FELSENTHAL AND OVERFLOW NATIONAL WILDLIFE REFUGES
TRANSPORTATION STUDY
Transportation Study Report

Contract No. DTFH71-09-D-00001, Task Order: 11-017

US Department of Transportation, Federal Highway Administration, Eastern Federal Lands Highway Division
in cooperation with US Fish and Wildlife Service and the Felsenthal National Wildlife Refuge

Kimley-Horn
and Associates, Inc.

June 2012

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Executive Summary

The South Arkansas National Wildlife Refuges Complex consists of three National Wildlife Refuges (NWR) in southern Arkansas. The two Refuges studied in this report are the Felsenthal National Wildlife Refuge and the Overflow National Wildlife Refuge. The Felsenthal and Overflow NWRs contain approximately 65,000 and 14,000 acres, respectively, of mainly bottomland hardwood forest. Based on the number of hunting/fishing permits issued, approximately 400,000 people visited Felsenthal NWR and 15,000 people visited Overflow NWR last year.

Felsenthal NWR has the largest green-tree reservoir in the world, due in part to the Ouachita and Saline Rivers that flow through it. A green-tree reservoir is a bottomland hardwood forest that is carefully flooded during the dormant season of the hardwood forest communities to provide a habitat for wintering waterfowl. As a result, Felsenthal NWR is a prime location for recreational hunting, fishing, and wildlife observation. The Refuge is also known to contain the nests of red cockaded woodpeckers, a vulnerable species.

Overflow NWR also has a green-tree reservoir that serves mallard, wood duck, and other waterfowl populations in the Mississippi flyway. Additionally, Overflow NWR contains a number of accessible sloughs and creeks, as well as cropland acreage that is currently farmed.

This Transportation Study Report reviewed the surrounding transportation network at the Felsenthal and Overflow National Wildlife Refuges and provides short-, medium-, and long-range recommendations for the improvements to the existing transportation system. The study included development of a public involvement plan, inventory of existing conditions at the Refuge, and preliminary candidate alternatives identifying the responsible stakeholder partners. The preliminary candidate alternatives were then divided into potential improvements requiring construction and additional recommendations not requiring construction for initial screening. The construction alternatives were then evaluated in further detail to determine the preferred alternatives and developed into a short-, medium-, and long-range implementation plan. The implementation plan presented herein includes a summary of the environmental, social, and financial impacts of the conceptual roadway alternatives. Additional detailed information on the planning process is provided in this report.

Based on the results of the study, short-, medium- and long-range transportation roadway recommendations for the Felsenthal and Overflow NWRs include the following:

Short-Range (2017) –

Felsenthal NWR

- **Alternative F1** – Continued Maintenance of Internal Roadways

- **Alternative F2 –** Westbound Left-Turn Lane at Visitors Center Driveway (US 82)
- **Alternative F3** – Eastbound Right-Turn Lane at Visitors Center Driveway (US 82)
- **Alternative F4** – Channel Maintenance at Boat Ramps
- **Alternative F6 –** Boat Mooring Locations Feasibility Study
- **Alternative F7 –** Development of an Auto Tour Route

Overflow NWR

- **Alternative O1** – Continued Maintenance of Internal Roadways
- **Alternative O3** – Development of an Auto Tour Route

Medium Range (2022) –

Felsenthal NWR

- **Alternative F8 –** Bridge Replacement on Bradley County Road 65 S
- **Alternative F9 –** Roadway Improvements on New Lock 6 Road

Long Range (2027) –

Felsenthal NWR

- **Alternative F10 –** Installation of Boat Mooring Locations

Other alternatives developed during this transportation study not requiring construction include:

- **Alternative F5** and **Alternative O2** – Establish Agreements for Refuge Access Points at both Refuges
- Conduct a Speed Study on US 82 in the Vicinity of Felsenthal NWR
- Install Wayfinding Signs for the Refuge in the Surrounding Area at both Refuges
- Install Signs Regarding the Felsenthal NWR's Highway Advisory Radio
- Coordinate with Local Agencies and Municipalities to Encourage Usage of the Refuges
- Develop New Trails to Enhance the Visitor Experience at both Refuges
- Develop a Formal Trail map for the Refuges
- Provide Refuge Information at Visitors Center/Refuge Complex Kiosks at both Refuges
- Continue to Pursue Grant Opportunities for Additional Funding Sources

1 Introduction

South Arkansas Refuges Complex is a complex of three National Wildlife Refuges (NWRs) in Arkansas. The Felsenthal National Wildlife Refuge is located west of Crossett, Arkansas with approximately 65,000 acres of mainly bottomland hardwood forest. The Overflow National Wildlife Refuge is located between Hamburg, Arkansas and Parkdale, Arkansas with approximately 14,000 acres of mostly bottomland hardwood forest. Pond Creek National Wildlife Refuge is the third National Wildlife Refuge (NWR) in the Complex. Only the Felsenthal and Overflow NWR's are evaluated as part of this project.

The Ouachita and Saline Rivers pass through the Felsenthal NWR and the Refuge has the largest green-tree reservoir in the world. A green-tree reservoir is a bottomland hardwood forest that is carefully flooded during the dormant season of the hardwood forest communities to provide habitat for wintering waterfowl. Felsenthal Refuge is also the location of a number of red cockaded woodpecker nests.

Overflow NWR also has a green-tree reservoir and serves mallard, wood duck, and other waterfowl populations in the Mississippi flyway. Overflow NWR also has cropland acreage that is currently farmed.

1.1 USFWS Mission and Goals

The NWR System is administered through the United States Fish and Wildlife Service (USFWS) under the Department of the Interior. The mission of the USFWS is to:

"Work with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people."

The goals of the USFWS are aimed at fulfilling this mission. Primary USFWS goals are to:

- Sustain fish and wildlife populations including migratory birds, endangered species, anadromous fish, and marine animals;
- Conserve a network of lands and waters, including the NWR System; and
- Provide Americans opportunity to understand and participate in the conservation and use of fish and wildlife resources.

The USFWS manages refuges across the country. The passage of the NWR System Improvement Act of 1997 defines the mission of the NWR System as:

"…to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, plant resources and their habitats within the United States for the benefit of present and future generations of Americans."

The goals of the Wildlife Refuge System are to:

- Preserve, restore, and enhance threatened and endangered species in their natural ecosystems.
- Perpetuate the migratory bird resource.
- Preserve a natural diversity and abundance of fish and wildlife ecology.
- Provide the public an understanding and appreciation of fish and wildlife ecology.
- Provide Americans opportunity to understand and participate in the conservation and use of fish and wildlife resources.

The NWR System Improvement Act of 1997 identified six wildlife-dependent recreational uses that are recognized as priority public uses of refuge lands, including:

- Hunting
- Fishing
- Wildlife Observation
- Wildlife Photography
- Environmental Education
- Environmental Interpretation

1.2 Project Locations

The Felsenthal and Overflow NWRs boundaries are shown in **Figure 1.1**.

1.2.1 Felsenthal NWR

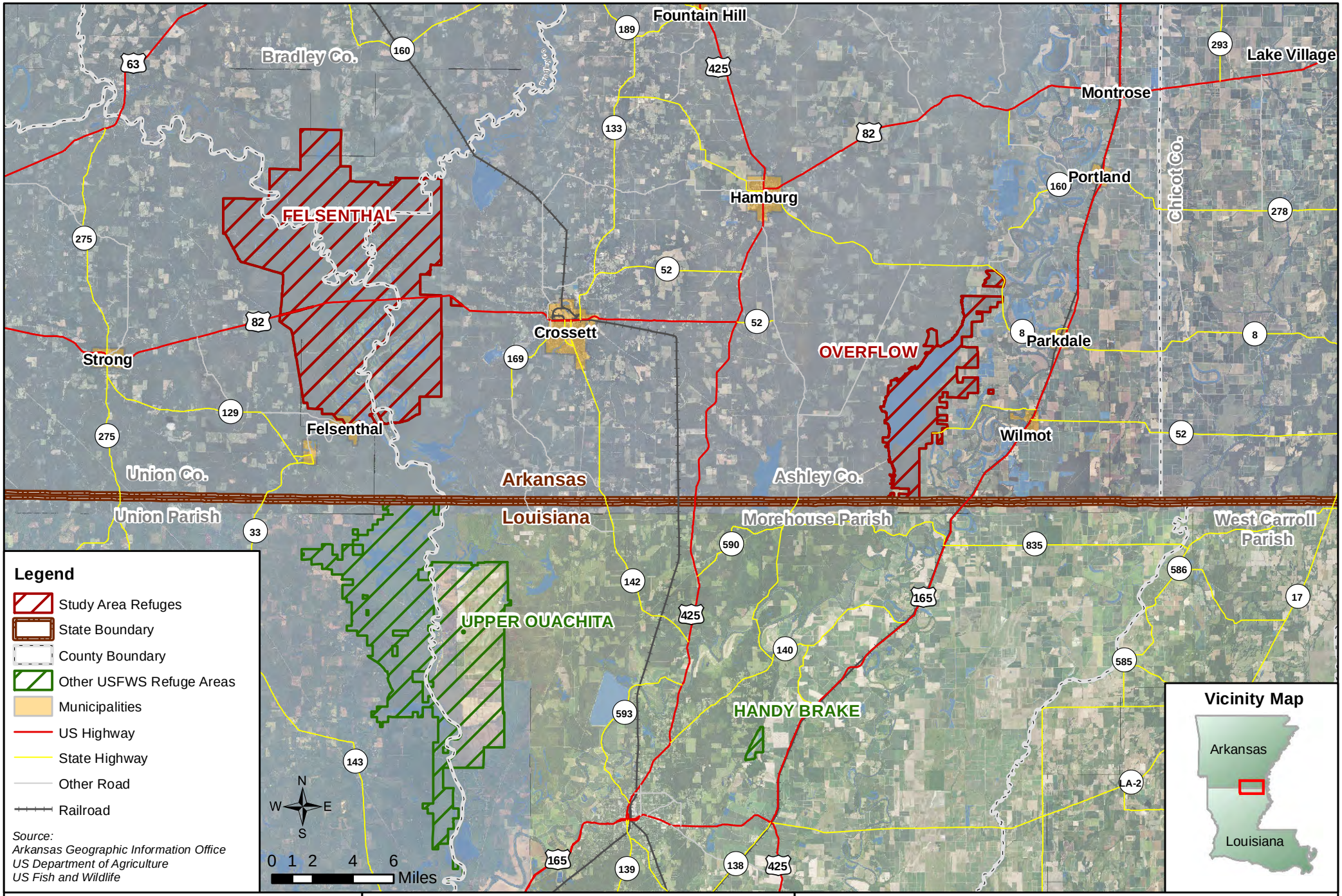
The Felsenthal NWR is located in southern Arkansas in Ashley, Bradley, and Union Counties. The public access areas are mainly located in Ashley County; however, some access routes to the Refuge include roadways in Bradley County and Union County. The general transportation study area for the Felsenthal NWR is shown in **Figure 1.2**.

Existing conditions for the Felsenthal NWR are discussed in **Section 3.1**.

1.2.2 Overflow NWR

The Overflow NWR is located in southern Arkansas in Ashley County. The Overflow NWR transportation study area is shown in **Figure 1.3**.

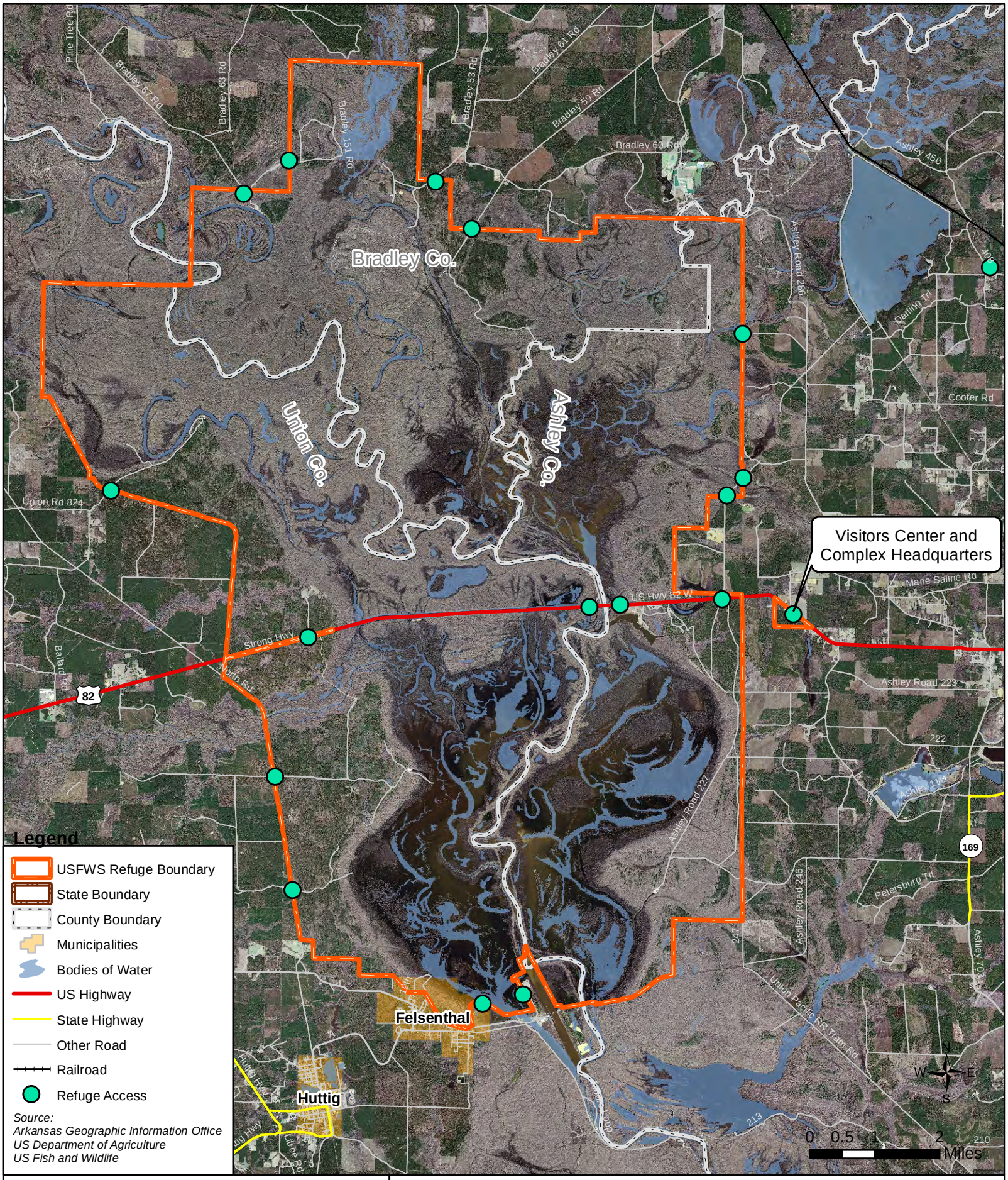
Existing conditions for the Overflow NWR are discussed in **Section 3.2**.



U.S. Department of Transportation
Federal Highway Administration

Figure 1.1: Location Map

Felsenthal and Overflow National Wildlife Refuges Transportation Study
Contract No.: DTFH71-09-D-00001



U.S. Department of Transportation
Federal Highway Administration

Figure 1.2: Felsenthal NWR Location Map

Felsenthal and Overflow National Wildlife Refuges Transportation Study
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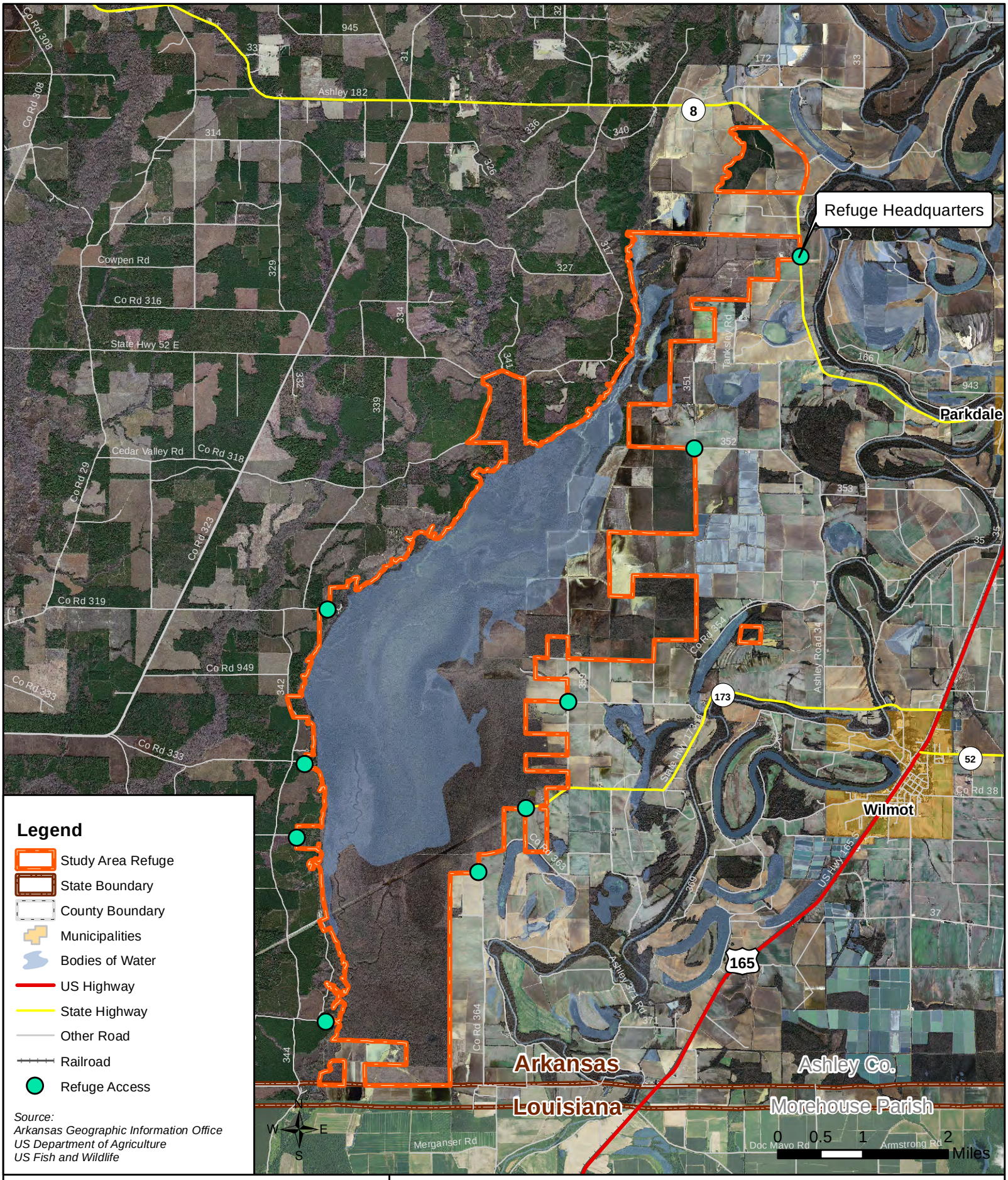

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Figure 1.3: Overflow NWR Location Map

Felsenthal and Overflow National Wildlife Refuges Transportation Study
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1.3 Project Background and Purpose

The Transportation Study documents the existing transportation infrastructure within and around the Refuges and looks at the roads and other regional transportation facilities adjacent to or providing access to the Refuges. The Transportation Study evaluates these existing conditions and proposes short-, medium-, and long-range transportation solutions to improve the mobility for visitors and staff to and within the Refuges. The information presented in this report can be used in the US Fish and Wildlife Service Southeastern Regional Long Range Transportation Plan. The key points and the proposed alternatives in this report should be considered in these future planning efforts to assist in investment decisions for the future.

During the data collection and analysis for the Transportation Study, existing studies and data were reviewed and referenced.

A list of supporting documentation and reference information used in the study can be found in **Appendix A**.

1.4 Overview of Transportation Study

This Transportation Study Report reviews the surrounding transportation system of Felsenthal NWR and Overflow NWR and provides short-, medium-, and long-range recommendations for the transportation system. This document is a compilation of three previously completed reports:

- Existing Conditions Report – January 2012
- Preliminary Candidate Alternatives Report – March 2012
- Short- and Long-Range Improvement Plan – May 2012

The comments received from the stakeholder and public meetings have been incorporated into the overall study and final recommendations.

2 Public Involvement

A public involvement plan was created to outline the public and stakeholder involvement efforts for the study. The public involvement plan including the project stakeholder list and notes from the three stakeholder meetings are included in **Appendices B** and **C**, respectively.

2.1 Stakeholder and Public Meetings

The first stakeholder meeting was conducted on November 8, 2011 (**Figure 2.1**) at the Refuge Complex Headquarters in Crossett, Arkansas. The focus of this meeting was to inform the stakeholders of the study, build consensus around the transportation challenges and opportunities at the Refuge, and establish what available data existed for the project team. Major project tasks, project schedule, project objectives, data/information requests, and the public involvement plan were reviewed.

During the meeting specific transportation issues within the Refuge such as safety, signage, highway advisory radio, modes of travel to access the Refuge, transit opportunities, and access points were discussed.

Figure 2.1: November 8, 2011 Stakeholder Kickoff Meeting

The second stakeholder meeting took place on February 28, 2012 at the Refuge Complex Headquarters in Crossett, Arkansas. The purpose of this meeting was to discuss the project reports that had been submitted to date and collect feedback from the stakeholders on the preliminary recommendations. Discussion at the meeting included a wide range of topics such as turn lane needs, the Auto Tour route, the need for boat mooring locations, and access points. Two members of the public attended the stakeholder meeting and provided feedback on the study, existing conditions, and potential opportunities around the Refuge.

The first public meeting followed the stakeholder meeting on February 28, 2012. The presentation boards showing the study area for the study and sample reports were presented.

The third stakeholder meeting (**Figure 2.2**) was held on May 3, 2012 at the Crossett Economic Development Foundation Building in Crossett, Arkansas. The Short- and Long-Range Improvement Plan recommendations were presented and discussed. Discussion included aspects of each alternative discussing the transportation impacts. Comments received during this meeting were incorporated into the study's recommendations.

Figure 2.2: May 3, 2012 Stakeholder Meeting

The second public meeting followed the stakeholder meeting (**Figure 2.3**) on May 3, 2012. The details of the project were presented again as well as potential conceptual alternatives for public feedback.

Figure 2.3: May 3, 2012 Public Meeting

3 Existing Conditions

Existing transportation facilities providing access to the Felsenthal and Overflow NWRs were reviewed. This section identifies the findings of this review and presents the existing conditions for both Refuges.

3.1 Felsenthal NWR

3.1.1 Overview

Felsenthal NWR (**Figure 3.1**) is part of the South Arkansas Refuges Complex, and is managed and maintained by the USFWS. It comprises an area of 65,000 acres.

Figure 3.1: Felsenthal NWR Visitors Center/Headquarters Entrance Sign

The Refuge objectives include:

- Provide habitat for migratory waterfowl and other birds
- Provide habitat and protection for endangered species such as the red cockaded woodpecker and threatened species such as the American alligator and the bald eagle
- Provide recreation and environmental education for the public
- Protect cultural resources

3.1.2 Felsenthal NWR History

The Felsenthal NWR was established in 1975 as mitigation for the US Army Corps of Engineers creation of the Ouachita and Black Rivers Navigation Project and the Felsenthal Lock and Dam. It is a natural depression area and the Saline and Ouachita Rivers run through the Refuge along with a network of sloughs, bayous, and lakes.

3.1.3 Regional Location

Felsenthal NWR is located in southern Arkansas. US 82 is a roadway that travels east-west and bisects the Refuge. **Figure 1.2** shows the location of the Felsenthal NWR.

In addition to US 82, Ashley, Union, and Bradley County roads and private roads also provide access to the Refuge.

3.1.4 Visitation Summary and Profile

Approximately 400,000 people visited the Refuge last year. Though official counts are not taken, Refuge-wide visitation estimates are based on the number of hunting/fishing permits.

Public use opportunities include hiking, fishing, wildlife observation, photography, hunting (youth and adult hunts), environmental education and interpretation, and camping.

Hunts and fishing seasons and events at the Refuge are shown in **Table 3.1**.

Table 3.1: Hunting and Fishing by time of year at Felsenthal NWR

Month(s)	Activity
April	Quota adult and youth turkey hunts
June	Youth fishing derby
October to January	Squirrel, rabbit, beaver, nutria, coyote, and feral hog hunting
October to January	Archery deer hunting
November	Quota gun deer hunt
November to January	Quail, raccoon, and opossum hunting
November to January	Waterfowl hunt

3.1.5 Entrances to the Refuge

There are a number of public entrances to the Felsenthal NWR.

Major entrances on US 82 are listed below and noted on the Refuge map shown in **Figure 1.2**.

- Felsenthal Visitors Center/Refuge Complex
- Shallow Lake Road
- Old Beer Joint
- Pine Island

Other access points are located off of North Road and Jones Lake Road from the west, through New Lock 6 Road to the US Army Corps of Engineers boat ramps south of the Refuge, and via Bradley County Road 53 and Bradley County Road 65 S from the north accessing Eagle Lake, Pereogeethe Lake, and Prairie Island. The Refuge can also be accessed from the north at Charivari Creek, from the east at McIntyre Bay, Goose Lake, and the Ouachita Bridge, and from the west at Locust Ridge.

Most entrances to the Felsenthal NWR are not gated. Paved parking areas exist at some boat ramps and at the Visitors Center. There is an unpaved parking area at the trailheads of the Sand Prairie Trail at the Crossett Campground and off Pine Island Road.

Wayfinding signs for the Refuge are very limited on US 82. Notification for westbound travelers of the Visitors Center location only occurs in the vicinity of the entrance to the Visitors Center.

3.1.6 Regional Transportation Conditions

This section describes the existing regional transportation infrastructure and traffic conditions.

3.1.6.1 Roadway Infrastructure

The Felsenthal NWR is located just west of the City of Crossett. The public access areas are served by US 82, North Road (private), Eagle Lake Road, New Lock 6 Road, Bradley County Road 65 S and Bradley County Road 53. US 82 and New Lock 6 Road are paved roadways and all other access roads are packed dirt with gravel. Based on discussion with stakeholders and Refuge staff, it was decided that these roadways were to be reviewed as part of this project.

Various other Ashley County, Bradley County, and Union County roads also provide access to the additional access points stated in the previous section.

3.1.6.1.1 US 82

US 82 is a two-lane road with a posted speed limit of 55 mph and partially paved shoulders (**Figure 3.2**). The volume of truck traffic on this section of highway is very high and is a significant portion of the traffic on this roadway as it serves timber industry activities. Per Arkansas State Highway and Transportation Department (AHTD) 2010 traffic counts; this roadway has an Annual Average Daily Traffic (AADT) volume of 2,700 vehicles per day. AHTD counts show that truck traffic makes up approximately 30% of the traffic on US 82.

Figure 3.2: US 82 in the vicinity of the Refuge Visitors Center

Per the AHTD, the sufficiency ratings for the bridges on US 82 in Ashley and Union Counties range from 56 to 84. The Sufficiency Rating formula is a method of evaluating highway bridge data by calculating several factors (structural adequacy, safety, serviceability, functional obsolescence, and special reductions) to obtain a numeric value that is indicative of the bridge's sufficiency to remain in service and its funding eligibility. The result of the Sufficiency Rating formula is a percentage in which 100 is an entirely sufficient bridge and 0 is an entirely deficient bridge, bridges with sufficiency ratings of lower than 50 qualify for federal funding.

3.1.6.1.2 Jones Lake Road

Jones Lake Road is a packed dirt and gravel road. It is located on the west side of the Refuge and travels from the North Road to Jones Lake.

3.1.6.1.3 North Road (private)

North Road is a privately owned, packed dirt and gravel road. It travels north-south on the western edge of the Refuge and is shown in **Figure 3.3**.

Figure 3.3: North Road south of US 82

3.1.6.1.4 New Lock 6 Road

New Lock 6 Road (**Figure 3.4**) is a paved two-lane roadway built on fill. It travels east-west from the Town of Felsenthal to the Felsenthal Lock and Dam and US Army Corps of Engineers' boat ramp at the southern edge of the Refuge.

Figure 3.4: New Lock 6 Road

3.1.6.1.5 Bradley County Road 65 S

Bradley County Road 65 S is a packed dirt and gravel roadway on the north side of the Refuge. Bradley County Road 65 S provides access to Pereogeethe Lake. **Figure 3.5** shows a timber bridge on the roadway. This bridge is weight limited to 4 tons for trucks with a short wheelbase and 7 tons for trucks with a longer wheelbase (**Figure 3.6**).

Figure 3.5: Timber bridge on Bradley County Road 65 S

Figure 3.6: Truck restrictions on Bradley County Road 65 S Timber Bridge

3.1.6.1.6 Bradley County Road 53

Bradley County Road 53 is a packed dirt and gravel roadway. It provides access to Eagle Lake on the north side of the Refuge. During an early site visit for this project, the project team noted a bridge on Bradley Count Road 53 under repair, as illustrated in **Figure 3.7**.

Figure 3.7: Bradley County Road 53

3.1.6.2 Historic Traffic Volumes

AHTD collected the following historical AADT data on US 82 in the vicinity of the Refuge from 2006–2010 as shown in **Table 3.2**.

Table 3.2: Historic AADT Volumes on US 82

Location	Year				
	2006	2007	2008	2009	2010
US 82, east of the Felsenthal NWR	2,800	2,900	2,700	2,700	2,700

Source: AHTD

Traffic growth has remained relatively flat in this area over the past five years.

