

**Black River Bottomland Hardwoods Mitigation Bank
The Banking Plan**

Table of Contents

Part 1 - The Banking Plan

Part 2 - MBRT Consensus Statement

Part 3 - Memorandum of Agreement

Part 4 - Signature Pages

**Black River Bottomland Hardwoods Mitigation Bank
The Banking Plan**

Part 1 - The Banking Plan

Black River Bottomland Hardwoods Mitigation Bank

The Banking Plan

| | |
|--|-----------|
| 1.0 INTRODUCTION. | 1 |
| 2.0 PREAMBLE. | 1 |
| 2.1 PURPOSE, GOALS AND OBJECTIVES. | 1 |
| 2.2 GENERAL DESCRIPTION OF THE MITIGATION BANK. | 1 |
| 3.0 ESTABLISHMENT OF THE MITIGATION BANK. | 2 |
| 3.1 MITIGATION PLAN. | 2 |
| 3.1.1 <i>Enhancement By Improving Backwater Flooding (Unit 1).</i> | 2 |
| 3.1.2 <i>Enhancement By Reestablishing A Bottomland Hardwood Community (Unit 2).</i> | 3 |
| 3.1.3 <i>Preservation (Unit 3).</i> | 4 |
| 3.1.4 <i>Enhancement By Upland Buffering (Unit 4).</i> | 4 |
| 3.1.5 <i>Upland Buffering (Unit 5).</i> | 4 |
| 3.2 ECOSYSTEM GOALS. | 5 |
| 3.3 BASELINE AND REFERENCE CONDITIONS. | 5 |
| 3.4 MONITORING REQUIREMENTS. | 5 |
| 3.4.1 <i>Hydrological Monitoring.</i> | 5 |
| 3.4.2 <i>Vegetation Monitoring.</i> | 6 |
| 3.5 SUCCESS CRITERIA. | 6 |
| 3.6 IMPLEMENTATION TIMETABLE. | 6 |
| 3.7 PROVISIONS FOR LONG-TERM USE. | 6 |
| 3.8 DEBITING PLAN - TYPES AND AMOUNTS OF CREDITS AVAILABLE. | 7 |
| 4.0 OPERATION OF BANK. | 7 |
| 4.1 PROVISIONS FOR WITHDRAWAL OF CREDITS. | 7 |
| 4.2 FINANCIAL ASSURANCE. | 8 |
| 4.3 SITE AUDIT BY MBRT. | 8 |
| 4.4 ACCOUNTING PROCEDURES. | 8 |
| 5.0 LONG-TERM MAINTENANCE AND MANAGEMENT. | 8 |
| 6.0 CONTINGENCY. | 8 |
| 7.0 DEFINITIONS. | 9 |
| 8.0 LITERATURE CITED. | 11 |
| Appendix A - Figures | |
| Appendix B - Mitigation Plan | |
| Appendix C - Factors Tables | |
| Appendix D - Accounting Forms | |

Black River Bottomland Hardwoods Mitigation Bank

1.0 INTRODUCTION.

Compensatory mitigation, in consideration of sequencing requirements and other regulations, is a common component of the wetlands regulatory process. Within the last decade an alternative approach to on-site compensatory mitigation has emerged -- wetland mitigation banking. Wetland mitigation banking allows larger, off-site wetland areas to be used to mitigate for a number of independent wetland impacts. The developer is not required to produce the compensatory wetland values, rather, the developer can purchase them from another entity that has produced and "banked" them for that purpose. The banked compensation credits are recognized by the regulatory agency as providing suitable compensation for wetland impacts.

Wetland mitigation banking is based on the premise that mitigation banking will provide greater ecological benefits than on-site, project specific mitigation. Because banking mitigates for numerous individual wetland conversions, compensation sites are likely to be larger and more viable hydrologically and biologically. Additionally, banked compensation wetlands can achieve functional success in advance of wetland conversions for which they are intended to mitigate. They can also be continuously monitored and managed to assure the production of the wetland functions at issue. Wetland banking offers potential efficiencies and economics of scale, and may offer consistent professional wetland management rather than reluctant management by the development entity (ELI 1993).

2.0 PREAMBLE.

State and Federal guidance is available for the general establishment and use of wetland mitigation banks (USEPA & USDOA 1990, 33 CFR 320.4(r), ELI 1993). On a more local level the Charleston District Corps of Engineers, in conjunction with State and Federal environmental agencies, recently provided *Standard Operating Procedure for Compensatory Mitigation* (COE 1996) and *Joint State/Federal Administrative Procedures for The Establishment and Operation of Wetland Mitigation Banks in South Carolina* (COE et al. 1996). These two documents provide specific guidance on the development and operation of mitigation banks in South Carolina. This guidance establishes a Mitigation Banking Review Team (MBRT), an interagency group of Federal, State, or local regulatory and resource agency representatives charged with the responsibility of monitoring the establishment, use, and operation of mitigation banks in South Carolina.

The Memorandum of Agreement (MOA) that follows will constitute the formal, written banking instrument developed in cooperation with the MBRT. The MOA has been prepared in accordance with the guidance cited above. The Mitigation Bank was initially presented to the MBRT at their monthly meeting in December, 1996. An on-site meeting was conducted on February 28, 1997, whereupon the components of enhancement, restoration, preservation, and upland buffering were reviewed. The MBRT sanctioned the concept, provided several recommendations, and requested specific information to be included in the plan, particularly riverine flooding and elevation data to support the premise of enhancement. The sections that follow describe the mechanisms of establishment, operation, and long-term management for the Black River Bottomland Hardwoods Mitigation Bank (BLHMB), a private, multi use wetland mitigation bank.

2.1 Purpose, Goals and Objectives.

The purpose of this MOA is to establish and define the Black River Bottomland Hardwoods Mitigation Bank (BLHMB) in Williamsburg County, South Carolina. The basic purpose of the BLHMB is to provide a compensatory off-site alternative for wetland losses associated with current and future authorized wetland impacts.

The BLHMB features both economic and ecological goals. Economically, the BLHMB will seek to provide a cost effective alternative to the development community for off-site mitigation of palustrine forested and riverine wetlands in portions of the Coastal Plain of South Carolina. This goal will presume a reasonable return on investment. Ecologically, the BLHMB will confront the important ecological issues of backwater flooding and desynchronization, habitat diversity, and forest fragmentation within the landscape context. These ecological goals are discussed in detail in Section 3.2.

Specific objectives of the BLHMB include the following:

- a. Determine baseline and reference conditions of the mitigation area.
- b. Execute the prescribed enhancement, restoration, preservation, and buffering of selected habitats.
- c. Provide for long-term maintenance and management of various components of the mitigation bank.

2.2 General Description of the Mitigation Bank.

The BLHMB is located adjacent to the Black River (south side) approximately 9.5 river miles below (downstream) Kingstree, Williamsburg County, South Carolina. The location of the BLHMB is depicted on Figures 1 and 2, on a Williamsburg County Highway Map and the 7.5 minute quadrangle map of Kellehan Crossroads, respectively, which are contained in Appendix A. The BLHMB will be established on a portion of an approximately 315-acre site containing 4,200 feet of frontage on the Black River.

Black River Bottomland Hardwoods Mitigation Bank

The site is relatively diverse, containing a variety of Coastal Plain habitats, including permanently flooded riverine guts and sloughs, deep alluvial bottomland hardwoods, seasonally to temporarily flooded mixed hardwood flats, mesic pine-mixed hardwoods, even-aged planted pine, and xeric sandhills. A survey plat of the property is depicted on Figure 3 (Appendix A). The BLHMB will offer enhancement and preservation, credits for riverine and palustrine forested wetlands. The total acreage of mitigation within the BLHMB is 81.6 acres.

The BLHMB will be operated by Ecological Associates, Inc. It is anticipated that the BLHMB will be a variable credits, multi-client bank, offering mitigation credits to any public or private entity whose project meets the permit requirements as well as any additional requirements of the BLHMB.

3.0 ESTABLISHMENT OF THE MITIGATION BANK.

The essential function of a wetland mitigation bank is to produce mitigation credits, the physical commodity whose value is traded or sold by the bank. Credits are produced at the mitigation site by any of the accepted methods -- restoration, creation, enhancement, or preservation. The sections that follow detail the mechanisms of credit production at the BLHMB site, and provide validation of their value.

3.1 Mitigation Plan.

The mitigation plan for the BLHMB consists of a comprehensive approach which includes five units. Wetland enhancement by improving backwater flooding (Unit 1), wetland enhancement by reestablishing a bottomland hardwood community (Unit 2), wetland preservation (Unit 3), wetland enhancement by upland buffering (Unit 4), and establishment of the upland buffer itself (Unit 5). The mitigation plan is depicted on Figure 4, contained in Appendix B. The table below identifies the various mitigation units and the number of acres credited as mitigation for each unit.

