Mobile Bay National Estuary Program
Project Implementation Committee

November 10, 2022, 1:00 pm – 3:00 pm
Five Rivers Tensaw Theater

Agenda

Meeting Objectives:

a) Provide update on activities related to the eastern shore (Baldwin County).
b) Other project status updates

1. **Welcome and Introductions**
   PIC Co-Chairs:
   Judy Haner, The Nature Conservancy
   Patric Harper, U.S. Fish & Wildlife Service

2. **Review and Approval of Minutes**

3. **Old Business**
   a) Management Conference Committee Status Updates
   b) Government Performance and Results Act (GPRA) Update

4. **New Business**
   a) Eastern Shore Project Updates
      a. Eastern Shore Watershed Management Plan – Suzanne Sweetser, Thompson Engineering
      b. Bon Secour Constructed Wetlands – Andy James, Volkert, Inc.
      c. Building Blocks of High-Quality Regulations – Matthew Brown, Baldwin County
      d. Lower Fish/Magnolia River Stream Restoration Program – Jason Kudulis, MBNEP
      e. Marlow Stream Restoration – Nick Combs, Thompson Engineering

   b) MBNEP Watershed Planning and Project Implementation Update
   c) Off-cycle topical meeting – push to 2023 – MRD Oyster Harvest Update
   d) Next meeting **TBD**

5. **Adjourn**

Project Implementation Committee Meeting – November 2022

Please sign-in out in the hallway

This presentation provides minutes of the November 10, 2022, Project Implementation Committee. Additional notes are added as needed.

Attendees: Cassie Bates, Emery Baya, Aubrey Bianco, Mary Kate Brown, Matthew Brown, Dottie Byron, Ashley Campbell, Nick Combs, Annelise Dodd, Cassie Eldredge, Ricky Fields, Casey Fulford, Judy Haner, Katy Hines, Rob Howell, Patric Harper, Jason Herrmann, Jordan Hollinghead, Webb Jackson Matthew Jones, Jeremiah Kolb, Cody Ledet, Nicole Love, Brian Mabry, Shannon McGlynn, David Newell, Autumn Nitz, Greg Pierce, Ryan Peek, Melissa Pringle, Justin Rigdon, Tina Sanchez, Eric Schneider, Derrick Scott, Sawyer Shotts, Katie Smith, Suzanne Sweetser, Jason White

MBNEP Staff: Jason Kudulis, Marti Messick, Christian Miller, Roberta Swann

Project Implementation Committee Agenda

Welcome and Call to Order:

Co-Chairs: Judy Haner, The Nature Conservancy, & Patric Harper, U.S. Fish and Wildlife Service

Review and approval of August 2022 minutes

Old Business:

Management Conference Committee Updates

GPRA Update

New Business:

- Eastern Shore Project Updates
- MBNEP Watershed Planning and Project Implementation Updates
- Next Meeting TBD

The meeting was called to order at 1:02pm.

Minutes from the August 2022 meeting were distributed for review prior to the meeting. Tina Sanchez motioned to accept the minutes; Dottie Byron seconded the motion.

Old Business: MBNEP staff provided updates for the other Management Conference committees.

- No updates. The other Management Conference committees did not hold another meeting after August.
- Government Performance and Results Act Update – slides follow

New Business:

Presentations focused on monitoring, planning, and restoration activities on the Eastern Shore. This continues our theme of focusing on different geographic sectors around coastal Alabama. Slides from presentations follow and supplemental notes are included as needed.

Jason Kudulis provided a summary of the 2022 Government Performance and Results Act (GPRA)

Government Performance and Results Act (GPRA)

Each National Estuary Program is required to prepare annual summaries of habitats protected or restored within their study area. Those annual summaries are made up of all the projects partners submit to us, as well as NEP led projects.
We are required to report all projects within the study area if they align with our CCMP values and actions.

When we report your project(s) your name remains attached to them. We aren't taking credit for them. We're just reporting that they occurred within our study area.

Why your input is important

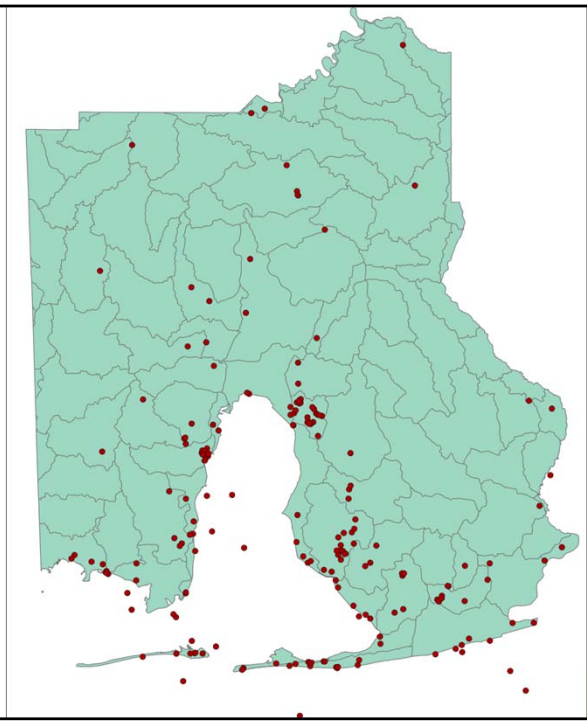
- Each NEP is required to prepare annual summaries on habitats protected or restored within their study area
- The MBNEP reports on project progress that aligns with CCMP values and actions
- Shows EPA the distribution of projects across the two coastal counties.
  - Allows gaps to be identified
  - Measure progress
  - Annual summaries are reported through the National Estuary Program On-Line Reporting Tool (NEPORT)

When we submit these projects, it shows EPA the distribution of projects across the two coastal counties.

Allows gaps to be identified
Measure progress
Annual summaries are reported through the National Estuary Program On-Line Reporting Tool (NEPORT)

2006-2022

- 210 projects reported
- 28,711 acres protected or restored
- 16 miles of channel/edge habitat
- $197M



The map shows all the projects that have been reported from 2006-2022.
210 projects have been reported with a total of 28,711 acres protected or restored.

2022 Submitted Projects

- 14 project submitted. Three rejected (boat ramps).
  - One marine debris; Two stream projects; One rehabilitation/creation; Seven acquisitions
  - 1,705 acres; 1.33 miles; $27.6M

Restoration Technique	Unit
Land Acquisition	1,583 acres
Stream Channel Rehabilitation	1,709 linear feet
Debris Removal	10,000 cubic yards
Rehabilitation/creation	72 acres

Eastern Shore Updates

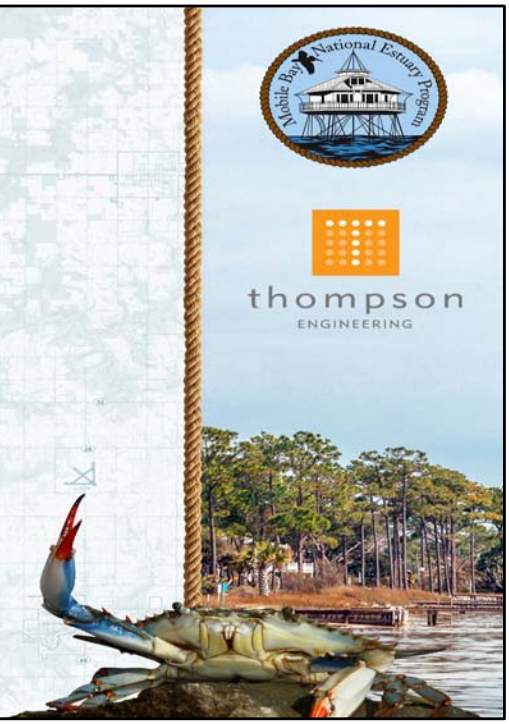
- Eastern Shore Watershed Management Plan – Suzanne Sweetser, Thompson Engineering
- Bon Secour Constructed Wetlands – Annelise Dodd & Katy Hines, Volkert, Inc.
- Building Blocks of High-Quality Regulations – Matthew Brown, Baldwin County
- Lower Fish/Magnolia River Stream Restoration Program – Jason Kudulis, MBNEP
- Marlow Stream Restoration – Nick Combs, Thompson Engineering

Presentations focused on monitoring, planning, and restoration activities on the Eastern Shore. This continues our theme of focusing on different geographic sectors around coastal Alabama. Slides from presentations follow and supplemental notes are included as needed.

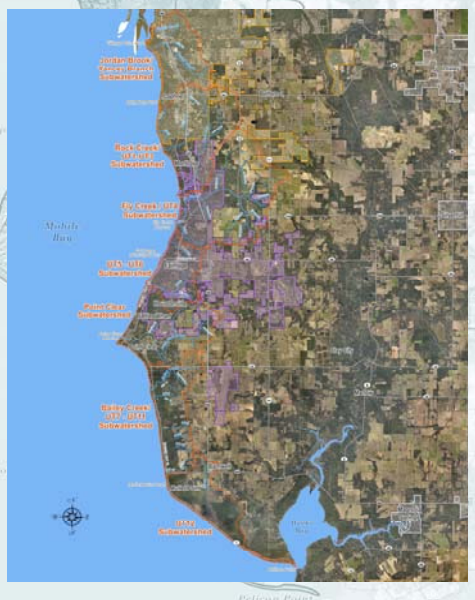
Suzanne Sweetser with Thompson Engineering provided the update.

Team

- Thompson Engineering, Inc.
- ESA
- Barry Vittor & Associates
- M&R Solutions
- Ephriam and Associates Consulting, LLC.

