Gum Log Creek Mitigation Bank Prospectus

streamworks mitigation services

TABLE OF CONTENTS

Introduction

The proposed Gum Log Creek Mitigation Bank will be a commercial bank located in the Lake Conway-Point Remove 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 stream and wetland mitigation project is located within ~480 acres in Sections 11, 10, 2, and 15, Township 7N, Range 18W of Pope County, Arkansas, northeast of Atkins, east of North Hopewell Loop (Table 1). The project will restore, enhance, or protect ~1,313 linear feet (LF) of Gum Log Creek, ~5,280 LF of White Oak Creek and ~21,716 LF of tributaries, and approximately 166-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. Army Corps of Engineers ("USACE", or "SWL"), the U.S. Environmental Protection Agency, Region VI ("EPA"), the U.S. Fish and Wildlife Service Region IV ("FWS"), the Arkansas Department of Environmental Quality ("ADEQ"), the Arkansas Natural Resources Commission ("ANRC"), the Arkansas Game and Fish Commission ("AGFC"), and the Arkansas Natural Heritage Commission ("ANHC"), as applicable.

Table 1: Summary of background information of the proposed Gum Log Creek Mitigation Bank

BACKGROUND INFORMATION	
Project Name	Gum Log Creek Mitigation Bank
Project Sponsor	Streamworks Mitigation Services, LLC
Site Location	Section 11, 10, 02, and 15 Township 7N, Range 18W
County	Pope
8-digit HUC	Lake Conway-Point Remove 11110203
10-digit HUC	West Fork Point Remove Creek 1111020301
12-digit HUC	Gum Log Creek 111102030106
Primary Service Area	Lake Conway-Point Remove 11110203 Lower Arkansas-Maumelle 11110207 Dardanelle Reservoir 11110207
Secondary Service Area	Frog-Mulberry 11110201 Robert S. Kerr 11110104 Poteau 11110105 Petit Jean 11110204 Bayou Meto 08020402
Protection Mechanism	Conservation Easement
Monitoring Frequency	Annually
Size of Project Area	~480 Acres/~28,309 LF of Stream ~166 Acres of Wetlands
Directions to Site	From I-40W, take Exit 94; Travel south (left) on Hwy 105 ~1 mile to Hwy 64; Turn east (left) onto Hwy 64 E and drive ~2.7 miles; Turn north (left)onto Union Grove Rd; Drive ~1.4 miles, gated property is on the right
Mitigation Objectives	To establish a mitigation bank in association with the granting of USACE permits through restoration and enhancement of ~28,309 LF of streams and 166 acres of wetlands, and associated riparian buffers.

1.0 Objective

The project objective is to develop a stream and wetland mitigation bank in the Lake Conway-Point Remove watershed in association with the granting of Department of the Army permits through

restoration, enhancement, and preservation of stream channels, wetlands, and associated buffers within the mitigation acreage. The project goal is to restore the perennial, intermittent, and ephemeral streams and to restore or enhance wetland habitat. The specific design objectives of the project include:

- Restoration or enhancement of channel dimension, pattern, and profile;
- Restoration or enhancement of wetlands;
- Water quality enhancement in the Lake Conway-Point Remove watershed through sediment reduction, nutrient reduction, 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 Gum Log Creek Mitigation Bank lies within ~480 acres located along Gum Log Creek and bordered by White Oak Creek on the east boundary. Gum Log Creek and White Oak Creek converge approximately three tenths of a mile to the east of the property boundary before converging with Point Remove Creek approximately one mile east of the property boundary (Appendix A: A-1).

The proposed mitigation bank is located approximately one mile west of the Ed Gordon Wildlife Management Area owned by the Arkansas Game & Fish Commission and managed as a bottomland hardwood area primarily for ducks and other migratory waterfowl. White Oak Creek is listed on the 2014 303(d) list as impaired due to turbidity and remains on the 2016 draft 303(d) list.

The site was historically used for row crops and pastureland. The streams were ditched, straightened, and filled to maximize agricultural production. In addition some streams where dammed to create ponds for livestock. Currently, ~80 acres is planted in Loblolly pine trees. Within this area the riparian zone will be replanted with native hardwoods and shrubs and will be protected against future clearcutting.

An appropriate buffer on all the streams within the proposed mitigation area will be established and protected under the conservation easement. Benefits include; improved water quantity through water retention, increased ground water recharge, reduction in turbidity by increased carbon contact on adjacent floodplains to Point Remove Creek, and provide connectivity to the nearby Arkansas River.

Restoration activities within the proposed mitigation bank will help to decrease the sediment supply into White Oak Creek. In 2008, a large tornado traveled across the southeastern portion of the proposed mitigation area. The trees that were damaged in this tornado are still causing log jams within the affected area. The western portion of the mitigation area was subjected to past logging practices that included clear-cutting. The tree tops where piled in stream channels for crossings. Timber remaining in the area was thinned and the tree tops were allowed to remain in the creek channels.

Multiple plant and animal species of concern potentially utilize the habitat within the proposed mitigation area. Further surveys will be conducted to determine which of these species are utilizing the site (Appendix C: Table 1).

Streamworks Mitigation Services, LLC has preserved, enhanced, or restored over 13.5 miles of streams, and ~80 acres of wetlands. More than 840 acres of land have been placed under conservation easements through Streamworks mitigation projects and well over two hundred thousand trees have been planted in riparian buffers and uplands. Streamworks currently maintains and monitors five Consolidated Mitigation Areas, one approved stream and wetland mitigation bank (Illinois River Mitigation Bank, 2014), and one pending approval (Caney Creek Mitigation Bank) with SWL. Currently, all of Streamworks mitigation projects have met or exceeded the performance standards and are considered to be in good condition.

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 an appropriate entity and filed at the courthouse in Pope County. During the mitigation period, 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 Lake Conway Point-Remove watershed extends through Pope, Yell, Perry, Conway, Faulkner Counties, into north Pulaski County then flows south into the Arkansas River. The Lake Conway-Point Remove watershed is located primarily in the Arkansas Valley Eco-region. Gum Log Creek is a perennial channel originating in central Pope County and flows southeast before connecting with the West Fork of Point Remove Creek. White Oak Creek originates in the southern part of Pope County west of the city of Atkins. White Oak Creek then flows east through the town of Atkins, then flows north before converging with Gum Log Creek. Atkins, Arkansas, receives an average of 48.89 inches of rainfall per year.

