Illinois River
Mitigation Bank Prospectus

streamworks mitigation services

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Introduction

The proposed Illinois River Mitigation Bank is a commercial bank located in the Illinois watershed and will be developed to be used as compensatory mitigation for unavoidable impacts authorized under Section 404 of the Clean Water Act. This combined wetland and stream mitigation project is located within 96 acres in Section 02, Township 16N, Range 32W of Washington County, Arkansas, west of Fayetteville along Viney Grove Road (Figure A-1). The project will restore, enhance, or protect 2,530 LF linear feet (LF) of the Illinois River and 6,303 LF of tributaries, and approximately 10-acres of wetlands under the guidance of the *Compensatory Mitigation for Losses of Aquatic Resources, Final Rule. Regulation 40CFR Part 230* (USACE & USEPA 2008). Interagency Review Team participation will include: the U.S. Fish and Wildlife Service, Region IV (FWS); the U.S. Environmental Protection Agency, Region VI (EPA); the Arkansas Department of Environmental Quality (ADEQ); the Arkansas Game and Fish Commission (AGFC); the Arkansas Natural Heritage Commission (ANHC); and the Arkansas Natural Resources Commission (ANRC), Arkansas Parks and Tourism (APT).

Table 1: Summary of background information of the proposed Illinois River Mitigation Bank

BACKGROUND INFORMATION	
Project Name	Illinois River Mitigation Bank
Project Sponsor	Streamworks Mitigation Services, LLC
Site Location	Section 02, Township 16N, Range 32W
County	Washington
8-digit HUC	Illinois 11110103
10-digit HUC	Headwaters Illinois River 1111010301
12-digit HUC	Lake Wedington-Illinois River 111101030103
Proposed Primary Service Area (**Arkansas only*)	Illinois 11110103 Elk 11070208 Lower Neosho 11010209 Lake O' The Cherokees 11070206 Robert S. Kerr Reservoir 11110104
Proposed Secondary Service Area (**Boston Mountain ecoregion, Arkansas, only*)	Frog_Mulberry 11110201 Dardanelle Reservoir 11110202
Protection Mechanism	Conservation Easement
Monitoring Frequency	annually
Anticipated Date of Final Monitoring	2018
Size of Mitigation Area	~95.8 acres/8,662 LF of streams ~25-acres of wetlands
Mitigation Objectives	To establish a consolidated mitigation area in association with the granting of Department of the Army permits through restoration and enhancement of a 8,662 LF of streams, 10-acres of wetlands, and associated riparian buffer zones.

1.0 Objective

The project objective is to develop a mitigation bank in the Illinois watershed in association with the granting of Department of Army permits through restoration, enhancement, and preservation of stream channels, wetlands, and associated buffers along Illinois River. The project goal is to restore

the perennial, intermittent, and ephemeral streams and to restore and create wetland habitat. The specific design objectives of the project include:

- Restoration or enhancement of channel dimension, pattern and profile;
- Water quality enhancement in the Illinois watershed through sediment reduction, nutrient removal, streambank stability, and erosion control;
- Water quantity improvement through water storage and flood control, improved ground water recharge, and improved and restored hydrologic connections;
- Enhancement of aquatic and terrestrial habitats through improved substrate and instream cover, addition of woody debris, reduction in water temperature due to shading, restoration of terrestrial habitat, increase of spatial extent of natural area, and improved aesthetics.

2.0 Site Selection and Justification

The proposed Illinois River Mitigation bank is a 95.8-acre site located along the Illinois River approximately 2,600 ft east of the Lake Wedington Cooperative Wildlife Management Area (WMA). The Lake Wedington WMA is a 16,000 acre unit of the Ozark National Forest Boston Mountain Ranger District established in cooperation with the Arkansas Game and Fish Commission (Figure A-1). Two federally listed bats, Gray bat and Indiana bat, exist within the watershed feeding on terrestrial and aquatic insects located in forested riparian areas (LaVal et al. 1977). The Neosho mucket mussel is a candidate species that has been found historically in the Illinois River concentrated in silty backwater areas and shallow riffles (Mather, 1990). These conditions exist within the proposed mitigation area and an aquatic survey is planned for Summer 2013.

Table 2: List of species of concern located in the Illinois watershed of Washington County, AR

Name	Common Name	Status		Rank	
		Federal	State	Global	State
Lampsilis rafinesqueana	Neosho mucket	C	INV	G2	S1
Etheostoma cragini	Arkansas darter	C	INV	G3G4	S1
Myotis grisescens	Gray bat	LE	INV	G3	S2S3
Myotis sodalis	Indiana bat	LE	INV	G2	S1

The proposed mitigation site was used primarily for hay production with stream channel segments ditched, filled or manipulated to facilitate agriculture. Riparian vegetation has been recently treated with herbicide to remove river cane (*Arundinaria gigantean*) encroaching into the working pastureland. Benefits include improved water quantity through water retention and increased ground water recharge. Restoration and reforestation of this site will improve water quality through water retention, reduce sediment contributions to the Illinois River, and provide connectivity to the nearby Ozark National Forest.

3.0 Site Protection Instrument

The property is owned by a private third party and the mitigation acreage will be placed in a conservation easement with the Arkansas Land Trust and filed at the courthouse in Washington County. The site will be monitored annually by the Arkansas Land Trust to ensure that the easement restrictions are being followed.

