Meeting Summary
HAT 3 Meeting
December 11, 2019
1:00 pm to 2:00 pm
Conference Call

Participants:
Angie Anderegg – Alabama Power
Jeff Baker – Alabama Power
Keith Chandler – Alabama Power
Kate Cosnahan – Kleinschmidt Associates
Allan Creamer – Federal Energy Regulatory Commission (FERC)
Colin Dinken – Kleinschmidt Associates
Amanda Fleming – Kleinschmidt Associates
Henry Hershey – Alabama Rivers Alliance (ARA)
Tina Mills – Alabama Power
Jason Moak – Kleinschmidt Associates
Sarah Salazar – FERC
Kelly Schaeffer – Kleinschmidt Associates

NOTE: A copy of the HAT 3 December 11, 2019 presentation is attached.

Meeting Summary:

Angie Anderegg (Alabama Power) opened the meeting by introducing everyone and stated that the purpose of the meeting was to discuss methods for the habitat analysis using the HEC-RAS model. Jason Moak (Kleinschmidt Associates) summarized the March 20, 2019 HAT 3 meeting and then reviewed the Downstream Aquatic Habitat Study Plan, including the goal, geographic scope, and methods. The study goal is to develop a model that describes the relationship between Green Plan operations and aquatic habitat and the geographic scope is the Tallapoosa River from R. L. Harris Dam (Harris Dam) through Horseshoe Bend.

The study methods include mesohabitat analysis, water level data (and temperature data for other studies) at up to 20 sites, and development of a HEC-RAS model as a tool to determine how operations affect wetted habitat. Jason explained that mesohabitat was analyzed using aerial photography and first-hand observations and then classified as riffles, runs, and pools. Mesohabitat types were summarized by reach: Malone, Wadley, Bibby's Ferry, Germany Ferry, Horseshoe Bend, and Irwin Shoals. There is a consistent mix of habitat types throughout the geographic scope except for the reach between Malone and Wadley, where riffles are more prevalent. Jason noted that the level loggers have been in the river since June 2019 and are recording water level and temperature data every 15 minutes.

Jason then reviewed the development of the HEC-RAS model. The model initially included 200 cross-sections between Harris Dam and Jaybird Landing. Some of these cross-sections in the existing model were interpolated based on surrounding landscape and did not accurately characterize actual channel geometry. Therefore, many of these cross-sections (>100) were surveyed in 2019 to provide better channel geometry for the HEC-RAS model. Jason provided

an example cross-section to compare the difference between the old data (pre-2019) and the new (2019). He explained that water surface elevations were also collected to provide reference points for water level data.

Alabama Power is adding the new channel geometry into the model. Jason provided some example graphs of how outputs from the model will be analyzed, including a graphic of a cross-section of the river with the amount of wetted perimeter at multiple discharge scenarios. He reiterated that this was an example of how the data will be analyzed and did not represent actual results. The analysis will focus on how wetted perimeter changes in relation to discharge in cubic feet per second (cfs). The range in wetted perimeter will be calculated by subtracting the minimum wetted perimeter from the maximum. Jason provided an example of a habitat duration curve that will aid in the comparisons.

Jason reviewed the operating scenarios that will be analyzed: peaking only, the Green Plan, 150 cfs minimum flow with peaking, and a modified Green Plan (different timing of pulses or different frequencies). Allan Creamer (FERC) asked if Alabama Power will analyze different minimum flow scenarios other than 150 cfs. Jason replied that no additional operating scenarios have been proposed by stakeholders to date, and that some stakeholders have wanted to see results of these four scenarios before proposing different scenarios. Allan suggested looking at a wider range of minimum flow scenarios once stakeholders have reviewed initial results.

Angie noted that any impacts of the operating scenarios on temperature will be examined and this is just one data point in the overall relicensing studies. Jason added that, for example, the effect of the operating scenarios on fish will be measured to determine the optimal conditions for fish, and then the effect of those conditions on lake levels will be analyzed. Angie announced that there will be another HAT 3 meeting in March 2020; date to be determined. Henry Hershey (Alabama Rivers Alliance) asked if the cross sections account for islands and side chutes. Jason replied that they do since the model geometry was constructed using LIDAR, which captured objects such as islands that are above the water.

R.L. Harris Project Relicensing

HAT 3 – Downstream Habitat Study

December 11, 2019

Meeting Agenda

- Study Overview
- Mesohabitat Mapping
- Level Logger Deployments
- HEC-RAS Model Development
- Analysis of HEC-RAS Outputs

HARRIS DAM
RELICENSING

Downstream Aquatic Habitat Study

Goal

To develop a model that describes the relationship between Green Plan operations and aquatic habitat.

Geographic Scope

Harris Dam through Horseshoe Bend

Methods

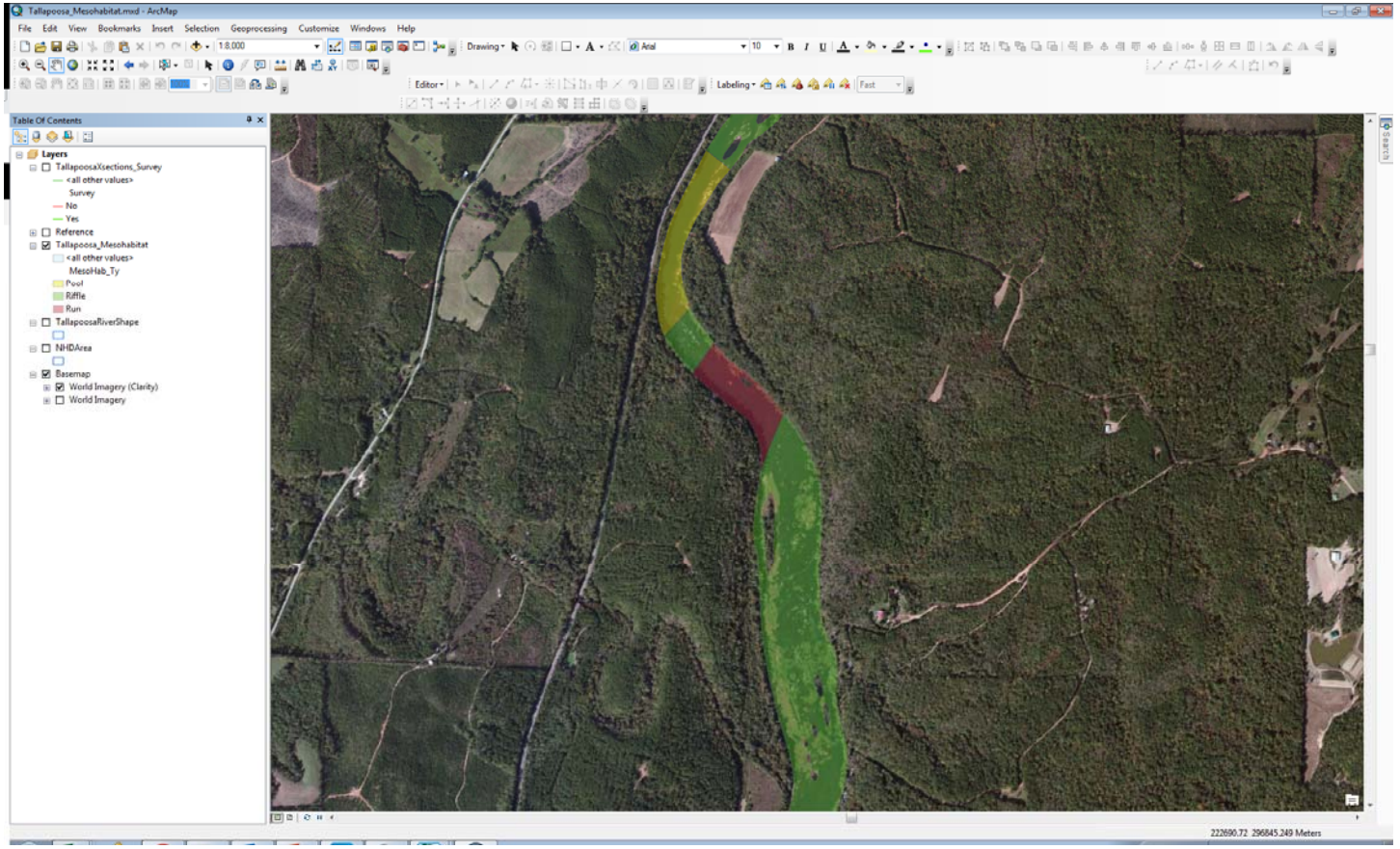
1. Mesohabitat Analysis: Desktop analysis of the types of available habitat (classified as riffle, run, pool)

2. Install water level loggers at up to 20 sites

3. Use HEC-RAS to evaluate the effect of current operations on the amount and persistence of wetted aquatic habitat, especially shoal/shallow-water habitat.

