

Welcome

The U.S. Army Corps of Engineers (USACE) is currently seeking feedback on its Claiborne and Millers Ferry Locks and Dams Fish Passage Feasibility Report and Integrated Environmental Assessment that evaluates Federal interest in establishing fish passage through restoring connectivity in the Alabama and Cahaba Rivers.



STEP 1: Please sign in at the information table

STEP 2: Visit displays placed around the room, in any order, to learn more

STEP 3: Provide comments on the Claiborne and Millers Ferry Locks and Dams Feasibility Study by any of the following methods:

- By comment forms at the public meetings
- By email to **AlabamaFishPassage@usace.army.mil**
- By letter to the USACE Mobile District Commander

Comments will be collected through May 31, 2023, for consideration in the next phase of the study process



US Army Corps
of Engineers
Mobile District

SMART* Planning Feasibility Study Milestones

FISH PASSAGE STUDY TIMELINE

36 MONTHS



- Identify study objectives
- Define problems & opportunities
- Inventory & forecast
- Formulate alternative plans
- Evaluate alternatives & identify reasonable array

- Develop the “Future without Project Condition”
- Analyze, evaluate and compare alternatives to identify Tentatively Selected Plan
- Prepare the draft report
- Vertical team concurrence on Tentatively Selected Plan
- Release draft report review (Public, Agency, Division)

- Consider and respond to review comments
- Agency consultation activities
- Agency endorsement of recommended plan
- Prepare the final report
- Final report package transmitted to HQUSACE

- HQUSACE review of final report
- Report approval
- Report submitted to Congress

* SMART planning is:

S: Specific M: Measurable A: Attainable R: Risk Informed T: Timely



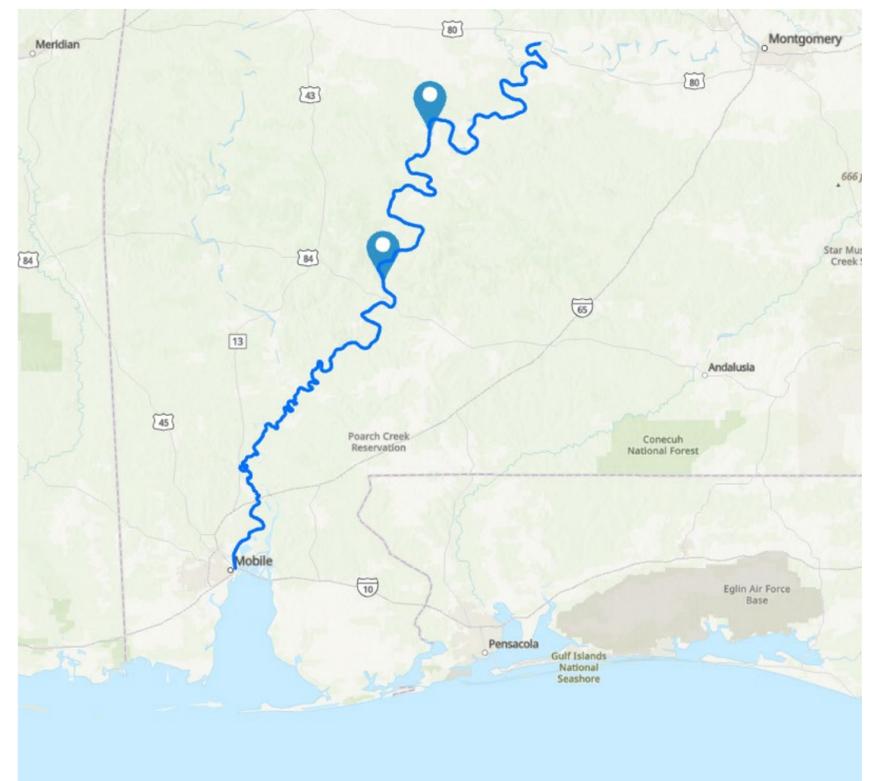
Purpose and Need

Purpose:

- ✓ Evaluate Federal interest in establishing fish passage through restoring connectivity in the Alabama and Cahaba Rivers to address the impacts created by the dams
- ✓ Reconnect over 230 miles of the Alabama and Cahaba Rivers to the Mobile River Delta into the Gulf of Mexico, providing connectivity for multiple species of fish, crawfish, mussels, turtles, etc.

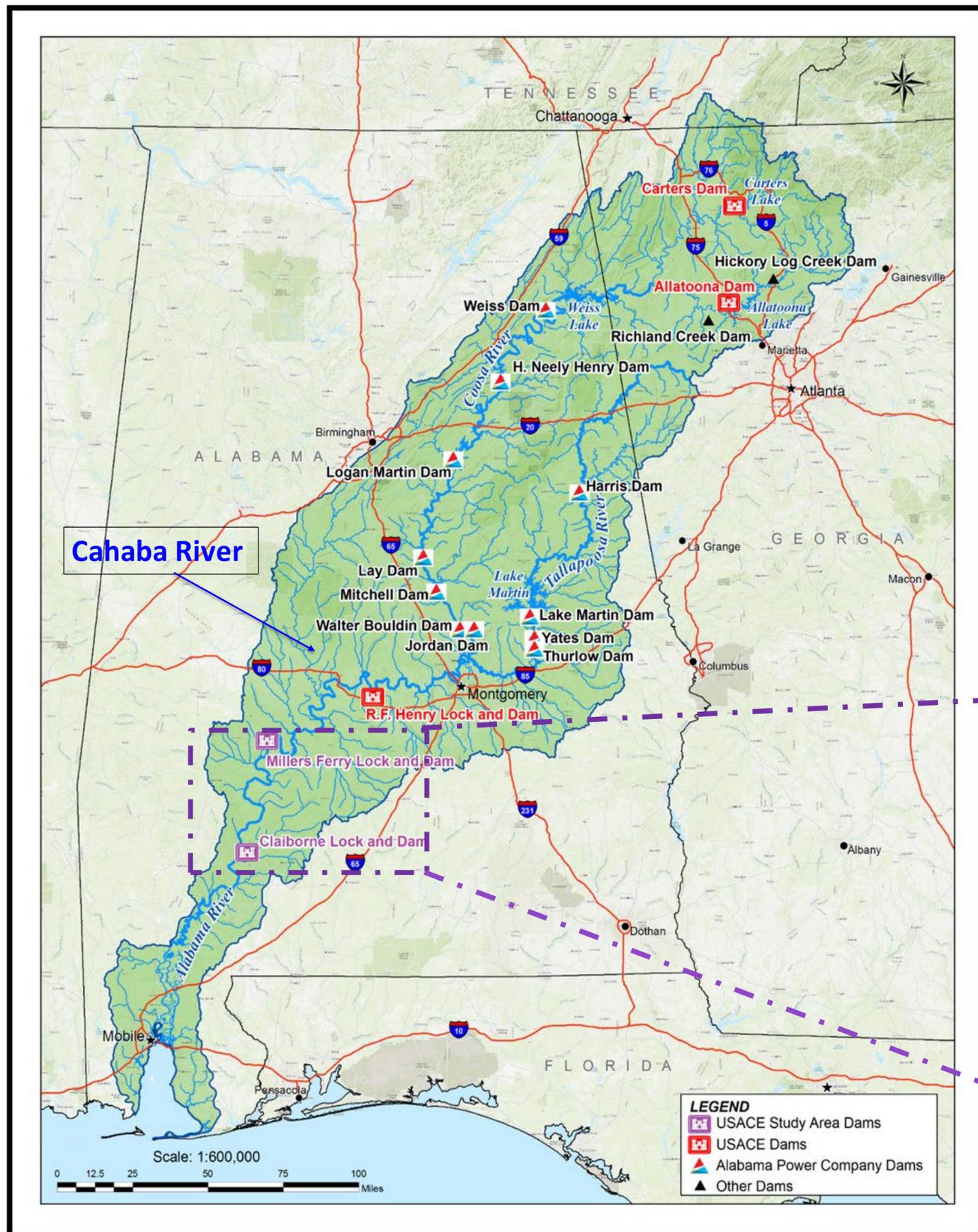
Need:

- ✓ Directly address the loss of habitat connectivity for fish movement in the river system
- ✓ Allow the river ecosystem to be resilient to external stressors within a certain range of natural variation, maintaining a self-sustaining condition of the ecosystem
- ✓ Maintain the process of carbon sequestration that occurs in the bottom hardwoods of the delta, a critical process that captures and stores carbon dioxide in the ground thereby improving ecosystem resiliency

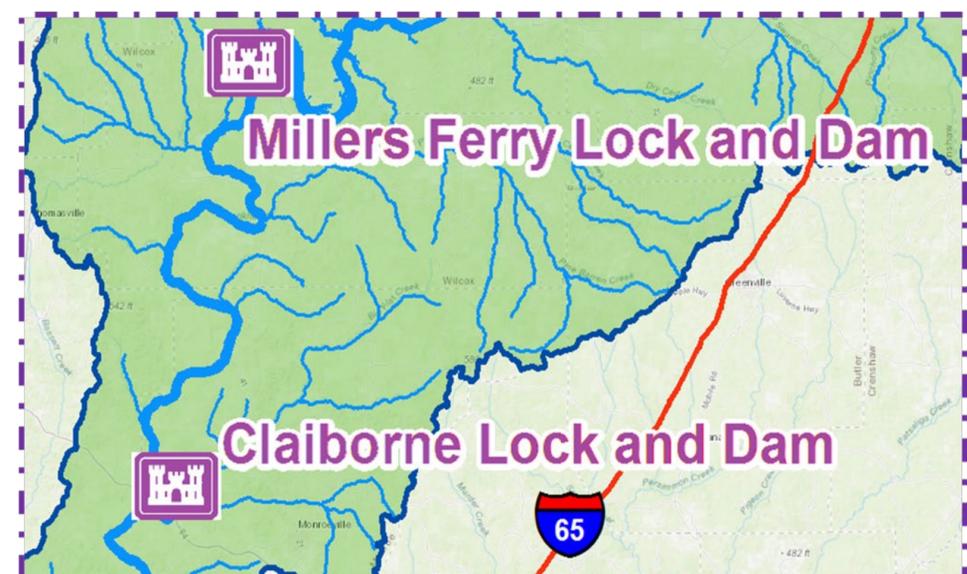


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Study Area



- The study area is part of the Alabama-Coosa-Tallapoosa River Basin which contains 6 USACE dams and 11 privately owned dams
- Claiborne Lock and Dam and Millers Ferry Lock and Dam are located on the lower Alabama River. They are the only locks and dams south of the Cahaba River.



