pedestrian survey of the Area of Potential Effect. The findings were documented through an environmental evaluation (NRCS-CPA-52) and Cultural Resources Worksheet (MO-CR-1) per the Prototype Programmatic Agreement with SHPO (Attachment 8).

C. Site Protection Instrument

The Sponsor owns the land that contains the Bank. To ensure that the Bank site remains in its desired state in perpetuity, the entire Bank site will be protected by a conservation easement which will preserve the Bank lands as undeveloped wildlife habitat (Attachment 6). After the

Bank is approved, copies of the finalized and recorded conservation easement shall be provided to the USACE. The terms of the easement will be enforceable by the USACE.

There are no short-term or long-term plans to transfer title of the property to another party. It is the intention of the Sponsor to maintain the property in perpetuity as highly functioning wetland, stream, and riparian habitat in accordance with the terms of the long-term management plan and conservation easement (Attachment 6). However, in the instance that the title to the property is transferred to another party the conservation easement shall stay with the property.

The property owners have all the surface and subsurface mineral rights on the Bank site. Therefore, no third party has the right to disturb the surface of the Bank to access potential mineral or hydrocarbon resources.

D. Baseline Information

Historically, the Bank site was a complex of forested, emergent, and scrub-shrub wetlands and stream channels. Hardwood timber was present on the higher elevation areas of the sites. Lower elevation areas were characterized as cypress-tupelo sloughs. The soils are primarily Amagon and Overcup, which are poorly drained and nearly level and are typically found in former drainageways of delta streams and basins (Attachment 4). The Bank site is located in the St. Francis basin, in an area formerly known as the Glade Swamp (Figure 1). According to the National Cooperative Soil Survey's Web Soil Survey found at http://websoilsurvey.nrcs.usda.gov/app/ and administered by the NRCS, soils on the site are mapped as primarily Amagon and Overcup, which are poorly drained and nearly level and are typically found in former drainageways of delta streams and basins (Attachment 4).

The land was initially cleared in the early 1960's and has been actively farmed since that time. During the 1970's, the site was graded and levees were established. During the 1980's, the site was precision graded and additional levee work was conducted. Throughout the period of agricultural use, the site has been planted to corn, soybeans, or rice.

The Bank site is located near Dexter, Missouri, Stoddard County. The Bank site is are located in Sections 25/34, T25N, R9E, Stoddard County, in the southeast portion of Missouri, commonly referred to as the Bootheel Region (Figure 1). The northern and western boundaries are Lick Creek (Drainage Ditch 12), the southern boundary is a wooded area and agricultural land, and the eastern boundary is County Road 667 with adjacent agricultural property that will allow it to provide significant water quality benefits for the watershed as agricultural runoff will be filtered as it flows through the Bank property (Figure 3). Additionally, flood waters from Lick Creek (Drainage Ditch 12) and Dexter Main Ditch will be stored and filtered through the Bank site, providing substantial water quality and wildlife benefits.

During the development of the Wetland and Stream Restoration Site Plan (Attachment 5), the historical plant and animal communities (Attachment 3) and the types of remediation needed to restore those environments were evaluated and incorporated. The history of the floodplain was considered to develop an understanding of the alterations that impacted the watershed. An understanding of the modifications is required to guarantee the success of habitat restoration. By understanding the interrelations between soils, hydrology, flora, and fauna; the Sponsor will be able to modify and adjust the landscape from the theoretical to the actual, in a large scale success of the Bank restoration.

The restoration of the Bank site will include (a) restoration of site hydrology; and (b)

restoration of native vegetation through plantings and site management (Attachment 4). Site development includes low profile berms to restore the site (Attachment 5). The berms will be constructed to maintain saturation to the surface for a portion of the site, with a portion of the pool to hold more than 6 inches of water during full pool period. A series of shallow pools will be excavated to provide emergent and scrub-shrub wetland habitat throughout the site. The objective of the plant community restoration is to assure the establishment and development of self-sustaining, native wetland plant communities. This will be accomplished through land shaping and plantings to produce a wetland mosaic of emergent, scrub-shrub, and forest plant communities (Attachments 4 and 5). Newly constructed berms and other disturbed areas, will be seeded according to the Wetland and Stream Restoration Site Plan (Attachment 5). The remaining portions of the Bank site will be established through natural regeneration.

The NRCS has conducted a Certified Wetland Determination of all Phases of the Bank site and determined that the entire area of 640 acres is prior-converted cropland (Attachment 2). Archeological and historic concerns were coordinated with the State Historic Preservation Officer (SHPO). A cultural resources survey of the Bank site was completed and no cultural resources are discovered during the pedestrian survey of the Area of Potential Effect. The findings were documented through an environmental evaluation (NRCS-CPA-52) and Cultural Resources Worksheet (MO-CR-1) per the Prototype Programmatic Agreement with SHPO (Attachment 8). The IRT also evaluated in 2017 and approved the site for a wetland mitigation bank.

E. Determination of Credits

1. Wetland Credits

Upon approval of the MBI, the USACE, in consultation with the IRT, will grant the Bank the total quantity of wetland credits. This amount will be determined using the State of Missouri Wetland Mitigation Assessment Method (MWMAM). The release of these credits shall follow the schedule described in the Final MBI.