4.0 Baseline Information

The Illinois River watershed is located in Benton and Washington counties of Northwest Arkansas and flows into northeast Oklahoma before reaching the Arkansas River below Lake Tenkiller. It is a perennial channel originating in the Ozark Highlands of south central Washington County. The Illinois River mitigation bank site is located within the Ozark Highlands (39); subsection 39b –Dissected Springfield Plateau ecoregion (AWAP 2004) approximately 15 miles west of downtown Fayetteville near Lake Wedington. The valley slope within the project area is relatively flat, with elevations ranging from 1,059 ft MSL for the uplands along Viney Grove Rd to 1,023 ft MSL along the thalweg of the Illinois River. Channel slope of the existing ditch, Reach A, is approximately 0.0017ft/ft . Lake Wedington, Arkansas, receives an average of 46 inches of rainfall per year.

Soils are mapped into six primary units, all are considered partially hydric. The Illinois riparian zone, 35.8 acres, is Razort silt loam, slope 3-8 percent, occasionally flooding. These are moderately well-drained soils with a parent material of cherty limestone. The secondary soils, 22.5 acres, Guin very gravelly silt loam, 3-8 percent slopes, located on the western portion of the property along Viney Grove Road. These are well drained soils with a parent material of loamy colluvium derived from cherty limestone. The third soil type is Sloan silt loam, 21.8 acres, slope of 0-3 percent, with frequent flooding. These are frequently flooding soils. The forth unit is Razort gravelly silt loam, 17.4 acres, with occasional flooding and a slope of 0-2 percent. These are well drained soils with a parent material of loamy alluvium. The fifth unit is Captina silt loam, 5.6 acres, with 1-3 percent slopes. These are moderately well drained soils with a parent material of silty pedisediment over silty and clayey residuum weathered from cherty limestone. The sixth unit is Captina silt loam, 4.0 acres, with 3-6 percent slopes. These soils are moderately well-drained with a parent material of silty pedisediment over silty and clayey residuum weathered from cherty limestone (Figure A-5). A formal wetland delineation is scheduled to determine jurisdictional status.

Bermuda grass (*Cynodon dactylon*) and tall fescue (*Festuca arundinacea*) dominate the open pasture land. Preliminary plant observations reveal the wetland components of this site are represented by various sedges (*Carex spp*.), panic grasses (*Dichanthelium/Panicum spp*.), and cattails (*Typha latifolia*). Establishment of baseline plant community monitoring transects is slated for Summer 2013.

In addition to the vegetative monitoring, avian point counts, and benthic macroinvertebrate and mussel sampling will be conducted to help determine restoration activities and goals, as well as, illustrate ecological lift after restoration activities are implemented.

5.0 Determination of Credits

The method of credit determination will be a combination of stream channel restoration, enhancement, preservation, and riparian buffer creation. The Little Rock Stream Method (USACE 2011) will be used to determine the amount of stream credits with wetland credit determination following the Charleston Method (USACE 2002). Stream segments that overlay with wetland areas or buffers will not be stacked for mitigation credits.

6.0 Mitigation Work Plan

The overall workplan for the site will focus on the restoration of Reach A and its four contributing tributaries. Site preparation activities will include conducting comprehensive topographic and geomorphic surveys of existing stream and wetland conditions. These existing conditions will be evaluated for departure from reference conditions and restored to appropriate dimension, pattern, and profile. All of the construction will be performed during the dry season. No construction will take place within the identified archaeological areas (Figure 7).

A prescribed burn will be conducted prior to construction. Mechanical ripping (outside the identified archaeological areas) will be performed prior to tree seedling planting to facilitate tree survival rates. The entire project area will be re-vegetated in native trees, shrubs, grasses, and forbs.

- **Illinois River**

Within this section of the river the Illinois River is a third order stream approximately 80 ft wide flowing south to north along the eastern boundary of the property. The channel is bedrock controlled throughout this 2,500 LF reach with fair to moderate evidence of lateral stress. Exposed streambanks will be stabilized using bioengineering techniques such as live-staking, live palisades, brush layering, and wattle fencing where applicable. Potential Neosho mucket mussel habitat exists with active riffles, and shallow backwater areas with a sand and gravel substrate.

- **Reaches A-E**

Preliminary site surveys found Reach A as a 6-12 ft wide intermittent channel originating west of Viney Grove Rd that was ditched to drain the adjacent pastures. Reach A takes an abrupt right angle turn at the confluence with Reach E and flows north 2,700 LF before the confluence with Reach C. Looking at historical photographs Reach B is a 4-6 ft wide ephemeral channel that has also been ditched to expedite drainage. The upper portion has been filled with stream channel features completely obliterated. The new planform will route the stream to meander 1,436 LF down valley as seen in older aerial photographs before reaching Reach A at station 2+668. Reach C is an intermittent creek channel receiving waters from Lake Wedington and located 6,500 ft from the dam spillway. Approximately 570 LF of this channel flows through the project area. Bank stabilization activities will be performed along exposed streambanks and the riparian zone will be re-vegetated. Reach D is an ephemeral ditch that drains Wetland Area B for 516 LF before reaching Reach A. Another ditched channel, Reach E, enters from the south and currently connects with Reach A at the property boundary. Both of these reaches will be reconstructed to exhibit historical planform features. These existing ditches will be plugged where feasible and left open as wetland depression areas.