BANK ACREAGE SUMMARY

| UNIT | MITIGATION | DESCRIPTION |
|--------------|----------------------|--|
| Unit 1 | 25.3 acres | Enhancement of bottomland hardwoods by improving backwater flooding |
| Unit 2 | 5.0 acres | Enhancement by reestablishing a bottomland hardwood community |
| Unit 3 | 37.7 acres | Preservation of bottomland hardwood wetlands adjacent to Black River |
| Unit 4 | 13.6 acres | Enhancement of bottomland hardwoods by buffering |
| Unit 5 | 0 acres [†] | Upland buffer - 100 ft. upland buffer surrounding Unit 3 |
| Total | 81.6 acres | Acres used in calculation of mitigation credits. |

[†]No credit is given for the upland buffer in Unit 5 since credit is obtained through enhancement in Unit 4. All units will be preserved through a conservation easement, including the upland buffer (Unit 5) consisting of 13.6 acres.

3.1.1 Enhancement By Improving Backwater Flooding (Unit 1).

The primary component of the BLHMB is the enhancement of approximately 25.3 acres of bottomland hardwood wetlands by removing five constricting road crossings to improve backwater flooding. Bottomland hardwoods are known to perform an array of valuable functions that have been determined to be of great value to our social system (Brinson et al. 1981, Wharton et al. 1986). Water is the driving force of the bottomland hardwood community. An understanding of the seasonal dynamics of bottomland hardwoods, particularly the water cycle, is necessary to clarify the functional role of these systems within the landscape.

Typically, rising waters in the late winter and spring flood the forest floor. The flood depth, duration, and frequency determines to a great degree which plant and animal species inhabit the floodplain. The flooding waters carry large amounts of sediment and dissolved nutrients. As the water rises out of the river bank it spreads over the floodplain and slows, dropping its sediment load. These deposits form a rich subsidy of nutrients to the system, resulting in higher production and diversity. During this period of flooding, water storage in the bottomlands reduces flood crests downstream. While the forest floor is flooded, many species of fish and invertebrates move up into the floodplain to feed and spawn. As floodwaters recede they move with the waters edge, feeding on the abundant detritus and other food materials. Terrestrial animals also follow the receding water line. In effect, flooding provides a moving, highly productive ecotone that concentrates bottomland hardwoods fauna (Gosselink and Lee 1987).

The literature is replete with studies of adverse impacts to bottomland hardwoods. The most damaging alterations to the wetland functions associated with bottomland hardwoods are those that modify the driving forces of the natural system -- water, sediments, and nutrients - the primary source of energy and materials supplied to these ecosystems (Cairns et al. 1981). Some of the most

Black River Bottomland Hardwoods Mitigation Bank

damaging alterations include diking, damming, road crossings, and other activities that restrict the normal overflow and/or backwater flooding patterns to these systems (Belt 1975, Fredrickson 1979).

Dale et al. (1979) reported that the largest yields of finfish tend to be supported by those bottomland hardwood areas that are connected directly (i.e., a "water bridge is present) to the main channel during flooding. Such water bridges are essential because they allow adult fish to have access during the flooding period to fertile floodplain areas, which are critical sites for reproduction, food, and cover. At the same time, the presence of water bridges allows fish to follow receding floodwaters back into the main channel. The primary mechanism for enhancement at the BLHMB is to restore the historical "water bridges" to bottomland hardwood areas.

In the instant case five existing roadways with insufficient culverts, or no culverts at all, are restricting normal backwater flooding to two separate bottomland hardwood wetland areas totaling approximately 25.3 acres (Area A = 10.2 acres, Area B = 15.1 acres). These acres are contiguous with the adjacent river swamp, and at elevations that allow flooding to substantial depths for sustained periods during the flood cycle. The areas to be enhanced are in relatively close proximity to the Black River (Figure 4, Appendix B). Historical maps and photographs indicate that the road crossings in question were placed across the primary flooding corridors for large areas of backwater swamp.

The primary mechanism for enhancement is to remove the restrictive road crossings to reestablish normal backwater flooding to these areas (Areas A and B on Figure 4).

Area A is impacted by three road crossings.

- The largest road crossing spans approximately 200 feet of swamp and has a single 14-inch culvert. This roadway and culvert will be removed in its entirety.
- A second road crossing spans approximately 180 feet of swamp and has no culverts. This road crossing will also be removed in its entirety.
- The third road crossing spans approximately 120 feet of swamp with a single 12-inch culvert. This roadway will be replaced with a bridge approximately 20 feet wide.

Area B is restricted by two road crossings.

- The largest crossing spans approximately 200 feet of swamp. This crossing will be removed in its entirety.
- The second crossing spans approximately 40 feet of swamp. This crossing will be replaced with a bridge approximately 20 feet wide.

These measures will restore normal backwater flooding to approximately 25.3 acres of bottomland hardwoods. Normal water quality and water resource functions, including floodwater storage, sediment stabilization, sediment/toxicant retention, nutrient removal/transformation, production and export, and fisheries habitat, will be substantially enhanced. The function of providing habitat, and ingress/egress for riverine fishes will be particularly enhanced.

3.1.2 Enhancement By Reestablishing A Bottomland Hardwood Community (Unit 2).

Wetland enhancement in this unit of the BLHMB will consist of reestablishing 5.0 acres of seasonally flooded forested wetlands that have been converted to even-aged loblolly pine (*Pinus taeda*). The acres proposed for reestablishing a bottomland hardwood community are part of a larger block of land that was converted to loblolly pine in 1978 by classical methods of deep bedding and planting. Historical photographs and soil maps show these areas as seasonally to temporarily flooded mixed hardwood flats. These areas are easily distinguished in the field by hydric soil conditions and standing water during periods of normal seasonal flooding.

The mechanism for reestablishment of the bottomland hardwood community in these areas will be to remove the existing planted pine component, remove the existing bedding by root rakes or similar reforestation equipment, if necessary, and plant with appropriate wetland tree species. The existing soils, as well as the hydrological pathways (surface inundation from adjacent swamp forests), are suitable for reestablishment of the wetland community. Reestablishment of the bottomland community at this location is expected to require minimal, if any maintenance. Subsequent to site preparation, the area will be hand planted with one year old bare-root seedlings on 10-foot centers throughout the area. Species selected for planting will be species that have been

Black River Bottomland Hardwoods Mitigation Bank

determined to predominate in similar adjacent and surrounding wetland areas. Potential species to be planted will include the following, with a preference toward high quality wildlife foods and/or mast producing species:

- Chestnut oak -- (*Quercus michauxii*)
- Bald cypress -- (*Taxodium distichum*)
- Swamp tupelo -- (*Nyssa sylvatica* var. *biflora*)
- Green ash -- (*Fraxinus pennsylvanicus*)
- Laurel oak -- (*Quercus laurifolia*)
- Cherrybark oak -- (*Quercus pagoda*)
- Overcup oak -- (*Quercus lyrata*)
- Water hickory -- (*Carya aquatica*)

3.1.3 Preservation (Unit 3).

The primary wetland preservation at the BLHMB will consist of preserving approximately 51.3 acres of mature bottomland hardwood wetlands that are located adjacent to the Black River. The wetlands to be preserved are typically mature, uneven-aged swamp forests containing representatives of all six floodplain zones, as described by the National Wetlands Technical Council (Larson et al. 1981). The preservation area contains the following specific community types organized according to zones:

| AREA | DESCRIPTION |
|----------|---|
| Zone I | River channels, and permanently inundated backsloughs. |
| Zone II | Intermittently exposed to semi-permanently flooded cypress-tupelo sloughs and floodplain swales. |
| Zone III | Semi-permanently flooded or saturated cypress-tupelo flats, mixed oak flats, and American elm-green ash-tupelo flats. |
| Zone IV | Seasonally flooded willow oak-water oak-gum flats. |
| Zone V | Temporarily flooded chestnut oak-water oak-red maple flats. |

The wetland preservation area represents a diverse assemblage of community types generally exhibiting the entire continuum of hydrological zones from the river channel to the adjacent upland forest. Additionally, the area has an old-growth component that has been shown to be of particular importance to a variety of southern swamp species of wildlife (Connor 1978, Schoen et al. 1981). As a mature, generally unaltered streamside or riparian zone, the area is a particularly good candidate for preservation and multi-species management (Howard and Allen 1988). The preserved wetlands will be severely restricted, to include prohibitions on all timber harvesting.

In addition to 51.3 acres of mature bottomland hardwoods, wetland preservation will also include the preservation of 30.3 acres of enhanced wetlands (Units 1 and 2). All the preserved wetlands (81.6 acres) and the 13.6 acres of upland buffer (Unit 4) will be placed in a conservation easement to be held by responsible conservation entity properly organized under Section 501(C)(3) of the U.S. Tax Code.

