Meeting Summary
HAT 3 Meeting
February 20, 2020
1:00 pm to 1:45 pm
Conference Call

Participants:
Angie Anderegg – Alabama Power
Jeff Baker – Alabama Power
Kate Cosnahan – Kleinschmidt Associates
Allan Creamer – Federal Energy Regulatory Commission (FERC)
Colin Dinken – Kleinschmidt Associates
Amanda Fleming – Kleinschmidt Associates
Todd Fobian – Alabama Department of Conservation of Natural Resources (ADCNR)
Donna Matthews – Tallapoosa River Heritage
Tina Mills – Alabama Power
Ashley McVicar – Alabama Power
Jason Moak – Kleinschmidt Associates
Sarah Salazar - FERC

NOTE: A copy of the HAT 3 February 20, 2020 presentation is attached.

Meeting Summary:

Angie Anderegg (Alabama Power) opened the meeting by introducing everyone and recapping the previous HAT 3 conference call from December 2019. In December, the methods for the analysis were presented. The purpose for this conference call was for Jason Moak (Kleinschmidt Associates) to present some preliminary results.

Jason reviewed the purpose and goal of the Downstream Aquatic Habitat Study, which is to develop a model that describes the relationship between Green Plan operations and aquatic habitat. The HEC-RAS model outputs will be used to determine how current operations affect the amount and persistence of wetted habitat. Jason discussed how mesohabitat of the Tallapoosa River downstream of Harris Dam was delineated into riffles, pools, and runs for different reaches (Malone, Wadley, Bibby's, Germany, HOBE, and Irwin Shoals) using GIS. Jason stated that 20 water level loggers have been deployed since June 2019 and they are logging both water level and temperature data every 15 minutes.

Jason discussed how the HEC-RAS model was developed. Previously, the model included roughly 200 cross-sections between Harris Dam and Jaybird Landing. However, some of the data had been interpolated using the surrounding landscape and were not ideal. More than 100 cross-sections were surveyed in 2019 to provide better channel geometry for the HEC-RAS model.

The HEC-RAS model will be used to examine the feasibility of alternative operating modes. For this study, the amount of wetted habitat will be measured under the different operating mode scenarios. Jason presented some examples of the results. Areas closer to the dam show more drastic fluctuations in discharge when compared to more downstream reaches. Jason

demonstrated how shallow-water habitats would be affected more by changes in operating modes than pool habitats, which exhibit a less variable range of responses and smaller changes to wetted perimeter.

Jason explained the daily range comparison calculation: wetted perimeter range = wetted max - wetted min. An example frequency comparison between peaking, Green Plan, and 150 cubic feet per second (cfs), was shown to explain what the results may look like, but no actual data was used for this example. The operating scenarios that will be analyzed are peaking only, Green Plan, 150 cfs minimum flow, and a modified Green Plan. The modified Green Plan has not been determined yet and will likely resemble the current Green Plan but with pulses occurring at different times of day. Jason showed a figure of elevation changes from the dam downstream through Horseshoe Bend.

Sarah Salazar (Federal Energy Regulatory Commission (FERC)) asked if the model could be used to examine change in water levels at the erosion sites described in the Erosion and Sedimentation Study and Jason confirmed that the model will be used to determine how these operation scenarios can affect the erosion areas. He stated that the model will also be used to measure the effects of alternative operation scenarios on the operation curve change of the lake.

Jason and Angie said these notes and presentation will be uploaded to the relicensing website. Jason stated that some of the data is being reviewed and therefore some results were not yet ready to be shown, but more results will be presented in March. Angie will send out information about the March 19 HAT meeting soon.