Wetlands

There are two primary wetland areas, totaling approximately 10-acres, within the proposed mitigation site, an existing Wetland Area A and a degraded Wetland B. The wetland activities will be a combination of restoration and enhancement of existing wetland features. Wetland Area A is a 10-acre elongated area located in the swale adjacent to the ditch of Reach A (Figure 4). Wetland indicators are present onsite including, but not limited to, the existence of wetland hydrology, true aquatic plants and active crayfish burrows. Only acreage outside of the 100-ft

stream riparian buffer zone will be assessed for wetland mitigation credit potential. The second wetland area, Wetland Area B, is also located within an elongated 5-acre swale in the Illinois River floodplain. This wetland area has been filled in places to facilitate hay production. This wetland drains into Reach E at the northern end. Fill material will be removed from impacted areas and the entire wetland area will be revegetated with appropriate vegetation grown within the Streamworks Mitigation Services, LLC greenhouse operation.

Riparian Buffer

The entire mitigation area will be re-vegetated through hand planting native hardwood and herbaceous species with a density of 302 stems/acre. A minimum 100-ft buffer will be maintained where property boundaries allow and increased to include upland buffers where possible. During the dormant season, Black willow (*Juglans nigra*), Alder (*Alnus serrulata*) and Sycamore (*Platanus occidentalis*) stakes will be placed along the streambanks of the intermittent and perennial channels. Tree and shrub seedlings will be planted in winter 2015-2016. The floodplain zone will consist of the appropriate floodplain species, while the upland buffers will consist of an oak-hickory mix with a representative understory if available.

7.0 Operation and Maintenance Plan

The project will be developed and implemented by Streamworks Mitigation Services, LLC. The site will be maintained and monitored annually by Streamworks with reports submitted to the LRD for review.

8.0 Performance Standards

The overall performance standard and success criteria for stream and wetland compensation is demonstrable ecological lift within the project site. This lift will be measured through biological surveys and reinforced through geomorphic monitoring, vegetative monitoring, and qualitative stability indices. The performance standards will follow guidelines from the Compensatory Mitigation Standard Operating Procedure (USACE 2006) and approved by the IRT and LRD.

9.0 Monitoring Requirements

Monitoring will be conducted by Streamworks Mitigation Services, LLC, for five years or until the LRD determines the project is complete. Permanent cross-sections and longitudinal feature parameters will be established following the guidelines set forth in the Little Rock Stream Method (USACE 2011). This data will be collected and analyzed annually to determine if success criteria are being met.

10.0 Long-term Management

An escrow account will be established by Streamworks Mitigation Services, LLC to adequately service long-term management goals. These long-term management activities will be conducted by Streamworks. At a later time, and with approval from the LRD, Streamworks may designate a long- term steward or an entity to act as steward.

11.0 Adaptive Management

Upon a determination by USACE that performance standards have not been met or the

compensatory mitigation project is not on track to meet those standards, the monitoring period may be extended. USACE may also revise monitoring requirements when remediation and/or adaptive management are required. In the event that the success criteria have not been met, remedial action will be taken within 90 days.

12.0 Financial Assurances

Financial assurances will be provided by Streamworks Mitigation Services, LLC.

References

AWAP (2004) *Ecoregions of Arkansas* , Arkansas Wildlife Action Plan

USEPA and USACE (2008) Compensatory Mitigation for Losses of Aquatic Resources, Final Rule. Regulation 40CFR Part 230

USACE (2005) Compensatory Mitigation Standard Operating Procedure, Department of Army, Regulatory Branch, LRD.

USACE (2011) Little Rock District Stream Method. Department of the Army, Little Rock

District. USEPA (1972) Clean Water Act, CWA. 33 U.S.C. §1251 et seq. Regulation 40 C.F.R.

pts. 104-149.
Charleston Regulatory Division - Standard Operating Procedure Issued September 19, 2002 Compensatory Mitigation

LaVal, R. K., R. L. Clawson, M. L. LaVal, and W. Caire. (1977). Foraging behavior and nocturnal activity patterns of Missouri bats, with emphasis on the endangered species Myotis grisescens and Myotis sodalis. J. Mamm. 58:592-599

Mather, C. (1990). Status survey of the western fanshell and the Neosho mucket in Oklahoma. Final Report to the Oklahoma Deptartment of Wildlife Conservation. Project No. E-7, Oklahoma. 22 pp.