Mesohabitat Mapping and Analysis

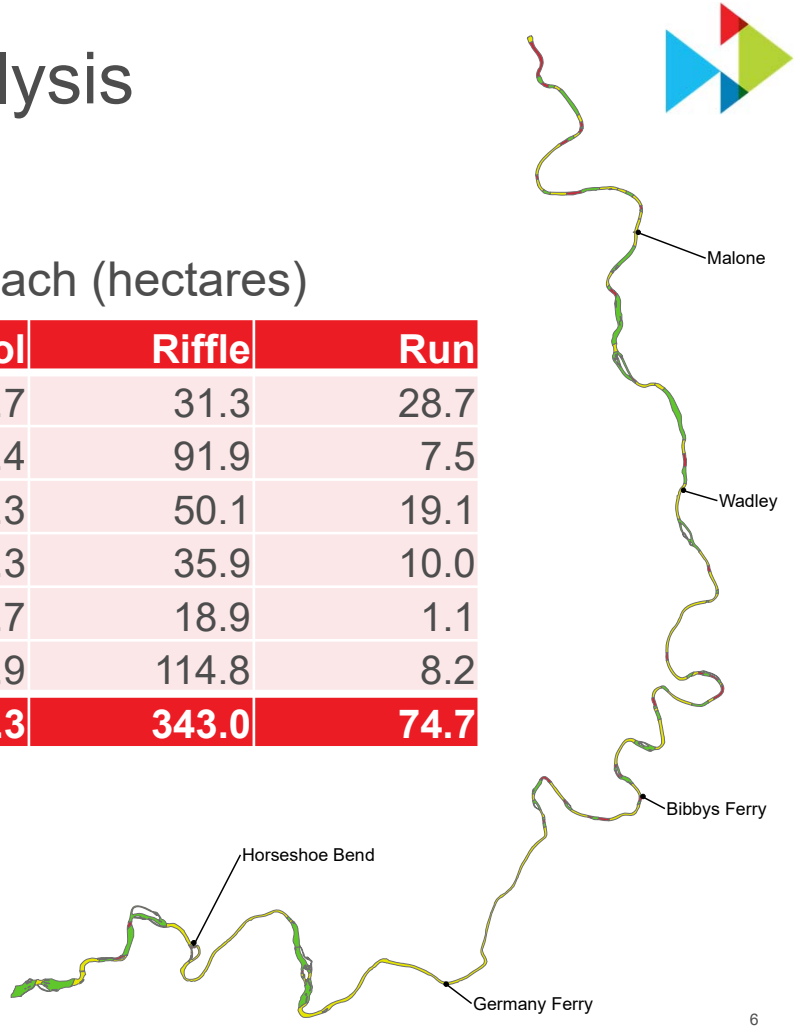
Mesohabitat Mapping



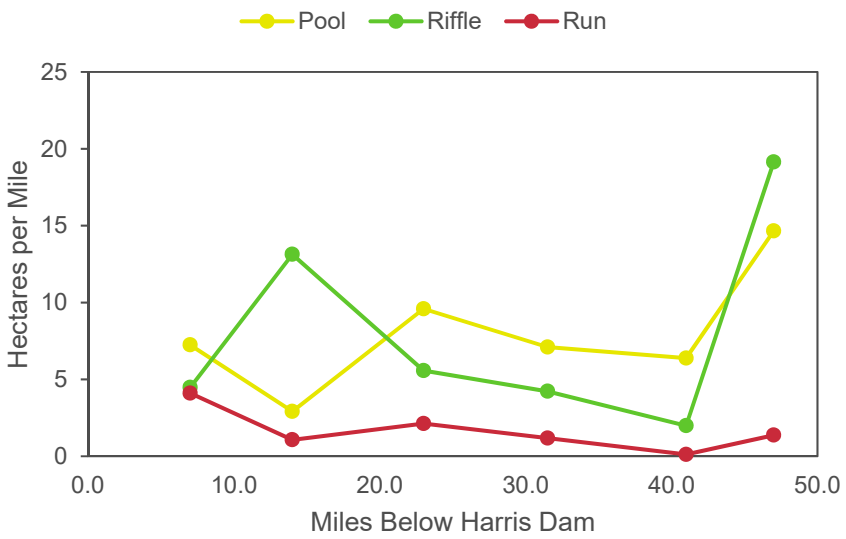
Mesohabitat Analysis

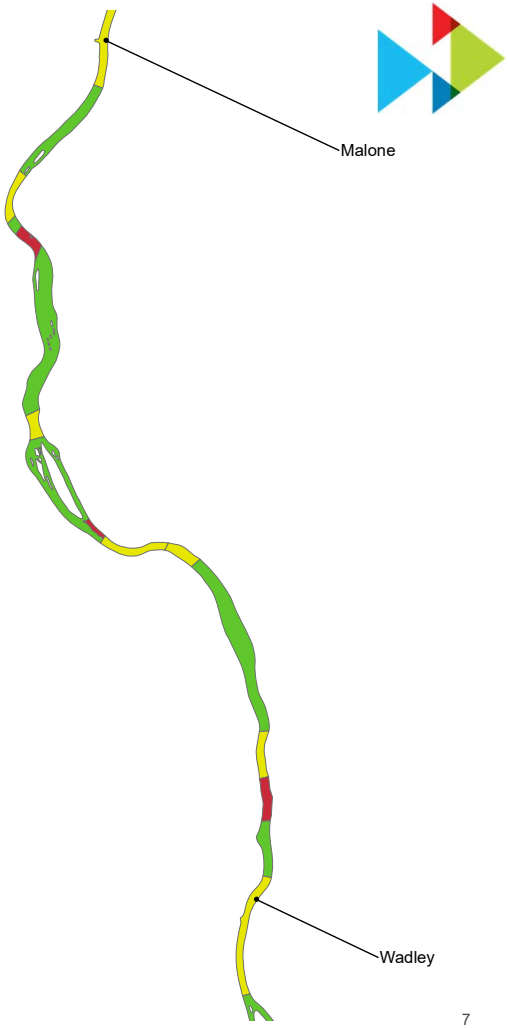
Mesohabitat Type by Reach (hectares)

Reach	Pool	Riffle	Run
Malone	50.7	31.3	28.7
Wadley	20.4	91.9	7.5
Bibbys Ferry	86.3	50.1	19.1
Germany's Ferry	60.3	35.9	10.0
Horseshoe Bend	60.7	18.9	1.1
Irwin Shoals	87.9	114.8	8.2
Grand Total	**366.3**	**343.0**	**74.7**