3.1.4 Enhancement By Upland Buffering (Unit 4).

The wetland enhancement in Unit 4 will consist of placing a 100-foot wide upland buffer around 51.3 acres of mature bottomland hardwood wetlands adjacent to the Black River (Unit 3). The preserved wetlands will be significantly enhanced by the placement of a highly restricted upland buffer around these wetlands.

3.1.5 Upland Buffering (Unit 5).

The upland buffer will consist of a 100-foot wide strip of uplands bordering the preserved wetlands. The upland buffer will be restricted to include prohibitions on clearcutting, conversion to pine monoculture, and mechanical site preparation. A single selective harvest of the merchantable pine timber will be conducted in two selected areas of planted pine that occur within the buffer area. This cut will take place within the next five years and will maintain a minimum of 300 trees per acre or a basal area of 50, whichever is less. Subsequent to this single partial harvest of pine timber within the planted pine stands, no timber harvesting of any kind will be allowed within the upland buffer. The planted pine stands within the upland buffer that will be subject to cutting as described above are identified on Figure 4, contained in Appendix B. The upland buffer, as well as the preserved wetlands, will be placed in a conservation easement to be held by responsible conservation entity properly organized under Section 501(C)(3) of the U.S. Tax Code.

Black River Bottomland Hardwoods Mitigation Bank

3.2 Ecosystem Goals.

Mitigation banking presents an opportunity to deal with ecological issues on a landscape scale in a way that on-site, project specific mitigation may not. Mitigation banking is also a superior method (possibly the only method) to address the mitigation of cumulative impacts. Ecosystem goals for mitigation of bottomland hardwoods should logically follow goals for cumulative impact regulation in these systems. The goals of cumulative impact assessment and regulation have been discussed in detail by Gosselink and Lee (1987), whose work was relied on heavily in developing ecosystem goals for the BLHMB. As a complete bottomland hardwoods system, i.e., a continuum from river channel to uplands, goals of the BLHMB will be to restore, enhance, and maintain the range of functions attributed to bottomland hardwood systems. The following are specific ecosystem goals of the BLHMB, all of which extend beyond the limits of this project:

- a. Mitigate to enhance subsidized production. Restore and enhance the important functions of sediment and nutrient subsidy, which are responsible for the relatively high primary production, secondary productivity, and species diversity of bottomland hardwoods.
- b. Mitigate to maintain water quality enhancement. Maintain water quality by facilitating sediment trapping, transformation of nutrients, filtration of pollutants.
- c. Mitigate to enhance flood water desynchronization and storage. Restore and enhance the functions of floodwater storage, which depend upon the freely flooding nature of intact bottomland hardwoods.
- d. Mitigate to preserve large blocks of bottomland/upland forests. Preservation of large blocks of undisturbed bottomland hardwoods benefits area-sensitive species over more opportunistic generalists and edge species.
- e. Mitigate to maintain contiguity between bottomland hardwood forests and river, and between bottomland hardwood forests and upland forests. Maintaining the continuum of habitats across the floodplain maximizes species diversity and extends the habitats of far ranging species.

3.3 Baseline and Reference Conditions.

Baseline and reference conditions will be established in the enhancement units prior to enactment of mitigation measures. Quantitative indices will be used in these areas where appropriate. The following pertinent baseline conditions will be established for two of the four mitigation units:

| BANK UNIT | BASELINE CONDITIONS |
|-----------|---|
| Unit 1 | Flooding extent, depth, and duration, vegetation species composition and diversity. |
| Unit 2 | Vegetative species composition, inundation and/or depth to ground water table. |

3.4 Monitoring Requirements.

Monitoring of vegetation and hydrology will be conducted each year until it is demonstrated that the performance standards identified below have been satisfied and the various mitigation units mimic the functions of the adjacent reference ecosystem (RE). Monitoring reports will be submitted to the MBRT by December 31 of each monitoring year. Once it has been demonstrated that the mitigation units have achieved the pre-established performance standards yearly monitoring will be terminated. Monitoring will be conducted at five-year intervals thereafter for 20 years to summarize the continued function and value of the mitigation bank. However, monitoring at five-year intervals after initial success has been determined will not affect the success ruling or withdrawal of credits. Specific monitoring that will be employed in the various mitigation units is as follows:

| BANK UNIT | MONITORING TYPE |
|-----------|---|
| Unit 1 | Hydrological. |
| Unit 2 | Hydrological, vegetation species composition. |

3.4.1 Hydrological Monitoring.

Hydrological monitoring will be conducted in Enhancement Units 1 and 2. Hydrological monitoring will consist of measuring the depth, frequency, and duration of flooding in Enhancement Unit 1, and the depth of inundation and/or depth to soil water table in Enhancement Unit 2. A paired approach will be used, with a separate, appropriate RE established for each mitigation unit. The location of the paired REs are shown on Figure 1, contained in Appendix B. A minimum of three staff gages/wells will be installed in each mitigation unit, and the comparable RE. Intensive monitoring will be conducted in Enhancement Unit 1 in the late winter (February - March, inclusive), when flooding is expected to be highest, and also in early spring (April - May, inclusive) in Enhancement Unit 2, when the soil water table is expected to be high. During these periods measurements will be taken weekly. During the balance of the year monthly measurements will be taken.

Black River Bottomland Hardwoods Mitigation Bank

3.4.2 Vegetation Monitoring.

Vegetation monitoring will be conducted in Enhancement Unit 2. Vegetation monitoring will be conducted by the quadrat sampling methodology as described for comprehensive wetland determination in the 1989 *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee for Wetland Delineation 1989). Vegetative monitoring will be performed once a year during the late summer, when vegetative growth is at its peak. Plot sampling will be conducted at 200-foot intervals along a permanent transect established through the long axis of each of the two areas and the RE. The location of the transects are shown on Figure 1 in Appendix B. Vegetative species composition and dominance will be determined for each vegetation stratum, in each sample plot. Trees and shrubs, and herbaceous understory will be sampled in 30-foot and five-foot circular plots, respectively. Dominance will be determined by obtaining measurements of stem density for trees and shrubs, and percent cover for herbaceous understory.

3.5 Success Criteria.

The establishment of success criteria is essential for evaluating the success of wetland mitigation. Performance standards and/or a reference ecosystem (RE) will be used to determine the success of the enhancement units of the BLHMB. The specific performance standards for each of the two enhancement units will be as follows:

| BANK UNIT | SUCCESS CRITERIA |
|-----------|--|
| Unit 1 | <ol style="list-style-type: none">1. The removed roadway sections will remain clear of obstructions.2. Depth and duration of flooding will be consistent with the adjacent, unaltered RE.3. Data for the two systems should be comparable to within 10 percent. |
| Unit 2 | <ol style="list-style-type: none">1. Mean density of 200 trees/shrubs per acre (TPA) including planted and volunteer species which match the dominant species of the RE.2. A minimum of 50 percent survival of planted species3. Establishment of 50 percent coverage of woody and herbaceous groundcover which includes at least 30 percent of species dominant in the RE.4. Less than 10 percent of the area comprised of nuisance and/or upland species5. Inundation depth and/or soil water table data comparable to the RE. |

3.6 Implementation Timetable.

The BLHMB will be implemented in several stages. The enhancement in Unit 1 will be performed in late summer, 1997, during the dry period of the year. All construction, including stabilization of excavated road crossings and adjacent areas will be completed prior to the fall/winter flooding period. The preservation of 81.6 acres of bottomland hardwood wetlands (Unit 1, 2, and 3), and 13.6 acres of upland buffer (Unit 4) will be implemented independently during summer, 1997. The enhancement in Unit 2 will be implemented in winter, 1998.

3.7 Provisions For long-Term Use.

The four units of the BLHMB will be placed in a conservation easement to be held by a responsible party. The four mitigation units will thus be protected in perpetuity. It is conceivable that the lands containing the mitigation units could be sold or transferred, however, the conservation easement and associated restrictions will be remain intact, and will essentially be a part of the land.

Black River Bottomland Hardwoods Mitigation Bank

3.8 Debiting Plan - Types and Amounts of Credits Available.

The BLHMB is a Variable Credits Mitigation Bank containing a range of 125.8 to 183.5 mitigation credits. The allowable mitigation credits have been established in accordance with the USACE's most recent SOP for compensatory mitigation, and in concert with the MBRT. Worksheets for establishing allowable credits for the BLHMB are contained in Appendix C. The breakdown of allowable mitigation credits according to the individual mitigation units is summarized in the following table:

MITIGATION CREDITS SUMMARY

| BANK UNIT | MITIGATION | |
|---|-------------|----------------------|
| | ACRES | CREDITS |
| Unit 1 – Enhancement (Improving Backwater Flooding) | 25.3 | 58.2 - 78.4 |
| Unit 2 – Enhancement (Reestablishment of BLH Community) | 5.0 | 14.0 - 18.0 |
| Unit 3 – Preservation | 37.7 | 26.4 - 49.0 |
| Unit 4 – Enhancement (Upland Buffer) | 13.6 | 27.2 - 38.1 |
| Unit 5 - Upland Buffer | 0 | 0 [†] |
| Totals | 81.6 | 125.8 - 183.5 |

[†]No credit is given for the upland buffer in Unit 5 since credit is obtained through enhancement in Unit 4. All units will be preserved through a conservation easement, including the upland buffer (Unit 5) consisting of 13.6 acres.