Appendix A
Figures

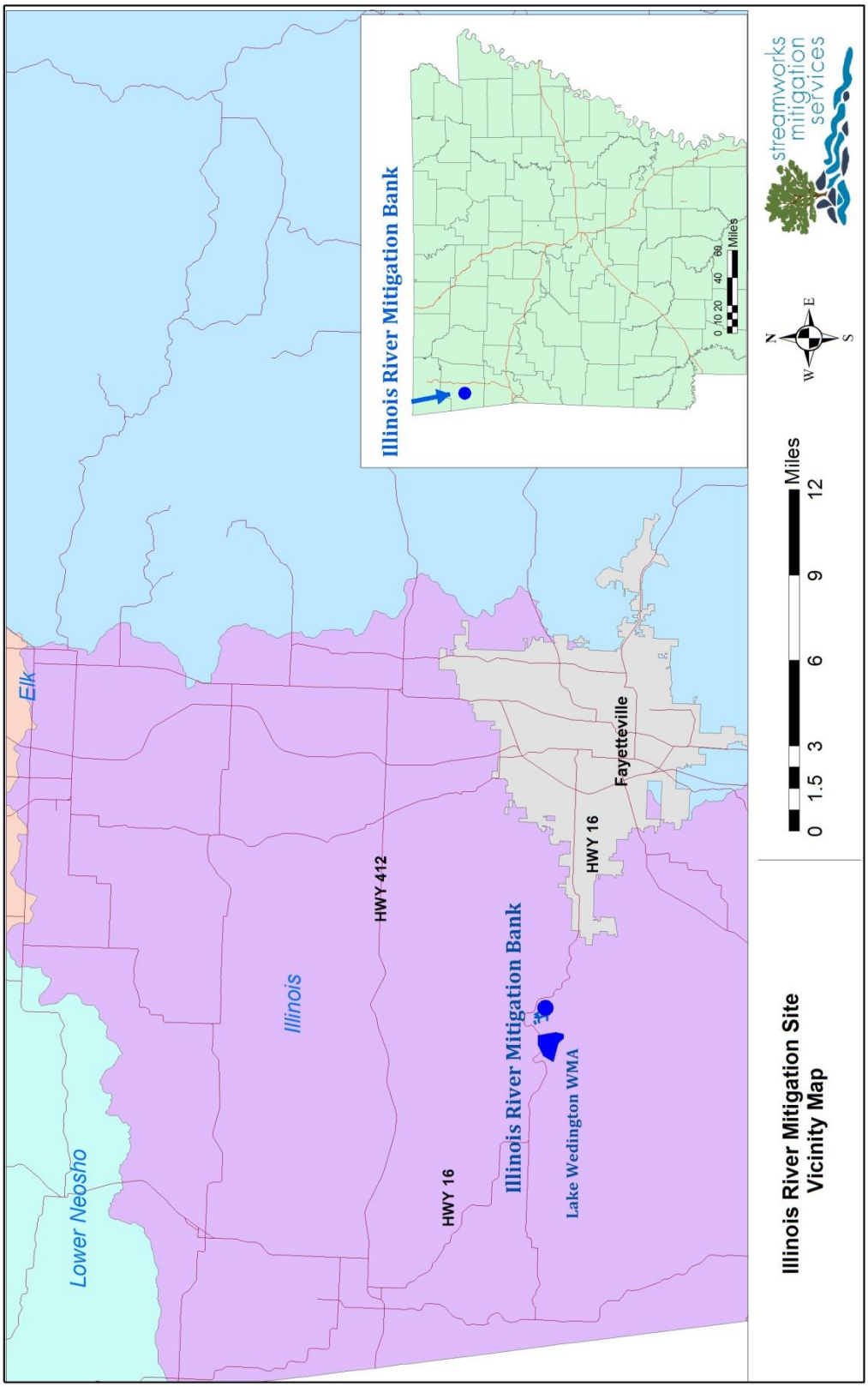

Figure 1: Vicinity Map for the Illinois River Mitigation Bank

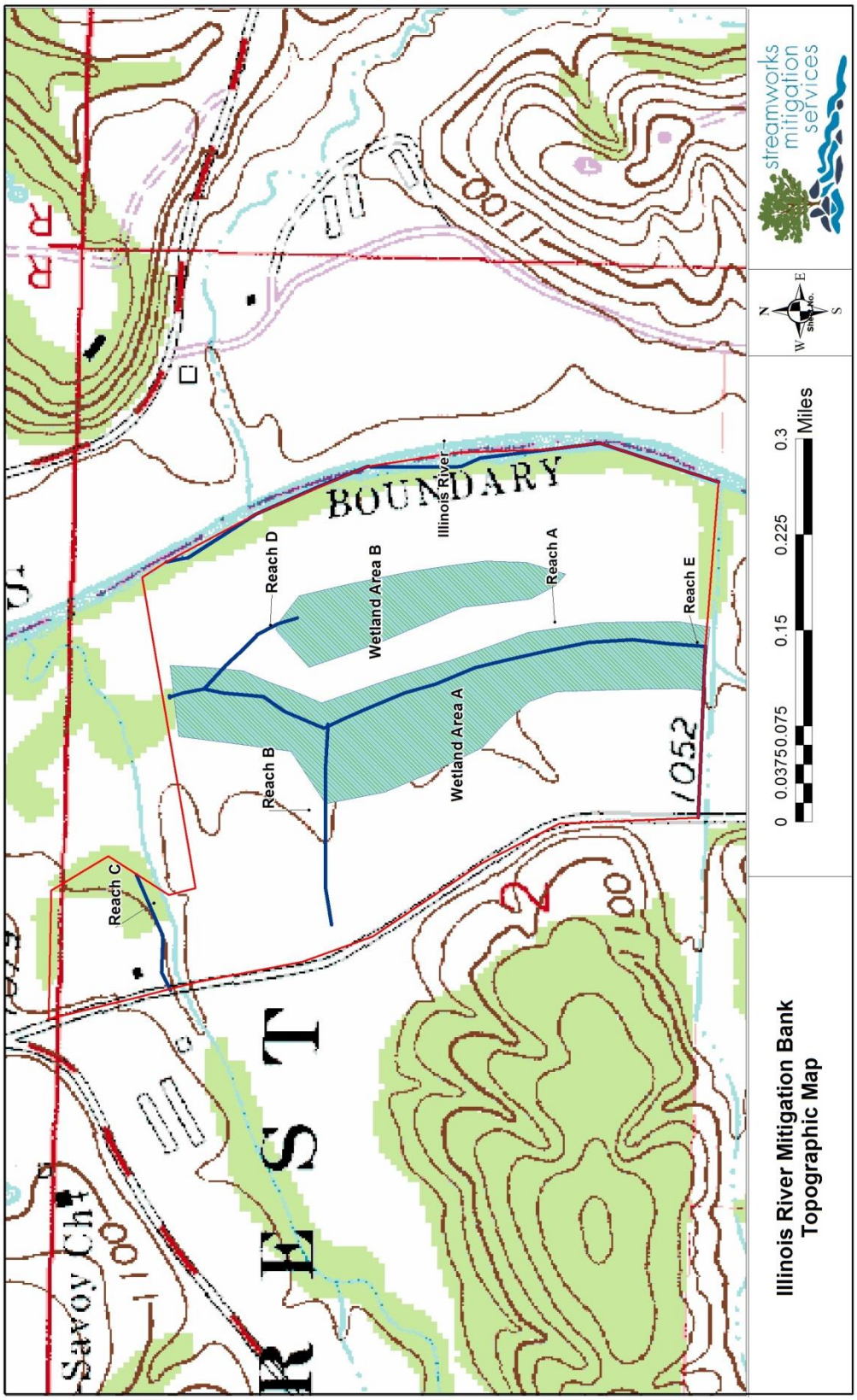

Figure 2: Topographic Map for the proposed Illinois River Mitigation Bank (USGS 24K)