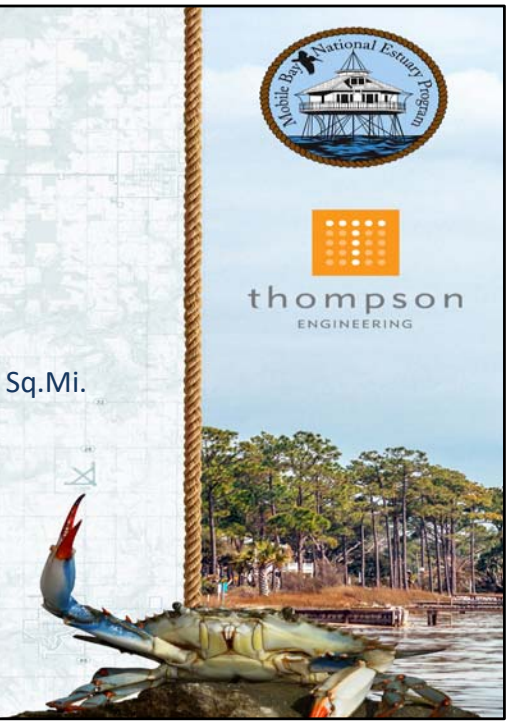


Subwatershed Map



Seven Subwatersheds

- Jordan Brook/Yancy Branch: 3.8 Sq.Mi.
- Rock Creek / UT1-UT3: 6.5 Sq.Mi.
- Fly Creek / UT-4: 8.48 Sq.Mi.
- UT5 – UT6 (City of Fairhope core): 2.86 Sq.Mi.
- Point Clear: 5.28 Sq.Mi.
- Bailey Creek / UT7-UT11: 4.45 Sq.Mi.
- UT12: 3.62 Sq.Mi.



Critical Issue Areas

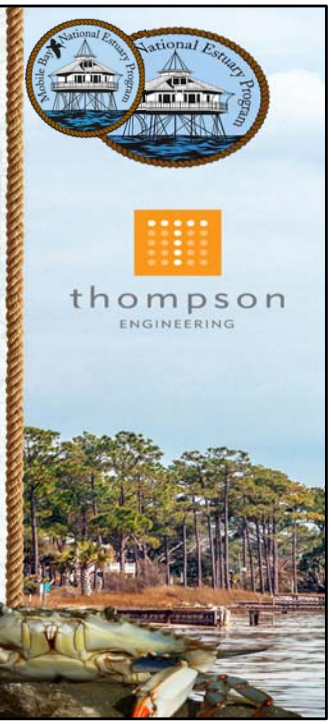
- **Development**
- **Water Quality**
- **Erosion/Sedimentation**
- Litter
- Human Health/Wellbeing
- Environmental Health and Resilience
- Habitat loss

Strategies for Development

- Stormwater Master Plan and inventory (*Short-term Strategy*)
  - Locate demonstration sites for proper creation and maintenance of retention ponds
    - Example; Fairhope Duck Pond
  - Assessment feasibility of a Stormwater Fee
- Promote and Expand Use of Low Impact Development Practices (*Long-term Strategy*)
  - The County and Cities of Fairhope and Daphne have started incorporating some practices and have begun coordinating ordinances to help implement these practices.
- Comprehensive Land Use Planning
  - Baldwin County and Cities of Fairhope and Daphne are in the process of these plans.

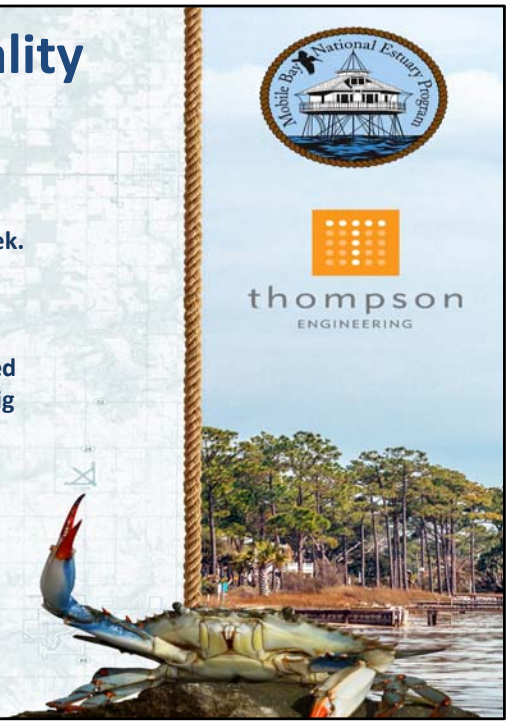
Water Quality
Sub-watershed Sediment Loads

- 64 tons/mi^2-yr geologic erosion rate ("natural")
- Greatest annual sediment loads in sub-basins
  - Red Gully (15,590 tons)
  - Tatumville Gully (5,581 tons)
  - Rock Creek (4,644 tons)
  - Fly Creek tributary at Woodland Drive (1,636)
- Increased urban development → Highest sediment loads
- Attributed to increased surface-water runoff driven erosion
- Red Gully, Tatum Gully, & Rock Creek - highest unit area sediment loads in Mobile and Baldwin Counties

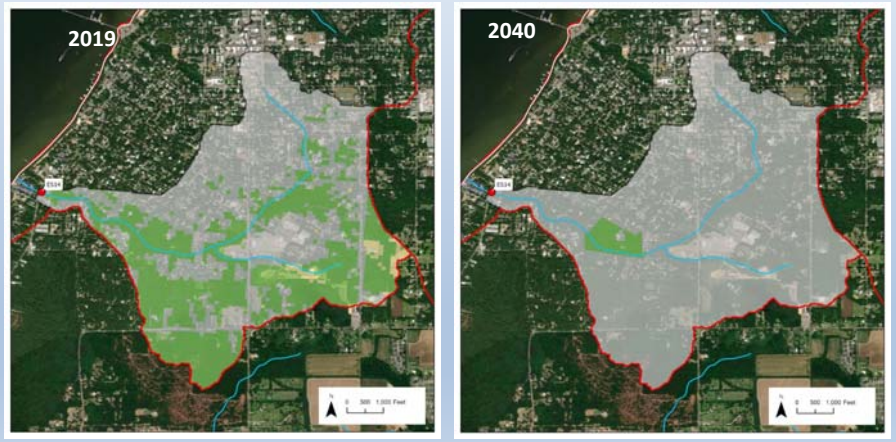


Strategies for Water Quality

- **Develop a comprehensive, long-term monitoring program of all major tributaries. (*Short-term Strategy*)**
  - **Identify all sources of impairments on Fly Creek.**
- **Assess the health and functionality of the gully systems along the Eastern Shore. (*Short-term Strategy*)**
  - **Volanta Gully, Tatumville Gully, Stack Gully, Red Gully (funding for a portion of this already), Big Mouth Gully.**
  - **Include an educational component on the importance of Gullies.**



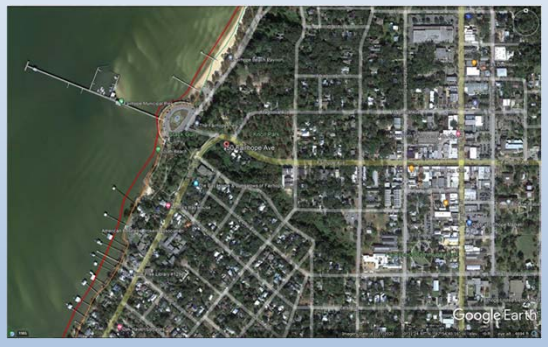
2019 to 2020 Tatumville Gully Developed Land-use Change



Tatumville Gully

- Dilapidated stormwater infrastructure
- Erosion

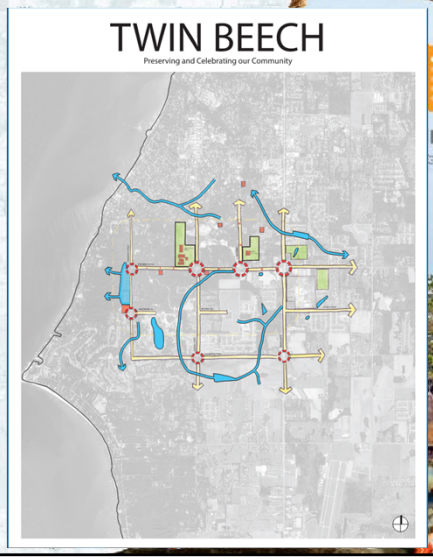
Stack Gully



- Erosion threatening property and infrastructure

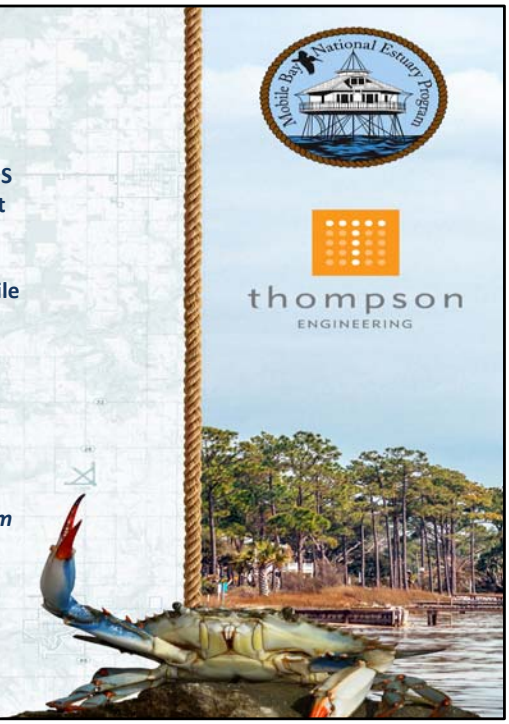
Water Quality, cont.