4.0 OPERATION OF BANK.

The BLHMB will be operated by Ecological Associates, Inc. under the general guidance of the MBRT and the *Joint State/federal Administrative Procedures for The Establishment and Operation of Wetland Mitigation Banks in South Carolina* (USACE et al. 1996). The specific elements of the operation of the BLHMB are described in the sections that follow.

4.1 Provisions for Withdrawal of Credits.

Debiting of credits will be in accordance with the USACE's SOP for compensatory mitigation that is in operation at the time of the desired Withdrawal. Mitigation bank credits and debits will be calculated using the factors shown on the mitigation tables and worksheets contained in Appendix D. For purposes of calculating credits the following kind and location factors will be used:

KIND FACTORS[†]

| |
|--|
| <i>Category 1</i> means riverine areas where the mean annual flow is greater than 5 cfs. |
| <i>Category 2</i> means isolated forested wetlands and riverine areas where the flow is less than 5 cfs. |
| <i>Category 3</i> means non-riverine scrub-shrub wetlands. |
| <i>Category 4</i> means non-riverine open waters (e.g. ponds, lakes). |
| <i>Category 5</i> means all other kinds of aquatic areas subject to approval on a case by case basis. |
| <i>Excluded kinds</i> means tidal waters, Carolina Bays, and emergent wetlands. |

[†]The BLHMB shall not be used as mitigation for impacts to excluded areas nor for impacts to aquatic areas which do not fit into categories 1-4 unless approved by the Corps on a case specific basis. Prior to approving such variances, the Corps will consult with the MBRT in accordance with MBRT procedures.

LOCATION FACTORS[†]

| |
|--|
| <i>Zone 1</i> means the portions of Black River watershed located within 4D and 5D. |
| <i>Zone 2</i> means the portions of Pee Dee and Lynches River watersheds within 4D and 5D. |
| <i>Zone 3</i> means the portions of Little Pee Dee and Waccamaw River watersheds within 4D and 5D. |
| <i>Zone 4</i> is not used for this bank. |
| <i>Zone 5</i> means all other areas subject to approval on a case by case basis. |

[†]The BLHMB shall not be used as mitigation for impacts which are outside of the zones given above unless approved by the Corps on a case specific basis. Prior to approving such variances, the Corps will consult with the MBRT in accordance with MBRT procedures. Areas 4D and 5D are explained in the Definitions Section under the term Service Areas.

Black River Bottomland Hardwoods Mitigation Bank

The BLHMB is located in the Black River Sub-basin of the Pee Dee River Basin (Beasley et al. 1988), or within the Pee Dee Service Unit (Unit 4D) as described in Attachment B of *Procedures for the Establishment and Operation of Wetland Mitigation Banks in South Carolina*. The MBRT has determined that the BLHMB is appropriate for mitigation of impacts to certain wetland types (see article 4.1, Kinds Factors) within Service Units 4D and 5D. In special circumstances, its use within other areas of Service Unit 4 (Coastal Plain) may be approved by the MBRT on a case by case basis.

Availability of credits for withdrawal from the bank is as follows. Fifty percent of the credits from Unit 1 will be available as soon as roadway removal has been accomplished and deemed satisfactory by the MBRT. The remaining fifty percent of Unit 1 credits will be available for withdrawal subsequent to MBRT concurrence that the success criteria for this unit as specified in Section 3.5 of this document have been met. Likewise, Unit 2 credits will become available subsequent to MBRT concurrence that the success criteria for Unit 2 as specified in Section 3.5 of this document have been met (approximately 3 years). Unit 3 (preservation) and Unit 4 (buffering) credits will become available as soon as documentation of execution of the conservation easement for these areas is provided to the MBRT. No credits will be withdrawn from any portion of the bank until the MBRT has approved the conservation easement and the conservation easement has been properly recorded.

4.2 Financial Assurance.

Financial guarantees serve an important function for mitigation banks in preparing for potential failure and allocating liability. There are numerous financial instruments that can serve to guarantee mitigation success and to provide a source of funds in the event of contingencies (ELI 1993). The potential for failure of the BLHMB is considered to be low since the majority of the mitigation is relatively passive, and rigorous, long-term preservation mechanisms will be in place. However, financial guarantees for the BLHMB will be established in the form of an escrow account. Upon sale of credits at market price, the credit producer (BLHMB) will deposit funds into an escrow account to ensure long-term maintenance, management, and monitoring. For each fully certified credit sold the credit producer will deposit 20 percent of the credit sale into the escrow account. Interest on the escrow account would be usable by the bank for maintenance, management, and monitoring, however, the principal would remain intact. Upon consensus that the various mitigation units have achieved success, the principle in the escrow account would be released to the bank.

4.3 Site Audit by MBRT.

The MBRT will be invited to inspect the BLHMB after implementation of each of the mitigation units. The BLHMB will also furnish the MBRT with a yearly report detailing the results of monitoring and any maintenance or management activities. The BLHMB will be open for visitation by the MBRT at any time during the life of the bank.

4.4 Accounting Procedures.

Accounting records will be maintained for each unit of the BLHMB, and for the bank as a whole. A copy of the *Variable Credits Mitigation Bank - Combined Acres and Credits Accounting Record* form that will be used is contained in Appendix E. A summary accounting record will be provided to the MBRT by December 31 of each year that the bank is in operation. A variation of this form will also be provided to each purchaser of bank credits for documentation.

5.0 LONG-TERM MAINTENANCE AND MANAGEMENT.

Long-term maintenance and management of a mitigation bank is necessary to insure realization of site specific and long-term ecological benefits. The validity of the BLHMB over the long-term will be established by placing the entire mitigation bank in a conservation easement to be held by an appropriate entity. Maintenance of the BLHMB will generally be minimal, as the majority of the mitigation is relatively passive. Relatively no maintenance is anticipated for Units 1, 3, and 4 of the BLHMB, with standard maintenance measures being applied to Unit 2, particularly during the early stages of hardwood regeneration. Typical maintenance measures that may be required in Unit 2 include replanting seedlings, fertilization, and management of competing vegetation. These measures will be applied as appropriate during the early stages of bottomland hardwood regeneration. Long term maintenance and management of the BLHMB will be the responsibility of the bank operator, Ecological Associates, Inc., for as long as the mitigation bank is in operation. Overall management responsibility of the various mitigation units will thereafter shift to the easement holder or their designee.

6.0 CONTINGENCY.

The potential for total or partial failure exists with any mitigation bank. Failure can arise from disease, weather, third-party damage, accidents, catastrophic events, depredation, or other factors. Contingency planning compels the bank operator to consider these factors during the planning stage and to determine what, if any, preventive and/or remedial measures shall be taken in the event of total or partial failure. Maintenance and monitoring are important in recognizing and preventing potential bank failure.

Black River Bottomland Hardwoods Mitigation Bank

The BLHMB does not possess a high risk for failure since the majority of the mitigation is relatively passive and the monitoring is intensive.

Contingency measures for the enhancement unit will consist of widening the breaches to allow additional flooding, if warranted, and the maintenance of the breaches by removal of any blockages that occur either naturally or otherwise. The contingency plan for the restoration unit will consist of vegetation management, replanting, and/or manipulating elevations until the performance standards for vegetation, hydrology, and soils have been achieved. Periodic monitoring of the preservation and upland buffer units should be sufficient to minimize potential failure in these units.

7.0 DEFINITIONS.

Control means the entity empowered or responsible for enforcing the preservation requirements. Related terms are:

Conservancy means a qualified, experienced, non-profit conservation or government organization.

POA means a property owners association or other similar, formally chartered, non-profit organization.

Private means a private individual or business enterprise.

Subdivided means more than one owner has separate ownership of a portion of the mitigation site.

Credit Schedule means the relative time when the mitigation will be performed. Related terms include:

Schedule 1. Means that no credits may be withdrawn prior to final determination of success.

Schedule 2. Means no more than 10% of the credits may be used before final determination of success.

Schedule 3. Means no more than 20% of the credits may be used before final determination of success.

Schedule 4. Means no more than 30% of the credits may be used before final determination of success.

Schedule 5. Means more than 30% of the credits may be used before final determination of success.