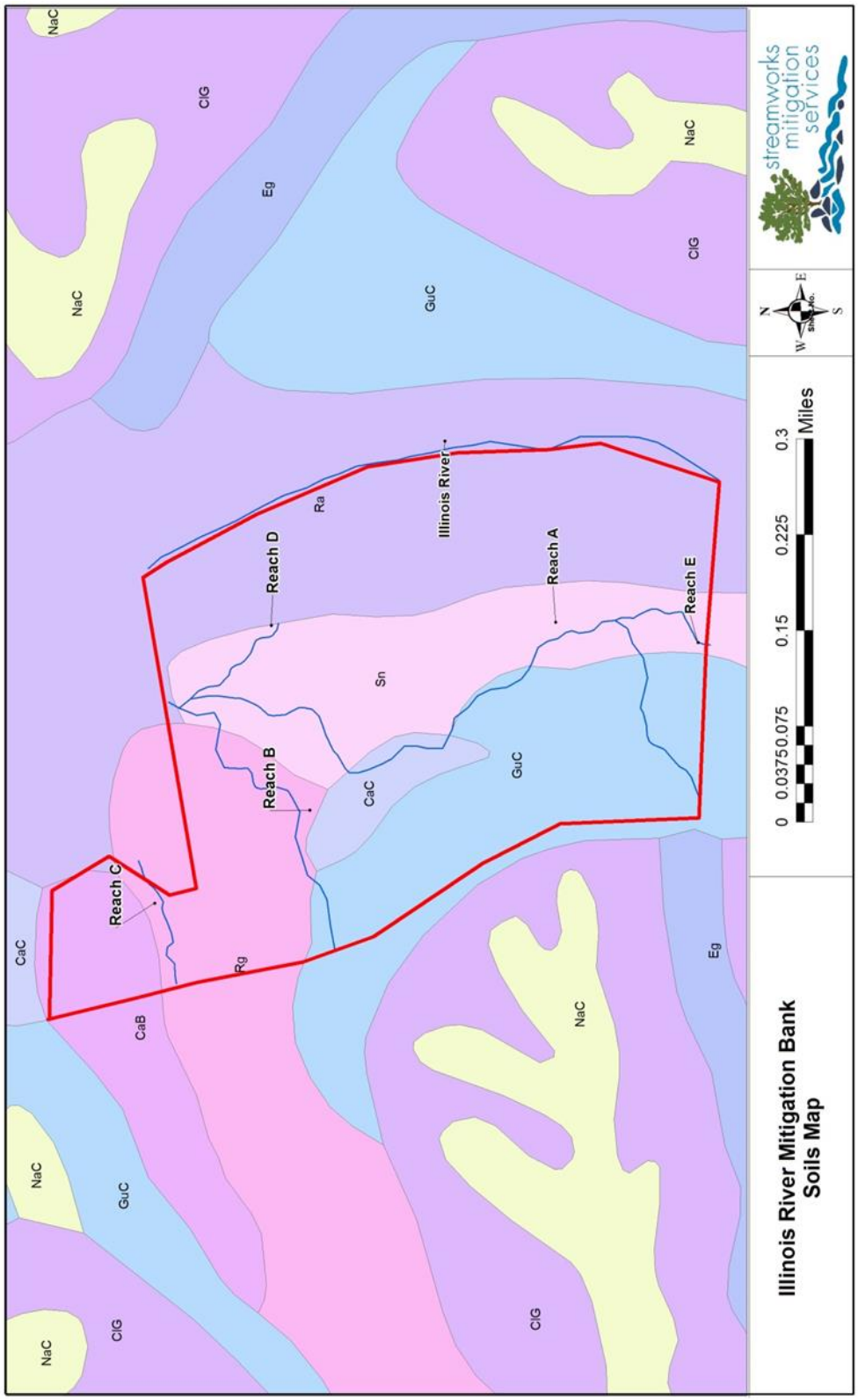

Figure 3: Soils map of the proposed Illinois River Mitigation Bank. Ra=Razort silt loam Sn= Sloan silt loam CaC=Captina silt loam GuC= Guin very gravelly silt loam Rg = Razort gravelly silt loam