Alternatives Considered

Focused and Final Array of Alternatives

1	No Action Alternative*
2	Dam Removal - both Claiborne and Miller Ferry Dams
3	Fixed Weir Rock Arch - both Claiborne and Miller Ferry Dams*
5 (5d)**	Natural Bypass Channel - both Claiborne and Miller Ferry Dams*
6	Partial Dam Removal - both Claiborne and Miller Ferry Dams
7	Dam Removal at Claiborne & Fixed Weir Arch at Millers Ferry
9	Dam Removal at Claiborne & Natural Bypass Channel at Millers Ferry
12 (12b)	Natural Bypass Channel at Claiborne & Fixed Weir Rock Arch at Millers Ferry*
13b	Natural Bypass Channel (right bank) at Claiborne & Fixed Weir Rock Arch at Millers Ferry*
17	Partial Dam Removal at Claiborne & Natural Bypass Channel at Millers Ferry

* Alternatives carried forward to the Final Array Detailed Analysis

** Alternative 5d identified as the Tentatively Selected Plan

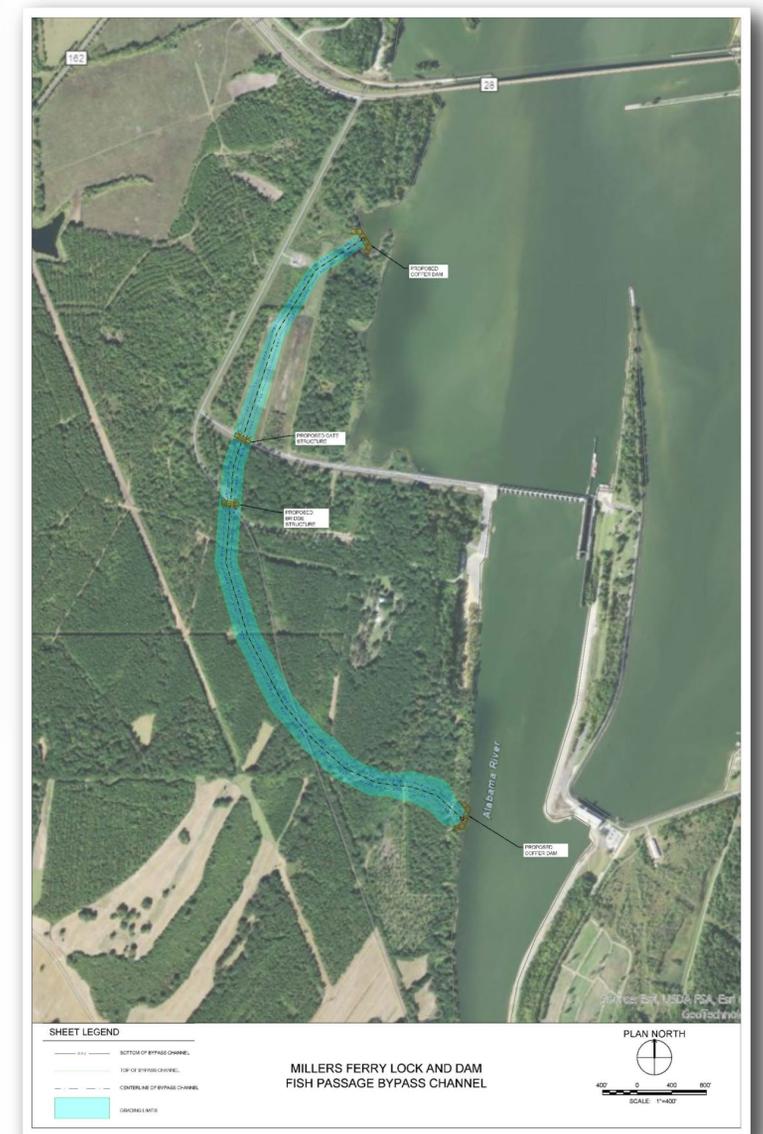


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Tentatively Selected Plan Claiborne and Millers Ferry Locks and Dams

Components:

- Natural bypass channel at both Claiborne and Millers Ferry Locks and Dams. Natural bypass channels mimic natural stream conditions. The bypass channels would circumvent the dam structures providing passage to aquatic species.
- Both bypass channels would be constructed along the right descending bank of the Alabama River using natural materials such as soil, riprap embankment protection, and stone weirs to create riffle pools.
- The Millers Ferry Natural Bypass Channel includes control gate structures and two vehicular bridges. The Millers Ferry Bypass Channel is longer due to channel bottom slope design constraints and the greater drop in elevation from the upper pool above the dam and the lower pool below.



Tentatively Selected Plan Claiborne Lock and Dam Conceptual Design and Project Alignment



Conceptual Design Information	Bypass at Claiborne Lock and Dam
Starting Elevation (ft-NAVD88)	33.1
Ending Elevation (ft-NAVD88)	3.5
Bottom Width (ft)	75
Side Slopes	1V:3H
Channel Construction Materials	Rock
Slope of Channel (ft/ft)	0.013
Channel Length (ft)	2100
Depth in Channel at Normal Pool (ft)	2.0
Number of Pools / Grade Control Structures	30
Pool Length (ft)	80
Maximum Velocity within Channel (ft/s)	7.4
Mean Velocity within Channel (ft/s)	4
Estimated Flow at Normal Pool (Millers Ferry - 80.1 ft-NAVD88; Claiborne - 35.1 ft-NAVD88; CFS)	1200

Tentatively Selected Plan Millers Ferry Lock and Dam Conceptual Design and Project Alignment



SHEET LEGEND

- BOTTOM OF BYPASS CHANNEL
- TOP OF BYPASS CHANNEL
- CENTERLINE OF BYPASS CHANNEL
- GRADING LIMITS

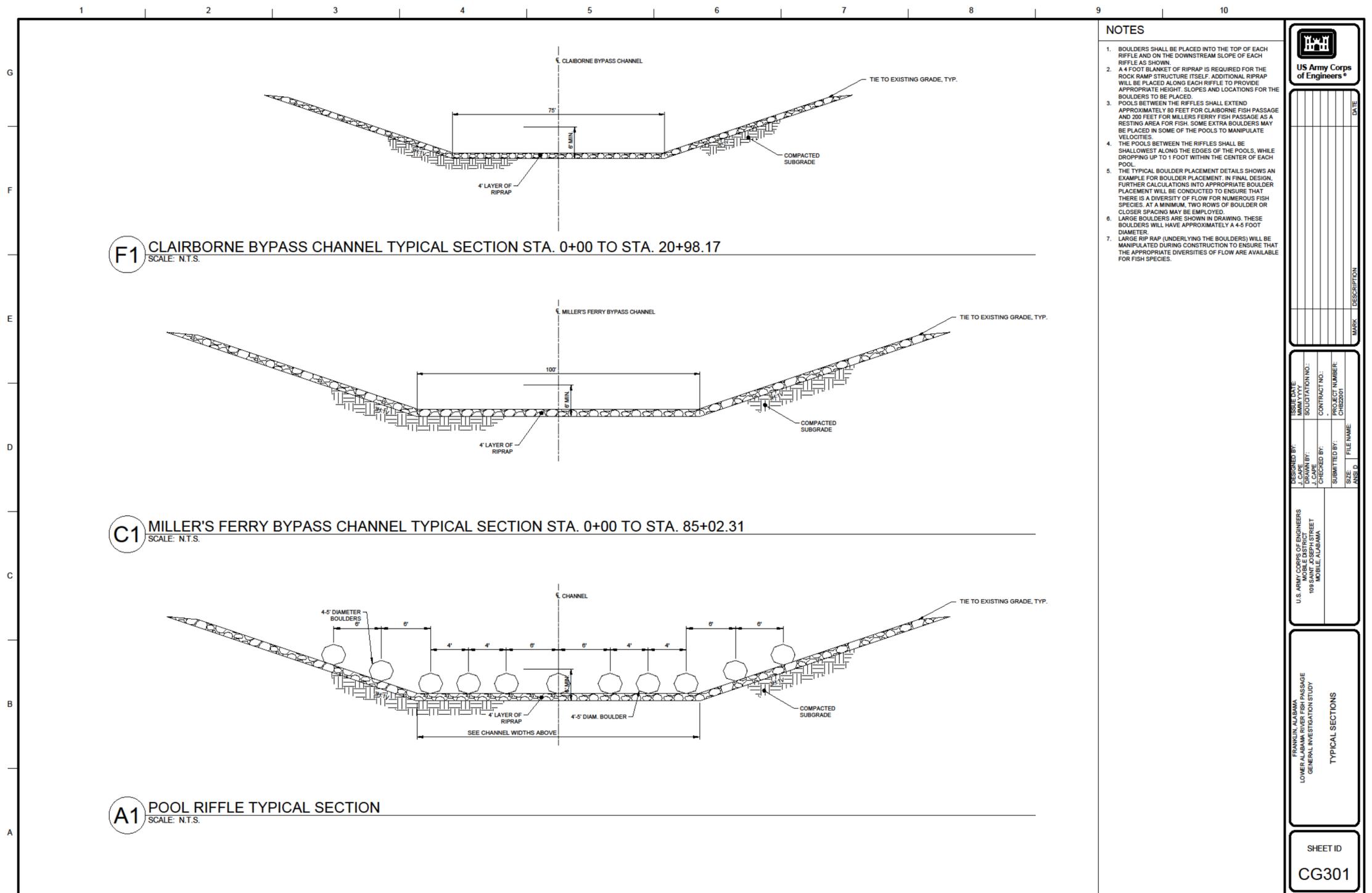
**MILLERS FERRY LOCK AND DAM
FISH PASSAGE BYPASS CHANNEL**

PLAN NORTH

400' 0 400 800'
SCALE: 1"=400'

Design Information	Bypass at Millers Ferry Lock and Dam
Starting Elevation (ft-NAVD88)	75
Ending Elevation (ft-NAVD88)	31
Bottom Width (ft)	100
Side Slopes	1V:3H
Channel Construction Materials	Rock
Slope of Channel (ft/ft)	0.005
Channel Length (ft)	8500
Depth in Channel at Normal Pool (ft)	5.1
Number of Pools / Grade Control Structures	44
Pool Length (ft)	200 - 210
Maximum Velocity within Channel (ft/s)	6.6
Mean Velocity within Channel (ft/s)	4.2
Estimated Flow at Normal Pool (Millers Ferry - 80.1 ft-NAVD88; Claiborne - 35.1 ft-NAVD88; CFS)	1200

Tentatively Selected Plan Bypass Channel Conceptual Design



Environmental Modeling

Modeling Summary

- Fish Passage Connectivity Index (FPCI) was used to compare "passability" of each alternative within the Final Array.
- The model is not predictive and does not evaluate habitat change, rather it evaluates how well an alternative performs at moving fish linearly.
- More information can be found in Appendix B-1 of the Integrated Feasibility Report and Environmental Assessment.