4.1 Soils

Soils are mapped into nine primary units. The largest unit is composed of Guthrie Silt Loam 1 to 3 percent slopes, ~163.7 acres. Guthrie slit loam is a rarely flooded, poorly drained soil, classified in hydrologic soil group D, with a parent material of fine silty alluvium derived from shale and silt stone. The second largest unit is Leadvale silt loam 1 to 3 percent slopes, ~119.5 acres. Leadvale silt loam is a moderately well drained, classified in hydrologic soil group C/D, soil with a parent material of old fine-silty alluvium derived from shale and siltstone over residuum weathered from sandstone and shale. The third soil unit is Pickwick silt loam, 0 to 3 percent slope. Pickwick silt loam is a well-drained soil, classified in hydrologic soil group B, with a parent material of silty pedisediment. The fourth soil unit is Cane loam, 3 to 8 percent slopes. Cane loam is a moderately well drained soil, classified in hydrologic soil group C, with a parent material of loamy colluvium from sandstone and shale. The fifth soil unit is Taft silt loam 0 to 2 percent slopes. Taft silt loam is somewhat poorly drained, classified in soil group C/D, with a parent material of old fine-silty alluvium derived from shale and siltstone over residuum weathered from sandstone and shale. The

sixth soil unit is Spadra silt loam, 1 to 3 percent slopes. Spadra silt loam is well drained loamy alluvium, classified in hydrologic group B, with a parent soil of sandstone and shale. The seventh soil unit is Pickwick silt loam, 3 to 8 percent slopes. Pickwick silt loam is a well-drained soil, classified in the hydrologic soil group B, with a parent material of silty pedisediment. The eighth soil unit is the McKamie very fine sandy loam, 3 to 8 percent slope. McKamie very fine sandy loam is well drained, classified in hydrologic group D, with a parent material of clayey alluvium. The ninth soil unit is the Mountainburg gravelly fine sandy loam 3 to 8 percent slopes. Mountainburg gravelly fine sandy loam is well drained, classified in hydrologic group D, with a parent material of gravelly and stony, loam residuum weathered from sand stone (Figure 1). A formal wetland delineation is scheduled to determine jurisdictional status.

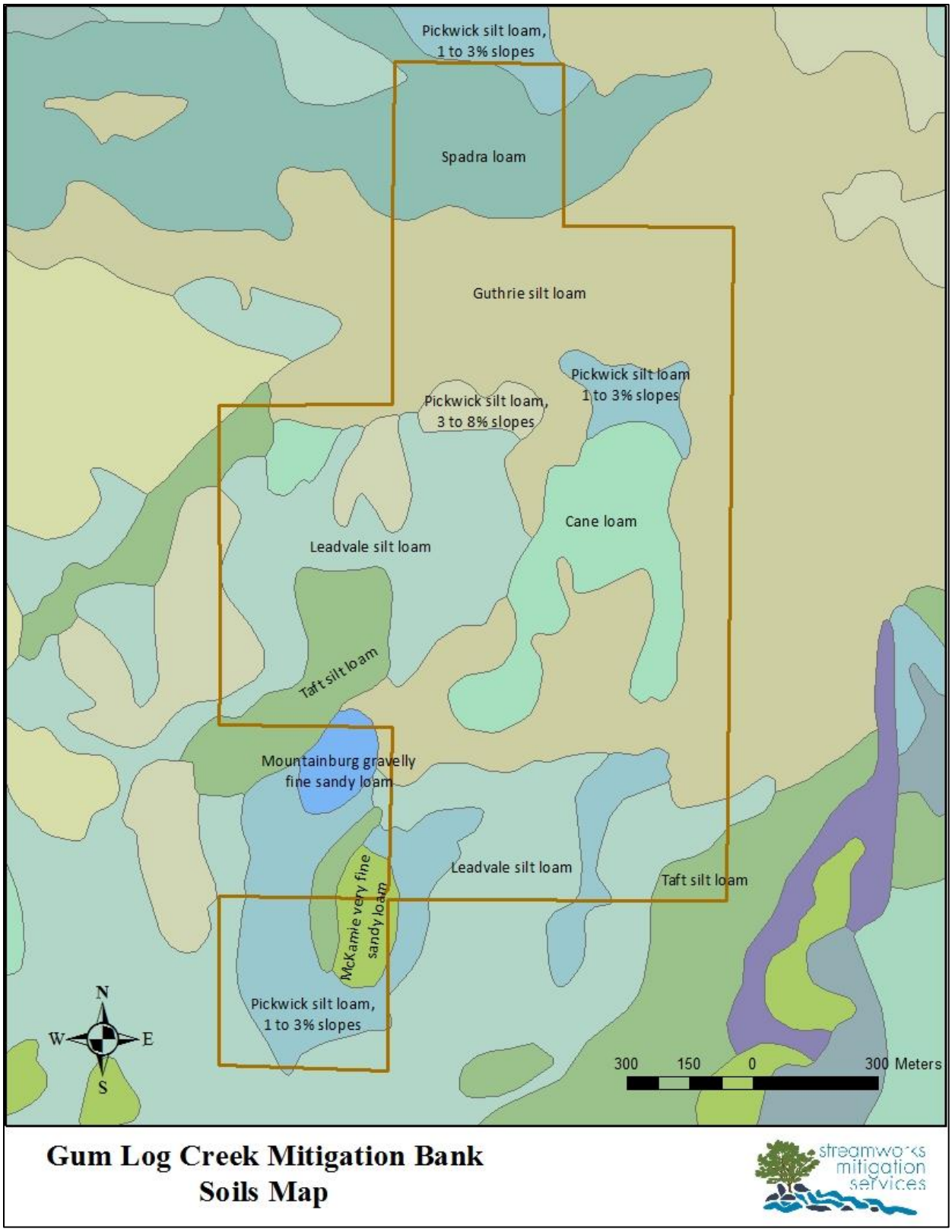


Figure 1: Soils map of the proposed Gum Log Creek Mitigation Bank.

4.2 Ecology

Various Oak species (*Quercus spp.*) dominate the majority of the vegetation located inside the proposed mitigation area. The invasive species, Chinese privet (*Ligustrum sinense*) and Baccharis (*Baccharis halimifolia*) have been found on the site and will be mechanically removed or treated with the appropriate herbicide. Establishment of baseline plant community monitoring transects will be scheduled. In addition to the baseline vegetative monitoring, avian point counts, benthic macroinvertebrate, and a bat survey 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 stream 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. Wetland credit determination will follow 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 work plan for the site will focus on the restoration and enhancement of the impacted streams and wetlands. Site preparation activities will include conducting comprehensive topographic and geomorphic surveys of existing stream and wetland conditions. Existing conditions will be evaluated for departure from historical and reference conditions and restored or enhanced to the appropriate dimension, pattern, and profile. If conditions allow, a prescribed burn will be conducted prior to construction. All of the construction will be performed during the dry season. Where it is appropriate, the site will be re-vegetated in native trees, shrubs, grasses, and forbs. Mechanical ripping will be utilized as needed prior to planting to facilitate tree survival rates.

6.1 Streams

- **Gum Log Creek**

Gum Log Creek is a third order stream ~40ft wide flowing east to west across the northern portion of the property. Approximately 1,313LF of Gum Log Creek flows through the property. The ditched channel shows moderate to heavy evidence of lateral stress. Exposed streambanks will be stabilized using appropriate methods (Appendix B: Photos 1 & 2).

- **White Oak Creek**

Preliminary site surveys found that White Oak Creek is a 20-30 ft. wide perennial channel that flows for ~1 mile south to north along the eastern boarder of the site. White Oak Creek drains the City of Atkins and has been straight line ditched. The channel has multiple head cuts and is moderately incised. White Oak Creek will be reconstructed to be more closely aligned with historical conditions (Appendix B: Photos 11 & 12).

- **Reach B**

Reach B is a perennial channel that flows ~2,752LF from west to northeast through the center of the property. After the logging activities, tree tops and slash were left in the upper portion of the channel causing impacts to channel stability (Appendix B: Photos 3 & 4).