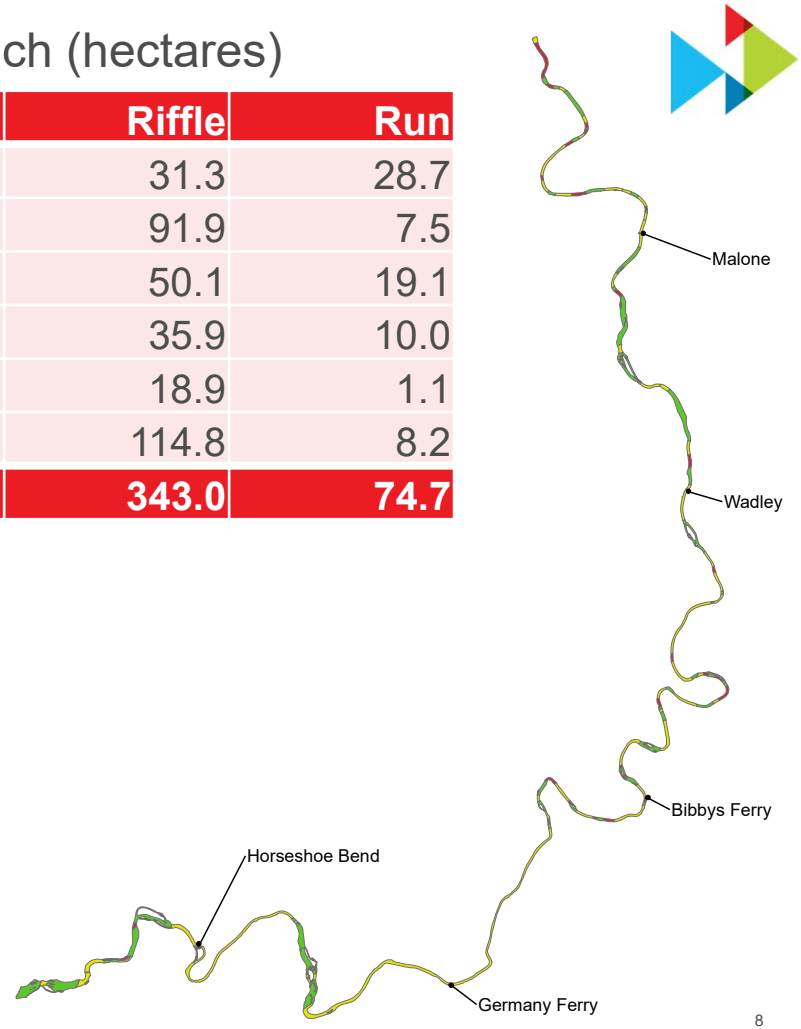
Mesohabitat Analysis



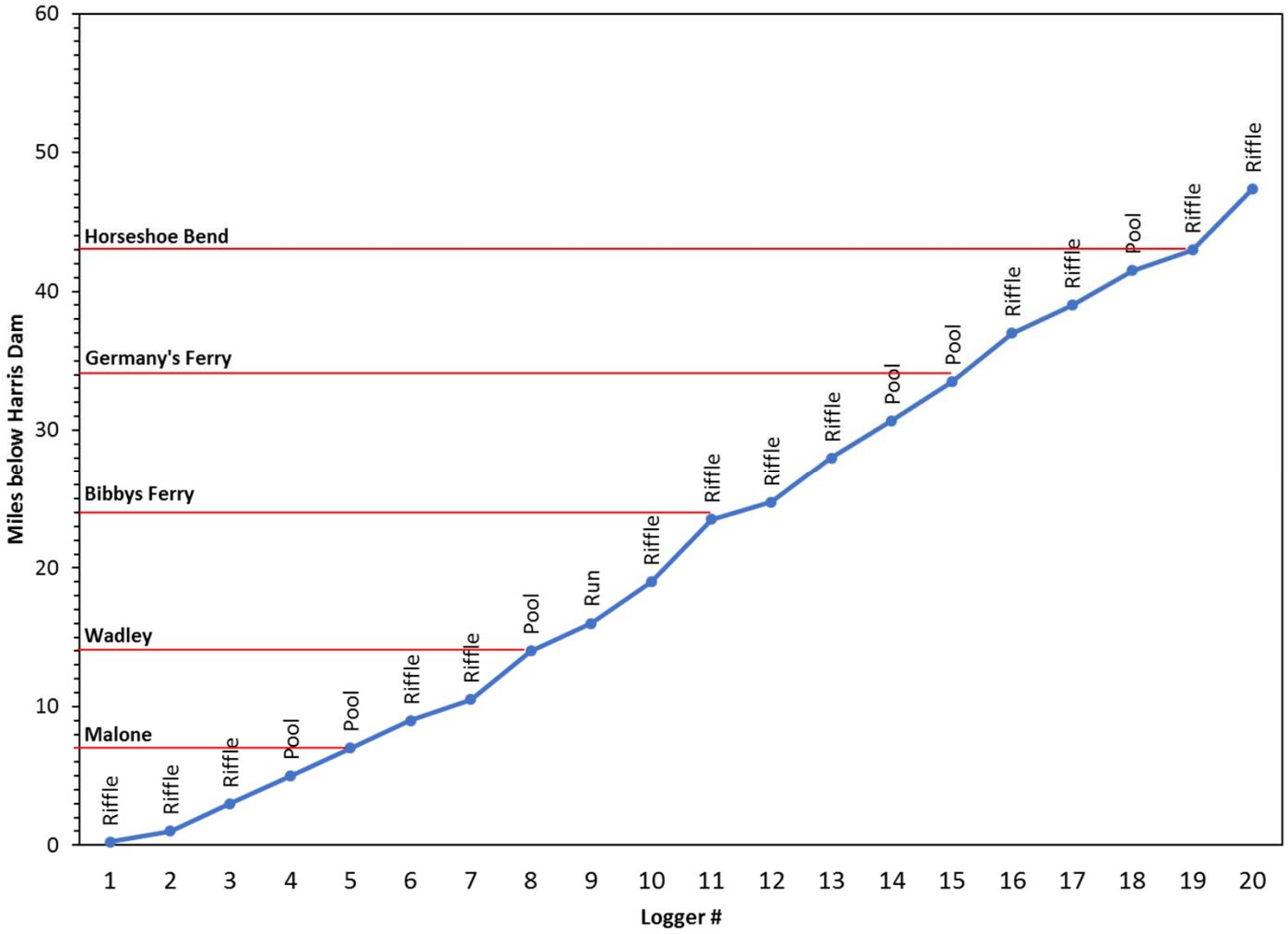


Mesohabitat Type by Reach (hectares)

Reach	Pool	Riffle	Run
Malone	50.7	31.3	28.7
Wadley	20.4	91.9	7.5
Bibbys Ferry	86.3	50.1	19.1
Germany's Ferry	60.3	35.9	10.0
Horseshoe Bend	60.7	18.9	1.1
Irwin Shoals	87.9	114.8	8.2
Grand Total	**366.3**	**343.0**	**74.7**