Size Scale: 1-3 (3=largest)

Size Scale: 1-3 (3=largest)

Representative Species

Benthic	Structured Shore/Sand-Gravel Bars	Pelagic
Host Fish		
2--Freshwater Drum* (G) <i>Aplodinotus grunniens</i>	2--Chain Pickerel* (G) <i>Esox niger</i>	3--Striped Bass (G) <i>Morone saxatilis</i>
1--Mobile Logperch* <i>Percina kathae</i>	2--Largemouth Bass* (G) <i>Micropterus salmoides</i>	2--Skipjack Herring <i>Alosa chrysochloris</i>
1--Gulf Logperch <i>Percina suttkusi</i>		
1--Blacktail Shiner* <i>Cyprinella venusta</i>		
Non-Host Fish		
3--Gulf Sturgeon (T) <i>Acipenser oxyrinchus desotoi</i>	2--Southern Walleye (G) <i>Sander sp.cf. vitreus</i>	3--Paddlefish <i>Polyodon spathula</i>
3--Alabama Sturgeon (E) <i>Scaphirhynchus suttkusi</i>	1--Mississippi Silvery Minnow <i>Hybognathus nuchalis</i>	3--Smallmouth Buffalo <i>Ictiobus bubalus</i>
2--Southeastern Blue Sucker <i>Cycleptus meridionalis</i>		3--Alligator Gar <i>Atractosteus spatula</i>
2--River Redhorse <i>Moxostoma carinatum</i>		2--American Eel <i>Anguilla rostrata</i>
1--Crystal Darter <i>Crystallaria asprella</i>		

Habitat Model Formula

$$\epsilon = \frac{\sum_{i=1}^n [(E_i \times U_i \times D_i)/25]}{n}$$

Where,

- ϵ = Fish Passage Connectivity Index.
- i = a migratory fish species that occurs in Pool or reach below the dam.
- n = number of fish species included in the index (19)
- E_i = Chance of encountering the fishway entrance (expert elicitation)
- U_i = Potential for species i to use the fish passage pathway or fishway (critical swim speeds)
- D_i = Duration of availability (flow availability)

Habitat Model Process

FPCI Equation

- Calculate FPCI per species using formula above for both Claiborne and Millers Ferry separately

Habitat Units per Species

- Calculation Steps:
 1. Multiply Species FPCI by their total available preferred habitat
 2. Average all 19 Species Habitat Units

Habitat Units per Alternative

- Calculation Steps:
 1. Average the FPCI results for Claiborne and Millers Ferry
 2. Multiply the Average FPCI by the Average Habitat Units

Habitat Model Results

Measures	ϵ = Fish Passage Connectivity (Avg.)	Avg. Habitat Units
Alternative 1: No Action	0.003	6,513
Alternative 3: Fixed Weir Rock Arch – Both Dams	0.441	872,331
Alternative 5d: Natural Bypass Channel – Both Dams	0.523	1,005,661
Alternative 12b: Fixed Weir Rock Arch – CL and Natural Bypass MF	0.507	978,402
Alternative 13b: Fixed Weir Rock Arch – MF and Bypass - CL	0.457	899,590

MF – Millers Ferry Lock and Dam
CL – Claiborne Lock and Dam



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Natural Resource Benefits

America's Amazon

- Maintain and/or increase the high level of biodiversity that is otherwise threatened without the project

The Grand Scheme of Things:

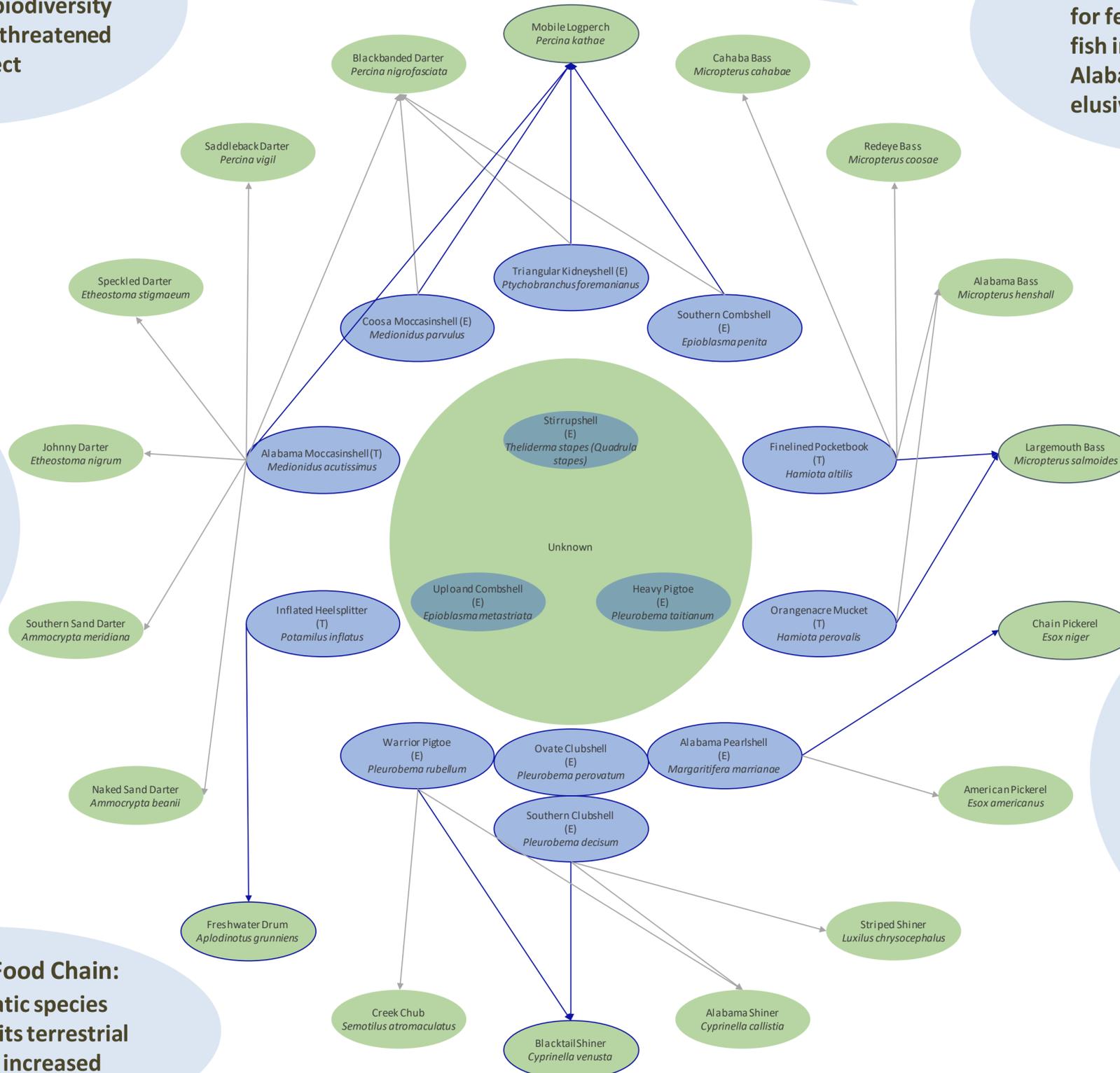
- Reconnection of the Mobile Delta to the Cahaba River would create a grand total of 390 river miles of accessible habitat

Protected Fishes

- Increased spawning habitat for federal and state listed fish including the rare Alabama sturgeon and the elusive Gulf sturgeon

So What?

- Biodiversity serves the entire natural and human community through climate positive benefits



All a Part of the Food Chain:

- Benefits to aquatic species indirectly benefits terrestrial species through increased ecosystem health

Ancillary Benefits:

- Most federally listed freshwater mussels in the Lower Alabama River would benefit through increased migration of their host fish



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Monitoring and Adaptive Management

What is it?

A way to evaluate the success of the constructed alternative and adjust if necessary

What parameters would be monitored?

Environmental criteria which are directly influenced within the constructed alternative such as:

- Temperature
- Dissolved oxygen
- Velocity
- Pool depth
- Species diversity including the presence of invasive and protected species

How would adaptive management be achieved?

- Developing a Monitoring and Adaptive Management Plan using subject matter experts to determine Decision and Success Criteria
- Conduct multi-year monitoring:
 - Preconstruction to obtain baseline data
 - During/post construction to assess success criteria

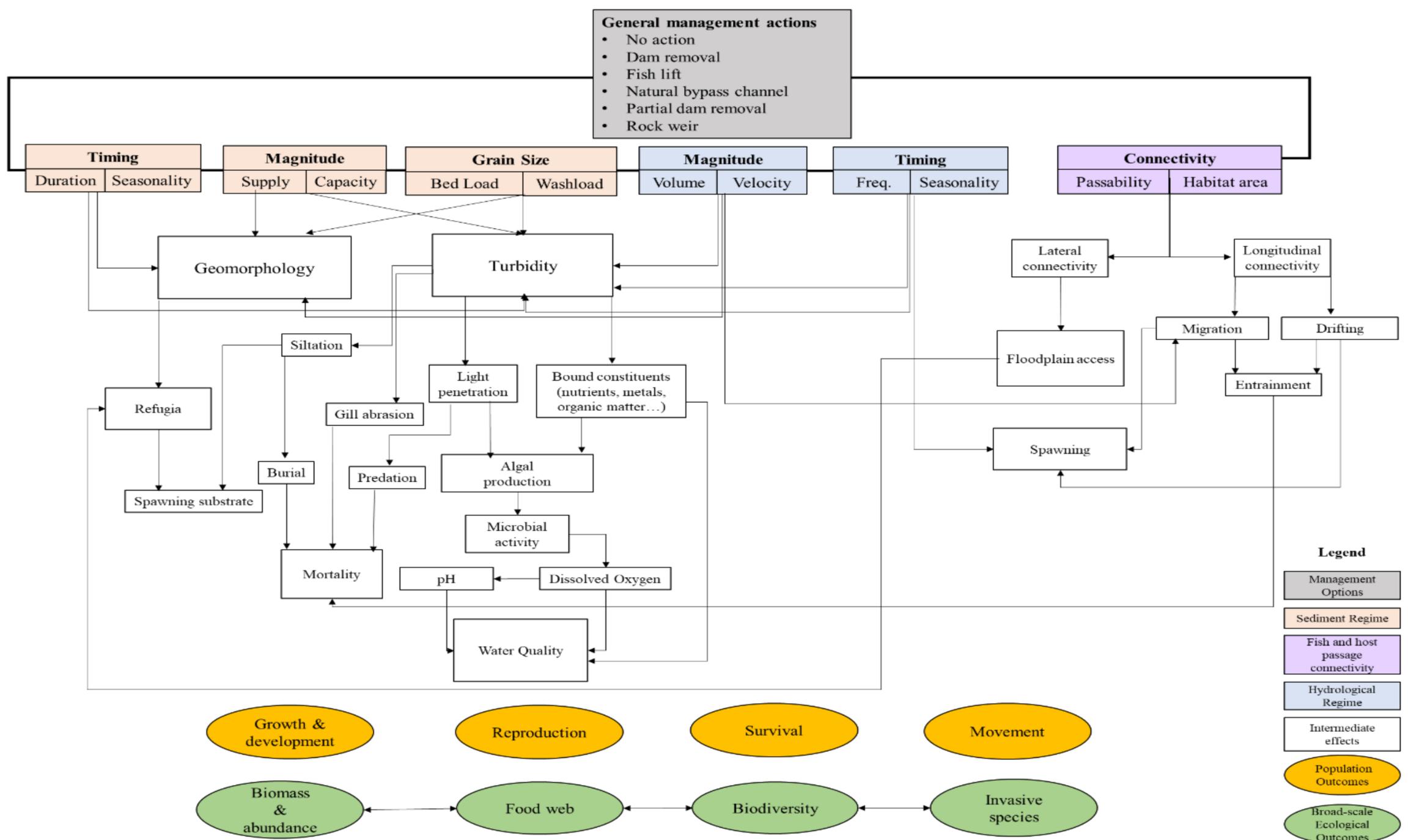
Where can I find more information?

Appendix B-2 of the Draft Integrated Feasibility Report and Environmental Assessment



Conceptual Ecological Model

This Conceptual Ecological Model was developed during National Environmental Policy Act (NEPA) scoping with environmental agencies to capture the connections within the natural environment to show how the Study Area functions



National Environmental Policy Act

Environmental Impacts Assessment

Clean Water Act:

- Coordination with ADEM for Water Quality Certification

Environmental Justice Executive Order:

- No disproportionate adverse impacts to the community

Fish and Wildlife Coordination Act:

- Draft Coordination Act Report under review

National Historic Preservation Act:

- Section 106 Coordination with Alabama State Historic Preservation Officer and Federally Recognized Tribal Nations

Migratory Bird Treaty Act:

- Approximately 25 acres of potential stopover site loss would not be significant compared to the overall Study Area

Endangered Species Act:

- *Informal Section 7 Coordination* with Fish and Wildlife Service for Alabama Sturgeon, Georgia Rockcress, Gulf Sturgeon, Inflated Heelsplitter, Southern Clubshell, and Tulotoma Snail

Protection of Wetlands Executive Order:

- *Mitigation is necessary* for impacts to wetlands
- Preliminary estimation of impacts :
 - ~ 4 acres at Claiborne
 - ~55 acres at Millers Ferry

Overall Analysis:

- Evaluates physical environment, biological/natural environment, cultural resources, and socioeconomic environment
- No significant *adverse* impacts were identified



Recreation Impacts

MILLERS FERRY LOCK AND DAM

The boat ramp at Shell Creek park would be open to the public but will likely be utilized by construction traffic.