The MWMAM, a wetland restoration assessment methodology, calculates credits based on a variety of site-specific characteristics and project details (Exhibit 1). Site-specific scores were developed to calculate the proposed total number of credits that will be established at the Bank site (Exhibit 1). This provides a consistent rationale to determine appropriate compensatory wetland mitigation for wetland impacts.

The total number of wetland credits were estimated using the Factors from the MWMAM. Based upon the site caharcteristics and the proposed restoration plan it is estimated that this method yields approximately 3.9 wetland credits per acre for the Bank (Exhibit 1).

2. Stream Credits

Upon signature of the Final MBI, the USACE, in consultation with the IRT, will grant the Bank stream credits. The number of proposed stream credits will be determined by using the Stream Mitigation Bank Credit Assessment Worksheet contained within the State of Missouri Stream Mitigation Method (MSMM).

The Sponsor is proposing to create riparian corridors by planting trees and shrubs at a minimum density of 20-foot spacing. The corridors will be 150 feet per side fo the intermittent streams, an example is illustrated in the Wetland and Stream Restoration Site Plan - Typical Drawings (Attachment 6).

F. Mitigation Work Plan

Site construction will consist of ungrading the prior-converted cropland (Attachment 2) to restore wetland, riparian, and stream habitat, for example see Attachment 5. The Bank site is located in Phase 2 (Attachment 1), which is located adjacent to Phase 1 (MO AG Bank, 2016). Erosion control measures will be undertaken as necessary to prevent sediment from entering Lick Creek (Drainage Ditch 12) and Dexter Main Ditch or any of their tributaries.

After the grading and shaping is completed, the site will be planted with a diverse mixture of native wetland trees and shrubs (Table 1). Herbaceous vegetation will be restored through natural regeneration. Tree and shrub plantings consisted of seedlings and container individuals. All plant stock will be acquired from a nursery specializing in native plants.

The stream restoration will consist of restoring channels will through excavation and riparian corridor restoration. Typical construction details regarding the channel excavation and associated stream bank stabilization are included in Attachment 5.

The Sponsor possesses the knowledge, through 25 years of experience restoring wetlands, along with the financial resources and the equipment required to restore wetlands and make adjustments to these restoration project if necessary. This also includes the successful restoration of Phase 1 (MO AG Bank, 2016), which is immediately adjacent to the Bank site which is Phase 2 (Attachment 1). They have addressed unexpected issues and implemented adaptive management strategies that were needed to make adjustments. Their wetland mitigation bank sites were designed to be self-sustaining to minimize maintenance. The Bank will be restored to the same high degree of technical expertise and integrity and will be managed until it is sustainable.

Hydrology

Hydrologic functions of wetlands are viewed primarily in the context of modified flow regimes. Increased contact and residence time increases groundwater recharge and storage, which in turn augment baseflows. Complex plant community structure also promotes the slowing and infiltration of overland flows.

The Sponsor is uniquely qualified to restore the hydrology to the site because they have farmed the Bank site and land adjacent to the site for most of their lives. They have also restored Phase 1 of the Bank site (Attachnent 1) and other wetlands for mitigation banks and the NRCS Wetland Reserve Program within the same watershed.

The 48 inches of annual average precipitation, along with the existing soil characteristics, result in the Bank site being saturated with water in late winter and early spring. The property's location along Lick Creek (Drainage Ditch 12) and Dexter Main Ditch will create important benefits for the watershed as agricultural runoff will be filtered as it flows across the Bank property (Figure 3). Additionally, occasional flood waters from Lick Creek (Drainage Ditch 12) and Dexter Main Ditch will be filtered in the proposed wetlands which would also store flood waters and provide substantial wildlife benefits.

During the development of the Wetland and Stream Restoration Site Plan (Attachment 5), the historical plant and animal communities (Attachment 3) and the types of remediation needed to replicate those environments were studied and incorporated into this Plan. In addition, the history of the floodplain was evaluated to develop an understanding of the alterations that

impacted the watershed. By understanding the interrelations between soils, hydrology, flora, and fauna, the Sponsor will be able to modify and adjust the landscape from the theoretical to the actual, resulting in large scale success of wetland mitigation banking.

A detailed topographic survey utilizing a satelite was conducted and the site hydrology will be restored by altering the site elevations to achieve maxium enviromental lift at locations deterimined through the Wetland and Stream Restoration Site Plan (Attachment 5). The berms, along with land grading and shaping will be used to produce a temporary, semi-permanent, and permanent wetland mosaic of riparian, emergent, scrub-shrub, and bottomland forested habitats.

Vegetation

The objective of the plant community restoration is to assure the establishment and development of self-sustaining, native wetland plant communities. This will be accomplished through land shaping to produce a wetland mosaic of riparian, emergent, scrub-shrub, and forest plant communities. Micro- and macro-topographic feature development will be used to insure the proper vegetative response.