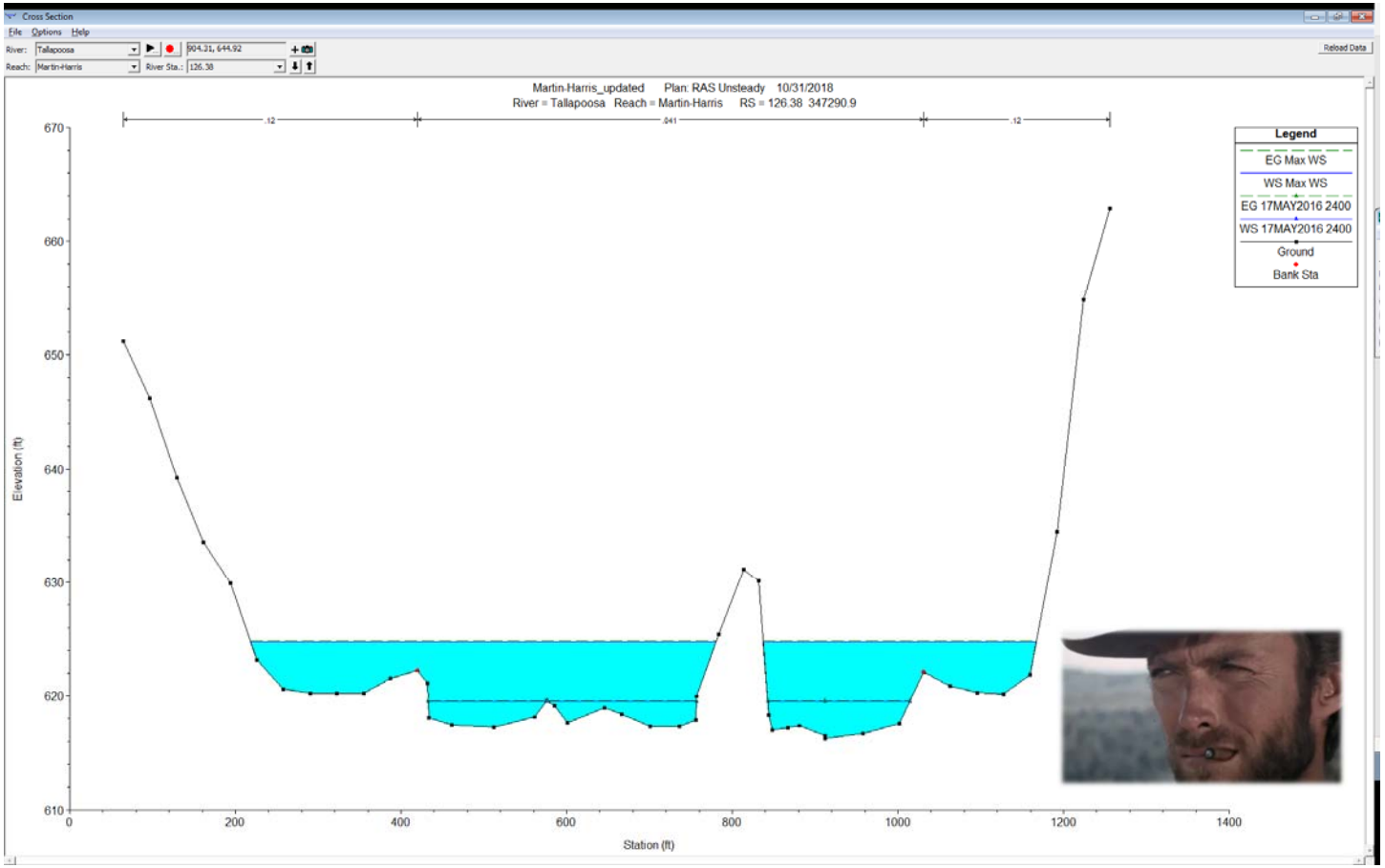


Water Level Logger Deployments

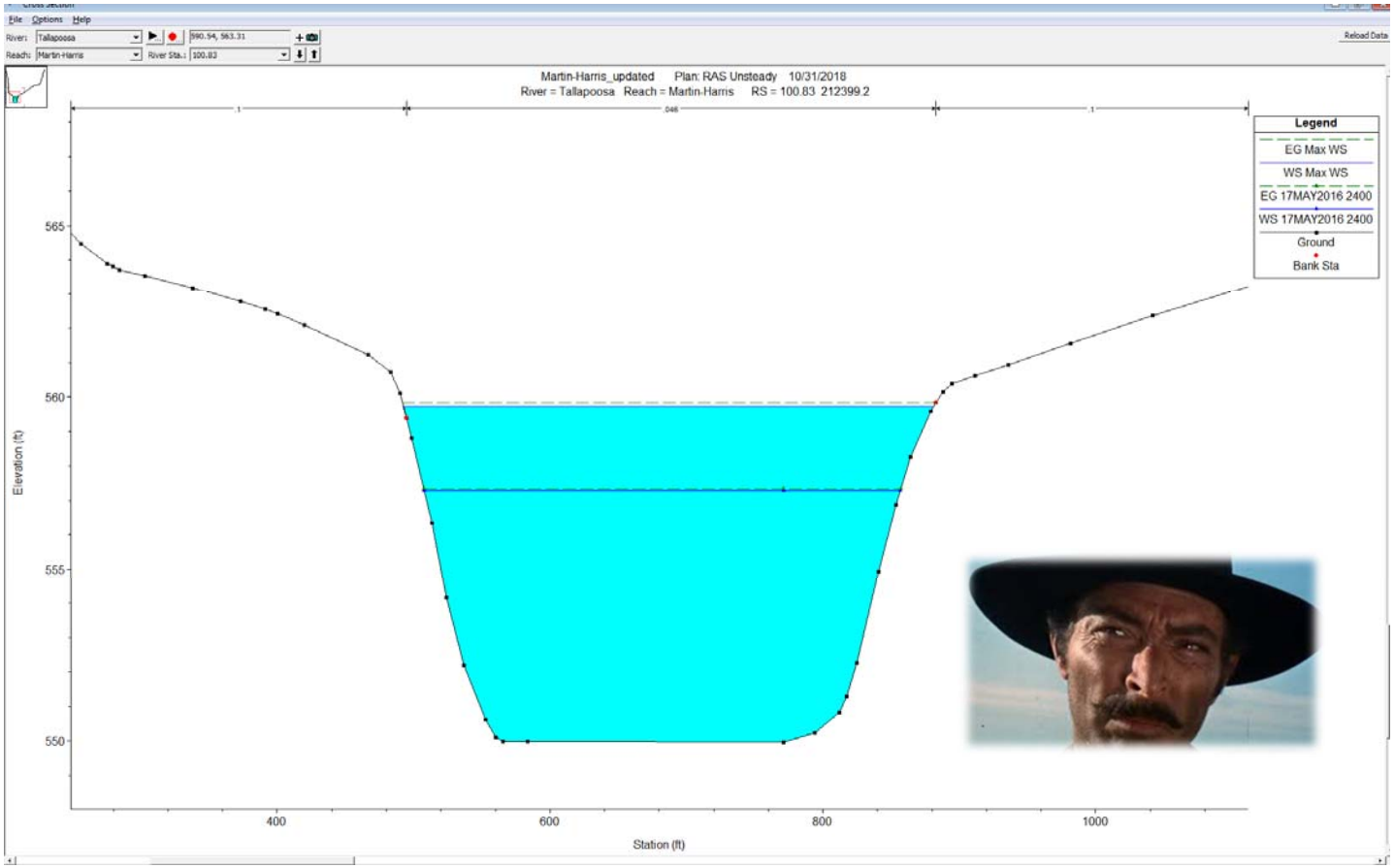

Miles below Harris Dam
Logger #
0
10
20
30
40
50
60
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Horseshoe Bend
Germany's Ferry
Bibbys Ferry
Wadley
Malone
Riffle
Riffle
Riffle
Pool
Pool
Riffle
Riffle
Pool
Run
Riffle
Riffle
Riffle
Pool
Pool
Riffle
Riffle
Pool
Riffle
Riffle