Access to the West Bank Day Use Area will be restricted during construction; however, access after construction would occur via bridge.

The Millers Ferry West Damsite Hunting Area will be closed during construction. "Duck Ponds" will be replaced by a portion of the bypass channel.



BOATING

FISHING

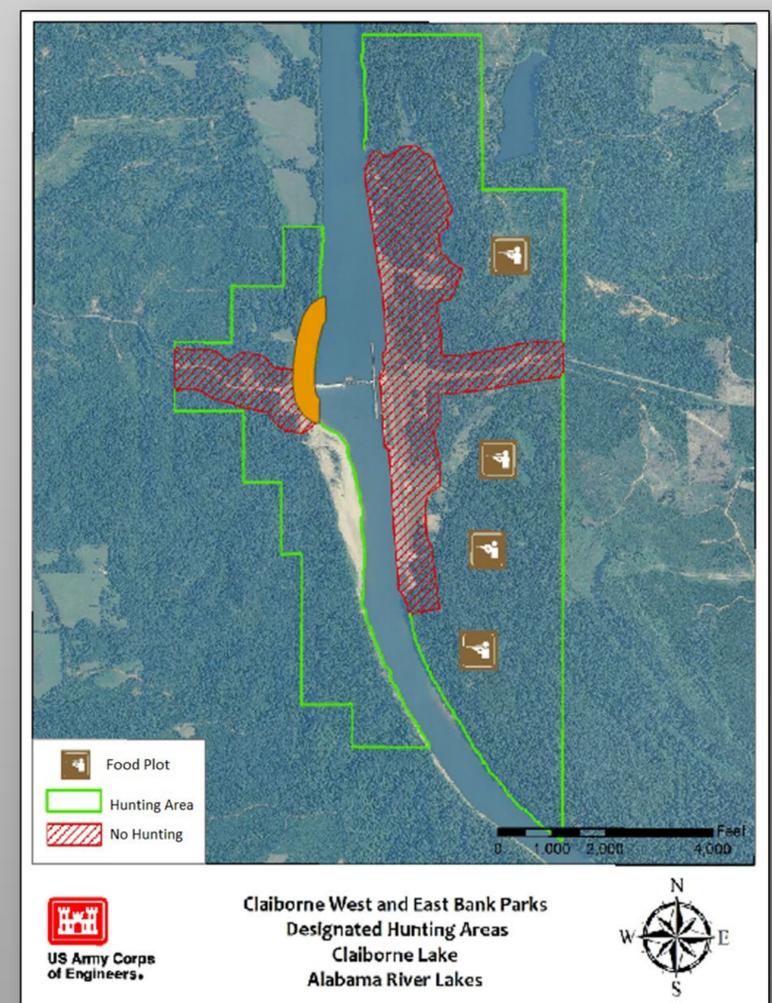
HUNTING

CLAIBORNE LOCK AND DAM

Local Boat Ramps will likely be utilized by construction traffic, but access will not be restricted to the public.

The fishing area around the fixed crest spillway will be closed during construction.

The West Bank Portion of the West and East Bank Parks will be temporarily closed during construction of the project.



Alternative Costs

Alternatives	Contingency%*	Total Project Cost**
Alt. 1: No Action Alternative	-	-
Alt. 3: Fixed Weir Rock Arch – Both Dams	42.4%	\$227M
Alt. 5d: Natural Bypass Channel – Both Dams (CL right bank, MF right bank)	41.6%	\$188M
Alt. 12b: CL - Fixed Weir Rock Arch and MF - Natural Bypass Channel (right bank)	41.5%	\$201M
Alt. 13b: CL - Natural Bypass Channel (right bank) and MF - Fixed Weir Rock Arch	42.3%	\$214M

MF – Millers Ferry Lock and Dam

CL – Claiborne Lock and Dam

* Contingencies developed using Abbreviated Risk Analysis Method

** Alternative Costs developed to a conceptual level of design

Total Project Costs include Construction, Real Estate, PED, Construction Management, Contingencies, and Escalation

Total Project Cost to be shared 35/65 percent between the Non-Federal Sponsor and the Federal Government



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Methods to Evaluate Alternative Plans

1. National Ecosystem Restoration (NER) Plan using Cost Effectiveness Analysis (CE)
2. Plan which maximizes total benefits using Multi Criteria Decision Analysis (MCDA)

Criteria	Metric	Description
Cost	Dollars – real-estate & construction	Class four cost estimates for Final Array
Ecological Lift	Habitat Units	Fish Passage Connectivity Index x Habitat
NER	Habitat Benefit Analysis	Determined using CE/ICA (Habitat Units and Cost)
NED Benefits	Impact to Hydropower -MWH/Dollars	Determine lost or gained Hydropower in MWH. Convert to dollars
EQ Benefits	Habitat Units	Fish Passage Connectivity Index x Habitat
RED Benefits	Employment & Value Added	Use RECONS certified model to compare Final Array
OSE Benefits	Habitat Units	Actions to halt biodiversity loss generally benefit the climate
Sponsor Support	Yes/No	Does the sponsor support the alternative

Maximizing benefits across The Four Accounts (Categories) with MCDA:

- A. Environmental Quality (EQ) – captures non-monetary effects on ecological, cultural, and aesthetic resources
- B. National Economic Development (NED) – captures changes in economic value of national output of goods and services
- C. Regional Economic Development (RED) – captures changes in distribution of regional economic activity
- D. Other Social Effects (OSE) – captures social aspects such as community resilience, public health, life safety and displacement

Alternatives	EQ	RED	NED	OSE	Total Score
Alt. 1: No Action Alternative	0.006	0.333	1	0.006	1.346
Alt. 3: Fixed Weir Rock Arch – Both Dams	0.867	0.666	0.883	0.867	3.284
Alt. 5d: Natural Bypass Channel – Both Dams (CL right bank, MF right bank)*	1	0.608	0.93	1	3.538
Alt. 12b: CL - Fixed Wier Rock Arch and MF - Natural Bypass Channel (right bank)	0.973	0.628	0.93	0.973	3.504
Alt. 13b: CL - Natural Bypass Channel (right bank) and MF - Fixed Wier Rock Arch	0.895	0.646	0.921	0.895	3.356

MF – Millers Ferry Lock and Dam
CL – Claiborne Lock and Dam

National Ecosystem Restoration Plan

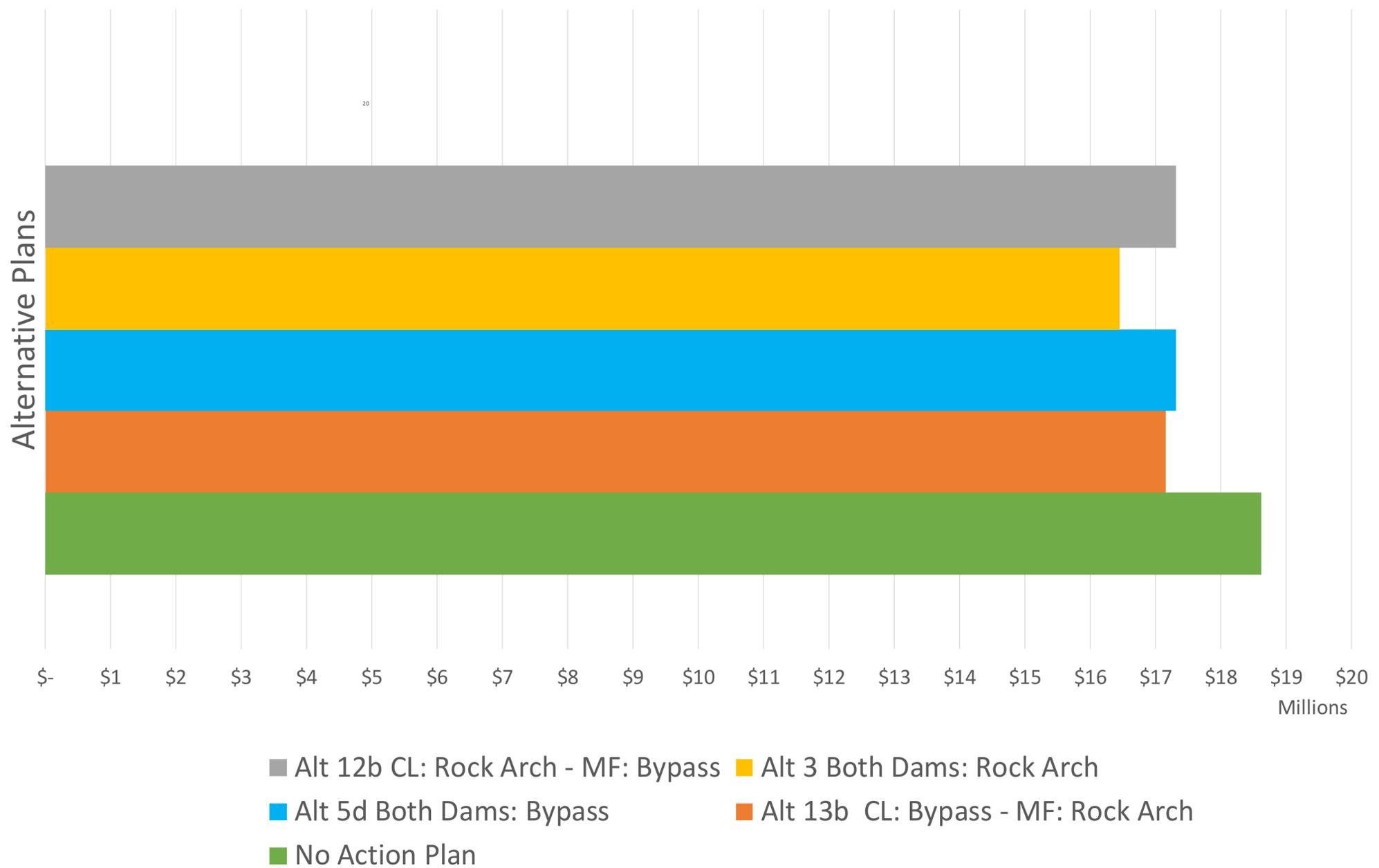
Cost Effectiveness Results

Alternatives	Avg Annual Habitat Units (HU)	Avg Annual Equivalent Cost	Avg Cost per HU	Best Buy?
Alt. 1: No Action Alternative	6,513	\$0	0	Yes
Alt. 3: Fixed Rock Weir – Both Dams	872,331	\$10,360,000	\$11.88	No
Alt. 5d: Natural Bypass Channel – Both Dams (CL right bank, MF right bank)*	1,005,661	\$8,496,000	\$8.45	Yes
Alt. 12b: CL - Fixed Rock Weir and MF - Natural Bypass Channel (right bank)	978,402	\$8,906,000	\$9.10	No
Alt. 13b: CL - Natural Bypass Channel (right bank) and MF - Fixed Rock Weir	899,590	\$9,236,000	\$10.27	No