Hydrology, means the properties, distribution, and circulation of water on the surface of the land, in the soil, and underlying rocks. Related terms include:

Created hydrology means the permanent manipulation of the topography resulting in an ecologically significant change in the hydrology of the area.

Mechanical hydrology means the employment of mechanical methods (e.g., pumps) to supply water to an area thereby causing an ecologically significant change in the hydrology of the area.

Natural hydrology means the area's hydrology as it existed prior to the actions of modern man. Hydrology which has been restored to its natural state qualifies as natural hydrology.

Kind is a factor used to compare the relative functions and values of the mitigation site to the impact site. For the purposes of the BRBH Mitigation Bank, the kind categories are defined as follows:

KIND FACTORS [†]

| |
|--|
| <i>Category 1</i> means riverine areas where the mean annual flow is greater than 5 cfs. |
| <i>Category 2</i> means isolated forested wetlands and riverine areas where the flow is less than 5 cfs. |
| <i>Category 3</i> means non-riverine scrub-shrub wetlands. |
| <i>Category 4</i> means non-riverine open waters (e.g. ponds, lakes). |
| <i>Category 5</i> means all other kinds of aquatic areas subject to approval on a case by case basis. |
| <i>Excluded kinds</i> means tidal waters, Carolina Bays, and emergent wetlands. |

[†] The BLHMB shall not be used as mitigation for impacts to excluded areas nor for impacts to aquatic areas which do not fit into categories 1-4 unless approved by the Corps on a case specific basis. Prior to approving such variances, the Corps will consult with the MBRT in accordance with MBRT procedures.

Black River Bottomland Hardwoods Mitigation Bank

Location is a factor used to compare the relative location of the mitigation site to the impact site. For the purposes of the BRBH Mitigation Bank, the location categories are defined as follows:

LOCATION FACTORS[†]

| |
|--|
| <i>Zone 1</i> means the portions of Black River watershed located within 4D and 5D. |
| <i>Zone 2</i> means the portions of Pee Dee and Lynches River watersheds within 4D and 5D. |
| <i>Zone 3</i> means the portions of Little Pee Dee and Waccamaw River watersheds within 4D and 5D. |
| <i>Zone 4</i> is not used for this bank. |
| <i>Zone 5</i> means all other areas subject to approval on a case by case basis. |

[†] The BLHMB shall not be used as mitigation for impacts which are outside of the zones given above unless approved by the Corps on a case specific basis. Prior to approving such variances, the Corps will consult with the MBRT in accordance with MBRT procedures. Areas 4D and 5D are explained in the Definitions Section under the term Service Areas

Maintenance means any long term or perpetual manipulation or action after completion of the monitoring period which is necessary to achieve the mitigation goal. Remedial or planned work during the monitoring period is not considered maintenance but is rather just a part of the mitigation work. Minimal (low level) maintenance includes weeding or removal of unwanted species. Moderate maintenance includes some replanting of the desired vegetation. High level maintenance includes significant replanting, addition of soils, hydrology manipulation, or other similar actions.

Monitoring & Contingencies (M & C Plans) means the actions which will be undertaken during the mitigation project to measure the level of success of the mitigation work and to correct problems or failures observed. For the purposes of this Mitigation Bank, the following definitions shall be used.

Bank Unit #1 has been determined to have Minimum M&C Plans.

Bank Unit #2 has been determined to have Strong M&C Plans.

Bank Unit #4 has been determined to have Minimum M&C Plans.

M&C Plans are not applicable for Bank Unit #3 since this unit received only preservation credits.

M&C Plans are not applicable for Bank Unit #5 since this unit received no direct credits.

Contingencies means the actions which will be employed to correct deficiencies or failures found during the monitoring period and to achieve the specified success criteria.

Monitoring means the collection of field data to measure the success of a mitigation effort. It usually includes analysis of the data, and submittal of a comprehensive report containing the data, analyses, and a narrative discussion of the findings and conclusions.

Minimum Level Monitoring & Contingencies Plans will typically include the following elements:

At least 5 years of monitoring (unless approved otherwise)

Restrictive covenants and/or conservation easements

Vegetation survival monitoring (including a commitment to replant if success is not achieved)

Moderate Level Monitoring & Contingencies Plans will typically include the following elements:

At least 5 years of monitoring

Restrictive covenants and/or conservation easements

Vegetation survival monitoring (including a commitment to replant if success is not achieved)

Basic hydrological monitoring

Collection of suitable baseline data

Substantial Level Monitoring & Contingencies Plans will typically include the following elements:

At least 5 years of monitoring

Conservation easements

Vegetation survival monitoring (including a commitment to replant if success is not achieved)

Extensive hydrological monitoring

Collection of suitable baseline data

Reference site comparison monitoring

Black River Bottomland Hardwoods Mitigation Bank

Strong Level Monitoring & Contingencies Plans will typically include the following elements:

At least 7 years of monitoring

Conservation easements

Vegetation survival monitoring (including a commitment to replant if success is not achieved)

Extensive hydrological monitoring

Collection of suitable baseline data

Reference site comparison monitoring

Suitable bonding

Alternative site provisions if mitigation site is determined unsuccessful

Net improvement is an evaluation of the net level of enhancement or restoration of the affected functions and values of an aquatic site. Adverse effects caused by the work must be considered in determining the net improvement.

Riverine, as used in this document, means rivers, streams, and similar natural flowing waterbodies together with their associated adjacent wetlands and riparian zones.

Service Area for the BRBH Mitigation Bank will be Units 4D and 5D as shown on the MBRT Service Units map. The BRBH Mitigation Bank shall not be used for compensatory mitigation for impacts which are outside of these service areas unless approved by the Corps on a case specific basis. Prior to approving such variances, the Corps will consult with the MBRT in accordance with MBRT procedures.

Soil means the upper layer of earth which may be dug or plowed and in which plants grow. Related terms include:

Existing Suitable Soil (E. S. S.) means the appropriate use of soils existing at the mitigation site or contiguous with the site and which have been determined to be of a proper type for the mitigation.

Transferred Suitable Soil (T. S. S.) means the appropriate use of soils imported to the site from a non-contiguous location which have been determined to be of a proper type for the proposed mitigation.

Unknown Suitability Soil (U. S. S.) means use of a soil type or source that is of unproven or uncertain suitability for the proposed mitigation.

Vegetation means the plant material within a defined area. Related terms used in this SOP include:

Natural vegetation involves no planting and allows spontaneous revegetation.

Planted means using transplanted or nursery stock vegetation.

8.0 LITERATURE CITED.

Beasley, B.R., D.A. Lange, and W.C. Brittain. 1988. South Carolina Rivers Assessment. South Carolina Water Resources Commission. Columbia, South Carolina. 249 pp.

Belt, C.B., Jr. 1975. The 1973 flood and man's construction of the Mississippi River. *Science* 189:681-684.

Brinson, M.M., B.L. Swift, R.C. Plantico, and J.S. Barclay. 1981. Riparian ecosystems: Their ecology and status. U.S. Fish Wildl. Serv., Biol. Serv. Prog. Washington, D.C. FWS/OBS 81/17. 151 pp.

Cairns, J., Jr., M.M. Brinson, R.L. Johnson, W.B. Parker, R.E. Turner, and P.V. Winger. 1981. Impacts associated with southeastern bottomland hardwood forest ecosystems. Pages 94-124 In: Clark, J.R. and J. Benforado (eds), Workshop Report on Bottomland Hardwood Wetlands. National Wetlands Technical Council, Washington, D.C. 185 pp.

Conner, R.N. 1978. Snag management for cavity nesting birds. Pages 120-128 In: Proceedings of the workshop on the management of southern forests for nongame birds. U.S. Dept Agri. For. Ser. Gen. Tech. Rep. SE-14. 176 pp.

Environmental Law Institute. 1993. Wetland Mitigation Banking. Environmental Law Institute, Washington, D.C. 159 pp. plus appendices.

Federal Interagency Committee for Wetland Delineation. 1989. Federal manual for identifying and delineating jurisdictional

Black River Bottomland Hardwoods Mitigation Bank

wetlands. USACE, USEPA, USFWS, USDA-SCS. Washington, D.C. Cooperative Technical Publication. 77 pp. plus appendices.

Frederickson, L.H. 1979. Floral and faunal changes in lowland hardwood forests in Missouri resulting from channelization, drainage, and impoundment. U.S. Fish Wildl. Ser., Biol. Serv. Prog. FWS/OBS-78-91. 130 pp.

Gosselink, J.G., and L.C. Lee. 1987. Cumulative impact assessment of bottomland hardwood forests. Center for Wetland Resources, LSU, Baton Rouge, La. LSU-CEI-86-09. 55 pp.

