MITIGATION BANKING
Design and Implementation

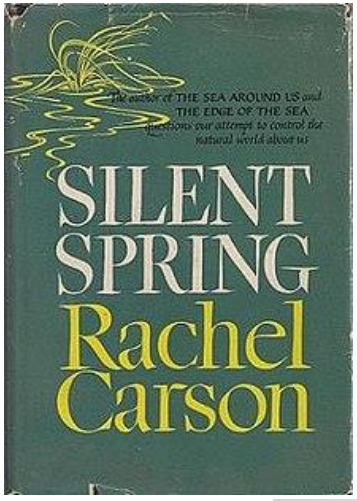
Rob Carlton, PWS
Goodwyn Mills Cawood, LLC.

GMC PROFESSIONAL EXPERIENCE

Staffing

- Currently 26 Employees across 6 GMC offices
- Range of Expertise
  - Biologist
  - Ecologist
  - Chemists
  - Geologist
  - Environmental Scientist
  - Civil Engineers
  - Biosystems Engineers
  - Environmental Engineers

WHAT STARTED ALL OF THIS?



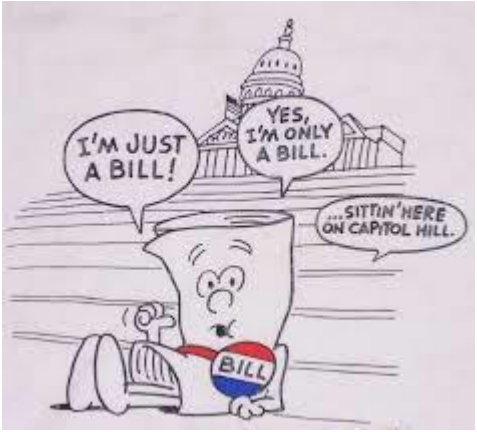
WHAT ARE THE LAWS THAT GOVERN?

Federal

- Rivers and Harbors Act of 1910
- Federal Water Pollution Control Act of 1942
- Clean Water Act of 1972
  - Section 404 (Waters of the US)
  - Section 402 (NPDES)
  - Section 319 (Nonpoint Source Management Program)
- 2008 Compensatory Mitigation Rule
- 2015 Clean Water Rule
- National Environmental Policy Act
- Threatened and Endangered Species Act

State

- State Water Quality Certificates (Section 401)
- State Buffer Variance Requirements
- State Stormwater Regulations
- State 319 Implementation Programs



WHAT ARE THE AGENCIES THAT GOVERN?

Federal Agencies

State Agencies

WHAT ARE THE RESOURCES WE ARE MANAGING?

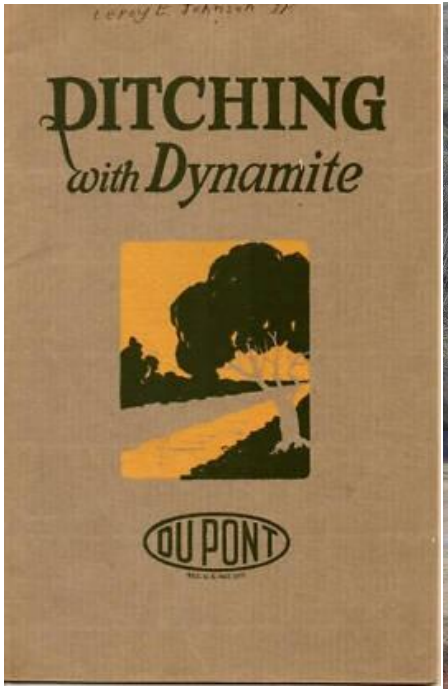
Waters of the US:

All waters including

- Intrastate lakes
- Rivers
- Streams
- Flats
- Wetlands
- Sloughs
- Prairie potholes
- Wet meadows
- Playa lakes
- Natural ponds

LAND MANAGEMENT IN THE SOUTH

- Aquatic Resources throughout the Southeast have been severely impacted by the following actions:
  - –Channelization
  - –Loss of Riparian Zones
  - –Excessive Armoring
  - –Cattle Grazing
  - –Bedded Pine Plantations
  - –Conversion to Crops



WHAT IS MITIGATION?

- “Compensatory mitigation involves actions taken to offset unavoidable adverse impacts to wetlands, streams, and other aquatic resources authorized by Clean Water Act section 404 permits and other Department of the Army (DA) permits” – [73 Fed Reg 19594]

- The measure of aquatic functions are based on the resources restored, enhanced, or preserved.

- Preservation – Protecting a highly functioning habitat
- Enhancement – Improving a semi-degraded habitat to increase function
- Restoration – Re-establishing a severely degraded system

WHAT IS MITIGATION?