- **Reaches A, C, G, and I**

Reaches A, C, G, and I are the intermittent channels located within the proposed mitigation bank. Reach A flows from west to east for ~1,483LF in the northern portion of the property. Reach A is currently full of logging debris and has no continuously defined channel. The logging debris will be removed and stream channels will be constructed between the remnant parts of the channel restoring it to appropriate dimension, pattern, and profile.

Reach C flows from the western boundary of the property to the northeast for ~764LF before flowing onto the adjacent property. This portion of Reach C lies within the clear-cut portion of the property (Appendix B: Photos 5 & 6). The channel is filled with slash piles, is moderately incised, and has been disturbed by logging equipment. Reach C re-enters the property and flows for ~1,103LF before it converges with Reach B. This portion of Reach C has no continuously defined channel. The brush piles and logging debris will be removed from the channel. Where the channel is undefined it will be reconstructed restoring it to appropriate dimension, pattern, and profile.

Reach G flows from west to east for ~3,513LF across the property. The upstream portion of Reach G flows through the southern portion of the clear-cut area before entering a pond (Appendix B: Photos 13 & 17). Within this section slash has been piled in the channel and multiple head cuts are migrating upstream. The section of Reach G downstream of the pond flows through the thinned timber and converges with Reach B (Appendix B: Photos 9, 14, 15 & 16). Within this section, slash has been left in the channel and the channel has been ditched. Debris piles will be removed from the upper portion of Reach G and the pond levee will be lowered to create deep water wetland habitat. In the lower section of Reach G, the slash will be removed and the channel returned to proper pattern, dimension, and profile.

Reach I flows from the southwestern portion of the property ~5,932LF to the northeast. Reach I headwaters on the western neighboring property in a cattle pasture (Appendix B: Photos 20 & 21). Once the channel enters the proposed mitigation site it flows into a pond. From the pond the reach flows to the northeast and is filled with logging debris and there is no continuously defined channel (Appendix B: Photos 18 & 19). Within Reach I the pond levee will be lowered, creating deep water wetland habitat, and logging debris removed from the channel. New portions of the channel will be constructed to reconnect the remnant portions that remain.

- **Reaches D, E, F, H, J, K, and L**

Reaches D, E, F, H, J, K, and L are the ephemeral channels located within the proposed mitigation bank. Reach D is an ephemeral channel that flows from south to north ~1,045LF through the clear-cut portion of the property. A logging road cuts across the upper portion of Reach D that is causing a large sediment load within this ephemeral channel (Appendix B: Photos 7 & 8). Within the lower portion, a large slash pile was pushed into the channel after the logging activities. The slash pile will be removed from the lower portion and the logging road will be maintained to decrease the sediment in Reach D.

Reach E flows from the west to east for ~816LF before converging with Reach G. This ephemeral channel is being impacted by slash and there is no continuously defined channel. The slash will be removed and channel remnants will be reconnected.

Reach F flows from west to east for ~465LF before it converges with Reach I. Reach F has been filled and has multiple head cuts migrating up stream (Appendix B: Photo 10). The channel will be reconstructed and the head cuts arrested.

Reach H flows from west to east ~367LF before converging with Reach I. Reach H has been affected by logging activities along with the 2008 tornado and is full of debris. The debris will be cleared and removed and the remnants reconnected.

Reach J flows from west to east ~1,158LF before flowing into White Oak Creek. Reach J is currently filled with storm debris and there is no continuously defined channel. The storm debris will be removed from the channel and the flood plain and the channel re-defined to the proper pattern, dimension, and profile.

Reach K flows from the southern border of the property to the northeast for ~1,721LF before converging with Reach J. This channel has debris from a tornado in 2008 and there is no continuously defined channel (Appendix B: Photo 22). The debris will be removed and the channel will be redefined by connecting the remnant portions of the channels.

Reach L flows ~597LF across the southeast corner of the property. This reach is a remnant portion of White Oak Creek.

6.2 Wetlands

The wetland areas located within the proposed mitigation bank total approximately 166 acres. The wetland activities will be a combination of restoration and enhancement of existing wetland features. 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 stream riparian buffer zone will be assessed for wetland mitigation credit potential.

6.3 Riparian Buffer

The riparian buffers of the mitigation area will be re-vegetated through hand planting native hardwood and herbaceous species with a density of 304 stems per acre. The under story will be planted with herbaceous mid-story species where the canopy is already established. During the dormant season, stakes such as, Black willow (*Salix nigra*), Eastern Cottonwood (*Populus deltoides*), and Sycamore (*Platanus occidentalis*), will be placed along the streambanks. The wetland acreage planting will consist of the appropriate species.