Bottomland hardwood trees and shrubs will be planted on the Bank site as part of the restoration of the forested and scrub-shrub plant community (Table 1). Natural recruitment of other desirable species of trees and shrubs within the same group are also expected. The Bank site will be prepared for restoration using grading and shaping and application of lime (2 tons/acre) and fertilizer (50-40-50) per acre. Bareroot (1-year old) seedlings will be hand planted using a 12-inch dibble bar. Species planted are listed in Table 1 and will be planted on the Bank site using a nominal spacing of 15 feet by 15 feet on elevations for the respective species requirements to assure success. The resulting density will be approximately 193 trees per acre. No single species will comprise more than 20 percent of the total trees planted to achieve diversity and promote patch dynamics within the Bank site. Seedlings/saplings will be planted between late November and mid-March before bud break in the spring. Herbaceous and woody vine stratum will be naturally regenerated after the wetland hydrologic restoration is complete. Hydrologic restoration will increase water detention and encourage native hydrophytic seed sources to re-establish sufficient plant coverage and diversity through natural recruitment and colonization.

Table 1. List of tree and shrub species for forested and scrub-shrub wetland restoration.

***Regional Wetland Indicator Status definitions:**

OBL = Obligated wetland species. Occurs almost always (estimated probability 99%) under natural conditions in wetlands.

FACW = Facultative wetland species. Usually occurs in wetlands (estimated probability 67 to 99%). Occasionally found in non-wetlands.

FAC = Facultative species. Equally likely to occur in wetlands or non-wetlands (estimated probability 34 to 66 %).

Bottomland Forest and Shrub Wetlands Plantings		
Common Name	**Scientific Name**	***Regional Wetland Indicator Status**
Shellbark Hickory	*Carya laciniosa*	FACW
Common Buttonbush	*Cephalanthus occidentalis*	OBL
Swamp Chestnut Oak	*Quercus michauxii*	FACW
Cherrybark Oak	*Quercus pagoda*	FAC
Pin Oak	*Quercus palustris*	FACW
Willow Oak	*Quercus phellos*	FACW
Nuttall's Oak	*Quercus texana*	OBL
Bald Cypress	*Taxodium distichum*	OBL

Soils

According to the National Cooperative Soil Survey's Web Soil Survey found at http://websoilsurvey.nrcs.usda.gov/app/ and administered by the NRCS, the areas of the Bank where restoration has occurred and proposed are dominated by Amagon Silt Loam, 0 to 1 percent slopes (Attachment 4). The Amagon series consists of poorly drained, slowly permeable soils that formed in beds of loamy sediments. These soils are on broad flats on the lower parts of old natural levees and in shallow depressions along natural drainage ways. The soils have redoximorphic features close to the surface and are suitable for the restoration of wetland functions. The 48 inches of annual average precipitation, along with the existing soil characteristics, result in the Bank site being saturated with water in late winter and early spring. The native vegetation in hardwood forest was mainly water-tolerant species of oak.

The restoration actions completed for all Phases of the Bank of these hydric soils will increase the natural bio-chemical process that historically occurred. As a result, important wetland and stream functions such a nutrient cycling, pollutant retention, flood storage, and sediment deposition will be increased significantly.

Wetland Restoration

Wetland restoration is the return of a wetland, and its functions, to original conditions prior to disturbance. Site location, history (Attachment 3), and physical characteristics are critical considerations when designing and optimizing a wetland restoration.

The wetland restoration of the Bank will reconnect this area to the watershed during frequent and common hydrologic events. Restoration of the watershed connection, will be accomplished by installing a culvert between the Bank site and a ditch to the south that collects drainage from the adjacent properties. The Bank site restoration is designed to allow this water to flow throughout the easement.

All Phases of the Bank site have a landscape position within the watershed that will allow it to provide significant water quality benefits. The property's location along Lick Creek (Drainage Ditch 12) and Dexter Main Ditch will create important benefits for the watershed as agricultural runoff will be filtered as it flows across the Bank site (Figure 3). Additionally, occasional flood waters from Lick Creek (Drainage Ditch 12) and Dexter Main Ditch will inundate the proposed Bank site and be stored, providing substantial wildlife benefits.

The major goals of the Wetland and Stream Restoration Site Plan (Attachment 5) are to replace the hydrologic, biogeochemical, plant community, and habitat functions impacted by the wetland conversions that will be mitigated to the Bank. These include flood attenuation, groundwater recharge and discharge, sediment retention, nutrient and contaminant removal, plant community structure and function, and wildlife habitat. The Wetland and Stream Restoration Site Plan (Attachment 5) provides information on historic (Attachment 3) and existing Bank site conditions; objectives and rationale for establishing each wetland function, and proposed restoration measures; performance standards and compliance monitoring procedures; site restoration plans, including operation, maintenance and management procedures; and allowed compatible and supplemental uses for the Bank site.

During the development of the Wetland and Stream Restoration Site Plan (Attachment 5), the historical plant (Attachment 3) and animal communities and the types of remediation needed to replicate those ecosystems were evaluated. The history of the floodplain was considered to

develop an understanding of the alterations that impacted the watershed (Attachment 3). An understanding of the modifications were required to guarantee the success of habitat restoration. By understanding the interrelations between soils, hydrology, flora, and fauna, the Sponsor was be able to modify and adjust the restoration from the theoretical to the actual.