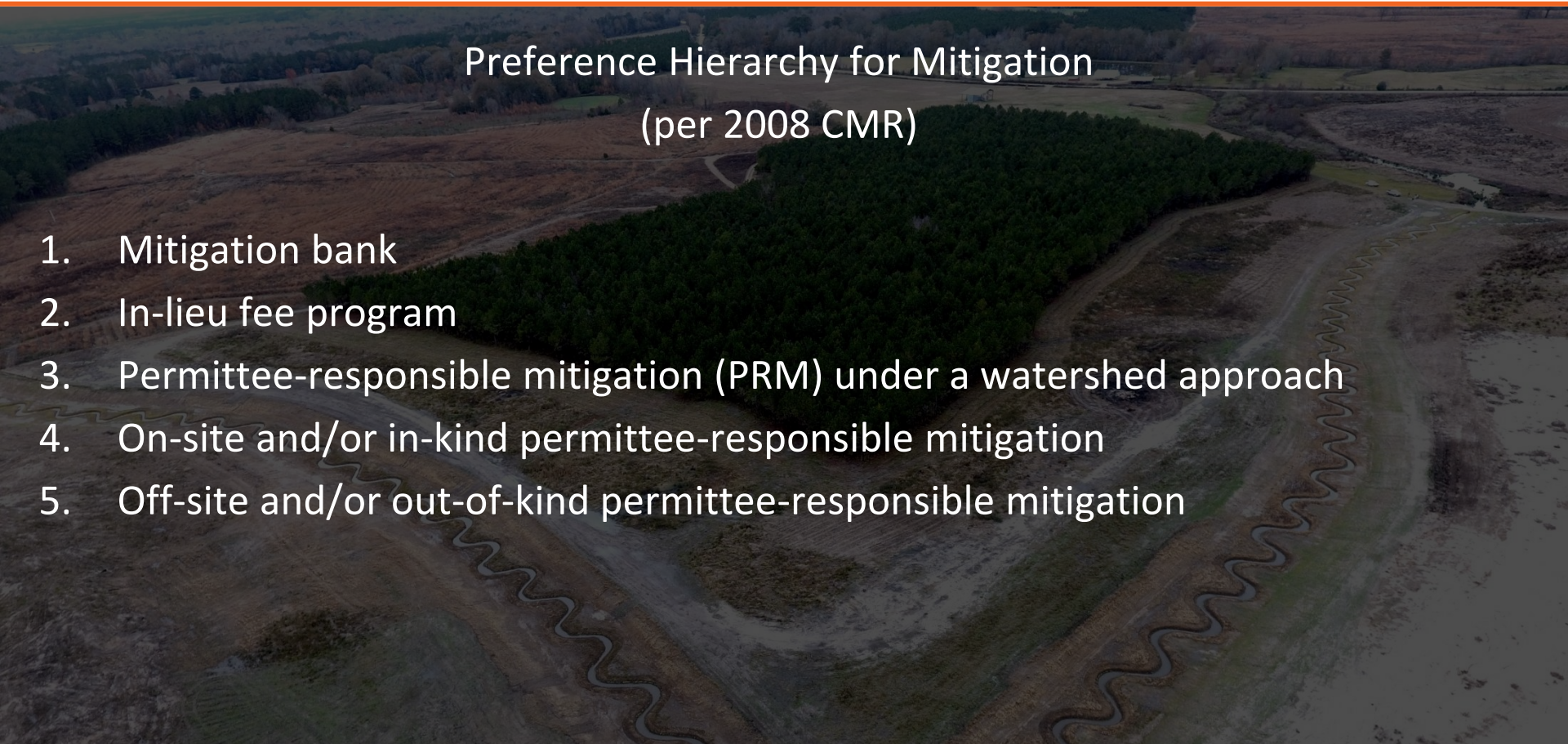
Preservation ⬆

Enhancement ⬆

Restoration ➡

➡

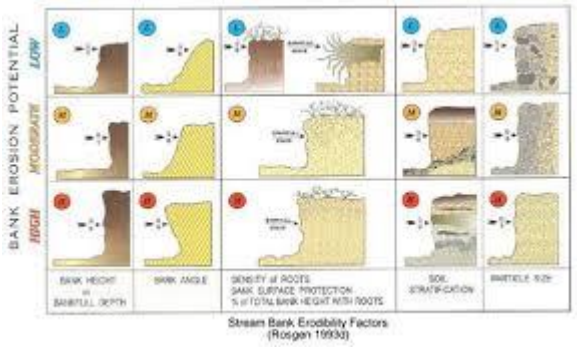
WHAT IS MITIGATION?



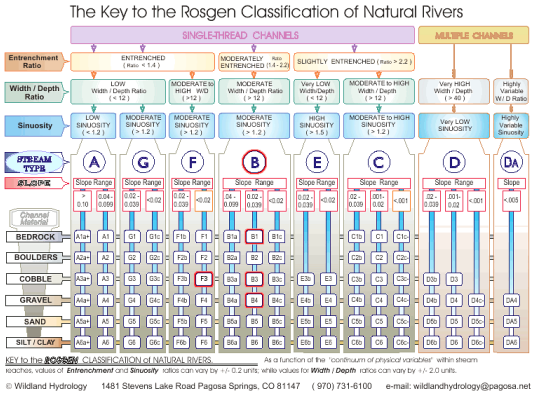
Preference Hierarchy for Mitigation
(per 2008 CMR)

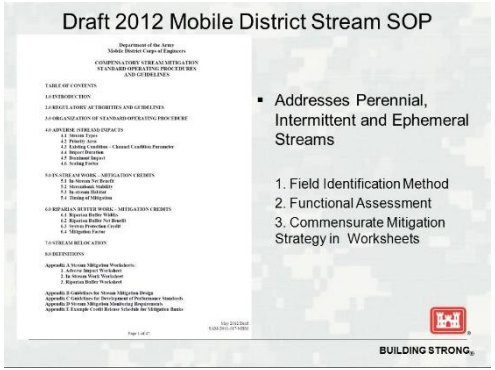
1. Mitigation bank
2. In-lieu fee program
3. Permittee-responsible mitigation (PRM) under a watershed approach
4. On-site and/or in-kind permittee-responsible mitigation
5. Off-site and/or out-of-kind permittee-responsible mitigation

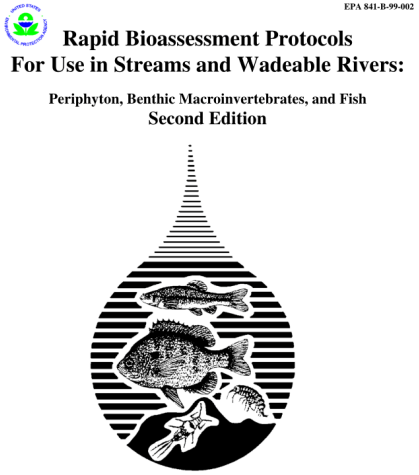
MITIGATION METHODOLOGY



Stream Bank Erodibility Factors
(Rosgen 1996)