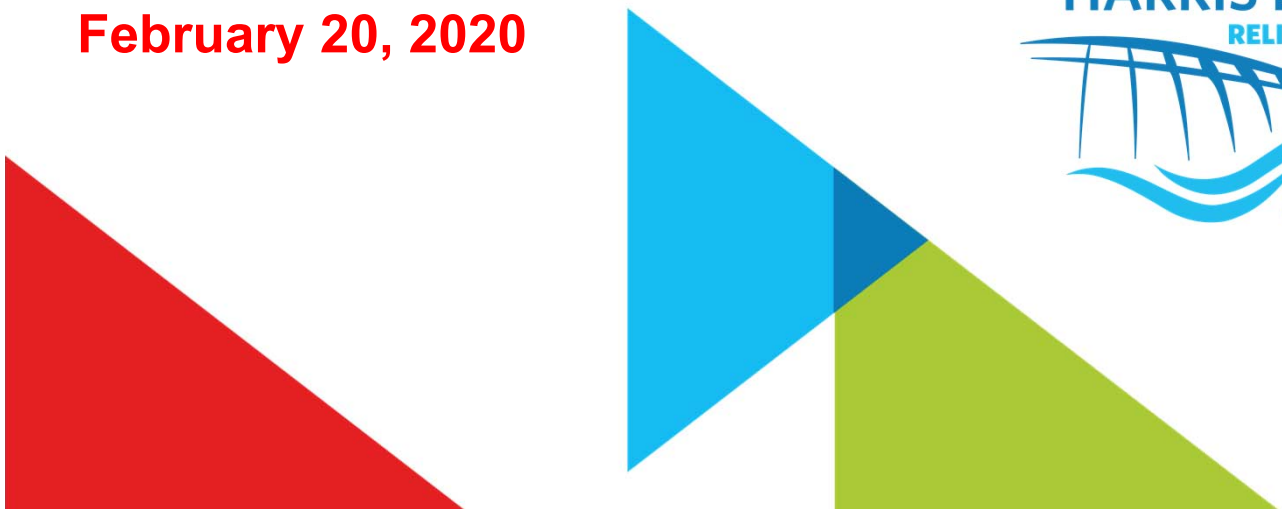
Todd Fobian (Alabama Department of Conservation of Natural Resources (ADCNR)) asked how long the loggers have been gathering data. Jason replied that some have been out longer than others, but there have been 20 loggers gathering data since June 2019. Donna Matthews (Tallapoosa River Heritage) asked if the whole dataset is derived from an average of different sampling times and asked if any data will describe what is simultaneously happening to the lake level. Jason said that Reservoir Management ensured that none of these proposed operation scenarios will affect the guide curve of the lake. For example, under the hypothetical minimum flow scenario, 150 cfs will consistently be released and any excess water will be used for generation, so all these scenarios should allow the lake to remain on the guide curve. Donna asked if these data are tied to rain events. Jason said extreme conditions occur, but these examples used a year with median conditions (2001). There are still high and low flow events within that dataset, however.

The group discussed the current rain conditions at the Tallapoosa River and throughout the rest of the Southeast. Todd asked about the amount of leakage at Harris Dam. Sarah asked if the model accounts for tributaries, which may contribute to flow. Jason stated these locations were identified and hydrographs for all the tributaries between Harris and the downstream end of the model were developed so the model should account for their contribution to flow.