MF – Millers Ferry Lock and Dam
 CL – Claiborne Lock and Dam

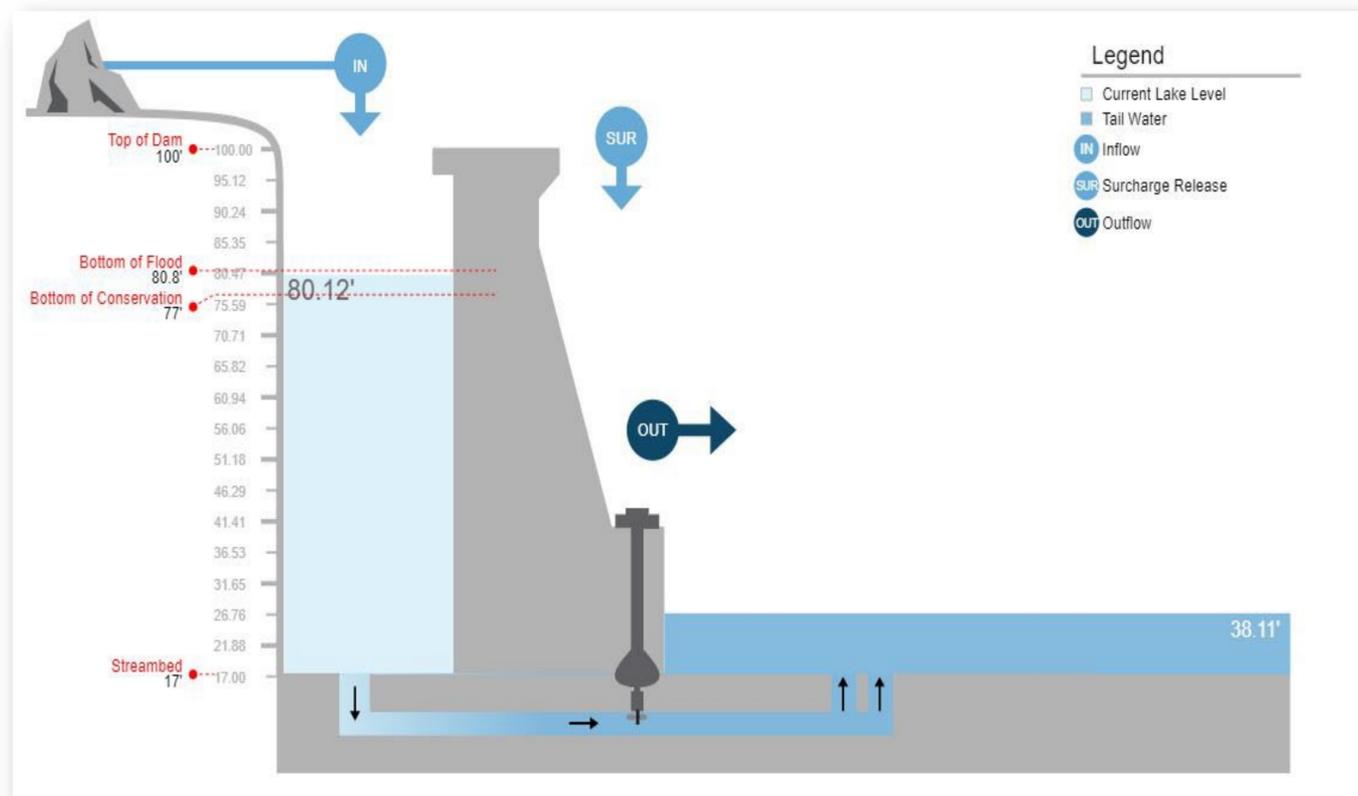
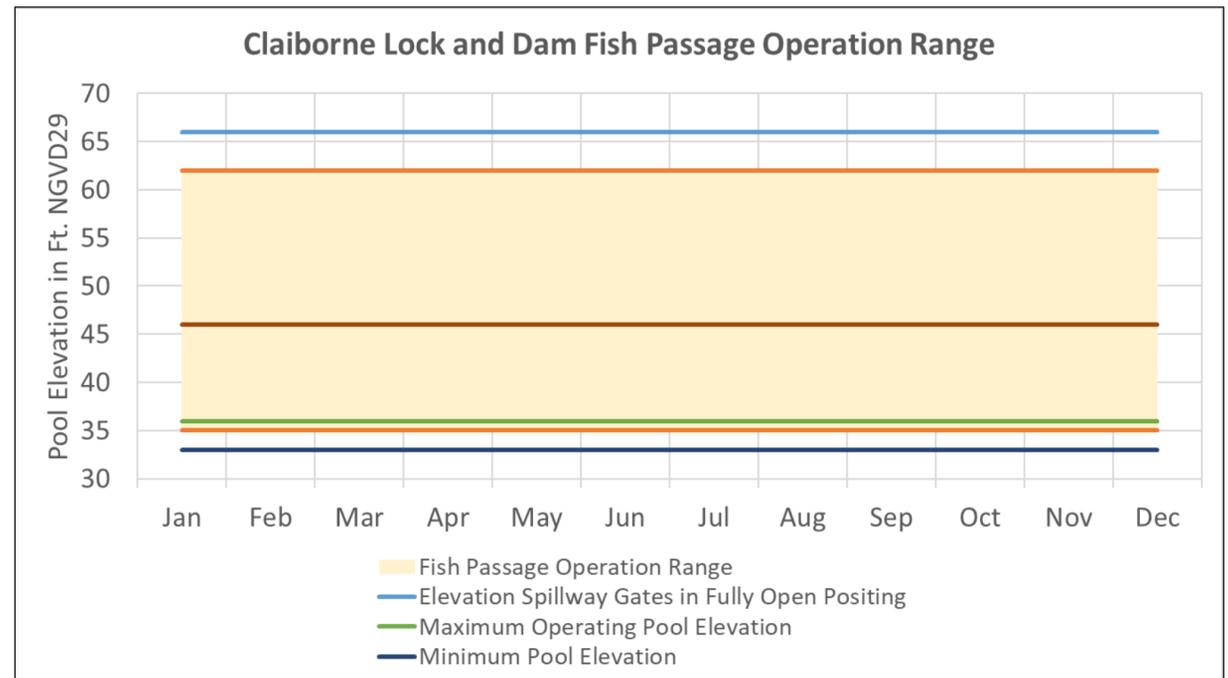
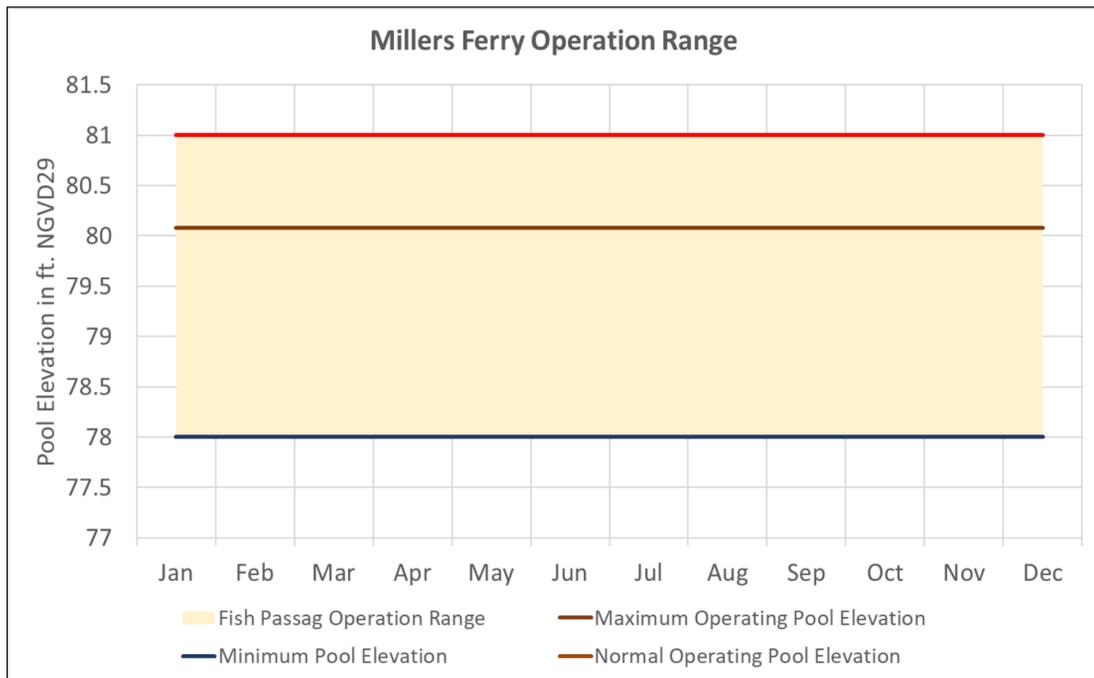
*Alternative 5d identified as the only best buy action option