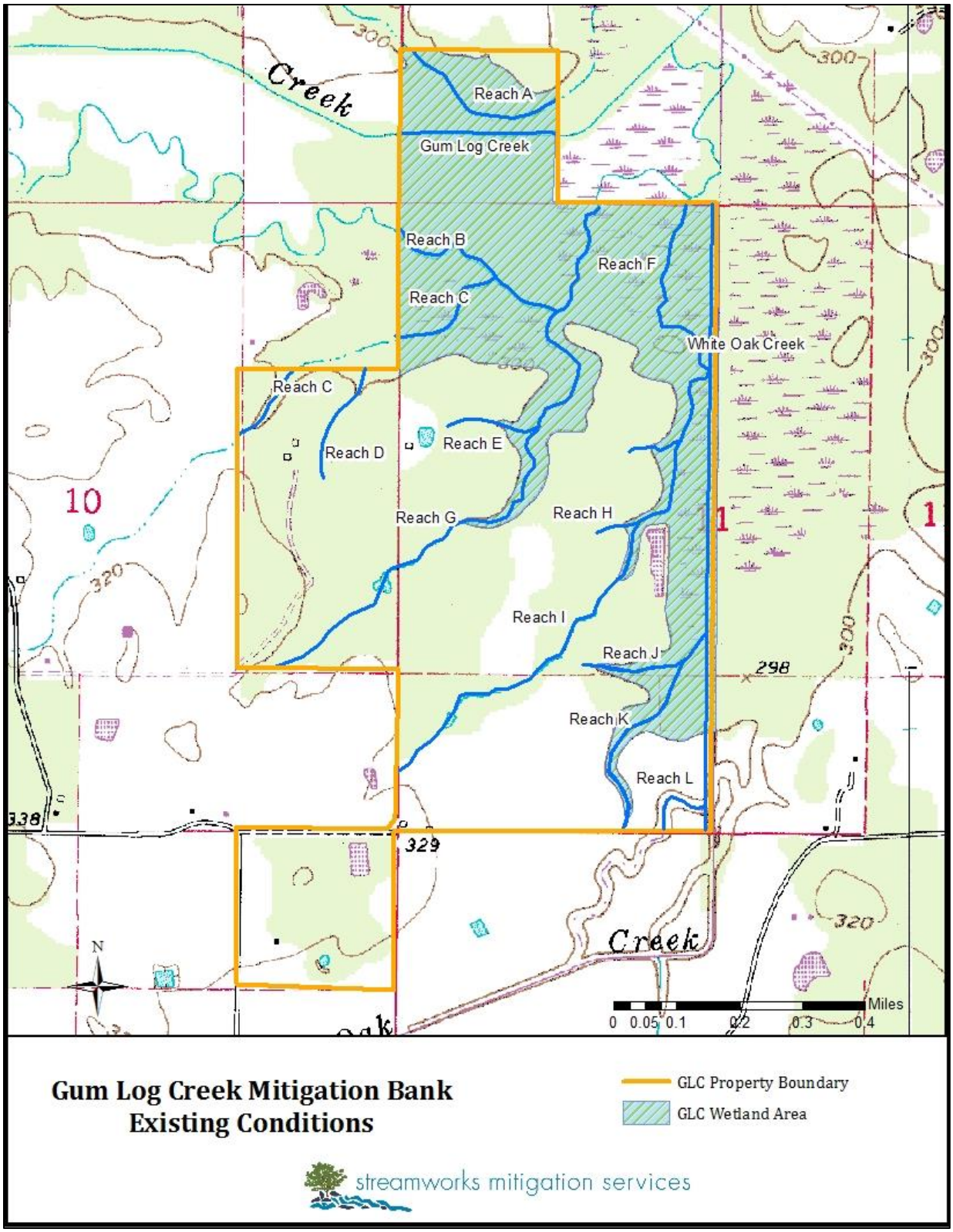


Figure 2: Topo map of existing conditions of the proposed Gum Log Creek Mitigation Bank

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 SWL for review for five years after initial construction or until the project is deemed successful.

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 2005) and approved by the IRT and SWL.

9.0 Monitoring Requirements

Monitoring will be conducted by Streamworks Mitigation Services, LLC, for five years or until the SWL 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 SWL, Streamworks may designate a long-term steward or an entity to act as steward.

11.0 Adaptive Management

Upon a determination by SWL 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. SWL 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.

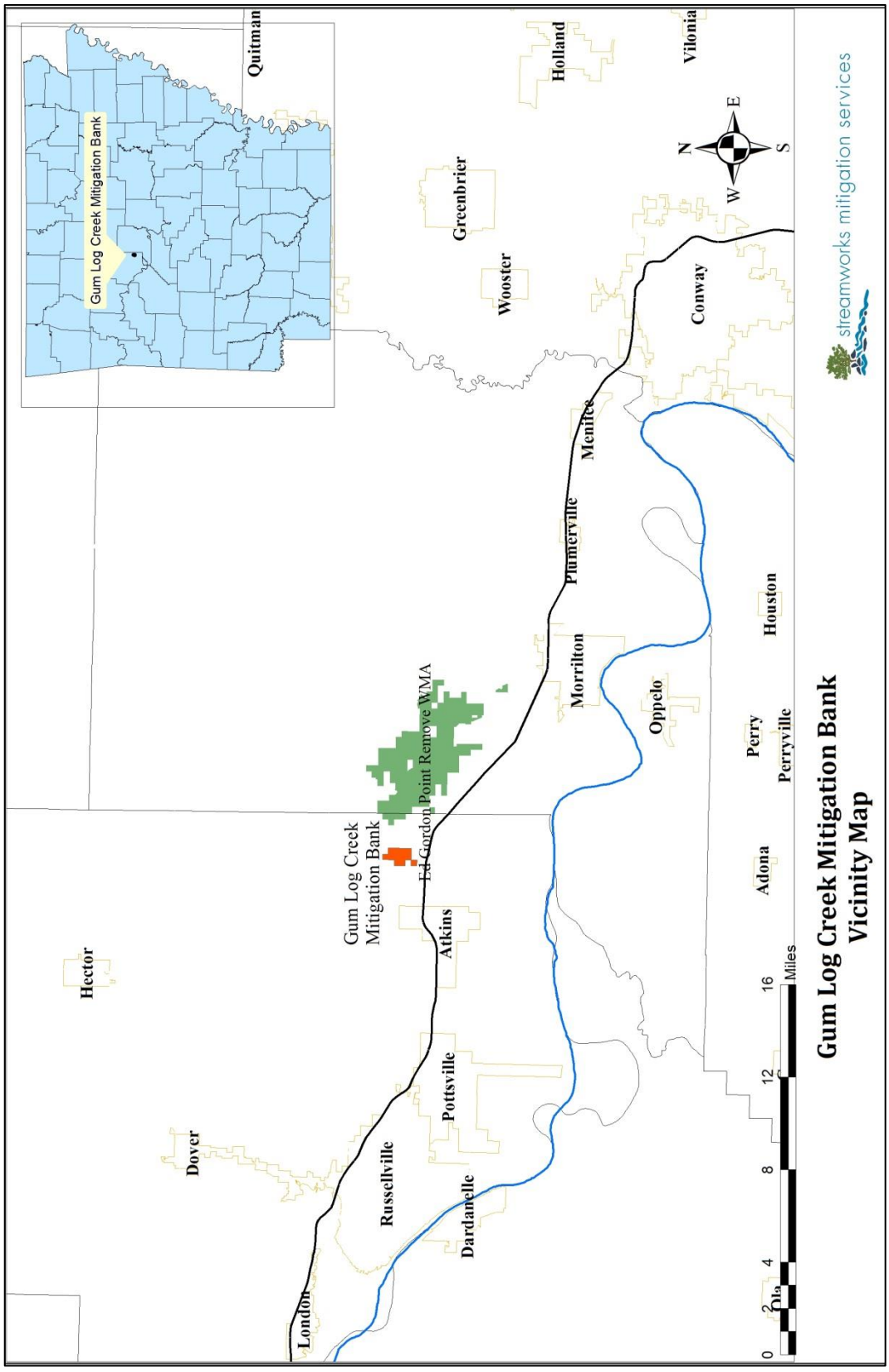
USACE (2005) Compensatory Mitigation Standard Operating Procedure, Department of Army, Regulatory Branch, Little Rock District.