HEC-RAS Model Development

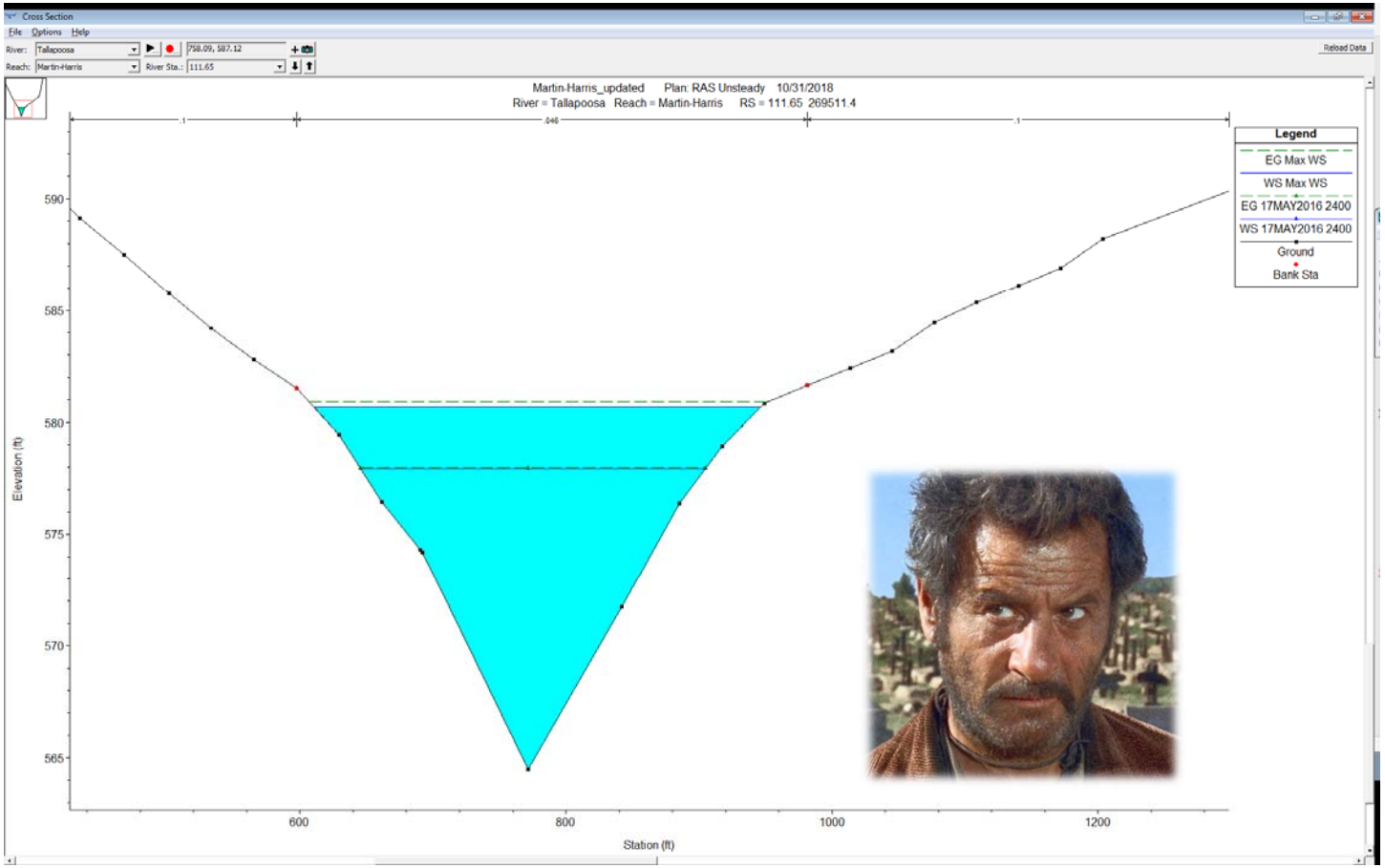
River Cross-Sections – The Good

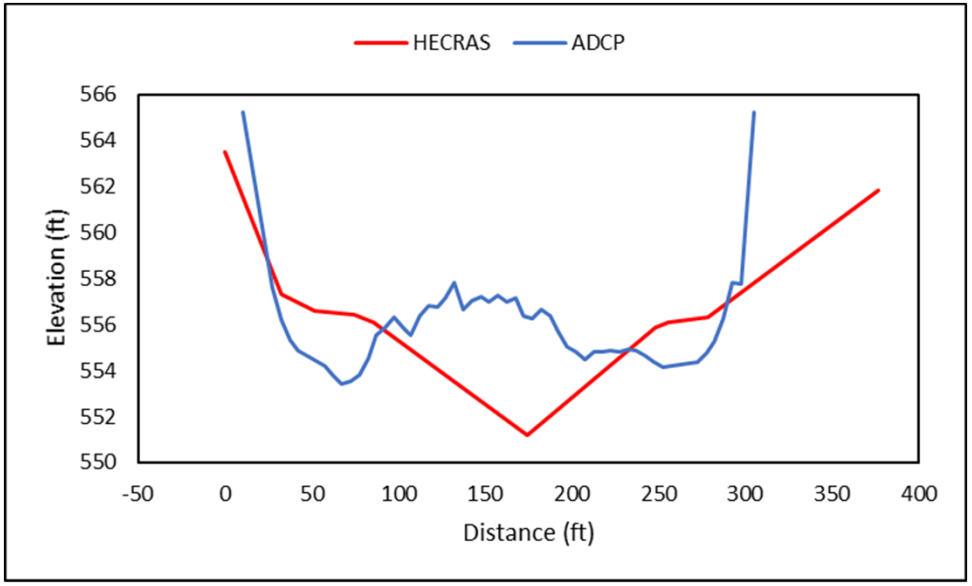


River Cross-Sections – The Bad



River Cross-Sections – and the Ugly

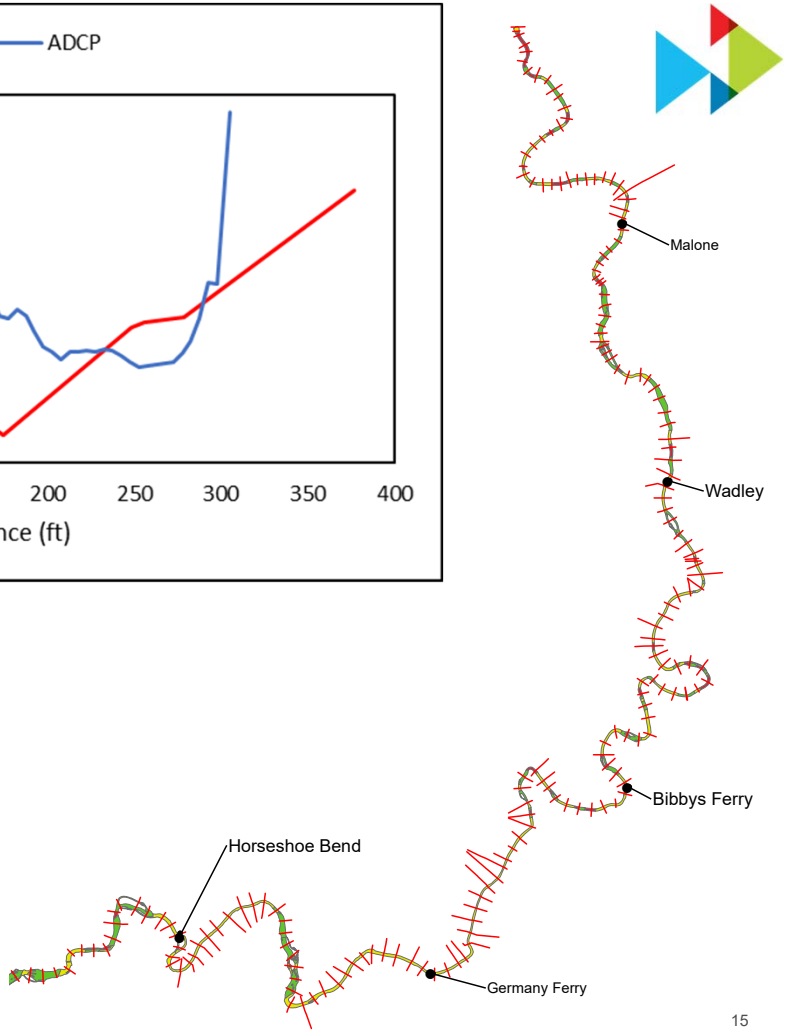


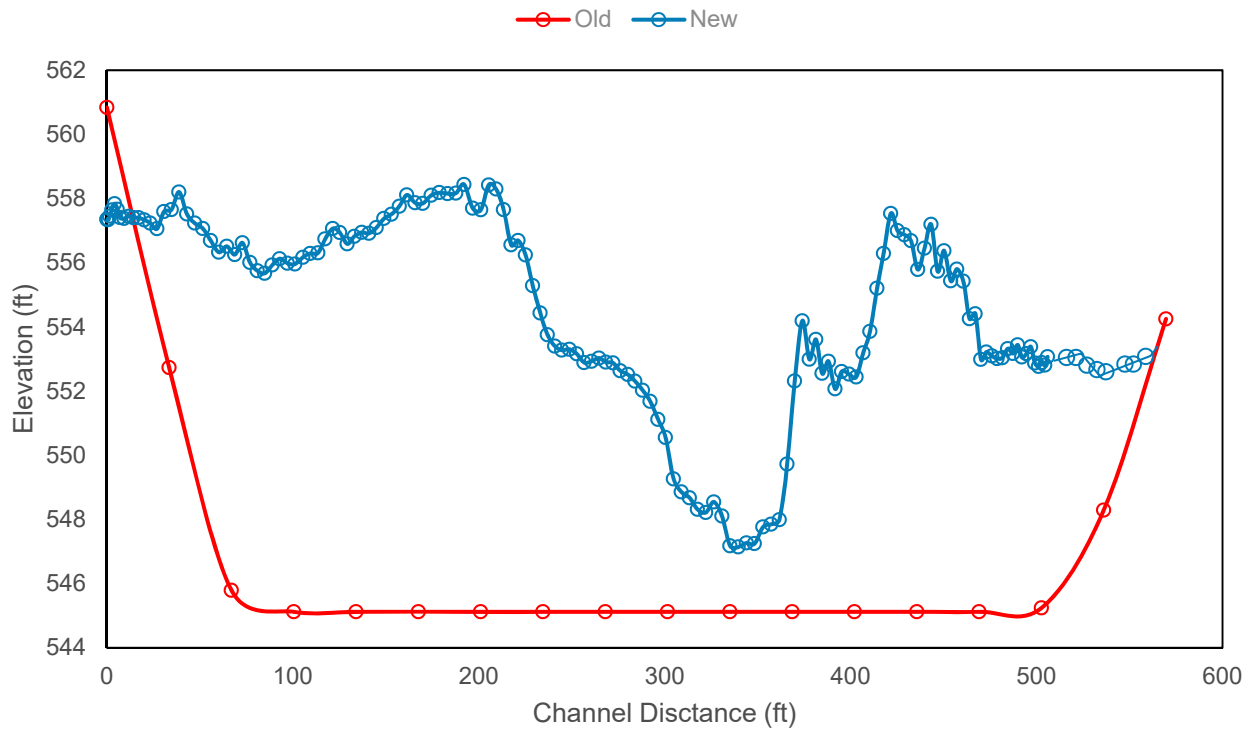


~200 cross-sections

Collect bathymetry data at:

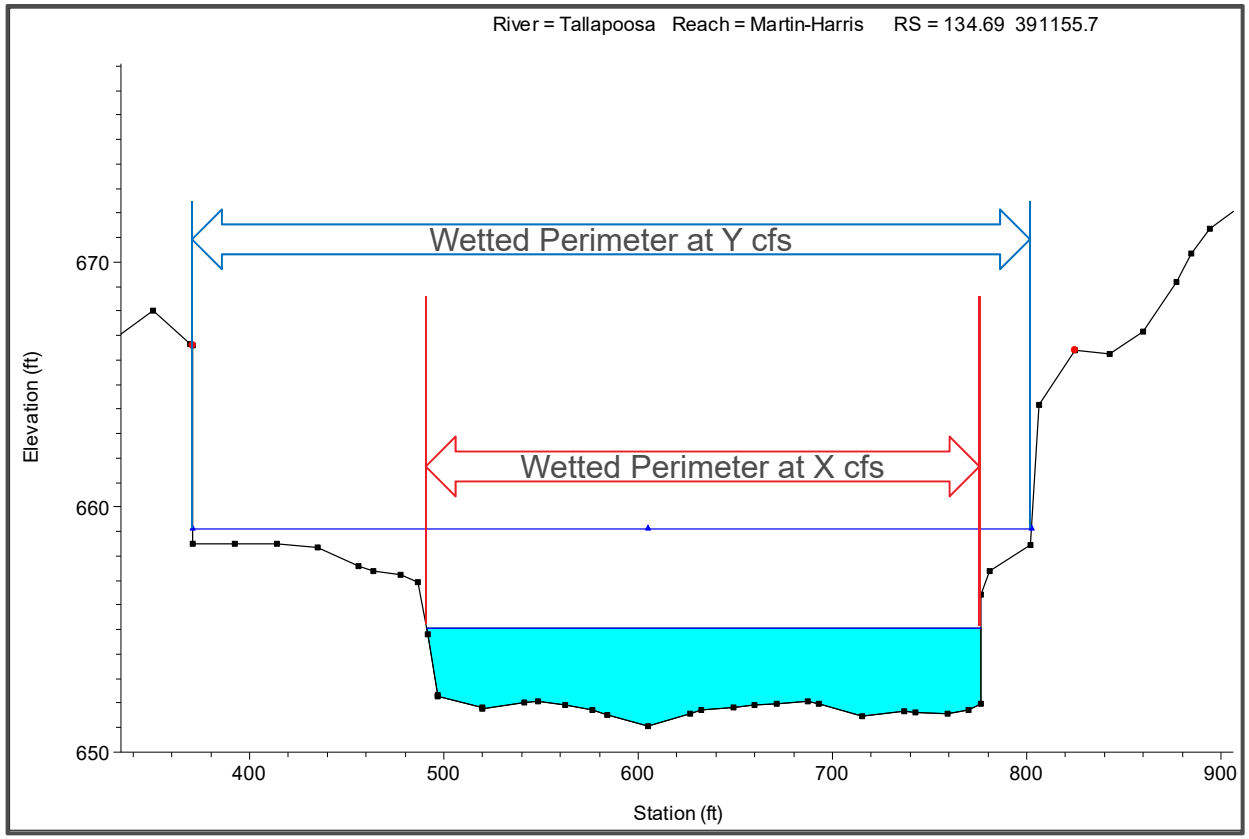
- Poorly interpolated cross-sections
- New cross-sections where gradient is steep




Old
New
562
560
558
556
554
552
550
548
546
544
Elevation (ft)
0
100
200
300
400
500
600
Channel Disctance (ft)

HEC-RAS Results Analysis

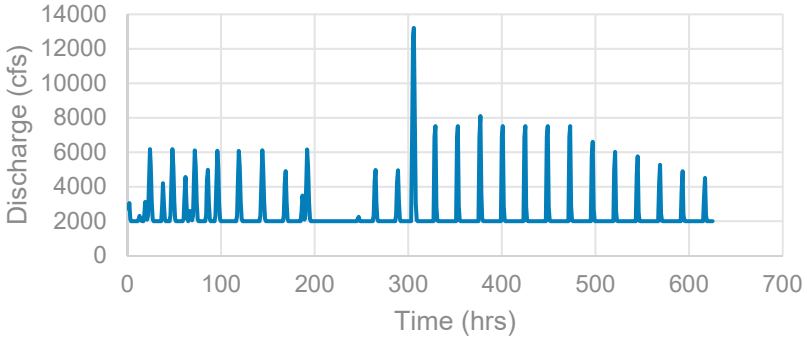
HEC-RAS Results Analysis

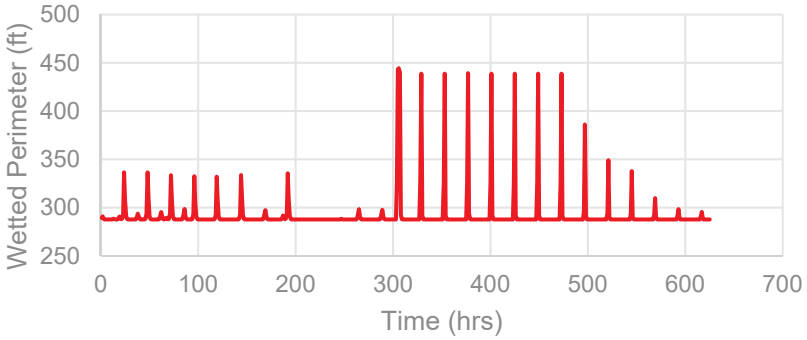


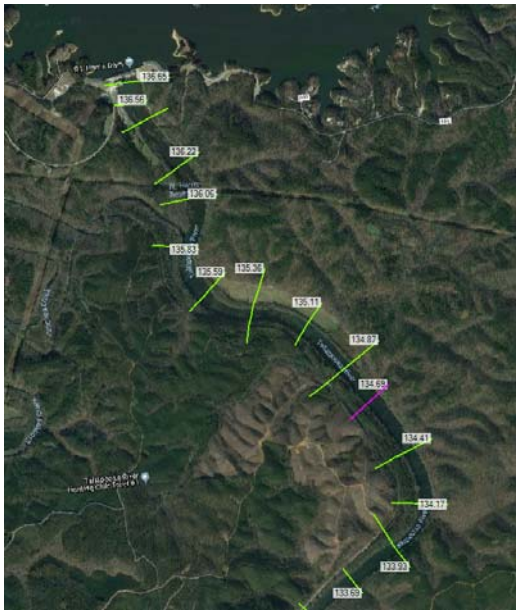
HEC-RAS Results Analysis

River Station	Discharge (cfs)	Wetted Perimeter (ft)	Water Surface Elevation (ft)
134.69	2001	287.71	654.58
134.69	2001	287.71	654.58
134.69	2000	287.71	654.57
134.69	2312	288.44	654.79
134.69	4240	293.02	656.11
134.69	6112	333.6	657.57
134.69	5227	310.29	657.25
134.69	3231	291.84	655.77
134.69	2134	288.3	654.75
134.69	2005	287.74	654.58
134.69	2000	287.71	654.58
134.69	2000	287.71	654.57
134.69	2000	287.71	654.57
134.69	2000	287.71	654.57
134.69	2000	287.71	654.57
134.69	2000	287.71	654.57
134.69	2000	287.71	654.57
134.69	2000	287.71	654.57
134.69	2000	287.71	654.57
134.69	2000	287.71	654.57
134.69	2000	287.71	654.57
134.69	2000	287.71	654.57