- Assess sanitary sewer infrastructure (*Short-term Strategy)*
  - *Fly Creek is a priority for identifying potential failing or not properly maintained septic systems as sources of impairments.*
- Assess flooding causes and determine potential remedies in the underserved community of Twin Beech (*Short-term strategy*)
- Assess need to monitor emerging pollutants: PFAS, microplastics, etc. (*Long-term Strategy)*



Strategies for Shoreline Erosion

- Comprehensive study of dilapidated piers to include; GIS inventory of damaged piers and a feasibility assessment of repair or removal along with natural shoreline stabilization. (*Long-term Strategy)*
- Updated assessment of stormwater outfalls along Mobile Bay. (*Short-term Strategy)*
  - The last study was conducted in 2012.
- In coordination with the Mobile Bay National Estuary Program, develop and implement a comprehensive coastline/shoreline management plan for the entire Mobile Bay. (*Long-term Strategy)*
- Identify areas for construction of living shoreline or shoreline protection/restoration measures. (*Long-term Strategy)*

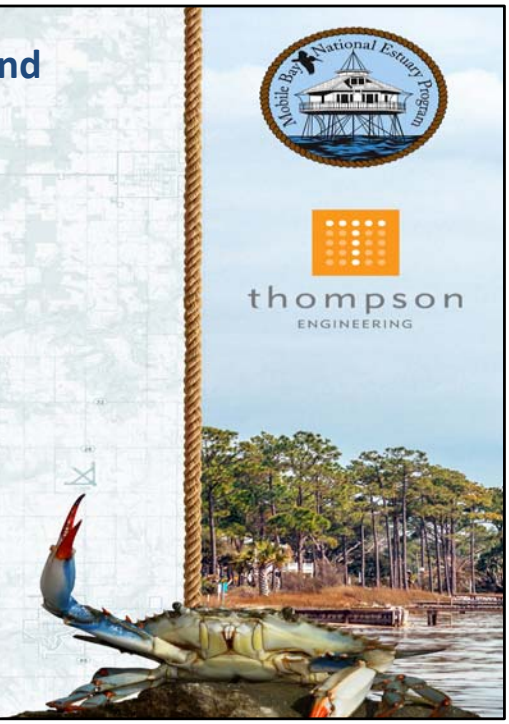


Strategies for Litter

- Develop a comprehensive litter plan based actual litter issues and prioritized litter abatement effort, including; (*Short-term Strategy)*
  - Baseline data collection to determine type and potential source of litter.
    - Include gullies, stormwater drainage basins, detention ponds, gullies and potential high traffic roadway crossings.
  - Assess the possibility of creating a post-storm municipal impact fee program for vulnerable areas
  - Identification of roadways where anti-litter educational signage would be beneficial (some sites have been identified within the City of Fairhope and funded through ADEM).
- Develop an in-stream debris, post-storm management plan (*Short-Term Strategy)*
  - Example; Point Clear Creek

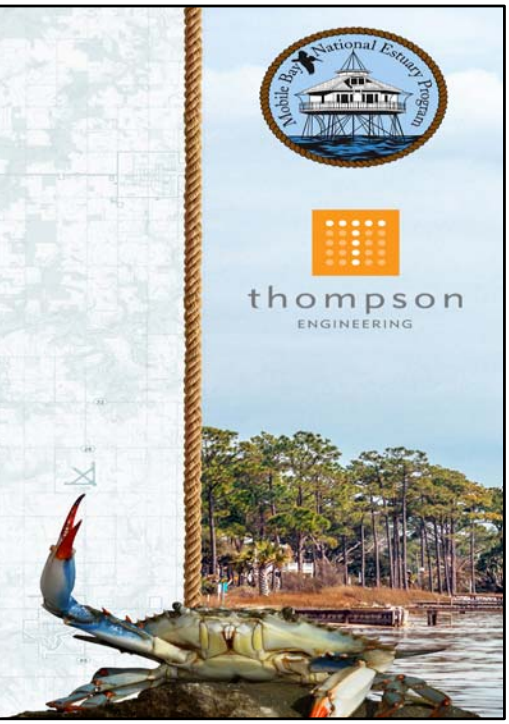
Strategies for Human Health and Wellbeing

- Increase green spaces throughout the watershed. (*Short-term Strategy*)
  - Triangle Park in Fairhope funded through GOMESA.
- Increase public access to Mobile Bay. (*Long-term Strategy*)
- Increase community signage in historic communities. (*Short-term Strategy)*
  - Twin Beech, Barnwell, Historic Downtown Daphne, Historic Downtown Fairhope, Point Clear, Montrose, Daphmont
- Develop a series of oral histories for significant historical communities including those above. *(Long-term Strategy)*



Strategies for Environmental Health and Resilience

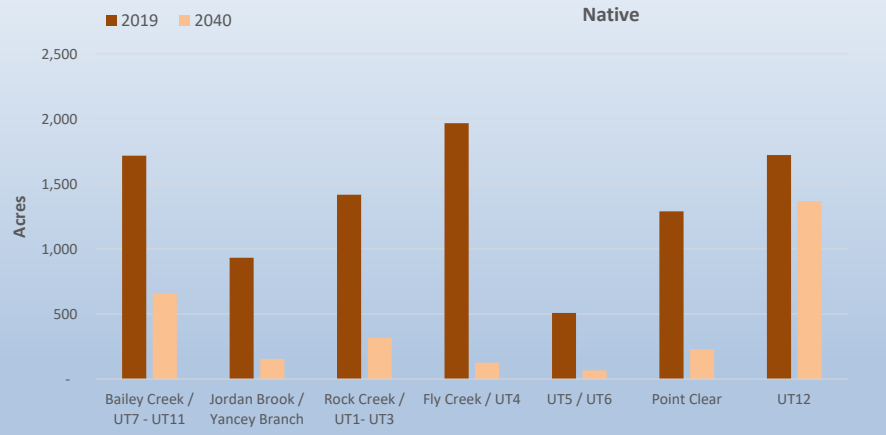
- Participate in Community Resilience Index (*Short-term strategy)*
  - City of Fairhope will be redoing in 2023
- Clean Marina Program (*Short-term Strategy)*
  - City of Fairhope Municipal Docks is undergoing designation process currently.



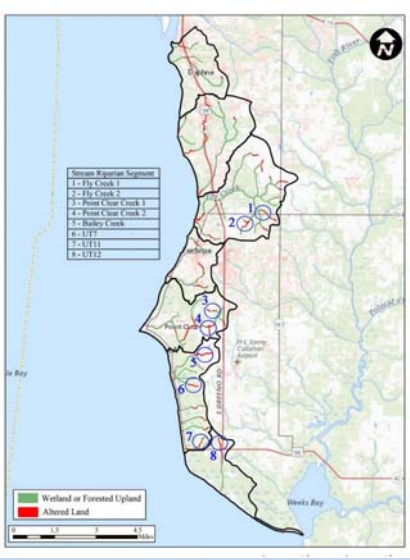
Strategies for Habitat Loss

- Strategize land acquisition for habitat preservation, wetland protection, and riparian buffers (*Long-term Strategy*)
  - *Example: Riparian buffer restoration of RB-FC1, RB-FC2, RB-PC1, RB-PC2, RB-BC, RB-UT7, RB-UT11, RB-UT12*
- Invasive species management (*Long-term strategy)*
  - *Fairhope Municipal Park, Village Point Preserve, all of the gullies.*

Large 2019 to 2040 Changes in Native Habitat



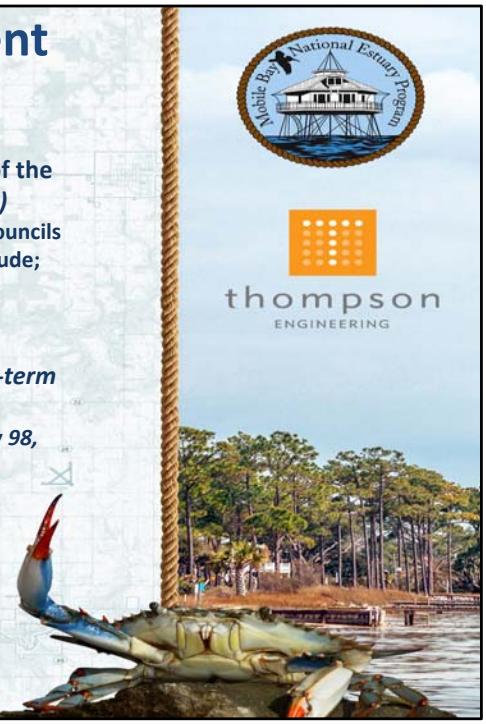
Wetland and Riparian Buffer Restoration



- Enhance and create habitat
- Aid in stormwater attenuation and potential reduction of nutrients/pollutants

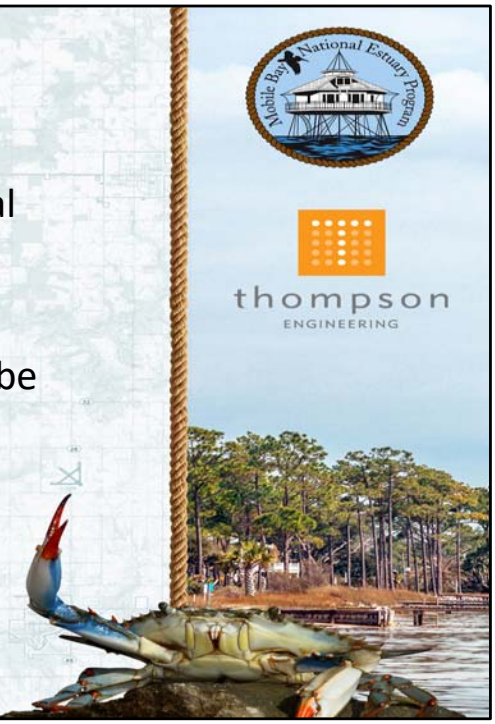
Administrative Management Measure

- Educate citizens about watersheds and outcomes of the watershed management plans (*Long-term strategy)*
  - Utilize representatives of pre-existing committees/councils to implement and champion the plan (examples include; Fairhope Environmental Advisory Board, Daphne Environmental Advisory Board, and Baldwin County Environmental Advisory Committee).
- Add more interpretative Watershed signage (*Short-term Strategy*)
  - *Village Point Park Preserve, Fly Creek at US Highway 98, Fairhope Municipal Pier, Montrose, Point Clear.*



Next Steps

- Draft is currently under internal and 3rd party review.
- Public review period
- Publication of Final Plan – will be available on MBNEP website
- Let's get some projects done!!