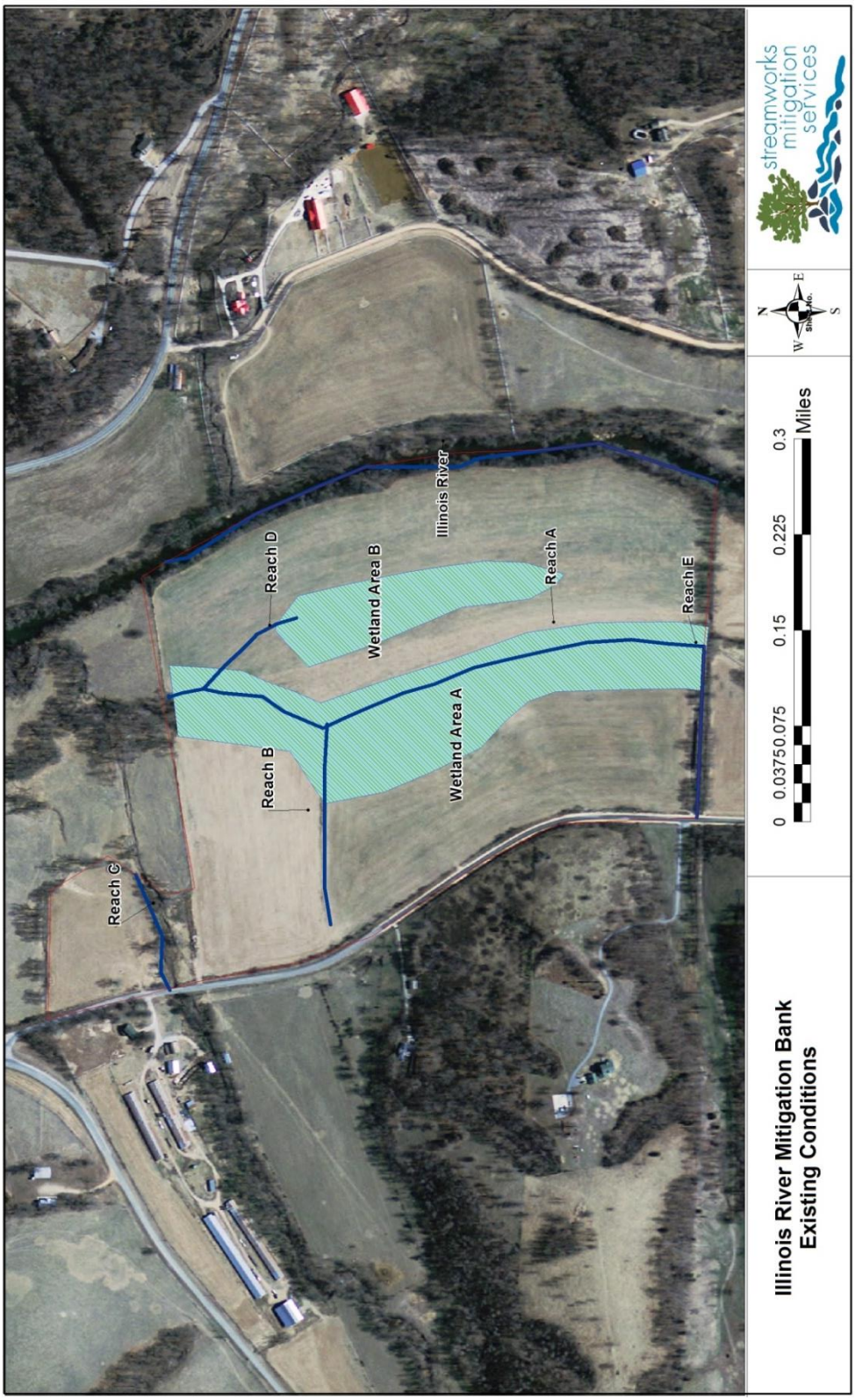

Figure 4: Aerial map of existing conditions of the proposed Illinois River Mitigation Bank