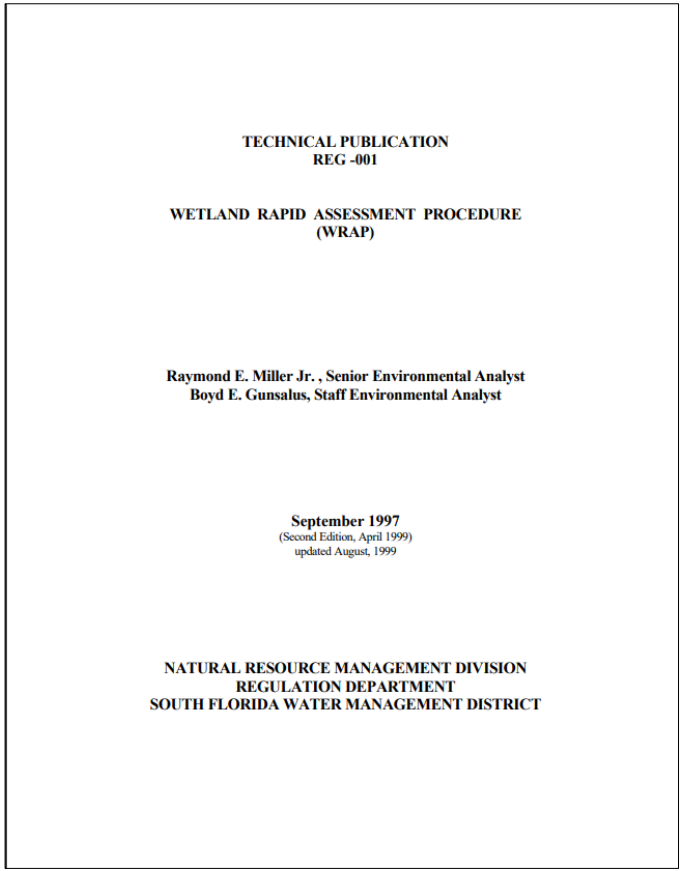






STREAM RESTORATION DESIGN

MITIGATION METHODOLOGY



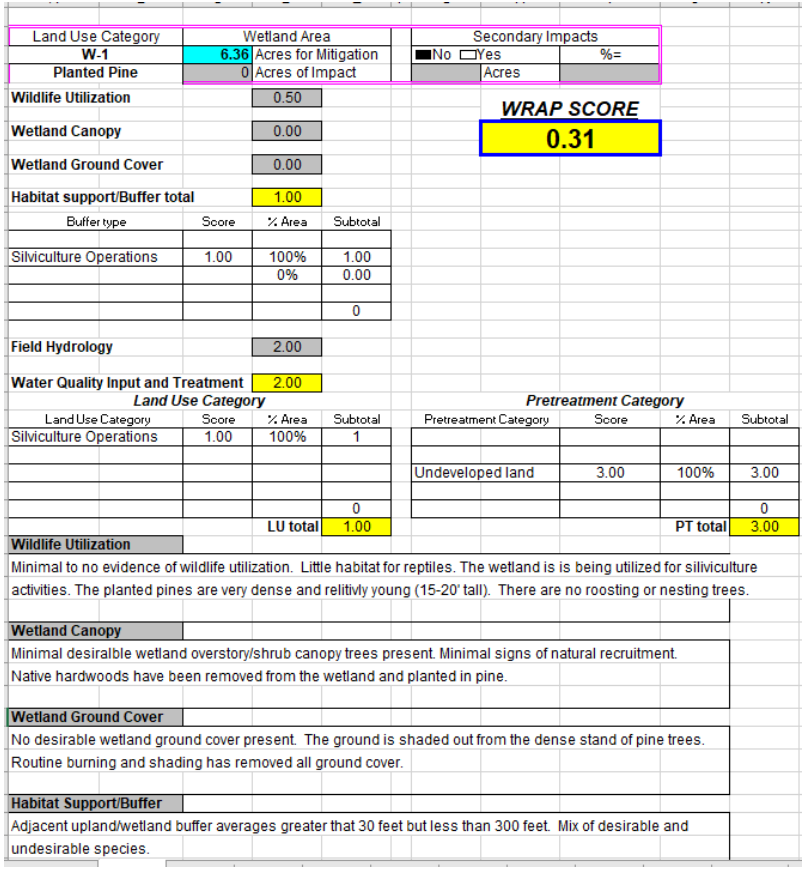
TECHNICAL PUBLICATION
REG -001

WETLAND RAPID ASSESSMENT PROCEDURE
(WRAP)

Raymond E. Miller Jr. , Senior Environmental Analyst
Boyd E. Gunsalus, Staff Environmental Analyst

September 1997
(Second Edition, April 1999)
updated August, 1999

NATURAL RESOURCE MANAGEMENT DIVISION
REGULATION DEPARTMENT
SOUTH FLORIDA WATER MANAGEMENT DISTRICT



Land Use Category	Wetland Area		Secondary Impacts	
W-1	6.36	Acres for Mitigation	■No □Yes	%=
Planted Pine	0	Acres of Impact	Acres	

Wildlife Utilization	0.50
Wetland Canopy	0.00
Wetland Ground Cover	0.00
Habitat support/Buffer total	1.00

WRAP SCORE
0.31

Buffer type	Score	% Area	Subtotal
Silviculture Operations	1.00	100%	1.00
		0%	0.00
			0

Field Hydrology	2.00
Water Quality Input and Treatment	2.00

Land Use Category

Land Use Category	Score	% Area	Subtotal
Silviculture Operations	1.00	100%	1
			0
		LU total	1.00

Pretreatment Category

Pretreatment Category	Score	% Area	Subtotal
Undeveloped land	3.00	100%	3.00
			0
		PT total	3.00

Wildlife Utilization

Minimal to no evidence of wildlife utilization. Little habitat for reptiles. The wetland is is being utilized for silviculture activities. The planted pines are very dense and relitivly young (15-20' tall). There are no roosting or nesting trees.

Wetland Canopy

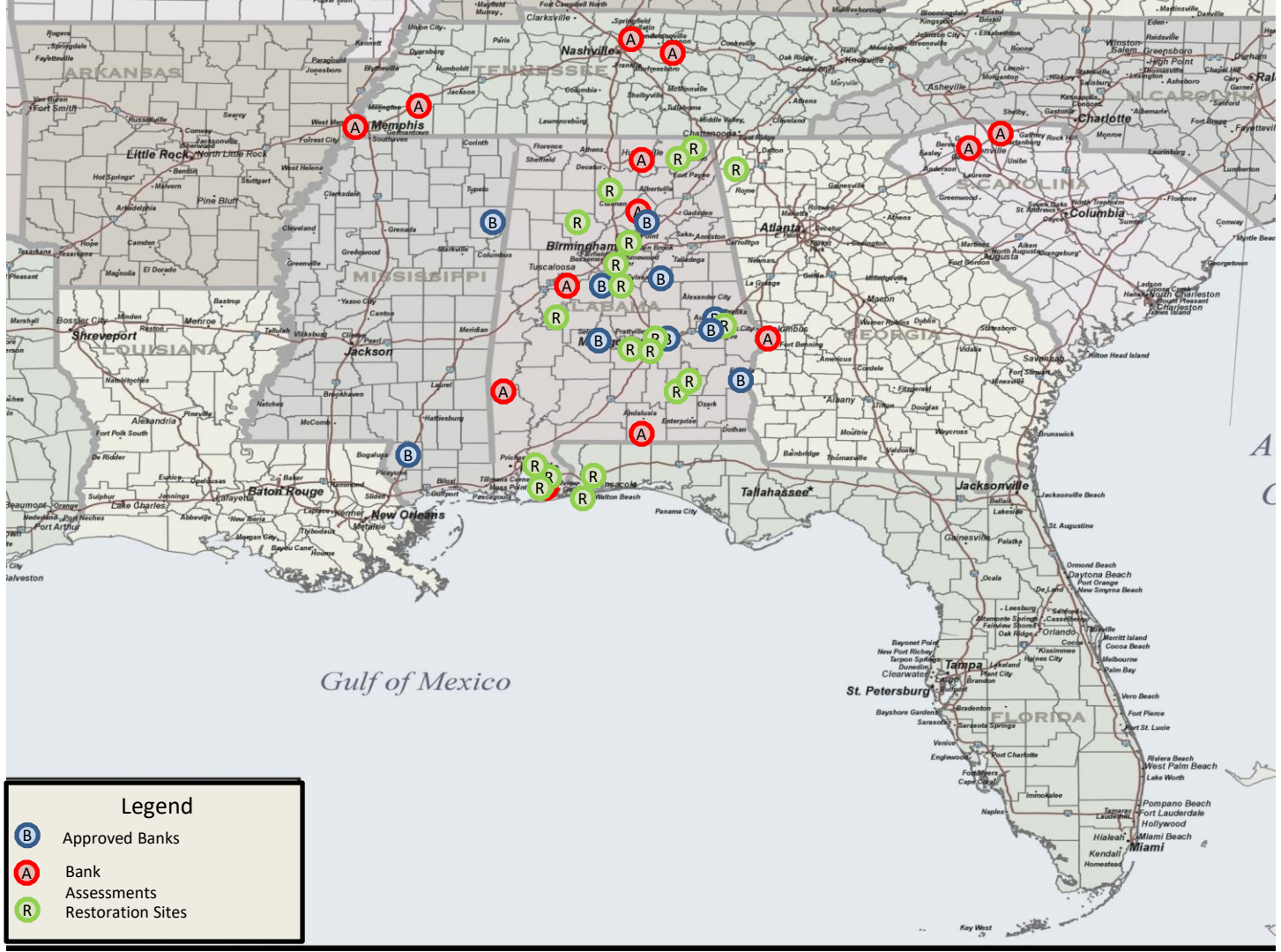
Minimal desirable wetland overstory/shrub canopy trees present. Minimal signs of natural recruitment. Native hardwoods have been removed from the wetland and planted in pine.