Estimated Hydropower Impacts

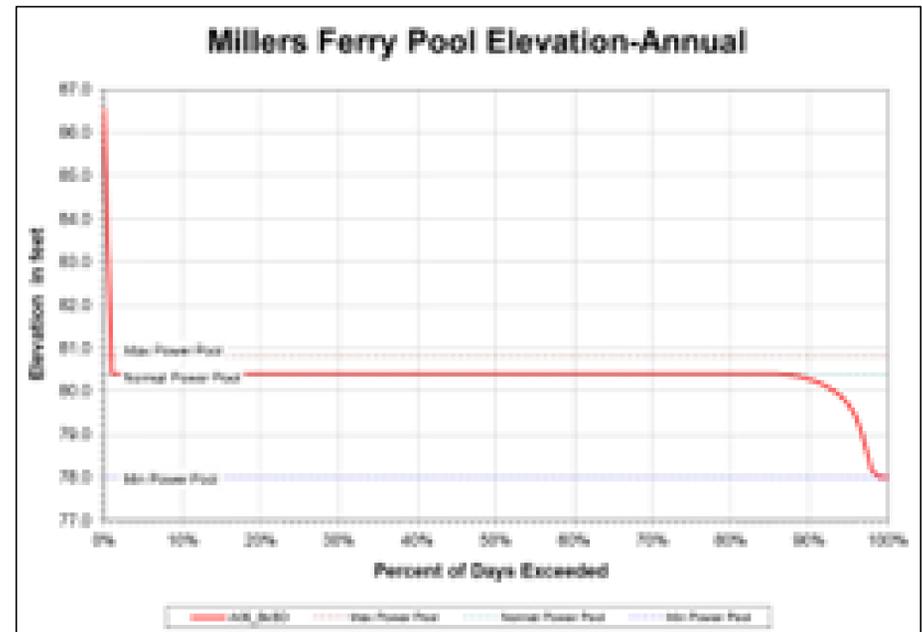
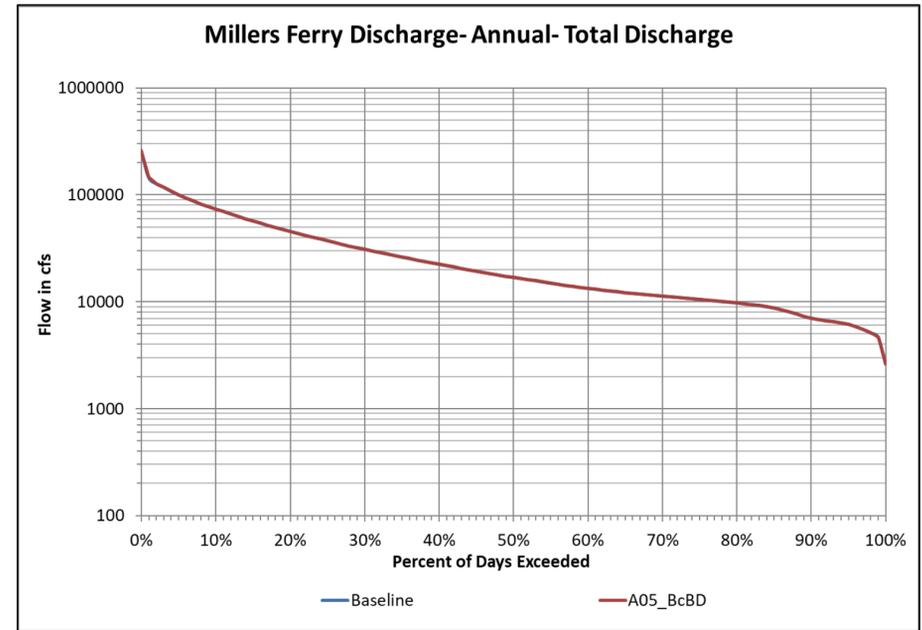
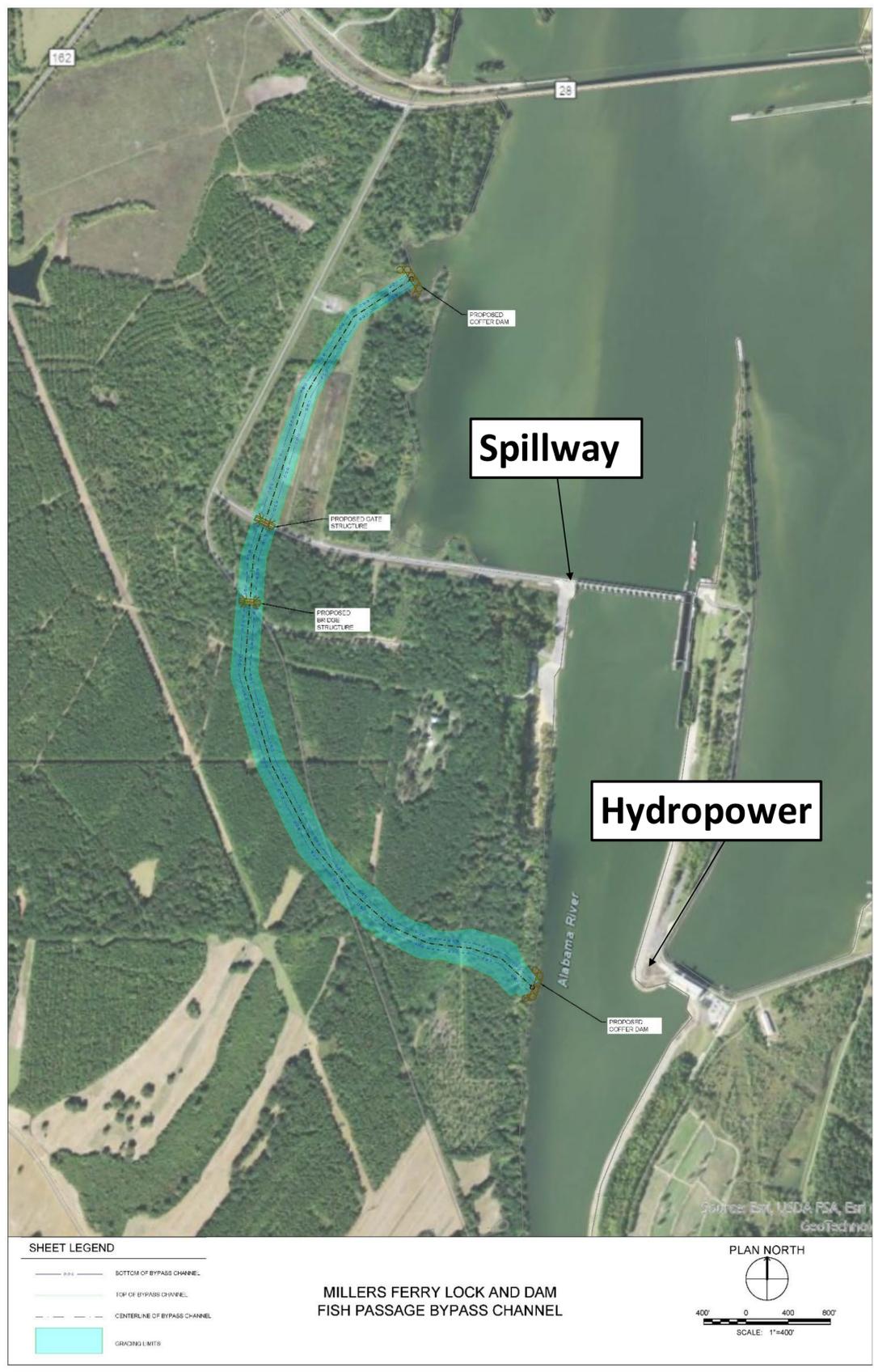


MF – Millers Ferry Lock and Dam
CL – Claiborne Lock and Dam

Millers Ferry and Claiborne Locks and Dams Operation Ranges

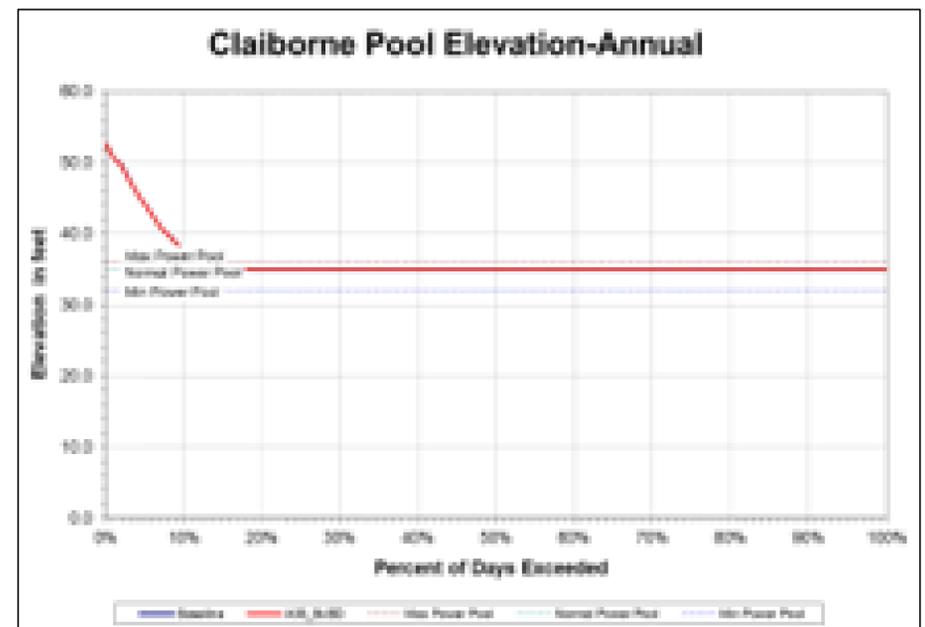
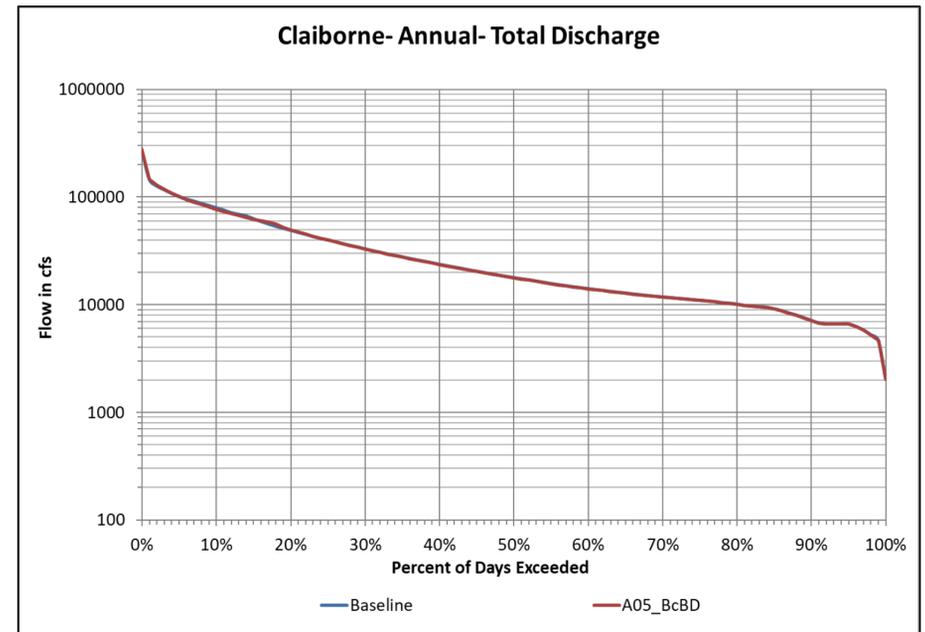
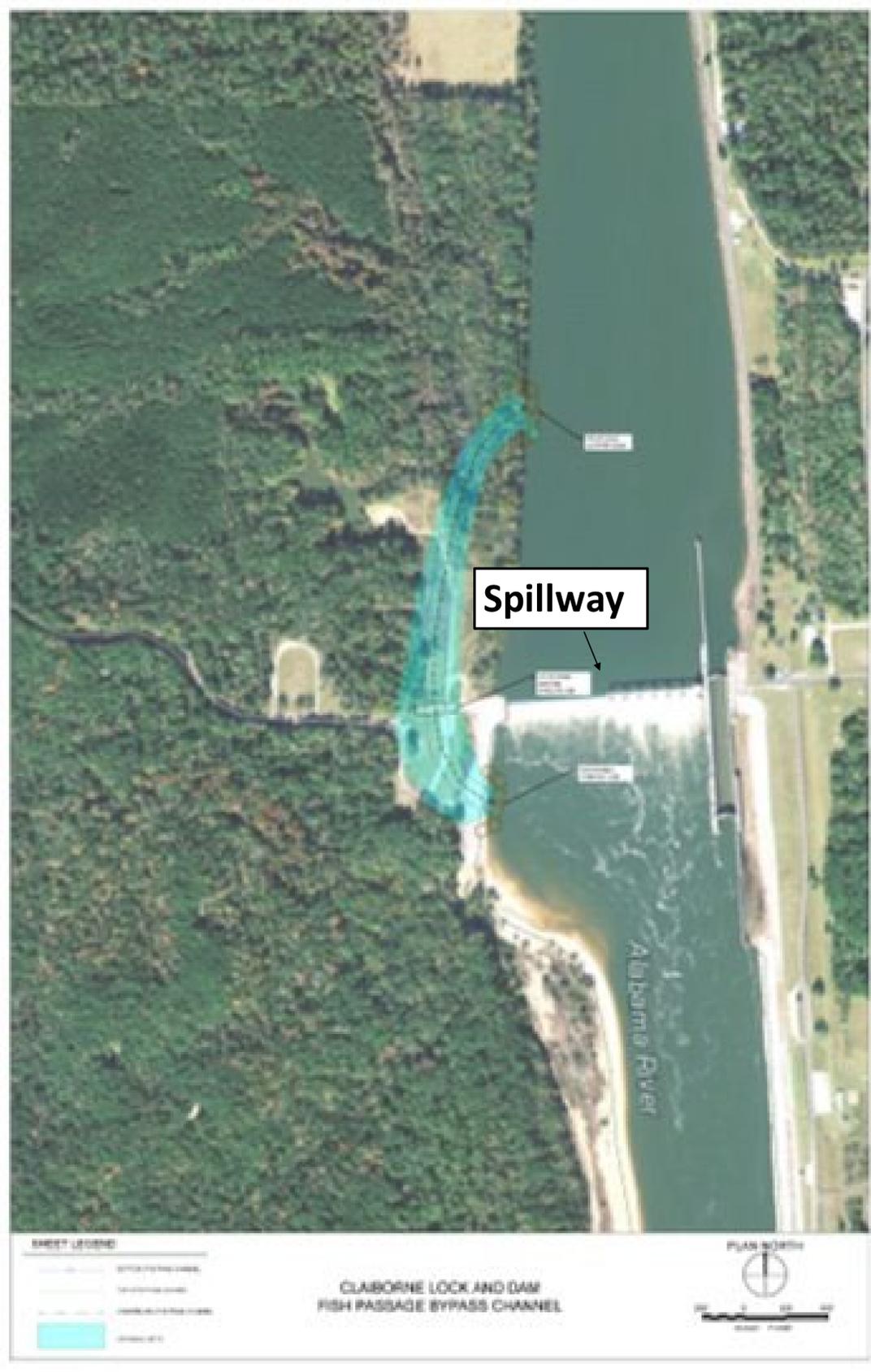