How are you getting your sediment loads? In step with all the other watershed management plans, we use a consistent methodology to develop a baseline water quality and sediment loading analysis. All of the WMPs and baseline assessment can be found on the mobilebaynep.com website library.

Rough idea when draft will be ready? Very soon. Pandemic slowed the process, so we are a little behind.

Annelise Dodd and Katy Hines with Volkert presented on the Bon Secour River Constructed Wetland project.

This project was a high priority recommendation in the 2017 Bon Secour, Oyster Bay, Skunk Bayou WMP.

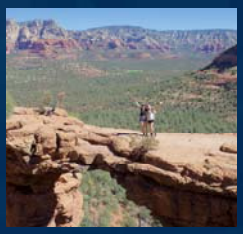
Hi, we're your speakers!

AUBURN UNIVERSITY
Samuel Ginn College of Engineering

ASSOCIATION OF STATE FLOODPLAIN MANAGERS

AUBURN UNIVERSITY
Samuel Ginn College of Engineering

LSU COLLEGE OF ENGINEERING



Bon Secour River Constructed Wetland

- Project Background
- Project Design
- Adaptive Management
- Project Construction
- Challenges and Lessons Learned
- Closing Remarks & Questions

VOLKERT

Project Background

- Project Identification
  - 2017 Bon Secour River Watershed Management Plan
  - Project Vicinity
- Project Objectives and Goals
  - Improve Water Quality
    - Reduce annual nutrient and sediment loads
  - Reduce Flooding
    - Create floodplain storage

VOLKERT

Project was identified as a significant source of sediment and nutrients in the watershed.

Project Outcomes

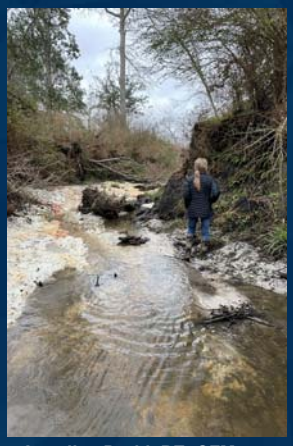
- 1,550 LF of Restored Stream
- 2,300 LF of Constructed Offline Stream Channel
- 15-acre constructed emergent wetland pond
- Create/restore 72 acres of wetlands
- Reduce annual nutrient and sediment loads
  - 800 tons sediment/year
  - Annual phosphorous reduction: 17%
  - Annual nitrogen reduction: 40%
- Flood elevations reduced approximately 4-6”

VOLKERT

Monitoring:
Year 1 - Quarterly
Year 2 - Biannual

Project Design – Design Team

Andrew James, PE



Annelise Dodd, PE, CFM

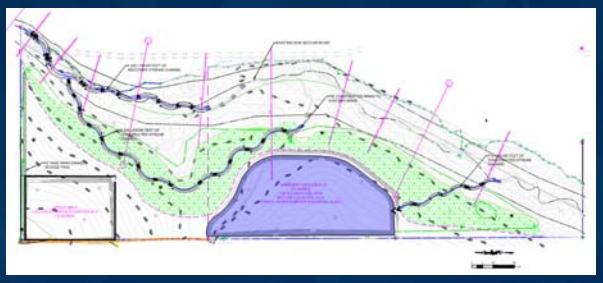
Katy Hines, EI

Sean Miller, EI

VOLKERT

Project Design

- Conceptual Design and Planning
  - Geomorphic Stream Assessment
  - Develop Reference Reach Data
  - Develop Design Criteria
  - Water Budget
  - Develop Invasive Species Management Plan



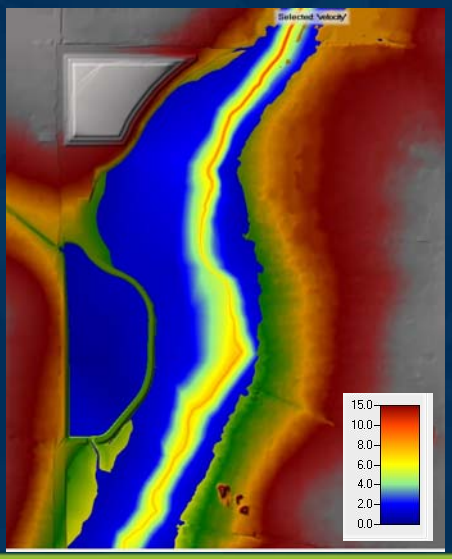
VOLKERT

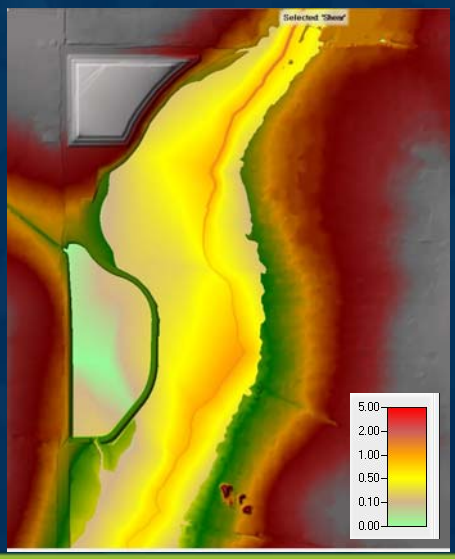
Project Design

- Iterative Design
  - Optimize hydroperiod for each component
  - Assess shear stress and velocity of stream components
  - Assess floodplain impacts
- Visualize data
  - HEC-RAS & RAS Mapper

VOLKERT

Project Design





VOLKERT

Project Construction

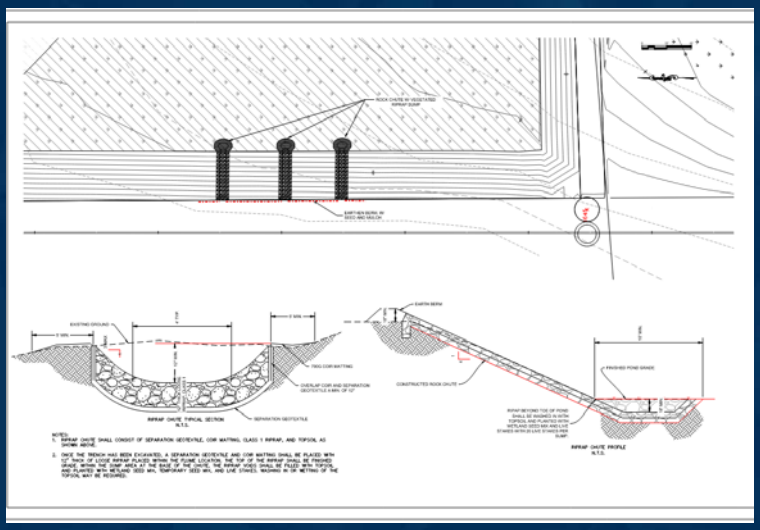
- Contractor: Streamline Environmental, LLC

VOLKERT

Project Construction

VOLKERT

Adaptive Management



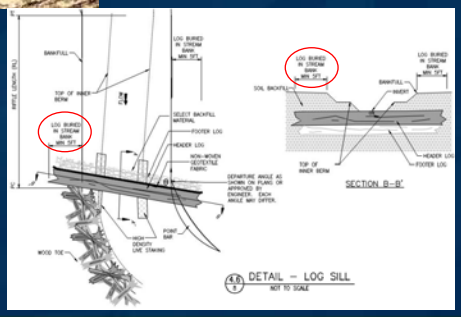
Some adaptive management was necessary.

Rill erosion from adjacent sod fields.

Tributary at outfall vegetation had not established before significant rains. Reworked lower end as a result of some noted erosion in the area.

Challenges and Lessons Learned

- Structure Placement and Installation
- Construction Oversite
- Off-Site Influences
- Construction Contingencies
  - Balancing Earthwork
  - Vegetation
  - Mother Nature
- Maintenance Warranties
  - Invasive Species Management
  - Vegetation
  - In-stream Structures
  - Stream Stability on Geomorphology



Proper oversight of structure installation according to plans. Must follow as designed and field verify.

Off-site influences from adjacent developments and ATV trespassing was an issue. Corrections were made.

Questions?

Is the monitoring report and Basis of Design available? Likely, yes. Need to check with City of Foley, the primary project manager.