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

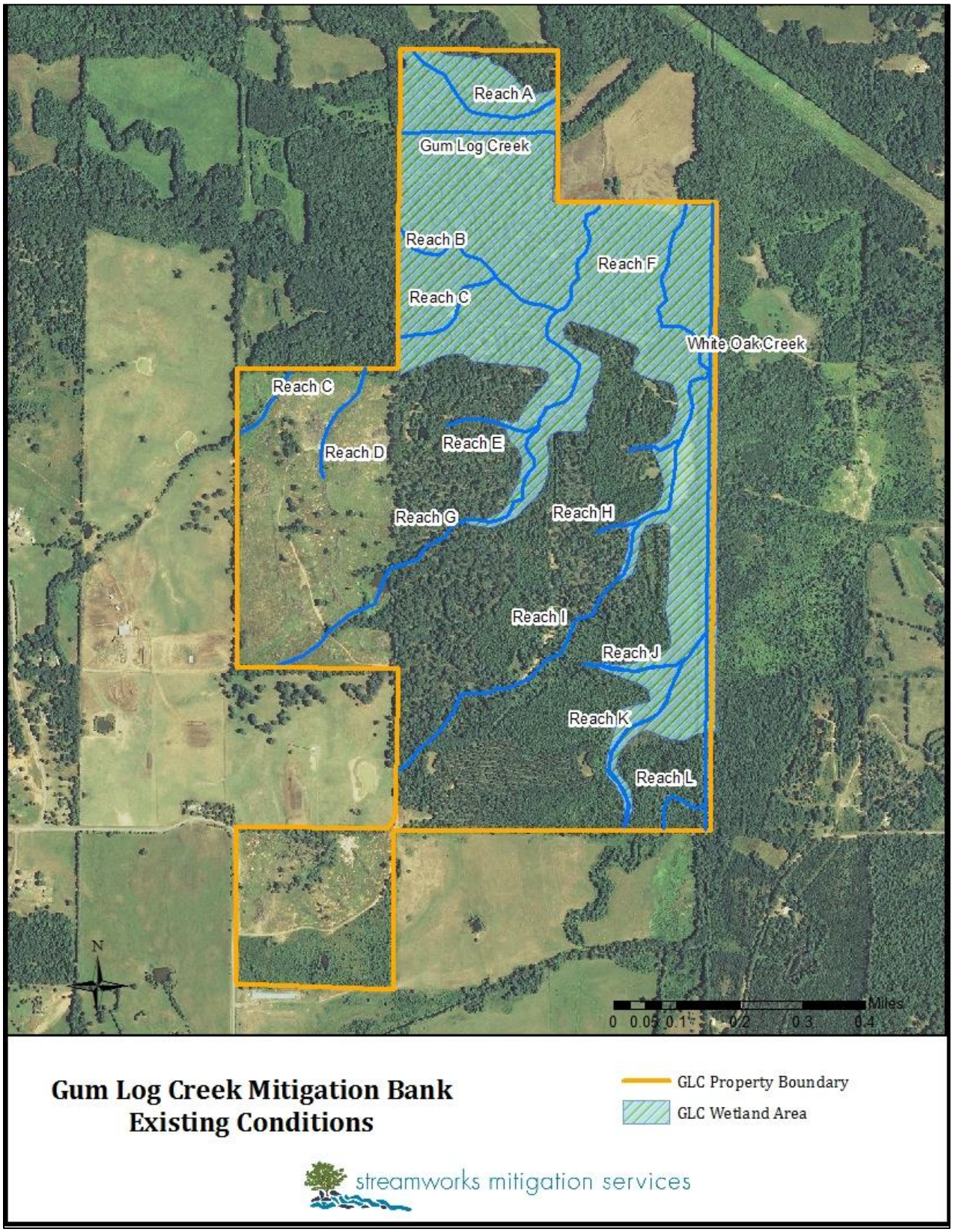
USEPA (1972) Clean Water Act, CWA. 33 U.S.C. §1251 et seq. Regulation 40 C.F.R. pts. 104-149.

USACE (2002) Compensatory Mitigation Standard Operating Procedure, Department of the Army, Regulatory Branch, Charleston Branch.