Larson, J.S., M.S. Beddinger, C.F. Bryan, S. Brown, R.T. Huffman, E.L. Miller, D.G. Rhodes, and B.A. Touchet. 1981. Transition from wetlands to uplands in southeastern bottomland hardwood forests. Pages 225-273 In: J.R. Clark and J. Benforado (eds) Workshop Report on Bottomland Hardwood Wetlands. National Wetlands Technical Council, Washington, D.C. 185 pp.

Schoen, J.W., O.C. Wallmo, and M.D. Kirchoff. 1981. Wildlife forest relationships: Is a reevaluation of old growth necessary? Trans. North Amer. Wildl. and Nat. Res. Conf. 46:531-544.

Wharton, C.H., W.M. Kitchens, and T.W. Sipe. 1982. The ecology of bottomland hardwood swamps of the southeast: A community profile. U.S. Fish and Wildl. Ser., Biol Serv. Prog. FWS/OBS-81-37. 134 pp.

U.S. Environmental Protection Agency and U.S. Army Corps of Engineers. 1990. Memorandum of understanding between the EPA and the DOA concerning the determination of mitigation under the Clean Water Act Section 404(b)(1) Guidelines. U.S. Govt. Printing Office, Washington, D.C.

U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish & Wildlife Service, S.C. Department of Natural Resources, S.C. Department of Health & Environmental Control, U.S. Department of Agriculture - Natural Resources Conservation Service. 1996. Joint State/Federal administrative procedures for the establishment and operation of mitigation banks in South Carolina. Mitigation Banking Review Team, Charleston, S.C. 17 pp. plus attachments.

Black River Bottomland Hardwoods Mitigation Bank

APPENDIX A - FIGURES

[This appendix consists of drawing sheets]

Black River Bottomland Hardwoods Mitigation Bank

APPENDIX B - MITIGATION PLAN

[This appendix consists of drawing sheets]

Black River Bottomland Hardwoods Mitigation Bank

APPENDIX C - FACTORS TABLES

Black River Bottomland Hardwoods Mitigation Bank

RESTORATION AND ENHANCEMENT MITIGATION FACTORS

| Factors | Options | | | | |
|---------------------------------|--|-------------------|------------------------------------|--------------------|-------------------|
| Net Improvement | Modest Enhancement 0.1 ----- to ----- | | Excellent Restoration ----- 2.0 | | |
| Vegetation | | | N. A. 0 | Natural † 0.1 | Planted 0.3 |
| Soils | | N. A. 0 | U. S. S. 0 | T. S. S. 0.1 | E. S. S. † 0.3 |
| Hydrology | | N. A. 0 | Mechanical 0 | Created 0.1 | Natural † 0.3 |
| Maintenance | | N. A. † 0 | Moderate 0 | Low 0.1 | None 0.3 |
| Monitoring & Contingencies Plan | N. A. † 0 | Minimum 0.1 | Moderate 0.2 | Substantial 0.3 | Strong 0.4 |
| Credits Schedule | Schedule 5 0 | Schedule 4 0.1 | Schedule 3 0.2 | Schedule 2 0.3 | Schedule 1 0.4 |
| Kind | Category 5 0.1 | Category 4 0.2 | Category 3 0.3 | Category 2 0.4 | Category 1 0.5 |
| Location | Zone 5 0.1 | Zone 4 0.2 | Zone 3 0.3 | Zone 2 0.4 | Zone 1 0.5 |

N. A. = Not Applicable

† Use this option to calculate credits for enhancement by buffering.

MITIGATION BANK RESTORATION AND ENHANCEMENT CREDITS

| Factor | Unit 1 | Unit 2 | Unit 4 |
|--------------------------|----------------------|----------------------|----------------------|
| Net Improvement | 0.6 | 1.0 | 0.3 |
| Soils | 0.3 | 0.3 | 0.3 |
| Hydrology | 0.1 | 0.3 | 0.1 |
| Vegetation | 0.3 | 0.3 | 0.3 |
| Maintenance | 0.3 | 0.2 | 0.3 |
| M & C Plan | 0.1 | 0.4 | 0.1 |
| Credit Schedule | 0.4 | 0.1 | 0.4 |
| Kind | 0.1 to 0.5 | 0.1 to 0.5 | 0.1 to 0.5 |
| Location | 0.1 to 0.5 | 0.1 to 0.5 | 0.1 to 0.5 |
| Sum of m Factors | $M_1 = 2.3$ to 3.1 | $M_2 = 2.8$ to 3.6 | $M_3 = 2.0$ to 2.8 |
| Mitigation Area in Acres | $A_1 = 25.3$ | $A_2 = 5.0$ | $A_3 = 13.6$ |
| Credits = $M \times A$ | 58.19 to 78.43 | 14.0 to 18.0 | 27.2 to 38.08 |

Total Restoration and Enhancement Credits = $\Sigma (M \times A) =$

| |
|------------------------|
| 99.39 to 134.51 |
|------------------------|

Black River Bottomland Hardwoods Mitigation Bank

PRESERVATION MITIGATION FACTORS

| Factors | Options | | | | | |
|------------------|---------------------------|-----------------|-------------------|-------------------|-------------------|--------------------|
| Control | Subdivided 0.1 | | Private 0.2 | | POA 0.3 | Conservancy 0.4 |
| Degree of Threat | None 0 | | Low 0 | | Moderate 0.1 | High 0.2 |
| Kind | Buffers [†] 0 | Category 5 0 | Category 4 0.1 | Category 3 0.2 | Category 2 0.3 | Category 1 0.4 |
| Location | Buffers [†] 0 | Zone 5 0 | Zone 4 0.1 | Zone 3 0.2 | Zone 2 0.3 | Zone 1 0.4 |

[†] When allowed, upland buffers are given a value of zero for kind and location factors.

The following definitions are noted here for ready reference. Refer to the definitions section and the Banking Plan for further information.

Category 1 means riverine areas where the mean annual flow is greater than 5 cfs.

Category 2 means isolated forested wetlands and riverine areas where the flow is less than 5 cfs.

Category 3 means non-riverine scrub-shrub wetlands.

Category 4 means non-riverine open waters (e.g. ponds, lakes).

Category 5 means all other kinds of aquatic areas subject to approval on a case by case basis.

Excluded kinds means tidal waters, Carolina Bays, and emergent wetlands.

Zone 1 means the portions of Black River watershed located within 4D and 5D.

Zone 2 means the portions of Pee Dee and Lynches River watersheds within 4D and 5D.

Zone 3 means the portions of Little Pee Dee and Waccamaw River watersheds within 4D and 5D.

Zone 4 is not used for this bank.

Zone 5 means all other areas subject to approval on a case by case basis.

The bank shall not be used as mitigation for impacts to excluded areas nor for impacts to aquatic areas which do not fit into categories 1-4 and zones 1-4 unless approved by the Corps on a case specific basis. Prior to approving such variances, the Corps will consult with the MBRT in accordance with MBRT procedures. Areas 4D and 5D are explained in the Definitions Section under the term Service Areas

MITIGATION BANK PRESERVATION CREDITS

| Factor | Unit 3 |
|----------------------------|-----------------------|
| Control | 0.4 |
| Threat | 0.1 |
| Kind | 0.0 to 0.4 |
| Dominant Location | 0.0 to 0.4 |
| Sum of m Factors | M = 0.5 to 1.3 |
| Mitigation Area in Acres | A = 37.7 |
| Mitigation Credits = M × A | 18.85 to 49.01 |

$$\text{Preservation Credits} = \sum (M \times A) = \boxed{18.85 \text{ to } 49.01}$$

Black River Bottomland Hardwoods Mitigation Bank

APPENDIX D - ACCOUNTING FORM

**Black River Bottomland Hardwood Mitigation Bank
Sample Worksheets and Accounting Records**

MITIGATION BANK RESTORATION AND ENHANCEMENT WORKSHEET

| Factor | Bank Unit #1 | Bank Unit #2 | Bank Unit #4 |
|------------------------------|---------------------|---------------------|---------------------|
| Net Improvement | 0.6 | 1.0 | 0.3 |
| Soils | 0.3 | 0.3 | 0.3 |
| Hydrology | 0.1 | 0.3 | 0.1 |
| Vegetation | 0.3 | 0.3 | 0.3 |
| Maintenance | 0.3 | 0.2 | 0.3 |
| M & C Plan | 0.1 | 0.4 | 0.1 |
| Credit Schedule | 0.4 | 0.1 | 0.4 |
| Kind | | | |
| Location | | | |
| Sum of m Factors | M = | M = | M = |
| Bank Mitigation Acres Used | A = | A = | A = |
| Bank Mitigation Credits Used | M × A = | M × A = | M × A = |

Total Restoration and Enhancement Credits From Bank = $\Sigma (M \times A) =$ credits

Notes:

See the banking plan definitions section and factors tables for values of kind and location factors.
Bank Unit #5 is buffer zone and is not allowed direct mitigation credit.