Building Blocks of High-Quality Regulations

Matthew Brown, Director, Baldwin County Planning and Zoning presented on opportunities and barriers to enact high-quality regulations. No slides for the presentation were available.

- Three simple building blocks: simple, manageable, communicable. *No municipality or entity has it all right. There is always room for improvement as we navigate a changing landscape, literally and figuratively.
    - Simple: can be simple but over complicated. Simple can be simple. Like a common “mouse trap” not the board game that never seemed to work – effective and mechanically simple.
        - Who benefits from simple regulations, developers, regulatory staff, citizens, or real estate agents? All of the above in some cases but primarily, in his opinion, the regulatory staff who has to implement the regulation. If it is not simple for those who enforce and manage, they must be able to fully understand and explain it.
        - Avoid legalese and academic jargon. Short direct mandates. Clean direct formatting.
    - Manageable: every system requires a system manager. A regulation is a system that must be managed. In government and regulatory environment, we can often focus on the rule and not the process for management.
        - What is the process you have to enforce consistently? Day to day process

is moving applications through the process. Administrative delays can run over and break the system. Have triggers and/or a flow chart for both applicant and regulator to follow.

- Communicable: plans and guides are most effective when they communicate well with other rules and departments. Terminology and language consistency simplifies interpretation – eliminate vast disparity. Provided a stormwater management plan example. Some confusion among “volume” definition, provided examples. A guidebook and the regulation do not always read apples to apples.
    - Make clear recommendations targeting a specific goal. Consider providing model language.

Jason Kudulis with the Mobile Bay National Estuary Program shared a presentation on the Lower Fish River Restoration Program.

Purpose, Goals, Objectives

- The **purpose** of the Lower Fish River Watershed Restoration Program is the promote the wise stewardship of the water quality and living resources of the Lower Fish River Watershed and Weeks Bay.
- The **goals** of the Lower Fish River Watershed Program are to: Improve hydrology in the Lower Fish River Watershed to improve water quality entering Weeks Bay, reduce sediment loads entering Weeks Bay, reduce nutrient loads entering Weeks Bay, and to improve biological conditions of wetlands and riparian buffers of priority headwater tributaries in the Lower Fish River Watershed.
- To achieve these goals, the following **objectives** have been developed: 1) Reduce sediment loading from the unnamed tributary "Marlow" to Fish River by 75%; 2) **Development of stream stabilization and restoration engineering and design plans for up to five other stream segments in the Lower Fish River Watershed;** 3) Conduct baseline monitoring at a minimum of eight stations throughout the Lower Fish River Watershed and at discharge points into Weeks Bay to establish pre-construction conditions for future restoration success monitoring.

The big picture model for this watershed restoration program was to duplicate the success we have seen in D'Olive in another coastal watershed.

A top priority of the watershed management plan was the Marlow stream restoration project (Objective 1). This has been completed. Nick Combs will share information on that effort in the following presentation. Beyond Marlow however not as many similar situations were yet identified.

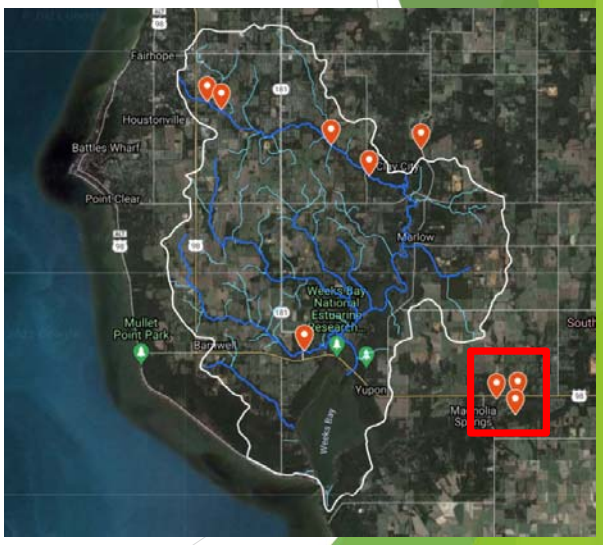
How We Got Here - Field Assessments in Five Target Subwatersheds

- Round 1 Results:
  - Productive exercise that identified issues and recommended remediation actions, however, most were small in scale.
  - Met with partners, including County, NRCS, and ADEM, to share results. Group agreed majority of sites were likely better suited for other funding opportunities.
  - Some were reexamined to be sure, and with permission from State the target area was expanded to include Magnolia River Watershed.

Field assessments were proposed in the five target subwatersheds to Fish River. This exercise would allow the project team to find and prioritize projects for engineering and design. While some issues were identified they were not of the scale and severity partners were looking to move forward to design and construction.

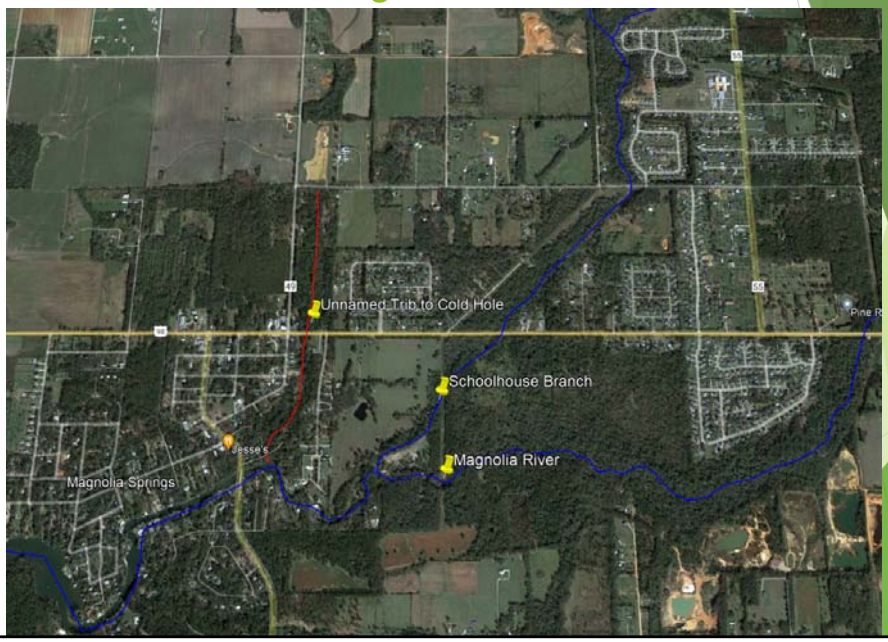
Where We Are Going - Magnolia River Investigation

- Round 2 Results:
  - Revisited some LFRW sites, added Magnolia.
  - Shared finding with Project Team and County. Agreed three sites in Magnolia were priority.



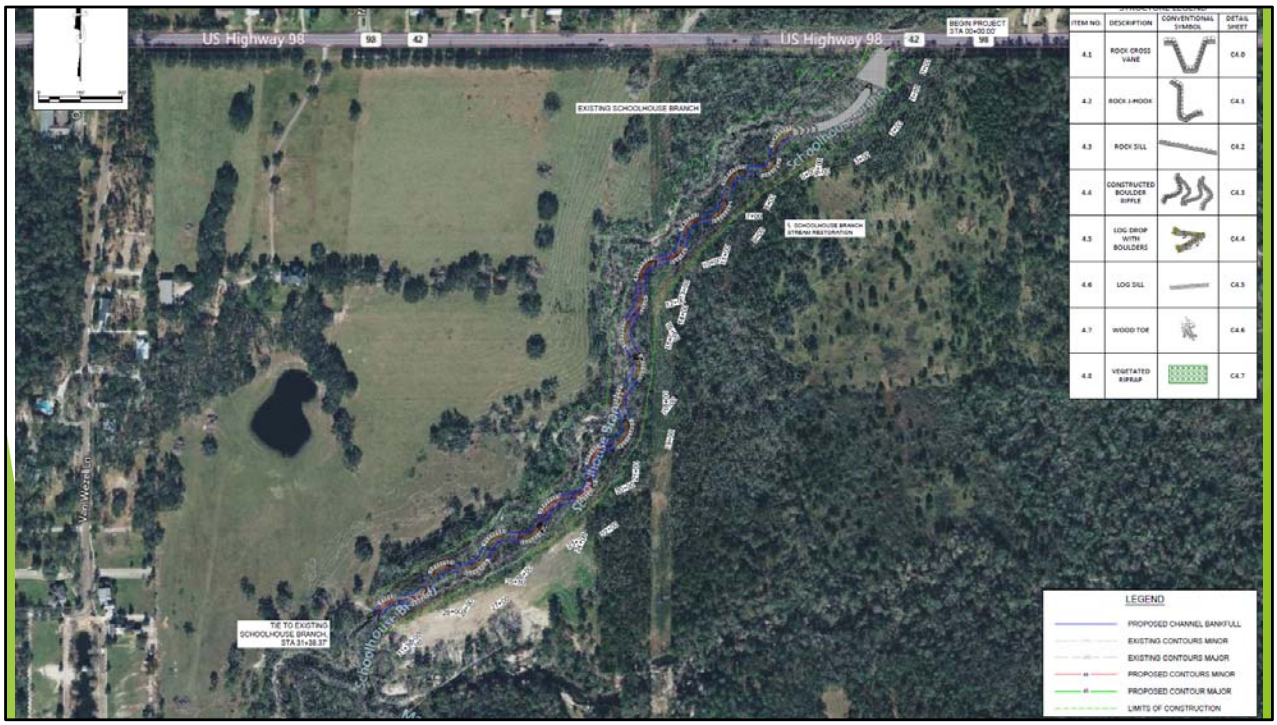
Using data previously collected in a 2009 Geological Survey of Alabama report, which was done under drought conditions, Magnolia River tributaries were not initially on the team's radar. However, getting in the field and knowing there were substantial impacts from the 2014 April flood event, we were able to locate three areas of significant sedimentation and bank instability.