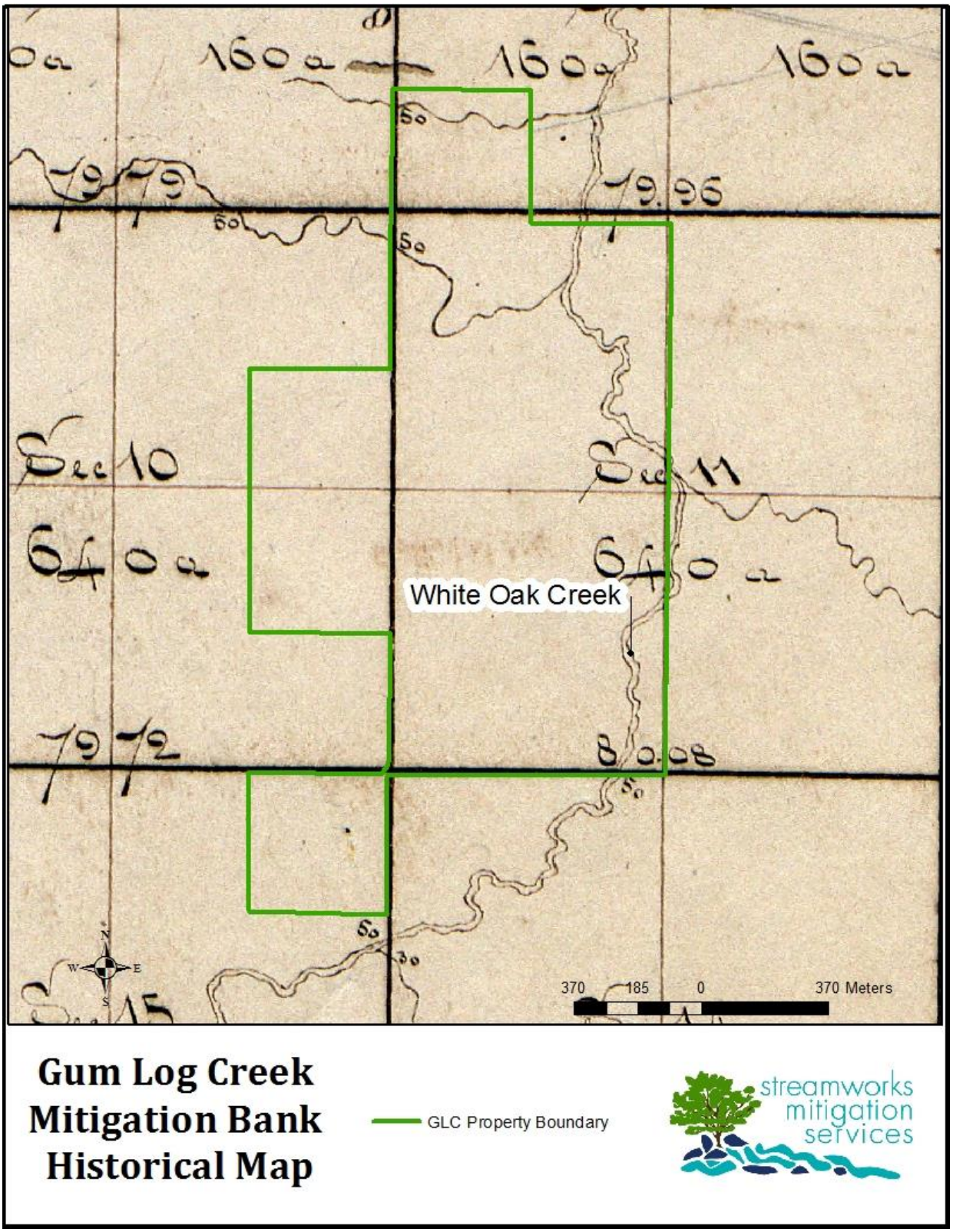
Appendix A
Maps



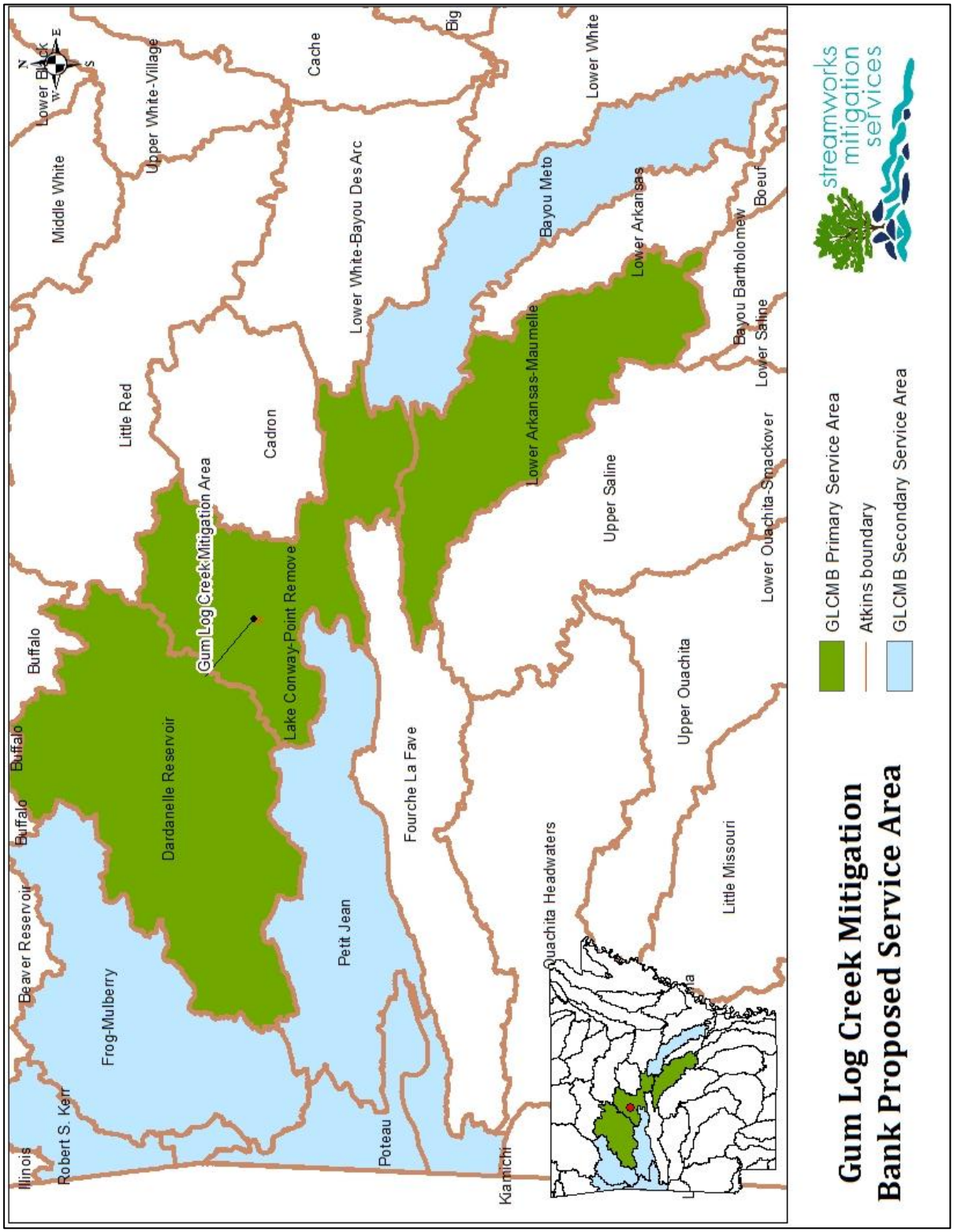
A.1: Vicinity Map for proposed Gum Log Creek Mitigation Bank



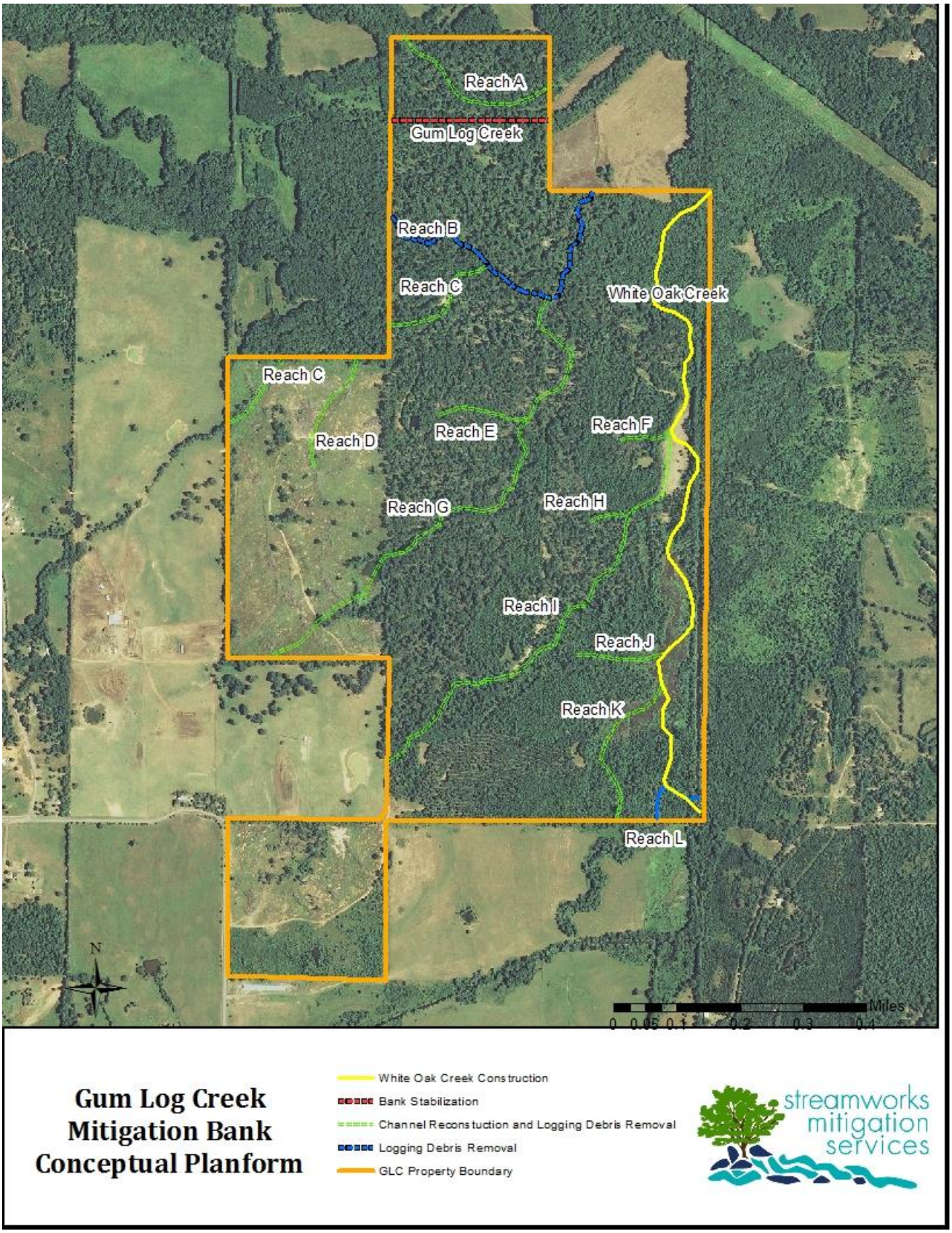
A.2: Aerial map of existing conditions of the proposed Gum Log Creek Mitigation Bank