R.L. Harris Project Relicensing

HAT 3 – Downstream Habitat Study

February 20, 2020



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

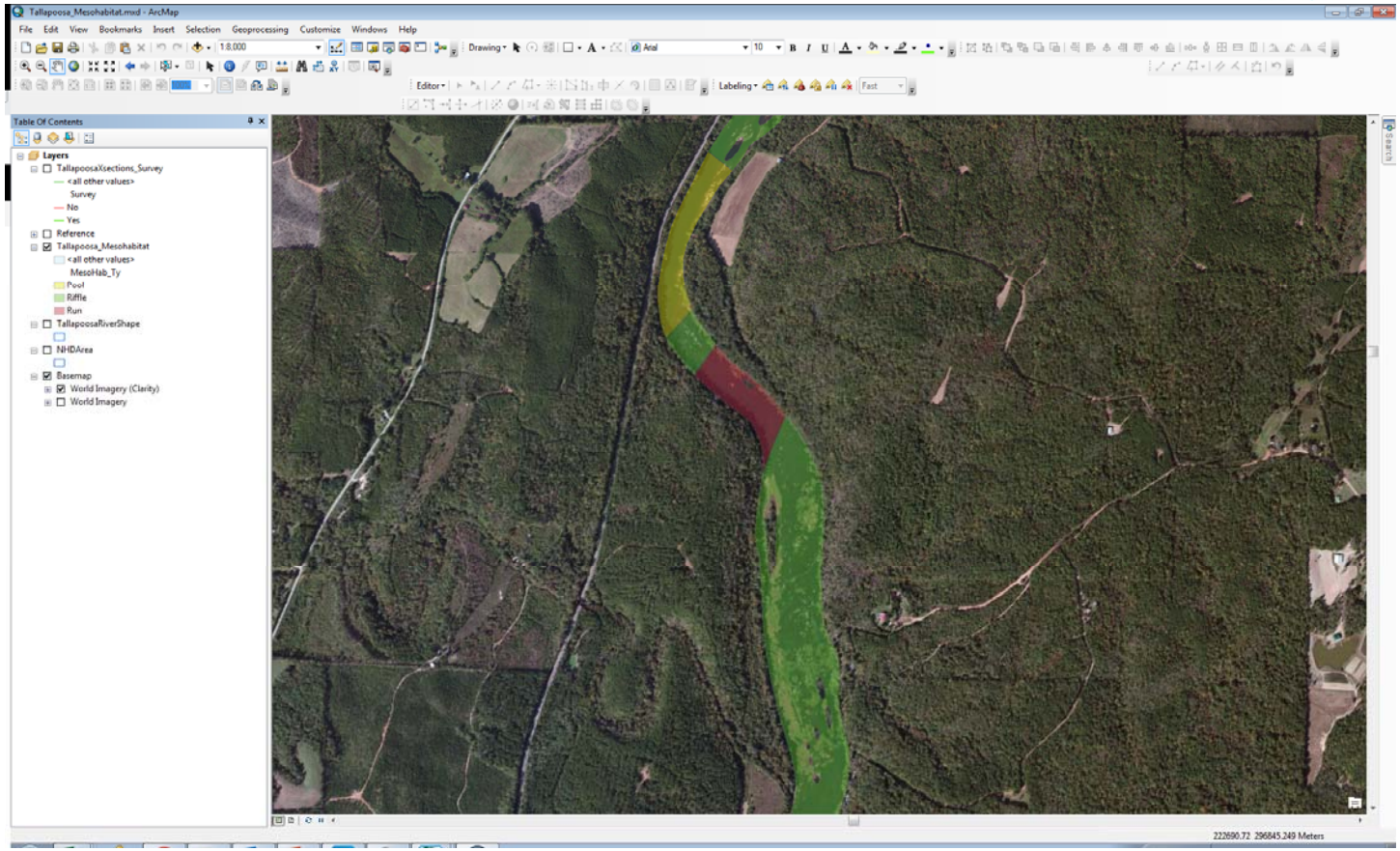
1. Mesohabitat Analysis: Desktop analysis of the types of available habitat (classified as riffle, run, pool)