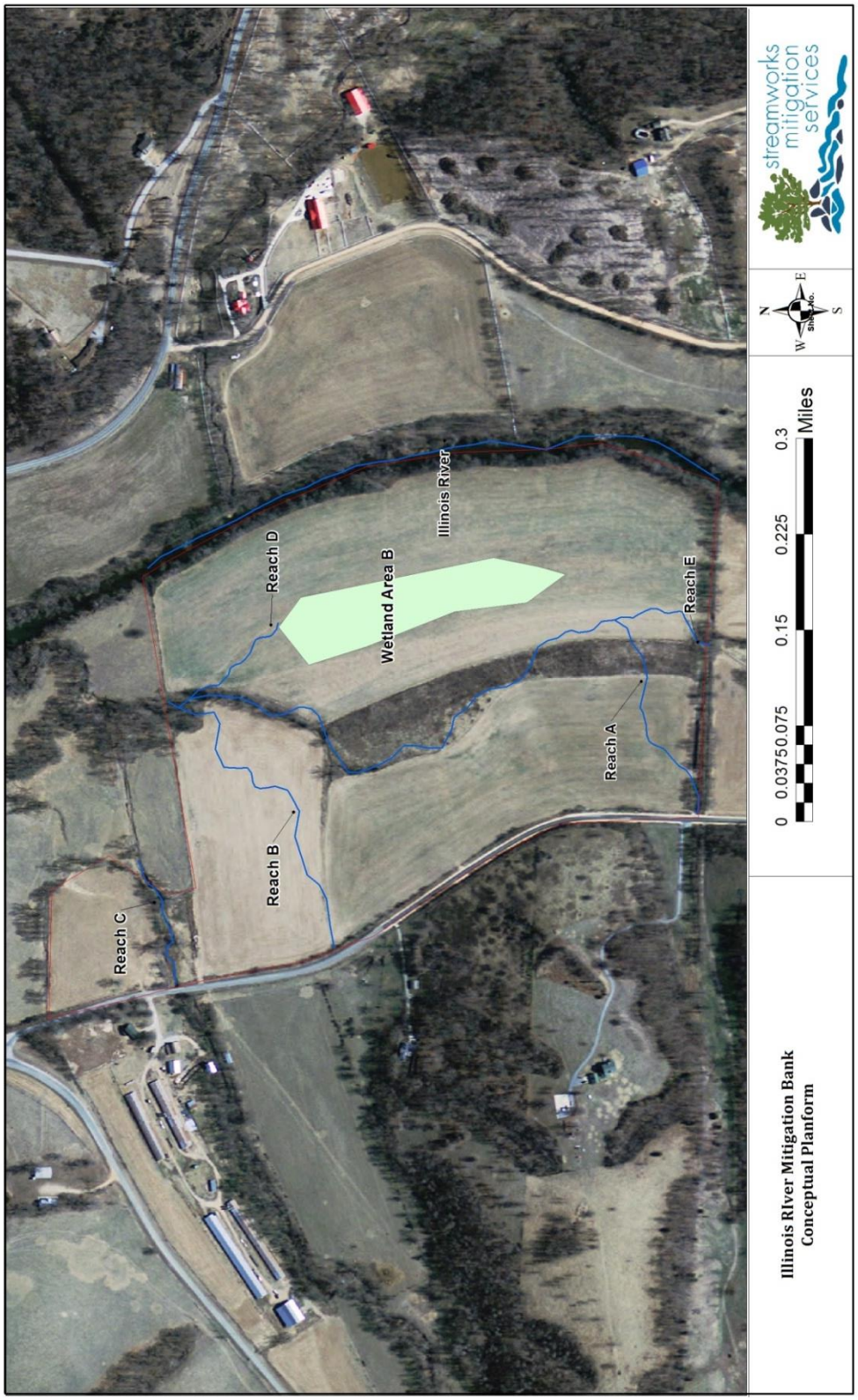

Figure 5: Aerial map of the conceptual planform of the proposed Illinois River Mitigation Bank

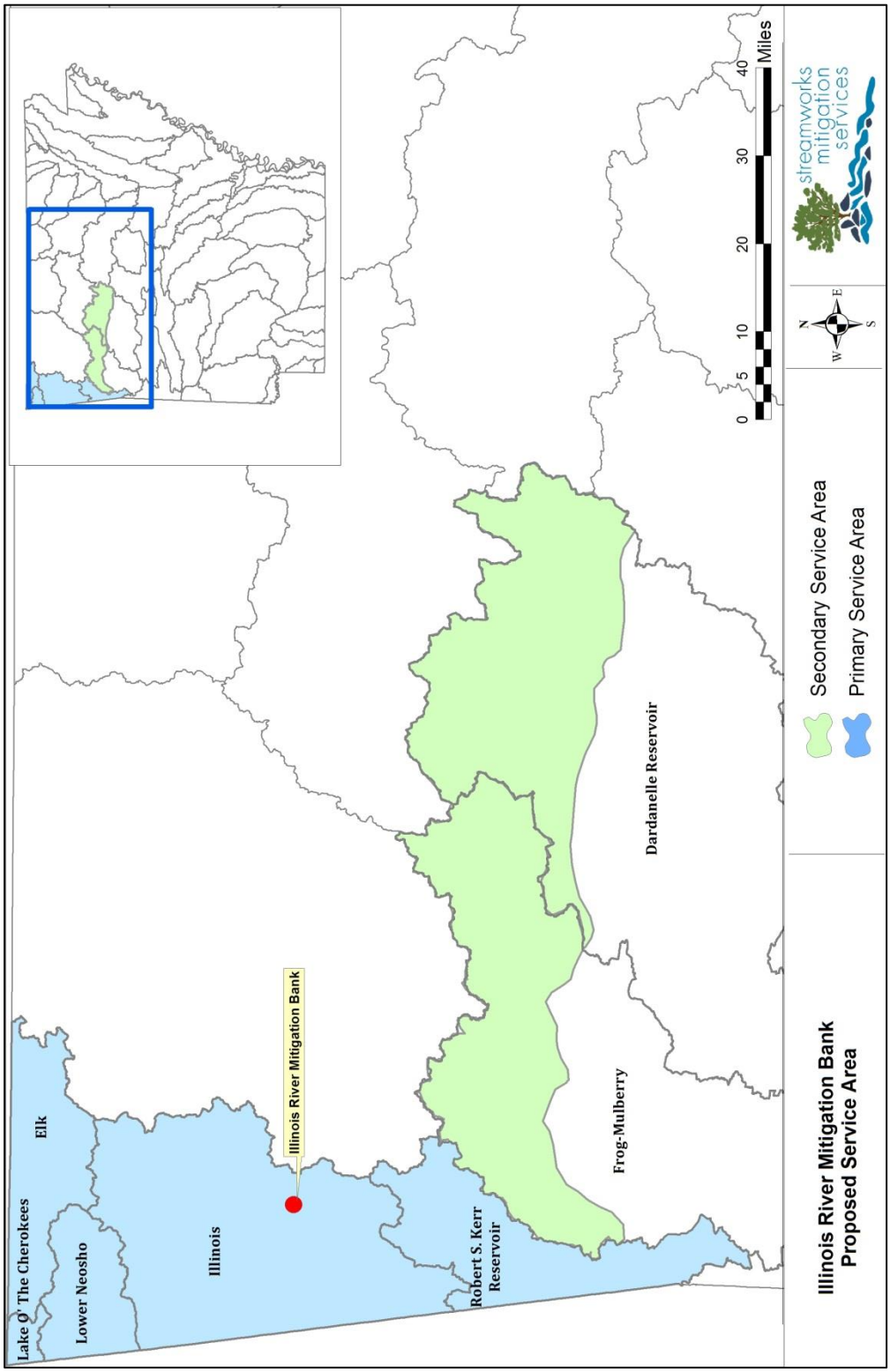

Figure 6: Primary and secondary service areas for the proposed Illinois River Mitigation Bank