Wetland Ground Cover

No desirable wetland ground cover present. The ground is shaded out from the dense stand of pine trees. Routine burning and shading has removed all ground cover.

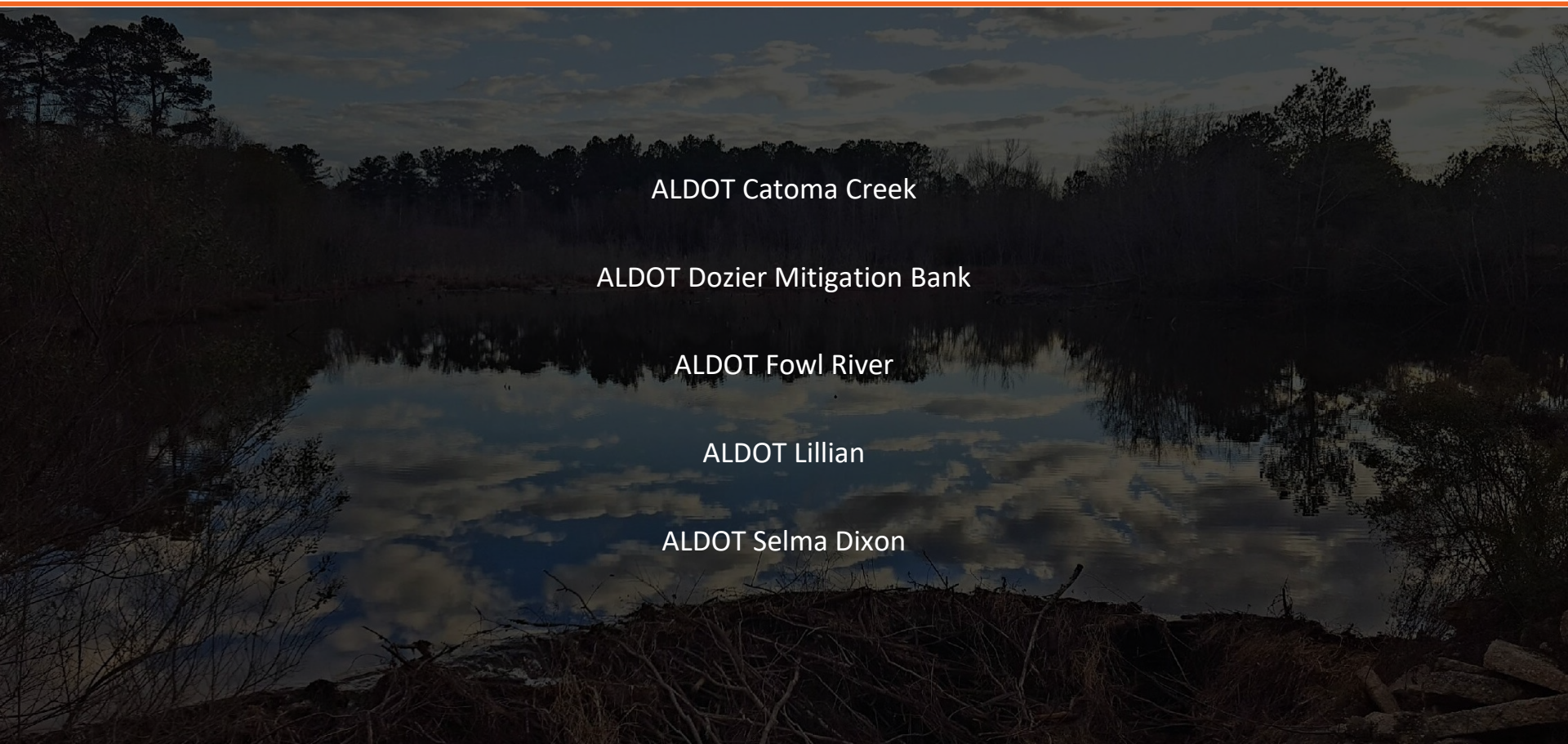
Habitat Support/Buffer

Adjacent upland/wetland buffer averages greater that 30 feet but less than 300 feet. Mix of desirable and undesirable species.