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

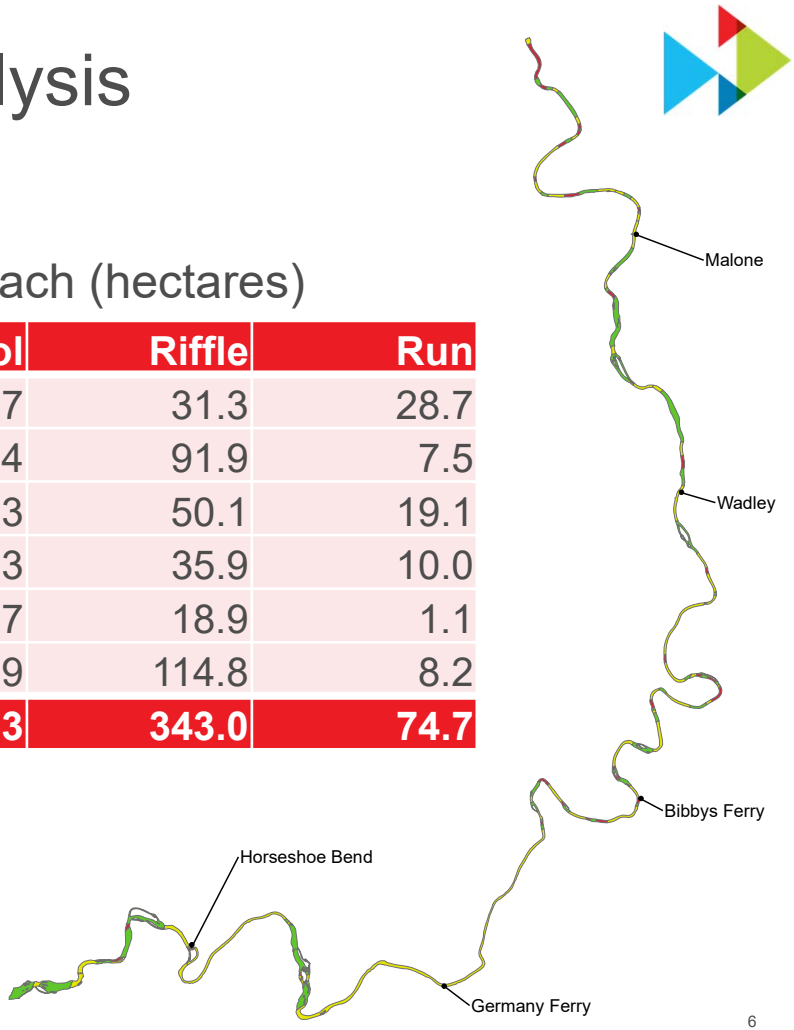
Mesohabitat Mapping



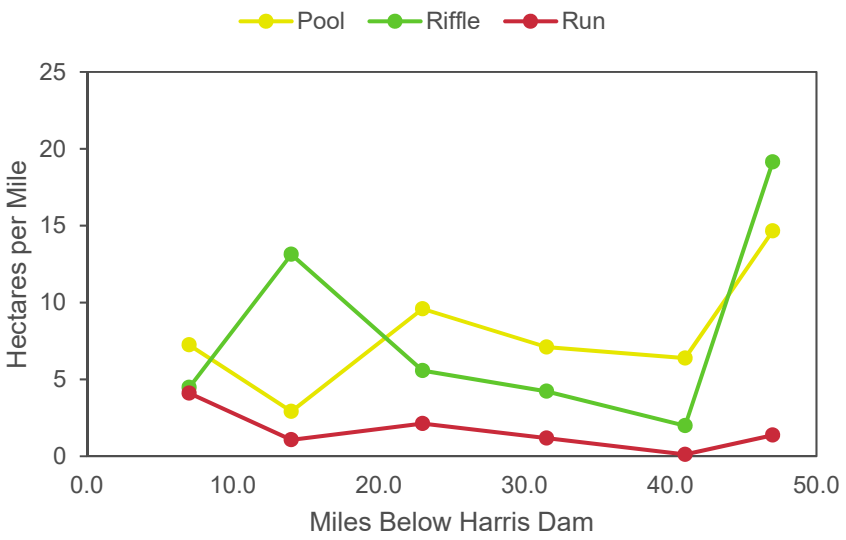
Mesohabitat Analysis

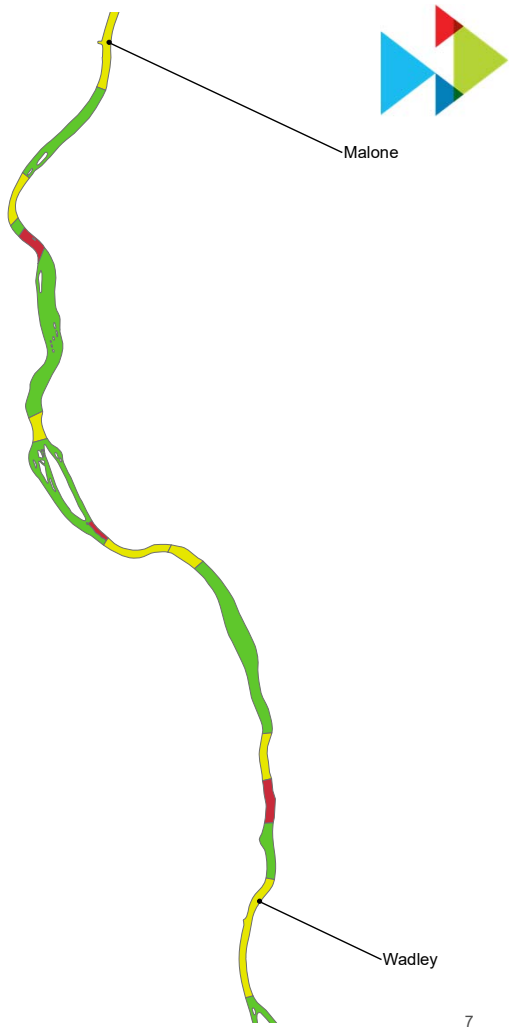