Flow Distribution Between Outlets Millers Ferry Lock and Dam



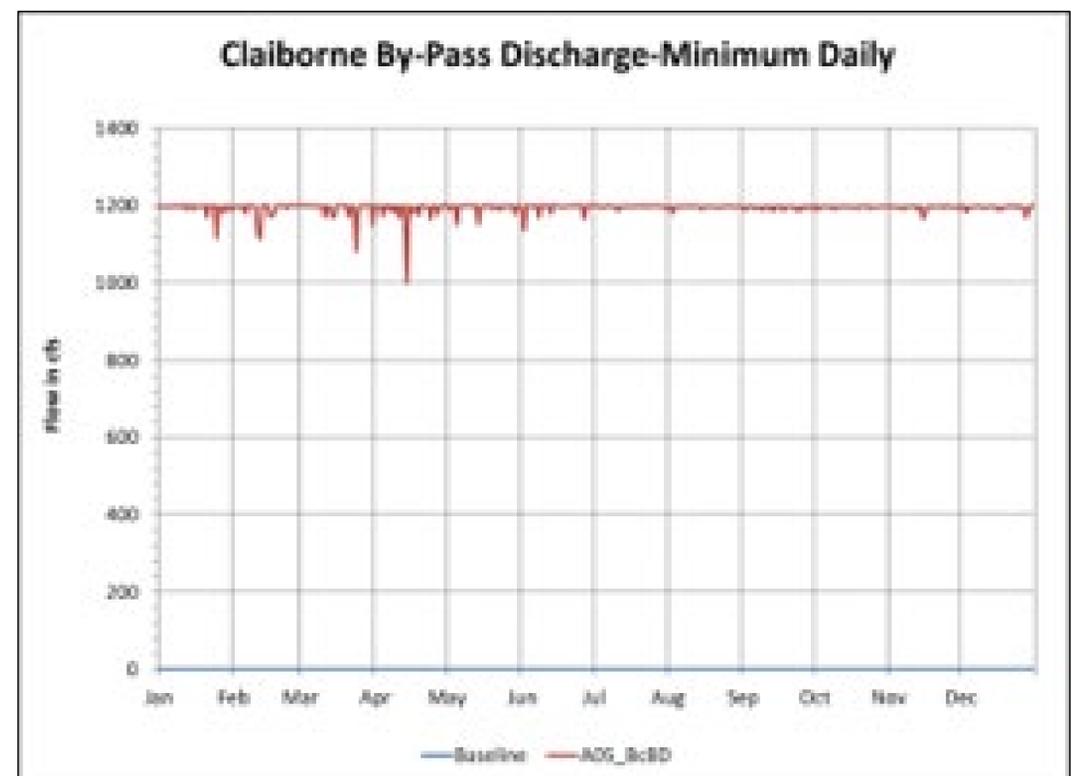
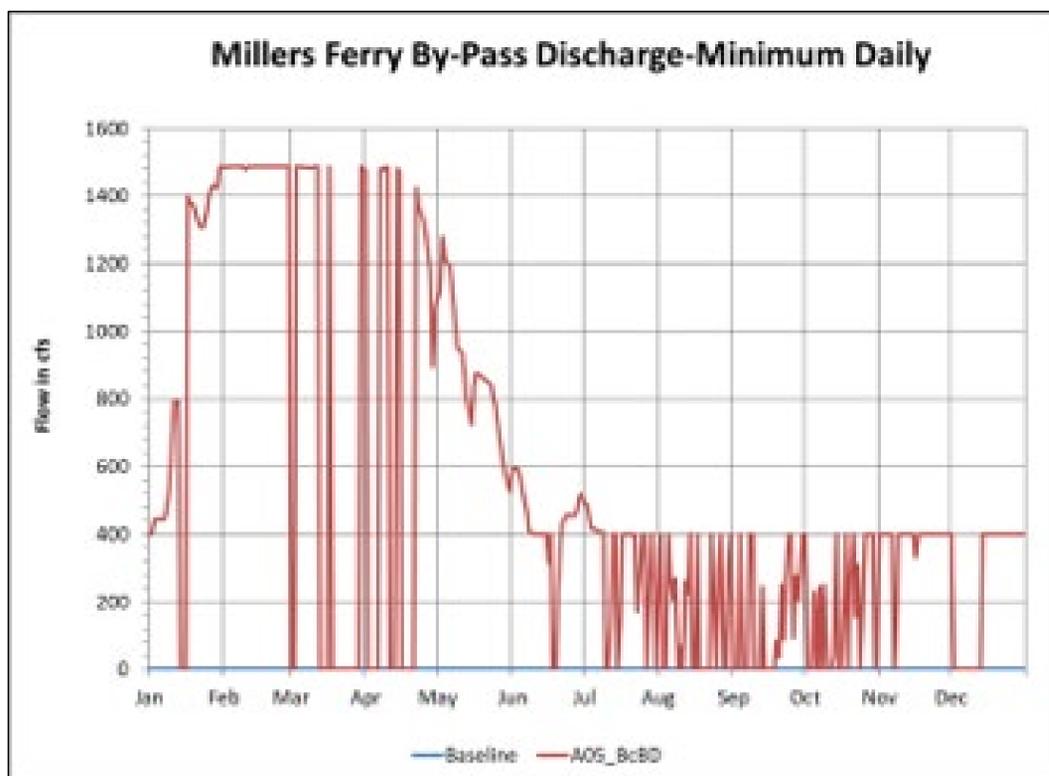
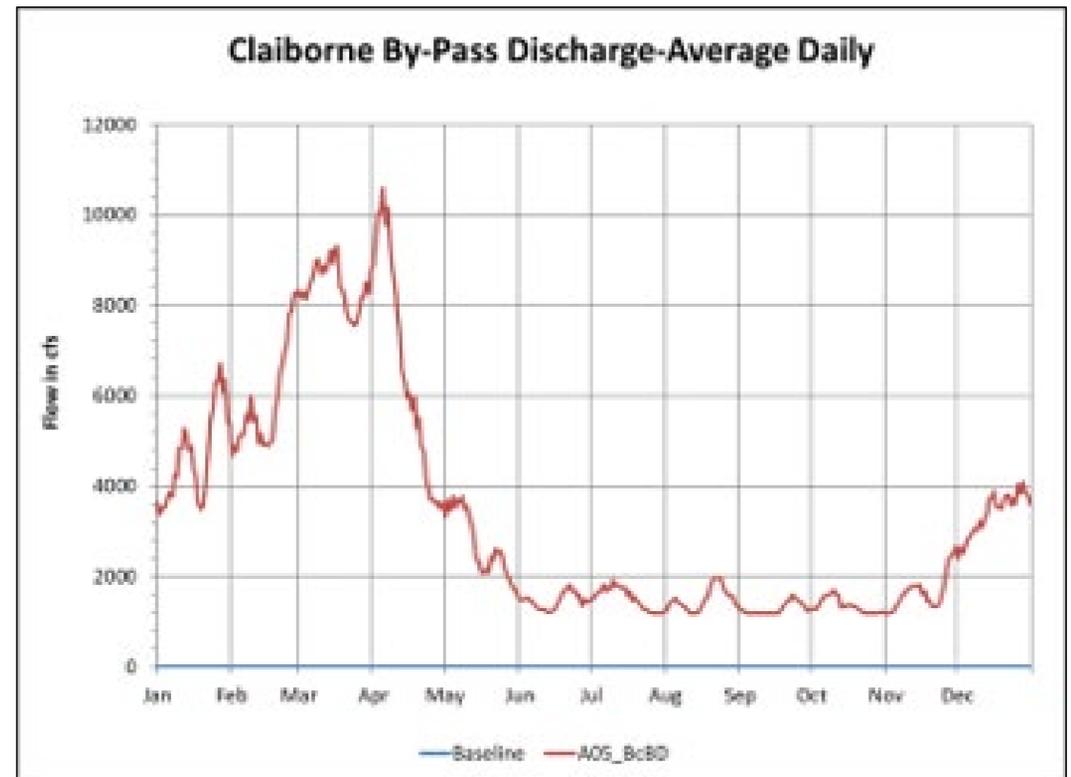
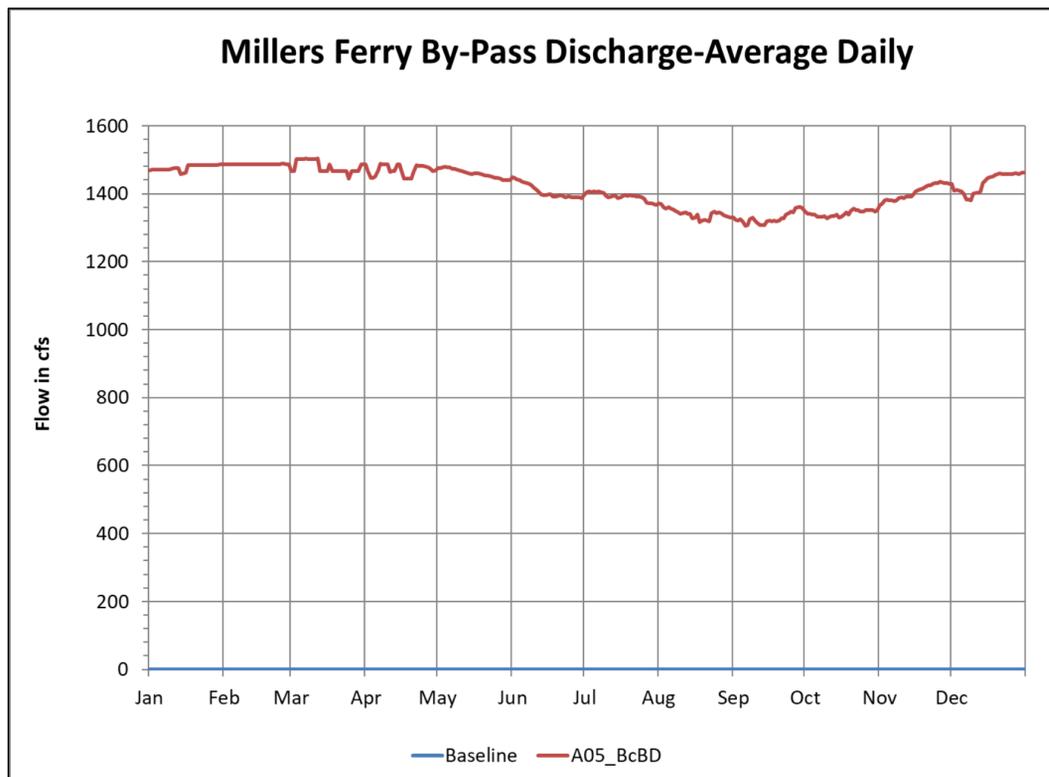
Condition	Outlet Sequence At Millers Ferry
Low	1. Hydropower
Normal	1. Hydropower 2. Fish Passage Bypass 3. Spillway
High	1. Spillway