The restoration of the Bank site include (a) restoration of site hydrology; and (b) restoration of native vegetation through plantings and site management. Site development may include berms that will allow for restoration of a variety of wetland habitats. The berms will assist to maintain saturation to the surface for a portion of the site, with a portion of the pool to hold more than 6 inches of water during full pool period. The objective of the plant community restoration will be to assure the establishment and development of self-sustaining, native wetland plant communities through land shaping and plantings of bottomland forested wetland species (Table 1). Restoring the historic features and hydrology (Attachment 3) will provide an environment for the seed bank to revegetate the herbaceous plant community. The adjacent wooded areas in the immediate vicinity of the Bank that will be a seed source for natural recruitment. This will produce a mosaic of riparian, emergent, scrub-shrub, and bottomland forest plant communities. Newly constructed berms, and other disturbed areas, will be seeded according to the Clean Water Act Section 404/401 guidelines. The remaining portions of the site will be established through natural regeneration.

Bottomland hardwood species that will be planted include those listed in Table 1 using a nominal spacing of 15 feet by 15 feet on elevations for the respective species requirements to assure success. The resulting density will be approximately 193 trees per acre. No single species will comprise more than 20 percent of the total trees planted to achieve diversity and promote patch dynamics within the Bank. Seedlings/saplings were planted between late November and mid-March before bud break in the spring. Herbaceous and woody vine stratum will be naturally regenerated after the wetland hydrologic restoration is complete.

Management of Bottomland Forested Wetlands

Historically, forested habitats in southeast Missouri were subject to periodic flooding that varied widely from year to year. This fluctuation will be maintained on the Bank site to restore the forest in a thriving, productive state. To emulate natural conditions managed forested wetlands should be left dry every 6-8 years. Water depths will not be excessive. Most wetland wildlife species prefer very shallow water depths

Management of Herbaceous Wetland Units

Herbaceous wetlands have a predominance of non-woody vegetation are usually managed to maintain seed production of desirable plants and control highly aggressive invasive species and undesirable plants (Table 2 and 3). Herbaceous wetlands generally are categorized as either seasonally flooded or emergent wetlands. Seasonally flooded wetlands typically have fluctuating water levels throughout the year and contain early succession plants. This plant community is generally made up of annual, rather than perennial, grasses, sedges, and broadleaf plants. These wetlands are flooded during wet periods of the year or during the migration season. Emergent wetlands, sometimes called “semi-permanent” wetlands, tend to be flooded for much longer durations than seasonally flooded wetlands, but productive marshes have very dynamic water fluctuations both within and among years. The vegetation is adapted to longer periods of flooding, and is characterized by emergent perennial plants.

Emergent wetlands are flooded throughout most of the year, but are shallow enough to allow plant growth. They are not just shallow ponds with stable water levels. The health,

productivity, and longevity of emergent wetlands is dependent on fluctuating water levels within and among years. Emergent vegetation becomes established during dry periods, but are adapted to flooding for long durations during the year. Common emergent plants include cattails, bulrush, sedges, spikerushes, arrowhead, pondweeds, and American lotus. Emergent wetlands typically contain a mix of robust emergent vegetation scattered in clumps among patches of open water.

Vegetation in newly created emergent marshes takes time to get established. Water levels should be partially drained to provide 6"–10" of water throughout most of the summer, if possible. These wetter conditions will discourage woody plants and herbaceous plants not adapted to extremely wet conditions. Plant succession will occur, with the initial vegetation being dominated by early succession annual plants, however, within approximately three years the plant community will contain more perennial plants.

G. Operation and Maintenance Plan

The Sponsor agrees to perform all necessary work to ensure that the Bank achieves the ecological performance standards described in Section 4. H, including, but not limited to, the replanting of vegetation, the removal of invasive species, mowing of areas as appropriate, and the use of prescribed burning. The management of invasive and undesirable species (Tables 2 and 3)will be undertaken to maintain biodiversity and wetland functions.

Methods of removal include:

- Extirpation
- Hand-cut
- Chemical spray
- Flooding
- Prescribed burning
- Soil disturbance
- Seedhead separation

The methods of removal described above will be used to control unwanted vegetation on the Bank. Extirpation refers to the removal of the plant and roots from the ground. After pulling, the plant can be left on the ground. For other species, hand cutting or power trimming to a height of 12-inches will suffice to prevent the plant material from making a seed head. Chemical spraying should be completed with a product containing glyphosate, including one approved for use in or near aquatic environments if applicable (Rodeo or equivalent). Control of tree saplings should utilize Tordon RTU or equivalent. All label directions and safety precautions will be followed while using approved herbicides. Herbicides will be applied with a backpack or bottle sprayer for best results and to minimize overspray onto native plant materials. Soil disturbance may be utlized where apporiate to eliminate unwanted species along with water manipulation.

The maintenance needs of the site will be determined during a minimum of three monitoring visits per year. Maintenance of the Bank property will continue for fifteen years after the commencement of restoration activities or five years after all credits have been released, whichever is sooner, at which point the ecosystems on the property will be self-sustaining and self-regulating. Deviation from the approved Wetland and Stream Restoration Site Plan

(Attachment 5) is subject to review and written approval by the USACE, in consultation with the IRT.

The Bank has been designed to ensure natural hydrology and landscape features will ensure long-term sustainability. Any long-term management such as prescribed burns, flooding, or invasive species control will be conducted as needed. The water rights are owned by the Sponsor.