Magnolia River Investigation



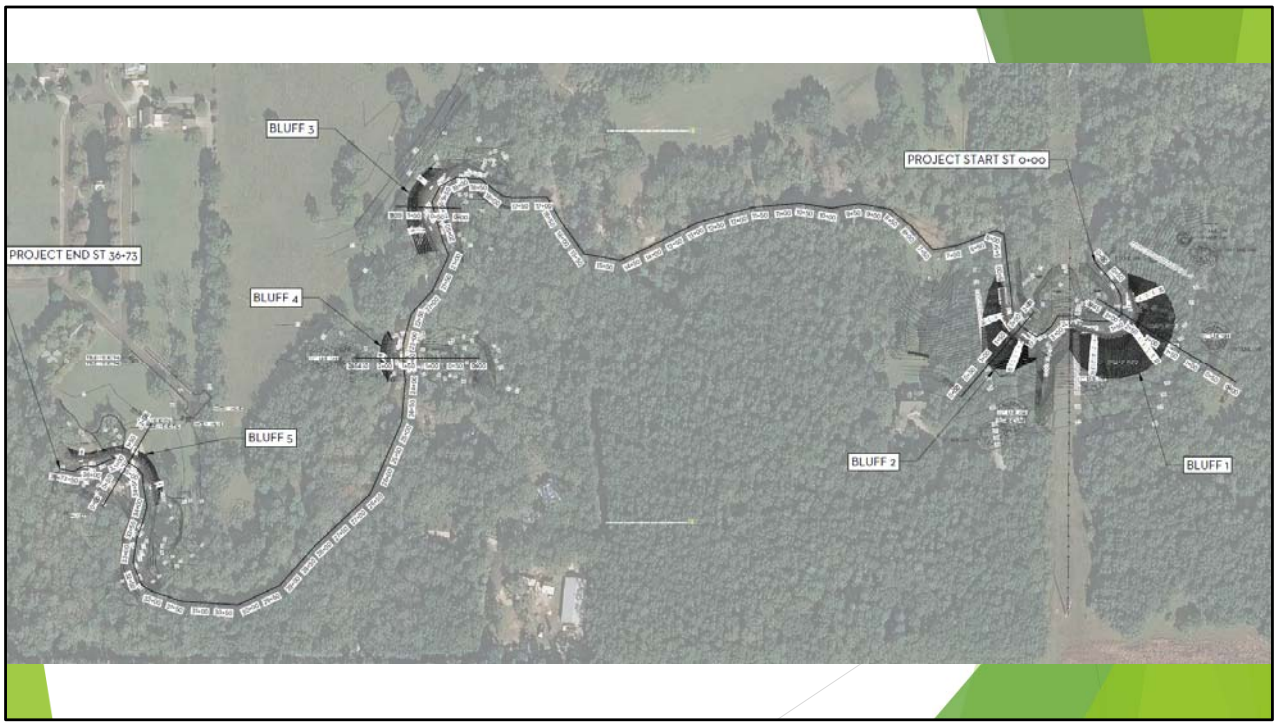
Three projects have been selected for engineering and design.

- Unnamed Tributary to the Cold Hole
- Schoolhouse Branch
- Magnolia River bluffs



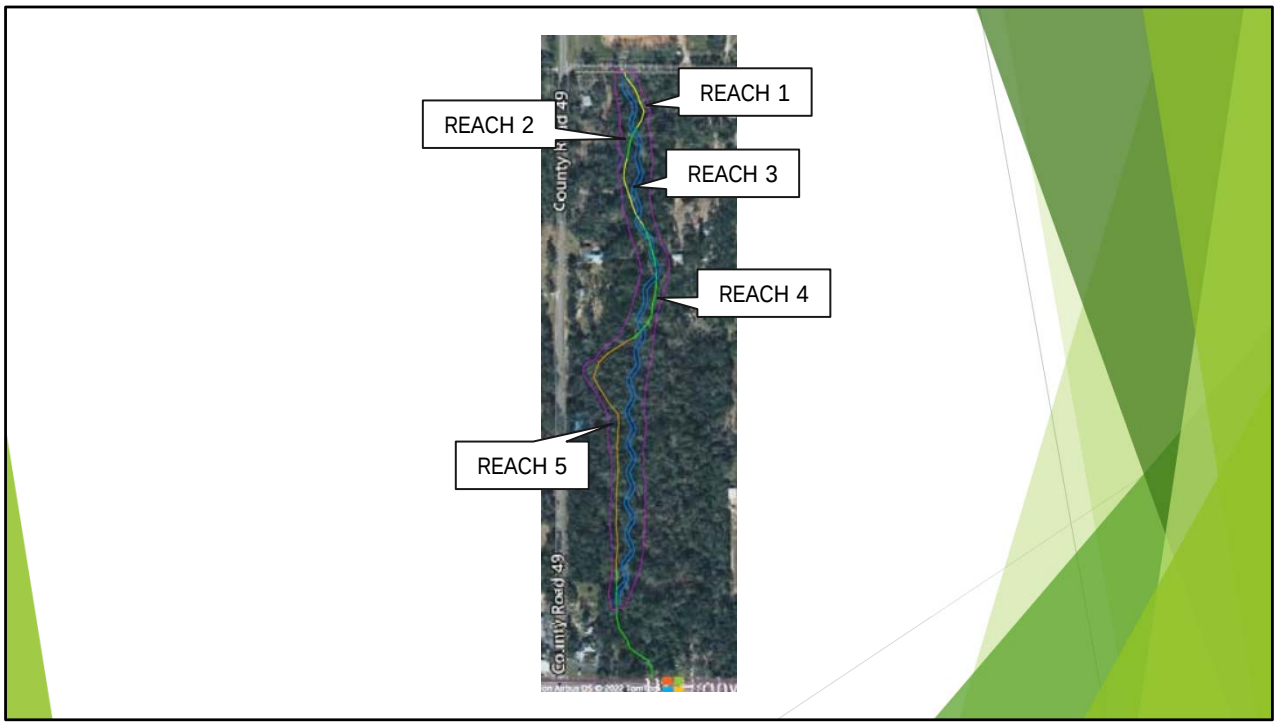
Schoolhouse Branch, anticipate 3,300 linear feet. Pictures of pre-restoration conditions follow.


Unnamed Trib to Cold Hole
Schoolhouse Branch
Magnolia River
Jesse's
Magnolia Springs
49
98
55



Five noncontiguous bluffs on the Magnolia River have been targeted for restoration. Totaling nearly 1,000 linear feet.


Unnamed Trib to Cold Hole
Schoolhouse Branch
Magnolia River
Jesse's
Magnolia Springs
49
98
55



An unnamed tributary between Beasley Road and HWY 98 is targeted for restoration. Reach 5 appears to be the primary area of instability, totaling about 1,125 linear feet.

Sedimentation at the Cold Hole on Magnolia River.

Next Steps

- Secure remaining landowner access
- Finish E&D
- Collect baseline data
  - Purchased equipment in step with what ADEM uses for data consistency
  - Vittor – Watershed Condition Framework
- Construction funding

Nick Combs with Thompson Engineering presented on the Marlow Stream Restoration Project.

This project was identified in the Weeks Bay Watershed Management Plan as a top priority.

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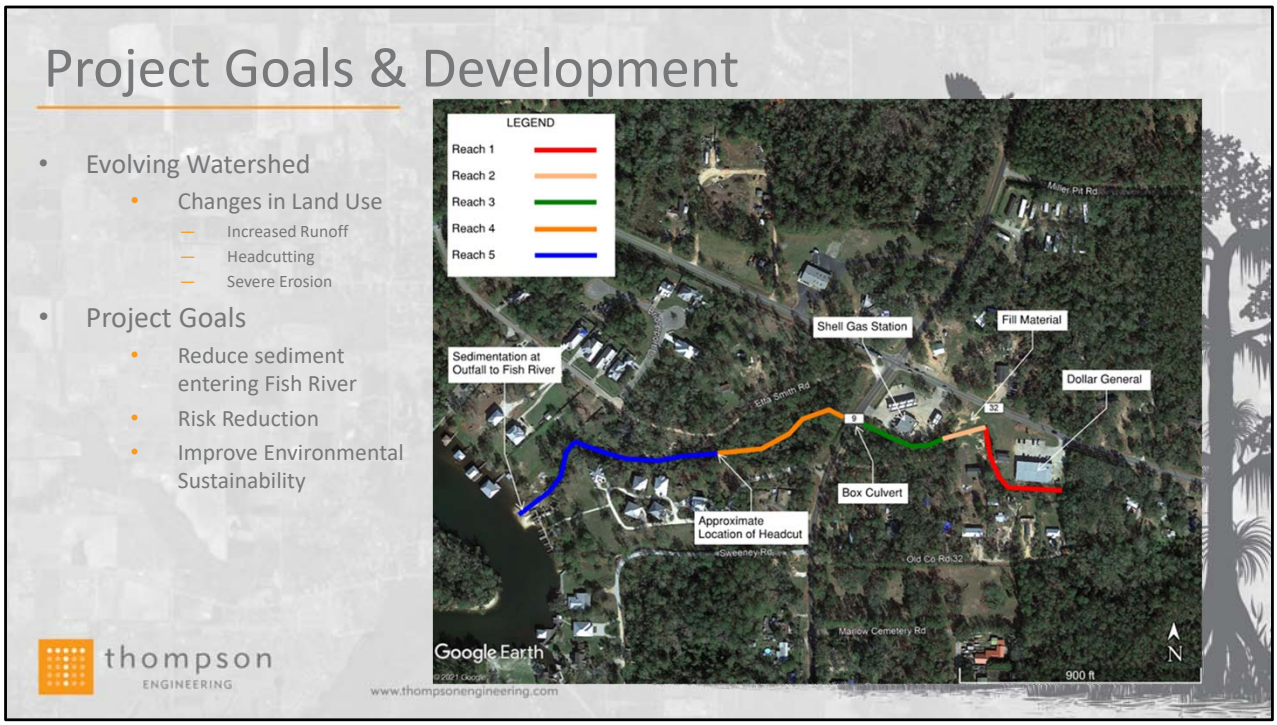

Spring Branch serves a tributary to Fish River near the intersection of Co Rd 9 and Co Rd 32. The project team site assessment and an evaluation of potential constraints led to the design only including reaches 4 & 5. This was the primary area of severe erosion and an active headcut.