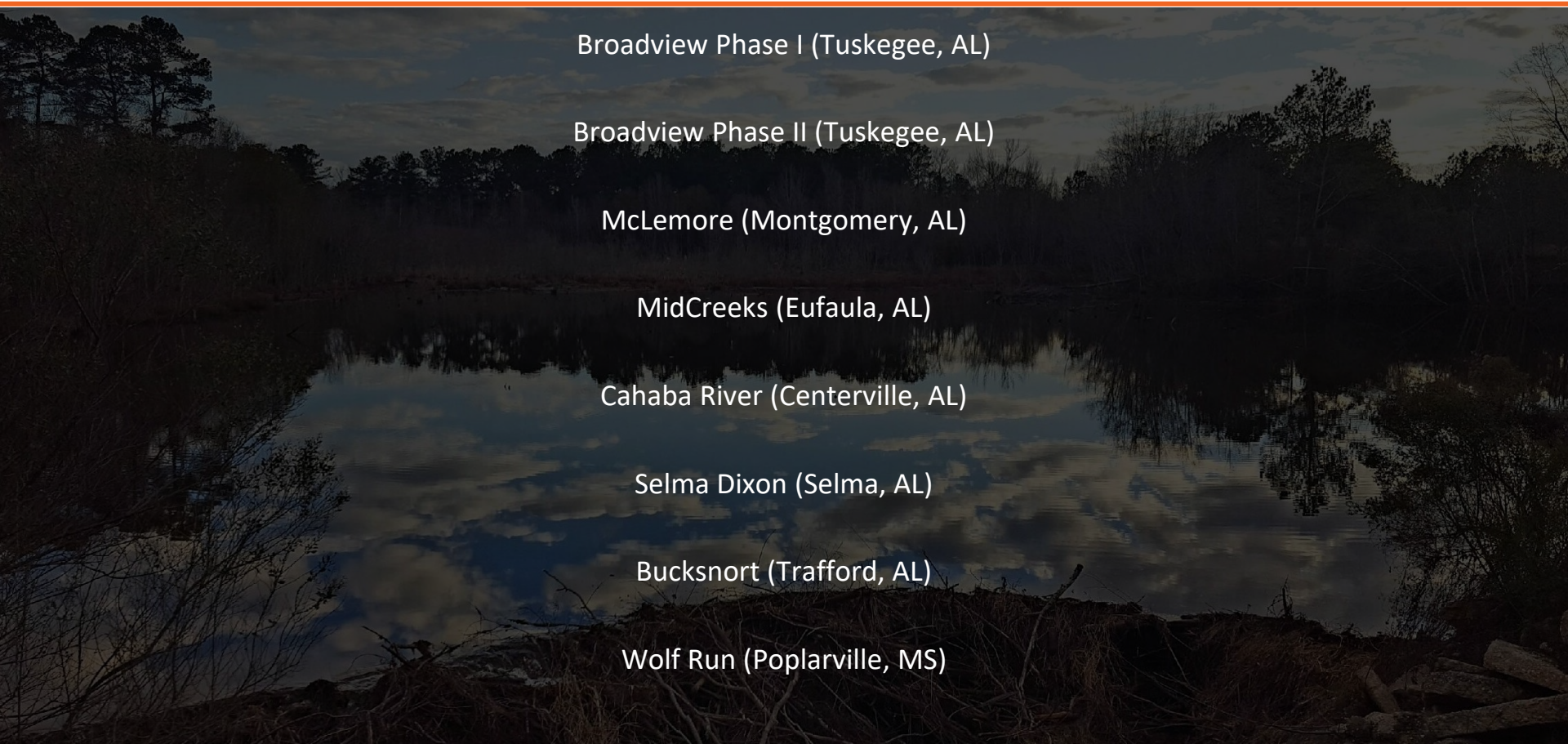

Legend
Approved Banks
Bank Assessments
Restoration Sites
Gulf of Mexico
Nashville
Memphis
Little Rock
Birmingham
Atlanta
Charlotte
Columbia
Jackson
Shreveport
Baton Rouge
New Orleans
Tallahassee
Jacksonville
Tampa
St. Petersburg
Miami
ARKANSAS
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
LOUISIANA
FLORIDA

USACE MOBILE DISTRICT

ALDOT MITIGATION BANKS



MITIGATION BANKS MANAGED BY GMC



Broadview Phase I (Tuskegee, AL)

Broadview Phase II (Tuskegee, AL)

McLemore (Montgomery, AL)

MidCreeks (Eufaula, AL)

Cahaba River (Centerville, AL)

Selma Dixon (Selma, AL)

Bucksnort (Trafford, AL)

Wolf Run (Poplarville, MS)

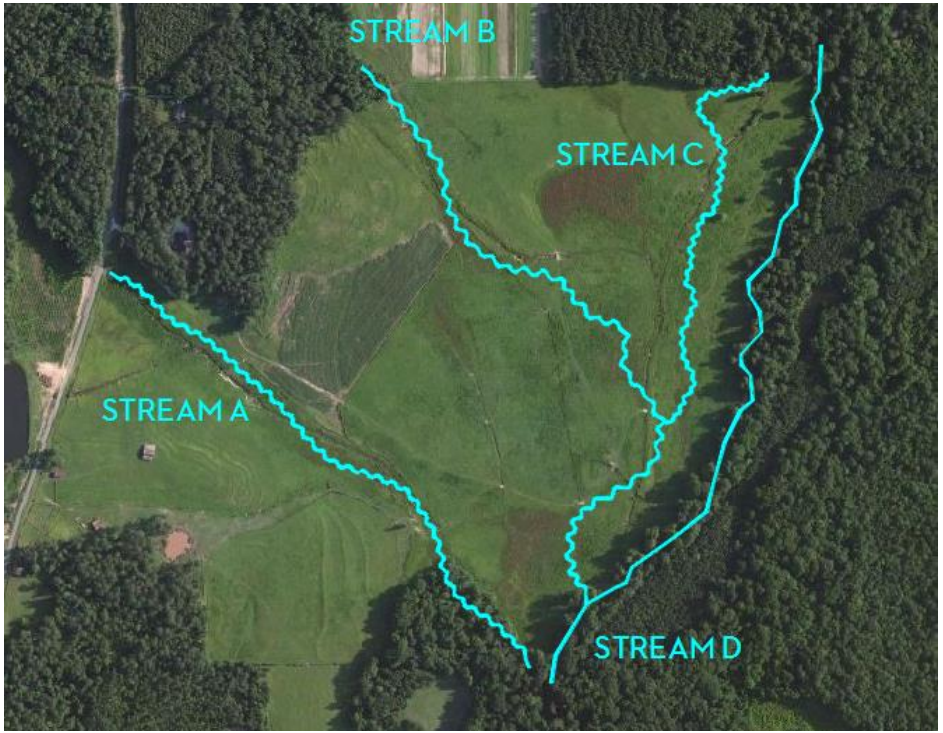
BROADVIEW MITIGATION BANK

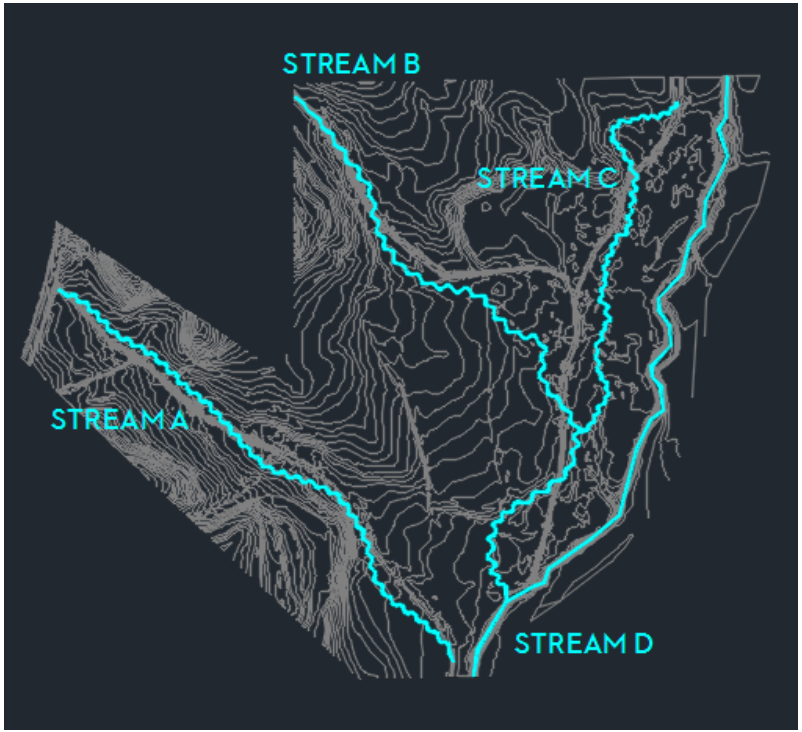
Phase I = 164 acres (20,000 linear feet of streams)

Phase II = 123 acres (wetlands)

BROADVIEW MITIGATION BANK

- Stream Restoration Alignments:



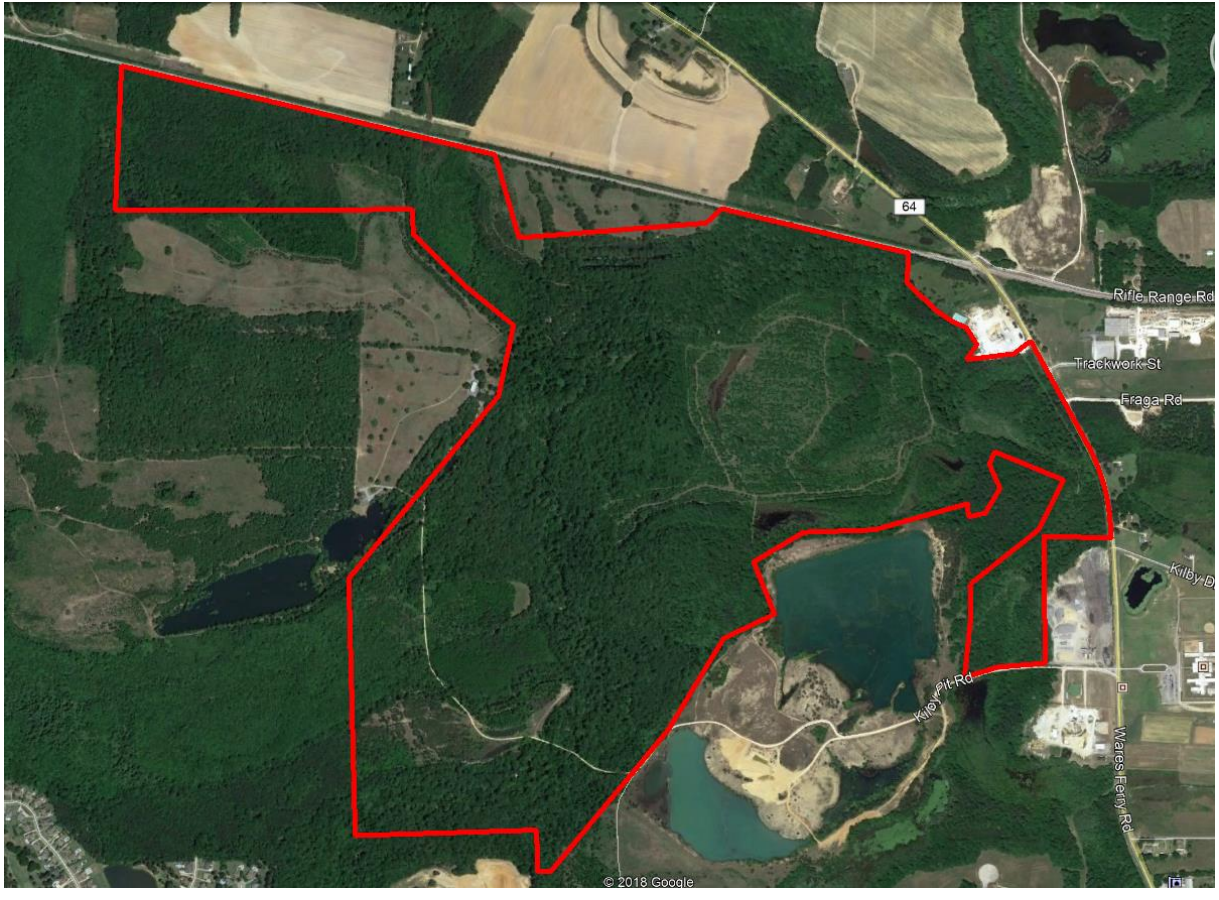


MCLEMORE MITIGATION BANK

Bank total: 717 acres

Wetlands: 647 acres

Streams: 25,000 linear feet



MCLEMORE MITIGATION BANK

MCLEMORE MITIGATION BANK

MIDCREEKS MITIGATION BANK

Bank total:

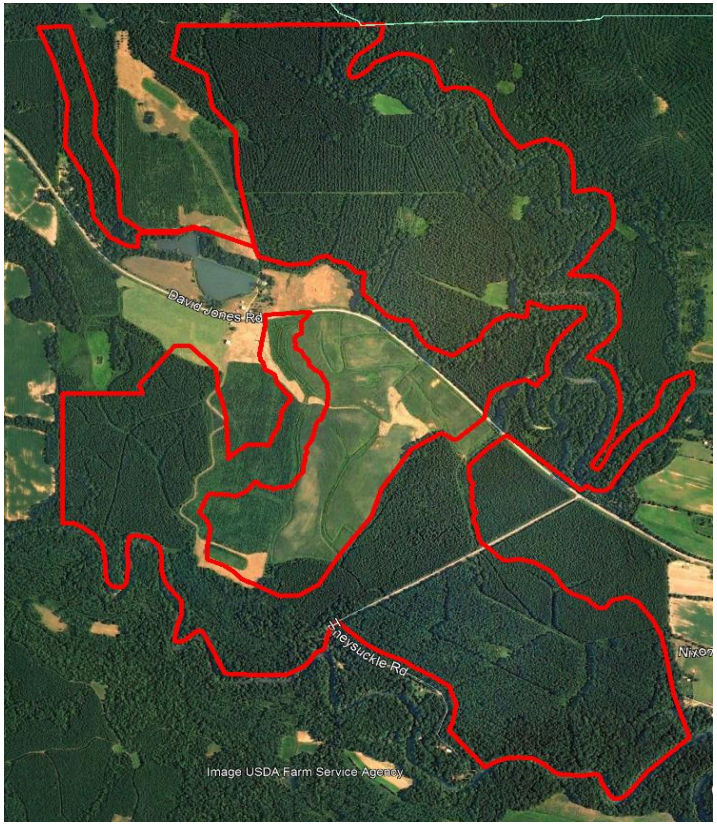
727.41 acres

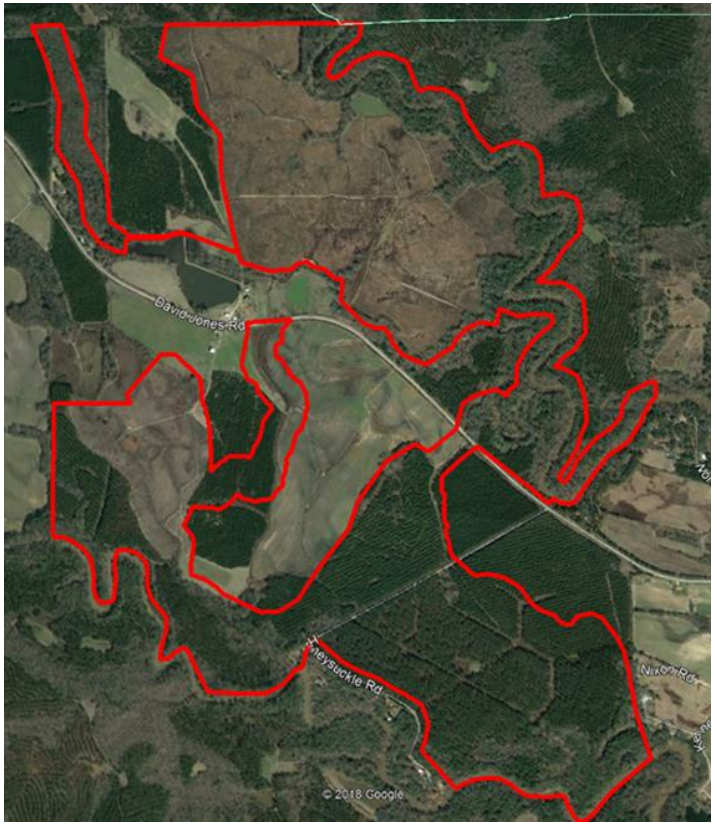
Wetlands:

412 acres

Streams:

37,430 linear feet





MIDCREEKS MITIGATION BANK

Stream F

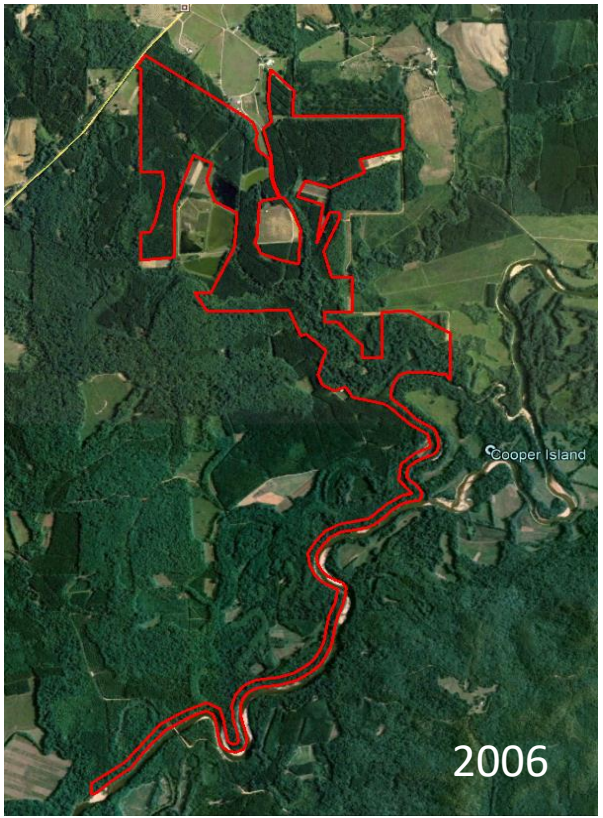
Wetland Polygon 4

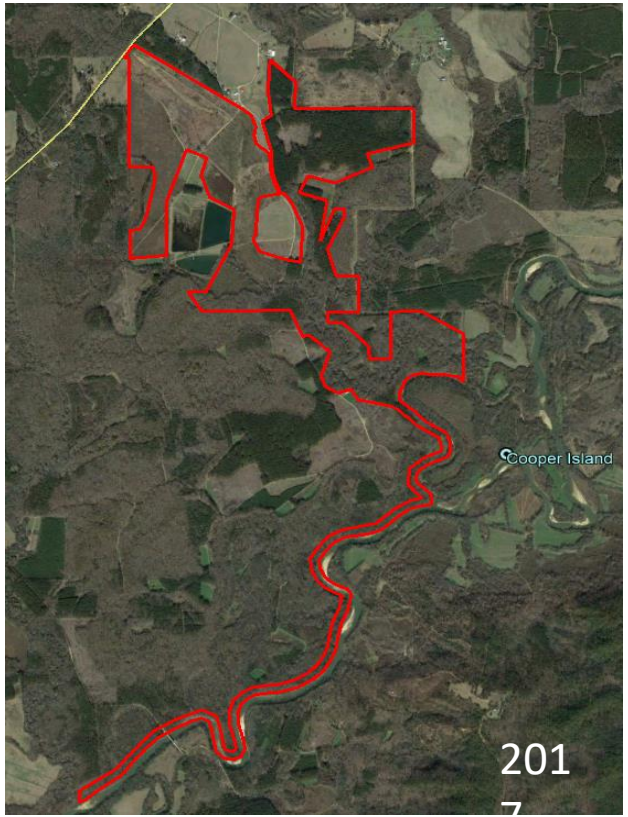
CAHABA RIVER MITIGATION BANK

Bank total: 725 acres

Wetlands: 343 acres

Streams: 51,687 linear feet

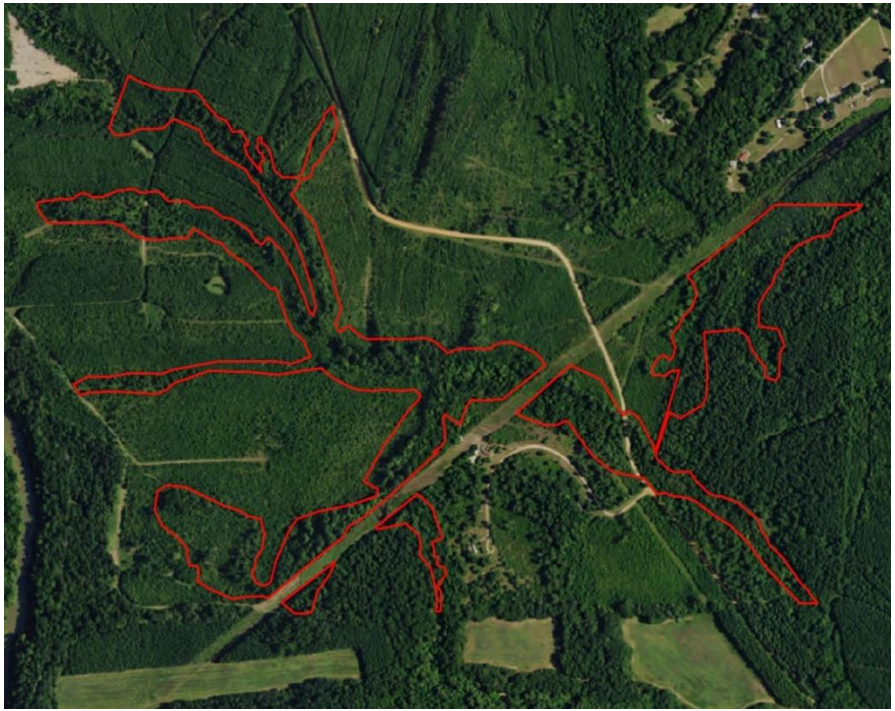


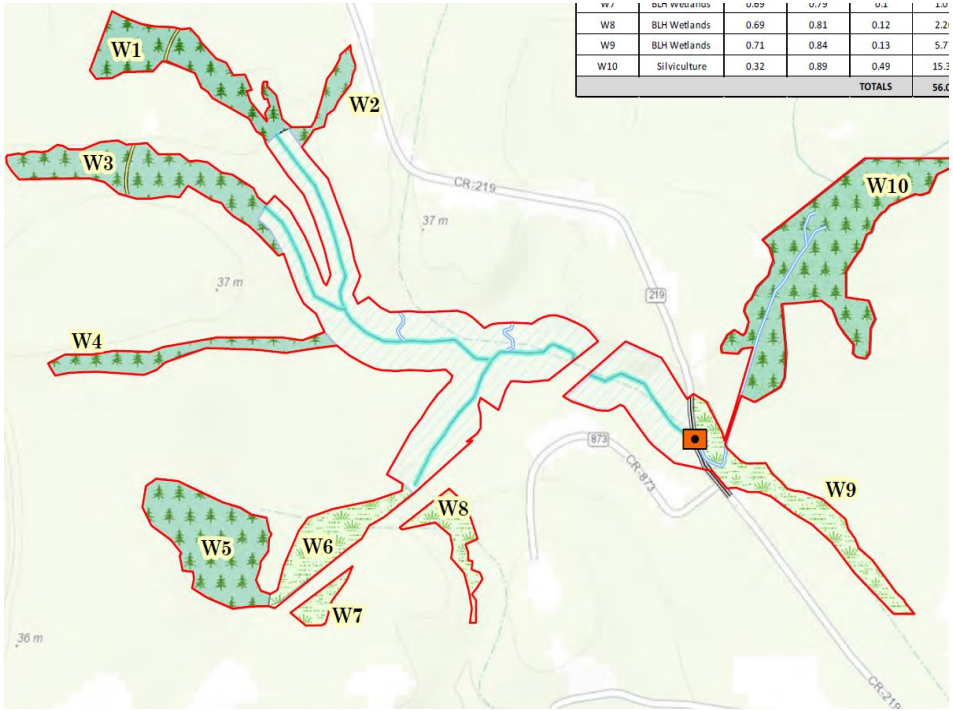


CAHABA RIVER MITIGATION BANK

SELMA DIXON MITIGATION BANK

Bank total: 93 acres - 80 acres of wetlands & 6,640 linear feet of stream





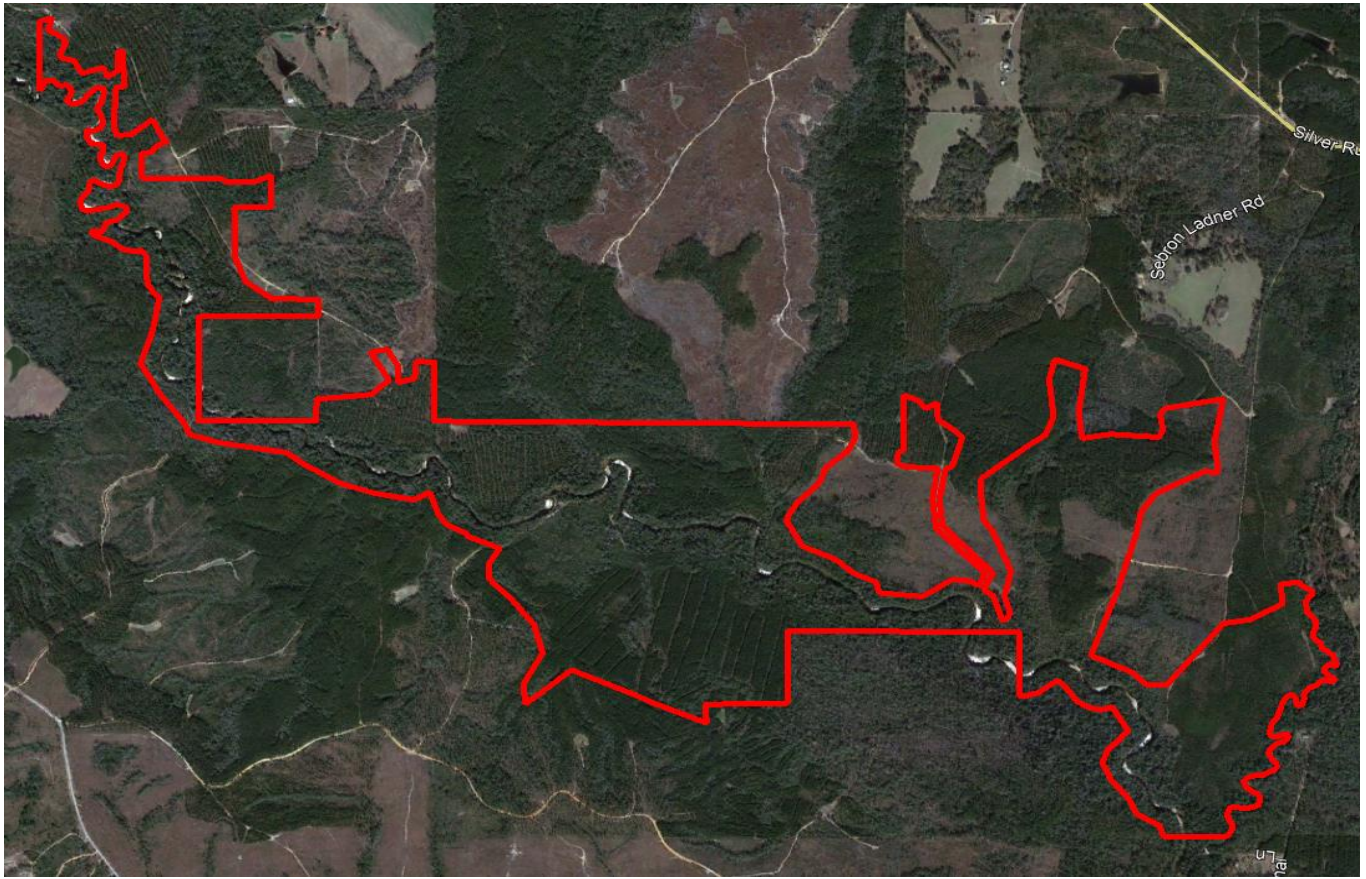
W8	BLH Wetlands	0.69	0.81	0.12	2.2
W9	BLH Wetlands	0.71	0.84	0.13	5.7