H. Ecological Performance Standards

MEC agrees to perform all necessary work to ensure that the Bank site achieves the ecological performance standards. The Bank site will be monitored on an annual basis until it can be demonstrated that the sites has reached an ecologically sound, self-sustaining condition for three consecutive years. This data will be used as the performance standard to determine the level of mitigation success and to identify problems requiring remedial action. A conservation easement deed (Attachment 7), that protects the functional integrity hydrology of the Bank site, will be recorded at the Stoddard county recorder's office.

Remedial measures, if necessary, will be developed by the Sponsor and reviewed and approved by USACE. Remediation will not be required for adverse impacts that are due to natural disasters that are beyond the control of MEC.

1. Wetland Credits

Wetland Hydrology

All Phases of the Bank must show evidence of wetland hydrology. This was verified by NRCS which conducted a Certified Wetland Determination of all Phases of the Bank site and determined that the entire area of 640 acres is prior-converted cropland (Attachment 2).

Hydrophytic Vegetation

All areas proposed for wetland creation, rehabilitation, enhancement or preservation must meet the required hydrophytic vegetation parameter in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0* or the most recent version of that document. Trees and shrubs planted in areas designated for Scrub-Shrub or Forested Wetland Creation shall have a 75% survival rate. Natural recruitment of equivalent desirable species of trees and shrubs within the same group (hardwoods, softwoods, fruit producing, mast producing, *etc*.) may count towards meeting the 75% survival rate at the discretion of the USACE. If areas do not meet this survival rate requirement, appropriate planting activities will be initiated.

Vegetative Cover

All areas that will generate wetland credits, including wetlands and upland buffers, will meet the following minimum absolute cover requirements of planted and naturally recruited vegetative species that are desirable, such as Highly Aggressive Invasive Species (Table 2) and Undesirable Species (Table 3). Year 1 is defined as the first growing season after initial planting and seeding. Exceptions will be made for areas of near-constant inundation that cannot support such a high absolute vegetative cover percentage. If areas do not meet the requirements related to vegetative cover, appropriate planting and/or seeding activities will be initiated.

Hydric Soils

All Phases of the Bank must show evidence of hydric soils. This was verified by NRCS which conducted a Certified Wetland Determination of all Phases of the Bank site and determined that the entire area of 640 acres is prior-converted cropland or hydric soils (Attachment 2).

Establishment of Wetland Conditions

Before the final credits can be released as detailed in Section 5, the presence of hydric soils, wetland hydrology, and hydrophytic plants will be demonstrable for the large majority of sampling data taken during the course of the monitoring of the project. It will be the decision of the USACE, in consultation with the IRT, to determine that areas proposed for wetland establishment have met all three criteria described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0* or the most recent version of that document with sufficient regularity to prove the establishment of wetland conditions across all areas intended for wetland development.

Invasive Species

Management of invasive species will be undertaken as is suitable to maintain biodiversity and ecological function. Until five years after the USACE has released all credits for sale, invasive species shall be controlled with the removal methods listed below. Highly Aggressive Invasive Species (Table 2), will be eradicated upon observation and shall not, in the aggregate, cover more than 5% of the absolute cover of the Bank. In addition, a combination of the absolute cover of species on the Highly Aggressive Invasive Species list (Table 2) and the absolute cover of species on the Undesirable Species list (Table 3), as determined in the Draft MBI, shall not comprise more than 10% of the Bank property.

Table 2. Highly aggressive invasive species.

Scientific Name	Common Name
Alliaria petiolata	Garlic Mustard
Carduus nutans	Musk Thistle
Cirsium arvense	Canada Thistle
Dipsacus fullonum	Common Teasel
Dipsacus lanciniatus	Cut-leaf Teasel
Elaeagnus umbellata	Autumn Olive
Euonymus fortunei	Wintercreeper
Euphorbia esula	Leafy Spurge
Lespedeza cuneata	Sericea lespedeza
Lonicera japonica	Japanese Honeysuckle
Lonicera morrowii & Lonicera maackii	Bush Honeysuckles
Lythrum salicaria	Purple Loosestrife
Melilotus alba & Melilotus officinalis	Sweet Clover (White & Yellow)
Phalaris arundinacea	Reed Canarygrass
Pueraria lobata	Kudzu
Rhamnus cathartica	Common Buckthorn
Rosa multiflora	Multiflora Rose
Securigera varia	Crown Vetch
Sesbania exaltata	Sesbania
Sorghum halepense	Johnson Grass

Table 3. Undesirable Species.

Scientific Name	Common Name	Month	Factor	Method
Abutilon spp.	Velvet Leaf	July-Oct	Discovery	1,2
Anthriscus spp.	Parsley	April-July	Discovery	1,3
Arctium spp.	Burdock	July-Sept	Height=1 feet	1,3,4
Cannabis spp.	Hemp	July-Sept	Discovery	1,2
Carduus spp.	Musk Thistle	May-Sept	Discovery	3
Centaurea spp.	Knapweed	May-Sept	Height=2 feet	3
Chenopodium spp.	Lamb's Quarters	May-Sept	Height=2 feet	1,2
Cicuta spp.	Water Hemlock	June-Sept	Height=2 feet	1,3
Cirsium spp.	Thistles (All)	May-Sept	Discovery	3
Conium spp.	Poison Hemlock	May-Aug	Height=2 feet	1,3
Croton spp.	Wooly Croton	July-Sept	Height=2 feet	1,2
Datura spp.	Jimson Weed	July-Sept	Discovery	1,3
Kochia spp.	Fireweed, Mexican	July-Sept	Height=1 feet	1,2
Lactuca spp.	Prickly Lettuce	June-Oct	Discovery	1,3
Lotus spp.	Birdsfoot Trefoil	May-Sept	Discovery	3
Maclura pomifera	Osage Orange	June-Oct	Discovery	2,3
Sonchus spp.	Sow Thistle	May-Oct	Discovery	1,3
Sorghum spp.	Sorghum hybrids	June-Nov	Discovery	3
Vicia spp.	Vetch	May-Oct	Discovery	1,3
Xanthium spp.	Cocklebur	July-Nov	Discovery	1,3