Figure 7: Archaeological sites identified within the project area

Appendix B
Photo documentation

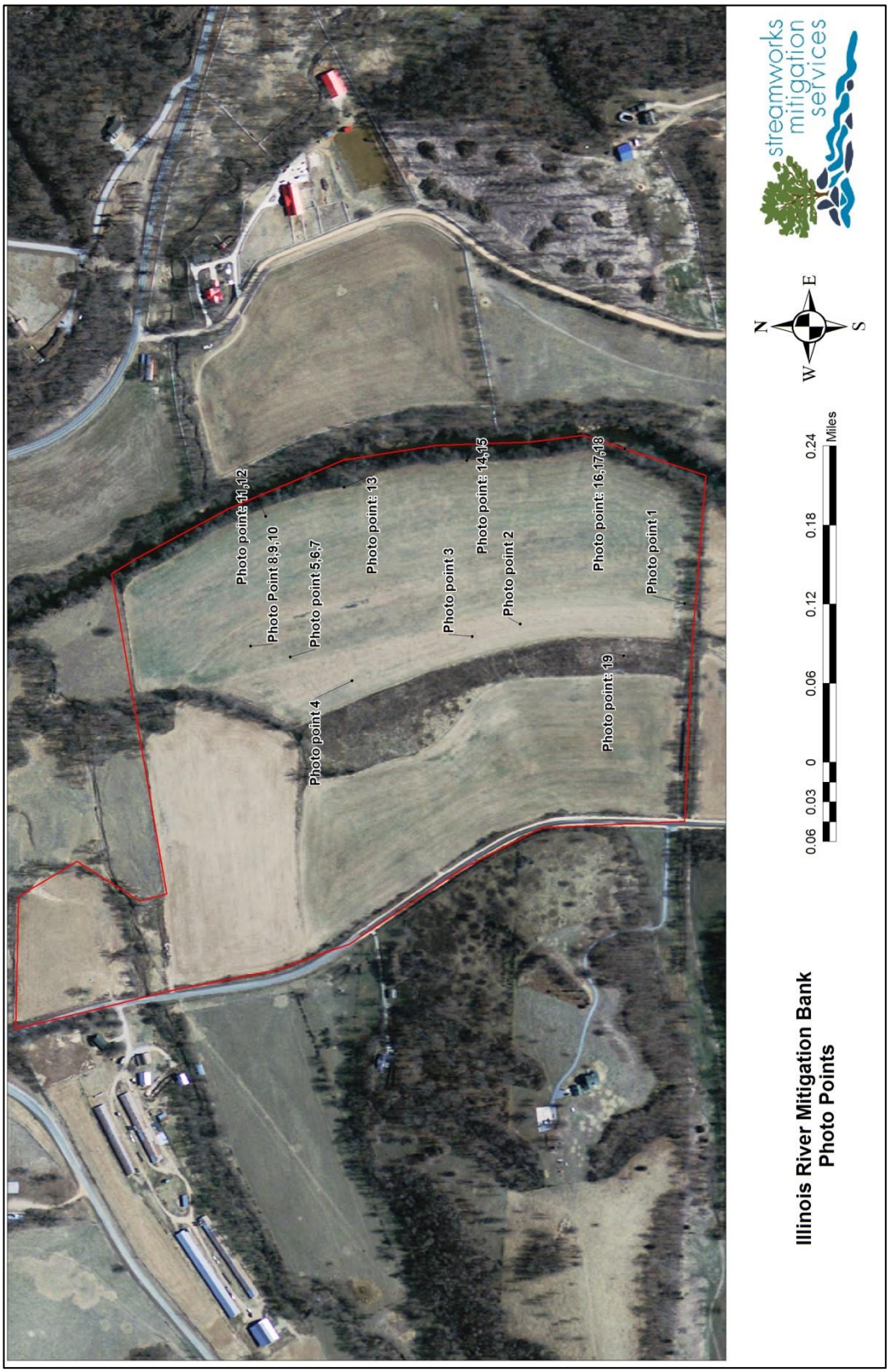

Figure B-1: Photo points taken on April 18, 2013 of the proposed Illinois River Mitigation Bank

Photo 1: Wetland Area A facing downstream

Photo 2: Reach A ditch facing downstream

Photo 3: Reach A facing upstream

Photo 4: Reach B entering Reach A

Photo 5: Reach A along southern property line

Photo 6: View of Reach A and Wetland Area A facing south

Photo 7: Reach A downstream of Viney Grove Rd.

Photo 8: Reach D facing upstream

Photo 9: Reach D ditch entering Reach A along the east pasture

Photo 10: Reach D enters Reach A along the northern property boundary

Photo 11: Illinois River facing downstream from the north end of the project site

Photo 12: View of pasture from north to south

Photo 13: Herbicide treated river cane along the west bank of Illinois River

Photo 14: Top of bank river left of the Illinois River in the middle of the property

Photo 15: View of the pasture facing east from the middle of Reach A

Photo 16: View of riffle facet of the Illinois River along the southern end of the project area

Photo 17: View of Illinois River looking upstream from the south end of the property

Photo 18: East bank of Illinois River from the west bank along the lower end of the reach

Photo 19: West side of the Reach A ditch facing south in the middle of the pasture