MITIGATION BANK PRESERVATION CREDITS WORKSHEET

| Factor | Bank Unit #3 |
|----------------------------|---------------------|
| Control | 0.4 |
| Threat | 0.1 |
| Kind | |
| Dominant Location | |
| Sum of m Factors | M = |
| Bank Mitigation Acres Used | A = |

Preservation Credits From Bank = $\Sigma (M \times A) =$ credits

Black River Bottomland Hardwood Mitigation Bank Sample Worksheets and Accounting Records

Mitigation Summary Worksheet For Permit Application # _____

I. Required Mitigation

| | | |
|----|-------------------------------------|--|
| A. | Total Required Mitigation Credits = | |
|----|-------------------------------------|--|

II. Non-Banking Mitigation Credit Summary

| | Credits | Acres |
|--|---------|-------|
| B. Creation | | |
| C. Restoration and/or Enhancement | | |
| D. Total No Net Loss Non-Bank Mitigation = B + C | | |
| E. Preservation | | |
| F. Total Proposed Non-Bank Mitigation = D + E | | |

III. Banking Mitigation Credit Summary

| | Credits | Acres |
|--|---------|-------|
| G. Creation | | |
| H. Restoration and/or Enhancement | | |
| I. Total No Net Loss Bank Mitigation = G + H | | |
| J. Preservation | | |
| K. Total Proposed Bank Mitigation = I + J | | |

IV. Grand Totals

| | Credits | Acres |
|--|---------|-------|
| L. Total Preservation Mitigation = E + J | | |
| M. Total Non-Preservation Mitigation = D + I | | |
| N. Total Proposed Mitigation = F + K | | |

The total Mitigation Credits (Row N) should be equal to or greater than the total Required Mitigation Credits (Row A) for the proposed mitigation to be acceptable. Other requirements given in the Mitigation SOP must also be satisfied, e.g., Row M must equal at least 50% of Row A, etc. If the answer to either of the questions below is no, then the proposed mix and/or quantity of mitigation is not in compliance with the policy and the plan should be revised or rejected, unless a variance is approved.

| | Yes | No |
|---|-----|----|
| $PMC \geq RMC$ or in words Are the Credits in Row N greater than or equal to Row A ? | | |
| $PMC_{\text{Non-Preservation}} \geq \frac{1}{2} RMC$ or in words Are the Credits in Row M greater than or equal to 50% of Row A ? | | |

**Black River Bottomland Hardwood Mitigation Bank
Sample Worksheets and Accounting Records**

MITIGATION BANK SAMPLE ACCOUNTING RECORD

(Sheet of)

| Date | Permit # | Unit #1 | | Unit #2 | | Unit #3 | | Unit #4 | | Unit #5 | |
|------------------|----------|-------------------|------------|-------------------|-----------|-------------------|------------|-------------------|------------|---------|------------|
| | | Credits | Acres | Credits | Acres | Credits | Acres | Credits | Acres | Credits | Acres |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| | | | | | | | | | | 0 | - |
| Total Used | | | | | | | | | | - | - |
| Total Remaining | | <u>Min</u> Max | | <u>Min</u> Max | | <u>Min</u> Max | | <u>Min</u> Max | | - | - |
| Used + Remaining | | <u>Min</u> Max | 25.3 acres | <u>Min</u> Max | 5.0 acres | <u>Min</u> Max | 37.7 acres | <u>Min</u> Max | 13.6 acres | - | 13.6 acres |
| Percentage Used | | <u>Min</u> Max | % | <u>Min</u> Max | % | <u>Min</u> Max | % | <u>Min</u> Max | % | - | - |

Note: Unit #5 is buffer zone area and is not allowed direct mitigation credit.

I hereby certify that the above accounting is an accurate and complete record in accordance with the provisions of the Black River Bottomland Hardwoods Mitigation Bank Memorandum of Agreement.

Name Signature

Date

Name Signature

Date

Black River Bottomland Hardwoods Mitigation Bank

Part 2 - MBRT Consensus Statement

MBRT CONSENSUS STATEMENT
Black River Bottomland Hardwoods Wetland Mitigation Bank

The undersigned representatives of the South Carolina Mitigation Banking Review Team (MBRT) by the signatures given below, hereby document the following consensus statements. This document is not binding and does not constitute a guarantee, approval, authorization, or promise of any kind. The purpose of this document is for recording and reporting the findings of the MBRT preliminary to a final decision regarding a mitigation banking proposal. Final approval and establishment of a mitigation bank shall be done by execution of a Memorandum of Agreement or issuance of a Department of the Army permit as appropriate.

1. The MBRT has considered the document titled "Memorandum of Agreement, Black River Bottomland Hardwoods Wetland Mitigation Bank" which is dated August 1, 1997, and finds it to be an acceptable agreement document for implementation of the Black River Bottomland Hardwoods Wetland Mitigation Bank.

2. The MBRT has considered the document titled "Black River Bottomland Hardwoods Wetland Mitigation Bank Banking Instrument" which is dated August 1, 1997, and the MBRT finds it to be an acceptable plan for the establishment, operation, management, and maintenance of the Black River Bottomland Hardwoods Wetland Mitigation Bank.

3. The MBRT finds that if the Black River Bottomland Hardwoods Wetland Mitigation Bank is established and operated in compliance with the above referenced MOA and Banking Plan, the bank will be in accordance with the policies and guidelines for mitigation banking established for South Carolina.

Rheta Geddings
S. C. Dept. of Health & Environmental Control

Chris Dowling
U.S. Army Corps of Engineers

Jeff Thompson
S. C. Dept. of Health & Environmental Control

Marjan Farzaad
U. S. Environmental Protection Agency

Susan Davis
S. C. Department of Natural Resources

Steve Gilbert
U. S. Fish and Wildlife Service

Lee Tippet
S. C. State Historic Preservation Office

Ben Stuckey
U. S. Natural Resources Conservation Service

Prescott Brownell
U. S. National Marine Fisheries Service

Black River Bottomland Hardwoods Wetland Mitigation Bank

Part 3 - Memorandum of Agreement

Black River Bottomland Hardwoods Wetland Mitigation Bank

THIS AGREEMENT is entered into by and between Mr. Dillard Nick Roark (owner) and the participating member agencies of the South Carolina Mitigation Banking Review Team (MBRT). The participating member agencies of the MBRT include the U.S. Department of the Army, Corps of Engineers (COE); the U.S. Department of the Interior, Fish and Wildlife Service (FWS); the U.S. Environmental Protection Agency (EPA); the U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS); the S.C. Department of Health and Environmental Control (DHEC); the S.C. Department of Natural Resources (DNR); and the National Marine Fisheries Service (NMFS).

WHEREAS, the purpose of this Memorandum of Agreement (MOA) is to establish a compensatory mitigation bank to provide the owner with a means of compensating for unavoidable impacts to aquatic resources; and

WHEREAS, the Black River Bottomland Hardwoods Wetland Mitigation Bank located about nine miles south of the Town of Kingstree in Williamsburg County, South Carolina (hereafter referred to as the "Bank") is currently owned by Mr. Dillard Nick Roark and has been identified by all involved agencies as a suitable mitigation bank site; and

WHEREAS, a mitigation banking instrument titled "Black River Bottomland Hardwoods Wetland Mitigation Bank" dated August 1, 1997, (hereinafter referred to as the "Bank Plan") has been reviewed and determined by the MBRT to be an acceptable plan for the establishment, operation, management, and maintenance of the Bank.

THEREFORE, it is mutually agreed among the parties to this MOA that the following general provisions are adopted and will be implemented upon signature of this agreement.

GENERAL PROVISIONS

1. The Owner is responsible for implementation of all aspects of the Bank Plan. The Bank Plan specifies the steps required for establishment, operation, management, and maintenance of the Bank.
2. In consideration of this agreement, the Owner may give, sell, trade, or use compensatory mitigation credits from the Bank in accordance with the terms and conditions given in this MOA and the Bank Plan.
3. The Owner may not sell or transfer this MOA or any portion of the property or easements constituting the Bank without the prior written approval of the MBRT or its successor agencies.
4. The Bank will only be used to compensate for unavoidable impacts to the categories of aquatic resources and within service areas specified in the Bank Plan, unless a case specific exception is approved in accordance with the procedures given in the plan.