Methods of removal include:

- Extirpation
- Hand-cut
- Chemical spray
- Flooding
- Prescribed burning
- Seedhead separation
- Soil disturbance

The methods of removal described above will be used to control unwanted vegetation on the Bank site. Extirpation refers to the removal of the plant and roots from the ground. After pulling, the plant can be left on the ground. For other species, hand cutting or power trimming to a height of 12-inches will suffice to prevent the plant material from making a seed head. Chemical spraying should be completed with a product containing glyphosate, including one approved for use in or near aquatic environments if applicable (Rodeo or equivalent). Control of tree saplings should utilize Tordon RTU or equivalent. All label directions and safety precautions will be followed while using approved herbicides. Herbicides will be applied with a backpack or bottle sprayer for best results and to minimize overspray onto native plant materials. Soil disdurbance maybe utlized where apporiate to elimalte unwanted species along with water manipuilation.

2. Stream Credits

All areas proposed for the generation of stream credits, with the exception of stream channel habitats, must meet the following vegetative cover, tree and shrub survival rate, and invasive

species criteria. Stream channel habitats must meet the stream channel restoration criterion.

Vegetative Cover

All riparian corridor areas will meet the following minimum absolute cover requirements of planted and naturally recruited vegetative species that are desirable, i.e. not on the Highly Aggressive Invasive Species or Undesirable Species lists (Tables 2 and 3). Year 1 is defined as the first growing season after initial planting and seeding. Exceptions will be made for areas of near-constant inundation that cannot support such a high absolute vegetative cover percentage. If areas do not meet this survival rate requirement, the USACE will determine appropriate planting activities will be initiated.

Tree and Shrub Survival Rate

Trees and shrubs planted on the Bank as part of the restoration shall have a 75% survival rate. Natural recruitment of equivalent desirable species of trees and shrubs within the same group (hardwoods, softwoods, fruit producing, mast producing, etc.) may count towards meeting the 75% survival rate at the discretion of the USACE. If areas do not meet this survival rate requirement, the USACE will determine appropriate planting activities will be initiated.

Invasive Species

Management of invasive species will be undertaken as is suitable to maintain biodiversity and ecological function. Until five years after the USACE has released all credits for sale, invasive species shall be controlled as follows. Species on the list of Highly Aggressive Invasive Species (Table 2) will be eradicated upon observation and shall not, in the aggregate, cover more than 5% of the absolute cover of the Bank. In addition, a combination of the absolute cover of species on the Highly Aggressive Invasive Species list (Table 2) and the absolute cover of species on the Undesirable Species list (Table 8) shall not comprise more than 10% of the Bank property.

In-Stream Channel Restoration

Before the final stream credits can be released, as detailed in Section 5, stream channel restoration activities must maintain satisfactory channel stability in the opinion of the USACE in consultation with the IRT. Restored stream channels shall demonstrate minimal levels of channel instability, bank erosion, and downcutting as well as maintain proper channel cross-section at permanent monitoring points for a number of years to be determined appropriate by the USACE, in consultation with the IRT. The Sponsor shall establish three permanent in-stream monitoring points along the restored stream channel and will take notes and photographs which will record the stability of the restored stream channel with special attention to ordinary high water mark formation and evidence of bank erosion and downcutting.

I. Monitoring Requirements

Monitoring Report: A monitoring report performed by a qualified natural resources specialist shall be supplied to USACE to ensure success of the Bank site. Success criteria shall be identified by the documentation of the hydrology on the site and survival of the seedlings planted. Monitoring of soils is not necessary since the Bank site is located within existing hydric soils. Reports shall be submitted to the USACE by October 15th each year that a report is required.

J. Long-term Management Plan

The Bank site will be protected in perpetuity with a permanent conservation easement deed (Attachment 7) to be held by a third party. Remediation will not be required for adverse impacts that are due to natural disasters that are beyond the control of MEC.

The Sponsor shall be responsible for long-term management and maintenance of the Bank sites. The Sponsor may request approval from USACE to assign long-term management and maintenance to a third party. Frequent maintenance inspections are intended to identify necessary corrective actions. The Sponsor will make the necessary equipment and labor available for routine and unexpected maintenance actions throughout the life of the Bank. All maintenance actions expected during the life of the Bank will be completed by the Sponsor using reserve funds expressly for that purpose.

The landowner will be allowed certain uses of the Bank sites, such as hunting, provided that the activity does not adversely affect the functional integrity of the Bank sites. A list of compatible, supplemental, and prohibited uses is provided in the conservation easement deed (Attachment 7).

There are no long-term plans to transfer title of the property to another party. It is the intention of the Sponsor to maintain the property in perpetuity as highly functioning habitat in accordance with the terms of the long-term management plan and conservation easement. The site's conservation easement deed (Attachment 7) shall stay with the property in the instance that the title to the property is transferred to another party. An annual report of the long-term management funding will be included along with the annual ledger report submitted to the USACE summarizing all of the Bank transactions of the previous year as described in Section 7.

K. Adaptive Management Plan

After initial Bank site construction, the Sponsor shall maintain the property using an adaptive management approach that will provide flexibility when dealing with unforeseen issues. The Sponsor shall implement all facets of site maintenance in perpetuity.

If the Bank site is not able to be constructed to match the Wetland and Stream Restoration Site Plan (Attachment 5) or if site monitoring and maintenance activities determine that the project as planned is unable to meet the ecological performance standards, then the Sponsor will approach the USACE with suggestions of design changes, site modifications, or revisions to monitoring or maintenance requirements in order to ensure that the Bank provides aquatic resource benefits. These changes may increase or decrease the number of wetland credits allocated to the Sponsor. If necessary, the ecological performance standards may have to be revised to address deficiencies in the compensatory mitigation project or in management strategies or objectives if the new standards provide for ecological benefits that are comparable or superior to the approved compensatory mitigation project. No other revisions to performance standards will be allowed except in the case of natural disasters.

If the Bank cannot be constructed in accordance with the Wetland and Stream Restoration Site Plan (Attachment 5), the Sponsor will notify the USACE. Any significant modifications in the Wetland and Stream Restoration Site Plan (Attachment 5) must be approved by the USACE.

L. Financial Assurances

The Bank will consist of privately-owned property. Authority is demonstrated by the

financial assurances of a bonding, as needed, and the financial assurances that come with easement restrictions assigned to the proposed conservation easement deed (Attachment 7). The Sponsor will contribute a percentage of each credit sold to an interest-bearing account to be used for management and maintenance activities as required by USACE.

The Sponsor agrees to not sell any credits prior to substantial completion of site construction; therefore, no financial assurances are needed for site construction. Additionally, the Sponsor holds an unencumbered fee simple title to the bank site; therefore, no financial assurances are required for land acquisition. All other credit releases are based upon the results of monitoring reports that assess the fulfillment of ecological performance standards.

5. CREDIT RELEASE SCHEDULE

A. Credit Release Provisions

Credits shall be released to the Sponsor by the USACE, in consultation with the IRT, as determined during the Draft MBI phase of the process. As the Sponsor reaches the stated performance milestones, documentation shall be submitted to the USACE demonstrating that the appropriate milestones for credit release have been achieved along with a request for the release of credits.

The USACE, in consultation with the IRT, may modify the credit release schedule, reduce the number of available credits or suspend credit sales or transfers altogether if the Sponsor is not achieving expected performance standards or if specific requirements of the instrument have not been met.

B. Credit Release Schedule

Upon submittal of all appropriate documentation by the Sponsor and subsequent written approval by the USACE, in consultation with the other members of the IRT, it is agreed that credits will become available for use by the Sponsor or for sale to a third party in accordance with the schedule determined at the Draft MBI phase of the process. Because the areas within the Bank that are designated for wetland credit generation generation may achieve performance milestones at different times, the Sponsor may request the release of wetland credits and stream credits either together or separately.

C. Credit Release Review Schedule

The credit release approval process shall follow the schedule described in the Mitigation Rule (33 C.F.R. Part 332.8(o)(9)). Specifically, after the Sponsor submits documentation to the USACE demonstrating that the appropriate milestones for credit release have been achieved and requests the release of credits, the USACE will provide copies of this documentation to the IRT members for review. The IRT members must provide any comments to the USACE within 15 days of receiving this documentation. However, if the USACE determines that a site visit is necessary, the IRT members must provide any comments to the USACE within 15 days of the site visit. The USACE must schedule the site visit so that it occurs as soon as it is practicable, but the site visit may be delayed by seasonal considerations that affect the ability of the USACE and the IRT to assess whether the applicable credit release milestones have been achieved After full consideration of any comments received, the USACE will determine whether the milestones have been achieved and the credits can be released. The USACE shall make a decision within 30 days of the end of that comment period and shall notify the Sponsor and the IRT. The USACE or any

IRT member will provide the Sponsor a minimum of 24 hours' notice before any compliance inspection or other visit to the Bank.

6. ACCOUNTING PROCEDURES

A. Use of Credits

The USACE, in consultation with the IRT as necessary, will determine the eligibility of projects to use the Bank for compensatory mitigation on a case-by-case basis. Projects that can be considered will be determined by the USACE and will include those requiring authorization under Section 404 and/or Section 401 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act, as well as mitigation projects, Supplemental Environmental Projects, unauthorized activities, non-compliance actions and after-the-fact permits. The USACE will determine the number and type(s) of credits required to compensate for the authorized impacts of each Department of the Army permit. MDNR will determine the number and type(s) of credits required to compensate for any impacts that are solely authorized under Section 401 of the Clean Water Act.

B. Credit Ledger

The Sponsor will create and keep current a credit ledger for the Bank in order to account for all credit transactions. This credit ledger will show all credit transactions for the Bank and will include the beginning and current balance of available credits for each credit type (wetland and stream), all additions and subtractions of credits, and any other changes in credit availability, such as additional credits released or suspended credit sales. The Sponsor will notify the USACE in writing each time a credit transaction occurs and will supply the USACE with an updated ledger after each transaction.

7. REPORTING

A. Monitoring Reports

The Sponsor shall submit to the USACE, for distribution to the other members of the IRT, an annual monitoring report in accordance with Regulatory Guidance Letter 08-03, or any future relevant guidance, for a period not less than five years after final construction and planting. This monitoring report shall be submitted shortly after the beginning of each calendar year. The monitoring report will be of sufficient content to accurately describe the progress, or lack thereof, of the Bank in meeting the performance standards. Monitoring reports will include as-built drawings, maps, and ground photography illustrating the site conditions and interpretation of the current site conditions. If available, approved wetland and/or stream assessment methods that provide qualitative measures of the functions of the resource will be submitted.

B. Credit Ledger Accounting Reports

A credit ledger report will be submitted to the USACE on an annual basis after the beginning of each calendar year and will be part of the administrative record for the Bank. The credit ledger report will show the beginning and ending balance of available credits and permitted impacts for each resource type, including types of credits debited, all additions and subtractions of credits, and any other changes in credit availability (*e.g.*, additional credits released, credit sales suspended). The USACE will distribute copies of this ledger to the other IRT members.

C. Financial Assurances Reports

The Sponsor will also provide the USACE a report of the financial assurance funding along with the submittal of the credit ledger report. This financial assurance report will show the beginning and ending balances, including deposits into and any withdrawals from, the accounts providing funds for financial assurances. The status of those assurances will also be stated as well as their potential expiration.

8. DEFAULT AND CLOSURE PROVISIONS

A. Default Provisions

If the USACE determines that the Bank is not meeting performance standards that are expected to be achieved at the Bank's current level of development or is not complying with the terms of this Banking Instrument, appropriate action will be taken. Such actions may include, but are not limited to, suspending credit sales, adaptive management, decreasing available credits, utilizing financial assurances, and or terminating the instrument.

If the USACE, in consultation with the IRT, determines that the Bank, or a specific portion of the Bank, fails to achieve the performance standards specified in Section 4.H of this MBI, the USACE shall give written notice to the Sponsor of such violation and demand corrective action sufficient to cure the violation and, where the violation involves injury to the Bank resulting from any use or activity inconsistent with the purpose of this Mitigation Banking Instrument to restore the portion of the Bank to its prior condition in accordance with a plan approved by USACE. If the USACE determines that the Bank is operating at a deficit, the Sponsor will be notified that debiting of credits from that Bank should immediately cease. The Sponsor shall cure the violation and notify the USACE of the remedial site activities within 60 days after receipt of notice thereof from the USACE, or under circumstances where the violation cannot reasonably be cured within a 60 day period, update the USACE of the situation and begin curing such violation within the 60 day period and diligently pursue such cure to completion. In the event the Sponsor fails to implement remedial actions necessary to address a failure in meeting the performance standards or for a credit deficit within 60 calendar days, the USACE will notify the Sponsor that debiting from the Bank is indefinitely suspended and will authorize to draw on the contingency funds to implement the necessary remedial actions.

In the event that a natural disaster destroys all or part of the Bank, all debiting from the Bank shall cease immediately. Such natural disasters include floods, tornados, fires, earthquakes, droughts, disease, regional pest infestation, *etc*., which the USACE, in consultation with the IRT, determines is beyond the control of the Sponsor to prevent or mitigate. The Sponsor shall not be responsible for restoring acreage for credits which were sold prior to any such natural disaster. However, the Sponsor shall be responsible for restoring acreage for which credits have been released to the Sponsor if those credits are unsold at the time of the natural disaster. If the damage is so severe that the Sponsor and the USACE, in consultation with the IRT, determine that project success is unattainable, then the Sponsor will not be obligated to restore any portion of the Bank.

B. Closure Provisions

Bank Closure will occur when the terms and conditions of this instrument have been determined by the USACE, in consultation with the IRT, to be fully satisfied or until all credits have been debited, whichever is later. Subsequent to bank closure, site management and maintenance will remain the responsibility of the Sponsor.

If adaptive management strategies are unsuccessful and performance standards are unattainable, the

Sponsor may request early closure of the Bank and forfeiture of the remaining anticipated credits.

9. APPROVAL OF THE FINAL INSTRUMENT AND THE INCORPORATION OF THE IRT'S COMMENTS

The Sponsor shall submit, for approval, a final MBI to USACE that adequately addresses the main topics and subtopics contained within this bank instrument guidance document. The final MBI will include supporting documentation outlining how the final MBI addresses the comments provided by the IRT.

10. REFERENCES

Dahl, T.E. and C.E. Johnson. 1991. Status and trends of wetlands in the conterminous United States, mid-1970's to mid-1980's. U.S. Department of Interior, Fish and Wildlife Service, Washington D.C. 28 pp.

Heitmeyer, M.E. 2010. An Evaluation of Ecosystem Restoration Options for the One-Percent Chance Exceedance Floodplain of the Cache River Basin in Arkansas and Missouri with Special Reference to Channel Blockage Near Grubbs, Arkansas and Sediment Management in the Big Creek Watershed. Greenbrier Wetlands Services, Advance, Missouri, GWS Report 10-08.