W10	Silviculture	0.32	0.89	0.49	15.3
				TOTALS	56.0

WOLF RUN MITIGATION BANK

Bank total:
721 acres

Wetlands:
357 acres

Streams:
30,720 linear feet

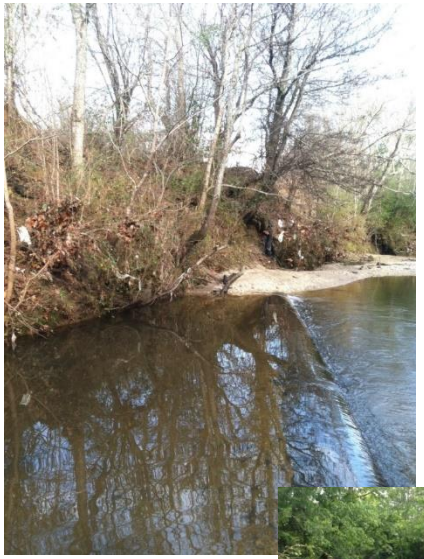


WOLF RUN MITIGATION BANK

STREAM RESTORATION

Not just for mitigation!

STREAM RESTORATION



FUTURE CHANGES

1. States assuming more regulatory control
2. Potential removal of ephemeral streams from regulations
3. Push towards more biological and chemical success criteria
4. Potential to add conservation component to banks for threatened and endangered species

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