A.3: GLO Map of Gum Log Creek Mitigation Bank

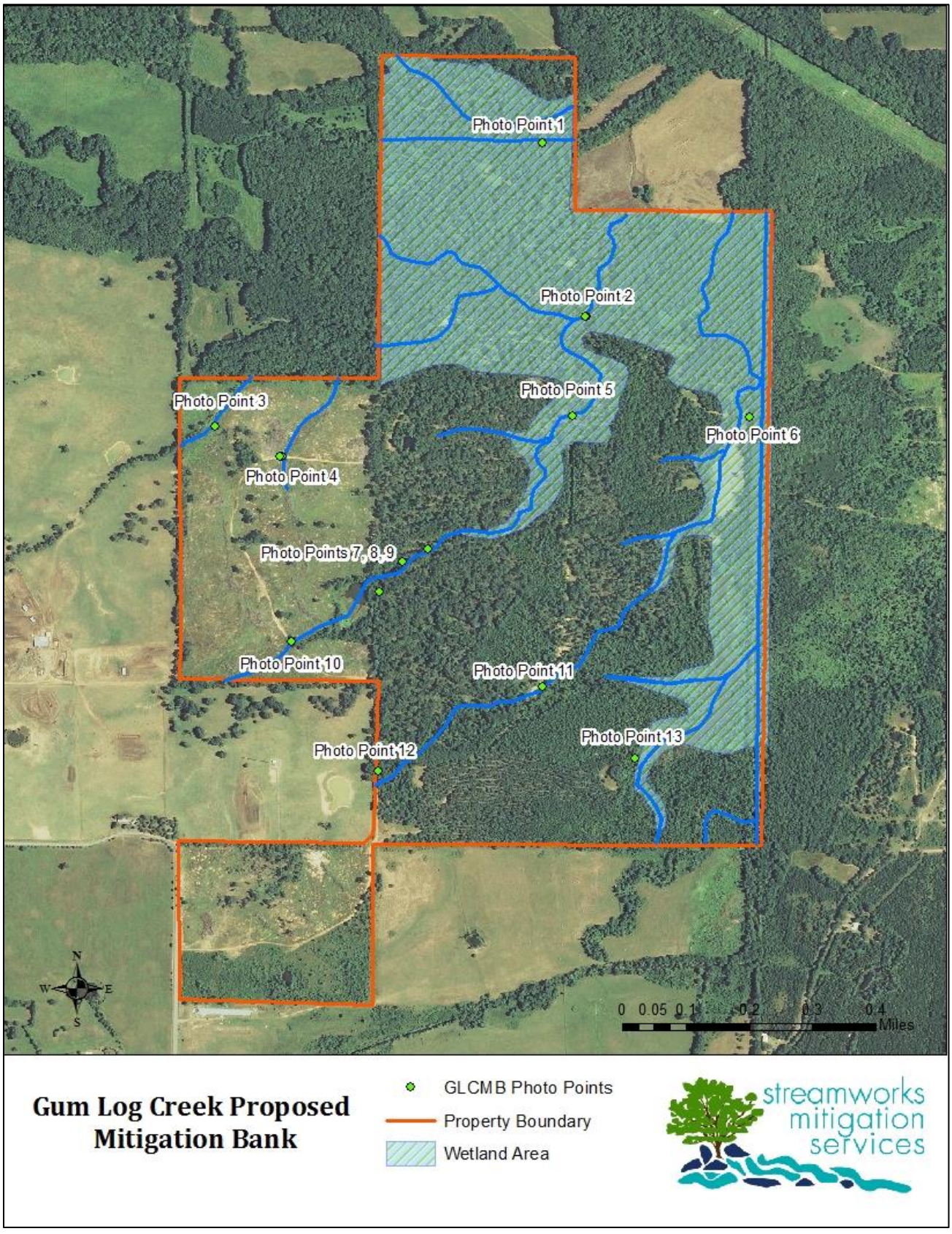


A.4: Primary and secondary service areas for the proposed Gum Log Creek Mitigation Bank



A.5: Aerial map of the conceptual planform of the proposed Gum Log Creek Mitigation Bank.

Appendix B
Photo Documentation



B.1: Photo points taken on November 20, 2015 of the proposed Gum Log Creek Mitigation Bank

Photo 1: Photo Point 1 Gum Log Creek facing upstream showing straightened channel

Photo 2: Photo Point 1 Gum Log Creek facing downstream showing straightened channel

Photo 3: Photo Point 2 facing upstream on Reach B

Photo 4: Photo Point 2 facing downstream on Reach B

Photo 5: Photo Point 3 Reach C facing downstream showing incision and logging debris in channel

Photo 6: Photo Point 3 Reach C facing upstream showing incision and logging debris in channel

Photo 7: Photo Point 4 Reach D facing upstream showing sediment and logging damage

Photo 8: Photo Point 4 Reach D facing downstream showing sediment deposition

Photo 9: Photo Point 5 Reach G facing upstream showing logging debris within channel

Photo 10: Photo Point 6 facing upstream on reach F and the surrounding wetland area

Photo 11: Photo Point 6 facing upstream on White Oak Creek showing straightened channel

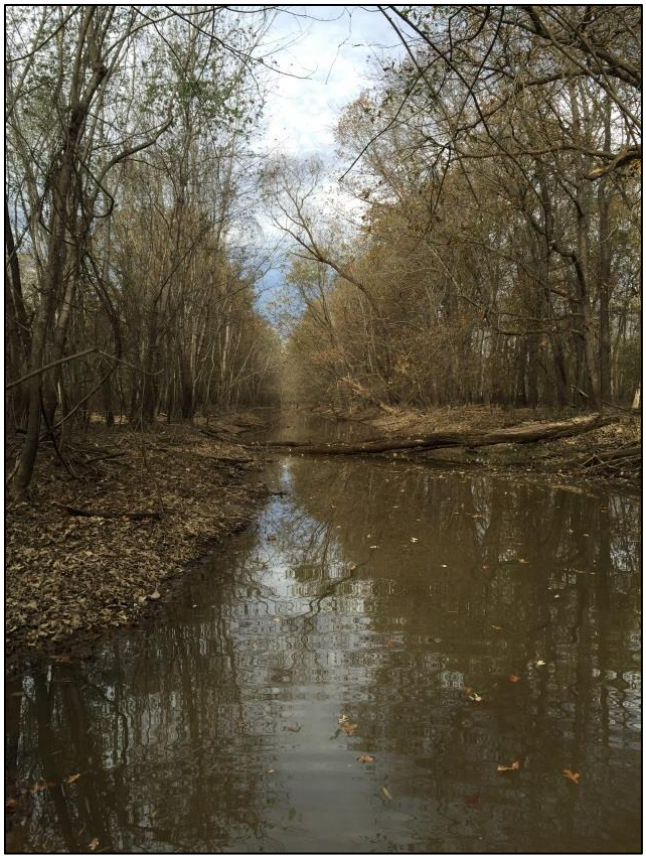


Photo 12: Photo point 6 of White Oak Creek facing downstream showing straightened channel

Photo 13: Photo Point 7 showing a pond on Reach G

Photo 14: Photo Point 8 upstream on Reach G showing logging debris in the channel

Photo 15: Photo Point 9 Reach G facing upstream showing logging debris in the channel

Photo 16: Photo Point 9 Reach G facing downstream showing logging debris in the channel

Photo 17: Photo Point 10 Reach G showing slash pile in channel

Photo 18: Photo Point 11 Reach I showing slash in channel facing downstream

Photo 19: Photo Point 11 Reach I facing upstream showing no defined channel

Photo 20: Photo Point 12 Reach I facing upstream onto neighboring property

Photo 21: Photo Point 12 Reach I showing no defined channel

Photo 22: Photo Point 13: Reach K and the surrounding wetland area showing tornado damage

Appendix C
Species of Concern for Pope County

Table 1: List of species of concern located in Pope County, AR

Name	Federal Status	State Status	Global Rank	State Rank
Animals - Invertebrates				
Alasmidonta marginata (elktoe)	-	INV	G4	S3
Cambarus causeyi (Boston Mountains crayfish)	-	INV	G2	S1
Cicindela unipunctata (woodland tiger beetle)	-	INV	G4G5	S2
Crangonyx aka (an amphipod)	-	INV	G1	S1?
Cyprogenia aberti (western fanshell)	-	INV	G2G3Q	S2
Heterosternuta ouachita (Ouachita diving beetle)	-	INV	GNR	S2
Lasmigona costata (flutedshell)	-	INV	G5	S3
Ligumia recta (black sandshell)	-	INV	G4G5	S2
Lirceus bicuspidatus (an isopod)	-	INV	G3Q	S2
Pygmarrhopalites clarus (a springtail)	-	INV	G4	S1S2
Scaphinotus inflectus (a ground beetle)	-	INV	GNR	S1
Speyeria diana (Diana Fritillary)	-	INV	G3G4	S2S3
Toxolasma lividum (purple lilliput)	-	INV	G3Q	S2
Villosa iris (rainbow)	-	INV	G5Q	S2S3
Villosa lienosa (little spectaclecase)	-	INV	G5	S3
Animals - Vertebrates				
Accipiter striatus (Sharp-shinned Hawk)	-	INV	G5	S1S2B
Asio flammeus (Short-eared Owl)	-	INV	G5	S3N
Atractosteus spatula (alligator gar)	-	INV	G3G4	S2?
Corynorhinus rafinesquii (Rafinesque's big-eared bat)	-	INV	G3G4	S3
Cycleptus elongatus (blue sucker)	-	INV	G3G4	S2
Erimyzon sucetta (lake chubsucker)	-	INV	G5	S2?
Etheostoma mihileze (sunburst darter)	-	INV	G4	S3
Eurycea spelaea (grotto salamander)	-	INV	G4	S3
Haliaeetus leucocephalus (Bald Eagle)	-	INV	G5	S2B, S4N
Hybognathus placitus (plains minnow)	-	INV	G4	SX
Hyla avivoca (bird-voiced treefrog)	-	INV	G5	S3
Lithobates areolatus circulosus (northern crawfish frog)	-	INV	G4T4	S2
Myotis grisescens (gray myotis)	LE	SE	G3	S2S3
Myotis leibii (eastern small-footed bat)	-	INV	G1G3	S1
Notropis girardi (Arkansas River shiner)	LT	SE	G2	SX
Ophisaurus attenuatus attenuatus (western slender glass lizard)	-	INV	G5T5	S3
Pandion haliaetus (Osprey)	-	INV	G5	S1B, S4N
Percina nasuta (longnose darter)	-	INV	G3	S2
Phenacobius mirabilis (suckermouth minnow)	-	INV	G5	S1
Plethodon angusticlavius (Ozark zigzag salamander)	-	INV	G4	S3
Plethodon serratus (southern red-backed salamander)	-	INV	G5	S3
Polyodon spathula (paddlefish)	-	INV	G4	S2?
Pseudacris streckeri (Strecker's chorus frog)	-	INV	G5	S2
Regina septemvittata (queen snake)	-	INV	G5	S2
Setophaga cerulea (Cerulean Warbler)	-	INV	G4	S3B
Sorex longirostris (southeastern shrew)	-	INV	G5	S2
Spea bombifrons (plains spadefoot)	-	INV	G5	S1
Sternula antillarum athalassos (Interior Least Tern)	LE	SE	G4T2Q	S2B

Table 1 cont.: List of species of concern located in Pope County, AR

Name	Federal Status	State Status	Global Rank	State Rank
Plants - Vascular				
Carex careyana (Carey's sedge)	-	INV	G4G5	S3
Carex stricta (tussock sedge)	-	INV	G5	S3
Caulophyllum thalictroides (blue cohosh)	-	INV	G4G5	S2
Claytonia caroliniana (Carolina spring-beauty)	-	INV	G5	SU
Crataegus macrosperma (fan-leaf hawthorn)	-	INV	G5	S1
Cypripedium kentuckiense (Kentucky lady's-slipper)	-	INV	G3	S3
Dalea lanata var. lanata (woolly prairie-clover)	-	INV	G5TNR	S2S3
Delphinium newtonianum (Moore's delphinium)	-	INV	G3	S3
Draba aprica (open-ground whitlow-grass)	-	ST	G3	S2
Eleocharis wolfii (Wolf's spike-rush)	-	INV	G3G4	S3
Eriocaulon koernickianum (small-head pipewort)	-	SE	G2	S2
Euphorbia hexagona (six-angle spurge)	-	INV	G5	S2
Gratiola brevifolia (sticky hedge-hyssop)	-	INV	G4	S3
Helianthus occidentalis ssp. plantagineus (plantain-leaf sunflower)	-	INV	G5T2T3	S1
Heuchera villosa var. arkansana (Arkansas alumroot)	-	INV	G5T3Q	S3
Hydrocotyle americana (marsh pennywort)	-	INV	G5	SH
Lilium superbum (Turk's-cap lily)	-	INV	G5	S1
Mimulus floribundus (yellow monkey-flower)	-	INV	G5	S2S3
Neviusia alabamensis (Alabama snow-wreath)	-	ST	G2	S1S2
Osmunda claytoniana (interrupted fern)	-	ST	G5	S1
Philadelphus hirsutus (hairy mock orange)	-	INV	G5	S2S3
Sanicula smallii (Small's black-snakeroot)	-	INV	G5	S3
Selaginella arenicola ssp. riddellii (Riddell's spike-moss)	-	INV	G4T4	S3
Silene ovata (ovate-leaf catchfly)	-	ST	G3	S3
Solidago ptarmicoides (white flat-top goldenrod)	-	INV	G5	S1S2
Spiranthes odorata (fragrant ladies'-tresses)	-	INV	G5	S1
Trichomanes petersii (dwarf bristle fern)	-	ST	G4G5	S2
Trifolium carolinianum (Carolina clover)	-	INV	G5	S1?
Utricularia subulata (zigzag bladderwort)	-	INV	G5	S2
Valerianella ozarkana (Ozark cornsalad)	-	INV	G3	S3
Vitis rupestris (sand grape)	-	INV	G3	S3