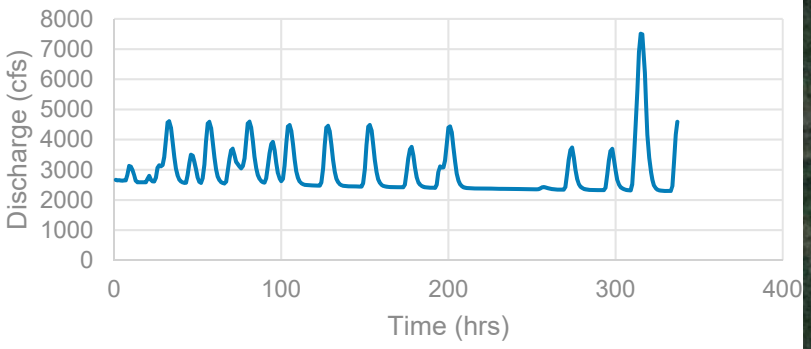
Tailwater Transect

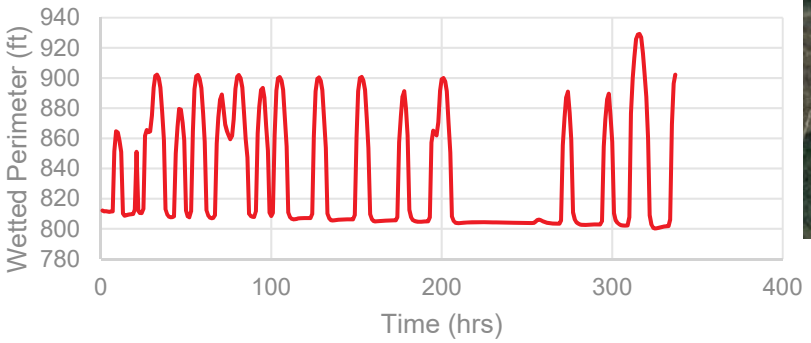


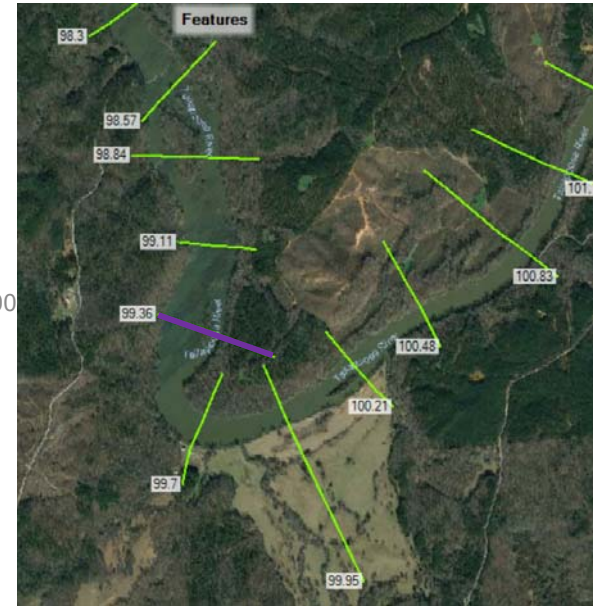




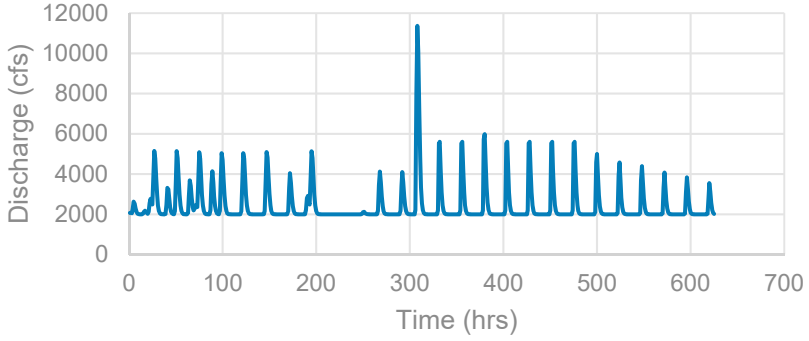
Shoal Transect

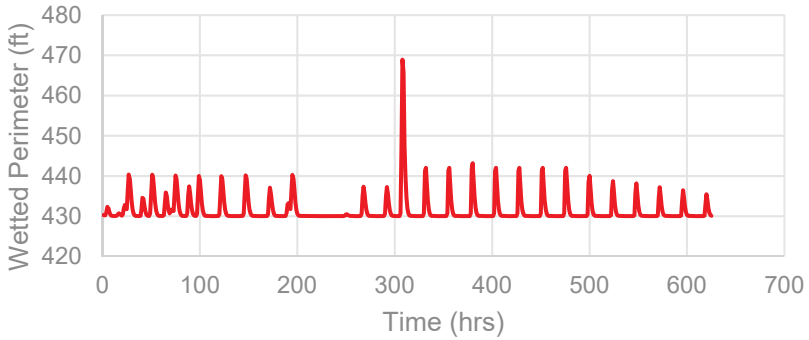






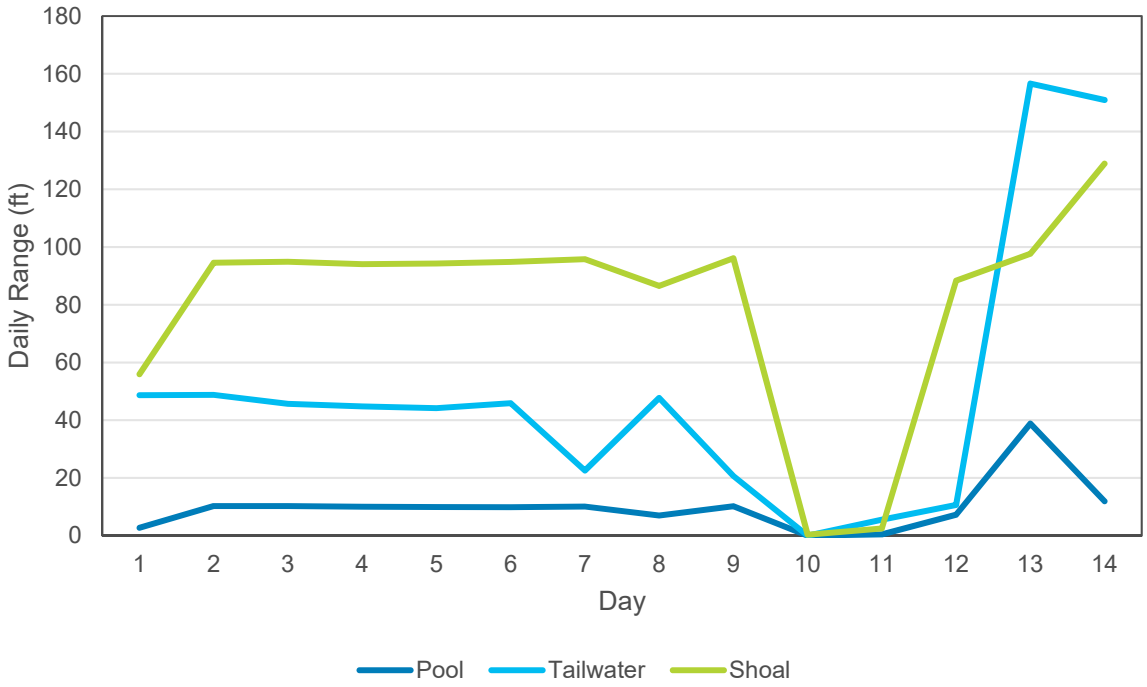
Pool Transect



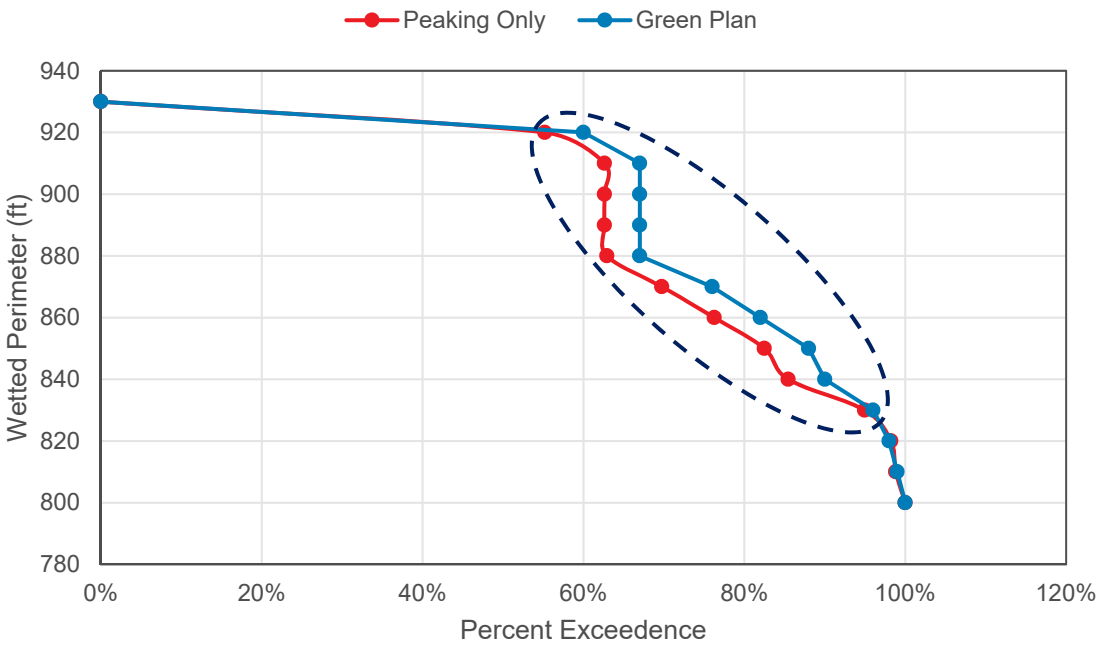


Example Range Comparison

$$WP_{range} = WP_{max} - WP_{min}$$