Geomorphic Assessment

- Channel Degradation
  - Inadequate Dimension
    - Low Entrenchment Ratio (Low as 1.0)
    - High Bank Height Ratio (Up to 7.0)
  - Poor Floodplain Connectivity
- Stream Characteristics
  - Sand Bed System
  - Slope 1-2%
  - Width:Depth Ratio Varies from 7-11
- Constraints
  - Horizontal/Vertical
    - Property Lines
    - Adjacent Roadway
    - Culvert & Outfall Tie-in

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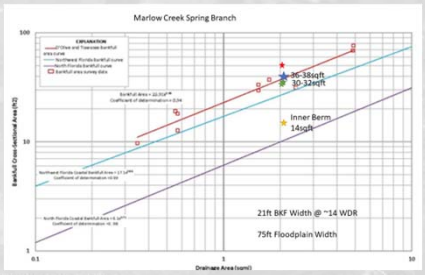
Part of the preliminary design work includes a geomorphic assessment.

Site condition pre-restoration.

Outfall deposits into Fish River.

Stream Restoration Design Process

- Iterative Natural Channel Design Approach
  - Reference Reach Data
    - Tiawasee & D'Olive
    - Pool and Riffle Pattern
  - Mini Regional Curve Data
    - Cross Sectional Area vs. Drainage Area



Parameter	Existing Stream			Design Stream			Reference Stream 1		
	Min	Median	Max	Min	Median	Max	Min	Median	Max
Stream name	Marlow Creek			Marlow Creek			Richland Creek, Moore CO, NC		
Stream type	G5c			C5			E5/4		
Drainage area, DA (sq mi)	2.06			2.06			0.27		
Mean riffle depth, d_{bkf} (ft)	1.9	2.1	2.0	1.08	1.15	1.20	0.8	0.9	0.9
Riffle width, W_{bkf} (ft)	13.6	16.4	18.9	24.0	24.4	25.0	7.6	8.4	9.2
Width-to-depth ratio, $[W_{bkf}/d_{bkf}]$	8.1	7.9	9.4	15.0	16.0	19.0	8.9	9.4	9.9
Riffle cross-section area, A_{bkf} (sq ft)	30	34	35	26	28	30	6.7	7.4	8.2
Max riffle depth, d_{mbkf} (ft)	3.85	3.4	3.03	1.7	2.0	2.2	1.2	1.3	1.3
Max riffle depth ratio, $[d_{mbkf}/d_{bkf}]$	2.0	1.6	1.5	1.6	1.7	1.8	1.4	1.5	1.6
Mean pool depth, d_{bkf} (ft)	1.7	1.3	1.0	1.1	1.2	1.4	1.2	1.3	1.4
Mean pool depth ratio, $[d_{bkf}/d_{bkf}]$	0.9	0.6	0.5	1.1	1.6	1.6	1.4	1.4	1.4
Pool width, W_{bkf} (ft)	23.0	32.0	45.0	27.0	29.0	30.0	n.a.	9.0	9.5
Pool width ratio, $[W_{bkf}/W_{bkf}]$	1.5	2.0	2.6	1.2	1.2	1.2	0.9	1.1	1.0
Pool cross-section area, A_{bkf} (sq ft)	38	40	45	31.2	34.4	42.0	8.2	9.4	10.6
Pool area ratio, $[A_{bkf}/A_{bkf}]$	1.3	1.2	1.2	1.2	1.3	1.4	1.2	1.3	1.3
Max pool depth, d_{mbkf} (ft)	4.4	4.4	5.0	2.8	3.3	3.4	2.0	2.1	2.5
Max pool depth ratio, $[d_{mbkf}/d_{bkf}]$	2.3	2.1	2.5	2.6	2.7	2.8	2.4	2.4	2.7
Low bank height, LBH (ft)	3.9	5.0	10.9	1.7	2.0	2.2	1.3	1.4	1.6
Low bank height ratio, [LBH/ d_{mbkf}]	1.5	2.3	3.6	1.0	1.0	1.0	1.0	1.0	1.1
Width flood prone area, W_{fpa} (ft)	39.6	77.7	74.6	36	120	190	60	70	85
Entrenchment ratio, ER $[W_{fpa}/W_{bkf}]$	2.5	1.4	1.5	1.5	4.9	7.4	7.9	8.3	9.2
Point bar slope (ft/ft)	0.05	0.10	0.15	0.05	0.20	0.25	0.35	0.40	0.45
Bankfull mean velocity, $v_{BKF} = Q/A$ (ft/s)	4.3	4.1	3.9	5.0	5.0	5.0	3.3	3.4	4.4
Bankfull discharge, Q_{BKF} (cfs)	130	140	150	130	140	150	22	25	36
Meander length, L_m (ft)	84.4	150.3	262.4	165.0	188.0	210.0	70.0	80.0	90.0
Meander length ratio $[L_m/W_{bkf}]$	3.5	11.0	13.9	6.9	7.7	8.6	8.3	9.5	10.7
Radius of curvature, Rc (ft)	22.8	40.2	45.6	59.0	63.0	75.0	14.0	18.0	32.0
Radius of curvature ratio $[Rc/W_{bkf}]$	1.5	2.5	2.6	2.2	2.6	3.0	1.9	2.1	3.5
Belt width, W_{blt} (ft)	65.1	96.9	123.1	75.0	83.0	90.0	30.0	36.0	42.0
Meander width ratio $[W_{blt}/W_{bkf}]$	6.2	5.9	6.6	3.0	3.3	4.0	4.0	4.3	4.5
Pool length, L_p (ft)	60.0	60.0	62.0	48.0	62.0	75.0	14.0	18.0	22.0
Pool length ratio $[L_p/W_{bkf}]$	2.6	1.9	1.4	2.0	2.5	3.0	1.9	2.1	2.4
Pool-to-pool spacing, p-p (ft)	73.0	87.0	143.0	100.0	115.0	135.0	32.0	40.0	52.0
Pool-to-pool spacing ratio. [p-p/W_{bkf}]	3.3	2.7	3.2	4.1	4.7	5.5	4.2	4.8	5.6
Stream length, SL (ft)	1206.0	1206.0	1206.0	1876.0	1876.0	1876.0	200.0	200.0	200.0
Valley length, VL (ft)	980.0	980.0	980.0	1681.0	1681.0	1681.0	170.0	170.0	170.0
Valley slope, VS (ft/ft)	0.0082	0.0082	0.0082	0.0110	0.0110	0.0110	0.0128	0.0128	0.0128
Average water surface slope, S (ft/ft)	0.0100	0.0114	0.0139	0.0081	0.0081	0.0082	0.0109	0.0109	0.0109
Sinuosity, k = SL/VL (ft/ft)	1.23	1.23	1.23	1.12	1.12	1.12	1.18	1.18	1.18

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Natural Channel Design philosophy compares healthy streams in the same eco-region to produce a regional curve including cross sectional area and drainage area. This provides somewhat of a template for the engineer to draft a design plan. Compare how the design behaves versus a natural functioning stream to produce a design layout.

Design Layout

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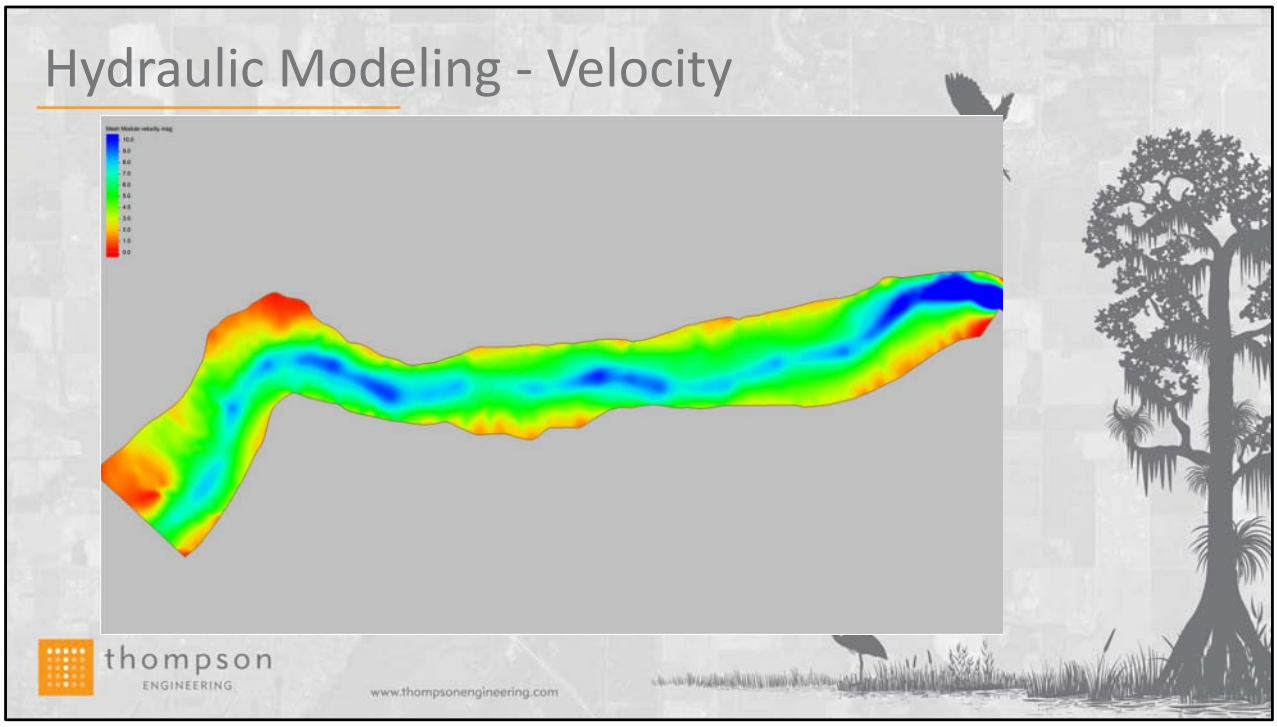
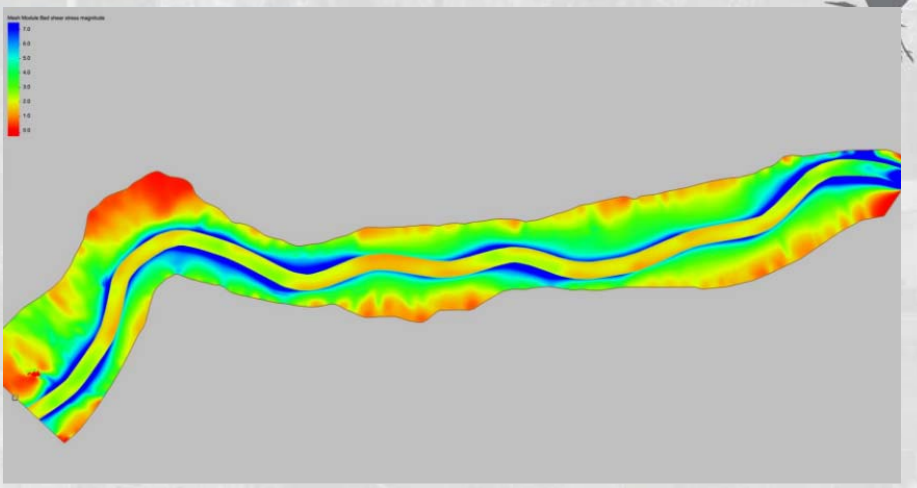


Hydraulic modeling is used to tweak the design and better understand areas of high stress. Looking at velocity and shear stress, potential issues can be smoothed out or additional channel/bank armoring can be added. Minimizes long term risk and improves resilience. Blue indicates area of higher velocity and stress (blue is areas of higher velocity and shear stress).

Hydraulic Modeling – Shear Stress



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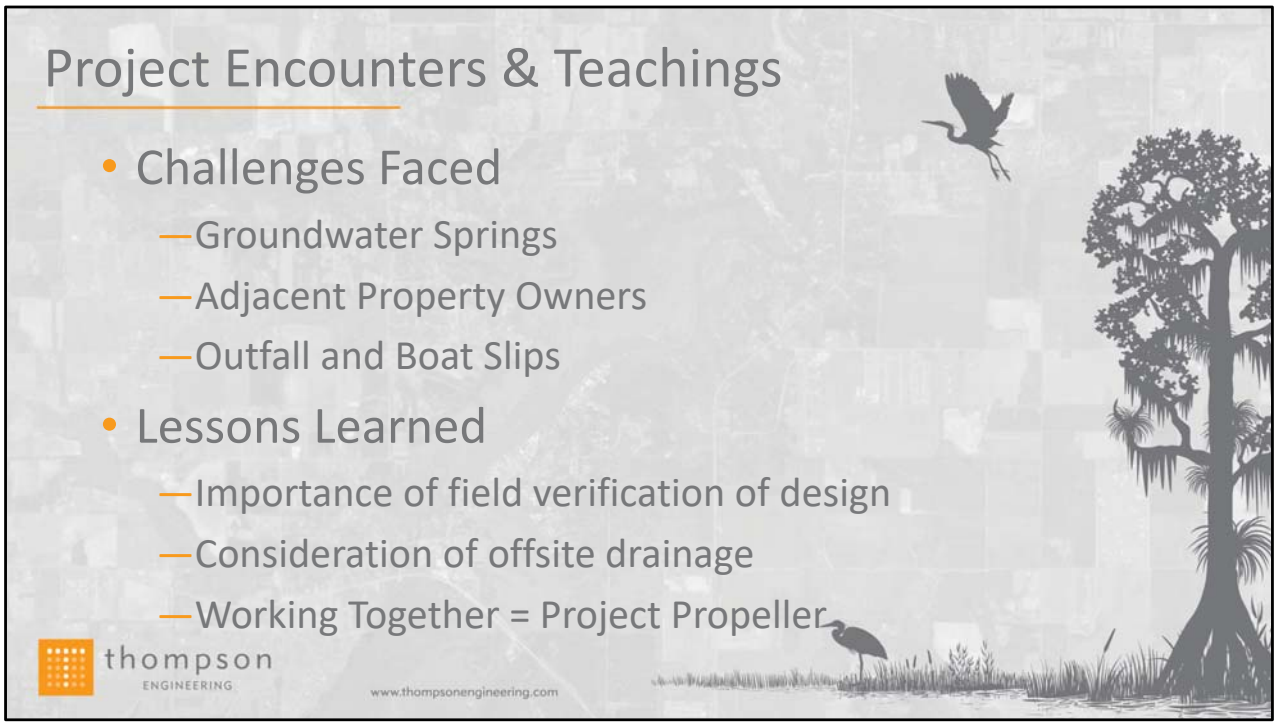
All kinds of stabilization structures area employed in the design. Each has a purpose to reduce velocity and shear stress by keeping the flow in the center of the channel and protecting the bank and floodplain from potential erosion.



Each project always has unforeseen challenges or obstacles that require careful thought. These are dynamic systems with unique characteristics. Verifying the design in the field and not only reviewing it on a computer is important during construction. When you are working on people's property as well you always want to be considerate. Once a project is completed the landowners remain.

Photo of different phases of project construction.

Photo of different phases of project construction.

Photo of different phases of project construction.

Drone flyover video was shown from just after construction of the new channel and floodplain. Vegetation will be planted in the dormant season over winter.

QUESTIONS?

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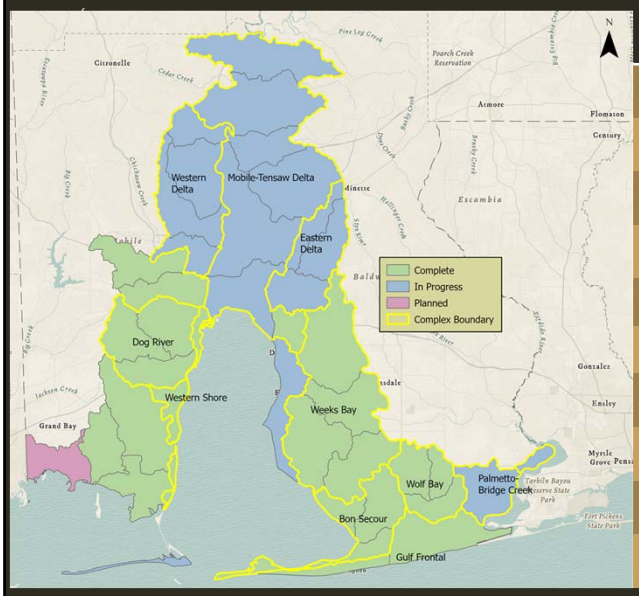
What reference reaches did you use? D'Olive and Tiawasee

Watershed Planning Update



Watershed	Status
Western Shore	Complete
Gulf Frontal	Complete
D'Olive Update	Complete
MTA Delta	In progress – Final Summer '22
Eastern Shore	In progress – Final Summer '22
Dauphin Island	In progress – Final Summer '22
Perdido	In Progress
Western Delta	In Progress
Eastern Delta	In Progress
Grand Bay	On Deck

Updated status of completed and ongoing watershed management plan activity in coastal Alabama.

Jason Hermann with Alabama Marine Resources Division provided a brief summary of the 2022 wild oyster season – with a harvest goal estimated, staff then assigns specific grids on the reef to harvest a percentage of the mature stock. They do not use a quota; the goal estimate allows better flexibility. They are having a very successful season so far with potentially 50,000 sacks before the end. The number of oystercatchers on the reef is perhaps double last year's number, almost 200 people on the reef each day, with an average of 1,000 sacks per day.

The committee is interested in planning a site visit during the 2023 wild oyster season to learn more about the State's management and harvest process.

Meeting was adjourned at 3:06pm.