Flow Distribution Between Outlets Claiborne Lock and Dam



Condition	Outlet Sequence At Claiborne
Low	1. Fish Passage
Normal	1. Fish Passage 2. Spillway
High	1. Fish Passage 2. Spillway

Seasonal Flow Through Bypass Structures



Submit Comments

Submit your comments on the Claiborne and Millers Ferry Locks and Dams Fish Passage Feasibility Report and Integrated Environmental Assessment by May 31, 2023, by any of the following methods:

- Submit comments onsite at the public meetings through comment forms
- By email to:
AlabamaFishPassage@usace.army.mil
- By letter addressed to: USACE Mobile District Commander, ATTN: PD-EI (Alabama Fish Passage), P.O. Box 2288, Mobile, AL 36628-0001



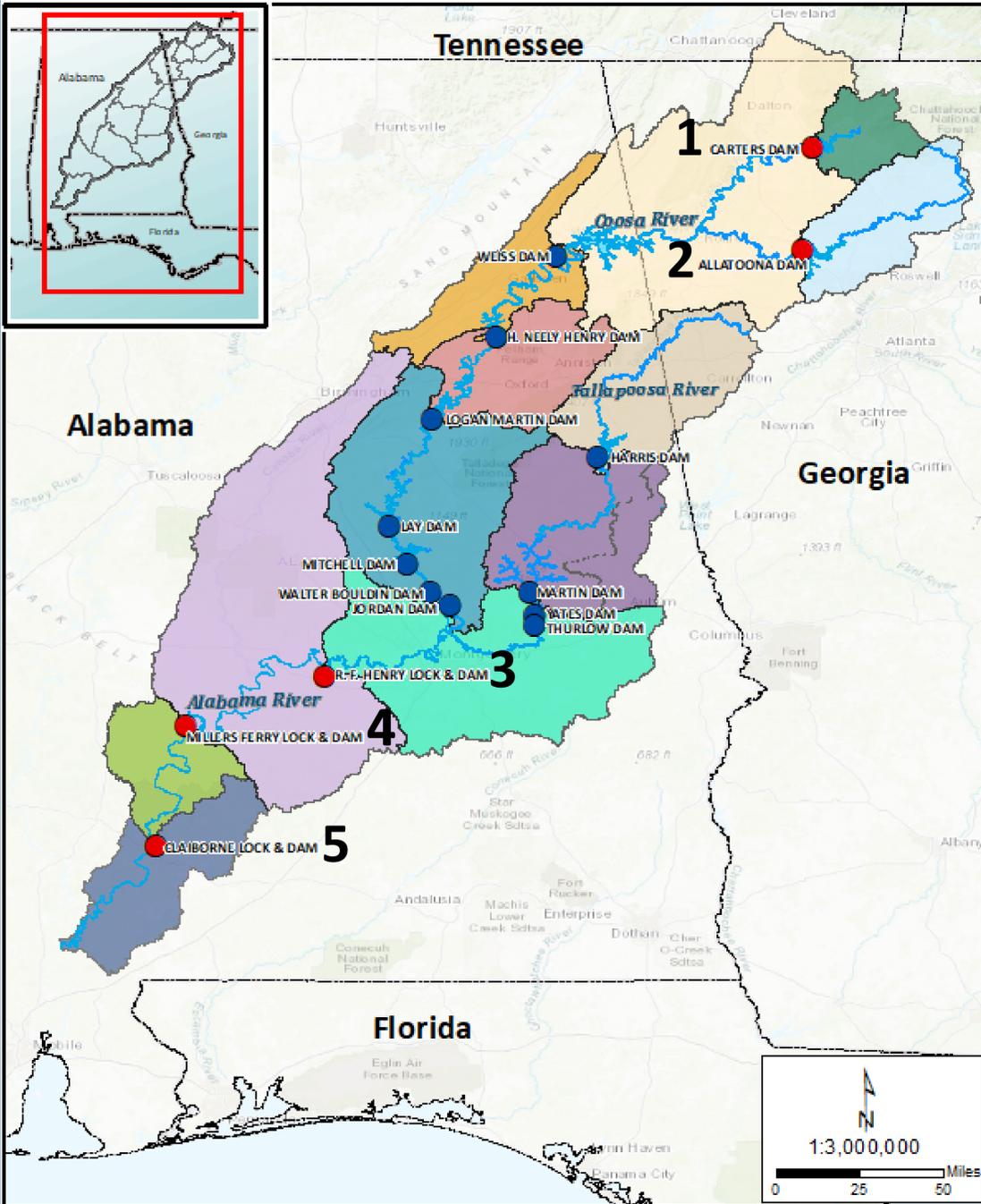
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Alabama-Coosa-Tallapoosa (ACT)

River Basin

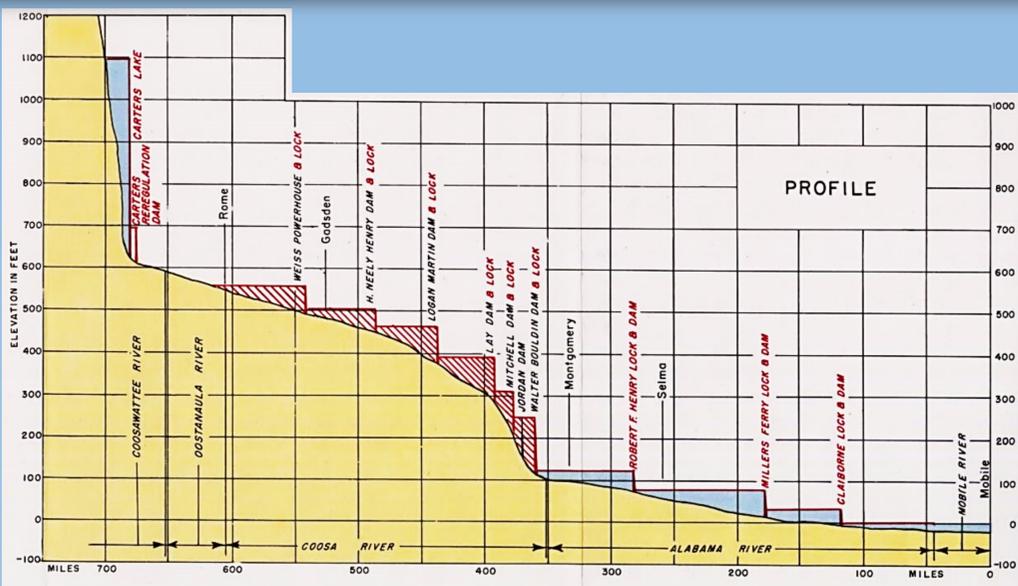
Basin Description

- The ACT River Basin drains northeastern and east-central Alabama, Northwestern Georgia, and a small portion of Tennessee.
- The Coosa River is formed by the Etowah and Oostanula Rivers at Rome, Georgia and flows first westerly, then southwesterly, and finally southerly for a total of 286 miles before joining the Tallapoosa River to form the Alabama River south of Wetumpka, Alabama.
- The Etowah River lies entirely within Georgia and is formed by several small mountain creeks which rise on the southern slopes of the Blue Ridge Mountains at an elevation of about 3,250 feet.
- The Oostanula River is formed by the Coosawattee and Conasauga Rivers at Newtown Ferry, Georgia, and meanders southwesterly through a broad plateau for 47 miles to its mouth at Rome Georgia.
- The Tallapoosa River rises in northwestern Georgia at an elevation of about 1,250 feet, and flows westerly and southerly for 268 miles, joining the Coosa River south of Wetumpka, Alabama.
- The Alabama River is formed by the confluence of the Coosa and Tallapoosa Rivers near Montgomery, Alabama, meandering westerly for about 100 miles to Selma, Alabama.



BASINS

- USACE DAMS
- NON-USACE DAMS
- CARTERS
- ALLATOONA
- WEISS
- NEELY HENRY
- LOGAN MARTIN
- HARRIS
- MILLERS FERRY
- LOWER COOSA
- MARTIN
- R.F. HENRY
- CLAIBORNE
- LOWER ALABAMA



Federal Dams

1 Carters Dam

Purpose: The Corps' Carters Lake and Carters Reregulation Dam on the Coosawattee River is a multipurpose project that provides flood risk management, hydropower, navigation, water supply, water quality, fish and wildlife conservation, and recreation.
Location: Coosawattee River

Declared Power Capacity:	600 ⁺ 4 MW
Conservation Storage:	141,402 ac-ft
Drainage Area:	374 ⁺ 5 sq mi
Normal Elevation:	1074 ft
Total Storage:	383,565 ac-ft
Year Completed:	1974
Length:	2,753 ft



2 Allatoona Dam

Purpose: Allatoona Dam and Lake is a multipurpose project that provides flood risk management, navigation, hydropower, recreation, water supply, water quality, and fish and wildlife conservation.
Location: Etowah River

Declared Power Capacity:	82.2 ⁺ 4 MW
Conservation Storage:	284,580 ac-ft
Drainage Area:	1,122 ⁺ 5 sq mi
Normal Elevation:	840 ft
Total Storage:	367,471 ac-ft
Year Completed:	1949
Length:	1,250 ft



3 R. F. Henry Dam

Purpose: The project is a multipurpose project providing hydropower, navigation, recreation, and fish and wildlife conservation.
Location: Alabama River in south central Alabama

Declared Power Capacity:	82 ⁺ 4 MW
Conservation Storage:	36,450 ac-ft
Drainage Area:	16,233 ⁺ 5 sq mi
Normal Elevation:	126 ⁺ 7 ft
Total Storage:	247, 210 ac-ft
Year Completed:	1972
Length:	1,530 ft



4 Millers Ferry Lock and Dam

Purpose: The project is a multipurpose project providing hydropower, navigation, recreation, and fish and wildlife conservation.
Location: 133 miles above the mouth of the Alabama River in the southwestern part of Alabama

Declared Power Capacity:	90 ⁺ 4 MW
Conservation Storage:	46, 704 ac-ft
Drainage Area:	20,633 ⁺ 5 sq mi
Normal Elevation:	80.8 ⁺ 7 ft
Total Storage:	346,354 ac-ft
Year Completed:	1969
Length:	8,860 ft



5 Claiborne Lock and Dam

Purpose: "The Claiborne Project is primarily a navigation structure. The reservoir provides navigation depths upstream and the dam reregulates peaking power releases from Millers Ferry.
Location: 72.5 miles above the mouth of the Alabama River in the southwestern part of Alabama.

Declared Power Capacity:	None
Conservation Storage:	NA
Drainage Area:	21,473 ⁺ 5 sq mi
Normal Elevation:	36 ⁺ 7 ft
Total Storage:	102,480 ac-ft
Year Completed:	1969
Length:	2,550 ft