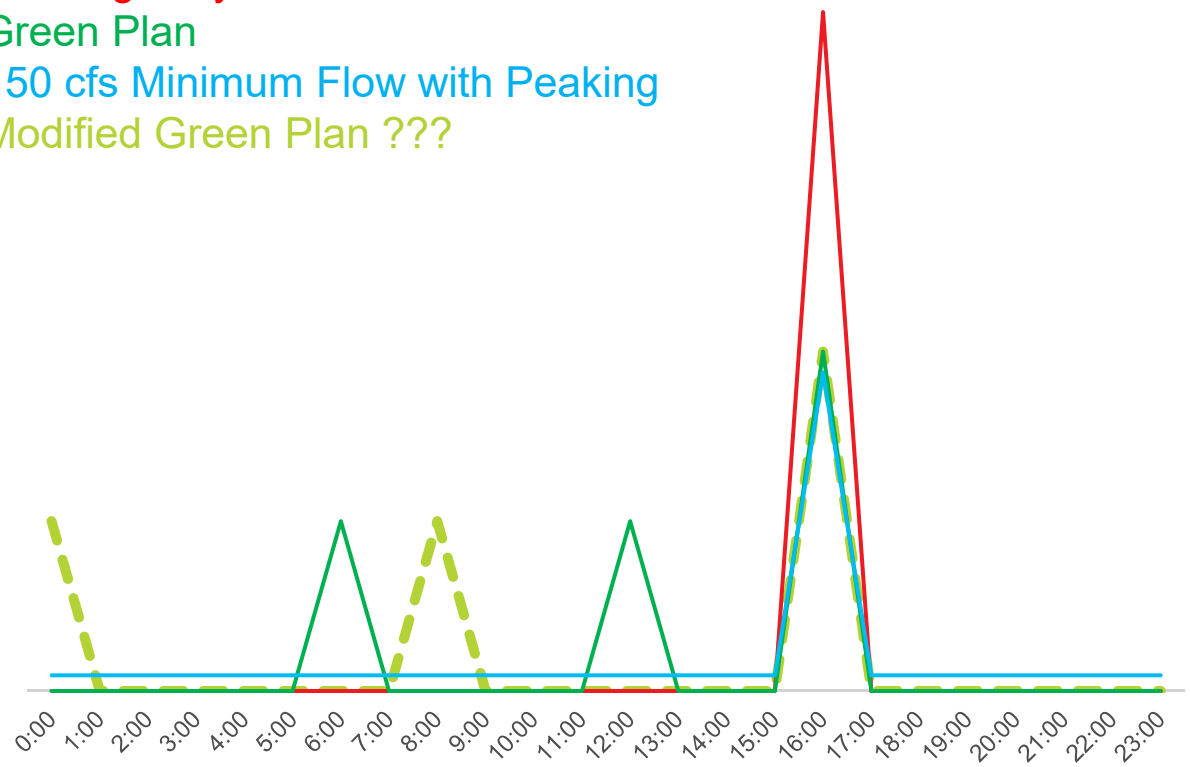


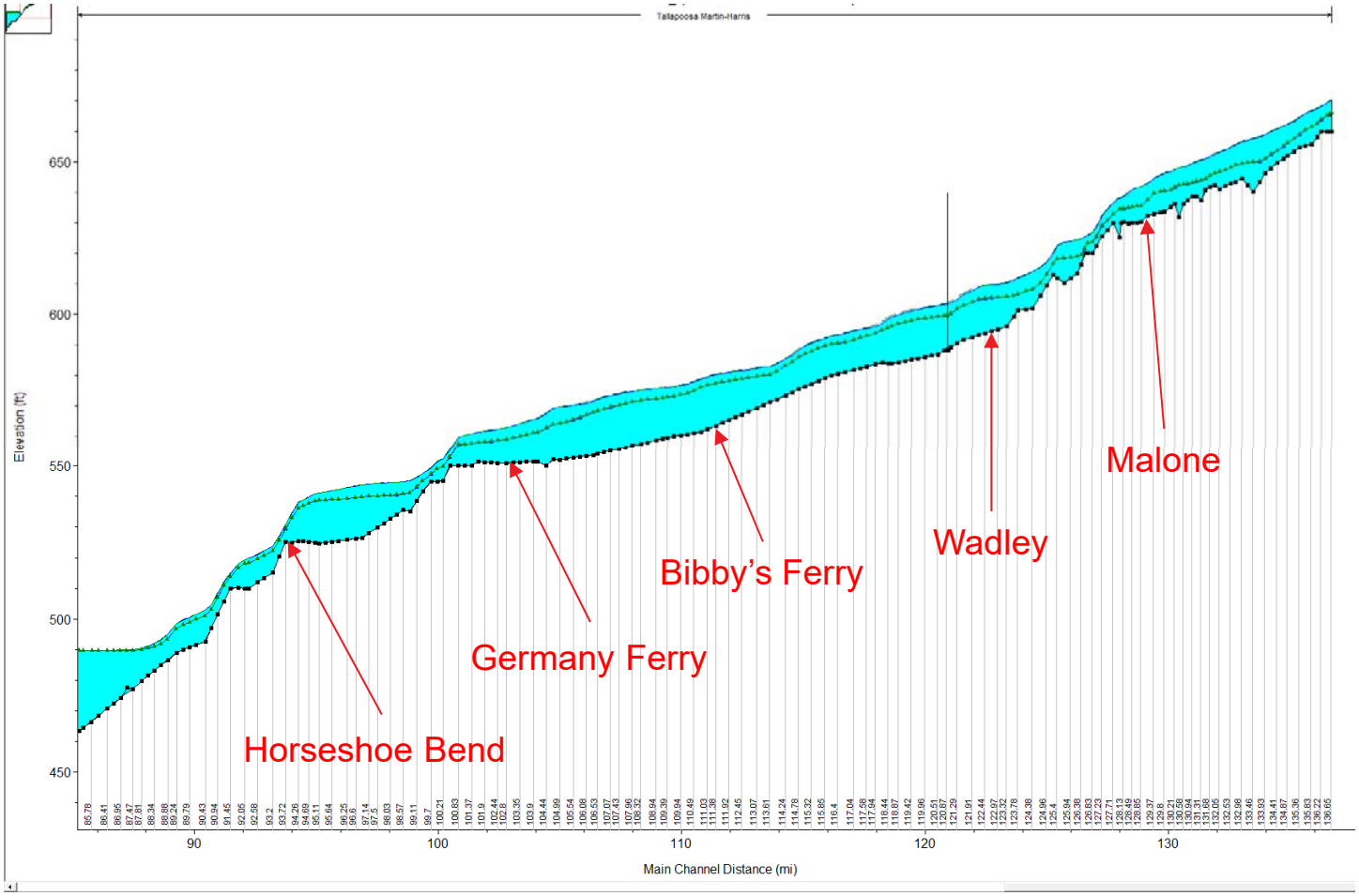
Example Frequency Comparison



Scenarios to Analyze

- Peaking Only
- Green Plan
- 150 cfs Minimum Flow with Peaking
- Modified Green Plan ???




Tallapoosa Martin-Harris
Elevation (ft)
650
600
550
500
450
90
100
110
120
130
Main Channel Distance (mi)
Horseshoe Bend
Germany Ferry
Bibby's Ferry
Wadley
Malone