3.1.6.3 Area Transportation Mode Split

The mode split analysis identifies the method of travel (automobile, transit, walk or bike) people in a defined geographic area take, expressed as a percentage of trips. As the main public access areas for the Felsenthal NWR are in Ashley, Bradley, and Union Counties, data from the counties was used to determine mode split. Approximately 93% of trips in Ashley County, 84% of trips in Bradley County, and 93% of the trips in Union County were taken by automobile. Analyzing mode split helps determine the transportation demand characteristics of the local community. As the most congested time on roadways often corresponds with the traditional work day, modal split analysis is often conducted based on how

people get to work. Journey-to-work data was obtained from the *2005-2009 American Community Survey* and is summarized for Ashley County, Bradley County, and Union County in **Table 3.3**. The *2005 2009 American Community Survey 5-year estimates* are based on the average traffic between 2005-2009.

Table 3.3: Mode Split Percentage for Ashley, Bradley and Union Counties

Mode	Ashley County	Bradley County	Union County
Automobile	92.65%	83.74%	92.82%
Transit	0.28%	0.09%	0.01%
Walk/Bike	2.46%	11.21%	0.86%
Other	3.27%	3.16%	4.19%
Work at Home	1.34%	1.80%	2.12%

Source: 2005-2009 American Community Survey 5-Year Estimates

3.1.6.4 Crash Summary

Based on information provided by the AHTD for 2008-2010, there were 11 crashes on US 82 in the vicinity of the Refuge. Of these crashes, 55% of the crashes were single vehicle crashes and almost 75% were not located at intersections. **Table 3.4** shows the number of crashes by crash type for this section of US 82.

Table 3.4: Crashes by Type for US 82 in the Vicinity of the Refuge 2008-2010

Crash Type	Number of Accidents
Single Vehicle	6
Angle	2
Sideswipe	1
Rear-end	1
Head on	1*

**Resulted in a fatality*
Source: AHTD

Based on the latest data from the National Highway Traffic Safety Administration's (NHTSA) *Fatality Analysis Reporting System* (FARS), there were two traffic fatalities in the vicinity of the Refuge on US 82, one in 2007 and one in 2008.

3.1.6.5 Planned Area Transportation Improvement Projects

AHTD has a corridor study planned for US 82 from El Dorado to Lake Village.

3.1.7 Refuge Transportation and Infrastructure

This section describes the existing transportation infrastructure within the Felsenthal NWR.

3.1.7.1 Refuge Roads

Roadways within the Refuge are mainly packed dirt with gravel and are maintained by the Refuge. However, the roadway and parking lot serving the Visitors Center/Complex Headquarters/Woodland Wildlife Trail is paved.

There are also a number of ATV trails in the Refuge.

3.1.7.1.1 Woodland Wildlife Trail

The Woodland Wildlife Trail is a 0.43 mile wheelchair accessible trail adjacent to the Visitors Center as shown in **Figure 3.8.**

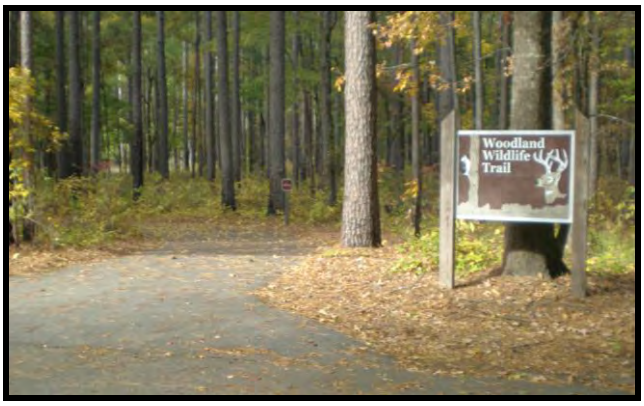


Figure 3.8: Woodland Wildlife Trail Trailhead

3.1.7.1.2 Sand Prairie Trail

The Sand Prairie Trail (**Figure 3.9**) is a native trail that is 2.78 miles long. It can be accessed from Pine Island Road or through the Crossett RV Park.

Figure 3.9: Sand Prairie Trail Trailhead at the Crossett RV Park

3.1.7.2 Water Transportation Access

There are seven boat ramp locations located on the Refuge and accessed off of Refuge roads, Pine Island, Deep Slough, Old Beer Joint (**Figure 3.10**), Shallow Lake, Jones Lake, Pereogeethe Lake, and Eagle Lake. Other boat ramp locations that provide access to the Refuge from off-Refuge sites (maintained by others) include the US Army Corps of Engineers boat ramp at the Felsenthal Lock and Dam (**Figure 3.11**), Grand Marias Recreation Site, and the Port of Crossett (**Figure 3.12**).

Figure 3.10: Old Beer Joint Boat Ramp

Figure 3.11: US Army Corps of Engineers Boat Ramp at the Felsenthal Lock and Dam

Figure 3.12: Port of Crossett Boat Ramp

3.1.7.3 Visitors Center and Refuge Complex

The Visitors Center and Refuge Complex is located on the eastern edge of the Refuge on US 82 (**Figure 3.13)**. The Visitors Center includes hands-on, interactive exhibits showing various areas of the Refuge and features cultural and historical information. The Refuge Complex headquarters are also within the Visitors Center building. The parking area at the Visitors Center has 39 parking spaces (two of which are handicapped). As stated previously, the Woodland Wildlife Trail is adjacent to the Visitors Center.

Figure 3.13: Felsenthal NWR Visitors Center

3.1.8 Transportation Issues

Based on information collected during the site visit, the review of the existing conditions information, the review of previous studies, and discussions with stakeholders, the following transportation issues and opportunities have been identified to be studied further.

3.1.8.1 Turn lane improvements at Visitors Center Entrance on US 82

The westbound left-turn lane into the Visitors Center is shown in **Figure 3.14**. Based on field observations and comments from stakeholders, there is concern that the current lengths of the turn lane transition and taper are too short, given the roadway's existing speed and vehicle volumes. As measured in the field, the storage length is approximately 100 feet with a taper length of approximately 200 feet.

Figure 3.14: Left-Turn lane into Visitors Center

Also, the potential for adding an eastbound right-turn lane was reviewed in an effort to address safety concerns from stakeholders regarding eastbound vehicles entering the Visitors Center. The through traffic on US 82 travels at a high rate of speed and closes in quickly on the vehicles turning into the Refuge, potentially resulting in rear-end collisions.

3.1.8.2 Large number of trucks on US 82 (Figure 3.15)

It was noted during the field observation visits that there is much higher than average truck traffic on US 82. As stated previously, trucks comprise 30% of the traffic volume on US 82 based on AHTD data. It appears this truck traffic is also traveling at high speeds as the speed limit is posted at 55 mph.

Figure 3.15: Example of Truck traffic on US 82

3.1.8.3 Sight Distance at Refuge exits on US 82

The sight distance measured in the field looking to the west as vehicles exit the Visitors Center entrance measured to be approximately 750 feet and was limited by the vertical curve in the roadway. The sight distance from the driveway is shown in **Figure 3.16**.

Figure 3.16: Sight Distance for US 82 (Westbound)

3.1.8.4 Speeding on US 82

It was noted by the stakeholders that there are concerns that traffic on US 82 is traveling higher than the posted speed limit. Based on discussions with the AHTD, a speed study can be requested for this area.

3.1.8.5 Signage Improvements

There is very limited directional signage for the Refuge on the surrounding roadways. On US 82, there is one directional sign to the Visitors Center and signs at the Refuge boundary. There is very limited signage in Crossett or other surrounding areas identifying how to get to the Refuge or the distance to the Refuge. This was reviewed with the AHTD and County representatives during the study, and a proposed signage plan was developed.

The Refuge has recently implemented a highway advisory radio broadcast to notify the public of information about the Refuge. These broadcasts can include safety notifications and information, such as the prescribed burning that occurs within the Refuge, and directional and general information about Refuge events. Signs with the information on the highway advisory radio are located within the Refuge. There are no signs on the adjacent public roadways identifying this highway advisory station. As a result, proposed highway advisory radio signage locations were developed during the study and reviewed with the AHTD.

3.1.8.6 Trail Enhancements

Currently, there is no formal trail map for the Refuge. The development of this map and the addition of new walking/biking trail routes were considered to enhance the visitors' experience.

As part of the trail map development, the development of an Auto Tour route in the Refuge was also considered.

3.1.8.7 Siltation and Mooring Locations at Boat Ramps

One item noted by the stakeholders was the siltation at boat ramps, as it is sometimes troublesome to get a boat from the ramp to the main channel. It was also noted that there is no location for a boater to moor their boat after launching. The potential of adding boat mooring locations at various ramps such as the Port of Crossett was suggested.

3.1.8.8 Determine Formal Access Points to the Refuge

Some of the Refuge access points are via private roads. If these private roadways fall into disrepair or if a bridge fails, access to the Refuge in that area may be compromised. A recommended process begins with identifying the critical Refuge access points, then coordination with the private land owners as an opportunity to develop a formal agreement to maintain access to key Refuge entrances.

3.2 Overflow NWR

3.2.1 Overview of Overflow NWR

Overflow NWR (**Figure 3.17**) is part of the South Arkansas Refuges Complex, and is managed and maintained by the USFWS. It comprises an area of approximately 14,000 acres in Ashley County, Arkansas.

Figure 3.17: Overflow NWR Entrance Sign

The Refuge objectives are:

- Provide diversity of habitat types for migratory waterfowl and other birds
- Provide habitat and protection for threatened bald eagle
- Provide opportunities for environmental and ecological research
- Provide a variety of recreational opportunities consistent with primary wildlife objectives
- Expand the public's understanding of and appreciation for the environmental with special emphasis on natural resources

3.2.2 Overflow NWR History

Established in 1980 to protect one of the remaining bottomland hardwood forests, Overflow NWR provides unique opportunities for visitors. There are a number of sloughs and creeks within the Refuge.

3.2.3 Regional Location

Overflow NWR is located in Ashley County, Arkansas, five miles west of Wilmot, Arkansas. The Refuge can be accessed via SR 173 and SR 8. **Figure 1.3** shows the location of the Overflow NWR.

3.2.4 Visitation Summary and Profile

Each year approximately 15,000 people visit the Refuge. Though official counts are not taken Refuge-wide, visitation estimates are based on the number of hunting permits issued.

Public use opportunities include trails, wildlife observation, photography and hunting.

Annual scheduled hunting seasons at the Refuge are shown in **Table 3.5**.

Table 3.5: Hunting by time of year at Overflow NWR	
Month(s)	**Activity**
October	Muzzleloader deer hunting
October to January	Archery deer hunting
October to January	Rabbit/Squirrel hunting
November to January	Waterfowl hunting

3.2.5 Entrances to the Refuge

The primary public use opportunity in the Refuge is waterfowl hunting. Visitors also come for wildlife observation and photography opportunities. Fishing is currently prohibited as studies have shown that the fish population is contaminated with agricultural and industrial chemicals.

Parking areas are located off SR 8, SR 173, Ashley County Road 34, and five unpaved roads on the west side of the Refuge. However, it should be noted that not all access points are accessible at this time due to the conditions of the surrounding private roads.

Directional signing is located in Hamburg, as shown in **Figure 3.18**. Additional wayfinding signs were also located along SR 8 directing visitors to the Overflow NWR Headquarters (**Figure 3.19**).

Figure 3.18: Directional sign for Overflow NWR in Hamburg

Figure 3.19: Direction sign for Refuge Headquarters on SR 8

3.2.6 Regional Transportation Conditions

This section describes the existing regional transportation infrastructure and traffic conditions.

3.2.6.1 Regional Roadway Infrastructure

Overflow NWR is located west of Wilmot, Arkansas and has public access points on SR 8, SR 173 and Ashley County Road 34, along with five unpaved roadways. These roadways define the transportation network that was reviewed for this project.

3.2.6.1.1 SR 8

SR 8 is a two-lane roadway with a posted speed of 55 mph. The Refuge is located on SR 8 between Hamburg and Parkdale, Arkansas. Per AHTD 2010 Annual Average Daily Traffic (AADT) counts, this roadway carries 580 vehicles per day just west of Parkdale in the vicinity of the Refuge.

Per the AHTD, the sufficiency ratings for the bridges on SR 8 in Ashley County in the vicinity of the Refuge are both approximately 73. As stated previously, the Sufficiency Rating formula is a method of evaluating highway bridge data by calculating several factors to obtain a numeric value that is indicative of the bridge's sufficiency to remain in service and its funding eligibility. The result of the Sufficiency Rating formula is a percentage in which 100 is an entirely sufficient bridge and 0 is an entirely deficient bridge, bridges with sufficiency ratings of lower than 50 qualify for federal funding.

3.2.6.1.2 SR 173

SR 173 is a two-lane roadway with a posted speed limit of 55 mph. The Refuge is located on SR 173, west of Wilmot. Per AHTD 2010 AADT traffic counts; this roadway caries 50 vehicles per day just east of the Refuge and the sufficiency rating for the bridge on SR 173 in Ashley County in the vicinity of the Refuge is approximately 84.

3.2.6.1.3 Ashley County Road 34

Ashley County Road 34 (**Figure 3.20**) is a two-lane roadway with a posted speed limit is 45 mph. This roadway connects SR 8 and SR 173 on the eastern side of the Refuge.

Figure 3.20: Ashley County Road 34

3.2.6.2 Historic Traffic Volumes

Arkansas State Highway and Transportation Department collected the following historical data on SR 8 and SR 173 in the vicinity of the Refuge from 2006–2010 as shown in **Table 3.6**.

Table 3.6: Historic Traffic Volumes on SR 8 and SR 173

Location	Year				
	2006	2007	2008	2009	2010
SR 8, west of Parkdale	640	610	610	520	580
SR 173, east of the Overflow NWR	40	40	60	50	50

Source: AHTD

Traffic growth has remained relatively flat in this area over the past five years.

3.2.6.3 Area Transportation Mode Split

Mode split analysis identifies the transportation method (automobile, transit, walk or bike) people in a defined geographic area use, expressed as a percentage of trips. Approximately 93% of trips in Ashley County were taken by automobile. Analyzing mode split helps determine the transportation demand characteristics of the local community. As the most congested time on roadways often corresponds with the traditional work day, modal split analysis is often conducted based on how people get to work. Journey-to-work data was obtained from the *2005 - 2009 American Community Survey* and compiled for Ashley County is summarized in **Table 3.7**. The *2005-2009 American Community Survey 5-year estimates* are based on the average of travel between 2005-2009.

Table 3.7: Mode Split Percentage for Ashley County	
Mode	**Ashley County**
Automobile	92.65%
Transit	0.28%
Walk/Bike	2.46%
Other	3.27%
Work at Home	1.34%

Source: 2005-2009 American Community Survey 5-Year Estimates

3.2.6.4 Crash Summary

Based on information provided by the AHTD from 2008-2010, there were 13 crashes on SR 8 in the vicinity of the Refuge. Of these crashes, 54% of the crashes were single vehicle crashes. **Table 3.8** shows the number of crashes by crash type for this section of SR 8.

Table 3.8: Crashes by Type on SR 8 in the Vicinity of the Refuge 2008-2010	
Crash Type	**Number of Accidents**
Single Vehicle	7*
Rear-End	2
Head On	2
Angle	2

Source: AHTD
**One accident resulted in a fatality*

There were no reported crashes from 2008–2010 in the vicinity of the Refuge on SR 173 based on AHTD data.

Based on the latest data from the National Highway Traffic Safety Administration's (NHTSA) *Fatality Analysis Reporting System* (FARS) and AHTD data, there was one fatality in 2008 and one fatality in 2009 on SR 8 and Ashley County Road 364, respectively. Both of these fatal crashes were in the vicinity of the Refuge.

3.2.6.5 Planned Area Transportation Improvement Projects

The AHTD, District 2, does not have any planned improvements identified in the vicinity of the Refuge.

3.2.7 Refuge Transportation and Infrastructure

This section describes the existing transportation infrastructure within the Overflow NWR.

3.2.7.1 Refuge Roads

Roadways within the Refuge and maintained by the Refuge are mainly packed dirt with gravel, and the parking areas are packed dirt with gravel. There are no formal walking/biking trails in the Refuge.

There are also a number of ATV trails in the Refuge.

3.2.7.2 Water Transportation Access

Boat landings exist throughout the Refuge with most being in the southern area of the Refuge.

3.2.8 Transportation Issues

Based on observations during the site visit, review of the existing conditions information, review of existing reports, and discussions with stakeholders, there are some transportation issues/opportunities to be studied further.

3.2.8.1 Determine Formal Access Points to the Refuge

Many of the Refuge access points are via private roads. If these private roads fall into disrepair or if a bridge fails, access to the Refuge in that area may be compromised. A recommended process begins with identifying the critical Refuge access points, then coordination with the private land owners as an opportunity to develop a formal agreement to maintain access to key Refuge entrances.

3.2.8.2 Enhance Visitor Experience

There is currently no formal education program for visitors or a formal trail map for the Refuge. The addition of the walking/biking trail routes could be created to enhance the visitors' experience.

As part of the trail map development, the development of an Auto Tour route was also considered.

4 Community and Environment

4.1 Felsenthal NWR

4.1.1 Community Features

Based on a review of the area for parks, schools, places of worship, cemeteries, and civic buildings in the study area, it was found that there are no major community facilities in the immediate vicinity of the Felsenthal NWR. Crossett, Arkansas has elementary, middle, and high schools; civic buildings; and places of worship within approximately ten miles of the Refuge. Smaller cities and towns have civic facilities and places of worship in the vicinity of the Refuge boundary. **Figure 4.1** shows the approximate locations of these features.

4.1.2 Demographic Profile of Study Area

Felsenthal NWR is located in three counties in southeast Arkansas: Ashley County, Bradley County, and Union County. Based on census data, all three counties containing the Refuge and the municipalities of Crossett and Strong have experienced a decline in population over the past decade of nearly 10% and for the City of Strong that number nearly topped 15%.

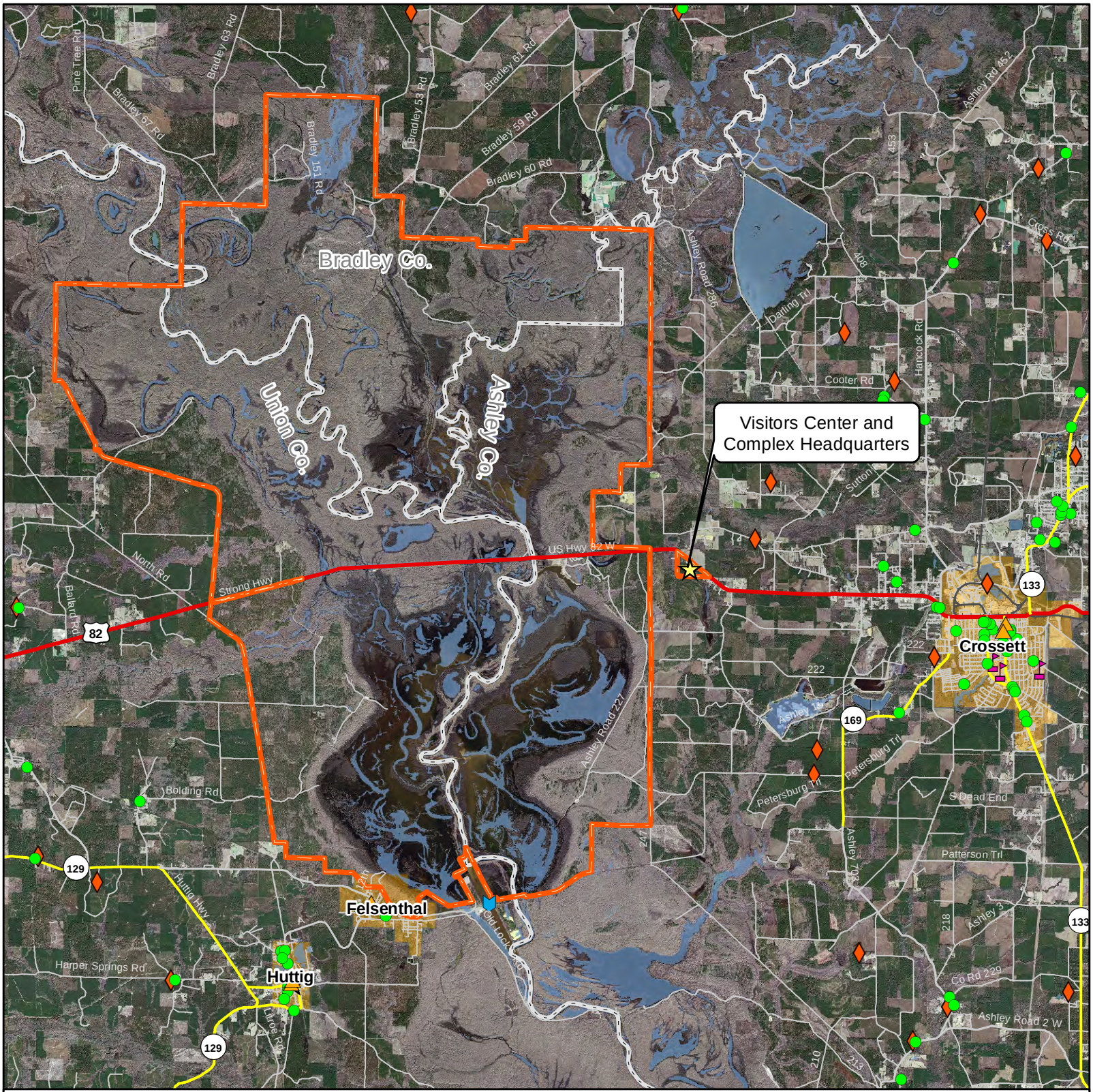
The Refuge is not immune to the impacts a declining population has on a community and could result in decreased user demand at the Refuge and impact the overall economic vitality of the region. Analyzing the transportation network in and around the Refuge ensures that the USFWS can provide acceptable levels of mobility, operation, and safety.

Table 4.1 shows the population figures in the counties and cities in proximity to Felsenthal NWR.

Table 4.1: Population for Counties and Cities near Felsenthal NWR

Location	2000	2010	Total Change	Percent Change
Arkansas	**2,673,400**	**2,915,918**	**242,518**	**9.1%**
Ashley County	24,209	21,853	-2,356	-9.7%
City of Crossett	6,097	5,507	-590	-9.7%
Bradley County	12,600	11,508	-1,092	-8.7%
Union County	45,629	41,639	-3,990	-8.7%
City of Strong	651	558	-93	-14.3%

Source: 2010 US Census



Legend

- USFWS Refuge Boundary
- State Boundary
- County Boundary
- Municipalities
- Bodies of Water
- US Highway
- State Highway
- Other Road
- Railroad
- Cemetery
- Place of Worship
- Dam with Lock
- Civic Building
- School
- Law Enforcement
- Hospital

0 0.5 1 2 Miles

N W E S

Source:
Arkansas Geographic Information Office
US Department of Agriculture
US Fish and Wildlife

U.S. Department of Transportation
Federal Highway Administration

Figure 4.1: Felsenthal NWR Community Resources

Felsenthal and Overflow National Wildlife Refuges Transportation Study
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4.1.3 Environmental Justice Impacts

According to the U.S. Environmental Protection Agency (EPA):

"Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across this Nation. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work."

For this plan, poverty level, income, and race in counties and municipalities in proximity to the Refuge were analyzed.

Poverty

Nationally, the percentage of individuals living below the poverty level is 13.5%. Arkansas has a higher than average percentage of individuals living below the poverty level at 17.7%. The three Arkansas counties where Felsenthal NWR is located are all greater than the national and state averages, with all of the counties exceeding 20%. Municipalities located near the Refuge are also experiencing higher than normal poverty levels, when compared with national and state averages.

Table 4.2 shows the percentage of individuals living below the poverty level in the counties and municipalities in proximity to Felsenthal NWR.

Table 4.2: Poverty Levels for Counties and Cities near Felsenthal NWR

Location	Population	Population with income in the past 12 months below poverty level	Percent Below Poverty Level
United States	**293,507,923**	**39,537,240**	**13.5%**
Arkansas	**2,755,680**	**488,788**	**17.7%**
Ashley County	21,637	4,393	20.3%
City of Crossett	*4,872*	*1,310*	*26.9%*
Bradley County	11,856	4,140	34.9%
Union County	42,226	8,714	20.6%
City of Strong	*249*	*48*	*19.3%*

Source: 2005-2009 American Community Survey 5-year estimates

Detailed information on poverty level can be found in **Appendix D**.

Income

Median household income in Arkansas ($38,542) is below the national median household income of $51,425 based on *2005–2009 American Community Survey 5-year Estimates*. **Table 4.3** shows the median household income in the study area and within select municipalities relative to the national median. Additional detailed information on income can be found in **Appendix D**.

Table 4.3: Median Household Income for Counties and Cities near Felsenthal NWR

	Median Household Income
United States	$51,425
Arkansas	$38,542
Ashley County	$33,007
City of Crossett	$25,889
Bradley County	$26,207
Union County	$35,732
City of Strong	$26,250

Source: 2005-2009 American Community Survey 5-year Estimates

Race

Whites comprise approximately 65% of the population in the three counties the Felsenthal NWR is located in. Blacks or African Americans comprise approximately 30%. The state average of Blacks or African Americans is 15% and the national average is 12.6%. No other race categories make up a significant percentage of the population in the study area.

Table 4.4 shows the numbers of individuals by race in the study area and within select municipalities relative to national and state values. Detailed information on race is also included in **Appendix D**.

Table 4.4: Individuals by Race for Counties and Cities near Felsenthal NWR							
Location	United States	Arkansas	Ashley County	City of Crossett	Bradley County	Union County	City of Strong
Total	308,745,538	2,915,918	21,853	5,507	11,508	41,639	558
White Alone	223,553,265	2,245,229	15,143	3,025	6,934	26,276	176
Black or African American Alone	38,929,319	449,895	5,640	2,326	3,173	13,721	339
American Indian and Alaska Native Alone	2,932,248	22,248	70	8	56	143	1
Asian Alone	14,674,252	36,102	40	26	27	207	1
Native Hawaiian and Other Pacific Islander Alone	540,013	5,863	3	0	1	14	0
Some Other Race Alone	19,107,368	99,571	709	63	1,162	756	30
Two or More Races	9,009,073	57,010	248	59	155	522	11

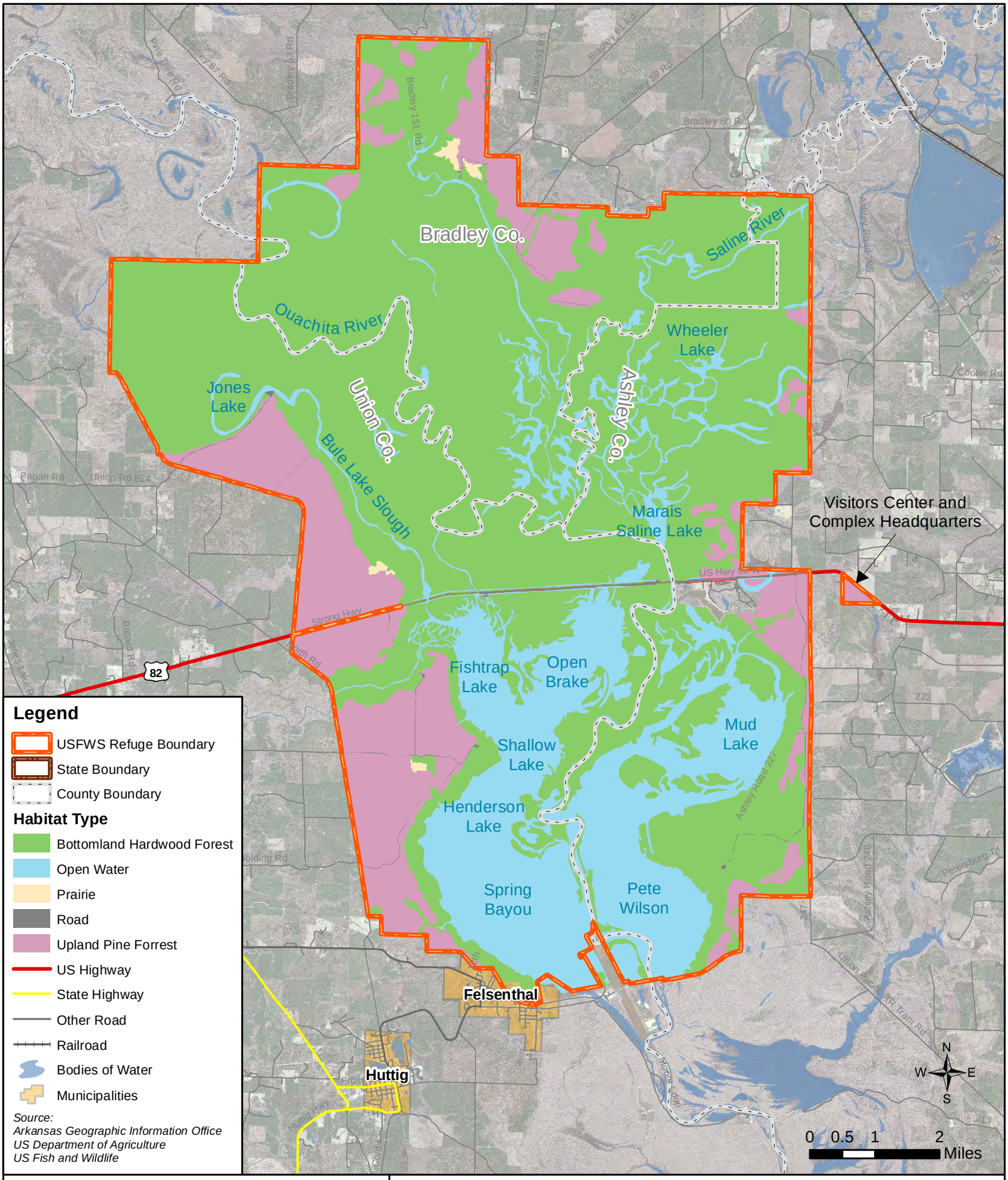
Source: 2010 US Census

4.1.4 Air Quality

The Felsenthal NWR is located in three counties, Ashley County, Bradley County, and Union County. All three of these counties are currently in attainment for all of the National Ambient Air Quality Standards (NAAQS) criteria pollutants.

4.1.5 Habitat

The Felsenthal NWR is comprised of a variety of habitats including bottomland hardwood forest, prairie, upland pine forest, and open water. As stated previously, this is a natural depression with a multitude of rivers, creeks, sloughs, bayous, swamps, etc. During the winter (from November to late spring), up to 21,000 acres of the bottomland hardwood forest can be flooded, making the location attractive to wintering waterfowl. **Table 4.5** shows the breakdown of habitat type and **Figure 4.2** illustrates the locations of the various habitats.



U.S. Department of Transportation
Federal Highway Administration

Figure 4.2: Felsenthal NWR Habitat Type

Felsenthal and Overflow National Wildlife Refuges Transportation Study
Contract No.: DTFH71-09-D-00001

Table 4.5: Habitat Type at Felsenthal NWR		
Habitat Type		**Acres**
Subcategory	**Subcategory Acreage**	
Permanent Water	15,000	
Forestland	49,383	
Pine		9,490
Pine-Hardwood		705
Bottomland Hardwood		39,000
Upland Hardwood		188
Open Fields, Prairies, and Nonproductive Areas	617	
Total		**65,000**

Source: Felsenthal and Overflow National Wildlife Refuges Comprehensive Conservation Plan, 2010

As discussed in the Felsenthal and Overflow National Wildlife Refuges Comprehensive Conservation Plan, 2010 (CCP), flooding is the Refuge's means of managing water levels and is called green-tree reservoir management. Felsenthal NWR has the largest green-tree reservoir in the world with the ability to flood approximately 36,000 acres each winter. Tree species in the green-tree reservoir area are primarily overcup oak and water hickory but also include nuttall oak, willow oak, and/or sweetgum.

Forestland is also actively managed through prescribed burning, thinning, regeneration, and stand improvement to enhance and maintain optimum habitat conditions for many birds, waterfowl, and resident wildlife. The Timber-Wildlife Management Plan (1995) dictates that sound silviculture practices be performed to provide a diversity of habitat. In upland areas, the timber is managed for the endangered red cockaded woodpecker, and artificial nests are placed in mature pines to supplement the other cavities.

The current wildlife list for the Felsenthal NWR contains at least 200 species of birds (100 species that nest), 40 species of mammals, 70 species of reptiles and amphibians, and 90 fish species. Over 300,000 waterfowl have been found in the Refuge in a given year. Felsenthal NWR has the only population of the endangered red cockaded woodpeckers on NWRs in the state. Trees that host colonies (**Figure 4.3**) are marked with white bands within the Refuge. Felsenthal NWR also hosts bald eagles during the winter.

Figure 4.3: Red Cockaded Woodpeckers Marked Trees

Twenty-four of the 30 threatened and endangered species in Arkansas can be found at Felsenthal NWR, most of which are aquatic species. The red cockaded woodpecker, bald eagles, alligator snapping turtles, Rafinesque's big-eared bat, and southeastern myotis bat are known to be located on the Refuge. The potential for pondberry (an endangered plant) exists but has not been documented on the Refuge. Similarly, the pink mucket mussel has been found in the vicinity of the Refuge but not within the Refuge Boundary. There have also been coordinated black bear management efforts throughout the years at the Refuge.

4.1.6 Floodplains and Wetlands

As discussed in the habitat section of the report, most of the Refuge is considered wetlands.

4.1.7 Cultural Resources

The Felsenthal NWR is located in an area where Caddo Indian activity dates back 5,000 years. This was also an area where farming settlements existed from 900–1600 AD. On the Refuge, there are remains of seasonal fishing camps, temple mounds with ceremonial plazas and Indian villages. Before the Civil War, agriculture was the primary land use for this area. The war curbed large-scale agricultural development and larger plantations were sold off in pieces after the war. Timber then became a main industry in the area. This area also experienced an "oil boom" in the 1920s, which resulted in high bromine concentrations, which has helped Arkansas become the largest producer of bromine in the world. The Visitors Center at the Refuge showcases the history of this area.

4.2 Overflow NWR

4.2.1 Community Features

A review of parks, schools, places of worship, cemeteries, and civic buildings immediately around the study area for the Overflow NWR was performed. The closest schools to this area are in Hamburg and Wilmot, Arkansas. Civic buildings for the Cities of Parkdale and Wilmot are both within approximately five miles from the Refuge. Civic buildings in the city of Hamburg are approximately 15 miles from the Refuge. **Figure 4.4** shows the approximate locations of these community features.

4.2.2 Demographic Profile of Study Area

Overflow NWR is located in Ashley County, Arkansas. Ashley County has experienced a decline of population over the past decade with a reduction of almost 10%. In addition, the nearby municipalities of Hamburg, Parkdale, and Wilmot saw reductions in population between 2000 and 2010 of approximately 6%, 27%, and 30%, respectively.

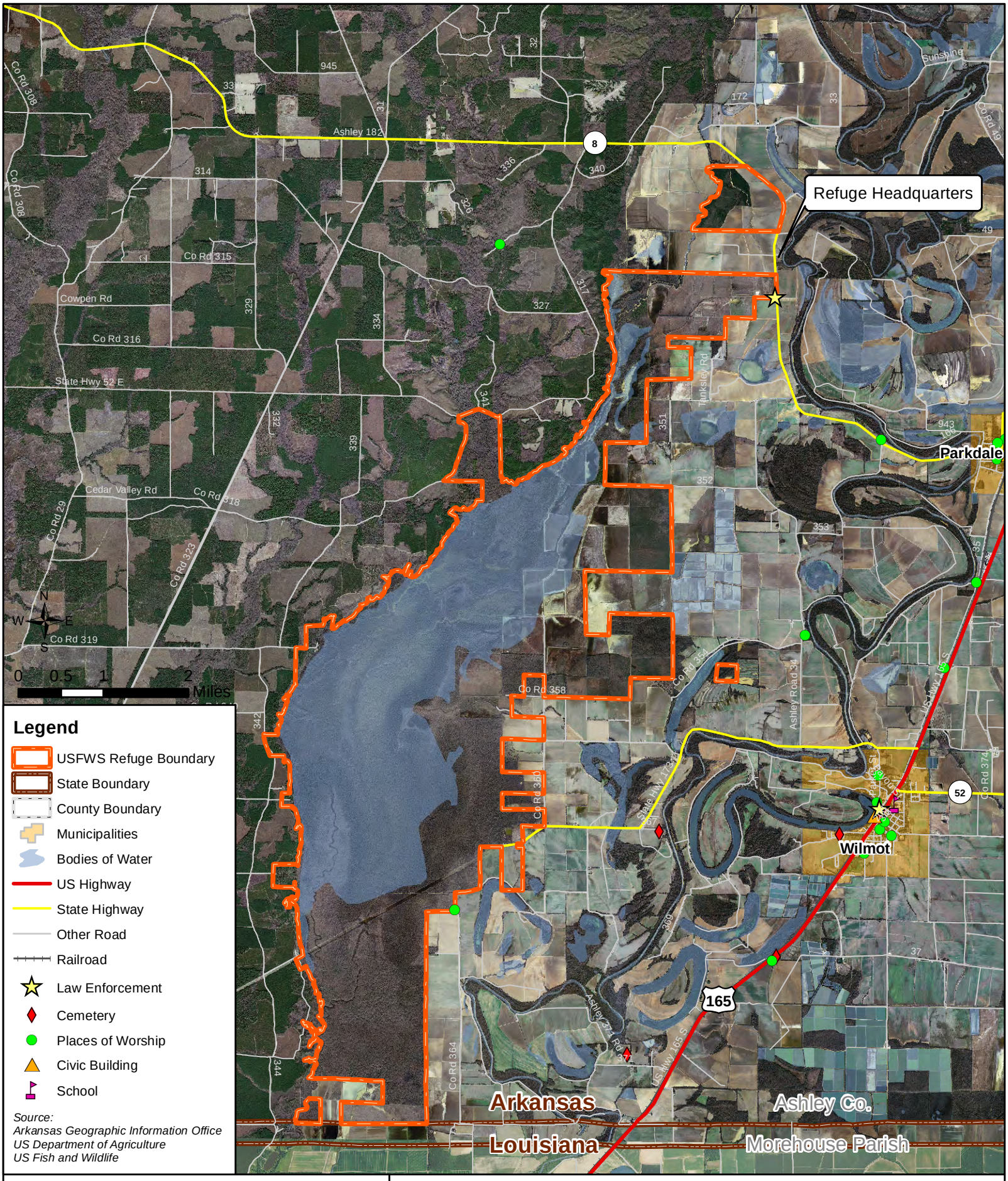
The Refuge is not immune to the impacts a declining population has on a community and could result in decreased user demand at the Refuge and impact the overall economic vitality of the region. Analyzing the transportation network in and around the Refuge ensures that the USFWS can provide acceptable levels of mobility, operation, and safety.

Table 4.6 shows the population figures in the counties and cities in proximity to the Refuge.

Table 4.6: Population for Counties and Cities near Overflow NWR

Location	2000	2010	Total Change	Percent Change
Arkansas	**2,673,400**	**2,915,918**	**242,518**	**9.1%**
Ashley County	24,209	21,853	-2,356	-9.7%
City of Hamburg	3,039	2,857	-182	-6.0%
City of Parkdale	377	277	-100	-26.5%
City of Wilmot	786	550	-236	-30.0%

Source: 2010 US Census



Legend

- USFWS Refuge Boundary
- State Boundary
- County Boundary
- Municipalities
- Bodies of Water
- US Highway
- State Highway
- Other Road
- Railroad
- Law Enforcement
- Cemetery
- Places of Worship
- Civic Building
- School

Source:
Arkansas Geographic Information Office
US Department of Agriculture
US Fish and Wildlife

U.S. Department of Transportation
Federal Highway Administration

Figure 4.4: Overflow NWR Community Resources

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4.2.3 Environmental Justice Impacts

According to the U.S. Environmental Protection Agency (EPA):

"Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across this Nation. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work."

For this plan, poverty level, income, and race in counties and municipalities in proximity to the Refuge were analyzed.

Poverty

The national percentage of individuals below the poverty level is 13.5%. Arkansas' poverty level is higher than national level at 17.7%. The poverty level for Ashley County is greater than the national average at 20.3%, Hamburg, the largest municipality in close proximity to the Refuge, also has a high percentage below the poverty level at almost 30%.

Table 4.7 shows the percentage individuals below the poverty level in Ashley County and the City of Hamburg.

Table 4.7: Poverty Level for Counties and Cities near Overflow NWR

Location	Population	Population with income in the past 12 months below poverty level	Percent Below Poverty Level
United States	**293,507,923**	**39,537,240**	**13.5%**
Arkansas	**2,755,680**	**488,788**	**17.7%**
Ashley County	21,637	4,393	20.3%
City of Hamburg	*2,734*	808	29.6%

Source: 2005-2009 American Community Survey 5-year estimates

Detailed information on poverty level can be found in **Appendix D**.

Income

Median household income in Arkansas ($38,542) is below the national median household income of $51,425 based on US Census data. **Table 4.8** shows the median household income in the study area and within select municipalities relative to the national median. Additional detailed information on income can be found in **Appendix D**.

Table 4.8: Median Household Income for Counties and Cities near Overflow NWR	
	Median Household Income
United States	$51,425
Arkansas	$38,542
Ashley County	$33,007
City of Hamburg	$30,469

Source: 2005-2009 American Community Survey 5-year estimates

Race

Whites comprise the majority of the population in Ashley County at approximately 69%. Blacks or African Americans comprise approximately 26%. The state average of Blacks or African Americans is 15% and the nation average is 12.6%. Although not the majority, Blacks or African Americans comprise a significant portion of the population. No other race categories make up a significant percentage of the population in the study area.

Table 4.9 shows the numbers of individuals by race in Ashley County and the City of Hamburg relative to national and state values. Detailed information on race is also included in **Appendix D**.

Table 4.9: Individuals by Race for Counties and Cities near Overflow NWR				
Location	**United States**	**Arkansas**	**Ashley County**	**City of Hamburg**
Total	308,745,538	2,915,918	21,853	2,857
White Alone	223,553,265	2,245,229	15,143	1,664
Black or African American Alone	38,929,319	449,895	5,640	859
American Indian and Alaska Native Alone	2,932,248	22,248	70	20
Asian Alone	14,674,252	36,102	40	4
Native Hawaiian and Other Pacific Islander Alone	540,013	5,863	3	1
Some Other Race Alone	19,107,368	99,571	709	273
Two or More Races	9,009,073	57,010	248	36

Source: 2010 US Census

4.2.4 Air Quality

The Overflow NWR is located in Ashley County. The county is currently in attainment for all of the National Ambient Air Quality Standards (NAAQS) criteria pollutants.

4.2.5 Habitat

The Overflow NWR is comprised primarily of a bottomland hardwood forest with a portion of the Refuge having been previously converted to cropland. **Table 4.10** shows the habitat types and their acreages. **Figure 4.5** shows these habitat types.

Table 4.10: Overflow NWR Habitat Type and Acreages

Habitat Types	Acres
Cropland/Moist Soil Rotation	600
Cropland only	245
Grassland Management	35
Moist Soil only	520
Reforested	2,020
Marsh	50
CRP Pine	179
Beaver Ponds & Scrub/Shrub Wetlands	1,500
Bottomland Hardwood Forest	8,625
Upland Hardwood/Pine	175
Administrative	24
Total	**13,973**

Source: CCP, 2010

Based on the *CCP*, 4,000 acres of the bottomland hardwood forest can be flooded annually as the green-tree reservoir, similar to the Felsenthal NWR.

The bottomland hardwood forest mainly contains willow oak and overcup oak. Other trees include hickory, elm, green ash, bald cypress and tupelo gum.

The cropland has 600 acres in moist soil rotation and 250 acres is used for crops such as rice, corn, soybeans and sometimes winter wheat and milo.

The current wildlife list for the Overflow NWR contains at least 200 species of birds (100 species that nest), 40 species of mammals, 70 species of reptiles and amphibians, and 90 fish species. Over 300,000 waterfowl have been found in the Refuge in a given year. Overflow NWR also hosts bald eagles during the winter.

Twenty-four of the 30 threatened and endangered species in Arkansas can be found at Overflow NWR, most of which are aquatic species. The least tern, bald eagle, alligator snapping turtle, Rafinesque's big-eared bat, and southeastern myotis bat are known to be located on the Refuge. The potential for pondberry (an endangered plant) exists but has not been documented on the Refuge. Similarly, the pink mucket mussel has been found in the vicinity of the Refuge but not within the Refuge Boundary. There have also been coordinated black bear management efforts throughout the years at the Refuge.

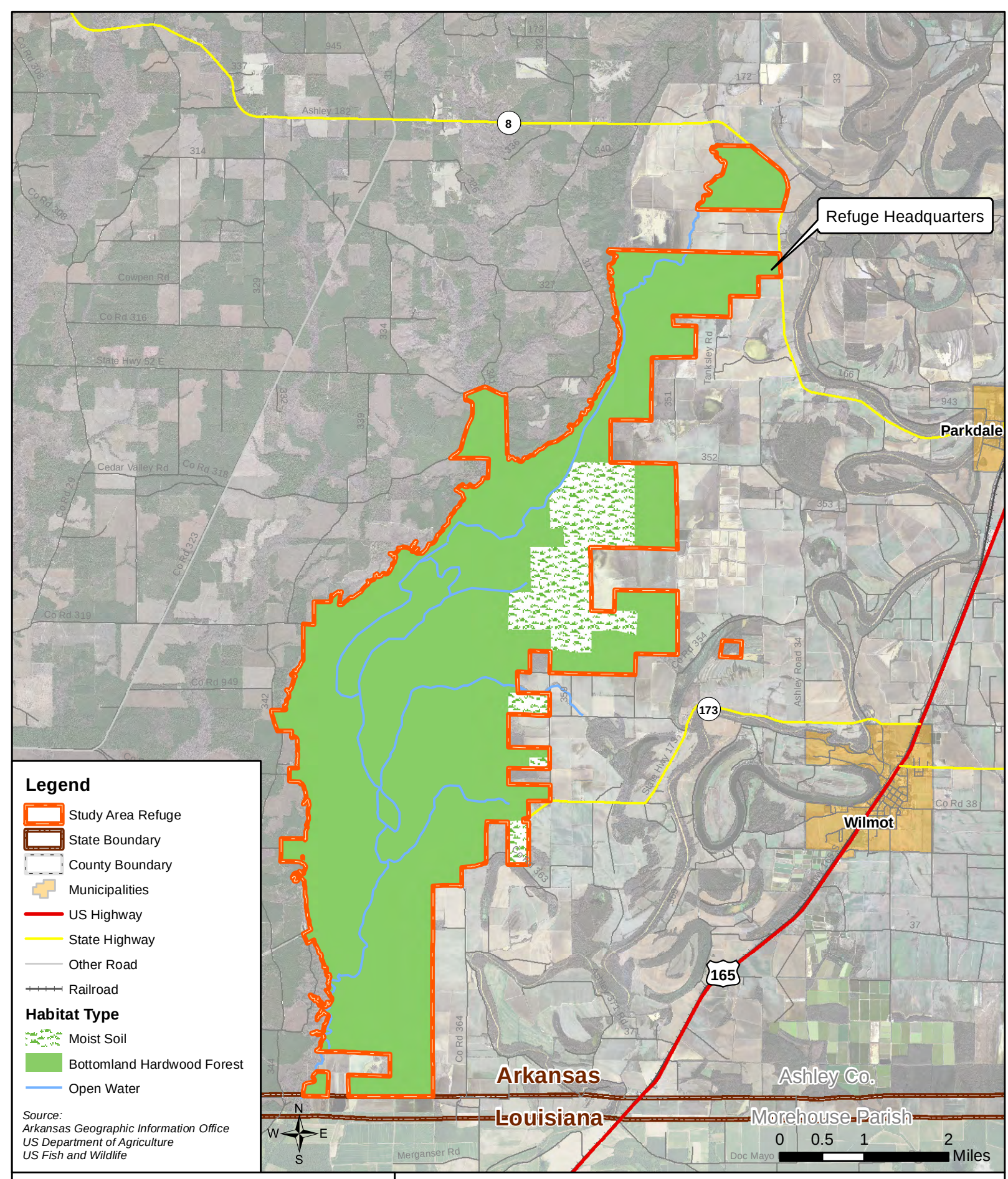

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Figure 4.5: Overflow NWR Habitat Type

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4.2.6 Floodplains and Wetlands

As discussed in the habitat section of the report, most of the Refuge is considered wetlands.

4.2.7 Cultural Resources

Similar to the area around the Felsenthal NWR, the Overflow NWR is located in an area where Caddo Indian activity dates back 5,000 years. This was also an area where farming settlements existed from 900–1600 AD. In the 1800s this land was acquired as part of the Louisiana Purchase and the Indians were eventually moved. Before the Civil War, agriculture was the primary land use for this area. The war curbed large-scale agricultural development and larger plantations were sold off in pieces after the war. Timber became a main industry in the area. For over 100 years, the land in and around the Refuge has been farmed which resulted in a nearly complete loss of wetlands and associated wetlands.

5 Alternatives Analysis

Based on the findings from the existing conditions review and comments from stakeholders, potential improvements to the Refuge's transportation network were reviewed and roadway alternatives initially screened. These alternatives were then screened environmentally, socially, and financially in more detail to develop the preferred alternatives for the Refuge.

Preliminary alternatives were initially developed then screened to develop conceptual alternatives. These are discussed in this section. The conceptual alternatives were further reviewed for impacts in **Section 6**.

5.1 Preliminary Alternatives

Preliminary alternatives for roadway construction improvements and other improvements were selected for the Refuge. These were further categorized by implementation time periods of short- (2017), medium- (2022), and long-range (2027). The matrix shown in **Table 5.1** was developed to identify potential alternatives and their responsible partners. The partner agencies for this project include: USFWS, the Arkansas State Highway and Transportation Department (AHTD), Bradley County, Ashley County, Union County, City of Hamburg, City of Crossett, City of Parkdale, City of Wilmot, Crossett Chamber of Commerce, US Army Corps of Engineers, Friends of Felsenthal, and Private Land Owners. At the project stakeholder meetings, the stakeholders have agreed to work together to implement the alternatives.

5.1.1 Felsenthal NWR

5.1.1.1 Transportation Improvements Involving Construction

Based on a review of the transportation facilities around the Refuge, the following transportation improvements are recommended for the Felsenthal NWR study area.

Short-Range Alternatives (2017)

- Continue to maintain internal roadways (i.e., adding base material and/or gravel, re-grading)
  Responsible Partner: USFWS
- Lengthen left-turn lane transition and taper to meet AHTD standards at the Visitors Center/Refuge Complex driveway on US 82
  Responsible Partners: AHTD, USFWS
- Add an eastbound right-turn lane on US 82 at the Visitors Center/Refuge Complex driveway with proper taper and deceleration distances
  Responsible Partners: AHTD, USFWS

Short-Range Alternatives
Medium-Range Alternatives
Long-Range Alternatives

		Alternatives	USFWS	AHTD	Bradley County	Ashley County	Union County	City of Hamburg	City of Crossett	City of Parkdale	City of Wilmot	Crossett Chamber of Commerce	Army Corps of Engineers	Friends of Felsenthal	Private Land Owners
Felsenthal National Wildlife Refuge	F1	Internal Roadway Condition Improvement	x												
	F2	Westbound Left-Turn Lane at Visitors Center Driveway (US 82)	x	x											
	F3	Eastbound Right-Turn Lane at Visitors Center Driveway (US 82)	x	x											
	F4	Channel Maintenance at Boat Ramps	x									x			
	F5	Establish Agreements for Refuge Access Points	x												x
	F6	Boat Mooring Locations Feasibility	x						x				x	x	
	F7	Auto Tour Route	x												
	F8	Bridge Replacement on Bradley County Road 65 S	x		x										
	F9	Roadway Improvements on New Lock 6 Road	x										x		
	F10	Installation of Boat Mooring Locations	x						x				x	x	
	Additional Recommendations														
		Conduct Speed Study on US 82 in the vicinity of Refuge		x											
		Install Wayfinding Signs for the Refuge in the Surrounding Area	x	x	x	x	x		x			x			
		Coordinate with AHTD for Installation of Highway Advisory Radio Signs along US 82	x	x											
		Develop Walking/Biking Trails	x											x	
		Develop a Formal Trail Map for the Refuge	x											x	
		Build upon Existing Kiosk Materials	x											x	
		Continue to Pursue Grant Opportunities for Additional Funding Sources	x	x									x		
		Coordinate with Local Agencies and Municipalities to Encourage Usage of the Refuge	x		x	x	x		x			x		x	
Overflow National Wildlife Refuge	O1	Internal Roadway Condition Improvement	x												
	O2	Establish Agreements for Refuge Access Points	x												x
	O3	Auto Tour Route	x												
	Additional Recommendations														
		Install Wayfinding Signs for the Refuge in the Surrounding Area	x			x		x		x	x				
		Develop Walking/Biking Trails	x												
		Develop a Formal Trail Map for the Refuge	x												
		Build upon Existing Kiosk Materials	x												
		Coordinate with Local Agencies and Municipalities to Encourage Usage of the Refuge	x			x		x		x	x				

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Table 5.1: Proposed Stakeholder Responsibilities

Felsenthal and Overflow National Wildlife Refuges
Transportation Study
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- Perform regular channel maintenance at boat ramps
  Responsible Partners: Army Corps of Engineers, USFWS

- Review the feasibility of implementing boat mooring locations at the Port of Crossett and the Felsenthal Lock and Dam
  Responsible Partners: City of Crossett, Army of Corps of Engineers, USFWS, Friends of Felsenthal

- Develop an Auto Tour route within the Refuge
  Responsible Partner: USFWS, Army Corps of Engineers

Medium-Range Alternatives (2022)

- Replace the bridge on Bradley County Road 65 S
  Responsible Partners: Bradley County, USFWS

- Improve New Lock 6 Road
  Responsible Partners: Army Corps of Engineers, USFWS

- Ongoing coordination for long-range alternatives
  Responsible Partner: USFWS

Long-Range Alternatives (2027)

- Construct boat mooring locations at Port of Crossett and Felsenthal Lock and Dam boat ramps (if deemed feasible)
  Responsible Partners: City of Crossett, USFWS, Army Corps of Engineers

5.1.1.2 Transportation Improvements Not Involving Construction

The following improvements for the Felsenthal NWR study area do not include construction.

Short-Range Alternatives (2017)

- Perform a speed study on US 82 in the vicinity of the Refuge
  Responsible Partners: AHTD

- Coordinate with adjacent private land owners to establish formal agreements for preservation and maintenance of private roads serving Refuge access points
  Responsible Partners: USFWS, Private land owners

- Install directional wayfinding signs for the Refuge in surrounding areas and communities
  Responsible Partners: AHTD, City of Crossett, Crossett Chamber of Commerce, Bradley County, Union County, USFWS

- Coordinate with AHTD for the installation of Refuge Highway Advisory Radio signs on US 82 to notify travelers of important Refuge information
  Responsible Partners: AHTD, USFWS

- Develop a detailed trail map for the Refuge including new walking/biking facilities, Auto Tour routes, and public boat launches
  Responsible Partners: USFWS, Friends of Felsenthal

- Use kiosks at the Refuge Complex entrance to build upon existing informational materials such as permits, trail maps, notes about special/hunting events, etc.
  Responsible Partners: USFWS, Friends of Felsenthal

- Ongoing coordination with stakeholders
  Responsible Partners: USFWS, AHTD, Bradley County, Ashley County, Union County, City of Crossett, Crossett Chamber of Commerce, Private land owners, Friends of Felsenthal

Medium-Range Alternatives (2022)

- Coordinate with local agencies and municipalities to encourage use of the Refuge
  Responsible Partners: USFWS, Crossett Chamber of Commerce, Bradley County, Ashley County, Union County, City of Crossett, Friends of Felsenthal

- Ongoing coordination with stakeholders
  Responsible Partners: USFWS, AHTD, Bradley County, Ashley County, Union County, City of Crossett, Crossett Chamber of Commerce, Private land owners, Friends of Felsenthal

Long-Range Alternatives (2027)

- Ongoing coordination with stakeholders
  Responsible Partners: USFWS, AHTD, Bradley County, Ashley County, Union County, City of Crossett, Crossett Chamber of Commerce, Private land owners, Friends of Felsenthal

5.1.2 Overflow NWR

5.1.2.1 Transportation Improvements Involving Construction

Based on a review of the transportation facilities around the Overflow NWR, the following transportation improvements are recommended for the Refuge study area.

Short-Range Alternatives (2017)

- Continue to maintain internal roadways (i.e., adding base material and/or gravel, re-grading)
  Responsible Partner: USFWS

5.1.2.2 Transportation Improvements Not Involving Construction

The following improvements for the Overflow NWR study area do not include construction.

Short-Range Alternatives (2017)

- Coordinate with adjacent land owners to establish formal agreements for preservation and maintenance of private roads serving Refuge access points
  Responsible Partners: USFWS, Private land owners

- Install additional directional wayfinding signs for the Overflow NWR in surrounding areas
  Responsible Partners: Ashley County, USFWS, City of Parkdale, City of Wilmot, City of Hamburg

- Develop a detailed trail map for the Overflow NWR including new walking/biking facilities, auto-tour routes, and boat launches.
  Responsible Partner: USFWS

- Develop an Auto Tour route within the Refuge
  Responsible Partner: USFWS

- Ongoing coordination with stakeholders
  Responsible Partners: USFWS, AHTD, City of Hamburg, City of Parkdale, City of Wilmot, Private land owners

Medium-Range Alternatives (2022)

- Use kiosks at the Refuge Complex entrance to build upon existing informational materials such as permits, trail maps, notes about special/hunting events, etc.
  Responsible Partner: USFWS

- Ongoing coordination with stakeholders
  Responsible Partners: USFWS, AHTD, City of Hamburg, City of Parkdale, City of Wilmot, Private land owners

Long-Range Alternatives (2027)

- Ongoing coordination with stakeholders
  Responsible Partners: USFWS, AHTD, City of Hamburg, City of Parkdale, City of Wilmot, Private land owners

5.2 Screening Criteria

The screening criteria used to select the preliminary candidate alternatives are detailed below. These screening criteria were established based on the conditions and issues that future improvements will need to address and were divided into the following four categories:

- Environmental and Cultural Impacts – Environmental and cultural impacts include issues pertaining to the natural environment (i.e. wetlands, floodplains, natural wildlife habitats) and social features (i.e. demographics, environmental justice, historical and cultural resources).
- Constructability – Constructability refers to the reasonable issues and elements involved with the physical construction of a recommendation. For example, this criterion would review whether or not the improvement could be effectively implemented within the physical constraints of the study area's existing conditions.
- Transportation Benefit – Transportation benefit includes the review of the properties and conditions associated with existing and future roadways, safety, connectivity, and capacity of the transportation network for the study area.
- Cost – Cost includes the financial obligation associated with implementing a recommendation including design, construction, long-term maintenance, and related expenses.

5.3 Preliminary Candidate Alternatives

Nine preliminary candidate alternatives (including a No Build alternative) presented in the *Preliminary Candidate Alternatives Report* were identified as either short-range (2017), medium-range (2022), or long-range (2027).

These alternatives are not exclusive and should all be considered for implementation in the future. Also, for some of the alternatives, the improvements have been broken down into sections and prioritized. This allows improvements to be implemented in phases as monies are available.

5.3.1 Felsenthal NWR

The following preliminary candidate alternatives for the Felsenthal NWR are summarized in **Figure 5.1.**

5.3.1.1 No-Build

The "No-Build" alternative provides no improvements to the existing transportation facilities in the study area. This would result in no improvement costs, impacts or enhancements to the natural or social environment in the study area. In the No-Build alternative, the existing habitat for the Refuge would not be impacted; however, the potential for issues to occur on the transportation facilities will likely remain the same or increase if no improvements are made.

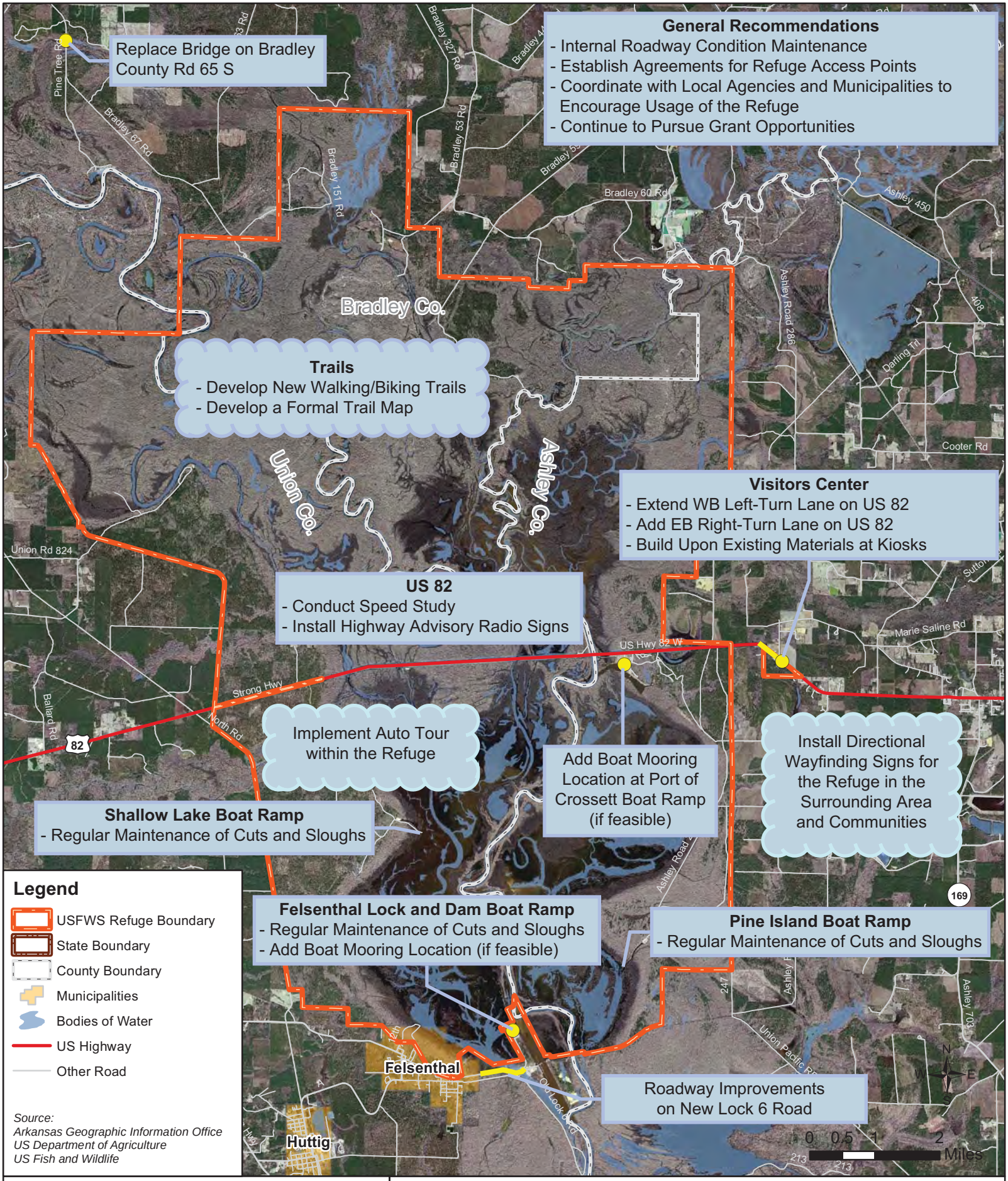

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Figure 5.1: Felsenthal NWR Preliminary Candidate Alternatives

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5.3.1.2 Short-Range Alternatives (2017)

5.3.1.2.1 Alternative F1 – Internal Roadway Condition Improvement

Continued maintenance of the existing internal Refuge roadways by adding gravel to unpaved surfaces and re-grading surfaces, where necessary, will provide improvements at a low cost and impact to the surrounding area.

5.3.1.2.2 Alternative F2 – Westbound Left-Turn Lane at Visitors Center Driveway (US 82)

The existing westbound left-turn lane at the Visitors Center was found to not meet the recommended length of the AHTD standard guidelines. The widening of US 82 that would be required to lengthen this turn lane would likely have some impact on the natural environment. The lengthening of this turn lane will improve access and help reduce the potential for rear-end collisions. Costs include design, construction, and maintenance of the roadway.

5.3.1.2.3 Alternative F3 – Eastbound Right-Turn Lane at Visitors Center Driveway (US 82)

Similarly to the westbound left-turn lane, the addition of an eastbound right-turn lane at the Visitors Center Driveway would require widening of US 82 in the vicinity of the turn lane. The construction associated with this widening would likely have an impact on the natural environment. The addition of an eastbound right-turn lane on US 82 will improve access and help reduce the potential for rear-end collisions with vehicles attempting to turn right into the Visitors Center driveway from US 82. Costs include design, construction, and maintenance of the roadway.

5.3.1.2.4 Alternative F4 – Perform Regular Channel Maintenance at the Felsenthal Lock and Dam, Pine Island and Shallow Lake Boat Ramps

As a result of siltation at the Felsenthal Lock and Dam, Pine Island, and Shallow Lake boat ramps, it is sometimes difficult for boaters to access the channel from the ramp. Regular maintenance of the cuts and sloughs at the boat ramps would be beneficial to visitors of the Refuge. An appropriate environmental study and related permitting would be required. Costs would be associated with these activities, as well as costs related to the physical dredging.

5.3.1.2.5 Alternative F5 – Establish Agreements for Refuge Access Points

Permanent access to the Refuge through private roads could be maintained through formal agreements with the private land owners. These formal agreements would establish access points and provide the opportunity to keep specific access points and roadways functional. The transportation benefit would be significant as visitors would be able to access the Refuge through formalized points. The terms would be determined during the negotiation of the agreements.

5.3.1.2.6 Alternative F6 – Boat Mooring Locations Feasibility

Boat mooring locations constructed at the Port of Crossett and/or the Felsenthal Lock and Dam boat ramps would provide boaters the opportunity to moor their boats after launching from the boat ramp. However, the costs and potential impacts to the natural environment would need to be studied further.

A study should be conducted to determine if the implementation of mooring facilities is feasible, given the potential impacts and costs. Short-term costs would include the cost of the feasibility study.

5.3.1.2.7 Alternative F7 – Auto Tour Route

The implementation of an Auto Tour route on existing roadways within the Refuge would enhance the visitor experience. There may be some limited impact to the environment associated with the construction of pull-off areas at points of interest within the Refuge. These pull-off areas would be planned in locations where they can provide an educational opportunity for the visitors, while limiting the environmental impact. Costs are expected to be limited.

5.3.1.3 Medium-Range Alternatives (2022)

5.3.1.3.1 Alternative F8 – Bridge Replacement on Bradley County Road 65 S

Bradley County Road 65 S is a packed dirt and gravel roadway on the north side of the Refuge. On this road there is an existing timber bridge with a weight restriction of 4 tons for short wheelbase trucks and 7 tons for trucks with a longer wheelbase. Given the existing bridge condition and weight restrictions, replacing this bridge should be considered. Construction costs for the replacement would vary depending on the type of bridge installed. Costs include design, construction, and maintenance of the facility. During the bridge replacement, vehicle traffic would be affected and alternate routes would be required.

5.3.1.3.2 Alternative F9 – Roadway Improvements on New Lock 6 Road

Improvements are needed for the subbase and roadbed support for New Lock 6 Road in the 3,500 feet section approaching the Lock and Dam boat ramp. The Army Corps of Engineers have previously applied for federal grant funding to replace this section of roadway, but have been unsuccessful. However, improvement of this roadway remains a priority project and the Army Corps of Engineers continues to pursue funding opportunities. Costs include design, construction, and maintenance of the facility.

5.3.1.4 Long-Range Alternatives (2027)

5.3.1.4.1 Alternative F10 – Installation of Boat Mooring Locations

If found feasible, as a follow-on to Alternative F6 - Boat Mooring Locations Feasibility Study, a formal environmental review, design and construction would be completed. Costs would include the necessary studies, design, construction and regular maintenance.

5.3.1.5 Additional Recommendations

The screening criteria do not apply to certain other recommendations. These additional recommendations are listed below.

- Conduct a speed study on US 82 in vicinity of the Refuge
- Install wayfinding signs for the Refuge in the surrounding area

- Coordinate with AHTD for the installation of signs along US 82 regarding the Refuge's Highway Advisory Radio to notify motorists of important Refuge information while traveling
- Coordinate with local agencies and municipalities to encourage usage of the Refuge
- Develop new walking/biking trails to enhance the visitor experience
- Develop a formal trail map for the Refuge
- Use kiosks at the Visitors Center/Refuge Complex entrances to provide additional Refuge information regarding such things as permits, trail maps, notes about special/hunting events, etc.
- Continue to pursue grant opportunities for additional funding sources

5.3.2 Overflow NWR

The following preliminary candidate alternatives for the Overflow NWR are summarized in **Figure 5.2.**

5.3.2.1 No-Build

The "No-Build" alternative provides no improvements to the existing transportation facilities in the study area. This would result in no improvement costs, impacts or enhancements to the natural or social environment in the study area. In the No-Build alternative, the existing habitat for the Refuge would not be impacted; however, the potential for issues to occur on the transportation facilities will likely remain the same or increase if no improvements are made.

5.3.2.2 Short-Range Alternatives (2017)

5.3.2.2.1 Alternative O1 – Internal Roadway Condition Improvement

Continual maintenance of the existing internal Refuge roadways by adding gravel to unpaved surfaces and re-grading surfaces, where necessary, provides transportation improvements at a low cost and impact to the surrounding area.

5.3.2.2.2 Alternative O2 – Establish Agreements for Refuge Access Points

Permanent access to the Refuge through private roads could be maintained through formal agreements with private land owners. These formal agreements would establish access points and provide the opportunity to keep specific access points and roadways functional. The transportation benefit would be significant as visitors would be able to access the Refuge through formalized points. The terms would be determined during the negotiation of the agreements.

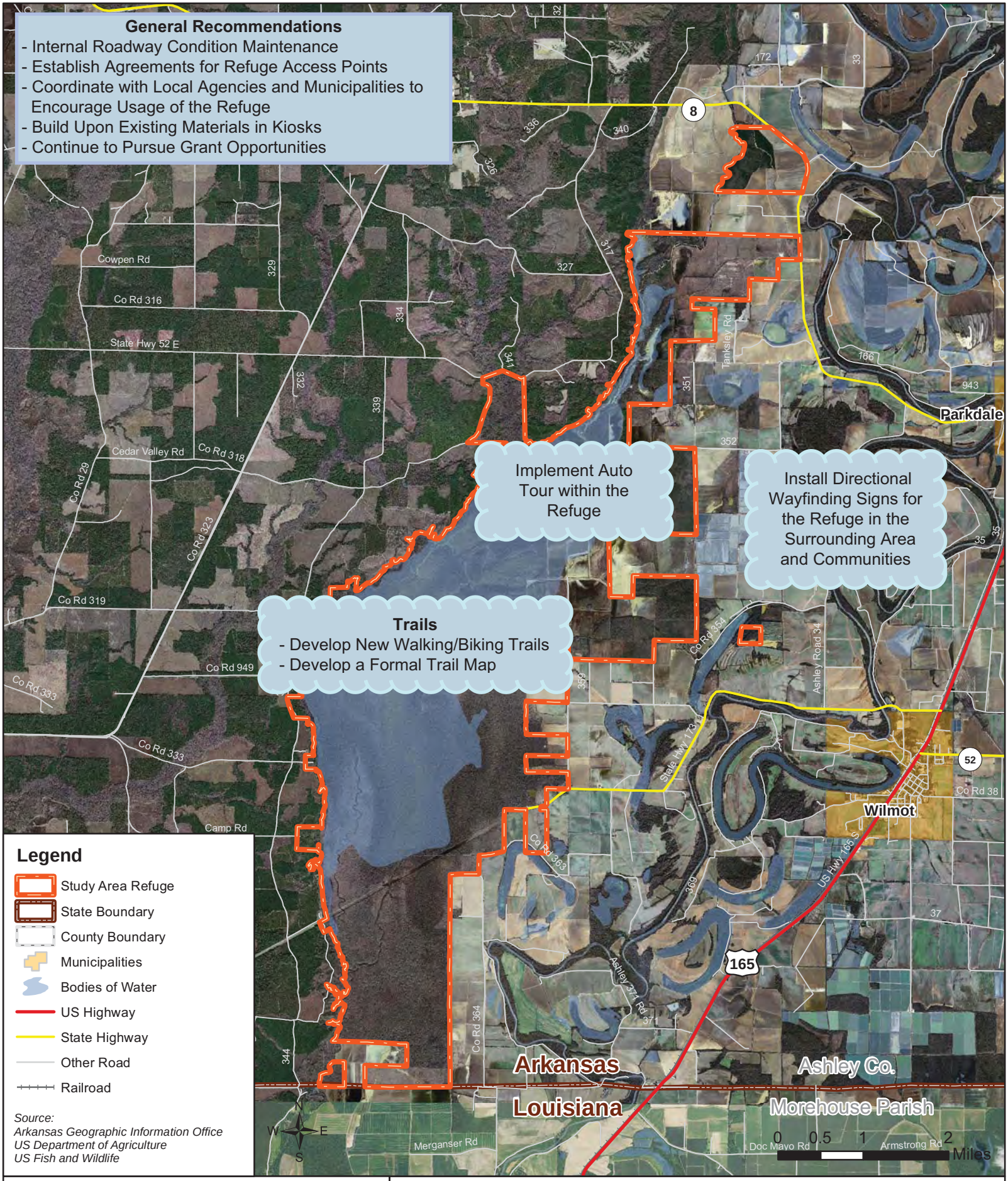

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Figure 5.2: Overflow NWR Preliminary Candidate Alternatives

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5.3.2.3 Medium-Range Alternatives (2022)

5.3.2.3.1 Alternative O3 – Auto Tour Route

The implementation of an Auto Tour route on existing roadways within the Refuge would enhance the visitor experience. There may be some limited impact to the environment associated with the construction of pull-off areas at points of interest within the Refuge. These pull-off areas would be planned in locations where they can provide an educational opportunity for the visitors with limited environmental impact.

5.4 Short- and Long-Range Implementation Plan Alternatives

This section describes the preliminary candidate alternatives and additional recommendations presented in the *Preliminary Candidate Alternatives Report*. For planning purposes, each alternative has been identified as either short-range (2017), medium-range (2022), or long-range (2027). Preliminary designs and construction cost estimates, if applicable, have been developed for each of the alternatives and are described in the following sections. Detailed impacts are identified for the alternatives in Felsenthal and Overflow NWRs in **Sections 6.3.1** and **6.3.2**, respectively. A summary table including impact information for each alternative is included as **Table 6.1** and opinions of probable costs are included in **Appendix E**.

It should be noted that all construction costs are conceptual. The engineer has no control over the cost of labor, materials, equipment, the contractor's price determination methods, competitive bidding, or market conditions. Opinions of probable costs provided herein are based on the information known to the engineer at this time and represent only the engineer's judgment as a design professional familiar with the construction industry. The engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from opinions of probable costs.

5.4.1 Felsenthal NWR

For this transportation study, it was decided that all of the preliminary candidate alternatives would be included in the short- and long-range improvement plan. Therefore, the following alternatives for the Felsenthal NWR are summarized graphically in **Figure 5.1**.

5.4.1.1 No-Build

The "No-Build" alternative provides no improvements to the existing transportation facilities in the study area. This would result in no improvement costs or additional impacts to the natural environment within the study area. In the No-Build alternative, the existing habitat for the Refuge would not be impacted; however, the potential for issues to occur on the transportation facilities will either remain the same or increase if no improvements are made.

5.4.1.2 Short-Range Alternatives (2017)

5.4.1.2.1 Alternative F1 – Internal Roadway Condition Maintenance

Continual maintenance of the existing internal roads and trails within the Refuge by adding gravel to unpaved surfaces, where necessary, will improve the quality of the roads and potentially increase safety for drivers. Additionally, managing drainage along unpaved roadways will lengthen the life and durability of the road surface. Potential costs associated with this alternative would vary depending on the road type and the extent of the maintenance required. The responsible partner for this alternative is USFWS.

5.4.1.2.2 Alternative F2 – Westbound Left Turn Lane at Visitors Center Driveway (US 82)

The existing westbound left-turn lane on US 82 has a storage length of approximately 100 feet and a taper length of approximately 200 feet. The Arkansas State Highway Transportation Department (AHTD) standards provide recommendations for turn lane transition lengths consistent with the Manual on Uniform Traffic Control Devices (MUTCD). These recommended lengths are determined based on the approach speed on the roadway and the distance that a driver must transition or shift to continue a through movement, which in this case is 12 feet.

The existing westbound left-turn lane taper at the Visitors Center/Refuge Complex driveway was found to not meet the recommended length specified by AHTD standard guidelines. The speed limit along this portion of US 82 is 55 mph, requiring a left-turn lane taper long enough to allow vehicles to safely decelerate as they transition to the left-turn lane. Lengthening the westbound left-turn lane at the Visitors Center/Refuge Complex driveway will allow left turning vehicles more time and area to decelerate without impeding the flow of traffic traveling west along US 82. The lengthening of this lane will likely help vehicles to access the Visitors Center/Refuge Complex driveway and reduce the potential for rear-end collisions, as well as improve the traffic flow along this portion of US 82 within the Refuge.

For the purposes of this study it was assumed the pavement would be widened on both sides of the road to laterally transition the through lanes away from each other a total of 12 feet. Therefore, the road must be widened by 6 feet on both sides and require a total transition length of 330 feet; two-thirds of the length as a transition area and one-third of the length as a taper area. The storage length should be based on the expected number of left turning vehicle arrivals during the peak traffic periods. AHTD recommends a minimum storage length of 100 feet. Based on observations during the field visits, it appears that the existing storage length is approximately 100 feet. Additionally, another transition area is required after the turn lane to transition the roadway back to a typical two-lane section. Transportation impacts associated with this improvement would include temporary traffic control in the vicinity of the Visitors Center/Refuge Complex driveway during construction. A location map and conceptual layout for the proposed turn lane taper are shown in **Figure 5.3**.

As this alternative moves forward, the turn lane would need to be designed and constructed with the proper coordination with AHTD. Assuming standard dimensions are used, the estimated construction cost to lengthen the left-turn lane, as well as the transition areas on US 82 into and out of the turn lane

area, is $560,000, when constructed simultaneously with Alternative F3, the eastbound right-turn lane. The responsible partners for this alternative are AHTD and USFWS.

5.4.1.2.3 Alternative F3 – Eastbound Right-Turn Lane at Visitors Center Driveway (US 82)

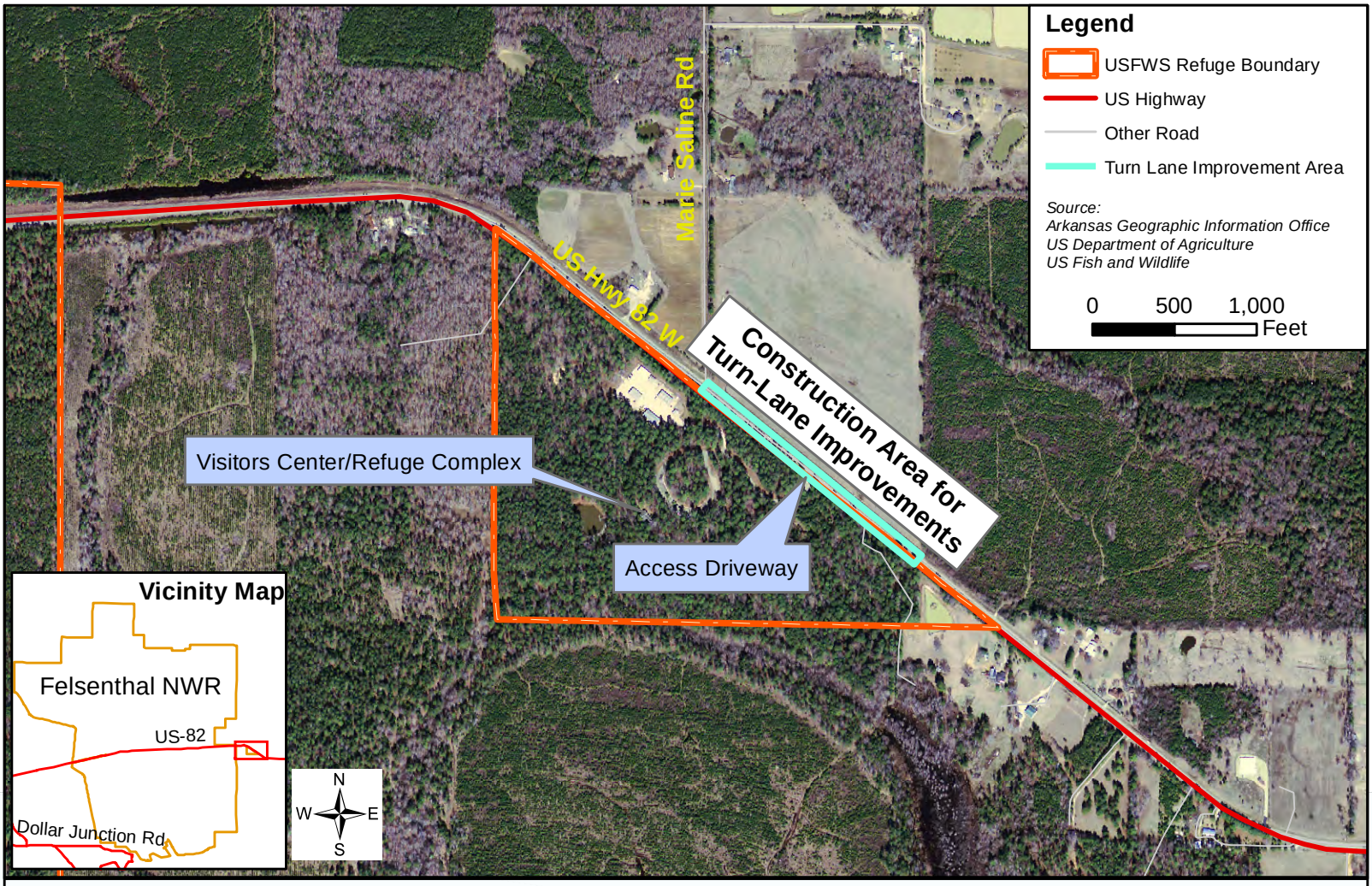
Similarly to the westbound left-turn lane, the addition of an eastbound right-turn lane at the Visitors Center/Refuge Complex driveway would allow right turning vehicles more time and area to decelerate without impeding the flow of vehicles traveling east along US 82. Currently, right turning vehicles must decelerate for the turn while still in the travel lane. For the purposes of this study, it was assumed this alternative would require a 12-foot widening for the length of the right-turn lane and taper area. Transportation impacts would include temporary traffic control in the vicinity of the Visitors Center/Refuge Complex during construction. A location map and conceptual layout for the proposed right-turn lane are shown in **Figure 5.3.**

As this alternative moves forward, the turn lane would need to be designed and constructed with the proper coordination with AHTD. Assuming standard dimensions are used, the construction cost for the addition of the right-turn lane and taper area is estimated to be $190,000, assuming it would be constructed simultaneously with Alternative F2, the westbound left-turn lane improvements. The responsible partners for this alternative are AHTD and USFWS.

5.4.1.2.4 Alternative F4 – Maintenance of Cuts and Sloughs at Felsenthal Lock and Dam, Shallow Lake, and Pine Island Boat Ramps

Due to siltation occurring at cuts and sloughs near the Felsenthal Lock and Dam, Shallow Lake, and Pine Island boat ramp areas, it is sometimes difficult for boaters to access the channels from the ramps. Removal of the silt at these locations would be beneficial to visitors of the Refuge by allowing boaters easier access to the main channels. As a result, the improvement will save boaters time, reduce wear and tear on boat equipment, and likely increase boating attractiveness for users. Transportation impacts include improving the connectivity between the cuts/sloughs and the main channels, as well as potentially increasing the capacity of the boat ramps. Before dredging can occur, an appropriate environmental study, survey, and related permitting would be required. The survey would determine which areas require dredging, as well as determine how much sediment must be removed.

It is estimated that the cost of this survey would be approximately $5,000 per location. If it is determined that dredging is necessary, the cost to dredge the areas is expected to be $15 to $20 per cubic yard of material removed, depending on the dredging process and equipment that is used. A map of the locations where maintenance of cuts and sloughs may be required is shown in **Figure 5.4**. The responsible partners involved with this alternative are the US Army Corps of Engineers and USFWS.



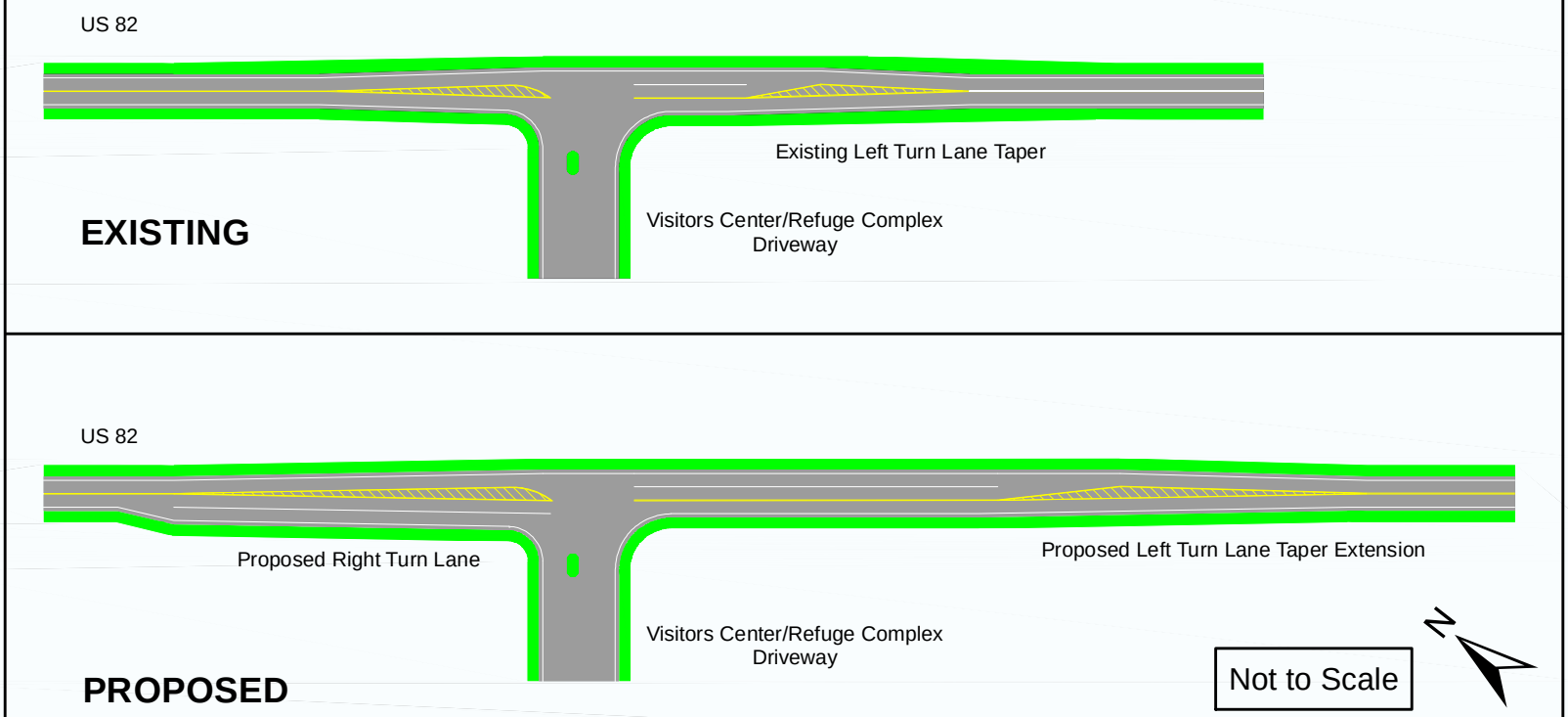


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Figure 5.3: Potential Turn-Lane Improvements at Refuge Visitors Center

Felsenthal and Overflow National Wildlife Refuges
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Alternatives F2 and F3

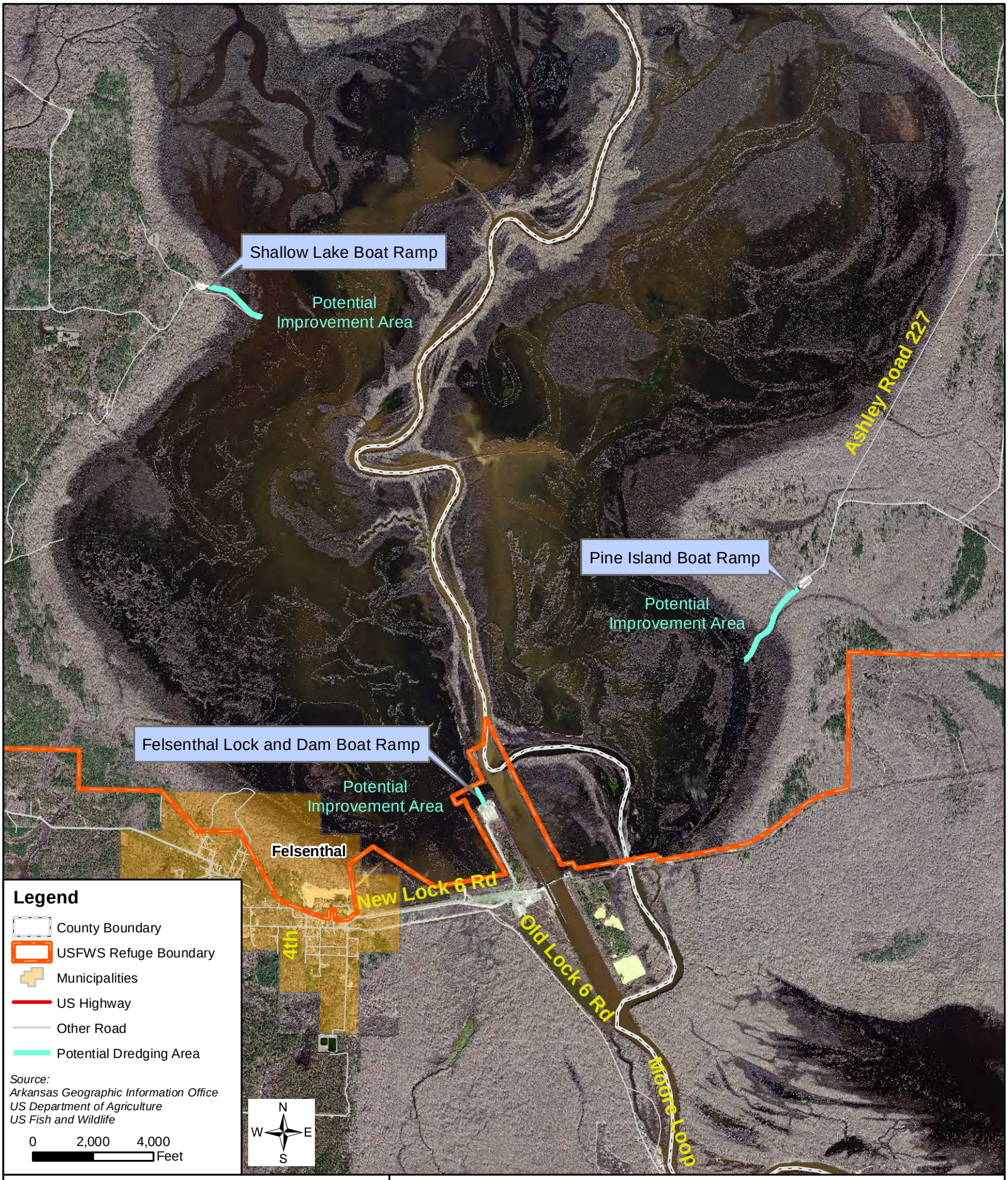

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Figure 5.4: Potential Maintenance Areas of Cuts and Sloughs

Felsenthal and Overflow National Wildlife Refuges Transportation Study
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Alternative F4

5.4.1.2.5 Alternative F6 – Mooring Location Feasibility Study

Currently, there are no established mooring locations near the boat ramps in Felsenthal NWR. Boat mooring locations constructed at the Port of Crossett and/or the Felsenthal Lock and Dam boat ramps would provide boaters the opportunity to moor after launching from the ramps. Costs and potential impacts to the natural environment associated with mooring locations need to be studied further. Additionally, due to the fluctuation of water levels and currents near the boat ramps, a feasibility study should be conducted to determine if the implementation of boat slips is justified, given the potential impacts and costs.

Short-term costs would include the feasibility study, which is has an estimated cost between $10,000 and $15,000. Long-term costs would be dependent on the feasibility study's recommendations. A map showing the locations where boat mooring location feasibility studies could be conducted is shown in **Figure 5.5**. The responsible partners related to this alternative include the City of Crossett, US Army Corps of Engineers, and USFWS. An additional opportunity for partnership could include the Friends of Felsenthal group.

5.4.1.2.6 Alternative F7 – Auto Tour Route

The implementation of an Auto Tour route on existing Refuge facilities would enhance the visitor experience. The Auto Tour route within the Refuge would include educational/scenic pull-offs along the route. The pull-off areas, signs, etc. should be planned in locations where they can provide an educational opportunity for the visitors, but have limited environmental impacts.

Costs are expected to be limited and are related to planning/design, construction, and maintenance as the route is expected to be planned on existing facilities. Assuming no significant road rehabilitation is needed, the cost is estimated to be $10,000 to $20,000 for limited grading, signage, and gates. The responsible partner for this alternative is USFWS, however, additional local partners would provide added benefits such as partnering with the Refuge to enhance the educational opportunities and helping with the upkeep of the Auto Tour route monetarily and/or through the development of a volunteer network.

5.4.1.3 Medium-Range Alternatives (2022)

5.4.1.3.1 Alternative F8 – Bridge Replacement on Bradley County Road 65 S

Bradley County Road 65 S is a packed dirt and gravel roadway northwest of the Refuge boundary. On this road there is an existing timber bridge which currently has a weight restriction of four tons for short wheelbase trucks and seven tons for trucks with a longer wheelbase. The replacement of the timber bridge on Bradley County Road 65 S would reduce the weight restrictions associated with the existing bridge, thus allowing heavier vehicles to make use of the corridor. By replacing this bridge, the connectivity of the roadway system to the Refuge would be restored allowing heavier vehicles access to the area. The bridge replacement would likely improve safety, connectivity, and capacity of the road. Construction costs are estimated to be approximately $125 per square foot of bridge deck.

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Figure 5.5: Potential Mooring Location Feasibility Study Areas

Felsenthal and Overflow National Wildlife Refuges
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Alternative F6

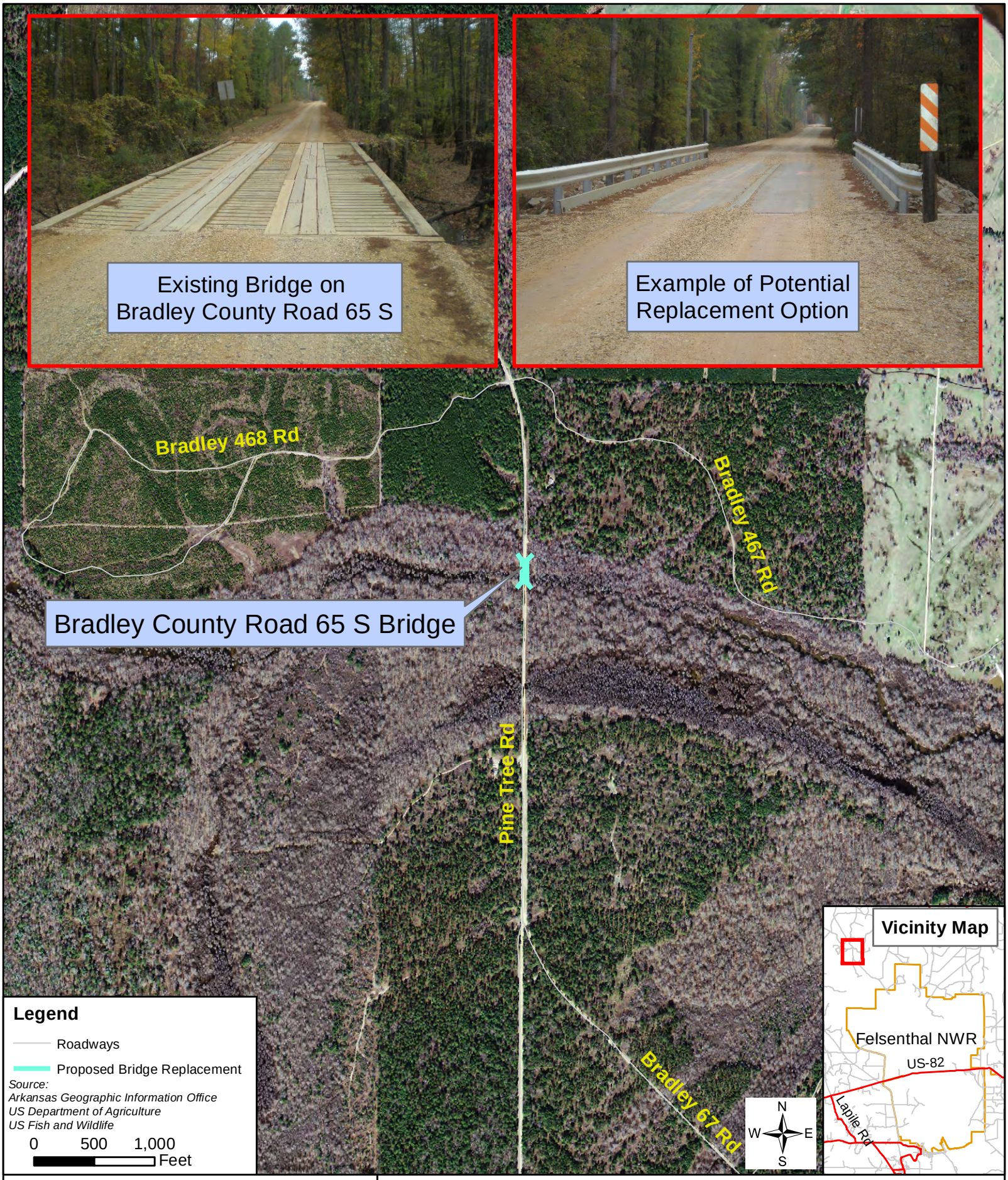

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Figure 5.6: Potential Replacement of Bradley County Road 65 S Bridge

Felsenthal and Overflow National Wildlife Refuges
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Alternative F8

Additional costs include design, construction, and maintenance of the facility. Limited environmental impacts are expected as the replacement would be constructed in place. During the bridge replacement, vehicle traffic would be affected and detours would be necessary. The responsible partners for this alternative are Bradley County and USFWS. A location map of the Bradley County Road 65 S bridge and surrounding area is shown in **Figure 5.6**.

5.4.1.3.2 Alternative F9 – Roadway Improvements on New Lock 6 Road

The US Army Corps of Engineers is currently seeking grant funding to improve a portion of New Lock 6 Road. A copy of the latest grant application is provided in **Appendix F**. Currently, a segment of New Lock 6 Road in the elevated section has insufficient compaction of fill. The roadway segment is located in the southern portion of Felsenthal NWR and serves as the only access onto the US Army Corps of Engineers recreation lands. The road was constructed nearly 30 years ago and improvements are needed for the subbase and roadbed support for a portion of the segment between the Town of Felsenthal and the Felsenthal Lock and Dam boat ramp. The segment in need of improvement is elevated by approximately 20 feet to allow for flooding of the adjacent river. The road also provides access for over 100,000 recreational visitors annually, as well as ensuring the uninterrupted operations of the Felsenthal Lock and Dam.

Per the most recent grant application, over the years, erosion has allowed voids to form under the roadbed, deteriorating the road to the point that major repairs are required for it to remain in service for the visiting public. The critical problem areas are located along both sides of the roadway and measure approximately 3,000 feet and 3,800 feet on the north and south slopes, respectively, as shown in **Figure 5.7**. These voids are present in the roadbed, shoulders, and adjacent slopes, in most cases with an entry point near the top of the elevated embankment and an exit point near the toe (see **Figure 5.8).** In spring of this year, the Army Corps of Engineers performed temporary stabilization repairs. The US Army Corps of Engineers developed an estimated project cost of $217,900.

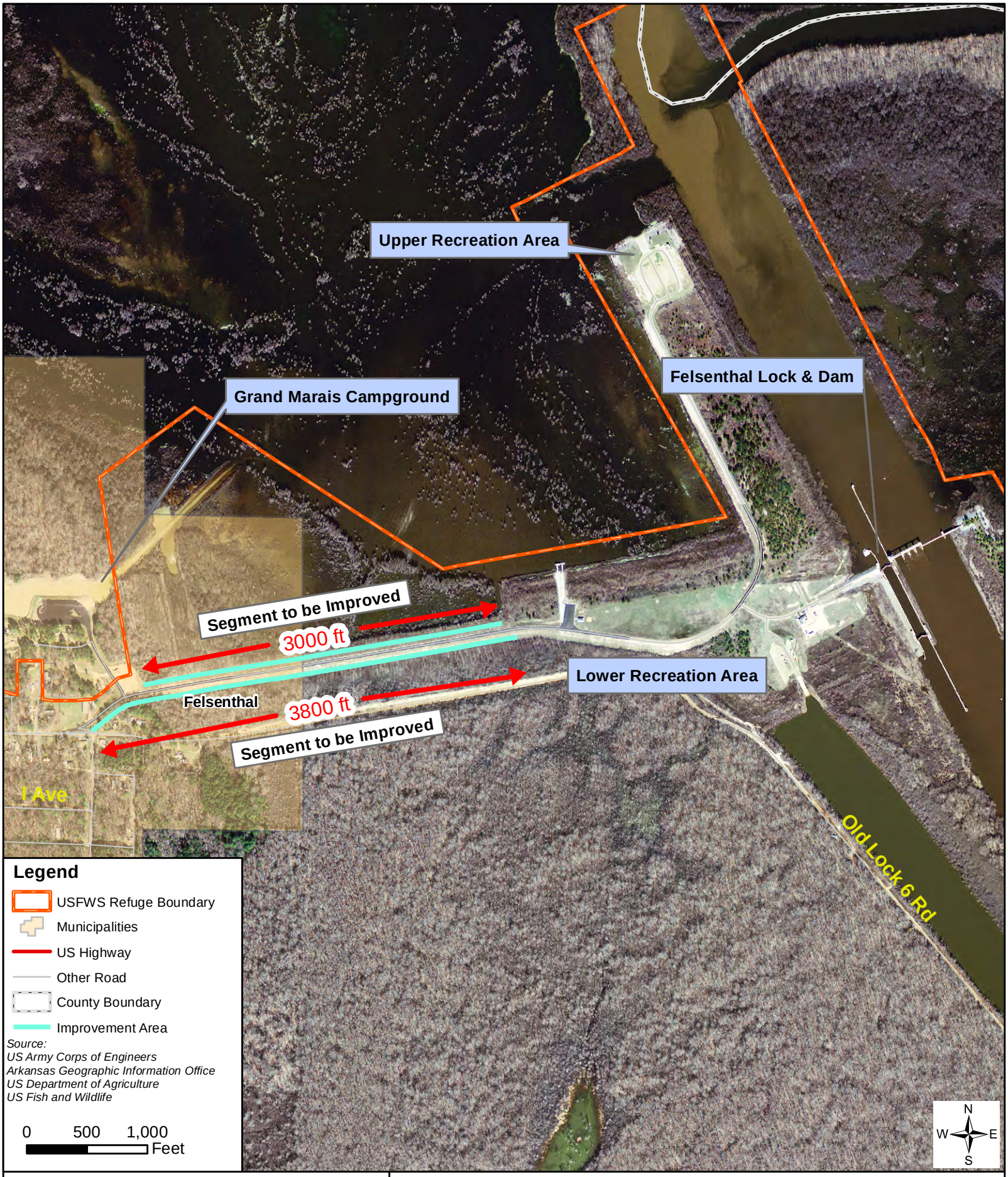

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Figure 5.7: Potential New Lock 6 Road Improvement Area

Felsenthal and Overflow National Wildlife Refuges Transportation Study
Contract No.: DTFH71-09-D-00001

Alternative F9

Photo Source: US Army Corps of Engineers

Figure 5.8: Voids along Embankment (Typical)

5.4.1.4 Long-Range Alternatives (2027)

5.4.1.4.1 Alternative F10 – Installation of Boat Mooring Locations

If warranted by the boat mooring location feasibility study (Alternative F6), mooring locations could be installed at the Felsenthal Lock and Dam and Port of Crossett boat ramps. The estimated cost to install a boat mooring location would be approximately $100,000-$200,000 for each location depending on the size and type of the mooring location. The responsible partners for this alternative are USFWS, City of Crossett, and the US Army Corps of Engineers. An additional opportunity for partnership could include the Friends of Felsenthal group.

5.4.1.5 Additional Recommendations

Nine additional alternatives have been developed that are not anticipated to have direct impacts to the environment.

5.4.1.5.1 Alternative F5 – Establish Agreements for Refuge Access Points

Establishing agreements with private land owners for use of their land/roads will increase access to the Refuge. The Refuge access points through roads on private lands could be memorialized through formal agreements with the private land owners. These formal agreements would establish the access points and provide the opportunity to keep specific access and roadways functional. Additionally, these agreements would likely lead to improvement/maintenance of the roads, benefitting both land owners and Refuge visitors. These access points would also improve connectivity and capacity of the roadways within the Refuge. The specific terms regarding the access points would be determined during the negotiation of the agreements between USFWS and the private land owners. Responsible partners for this alternative include USFWS and private land owners.

5.4.1.5.2 Conduct a Speed Study on US 82 in the Vicinity of the Refuge

The posted speed limit for US 82 adjacent to the Refuge entrance is 55 mph. However, there is a concern that traffic on US 82 is traveling at a higher rate than the posted speed limit. To review the existing speeds on US 82 in the vicinity of the Refuge, a speed study could be conducted. Based on the

results of a speed study, AHTD may consider requesting that the Arkansas State Police, Highway Patrol Division, continue enforcement on the section of US 82 that passes through the Refuge.

5.4.1.5.3 Install Wayfinding Signs for the Refuge in the Surrounding Area

There is very limited directional signage for the Refuge on the surrounding roadways. On US 82, there are signs at the Refuge boundary and one directional sign which reference the Visitors Center. There are currently a limited number of signs in the City of Crossett or other surrounding areas providing distance or directional information regarding the Refuge. Additional signage could be beneficial in providing information that directs visitors to the Refuge. By adding new signs and updating existing signs, motorists would be better informed of directional and locational information related to the Refuge. A proposed sign plan is shown in **Figures 5.9** and **5.10**.

Additional wayfinding signs at major decision making locations north of the Refuge directing visitors to the northern access points of the Refuge would also be beneficial.

5.4.1.5.4 Install Signs Regarding the Refuge's Highway Advisory Radio

The Refuge has implemented a highway advisory radio broadcast to notify the public of such things as prescribed burns, directional information, and other general information about Refuge events. Signs with information about the highway advisory radio are located within the Refuge; however, additional signs on adjacent public roadways regarding the highway advisory information would be beneficial to visitors and other users of the Refuge. The proposed locations of two highway advisory radio signs on US 82 are shown in the proposed sign plan (**Figure 5.9**).

5.4.1.5.5 Coordinate with Local Agencies and Municipalities to Encourage Usage of the Refuge

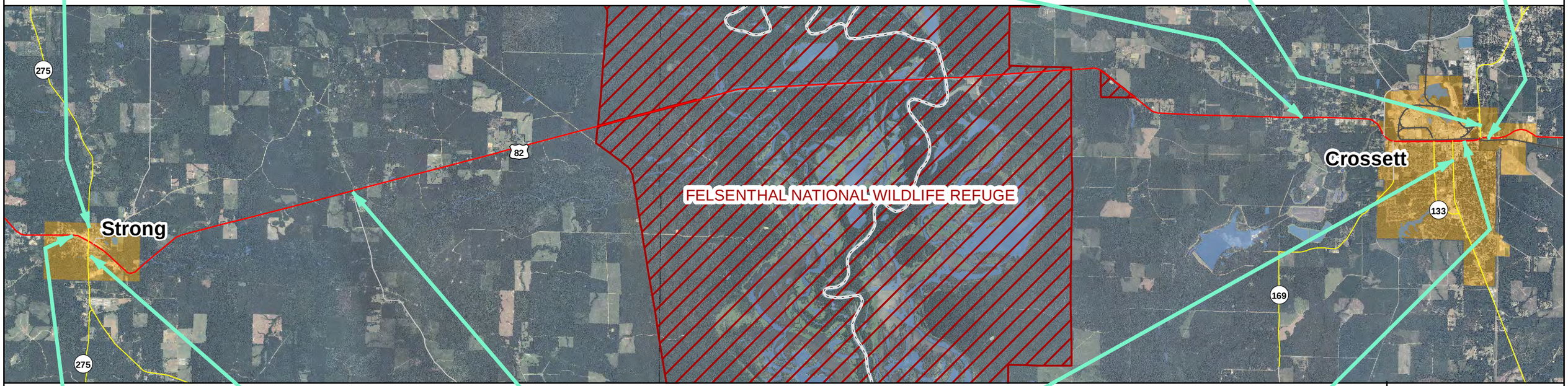
Coordination with local agencies and nearby municipalities would be beneficial and potentially increase visitation and Refuge usage. This coordination could include things such as flyers, mailers, media advertisements, etc. By working with local agencies and municipalities, information about the Refuge and special events can reach a greater number of people, likely increasing Refuge visitation.

5.4.1.5.6 Develop New Trails to Enhance the Visitor Experience

There are few formal trails within the Refuge. Developing new trails would provide visitors access to areas of the Refuge that cannot be easily accessed currently. Using these trails, visitors would be able to access and explore more areas of the Refuge for uses such as hunting, fishing, and wildlife observation.

5.4.1.5.7 Develop a Formal Trail map for the Refuge

There is currently no formal trail map for the Refuge. In addition to the development of new trails, a trail map would be beneficial for visitors by providing them information regarding landmarks and areas of the Refuge can be easily accessed via trail.



Note: The signs shown are for conceptual purposes only and are not to scale. Final sign layouts and dimensions are to be determined by AHTD.

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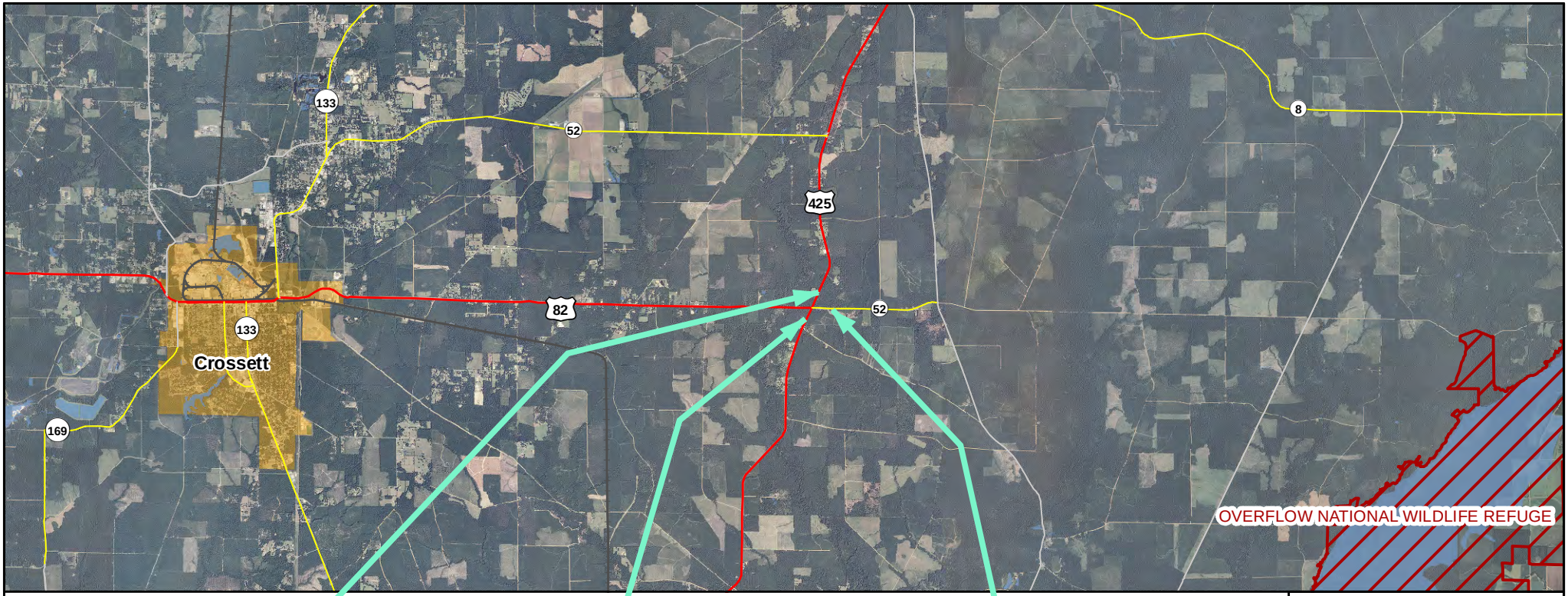
Figure 5.9: Proposed US 82 Signage Plan - West

Felsenthal and Overflow National Wildlife Refuges
Transportation Study
Contract No.: DTFH71-09-D-00001

0 0.5 1 2 3 4 Miles



Legend

- Overflow NWR
- County Boundary
- Municipalities
- US Highway
- State Highway
- Other Road
- Railroad

Source:
Arkansas Geographic Information Office
US Department of Agriculture
US Fish and Wildlife

Note: The signs shown are for conceptual purposes only and are not to scale. Final sign layouts and dimensions are to be determined by AHTD.

U.S. Department of Transportation
Federal Highway Administration

N
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Figure 5.10: Proposed US 82 Signage Plan - East

Felsenthal and Overflow National Wildlife Refuges Transportation Study
Contract No.: DTFH71-09-D-00001

0 0.5 1 2
Miles

5.4.1.5.8 Provide Refuge Information at Visitors Center/Refuge Complex Kiosks

To increase visitor awareness and education at the Refuge, it would be beneficial to provide information regarding such things as permits, trail maps, notes about special events, etc. at the kiosks located at the Visitors Center/Refuge Complex entrances.

5.4.1.5.9 Continue to Pursue Grant Opportunities for Additional Funding Sources

Grants are important opportunities for the Refuge, so it is necessary to continually identify and pursue additional funding sources.

5.4.2 Overflow NWR

For this transportation study, it was decided that all of the preliminary candidate alternatives would be included in the short- and long-range improvement plan. Therefore, the following alternatives for the Overflow NWR are summarized graphically in **Figure 5.2**.

5.4.2.1 No-Build

The "No-Build" alternative provides no improvements to the existing transportation facilities in the study area. This would result in no improvement costs or impacts to the natural environment in the study area. In the No-Build alternative, the existing habitat for the Refuge would not be impacted; however, the potential for issues to occur on the transportation facilities will likely remain the same or increase if no improvements are made.

5.4.2.2 Short-Range Alternatives (2017)

5.4.2.2.1 Alternative O1 – Internal Roadway Condition Maintenance

Continual maintenance of the existing internal roads and trails within the Refuge by adding gravel to unpaved surfaces, where necessary, will improve the quality of the roads and potentially increase safety for drivers. Additionally, managing drainage along unpaved roadways will lengthen the life and durability of the road surface. Potential costs associated with this alternative would vary depending on the type of road and the extent of maintenance required. The responsible partner for this alternative is USFWS.

5.4.2.3 Medium-Range Alternatives (2022)

5.4.2.3.1 Alternative O3 – Auto Tour Route

The implementation of an Auto Tour route on existing Refuge facilities would enhance the visitor experience. The Auto Tour route within the Refuge would include educational/scenic pull-offs along the route. The pull-off areas, signs, etc. should be planned in locations where they can provide an educational opportunity for the visitors, but have limited environmental impacts.

Costs are expected to be limited and are related to planning/design, construction, and maintenance as the route is expected to be planned on existing facilities. Assuming no significant road rehabilitation is needed, the cost is estimated to be $10,000 to $20,000 for limited grading, signage, and gates. The responsible partner for this alternative is USFWS, however, additional local partners would provide

added benefits such as partnering with the Refuge to enhance the educational opportunities and helping with the upkeep of the Auto Tour route monetarily and/or through the development of a volunteer network.

The proposed Auto Tour route is shown in **Figure 5.11** and will consist of a 16-foot wide gravel lane in the one-way sections and a 20-foot wide gravel lane in the two-way sections, there are three scenic pull-offs planned.

5.4.2.4 Additional Recommendations

Seven additional alternatives have been developed that are not anticipated to have direct impacts to the environment.

5.4.2.4.1 Alternative O2 – Establish Agreements for Refuge Access Points

Establishing agreements with private land owners for use of their land/roads will increase access to the Refuge. The Refuge access points through roads on private lands could be memorialized through formal agreements with the private land owners. These formal agreements would establish the access points and provide the opportunity to keep specific access and roadways functional. Additionally, these agreements would likely lead to improvement/maintenance of the roads, benefitting both land owners and Refuge visitors. These access points would also improve connectivity and capacity of the roadways within the Refuge.

The specific terms regarding the access points would be determined during the negotiation of the agreements between USFWS and the private land owners. Responsible partners for this alternative include USFWS and private land owners.

5.4.2.4.2 Install Wayfinding Signs for the Refuge in the Surrounding Area

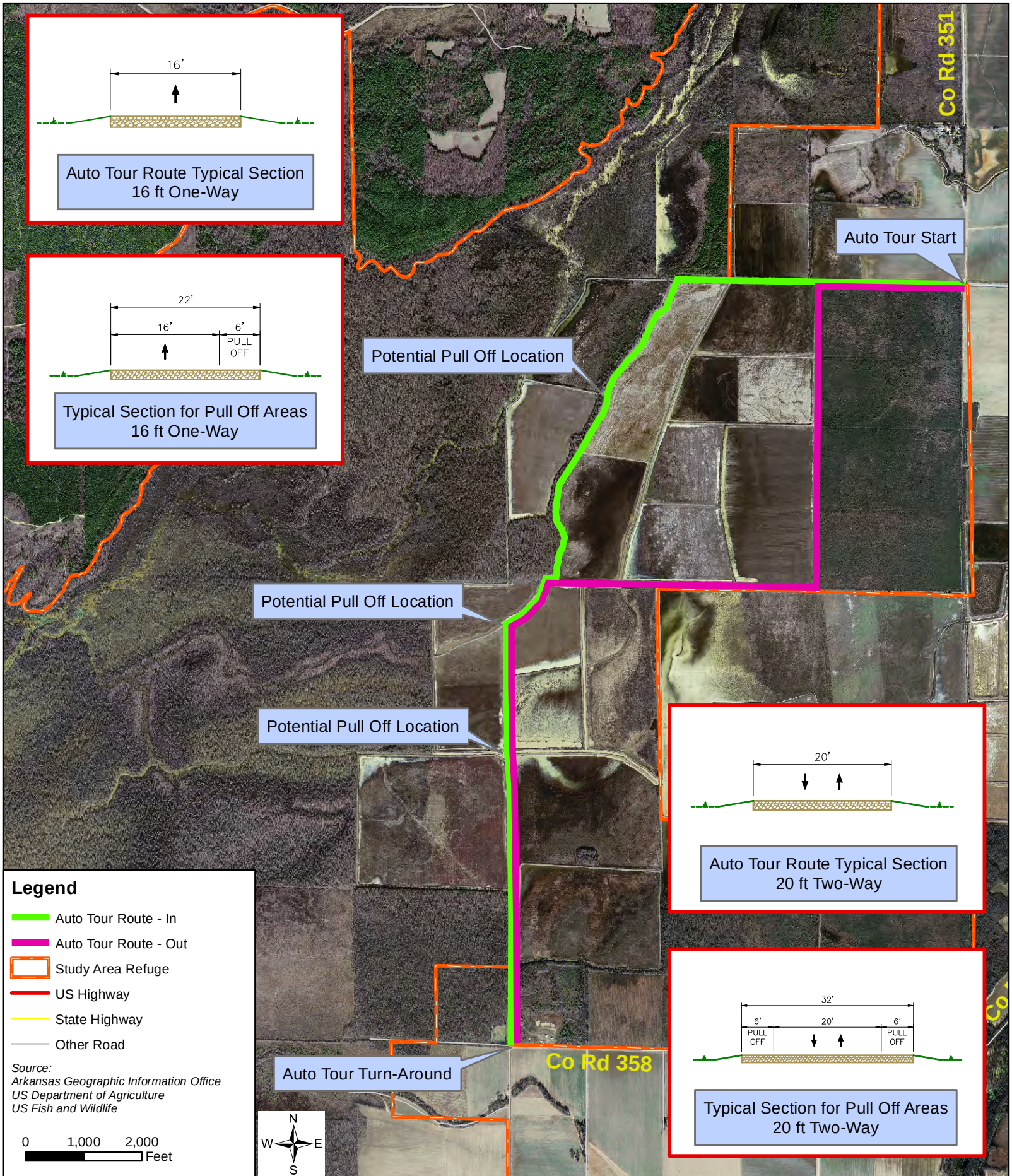
There are several signs in the surrounding areas providing information regarding the Refuge, however they do not include distance information. Adding distance information to the Overflow NWR sign on AR 8 would be beneficial in helping visitors find the Refuge.

5.4.2.4.3 Coordinate with Local Agencies and Municipalities to Encourage Usage of the Refuge

Coordination with local agencies and nearby municipalities would be beneficial and potentially increase visitation and Refuge usage. This coordination could include things such as flyers, mailers, media advertisements, etc. By working with local agencies and municipalities, information about the Refuge and special events can reach a greater number of people, likely increasing Refuge visitation.

5.4.2.4.4 Develop New Trails to Enhance the Visitor Experience

There are few formal trails within the Refuge. Developing new trails would provide visitors access to areas of the Refuge that cannot be easily accessed currently. Using these trails, visitors would be able to access and explore more areas of the Refuge for uses such as hunting, fishing, and wildlife observation and education.



U.S. Department of Transportation
Federal Highway Administration

Figure 5.11: Potential Overflow NWR Auto Tour Route

Felsenthal and Overflow National Wildlife Refuges Transportation Study
Contract No.: DTFH71-09-D-00001

Alternative O3

5.4.2.4.5 Develop a Formal Trail Map for the Refuge

There is currently no formal trail map for the Refuge. In addition to the development of new trails, a trail map would be beneficial for visitors by providing them information regarding landmarks and areas of the Refuge that can be easily accessed via trails.

5.4.2.4.6 Provide Refuge Information at Visitors Center/Refuge Complex Kiosks

To increase visitor awareness and education at the Refuge, it would be beneficial to provide information regarding such things as permits, trail maps, notes about special events, etc. at the kiosks located at the Visitors Center/Refuge Complex entrances.

5.4.2.4.7 Continue to Pursue Grant Opportunities for Additional Funding Sources

Grants are important opportunities for the Refuge, so it is necessary to continually identify and pursue additional funding sources.

6 Preliminary Impact Screening

This section describes the impact screening for the roadway improvement alternatives proposed at the Felsenthal and Overflow NWRs. Impacts are based on the preliminary footprints of the conceptual alternatives previously described.

6.1 Summary of Screening

The following categories were considered during the preliminary impact screening process.

Socioeconomic and Community Features – Socioeconomic composition of affected communities and impacts to community features.

Environmental Justice – Impacts on minority or low-income populations.

Cultural Resources – Impacts to historic or archaeological resources.

Transportation and Safety – Changes in traffic patterns and safety for drivers.

Visitor Use and Experience – Changes to visitor facilities and experience.

General Environmental Impacts – Estimated impacts to the natural environment including wetlands, floodplains, and wildlife habitats.

6.2 Potential Impacts to Existing Conditions

Socioeconomic and Community Features – The Felsenthal and Overflow National Wildlife Refuges are located in Ashley, Bradley, and Union Counties, Arkansas. The majority of alternatives proposed are within the boundaries of the Refuges. It is not expected that any community features will be adversely impacted by these improvements. Two public information meetings have occurred for this project and citizen input on the alternatives has been requested. Advertisement and notification of these meetings has been through press releases and the project specific web page.

Environmental Justice – Although the Refuges are open to all visitors, residents of Ashley, Bradley, and Union counties are more likely to pass through the Refuges. US 82, the main arterial to Felsenthal NWR, functions as both a local and regional facility providing access throughout the area. According to 2010 Census data, 35% of residents in Ashley, Bradley, and Union counties are minorities. The 2010 US Census also indicated that greater than 20% of families and individuals in Ashley, Bradley, and Union Counties are below the poverty level. All three counties exceed the national (13.5%) and state (17.7%) poverty levels. Each of the alternatives proposed occur along existing facilities and do not result in disproportionate impacts to low income or minority populations.

Cultural Resources – There are several archaeological sites and structures of historic importance such as the remains of seasonal fishing camps, temple mounds with ceremonial plazas, and Indian villages. There are no expected impacts to cultural resources for the alternatives considered in this study.

Transportation and Safety – The transportation study area for the project includes US, state and local roads in and around Felsenthal NWR and Overflow NWR. Improvements include turn-lane upgrades, regular roadway maintenance at both Refuges, subbase issues on New Lock 6 Road, and signs related to the Felsenthal NWR's highway advisory radio.

Visitor Use and Experience – Visitor experience will be enhanced by all of the proposed alternatives.

General Environmental Impacts – Based on aerial photographs and GIS land cover mapping, wetlands are located throughout the Felsenthal and Overflow NWRs. Impacts to wetlands are expected to be minimal for all alternatives. Minimal impacts are also expected for wildlife habitats, water bodies, and floodplains for several of the proposed alternatives.

6.3 Potential Impacts of Alternatives

6.3.1 Felsenthal NWR

6.3.1.1 Alternative F1 – Internal Roadway Condition Improvements

Socioeconomic and Community Features – This alternative will not directly impact any residents, communities, or community features.

Environmental Justice – There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative F1.

Transportation and Safety – Continual maintenance of the existing internal roads and trails within the Refuges by adding gravel to unpaved surfaces, where necessary, will improve the quality of the roads. Additionally, managing drainage along unpaved roadways will lengthen the life and durability of the road surface.

Visitor Use and Experience – Improving the condition of roadways in and around the Refuges will enhance the visitor experience by providing better quality roadways for visitors.

General Environmental Impacts – These improvements are expected to have minimal environmental impacts on floodplains and wildlife habitats.

6.3.1.2 Alternative F2 – Westbound Left-Turn Lane at Visitors Center Driveway (US 82)

Socioeconomic and Community Features – By providing a longer deceleration area for left turning vehicles, the traveling public on US 82 will be positively impacted.

Environmental Justice – There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative F2.

Transportation and Safety – Lengthening the westbound left-turn lane storage and taper at the Visitors Center/Refuge Complex driveway will allow left turning vehicles more time and distance to decelerate without impeding the flow of vehicles traveling west along US 82. This alternative is anticipated to improve access to the Refuge and help reduce the potential for rear-end collisions on US 82 at this location.

Visitor Use and Experience – By providing a longer distance for vehicles to decelerate as they turn into the Visitors Center/Refuge Complex, access to the Refuge is improved enhancing the visitor experience.

General Environmental Impacts – This improvement is expected to have minimal environmental impacts on wetlands, floodplains, and wildlife habitats.

6.3.1.3 Alternative F3 – Eastbound Right-Turn Lane Visitors Center Driveway (US 82)

Socioeconomic and Community Features – By providing a deceleration lane for right turning vehicles the traveling public on US 82 will be positively impacted.

Environmental Justice – There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative F3.

Transportation and Safety – Adding an eastbound right-turn lane at the Visitors Center entrance will allow right turning vehicles distance to decelerate without impeding the flow of vehicles traveling east along US 82. This alternative is anticipated to improve access to the Refuge and help reduce the potential for rear-end collisions on US 82.

Visitor Use and Experience – Providing an exclusive lane to decelerate as they prepare to turn into the Visitors Center/Refuge Complex, access to the Refuge is improved and enhances the visitor experience.

General Environmental Impacts – This improvement is expected to have minimal environmental impacts on floodplains and wildlife habitats.

6.3.1.4 Alternative F4 – Channel Maintenance at Boat Ramps

Socioeconomic and Community Features – This alternative will enhance recreational facilities for residents and local communities.

Environmental Justice – There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative F4.

Transportation and Safety – Removing silt by dredging the cuts and sloughs at the Felsenthal Lock and Dam, Shallow Lake, and Pine Island boat ramps will allow boaters to more easily access the channels from the boat ramps.

Visitor Use and Experience – This improvement will enhance the visitor experience by reducing wear and tear on boat equipment and likely increasing boat ramp attractiveness for users.

General Environmental Impacts – The maintenance is expected to have minimal environmental impacts on wetlands, water bodies, and wildlife habitats.

6.3.1.5 Alternatives F6 and F10 – Boat Mooring Locations Feasibility and Installation

Socioeconomic and Community Features – The mooring locations will enhance recreational facilities for residents and local communities.

Environmental Justice – There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternatives F6 and F10.

Transportation and Safety – A feasibility study will determine existing ramp usage, potential benefits, and the attractiveness to users associated with the addition of the potential boat mooring locations. If the feasibility study determines that either of the boat mooring locations are feasible, their installation would provide boaters the opportunity to moor after launching from the boat ramp at the Refuge.

Visitor Use and Experience – Boat mooring locations at the boat ramps would be a convenience for the ramp users and may increase ramp usage and boater visitation of the Refuge.

General Environmental Impacts – The feasibility study will not have any environmental impacts. Should the mooring locations be installed, minimal environmental impacts to water bodies and wildlife habitats are anticipated.

6.3.1.6 Alternative F7 – Auto Tour Route

Socioeconomic and Community Features – This alternative will enhance recreational facilities at the Refuge for residents and local communities.

Environmental Justice – There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative F7.

Transportation and Safety – The Auto Tour route is for educational and visitor experience purposes and will be developed on existing Refuge facilities.

Visitor Use and Experience – The Auto Tour route will include educational/scenic pull-offs in the Refuge, educating users about the Refuge and improving the visitor experience and user satisfaction.

General Environmental Impacts – The addition of the Auto Tour route is expected to have minimal environmental impacts on wetlands, floodplains, and wildlife habitats.

6.3.1.7 Alternative F8 – Bridge Replacement on Bradley County Road 65 S

Socioeconomic and Community Features – This alternative is anticipated to have a positive impact to the community and its residents.

Environmental Justice – This alternative will provide connectivity for vehicles in the area.

Cultural Resources – No impacts are anticipated as a result of Alternative F8.

Transportation and Safety – The replacement of the timber bridge on Bradley County Road 65 S would allow heavier vehicles to cross the bridge providing additional connectivity to the area.

Visitor Use and Experience – The bridge replacement would allow heavier axle loads to access the Refuge via this route.

General Environmental Impacts – It is expected for this bridge to be constructed in place and have minimal impacts on wetlands, floodplains, and wildlife habitats.

6.3.1.8 Alternative F9 – Roadway Improvements on New Lock 6 Road

Socioeconomic and Community Features – This alternative will improve the road accessing the US Army Corps of Engineers' recreational facilities.

Environmental Justice – There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative F9.

Transportation and Safety – Improving the subbase and roadbed support for New Lock 6 Road would increase the quality of the road for all users.

Visitor Use and Experience – The improvement of New Lock 6 Road will improve and preserve the quality of the road for vehicles accessing the Felsenthal Lock and Dam boat ramp.

General Environmental Impacts – The construction associated with the roadway improvement is anticipated to have minimal impacts on wetlands, floodplains, and wildlife habitats.

6.3.2 Overflow NWR

6.3.2.1 Alternative O1 – Internal Roadway Condition Improvements

Socioeconomic and Community Features – This alternative will not directly impact any residents, communities, or community features.

Environmental Justice – There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative O1.

Transportation and Safety – Continual maintenance of the existing internal roads and trails within the Refuges by adding gravel to unpaved surfaces, where necessary, will improve the quality of the roads. Additionally, managing drainage along unpaved roadways will lengthen the life and durability of the road surface.

Visitor Use and Experience – Improving the condition of roadways in and around the Refuges will enhance the visitor experience by providing better quality roadways for visitors.

General Environmental Impacts – These improvements are expected to have minimal environmental impacts on wetlands, floodplains and wildlife habitats.

6.3.2.2 Alternative O3 – Auto Tour Route

Socioeconomic and Community Features – This alternative will enhance recreational facilities at the Refuge for residents and local communities.

Environmental Justice – There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative F7.

Transportation and Safety – The Auto Tour route is for educational and visitor experience purposes and will be developed on existing Refuge facilities.

Visitor Use and Experience – The Auto Tour route will include educational/scenic pull-offs in the Refuge, educating users about the Refuge and improving the visitor experience and user satisfaction.

General Environmental Impacts – The addition of the Auto Tour route is expected to have minimal environmental impacts on wetlands, floodplains, and wildlife habitats.

Table 6.1: Impact Summary								
Impact or Resource Category	**Alternative F2**	**Alternative F3**	**Alternative F4**	**Alternatives F6 and F10**	**Alternative F7**	**Alternative F8**	**Alternative F9**	**Alternative O3**
	WB Left-Turn Lane Improvement	EB Right-Turn Lane Addition	Channel Maintenance at Cuts and Sloughs	Boat Mooring Locations Feasibility Study and Installation	Auto Tour Route	Bradley County Road 65 S Bridge Replacement	New Lock 6 Road Improvements	Auto Tour Route
Socioeconomic and Community Features	Positive impact	Positive impact	Positive impact	Positive impact	Positive impact	Positive impact	Positive impact	Positive impact
Environmental Justice	No impact	No impact	No impact	No impact	No impact	Positive impact	No impact	No impact
Cultural Resources	No impact anticipated	No impact anticipated	No impact anticipated	No impact anticipated	No impact anticipated	No impact anticipated	No impact anticipated	No impact anticipated
Transportation and Safety	Allows left turning vehicles more time and space to decelerate	Allows right turning vehicles more time and space to decelerate	Allows boaters to more quickly and easily access the channels from the boat ramps	Study – N/A Installation - opportunity to moor after launching	N/A	Increases connectivity for users	Improves the road quality for users	N/A
Visitor Use and Experience	Enhances	Enhances	Enhances	Enhances	Enhances	Enhances	Enhances	Enhances
General Environmental Impacts – Wetlands, Floodplains, Water Bodies, and Habitat	Minimal impacts anticipated	Minimal impacts anticipated	Minimal impacts anticipated	Study – N/A Installation – Minimal impacts anticipated	Minimal impacts anticipated	Minimal impacts anticipated	Minimal impacts anticipated	Minimal impacts anticipated

7 Implementation Priorities

Based on the preliminary impacts presented in this report and reflective of the general consensus of local public and agency representatives, the following short-, medium-, and long-range roadway improvement alternatives are recommended:

This report provides refinement and initial screening of the transportation alternatives presented in this study. With the cooperation of project stakeholders these alternatives should be placed on transportation plans and/or scheduled for further study as appropriate. Based on the preliminary impacts presented in this report, the following roadway improvement alternatives are recommended during the following timeframes:

Short-Range (2017) –

Felsenthal NWR

- **Alternative F1** – Continued Maintenance of Internal Roadways
- **Alternative F2 –** Westbound Left-Turn Lane at Visitors Center Driveway (US 82)
- **Alternative F3** – Eastbound Right-Turn Lane at Visitors Center Driveway (US 82)
- **Alternative F4** – Channel Maintenance at Boat Ramps
- **Alternative F6 –** Boat Mooring Locations Feasibility Study
- **Alternative F7 –** Development of an Auto Tour Route

Overflow NWR

- **Alternative O1** – Continued Maintenance of Internal Roadways
- **Alternative O3** – Development of an Auto Tour Route

Medium Range (2022) –

Felsenthal NWR

- **Alternative F8 –** Bridge Replacement on Bradley County Road 65 S
- **Alternative F9 –** Roadway Improvements on New Lock 6 Road

Long Range (2027) –

Felsenthal NWR

- **Alternative F10 –** Installation of Boat Mooring Locations

For the additional alternatives identified in this study, continued cooperation between stakeholders should occur.

8 List of Preparers

Federal Highway Administration

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Jennifer Bihl – *Project Manager*

James Collins – *Project Engineer*

Ryan Wetherell – *Project Engineer*

APPENDIX A

Supporting Documentation and References

List of Supporting Documentation

- *Felsenthal and Overflow National Wildlife Refuges Comprehensive Conservation Plan (CCP)*, U.S. Department of the Interior, Fish and Wildlife Service, Southeast Region, October 2010.
- Timber-Wildlife Management Plan (Revised 1995)
- *Fatality Analysis Reporting System*, National Highway Traffic Safety Administration, Updated annually.
- Area traffic counts, truck percentage data, bridge sufficiency data, planned improvements data, and turn-lane design standards, Arkansas State Highway and Transportation Department.
- 2000 Census Data, U.S. Census Bureau.
- 2010 Census Data, U.S. Census Bureau.
- Felsenthal and Overflow NWR Visitation Data, U.S. Fish and Wildlife Service.
- Felsenthal and Overflow NWR Fact Sheets and Maps, U.S. Fish and Wildlife Service.
- *American Community Survey 5-year Estimates*, 2005-2009
- Notes from discussions with FHWA staff.
- Notes from discussions with stakeholders.
- Site Visit Notes.

References

American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets*, 6th Edition. Washington DC, 2011.

U.S. Department of Transportation, Federal Highway Administration, *Manual on Uniform Traffic Control Devices for Street and Highways*. 2009 Edition with Revision Numbers 1 and 2 incorporated, dated May 2012.

APPENDIX B

Public Involvement Plan

Public Involvement Plan

DTFH71-09-D-00001
TASK ORDER 11-017

FELSENTHAL AND OVERFLOW NATIONAL WILDLIFE REFUGES TRANSPORTATION STUDY
SOUTHEASTERN, ARKANSAS

Prepared for:

FHWA: Eastern Federal Lands Highway Division

Prepared by:

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710 Boundary Street, Suite 1D

Beaufort, SC 29902

February 2012

1. INTRODUCTION

The preparation of a transportation study for the Felsenthal and Overflow National Wildlife Refuges is being performed to develop short- and long-range transportation enhancements for mobility to and within the Refuge.

2. BACKGROUND

2.1. PURPOSE OF PUBLIC INVOLVEMENT

The purpose of the public involvement process is to promote and provide a variety of meaningful forums for citizens to learn about and comment on the project. A list of known stakeholders is detailed later in this plan. The outcome of this effort will be that stakeholders and interested citizens will have had meaningful opportunities to provide input regarding mobility in and around the Felsenthal and Overflow National Wildlife Refuges.

2.2. PUBLIC INVOLVEMENT OBJECTIVES

- Disseminate information about this project to the general public and to directly affected stakeholders.
- Identify and actively solicit input from stakeholder groups affected by and interested in this project.
- Provide a variety of opportunities for public participation and involvement throughout the planning process.

2.3. PRINCIPLES GUIDING THE PUBLIC INVOLVEMENT

The project team recognizes and embraces the important role of public involvement in this project's process. Team members will be guided by the following principles when dealing with constituencies interested in this project:

- Two-way communication (i.e., the free exchange of information, ideas, and values between Federal Highway Administration: Eastern Federal Lands Highway Division (FHWA-EFLHD), US Fish and Wildlife Service (FWS), the Consultant (KHA), and citizens/stakeholders) will be sought. A specific methodology to solidify two-way communication will be established early and used routinely (e-mail contact, comment forms, etc.)

- Project information will be communicated to stakeholders and citizens identified within a defined study area through the website and public meetings.
- Reasonable input from the citizens will be given consideration by the project team.
- Citizen/public questions will be followed up on within two business days. This quick action builds trust and confidence.
- Public involvement activities and input will be documented.
- A series of formal public outreach actions including two public information meetings. Team members will be mindful of non-technical language, different cultures and the need for simple illustrations where possible. In addition, we will avoid the suit-and-tie look by using business-casual attire.
- Opportunities for multiple forms of input will be illustrated from the beginning. Interested citizens will be given the website information and the appropriate FHWA-EFLHD, FWS and KHA contact information.

3. COMMUNICATION STRATEGIES

To be effective, outreach efforts need to be tailored to the needs and concerns of specific constituent groups in a manner conducive to their involvement. Some communications can meet the diverse needs of stakeholders, such as through the use of newspaper columns. Other times, different strategies are more effective in accomplishing study objectives.

The strategies of the public involvement plan are to:

- Establish the need for better connections in clear and concise terms.
- Provide forums to encourage discussion and dialogue between the public and project team members.

4. PUBLIC INVOLVEMENT ACTION STEPS

4.1. INFORMATION GATHERING

4.1.1. PROJECT MAILING LIST AND SOCIAL MEDIA

A project mailing list, prepared by FHWA-EFLHD/FWS, will be used to announce each public information meeting. Citizens who request information about the project will be added to the study's database. The mailing list will be used to distribute targeted information important to the study and to track public comments and questions. A database of mailing addresses will be maintained through the project.

KHA will add the local officials, agencies, and additional citizens to the mailing list.

FWS staff will post meeting notices on the Refuge's Facebook page.

Deliverable: Project mailing list database

Responsible: Maintain and update mailing list – KHA/FWS

4.2. INFORMATION DISTRIBUTION

4.2.1. MEDIA RELATIONS

KHA will develop a draft of black and white text and graphics for newspaper notices to announce the public information meetings. After review and approval by FHWA-EFLHD/FWS, FWS will submit public meeting notices to newspapers to their regular public notification list. The media contact list for the study is shown in Table A-1.

Deliverable: Newspaper notices for public information meetings

Responsible: Newspaper notices – KHA/FWS

4.2.2. PUBLIC INFORMATION MEETINGS

Two public information meetings are planned. The purpose of the first meeting is to present an overview of the project and begin gathering information. The purpose of the second meeting is to share the developed alternatives and receive feedback. Meetings will be structured to provide opportunities for attendees to express their preferences and ideas, both verbally and in writing. Comment sheets will be distributed to obtain input from attendees. Results of the comment sheets will be summarized by KHA for submittal to FHWA-EFLHD/FWS.

The format for the meetings will be an informal walk-in session. Citizens may drop in any time during the workshop. A short powerpoint presentation may be available (on a loop) for viewing to provide general project information. Citizens are then encouraged to view large-scale maps and talk directly with the project team.

Deliverable: Coordination, promotion and hosting of two meetings

Responsible: KHA

4.2.3. STAKEHOLDER MEETINGS

Three stakeholder meetings will be held. The first meeting will explain the project process and identify constraints, key issues and expectations. The second meeting will solicit input from stakeholders on the alternative evaluations. The third meeting will review the results of the alternatives analysis and present final recommendations. A list of potential stakeholders is shown in the Appendix.

Deliverable: Scheduling, development and presentation of project, summary of comments

Responsible: KHA

4.2.4. WEBSITE

Project information will be developed and provided to EFLHD/FWS in pdf format to be posted on FHWA's website. This posted information will be another avenue to disseminate information to the public. Information updates will be provided as appropriate.

Deliverable: Updated information as needed (up to 1 time per month)

Responsible: Review of material– FHWA-EFLHD and FWS

Website Information Updates - KHA

APPENDIX

Table A-1: Media Contact Information		
Media Contact	**Location**	**Email**
Bastrop Daily Enterprise	Bastrop, LA	news@bastropenterprise.com
The News Star	Monroe, LA	news@thenewsstar.com
Ashley County Ledger	Hamburg, AR	editor@ashleycountyledger.com
The Ashley News Observer	Crossett, AR	news@ashleynewsobserver.com
Advance Monticellonian	Monticello, AR	editor@monticellonews.net
Arkansas Democrat-Gazette	Little Rock, AR	news@arkansasonline.com
The Beebe News	Beebe, AR	tbn@beebenews.com
El Dorado News-Times	El Dorado, AR	cqualls@eldoradonews.com
The Benton Courier	Benton, AR	news@bentoncourier.com
The Hope Star	Hope, AR	stephaniehs@hopestar.com
Pine Bluff Commercial	Pine Bluff, AR	pbcnews@pbcommercial.com
KDQN 92.1 - #1 Country	De Queen, AR	numberonecountry@yahoo.com
Eudora Enterprise	Eudora, AR	news@chicotnewspapers.com
Arkansas Game and Fish Commission	Little Rock, AR	kastephens@agfc.state.ar.us
The Ouachita Citizen	West Monroe, LA	news@ouachitacitizen.com
Eagle Democrat	Warren, AR	eaglepub@sbcglobal.net
Salineriverchronicle.com	Warren, AR	salineriverchronicle@gmail.com

Table A-2: Potential Stakeholders				
NAME	**AGENCY & POSITION**	**ADDRESS**	**PHONE**	**EMAIL**
Jo Ann Clark	USFWS, SER Refuge Roads/FLH Program Coordinator	1875 Century Blvd., Ste. 420 Atlanta, GA 30345	404-679-4114	joann_clark@fws.gov
Bernie Petersen	USFWS, Project Leader, South Arkansas Refuge Complex	PO Box 1157 Crossett, Arkansas 71635	870-364-1174	bernie_petersen@fws.gov
Susan Alexander	USFWS, Deputy Project Leader, South Arkansas Refuge Complex	PO Box 1157 Crossett, Arkansas 71635	870-364-1173	susan_alexander@fws.gov
Amanda Wilkinson	USFWS, Public Use Specialist, South Arkansas Refuge Complex	PO Box 1157 Crossett, Arkansas 71635	870-415-0787	amanda_wilkinson@fws.gov
Ross Flagen	USFWS, Overflow NWR Manager	Overflow NWR 3858 Hwy 8E Parkdale, AR 71661	870-473-2869	ross_flagen@fws.gov
Russell Hall	US Senator Mark Pryor's office	The River Market 500 Clinton Ave Ste. 401 Little Rock, AR 72201	501-324-6336	russell_hall@pryor.senate.gov
Gene Higginbotham	US Representative Mike Ross' office	George Howard, Jr. Federal Bldg. 100 East 8th Avenue, Room 2521 Pine Bluff, AR 71601	870-536-3376	gene.higginbotham@mail.house.gov
Jimmy Jeffress	Arkansas Senator	PO Box 904 Crossett, AR 71635	870-364-8291	jimmy.jeffress@arkleg.state.ar.us
Eddie Cheatham	Arkansas House of Representatives	2814 Ashley 239 Crossett, AR 71635	870-364-5659	cheathame@arkleg.state.ar.us
David Henning	Arkansas State Highway and Transportation Department – District 2, District Engineer	4900 Highway 65 S PO Box 6836 Pine Bluff, AR 71611-6836	870-534-1612	david.henning@arkansashighways.com
Carl Bachelor	Arkansas State Highway and Transportation Department – District 7, District Engineer	2245 California Avenue PO Box 897 Camden, AR 71711-0897	870-836-6401	carl.bachelor@arkansashighways.com
Emory Austin	Ashley County Judge	215 East Jefferson Street Hamburg, AR 71646	870-853-2000	N/A
Keith Neely	Bradley County Judge	101 East Cedar Warren, AR 71671	870-226-3853	ktneely@yahoo.com
Mike Loftin	Union County Judge	101 North Washington El Dorado, AR 71730	870-864-1900	mloftin@unioncountyar.com

Table A-2: Potential Stakeholders				
NAME	**AGENCY & POSITION**	**ADDRESS**	**PHONE**	**EMAIL**
Scott McCormick	Town of Crossett, Mayor	PO Box 560 Crossett, AR 71635	870-364-4825	s.mccormick76@yahoo.com
Leonard Watkins	City of Parkdale, Mayor	PO Box 145 Parkdale, AR 71661	870-473-2366	city123@windstream.net
Dane Weindorf	City of Hamburg, Mayor	305 East Adams Hamburg, AR 71646	870-853-5300	daneweindorf@gmail.com
Mike Smith	Crossett Economic Development Foundation	125 Main Street Crossett, AR 71635	870-364-8745	mike@cityofcrossett.net
Richard Magby	Army Corps of Engineers	667 New Lock 6 Road Huttig, AR 71747	870-943-2307	richard.e.magby@usace.army.mil
Pam Ferguson	Crossett Chamber of Commerce	101 West First Avenue Crossett, Arkansas 71635	870-364-6591	pam_ferguson@windstream.net
Richard Stich	Friends of Felsenthal, President	PO Box 717 Crossett, AR 71635	870-567-5471	richard.stich@plumcreek.com
Teresa Walsh	Georgia Pacific	PO Box 3333 Crossett, AR 71635	870-567-8422	teresa.walsh@gapac.com
Tom Tomlinson	Molphus Timberlands	3320 West Hillsboro Street El Dorado, AR 71730	870-862-6700	ttomlinson@molphus.com
Ken McDonald	Plum Creek	128 Main Street Crossett, AR 71635	870-567-5471	ken.mcdonald@plumcreek.com

APPENDIX C

Stakeholder Meeting Notes

Meeting 1: November 8, 2011

Meeting 2: February 28, 2012

Meeting 3: May 3, 2012

Felsenthal/Overflow National Wildlife Refuges Transportation Study
Eastern Federal Lands Highway Division
Federal Highway Administration
Contract No. DTFH71-09-D-00001 Task Order: 11-017

Stakeholder Meeting #1
November 8, 2011, 10:00 AM

Kimley-Horn and Associates, Inc

MEETING NOTES

Attendees:

Stakeholders Present
Russell Hall – Senator Mark Pryor's office
Gene Higginbotham – Congressman Mike Ross' office
Carl Bachelor – Arkansas State Highway and Transportation Department, District 7
Dee Dee Smith – City of Hamburg
Richard Magby – US Army Corps of Engineers
Ronnie Greer – Friends of Felsenthal
Richard Stich – Plum Creek and Friends of Felsenthal
Christi Price – Georgia Pacific
Pam Ferguson – Crossett Chamber
Ken McDonald – Plum Creek

Federal Highway Administration Eastern Federal Lands Highway Division (FHWA EFLHD)
Chris Jaeschke

U.S. Fish and Wildlife Service (FWS)
Bernie Petersen
Susan Alexander
Bill Burchfield
Amanda Wilkinson
Ross Flagen

Kimley-Horn and Associates, Inc. (KHA)
Jennifer Bihl
James Collins

Meeting Summary:

Bernie Petersen welcomed the group and Chris Jaeschke gave an explanation of the Transportation Study for the Felsenthal and Overflow National Wildlife Refuges. Jennifer Bihl then provided a general overview of the study, presented the project schedule, and provided examples of

improvements that were successfully implemented as a result of similar Transportation Studies at other Refuges around the country. This transportation study will summarize the project team's review of the existing conditions and the results of coordination with the Refuges' staff, stakeholders, and the public indentifying transportation improvement opportunities in and around the Refuges. The project will consist of four reports, an existing conditions report, a preliminary candidate alternatives report, a short and long range improvement plans and the transportation study document, summarizing the study. Stakeholders will have the opportunity to review project materials, including draft recommendations and reports throughout the course of the project. The next stakeholder meeting and the first public meeting are tentatively scheduled for February 2012. The final stakeholder meeting and final public meeting are schedule to be held in April 2012. Final project documentation is scheduled to be completed in June 2012. Recommendations are anticipated to be both of a short-term nature, implemented in the next five years, and longer-term nature, beyond the five year horizon.

The stakeholder discussed potential opportunities for transportation improvements around the Refuges that they would like considered in the transportation study. The opportunities and associated discussion are summarized as follows:

- US 82 turn lane improvements at Visitors Center entrance/exit
    - Large number of trucks on US 82 traveling at high speeds – Arkansas State Highway and Transportation Department counts will obtained to determine the percent of trucks on the facility
    - Lengthen WB left-turn lane taper
    - Create EB right-turn lane
    - Potential sight distance issue looking west due to the vertical curve in the roadway
    - Arkansas State Highway and Transportation Department will entertain a request where they investigate whether changes are warranted. They can also conduct a speed study if requested. This will be requested as an action item for the study.
    - Question - Is it possible to relocate the entrance? USFWS – no it cannot be relocated based on land holdings

- Modes of travel reviewed in this study will be mainly vehicle, bicycle, pedestrian, and ATV; however the inclusion of boat access or canoe access opportunities can be noted for future consideration.
    - Boat Access – Potential for boat slip at Crossett Harbor and at ramp near the Town of Felsenthal
    - Canoe Trails – Potential for canoe trails at Felsenthal NWR
    - Handicap accessible trail located at Visitors Center now
    - Potential for trail to hunting/fishing area that is also handicap accessible?

- Transit opportunities
    - Is there potential for a bus service to serve the Refuges from neighboring cities and towns?
    - Arkansas State Highway and Transportation Department has a division that deals directly with bus service. There are opportunities where they would provide the buses to another entity that would then operate and maintain the service. An

example would be Southeast Arkansas Transit provides similar service for hospitals, etc.

- Visitor experience enhancements and education
  - Wildlife observation opportunities/platforms throughout the refuge
  - Enhance walking trails with plant identification markers
  - Enhance signage for trails
  - Potential for auto-tour route at both Refuges with stops along the way
  - Opportunity for bike trail to Crossett RV park
  - Enhance bird watching opportunities at Overflow NWR
  - Mapping of trails at both Refuges
  - Increased publicity for trails at both Refuges

- Access to Overflow NWR
  - Plum Creek roadways provide 95% of the access to the Overflow NWR
  - One of the primary access points on the west is out due to a bridge failure
  - Potential for Plum Creek and Refuge to work together to identify the primary access points and determine what additional steps are needed to maintain access into the future, such as easements.

- Access to Felsenthal NWR
  - Also has access via a number of private roads
  - Review access points and determine what additional steps are needed to maintain access in the future.

- Is there a need for a bike trail from Crossett to Felsenthal NWR?
  - May not get a lot of use
  - Would be adjacent to Hwy 82 with large trucks moving at high speeds
  - Would be better to have a bike trail within the Refuge

- Corps of Engineers Boat Ramp
  - Issues with siltation from ramp to channel
  - Long term need for improvements to access road from the town of Felsenthal to Lock and Dam and boat ramp. Have not been successful with previous grant applications.

- Make improvements that will draw people from other areas
  - Unique and interactive opportunities, ex. Segway trails, long distance trails

- Signage
  - Improve destination signs – in Crossett, Hamburg, and Parkdale and on the north end of Felsenthal NWR, to Eagle Lake, for example
  - Enhance maps to show how people get to various areas and trails

- Crash Data on US 82 – This data will be requested from Arkansas State Highway and Transportation Department for the study.

- Review access roadways north of Felsenthal NWR, there are some bridge issues on Bradley County Roads

- Continue to coordinate with stakeholders and the communities to promote Refuge and the opportunities in the Refuge. The Refuge is a partner in the community.

Jennifer then discussed the next steps. The existing conditions report is being prepared now and will be available for review by the stakeholders on the FHWA EFLHD website.

The next meeting will be in February to discuss draft concepts developed as a result of discussion today and the existing conditions review.

Felsenthal/Overflow National Wildlife Refuges Transportation Study
Eastern Federal Lands Highway Division
Federal Highway Administration
Contract No. DTFH71-09-D-00001 Task Order: 11-017

Stakeholder Meeting #2

February 28, 2012, 2:00 PM

Kimley-Horn and Associates, Inc

MEETING NOTES

Attendees:

Stakeholders Present
David Henning – Arkansas State Highway and Transportation Department
Dane Weindorf – Mayor of Hamburg
Teresa Walsh – Georgia Pacific
Mike Smith – Crossett Economic Development Foundation
Ken McDonald – Plum Creek
Richard Magby – US Army Corps of Engineers
Jim Cutbirth – Georgia Pacific
Scott McCormick – City of Crossett

Federal Highway Administration Eastern Federal Lands Highway Division (FHWA EFLHD)
Chris Jaeschke

U.S. Fish and Wildlife Service (FWS)
Bernie Petersen
Susan Alexander
Ross Flagen

Kimley-Horn and Associates, Inc. (KHA)
Jennifer Bihl
James Collins
Ryan Wetherell

Interested Citizens
Johnnie Bolin – Crossett
Nancy Loon – Crossett

Meeting Summary:

Jennifer Bihl welcomed stakeholders. Comment forms were handed out and reviewed. The project schedule was also reviewed and where we are in the project was discussed, as well as next steps. It was also noted that project documents are available on the Eastern Federal Lands FTP site. Introductions were made of team members and then the attendees introduced themselves. The group then began review of the draft Transportation Recommendations and potential partners. It was noted that in these economic times partnerships in projects is key.

Discussion points:

- Bradley County 65S Bridge Replacement - Currently a timber bridge with significant weight restrictions. The roadway serves timber land and Refuge access. Bradley County replaced a similar bridge last fall on Bradley _____.

- Turn lanes are needed on US 82 –

    - Various stakeholders noted that it is sometimes scary to turn into Refuge.

- New Lock 6 Road Improvement – 3,500 feet on western end of the road in the elevated section – compaction of the fill not sufficient. Richard will send us a copy of their latest grant application.

- Autotour route – A great idea to expose more people to the Refuges.

    - Route would loop and have stops to see things along the way.

    - At Felsenthal NWR, it may require some new roadway to make loop. May be able to use part of Pine Island Road and construct a loop to connect to other roads.

    - Plum Creek may be able to help with a permanent access loop.

    - May include turnouts for historic or natural features. Great opportunities for partnerships.

- Discussed the need for formal trail maps – The Refuge is currently working on this.

- The potential for boat slips –

    - Issues: Fluctuation of water levels and currents. Stakeholders noted issues of boats floating off the ramp unattended with current situation.

- Costs: May be upwards of $150 – 200K to install. This has been pursued before and funding was an issue.
- AHTD has allowed a courtesy dock under bridge.
- Partner with the Friends of Felsenthal on opportunity.
- Game & Fish has recently built a handicap ramp with rail at the Poet of Crossett.

- Refuge access was discussed.
  - Felsenthal NWR
    - Inside Refuge – All roads are owned by the Refuge.
    - West side – Some roads are owned by Plum Creek, some are county roads.
    - On the west side north of US 82 – North Road to Jones Lake Road access to the Refuge is owned by Plum Creek.
    - North Road is a Plum Creek Road with active timbering and trucks.
  - Overflow NWR
    - Inside Refuge – All roads are owned by the Refuge.
    - Access points on the west side of Refuge are by roads owned by Plum Creek.
  - Refuge staff needs to meet with Plum Creek to establish primary access points for the Refuge.

Other Discussion:

- Lack of advertisement from the Parks and Tourism Department for Felsenthal NWR is disappointing. Refuge staff now has a seat on the Arkansas South Tourism Board.
- Are horses allowed at the Refuge? Allowable activities must be wildlife related. A trail ride would not be permitted. All activities are reviewed for six qualifications about intent of use; i.e., hunting, fishing, bird watching, etc.

The Team discussed the materials on the Eastern Federal Lands FTP site, and the project's next steps. There will be three more reports prepared. Examples of these reports from previous studies were shown.

Felsenthal/Overflow National Wildlife Refuges Transportation Study
Eastern Federal Lands Highway Division
Federal Highway Administration
Contract No. DTFH71-09-D-00001 Task Order: 11-017

Stakeholder Meeting #3

May 3, 2012, 2:00 PM

Kimley-Horn and Associates, Inc

MEETING NOTES

Attendees:

Stakeholders Present
Pam Ferguson – Crossett Chamber of Commerce
David Henning – Arkansas State Highway and Transportation Department
Richard Magby – US Army Corps of Engineers
Scott McCormick – City of Crossett
Mike Smith – Crossett Economic Development Foundation
Teresa Walsh – Georgia Pacific

Federal Highway Administration Eastern Federal Lands Highway Division (FHWA EFLHD)
Chris Jaeschke

U.S. Fish and Wildlife Service (FWS)
Susan Alexander
JoAnn Clark
Ross Flagen
Amanda Wilkerson

Kimley-Horn and Associates, Inc. (KHA)
Jennifer Bihl
James Collins
Ryan Wetherell

Meeting Summary:

Jennifer welcomed stakeholders. Chris and Susan provided some opening remarks and thanked the stakeholders for participating in the project. Comment forms were handed out to the attendees. The project schedule and status were reviewed and the remaining steps were outlined. It was also noted that project documents are available on the Eastern Federal Lands FTP site. Introductions were made of team members and then the attendees introduced themselves. The group then began review of the transportation recommendations and partners. It was noted that in these economic times partnering is key to project implementation.

Discussion points:

- Turn lanes at the Refuge's Visitor Center were reviewed and discussion occurred regarding the proposed addition of a right-turn lane and lengthening of the taper and storage for the left-turn lane.

- The proposed sloughs where regular dredging activities should be considered along with the proposed mooring locations were reviewed with the stakeholders.

- The conceptual alignment and opportunity for the auto tour route with pull off locations were reviewed for Overflow. It was noted that edits to the alignment and pull off locations were likely going to be made based on a more detailed review of the alignment by Refuge staff, however the opportunities continue to exist and the ability to implement the route would require limited improvements within the Refuge

- Jennifer shared that the route within Felsenthal was still being developed and likely would not be completed in time for inclusion in this report, but that the general concept of an auto tour route within Felsenthal would be noted.

- The recommended improvements to New Lock 6 Road were discussed. Richard Magby confirmed that recent activities had put a band aid type of fix on the issue and provided a top dressing to the roadway shoulders providing stability in the short-term, but that the cause of the issues was not addressed and that the reconstructive improvements previously identified were still needed.

- The proposed bridge replacement on Bradley County Road 65S was reviewed as a recommended improvement that was needed for the long-term accessibility along that stretch of road.

Other Discussion:

- Safety along US 82 was discussed, particularly relative to those two or three times a year that a major bass tournament is being held and the boaters are backed up in the dark, wee

hours of the morning onto US 82 waiting to turn onto the roadway leading to the boat ramp at either the Old Beer Joint or Port of Crossett. Both of which are near the bridge over the Ouachita River, which limits sight distance along US 82. Additionally, many driving along US 82 appear to be exceeding the speed limit, which presents additional safety issues during these events.
    - Was recommended that AHTD and Refuge staff work on a plan for placing temporary variable message signs on US 82 east and west of the entrance prior to and on the days of those major events to warn motorists of the possibility for congestion ahead.
    - David was looking into his opportunities for assisting with the placing of the signs
- Statements about the need for turn lanes at other major access locations, such as the Old Beer Joint and the RV park were noted.
    - David noted that a corridor study for US 82 from El Dorado to Lake Village was being completed and included this section of US 82 and these statements would be shared with the project team completing that study.
- It was requested that walking and biking trails be formalized and that a map be prepared to identify these routes. Refuge staff indicated they were working on these sorts of visitor experience tools.
- Discussion occurred regarding tourism at the refuges and it was noted that the openness of refuges was changing to be more accepting of visitors to experience the facilities and that plans and communications were being developed and rolled out to encourage a broader spectrum of users.
- Enforcement of speeds along US 82 occurs on a regular basis through police patrol and citations; however this does not deter speeding due to the nature and visibility along the roadway.
- Staff noted that a gate was being installed on the access to the Old Beer Joint, so that the parking and ramp facilities could be closed during high water events.
- David is ready to assist with the signing for Felsenthal and Overflow and suggested that the sign plan show the signs on the same posts with the green signs, but below them on a brown destination board.
    - The Refuge would be responsible for reimbursement of AHTD for the capital investment of producing the signs, but future maintenance of the sign would be addressed by AHTD. David was going to estimate the cost of the signs for Susan's budgetary uses.
    - A sign will be added to the plan for the Old Beer Joint access to assist users identify the location of the access as it is difficult to see as one approaches due to the topography.

APPENDIX D

Supporting Data Tables

U.S. Census Bureau
American FactFinder

C17002. RATIO OF INCOME TO POVERTY LEVEL IN THE PAST 12 MONTHS - Universe: POPULATION FOR WHOM POVERTY STATUS IS DETERMINED
Data Set: 2005-2009 American Community Survey 5-Year Estimates
Survey: American Community Survey

NOTE. Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

For information on confidentiality protection, sampling error, nonsampling error, and definitions, see Survey Methodology.

	United States		Arkansas		Louisiana		Ashley County, Arkansas		Bradley County, Arkansas	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	293,507,923	+/-15,551	2,755,680	+/-1,171	4,285,810	+/-1,068	21,637	+/-848	11,856	+/-173
Under .50	17,124,388	+/-123,530	194,770	+/-5,149	336,474	+/-8,572	1,485	+/-442	1,720	+/-746
.50 to .99	22,412,852	+/-139,923	294,018	+/-6,457	453,160	+/-7,946	2,908	+/-616	2,420	+/-835
1.00 to 1.24	12,916,533	+/-69,974	166,180	+/-5,030	228,620	+/-6,442	1,369	+/-420	849	+/-254
1.25 to 1.49	13,265,892	+/-65,424	163,597	+/-4,598	224,763	+/-6,510	1,354	+/-419	1,006	+/-366
1.50 to 1.84	18,480,297	+/-75,034	219,694	+/-6,052	291,882	+/-6,174	2,388	+/-479	827	+/-327
1.85 to 1.99	7,985,406	+/-41,799	94,379	+/-3,738	123,882	+/-4,748	1,129	+/-475	287	+/-150
2.00 and over	201,322,555	+/-432,726	1,623,042	+/-10,757	2,627,029	+/-13,056	11,004	+/-790	4,747	+/-1,189

Source: U.S. Census Bureau, 2005-2009 American Community Survey

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

While the 2005-2009 American Community Survey (ACS) data generally reflect the November 2008 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2000 data. Boundaries for urban areas have not been updated since Census 2000. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Explanation of Symbols:
1. An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.

B19013. MEDIAN HOUSEHOLD INCOME IN THE PAST 12 MONTHS (IN 2009 INFLATION-ADJUSTED DOLLARS) - Universe: HOUSEHOLDS
Data Set: 2005-2009 American Community Survey 5-Year Estimates
Survey: American Community Survey

NOTE. Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

For information on confidentiality protection, sampling error, nonsampling error, and definitions, see Survey Methodology.

	United States		Arkansas		Louisiana		Ashley County, Arkansas		Bradley County, Arkansas	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Median household income in the past 12 months (in 2009 inflation-adjusted dollars)	51,425	+/-83	38,542	+/-288	42,167	+/-259	33,007	+/-2,200	26,207	+/-3,273

Source: U.S. Census Bureau, 2005-2009 American Community Survey

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of

the Data). The effect of nonsampling error is not represented in these tables.

While the 2005-2009 American Community Survey (ACS) data generally reflect the November 2008 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2000 data. Boundaries for urban areas have not been updated since Census 2000. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Explanation of Symbols:
1. An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
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Standard Error/Variance documentation for this dataset:
Accuracy of the Data

U.S. Census Bureau
American FactFinder

C17002. RATIO OF INCOME TO POVERTY LEVEL IN THE PAST 12 MONTHS - Universe: POPULATION FOR WHOM POVERTY STATUS IS DETERMINED
Data Set: 2005-2009 American Community Survey 5-Year Estimates
Survey: American Community Survey

NOTE. Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

For information on confidentiality protection, sampling error, nonsampling error, and definitions, see Survey Methodology.

	Union County, Arkansas		Morehouse Parish, Louisiana		Union Parish, Louisiana		Crossett city, Arkansas		Hamburg city, Arkansas	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	42,226	+/-538	27,856	+/-296	22,393	+/-243	4,872	+/-846	2,734	+/-20
Under .50	4,226	+/-820	4,176	+/-792	2,250	+/-517	263	+/-192	162	+/-128
.50 to .99	4,488	+/-731	3,693	+/-729	2,635	+/-729	1,047	+/-398	646	+/-251
1.00 to 1.24	2,973	+/-615	1,176	+/-333	1,181	+/-328	233	+/-172	151	+/-99
1.25 to 1.49	2,164	+/-492	1,574	+/-355	1,172	+/-393	224	+/-177	141	+/-129
1.50 to 1.84	3,786	+/-659	2,835	+/-669	1,331	+/-402	567	+/-283	337	+/-166
1.85 to 1.99	803	+/-275	838	+/-415	1,115	+/-447	57	+/-78	80	+/-82
2.00 and over	23,786	+/-1,100	13,564	+/-792	12,709	+/-858	2,481	+/-608	1,217	+/-195

Source: U.S. Census Bureau, 2005-2009 American Community Survey

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

While the 2005-2009 American Community Survey (ACS) data generally reflect the November 2008 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2000 data. Boundaries for urban areas have not been updated since Census 2000. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

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B19013. MEDIAN HOUSEHOLD INCOME IN THE PAST 12 MONTHS (IN 2009 INFLATION-ADJUSTED DOLLARS) - Universe: HOUSEHOLDS
Data Set: 2005-2009 American Community Survey 5-Year Estimates
Survey: American Community Survey

NOTE. Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

For information on confidentiality protection, sampling error, nonsampling error, and definitions, see Survey Methodology.

	Union County, Arkansas		Morehouse Parish, Louisiana		Union Parish, Louisiana		Crossett city, Arkansas		Hamburg city, Arkansas	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Median household income in the past 12 months (in 2009 inflation-adjusted dollars)	35,732	+/-2,238	31,264	+/-1,696	35,788	+/-2,923	25,889	+/-4,641	30,469	+/-6,718

Source: U.S. Census Bureau, 2005-2009 American Community Survey

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

While the 2005-2009 American Community Survey (ACS) data generally reflect the November 2008 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2000 data. Boundaries for urban areas have not been updated since Census 2000. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

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Standard Error/Variance documentation for this dataset:
Accuracy of the Data

U.S. Census Bureau
American FactFinder

C17002. RATIO OF INCOME TO POVERTY LEVEL IN THE PAST 12 MONTHS - Universe: POPULATION FOR WHOM POVERTY STATUS IS DETERMINED

Data Set: 2005-2009 American Community Survey 5-Year Estimates
Survey: American Community Survey

NOTE. Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

For information on confidentiality protection, sampling error, nonsampling error, and definitions, see Survey Methodology.

	Strong city, Arkansas	
	Estimate	Margin of Error
Total:	249	+/-92
Under .50	24	+/-26
.50 to .99	24	+/-27
1.00 to 1.24	15	+/-28
1.25 to 1.49	34	+/-31
1.50 to 1.84	52	+/-54
1.85 to 1.99	0	+/-119
2.00 and over	100	+/-51

Source: U.S. Census Bureau, 2005-2009 American Community Survey

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

While the 2005-2009 American Community Survey (ACS) data generally reflect the November 2008 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2000 data. Boundaries for urban areas have not been updated since Census 2000. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

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B19013. MEDIAN HOUSEHOLD INCOME IN THE PAST 12 MONTHS (IN 2009 INFLATION-ADJUSTED DOLLARS) - Universe: HOUSEHOLDS

Data Set: 2005-2009 American Community Survey 5-Year Estimates
Survey: American Community Survey

NOTE. Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

For information on confidentiality protection, sampling error, nonsampling error, and definitions, see Survey Methodology.

	Strong city, Arkansas	
	Estimate	Margin of Error
Median household income in the past 12 months (in 2009 inflation-adjusted dollars)	26,250	+/-8,278

Source: U.S. Census Bureau, 2005-2009 American Community Survey

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

While the 2005-2009 American Community Survey (ACS) data generally reflect the November 2008 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2000 data. Boundaries for urban areas have not been updated since Census 2000. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

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Standard Error/Variance documentation for this dataset:
Accuracy of the Data

U.S. Census Bureau
American FactFinder

B17001. POVERTY STATUS IN THE PAST 12 MONTHS BY SEX BY AGE - Universe: POPULATION FOR WHOM POVERTY STATUS IS DETERMINED
Data Set: 2005-2009 American Community Survey 5-Year Estimates
Survey: American Community Survey

NOTE. Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

For information on confidentiality protection, sampling error, nonsampling error, and definitions, see Survey Methodology.

	United States		Arkansas		Louisiana		Ashley County, Arkansas		Bradley County, Arkansas	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	293,507,923	+/-15,551	2,755,680	+/-1,171	4,285,810	+/-1,068	21,637	+/-848	11,856	+/-173
Income in the past 12 months below poverty level:	39,537,240	+/-250,842	488,788	+/-8,350	789,634	+/-11,838	4,393	+/-686	4,140	+/-1,382
Male:	17,404,017	+/-121,411	212,199	+/-4,366	327,541	+/-6,258	1,865	+/-403	2,209	+/-878
Under 5 years	2,246,058	+/-24,934	28,959	+/-1,303	45,760	+/-1,684	179	+/-96	217	+/-73
5 years	387,217	+/-5,900	4,968	+/-464	8,672	+/-782	0	+/-119	85	+/-68
6 to 11 years	2,180,473	+/-22,990	29,527	+/-1,235	47,762	+/-1,914	242	+/-92	196	+/-73
12 to 14 years	1,021,800	+/-11,500	12,266	+/-718	21,441	+/-1,201	144	+/-76	36	+/-37
15 years	360,373	+/-5,273	4,080	+/-482	7,045	+/-542	18	+/-24	11	+/-13
16 and 17 years	671,257	+/-7,114	7,701	+/-646	13,953	+/-974	74	+/-51	20	+/-25
18 to 24 years	2,636,966	+/-17,239	28,796	+/-1,388	49,916	+/-2,132	307	+/-202	278	+/-204
25 to 34 years	2,052,232	+/-15,047	25,636	+/-1,453	30,968	+/-1,350	162	+/-107	543	+/-357
35 to 44 years	1,784,478	+/-16,228	21,192	+/-1,129	26,897	+/-1,312	198	+/-89	426	+/-237
45 to 54 years	1,721,899	+/-13,923	20,081	+/-928	31,194	+/-1,365	264	+/-83	189	+/-152
55 to 64 years	1,221,965	+/-11,321	15,425	+/-732	23,413	+/-1,037	184	+/-80	142	+/-160
65 to 74 years	603,536	+/-5,225	7,100	+/-536	11,603	+/-674	28	+/-21	35	+/-31
75 years and over	515,763	+/-5,002	6,468	+/-450	8,917	+/-562	65	+/-51	31	+/-28
Female:	22,133,223	+/-133,914	276,589	+/-4,960	462,093	+/-6,792	2,528	+/-375	1,931	+/-546
Under 5 years	2,172,424	+/-23,155	28,519	+/-1,203	45,210	+/-1,629	223	+/-50	238	+/-103
5 years	373,941	+/-5,320	4,804	+/-521	9,062	+/-775	98	+/-83	0	+/-119
6 to 11 years	2,111,885	+/-23,991	28,114	+/-1,348	46,104	+/-1,846	267	+/-106	170	+/-105
12 to 14 years	992,831	+/-11,853	12,187	+/-661	22,271	+/-1,035	61	+/-50	77	+/-65
15 years	348,452	+/-4,741	3,954	+/-383	7,374	+/-675	70	+/-60	8	+/-9
16 and 17 years	691,091	+/-7,805	9,393	+/-658	13,928	+/-744	82	+/-46	71	+/-71
18 to 24 years	3,415,171	+/-16,005	38,090	+/-1,573	73,487	+/-2,164	393	+/-151	193	+/-79
25 to 34 years	3,231,361	+/-23,404	41,804	+/-1,487	65,256	+/-1,844	327	+/-101	300	+/-112
35 to 44 years	2,566,593	+/-22,348	28,721	+/-1,289	49,844	+/-1,677	274	+/-93	109	+/-73
45 to 54 years	2,137,461	+/-17,274	26,521	+/-1,160	45,491	+/-1,674	340	+/-98	298	+/-236
55 to 64 years	1,636,813	+/-11,738	20,480	+/-848	35,067	+/-1,193	153	+/-63	159	+/-168
65 to 74 years	1,056,243	+/-5,863	14,051	+/-653	22,738	+/-902	76	+/-44	146	+/-139
75 years and over	1,398,957	+/-8,675	19,951	+/-892	26,261	+/-1,019	164	+/-92	162	+/-61
Income in the past 12 months at or above poverty level:	253,970,683	+/-261,705	2,266,892	+/-8,577	3,496,176	+/-11,825	17,244	+/-944	7,716	+/-1,413
Male:	126,523,466	+/-128,282	1,130,260	+/-4,859	1,740,692	+/-6,279	8,759	+/-462	3,810	+/-867
Under 5 years	8,253,489	+/-25,433	70,809	+/-1,257	110,579	+/-1,767	489	+/-96	244	+/-47
5 years	1,588,955	+/-9,989	14,510	+/-886	20,604	+/-1,162	97	+/-55	48	+/-36
6 to 11 years	9,875,803	+/-25,283	87,092	+/-1,743	134,427	+/-2,221	722	+/-157	260	+/-85
12 to 14 years	5,256,613	+/-16,438	43,470	+/-1,284	72,458	+/-1,864	405	+/-96	145	+/-65
15 years	1,816,107	+/-8,125	16,233	+/-697	25,443	+/-952	110	+/-40	65	+/-38
16 and 17 years	3,662,772	+/-9,661	32,854	+/-898	52,598	+/-1,268	346	+/-57	166	+/-83
18 to 24 years	11,056,411	+/-16,708	93,393	+/-1,420	175,074	+/-1,836	557	+/-133	79	+/-145
25 to 34 years	17,783,656	+/-17,579	155,796	+/-1,556	241,724	+/-1,931	1,163	+/-229	381	+/-201
35 to 44 years	19,063,617	+/-18,299	159,522	+/-1,327	247,660	+/-1,435	1,224	+/-145	525	+/-235
45 to 54 years	19,398,444	+/-17,680	168,549	+/-1,146	267,544	+/-1,522	1,322	+/-96	634	+/-189
55 to 64 years	14,317,270	+/-12,617	137,782	+/-934	199,349	+/-1,085	1,181	+/-80	527	+/-161
65 to 74 years	8,281,353	+/-5,744	88,502	+/-673	114,938	+/-743	875	+/-60	420	+/-56
75 years and over	6,168,976	+/-5,516	61,748	+/-569	78,294	+/-753	268	+/-232	316	+/-45
Female:	127,447,217	+/-138,354	1,136,632	+/-5,097	1,755,484	+/-6,984	8,485	+/-578	3,906	+/-592
Under 5 years	7,865,763	+/-24,309	66,677	+/-1,302	103,710	+/-1,689	478	+/-87	116	+/-69
5 years	1,528,879	+/-9,646	13,078	+/-752	22,510	+/-1,030	57	+/-57	37	+/-37
6 to 11 years	9,393,512	+/-28,618	82,586	+/-1,460	125,382	+/-2,043	599	+/-131	355	+/-87
12 to 14 years	4,984,504	+/-16,497	42,246	+/-1,197	68,178	+/-1,650	369	+/-124	118	+/-60
15 years	1,725,768	+/-6,885	14,640	+/-650	23,399	+/-1,120	231	+/-92	48	+/-28
16 and 17 years	3,454,552	+/-9,703	30,143	+/-787	50,059	+/-1,010	211	+/-66	80	+/-40
18 to 24 years	9,743,603	+/-14,342	82,318	+/-1,556	147,752	+/-2,121	470	+/-140	148	+/-69
25 to 34 years	16,553,243	+/-24,998	144,801	+/-1,507	227,471	+/-2,153	1,030	+/-122	401	+/-59

35 to 44 years	18,694,939	+/-24,385	159,504	+/-1,397	249,472	+/-1,762	1,253	+/-118	631	+/-109
45 to 54 years	19,940,647	+/-19,795	173,827	+/-1,129	279,997	+/-1,757	1,189	+/-98	586	+/-220
55 to 64 years	15,171,205	+/-12,953	145,674	+/-976	211,249	+/-1,259	1,299	+/-63	582	+/-112
65 to 74 years	9,396,764	+/-6,856	96,842	+/-859	131,553	+/-1,000	634	+/-231	343	+/-209
75 years and over	8,993,838	+/-10,446	84,296	+/-931	114,752	+/-1,143	665	+/-145	461	+/-107

Source: U.S. Census Bureau, 2005-2009 American Community Survey

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Standard Error/Variance documentation for this dataset:
Accuracy of the Data

U.S. Census Bureau
American FactFinder

B17001. POVERTY STATUS IN THE PAST 12 MONTHS BY SEX BY AGE - Universe: POPULATION FOR WHOM POVERTY STATUS IS DETERMINED
Data Set: 2005-2009 American Community Survey 5-Year Estimates
Survey: American Community Survey

NOTE. Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

For information on confidentiality protection, sampling error, nonsampling error, and definitions, see Survey Methodology.

	Union County, Arkansas		Morehouse Parish, Louisiana		Union Parish, Louisiana		Crossett city, Arkansas		Hamburg city, Arkansas	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	42,226	+/-538	27,856	+/-296	22,393	+/-243	4,872	+/-846	2,734	+/-20
Income in the past 12 months below poverty level:	8,714	+/-755	7,869	+/-813	4,885	+/-744	1,310	+/-413	808	+/-268
Male:	3,730	+/-403	3,364	+/-399	2,102	+/-404	504	+/-258	366	+/-168
Under 5 years	467	+/-133	323	+/-130	335	+/-122	64	+/-79	6	+/-12
5 years	167	+/-80	89	+/-60	6	+/-9	0	+/-119	0	+/-119
6 to 11 years	555	+/-125	596	+/-138	369	+/-148	44	+/-42	62	+/-63
12 to 14 years	304	+/-124	302	+/-100	219	+/-105	71	+/-56	58	+/-62
15 years	72	+/-47	114	+/-76	134	+/-92	11	+/-20	7	+/-12
16 and 17 years	156	+/-83	103	+/-53	110	+/-93	5	+/-9	8	+/-13
18 to 24 years	587	+/-164	333	+/-143	139	+/-106	205	+/-184	27	+/-30
25 to 34 years	263	+/-117	427	+/-140	188	+/-95	10	+/-16	62	+/-72
35 to 44 years	350	+/-138	350	+/-155	142	+/-99	15	+/-25	14	+/-16
45 to 54 years	414	+/-116	270	+/-97	162	+/-89	58	+/-42	104	+/-81
55 to 64 years	234	+/-111	186	+/-80	158	+/-86	13	+/-20	10	+/-17
65 to 74 years	73	+/-41	98	+/-49	50	+/-37	0	+/-119	5	+/-8
75 years and over	88	+/-49	173	+/-53	90	+/-44	8	+/-17	3	+/-7
Female:	4,984	+/-488	4,505	+/-517	2,783	+/-417	806	+/-234	442	+/-163
Under 5 years	553	+/-106	534	+/-99	184	+/-68	110	+/-78	49	+/-52
5 years	60	+/-74	20	+/-31	111	+/-83	0	+/-119	16	+/-26
6 to 11 years	285	+/-116	512	+/-138	87	+/-80	66	+/-57	53	+/-46
12 to 14 years	272	+/-115	251	+/-96	236	+/-124	11	+/-18	24	+/-36
15 years	38	+/-43	65	+/-47	20	+/-24	23	+/-30	0	+/-119
16 and 17 years	189	+/-73	192	+/-83	111	+/-70	24	+/-33	0	+/-119
18 to 24 years	901	+/-122	280	+/-103	239	+/-116	227	+/-122	79	+/-87
25 to 34 years	438	+/-136	725	+/-159	457	+/-133	92	+/-66	50	+/-43
35 to 44 years	522	+/-122	388	+/-109	348	+/-143	55	+/-43	25	+/-30
45 to 54 years	612	+/-157	468	+/-128	239	+/-105	84	+/-65	82	+/-62
55 to 64 years	525	+/-109	382	+/-107	236	+/-76	29	+/-30	30	+/-22
65 to 74 years	178	+/-64	272	+/-87	203	+/-59	26	+/-29	9	+/-9
75 years and over	411	+/-109	416	+/-93	312	+/-114	59	+/-60	25	+/-38
Income in the past 12 months at or above poverty level:	33,512	+/-914	19,987	+/-839	17,508	+/-750	3,562	+/-782	1,926	+/-268
Male:	16,259	+/-600	9,864	+/-403	8,792	+/-382	1,773	+/-397	891	+/-164
Under 5 years	1,013	+/-140	691	+/-130	422	+/-103	64	+/-42	89	+/-39
5 years	227	+/-107	77	+/-55	71	+/-49	41	+/-47	5	+/-8
6 to 11 years	1,019	+/-157	663	+/-162	586	+/-149	79	+/-66	80	+/-48
12 to 14 years	617	+/-130	321	+/-89	303	+/-108	50	+/-49	10	+/-12
15 years	389	+/-108	245	+/-104	126	+/-77	6	+/-11	14	+/-17
16 and 17 years	432	+/-98	219	+/-101	118	+/-60	106	+/-64	49	+/-39
18 to 24 years	1,220	+/-179	949	+/-155	787	+/-106	133	+/-95	55	+/-50
25 to 34 years	1,896	+/-218	1,013	+/-161	1,135	+/-109	256	+/-181	113	+/-52
35 to 44 years	2,291	+/-140	1,410	+/-182	1,212	+/-92	209	+/-106	162	+/-64
45 to 54 years	2,623	+/-153	1,519	+/-115	1,469	+/-86	230	+/-99	105	+/-59
55 to 64 years	2,205	+/-115	1,386	+/-77	1,216	+/-98	290	+/-95	82	+/-42
65 to 74 years	1,321	+/-49	807	+/-61	846	+/-45	244	+/-81	76	+/-35
75 years and over	1,006	+/-93	564	+/-63	501	+/-51	65	+/-78	51	+/-56
Female:	17,253	+/-502	10,123	+/-543	8,716	+/-446	1,789	+/-438	1,035	+/-162
Under 5 years	910	+/-131	429	+/-96	557	+/-57	70	+/-55	57	+/-41
5 years	236	+/-93	153	+/-102	88	+/-55	0	+/-119	11	+/-13
6 to 11 years	1,235	+/-188	641	+/-117	556	+/-146	98	+/-60	81	+/-48
12 to 14 years	700	+/-172	329	+/-104	322	+/-135	115	+/-69	64	+/-48
15 years	178	+/-95	135	+/-73	133	+/-63	55	+/-44	74	+/-65
16 and 17 years	506	+/-81	237	+/-87	223	+/-65	52	+/-38	8	+/-11

18 to 24 years	886	+/-124	965	+/-103	696	+/-117	131	+/-91	59	+/-50
25 to 34 years	2,055	+/-159	1,034	+/-159	980	+/-109	161	+/-89	101	+/-51
35 to 44 years	2,342	+/-132	1,480	+/-109	1,090	+/-118	183	+/-79	211	+/-89
45 to 54 years	2,719	+/-160	1,722	+/-131	1,509	+/-92	291	+/-107	93	+/-49
55 to 64 years	2,058	+/-110	1,314	+/-109	1,209	+/-75	318	+/-109	112	+/-48
65 to 74 years	1,594	+/-77	935	+/-87	844	+/-73	164	+/-83	79	+/-43
75 years and over	1,834	+/-149	749	+/-142	509	+/-121	151	+/-95	85	+/-54

Source: U.S. Census Bureau, 2005-2009 American Community Survey

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

While the 2005-2009 American Community Survey (ACS) data generally reflect the November 2008 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2000 data. Boundaries for urban areas have not been updated since Census 2000. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Explanation of Symbols:
1. An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.

Standard Error/Variance documentation for this dataset:
Accuracy of the Data

U.S. Census Bureau
American FactFinder

B17001. POVERTY STATUS IN THE PAST 12 MONTHS BY SEX BY AGE - Universe: POPULATION FOR WHOM POVERTY STATUS IS DETERMINED
Data Set: 2005-2009 American Community Survey 5-Year Estimates
Survey: American Community Survey

NOTE. Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

For information on confidentiality protection, sampling error, nonsampling error, and definitions, see Survey Methodology.

	Strong city, Arkansas	
	Estimate	Margin of Error
Total:	249	+/-92
Income in the past 12 months below poverty level:	48	+/-38
Male:	25	+/-23
Under 5 years	4	+/-8
5 years	0	+/-119
6 to 11 years	0	+/-119
12 to 14 years	0	+/-119
15 years	0	+/-119
16 and 17 years	4	+/-8
18 to 24 years	12	+/-15
25 to 34 years	0	+/-119
35 to 44 years	0	+/-119
45 to 54 years	5	+/-9
55 to 64 years	0	+/-119
65 to 74 years	0	+/-119
75 years and over	0	+/-119
Female:	23	+/-18
Under 5 years	0	+/-119
5 years	0	+/-119
6 to 11 years	0	+/-119
12 to 14 years	0	+/-119
15 years	0	+/-119
16 and 17 years	0	+/-119
18 to 24 years	13	+/-14
25 to 34 years	0	+/-119
35 to 44 years	3	+/-5
45 to 54 years	4	+/-6
55 to 64 years	3	+/-6
65 to 74 years	0	+/-119
75 years and over	0	+/-119
Income in the past 12 months at or above poverty level:	201	+/-86
Male:	102	+/-45
Under 5 years	0	+/-119
5 years	0	+/-119
6 to 11 years	8	+/-14
12 to 14 years	9	+/-10
15 years	4	+/-6
16 and 17 years	5	+/-7
18 to 24 years	0	+/-119
25 to 34 years	6	+/-7
35 to 44 years	14	+/-17
45 to 54 years	20	+/-13
55 to 64 years	8	+/-11
65 to 74 years	28	+/-24
75 years and over	0	+/-119
Female:	99	+/-49
Under 5 years	0	+/-119
5 years	0	+/-119
6 to 11 years	5	+/-9
12 to 14 years	0	+/-119
15 years	0	+/-119
16 and 17 years	17	+/-26
18 to 24 years	0	+/-119
25 to 34 years	11	+/-15

35 to 44 years	0	+/-119
45 to 54 years	8	+/-8
55 to 64 years	25	+/-19
65 to 74 years	11	+/-13
75 years and over	22	+/-15

Source: U.S. Census Bureau, 2005-2009 American Community Survey

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

While the 2005-2009 American Community Survey (ACS) data generally reflect the November 2008 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2000 data. Boundaries for urban areas have not been updated since Census 2000. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Explanation of Symbols:
1. An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.

Standard Error/Variance documentation for this dataset:
Accuracy of the Data

P3

RACE
Universe: Total population
2010 Census Summary File 1

NOTE: For information on confidentiality protection, nonsampling error, and definitions, see http://www.census.gov/prod/cen2010/doc/sf1.pdf.

	United States	Arkansas	Louisiana	Ashley County, Arkansas	Bradley County, Arkansas	Union County, Arkansas	Morehouse Parish, Louisiana	Union Parish, Louisiana
Total:	308,745,538	2,915,918	4,533,372	21,853	11,508	41,639	27,979	22,721
White alone	223,553,265	2,245,229	2,836,192	15,143	6,934	26,276	14,345	15,682
Black or African American alone	38,929,319	449,895	1,452,396	5,640	3,173	13,721	13,133	6,182
American Indian and Alaska Native alone	2,932,248	22,248	30,579	70	56	143	36	58
Asian alone	14,674,252	36,102	70,132	40	27	207	102	32
Native Hawaiian and Other Pacific Islander alone	540,013	5,863	1,963	3	1	14	14	17
Some Other Race alone	19,107,368	99,571	69,227	709	1,162	756	75	572
Two or More Races	9,009,073	57,010	72,883	248	155	522	274	178

	Crossett city, Arkansas	Hamburg city, Arkansas	Strong city, Arkansas
Total:	5,507	2,857	558
White alone	3,025	1,664	176
Black or African American alone	2,326	859	339
American Indian and Alaska Native alone	8	20	1
Asian alone	26	4	1
Native Hawaiian and Other Pacific Islander alone	0	1	0
Some Other Race alone	63	273	30
Two or More Races	59	36	11

Source: U.S. Census Bureau, 2010 Census.

APPENDIX E
Opinions of Probable Cost

CONCEPT ESTIMATE OF PROBABLE PROJECT COST
Alternative F2 - Westbound Left-Turn Lane at Visitors Center Driveway (US 82)

Description	Unit	Quantity	Unit Cost	Amount
CLEARING AND GRUBBING	AC	1.90	$ 25,000.00	$ 47,500.00
BORROW[2]	CY	2,000	$ 13.86	$ 27,720.00
ROADWAY PAVEMENT[1]	SY	1,100	$ 54.00	$ 59,400.00
SUBTOTAL ROADWAY				**$ 134,620.00**
MISCELLANEOUS ROADWAY (60%)	LS			$ 80,772.00
DRAINAGE (50%)	LS			$ 67,310.00
SIGNING AND PAVEMENT MARKINGS (10%)	LS			$ 13,462.00
SUBTOTAL CONSTRUCTION				**$ 296,164.00**
MAINTENANCE OF TRAFFIC (10%)	LS			$ 29,616.40
MOBILIZATION (10%)	LS			$ 29,616.40
TOTAL CONSTRUCTION				**$ 355,396.80**
"SAY"			**Subtotal**	**$ 360,000.00**
Engineering, Survey and CEI (30%)				**$ 106,619.04**
Contingency (25%)				**$ 88,849.20**
"SAY"			**Total**	**$ 560,000.00**

(1) ASSUMES 12" OF STABILIZED SUB BASE, 10" OF LIME ROCK BASE, 3.5" OF SUPERPAVE ASPHALT, & 1.5" OF FRICTION COURSE.

(2) ASSUMES 4 FEET OF BORROW FOR THE AREA OF PAVEMENT.

Kimley-Horn and Associates, Inc. has no control over the cost of labor, materials, equipment, or services furnished by others, or over methods of determining price, or over competitive bidding or market conditions. Any and all professional opinions as to costs reflected herein, including but not limited to professional opinions as to the costs of construction materials, are made on the basis of professional experience and available data. Kimley-Horn and Associates, Inc. cannot and does not guarantee or warrant that proposals, bids, or actual costs will not vary from the professional opinions of costs shown herein.

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CONCEPT ESTIMATE OF PROBABLE PROJECT COST
Alternative F3 - Eastbound Right-Turn Lane at Visitors Center Driveway (US 82)

Description	Unit	Quantity	Unit Cost	Amount
CLEARING AND GRUBBING	AC	0.40	$ 25,000.00	$ 10,000.00
BORROW[2]	CY	600	$ 13.86	$ 8,316.00
ROADWAY PAVEMENT[1]	SY	450	$ 54.00	$ 24,300.00
SUBTOTAL ROADWAY				**$ 42,616.00**
MISCELLANEOUS ROADWAY (60%)	LS			$ 25,569.60
DRAINAGE (50%)	LS			$ 21,308.00
SIGNING AND PAVEMENT MARKINGS (10%)	LS			$ 4,261.60
SUBTOTAL CONSTRUCTION				**$ 93,755.20**
MAINTENANCE OF TRAFFIC (10%)	LS			$ 9,375.52
MOBILIZATION (10%)	LS			$ 9,375.52
TOTAL CONSTRUCTION				**$ 112,506.24**
"SAY"			**Subtotal**	**$ 120,000.00**
Engineering, Survey and CEI (30%)				**$ 33,751.87**
Contingency (25%)				**$ 28,126.56**
"SAY"			**Total**	**$ 190,000.00**

(1) ASSUMES 12" OF STABILIZED SUB BASE, 10" OF LIME ROCK BASE, 3.5" OF SUPERPAVE ASPHALT, & 1.5" OF FRICTION COURSE.

(2) ASSUMES 4 FEET OF BORROW FOR THE AREA OF PAVEMENT.

Kimley-Horn and Associates, Inc. has no control over the cost of labor, materials, equipment, or services furnished by others, or over methods of determining price, or over competitive bidding or market conditions. Any and all professional opinions as to costs reflected herein, including but not limited to professional opinions as to the costs of construction materials, are made on the basis of professional experience and available data. Kimley-Horn and Associates, Inc. cannot and does not guarantee or warrant that proposals, bids, or actual costs will not vary from the professional opinions of costs shown herein.

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APPENDIX F
New Lock 6 Road Improvement Grant Application

PUBLIC LANDS HIGHWAYS DISCRETIONARY PROGRAM (PLHD)

FY 2011 GRANT APPLICATION

PART A. PROJECT INFORMATION

Project Title:	Felsenthal Public Access Road
Project Location (Include City/County, State):	Huttig/Union/Arkansas
State Priority (to be completed by State DOT):	
GRANTEE CONTACT INFORMATION	
Grantee Contact Name:	Richard Magby
Federal Agency/Project Sponsor:	U.S. Army Corps of Engineers
Mailing Address (Street/P.O. Box):	667 New Lock 6 Road
City, State, Zip code:	Huttig, AR 71747
Phone:	870-943-2307 ext. 103
Fax:	870-943-2546
E-Mail:	Richard.E.Magby@usace.army.mil
STATE DOT CONTACT INFORMATION	
State Contact Person:	Lorie Tudor
Phone:	501-569-2542
Fax:	501-569-2623
E-Mail:	Lorie.Tudor@arkansashighways.com
FHWA DIVISION OFFICE CONTACT INFORMATION	
Division Contact Person:	Susan Wimberly
Phone:	501-324-6434
Fax:	501-324-6423
E-Mail:	Susan.Wimberly@dot.gov
CONGRESSIONAL INFORMATION	
Congress Member:	Ross, Mike
Congressional District No.:	Arkansas 4th Congressional District
PLHD Program Funds Requested:	$217,900
Leveraged Funds (if applicable):	$0.00
Total Project Cost (includes funding request plus leveraged funds if applicable):	$217,900
TO BE COMPLETED BY THE FHWA DIVISION OFFICE	

State Administered?		Yes		No
Federal Lands Division Administered?		Yes		No
If yes, which Division?				
Direct Allotment of PLHD funding to Federal Agency?		Yes		No
If yes, which Federal Agency?				
Can the project be obligated by September 30, 2011?		Yes		No
Date grant application approved by FHWA Division Office				

Part B. Project Abstract

PLHD funds will be utilized to make major repairs to the road, shoulder and elevated road embankment which provides public access to three different Corps of Engineers recreation areas as well as to Felsenthal Lock & Dam. PLHD funds will allow for critical repairs to prevent further road damage which is increasing due to the continuous displacement of support material from the roadbed and road shoulder. Funds will be used to dig out voids and fill with a more suitable and stable clay material so as to prevent the pending and complete loss of this public road. If funded this would be a complete project and not a portion of a larger project and has not received previous PLHD funds.

Part C. Project Narrative

The project road is located near Huttig, AR (667 New Lock 6 Road) in Union County Arkansas and serves as the only access onto the highly developed Corps of Engineers recreation lands and is now nearing 30 years since it was first constructed. Over those years voids have appeared and grown and it has deteriorated to the point that major repairs are mandatory for it to remain serviceable to the visiting public. These voids have formed in the roadbed, shoulders and adjacent slopes in most cases with an entry point near the top of the elevated embankment and an exit point near the toe (See figure 1) which permits piping of soil and sediments causing instability and damage to the subsurface and the road surface itself. Numerous attempts have been made in the past to fill the entry points with materials to prevent piping and loss of support for the road. All materials that have been placed in the entry point of the voids have quickly moved through the void and been lost with only a very minor and temporary benefit. The roadway is elevated approximately 20 feet to allow for adjacent flooding of the river. The critical problem areas are along both sides of the roadway and measure approximately 3000’ on the north side and 3800 feet along the south slope. (See figure 2) To properly complete the job it will be absolutely necessary to prevent the movement of rainwater and the movement

of soil through the embankment and to do so it will require that the damaged areas be dug up and repaired. This public access road provides access to over 100,000 recreational visitors yearly as well as ensuring the uninterrupted operations of the Felsenthal Lock & Dam. The lock and dam provides additional recreational access to boaters utilizing the waterway by passing over 1000 pleasure boats through the lock chamber annually. Recreation facilities in which this road services include: 50 campsites, 3 boat ramps, 1 handicapped accessible fishing pier, 1 picnic shelter, 2 picnic areas, 3 public restrooms, 2 shower houses, 1 playground and 8 parking areas with spaces for 290 vehicles. If approved, this project would allow for the restoration of the access road to facilitate its continued safe operations for all users of the areas. Plans are to dig out the unstable sections and areas with voids and replace with a suitable and more stable clay material, compact the clay fill to prevent future erosion and to also repair the damaged areas of the existing roadway which have become a safety hazard to the public who utilize the road. (See figure 3). In order to more efficiently and effectively complete the repairs it will require the removal of approximately 6800 feet of guard railing and 3800 feet of PVC water lines. Both features are within and surrounded by failed roadbed. After repairs have been made, plans include the re-installation of the protective guard rail and water line. Lastly plans are to seed the entire area to establish a uniform turf to protect the slopes from future erosion. In order to facilitate critical repairs along the of roadway a budget and scope of work was designed as follows:

Equipment usage for repairs: Track hoe, 2 Dozers, Dump truck, Crew truck, Truck/low boy @ 30 working days= $36,900, Fuel: 3000 gal @ $4.00=$12,000, Labor for dirt work -960 labor hours -$38,000, Labor for traffic control- 480 labor hours -$7200, Clay fill materials: 20,000 yd @ $2.50/yd-$50,000, Equipment/Labor for 6800' of Guard rail removal/re-installation: Equipment-$10,000, 640 labor hours-$25,600, Repair of damage to existing road surface= $32,000 and Removal and replacement of 3800' of 1" PVC water line= Materials-$1000, Equipment- $400, Labor- $800, Seed and turf re-establishment- $4000 for a total estimated project cost of $217,900.

In its present condition, the road shoulder and slopes can't be fully or safely mowed and maintained which will allow vegetation to soon hamper repairs but by acting now and with the completion of this project recreation access can be enhanced and preserved well into the future for visitors to these areas.

Figure 1

Figure 2

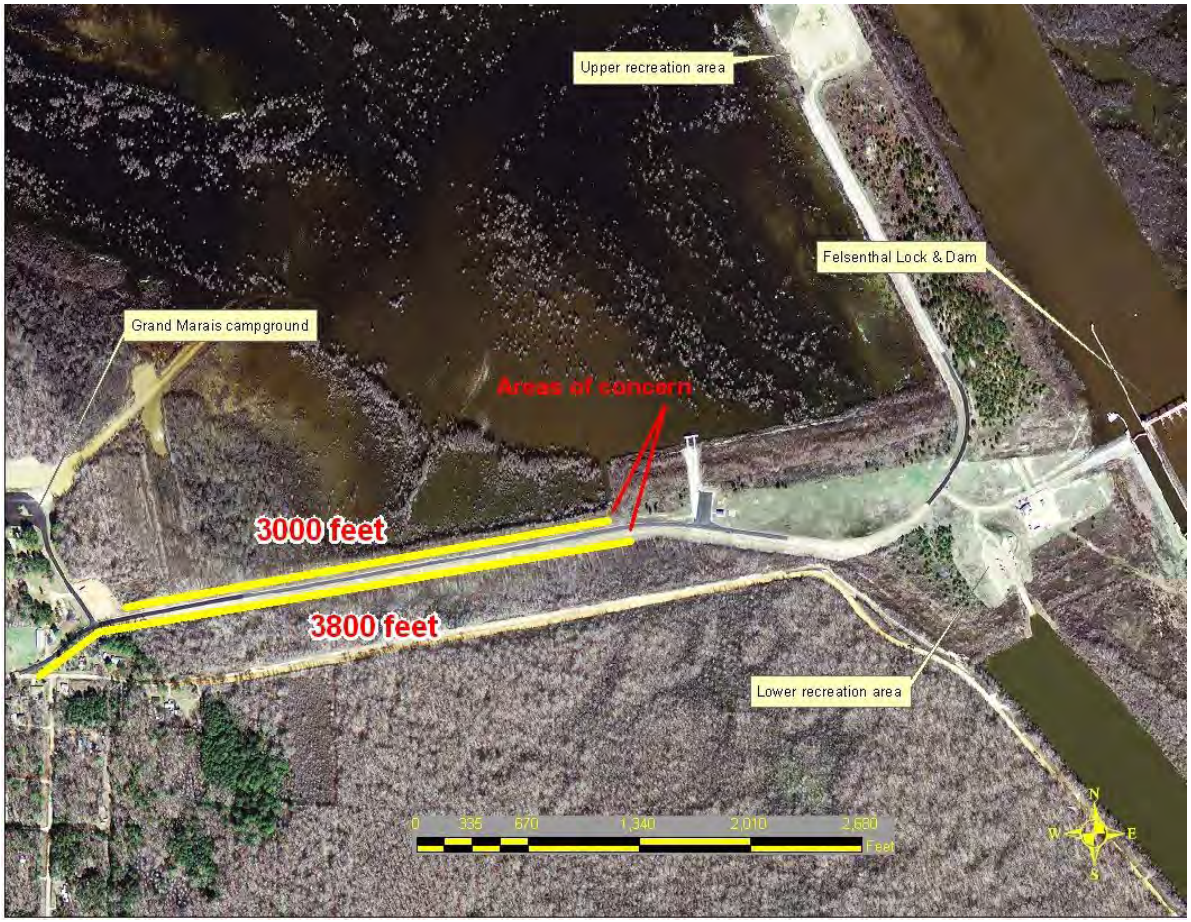

Figure 3

Part D. Project Eligibility

This road project provides the only public vehicular access to the three U.S. Army Corps of Engineers, Vicksburg District owned Recreation areas: Grand Marais Recreation Area & Campground, Felsenthal Upper Pool, Felsenthal Lower pool Recreation areas as well as the Felsenthal Lock & Dam on the Ouachita River.

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