Black River Bottomland Hardwoods Wetland Mitigation Bank

5. Mitigation credits will be available for use in accordance with the terms and conditions given in the Bank Plan upon the signing of this MOA by the Owner, COE, and DHEC. No credits may be withdrawn from any portion of the bank until this MOA has been signed by the Owner, COE, and DHEC.
6. Proposed Mitigation Credits (PMC) will be calculated using the factors shown on the tables and worksheets contained in the Bank Plan. Required Mitigation Credits (RMC) for project impacts using the bank shall be calculated using the most current factors and procedures for mitigation credit calculations in effect at the time of a proposed mitigation transaction. The Owner will prepare and submit completed worksheets for each mitigation transaction consuming credits from the bank. The Owner will also prepare and submit an annual summary of all bank transactions.
7. Before credits may be withdrawn from any portion of the bank the MBRT must approve a conservation easement. Also, before credits may be used from any portion of the Bank, the Owner must submit to the MBRT evidence of recording of the approved conservation easement for said portion of the Bank.
8. Before additional credits or properties may be added to the Bank Plan, the MBRT must review and approve a revised Bank Plan including revised credit factors, credit calculations, and such other information as the MBRT determines necessary. If the MBRT approves addition of properties to the Bank, the Owner will execute either restrictive covenants or a conservation easement, subject to MBRT review and approval, covering the addition and have it recorded with the property deed after approval by the MBRT.
9. Modification of this MOA or the Bank Plan can be proposed at any time, but it will require mutual agreement by all signatory agencies before the changes can be adopted.
10. Representatives of the MBRT shall be granted reasonable access to the Bank properties, in accordance with any procedures described in the Conservation Easement or Bank Plan, for the purposes of inspection of the property and compliance monitoring of the Bank Plan.
11. The COE shall serve as MBRT point of contact for this bank. The MBRT may change the MBRT point of contact for the Bank upon written notice to the Owner. The Owner shall submit all reports and documents required by the Bank Plan to the MBRT point of contact. The MBRT point of contact shall be responsible for monitoring and archiving all documents and reports submitted by the Owner, reviewing submitted documents for compliance with the Bank Plan, and periodically reporting to the MBRT on the status of the Bank.
12. Should any separable part of this MOA be determined to be contrary to law or governmental regulation, the remainder shall continue in full force and effect.

Execution of this Memorandum of Agreement evidences that the signatories agree to the establishment, operation, management, and maintenance of the Black River Bottomland Hardwoods Wetland Mitigation Bank as presented in the Bank Plan.

Black River Bottomland Hardwoods Wetland Mitigation Bank

Part 4 - Signature Pages

Mr. Dillard Nick Roark

United States Army Corps of Engineers
United States Environmental Protection Agency
United States Department of the Interior
United States Department of Agriculture
United States Department of Commerce

South Carolina Department of Natural Resources
South Carolina Department of Archives and History
South Carolina Department of Health and Environmental Control

Black River Bottomland Hardwoods Wetland Mitigation Bank

**Signature Page for
Mr. Dillard Nick Roark**

Mr. Dillard Nick Roark hereby agree to the document titled "Memorandum of Agreement, Black River Bottomland Hardwoods Wetland Mitigation Bank" dated August 1, 1997.

IN WITNESS WHEREOF, Mr. Dillard Nick Roark have executed this agreement the date written below.

_____ Date: _____
Mr. Dillard Nick Roark

IN THE PRESENCE OF: _____
Printed Name:

IN THE PRESENCE OF: _____
Printed Name:

=====

PERSONALLY appeared before me _____, the undersigned witness, and made oath that he/she saw the within named Mr. Dillard Nick Roark sign, seal and as their act and deed, deliver the within named Memorandum of Agreement, Black River Bottomland Hardwoods Wetland Mitigation Bank; and that he/she with the other witness named above witnessed the execution thereof.

[Signature of Witness]

SWORN to and subscribed before me
this ____ day of _____, 1997.

NOTARY PUBLIC FOR SOUTH CAROLINA

My Commission Expires: _____

Black River Bottomland Hardwoods Wetland Mitigation Bank

**Signature Page for
The United States Army Corps of Engineers**

The United States Army Corps of Engineers hereby agrees to the document titled "Memorandum of Agreement, Black River Bottomland Hardwoods Wetland Mitigation Bank" dated August 1, 1997.

IN WITNESS WHEREOF, The U. S. Army Corps of Engineers has caused its duly authorized officer to execute this agreement the date written below.

_____ Date: _____
Printed Name:
For The U.S. Army Corps of Engineers, Charleston District

IN THE PRESENCE OF: _____
Printed Name:

IN THE PRESENCE OF: _____
Printed Name:

Black River Bottomland Hardwoods Wetland Mitigation Bank

**Signature Page for
The South Carolina Department of Health and Environmental Control**

The South Carolina Department of Health and Environmental Control hereby agrees to the document titled "Memorandum of Agreement, Black River Bottomland Hardwoods Wetland Mitigation Bank" which is dated August 1, 1997.

IN WITNESS WHEREOF, The South Carolina Department of Health and Environmental Control has caused its duly authorized officer to execute this agreement the date written below.

_____ Date: _____

Printed Name:

For The South Carolina Department of Health and Environmental Control

IN THE PRESENCE OF: _____
Printed Name:

IN THE PRESENCE OF: _____
Printed Name:

Black River Bottomland Hardwoods Wetland Mitigation Bank

**Signature Page for
The South Carolina Department of Natural Resources**

The South Carolina Department of Natural Resources hereby agrees to the document titled "Memorandum of Agreement, Black River Bottomland Hardwoods Wetland Mitigation Bank" dated August 1, 1997.

IN WITNESS WHEREOF, The South Carolina Department of Natural Resources has caused its duly authorized officer to execute this agreement the date written below.

_____ Date: _____
Printed Name:
For The South Carolina Department of Natural Resources

IN THE PRESENCE OF: _____
Printed Name:

IN THE PRESENCE OF: _____
Printed Name:

Black River Bottomland Hardwoods Wetland Mitigation Bank

**Signature Page for
The South Carolina Department of Archives and History**

The South Carolina Department of Archives and History, State Historic Preservation Office hereby agrees to the document titled "Memorandum of Agreement, Black River Bottomland Hardwoods Wetland Mitigation Bank" which is dated August 1, 1997.

IN WITNESS WHEREOF, The South Carolina Department of Archives and History, State Historic Preservation Office has caused its duly authorized officer to execute this agreement the date written below.

_____ Date: _____

Printed Name:

For The South Carolina Department of Archives and History, State Historic Preservation Office

IN THE PRESENCE OF: _____

Printed Name:

IN THE PRESENCE OF: _____

Printed Name:

Black River Bottomland Hardwoods Wetland Mitigation Bank

**Signature Page for
The United States Environmental Protection Agency**

The United States Environmental Protection Agency hereby agrees to the document titled "Memorandum of Agreement, Black River Bottomland Hardwoods Wetland Mitigation Bank" dated August 1, 1997.

IN WITNESS WHEREOF, The United States Environmental Protection Agency has caused its duly authorized officer to execute this agreement the date written below.

_____ Date: _____
Printed Name:
For The United States Environmental Protection Agency

IN THE PRESENCE OF: _____
Printed Name:

IN THE PRESENCE OF: _____
Printed Name:

Black River Bottomland Hardwoods Wetland Mitigation Bank

**Signature Page for
The United States Department of the Interior**

The United States Department of the Interior, Fish and Wildlife Service hereby agrees to the document titled "Memorandum of Agreement, Black River Bottomland Hardwoods Wetland Mitigation Bank" which is dated August 1, 1997.

IN WITNESS WHEREOF, The United States Department of the Interior, Fish and Wildlife Service has caused its duly authorized officer to execute this agreement the date written below.

_____ Date: _____

Printed Name:

For The United States Department of the Interior, Fish and Wildlife Service

IN THE PRESENCE OF: _____
Printed Name:

IN THE PRESENCE OF: _____
Printed Name:

Black River Bottomland Hardwoods Wetland Mitigation Bank

**Signature Page for
The United States Department of Agriculture**

The United States Department of Agriculture, Natural Resources Conservation Service hereby agrees to the document titled "Memorandum of Agreement, Black River Bottomland Hardwoods Wetland Mitigation Bank" which is dated August 1, 1997.

IN WITNESS WHEREOF, The United States Department of Agriculture, Natural Resources Conservation Service has caused its duly authorized officer to execute this agreement the date written below.

_____ Date: _____

Printed Name:

For The United States Department of Agriculture, Natural Resources Conservation Service

IN THE PRESENCE OF: _____

Printed Name:

IN THE PRESENCE OF: _____

Printed Name:

Black River Bottomland Hardwoods Wetland Mitigation Bank

**Signature Page for
The United States Department of Commerce**

The United States Department of Commerce, National Marine Fisheries Service hereby agrees to the document titled "Memorandum of Agreement, Black River Bottomland Hardwoods Wetland Mitigation Bank" which is dated August 1, 1997.

IN WITNESS WHEREOF, The United States Department of Commerce, National Marine Fisheries Service has caused its duly authorized officer to execute this agreement the date written below.

_____ Date: _____

Printed Name:

For The United States Department of Commerce, National Marine Fisheries Service

IN THE PRESENCE OF: _____

Printed Name:

IN THE PRESENCE OF: _____

Printed Name: