



FELSENTHAL AND OVERFLOW NATIONAL WILDLIFE REFUGES TRANSPORTATION STUDY

Preliminary Candidate Alternatives 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.

March 2012

**Felsenthal and Overflow National Wildlife Refuges
Transportation Study**

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1. Introduction

The South Arkansas National Wildlife Refuges Complex consists of three National Wildlife Refuges (NWR) in Arkansas. The two Refuges studied in this report are the Felsenthal National Wildlife Refuge and the Overflow National Wildlife Refuge. The Felsenthal NWR, located west of Crossett, Arkansas, contains approximately 65,000 acres of mainly bottomland hardwood forest. The Overflow National Wildlife Refuge, located between Hamburg, Arkansas and Parkdale, Arkansas, contains approximately 14,000 acres of mostly bottomland hardwood forest. **Figure 1.1** shows an overview location map of the two Refuges. The third refuge that is part of the South Arkansas NWR complex, but is not included in this study, is the Pond Creek NWR located in western Arkansas.

1.1 Purpose

The purpose of this report is to develop the candidate transportation alternatives for each Refuge. This will be accomplished by using the information collected during discussions with stakeholders and applying screening criteria to the conceptual alternatives to identify fatal flaws. Based on this initial screening, the list of preliminary candidate transportation alternatives will be developed and presented in this report, which will then be incorporated into the Transportation Study for the Felsenthal and Overflow NWRs.

1.2 Design Years

The design years used for this report will take into consideration short- (year 2017), medium- (year 2022), and long-range (year 2027) transportation improvements.

2. Summary of Transportation Conditions and Issues

The Felsenthal NWR is located in southern Arkansas in Ashley, Bradley, and Union Counties, just west of the City of Crossett. The public access areas are mainly located in Ashley County; however, some access routes to the Refuge include roadways in Bradley and Union Counties. There are five public access points on US 82. 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.

The Overflow NWR, located in Ashley County, Arkansas, is located five miles west of Wilmot, Arkansas, between Hamburg and Parkdale, Arkansas. The Overflow NWR has public access points and parking areas along SR 8, SR 173, and Ashley County Road 34, as well as from five unpaved private roadways on

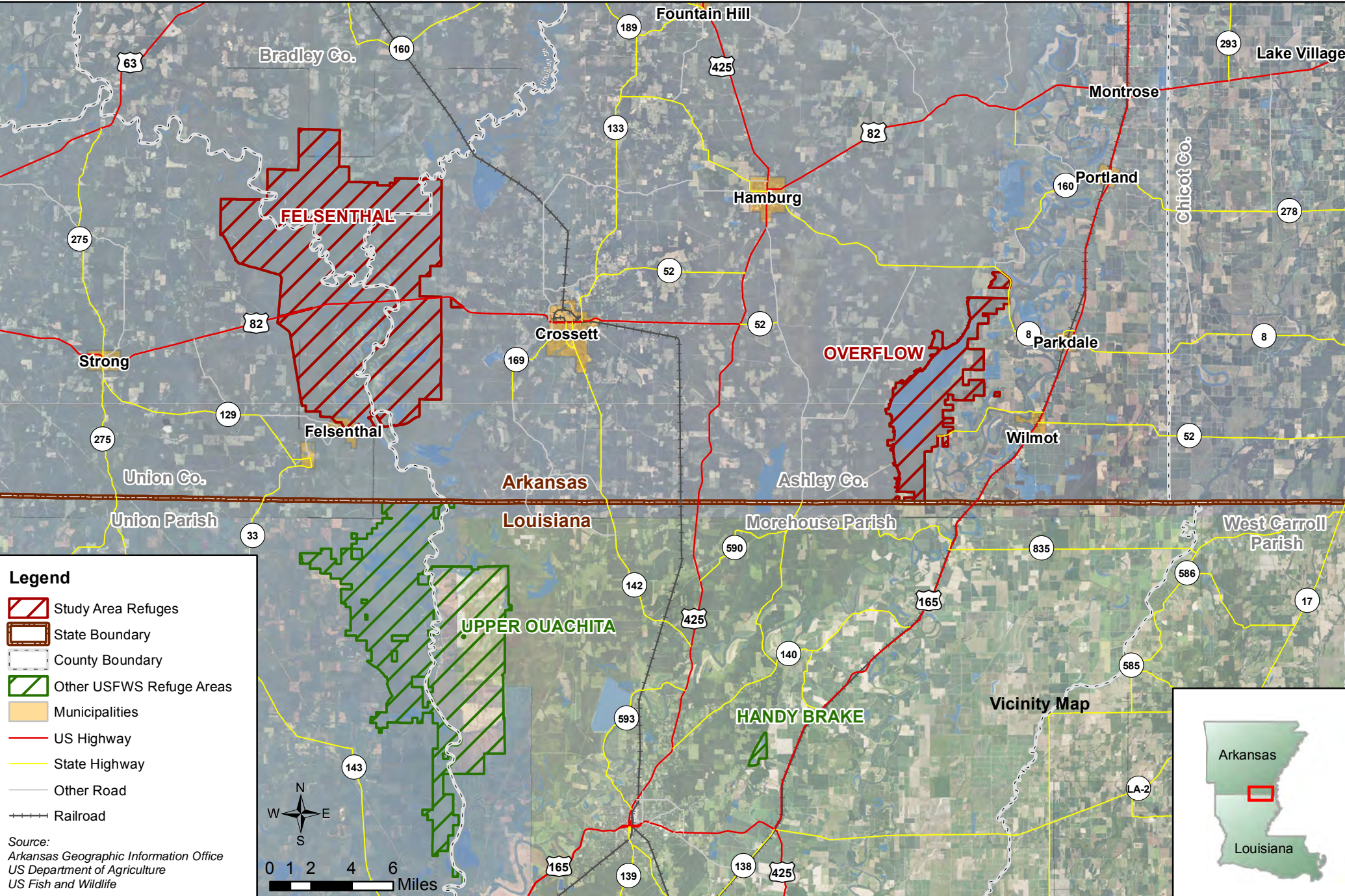


Figure 1.1: Overall Site Location Map

**Felsenthal and Overflow National Wildlife Refuges
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the west side of the Refuge. Roadways and parking areas within the Overflow NWR are maintained by the Refuge and consist mainly of a compacted dirt base with gravel. Refuge roadways are limited to ATV and Refuge vehicle use. However, since the Refuge does not maintain the unpaved private roads, the conditions of these roads may restrict access to the west side of the Refuge. There are currently no formal walking/biking trails provided in the Overflow NWR.

Based on information collected during the site visit, a review of the existing conditions information, previous studies, and discussions with stakeholders, transportation opportunities and issues at the Refuges have been identified and are contained in the following sections.

2.1 Felsenthal NWR

2.1.1 Turn Lane Improvements - Visitors Center Driveway (US 82)

The 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. This transition can generally be accomplished in one of two ways:

- 1) Widen the pavement on one side of the road and laterally transition the through lane 12 feet.
- 2) Widen the pavement on both sides of the road and laterally transition the through lanes away from each other a total of 12 feet.

If the second transition alternative is used and the road is widened equally on both sides (6 feet), the total length of the transition would be half the length of transitioning one through lane the full 12 feet. Based on the AHTD standards, transition option 1 would require no less than 660 feet and transition option 2 would require no less than 330 feet, depending on how much of the transition occurs in each direction. The existing transition length of 200 feet does not meet AHTD standards.

The second component in the development of the left-turn lane is the taper from the through lane into the left-turn lane. AHTD standards state that this taper length should be one-third of the full transition length or, in this case, 220 feet. This taper length should be used regardless of which transition option is used.

The final component of the left-turn lane is the storage length. The storage length should be based on the expected number of left-turn 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 of 100 feet meets AHTD standards.

Due to the high speeds on US 82, adding an eastbound right-turn lane for the entrance to the Visitors Center could help reduce the potential for rear-end collisions and provide an added measure of comfort for those entering the Visitors Center. Currently, eastbound vehicles entering the Visitors Center must

decelerate in the through lane to make a right turn. To alleviate this condition, a right-turn deceleration lane could be built along eastbound US 82 at the entrance to the Visitors Center. Standards for deceleration lanes published by the American Association of State Highway Transportation Officials (AASHTO) indicate that the transition from a through lane to a deceleration lane should be approximately 180 feet. The length of the deceleration portion of a right-turn lane is based on the initial speed of a vehicle on the roadway and the speed to which the turning vehicle must slow. In this situation, the deceleration lane length should be 480 feet.

These turn lane improvements should be reviewed with AHTD and a formal request be made to begin design activities.

2.1.2 High Truck Volume (US 82)

There is a relatively high percentage of trucks on US 82. According to year 2010 traffic counts collected by AHTD, trucks comprise 30% of the vehicles on US 82. With a posted speed limit of 55 mph, truck traffic is traveling at high speeds.

2.1.3 Sight Distance Improvement - Visitors Center Driveway (US 82)

The sight distance for vehicles exiting the Visitors Center was measured to be approximately 800 feet to the west. The sight distance to the east when exiting the Visitors Center, is unobstructed. The recommended minimum sight distance for the design speed of 55 mph is 610 feet, as provided in AASHTO's *Geometric Design of Highways and Streets*. Existing sight distance exceeds AASHTO standards.

2.1.4 Speeding Issues (US 82)

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 rate greater 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, increase enforcement on the section of US 82 that passes through the Refuge.

2.1.5 Signage Improvements

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 to the Visitors Center. There are currently no signs in the City of Crossett or other surrounding areas providing distance or directional information regarding the Refuge. Additional signage would be beneficial in providing information that directs visitors to the Refuge.

Additionally, the Refuge has recently 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.

2.1.6 Enhance Visitor Experience

The Refuge can continue to enhance the visitor experience by developing an auto-tour route within the Refuge, as well as continuing to develop new walking and biking trails throughout the Refuge and documenting these facilities on a comprehensive trail map.

2.1.7 Boat Ramp Improvements

It was noted that siltation is occurring in the cuts and sloughs at the Army Corps of Engineers boat ramp near the Felsenthal Lock and Dam and at the boat ramps at Pine Island and Shallow Lake.

Another concern is that there are currently no mooring locations for boaters at the Port of Crossett or Felsenthal Lock and Dam boat ramps. This presents a challenge for boaters launching boats, parking trailers, and embarking and disembarking vessels.

2.1.8 Refuge Access Points

Some of the Refuge access points are from private roads. If these private roads fall into disrepair, access to the Refuge in that area is compromised. By identifying critical Refuge access points, coordination with the private land owners will provide opportunities to develop formal cooperative agreements to maintain access to key Refuge entrances in perpetuity.

2.2 Overflow NWR

2.2.1 Enhance Visitor Experience

There is currently no formal education program or trail map for visitors of the Overflow NWR. Walking and biking trail routes could be created to enhance the visitor experience. The Refuge could also develop an auto-tour route to further enhance the visitor experience.

2.2.2 Refuge Access Points

Similar to the issue at Felsenthal NWR, some of the Overflow NWR access points are served by private roads. If these private roads fall into disrepair, access to the Refuge in that area is compromised. By identifying the critical Refuge access points, coordination with the private land owners will provide opportunities to develop formal cooperative agreements to maintain access to key Refuge entrances.

3. Conceptual Alternatives

The following section identifies potential short-, medium-, and long-range conceptual alternatives for transportation improvements that involve construction activities and those that do not involve construction activities. Conceptual alternatives examine transportation strategies that could potentially address the issues that have been identified. **Table 3.1** shows the preliminary alternatives and responsible partners.

Table 3.1: Proposed Stakeholder Responsibilities for Draft Transportation Alternatives

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

Alternatives		Stakeholders													
		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 Commerce	Friends of Engineers	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						

3.1 Felsenthal NWR

3.1.1 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 westbound 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
- 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 Corps of Engineers, USFWS, Friends of Felsenthal
- Develop an auto-tour route within the Refuge
Responsible Partner: USFWS

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

3.1.2 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, Ashley 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 Refuge entrances to provide additional Refuge information regarding such things 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

3.2 Overflow NWR

3.2.1 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

3.2.2 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

- Coordinate with local agencies and municipalities to encourage use of the Refuge
Responsible Partners: USFWS, Ashley County, City of Hamburg, City of Parkdale, City of Wilmot

- 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

4. 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. Preliminary Candidate Alternatives

The initial screening of the conceptual alternatives for the Felsenthal and Overflow NWRs are presented below. A “No-Build” alternative is included for each Refuge.

5.1 Felsenthal NWR

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

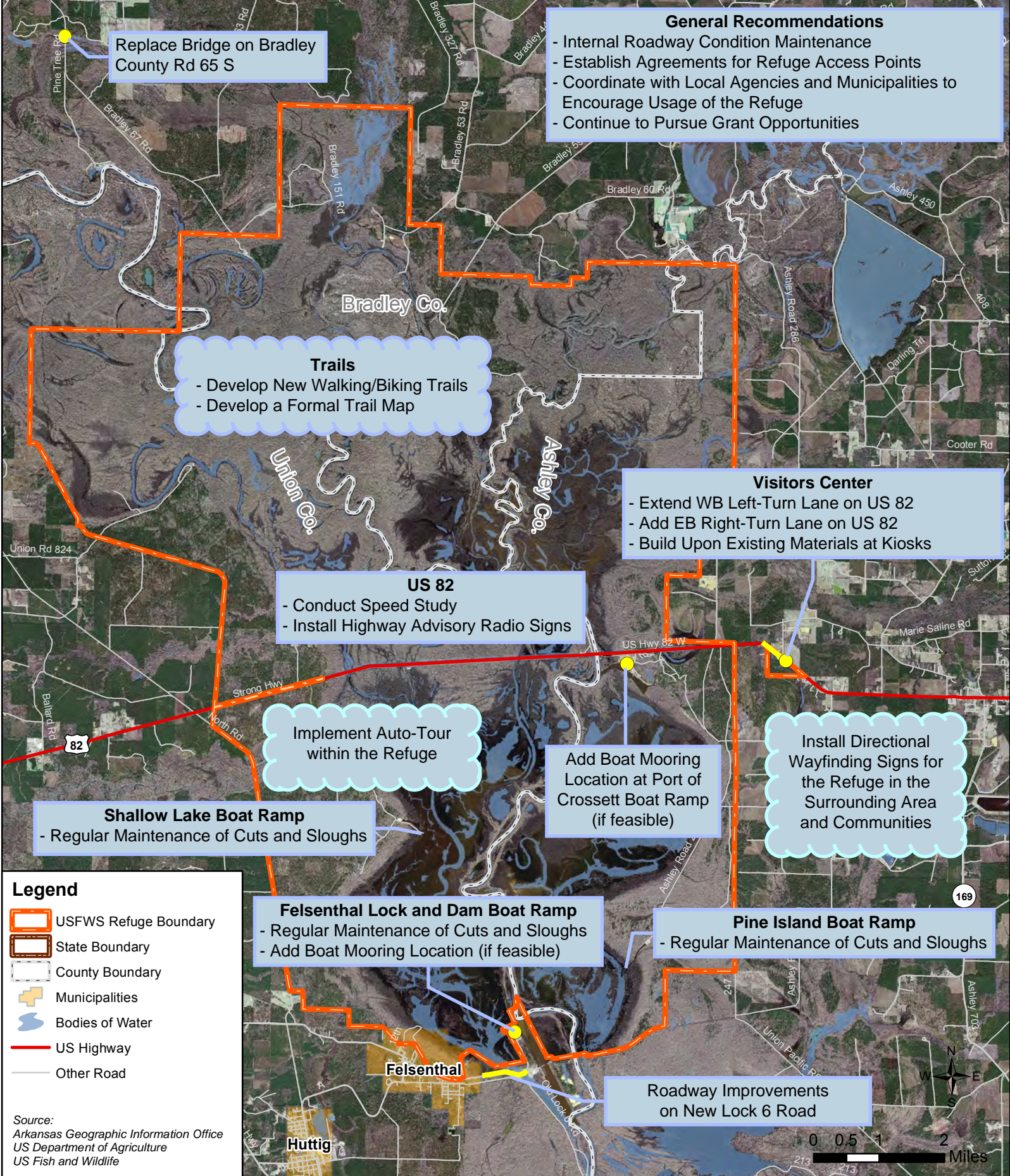


Figure 5.1: Felsenthal NWR Preliminary Candidate Alternatives

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5.1.1 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 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 remain the same or increase if no improvements are made.

5.1.2 Short-Range Alternatives (2017)

5.1.2.1 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 relatively low impact to the surrounding area.

5.1.2.2 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 in the vicinity of the turn lane to lengthen this turn lane would likely have some impact on the natural environment. There would be a cost associated with the construction efforts, but the lengthening of this turn lane will help vehicles to enter the Visitors Center more safely and reduce the potential for rear-end collisions. Costs include design, construction, and maintenance of the roadway.

5.1.2.3 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. There would be a cost associated with the construction efforts, but the addition of an eastbound right-turn lane on US 82 will 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.

5.1.2.4 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 dredging as needed.

5.1.2.5 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.

5.1.2.6 Alternative F6 – Boat Mooring Locations Feasibility

Boat mooring locations constructed at the Port of Crossett and/or the Felsenthal Lock and Dam 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 boat mooring locations is feasible, given the potential impacts and costs. Short-term costs would include the cost of the feasibility study.

5.1.2.7 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.

5.1.3 Medium-Range Alternatives (2022)

5.1.3.1 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 four tons for short wheelbase trucks and seven 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.

5.1.3.2 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-foot section approaching the Lock and Dam boat ramp. The Army Corps of Engineers has 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.

5.1.4 Long-Range Alternatives (2027)

5.1.4.1 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.

5.1.5 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 use of the Refuge
- Develop new walking/biking trails to enhance 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

5.2 Overflow NWR

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

5.2.1 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.

5.2.2 Short-Range Alternatives (2017)

5.2.2.1 *Alternative 01 – 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 with a relatively low impact to the surrounding area.

5.2.2.2 *Alternative 02 – 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.

5.2.3 Medium-Range Alternatives (2022)

5.2.3.1 *Alternative 03 – 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.

General Recommendations

- Internal Roadway Condition Maintenance
- Establish Agreements for Refuge Access Points
- Coordinate with Local Agencies and Municipalities to Encourage Usage of the Refuge
- Build Upon Existing Materials in Kiosks
- Continue to Pursue Grant Opportunities

Trails
 - Develop New Walking/Biking Trails
 - Develop a Formal Trail Map

Implement Auto-Tour within the Refuge

Install Directional Wayfinding Signs for the Refuge in the Surrounding Area and Communities

Legend

- Study Area Refuge
- State Boundary
- County Boundary
- Municipalities
- Bodies of Water
- US Highway
- State Highway
- Other Road
- Railroad

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



0 0.5 1 2 Miles
 Doc Mayo Rd Armstrong Rd



Figure 5.2: Overflow NWR Preliminary Candidate Alternatives

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5.2.4 Additional Recommendations

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

- Install directional wayfinding signs for the Refuge in the surrounding area
- Coordinate with local agencies and municipalities to encourage use of the Refuge
- Develop new walking/biking trails to enhance visitor experience
- Develop a formal trail map for the Refuge
- Use kiosks at the Visitors Center/Refuge Complex entrance to provide additional Refuge information regarding things such as permits, trail maps, notes about special/hunting events, etc.
- Continue to pursue grant opportunities for additional funding sources

6. Summary and Conclusions

The alternatives presented in this Preliminary Candidate Alternatives Report for the Felsenthal and Overflow NWRs were selected based on the conceptual alternatives identified from the existing transportation conditions and discussions with stakeholders. These conceptual alternatives were screened based on the established criteria (environmental and cultural impacts, constructability, transportation benefit, and cost). These preliminary alternatives will be screened in greater detail in the next phase of the Transportation Study, which will present final candidate alternatives and recommendations for implementation based on stakeholder and public input.