Mesohabitat Type by Reach (hectares)

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





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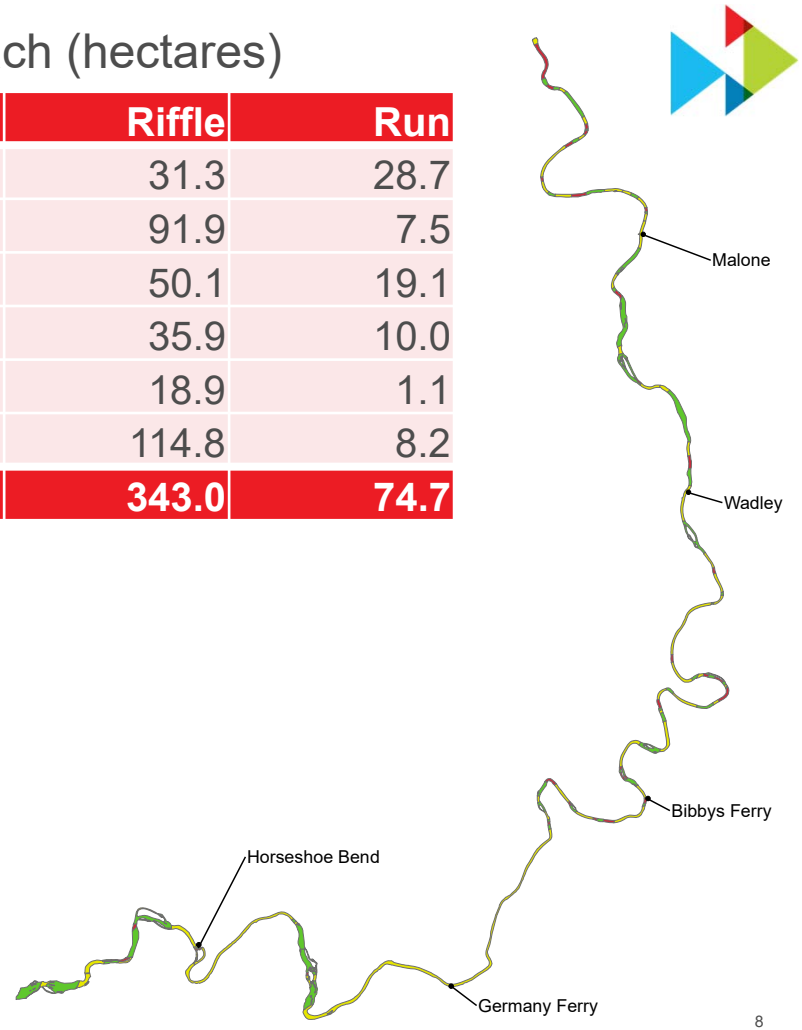
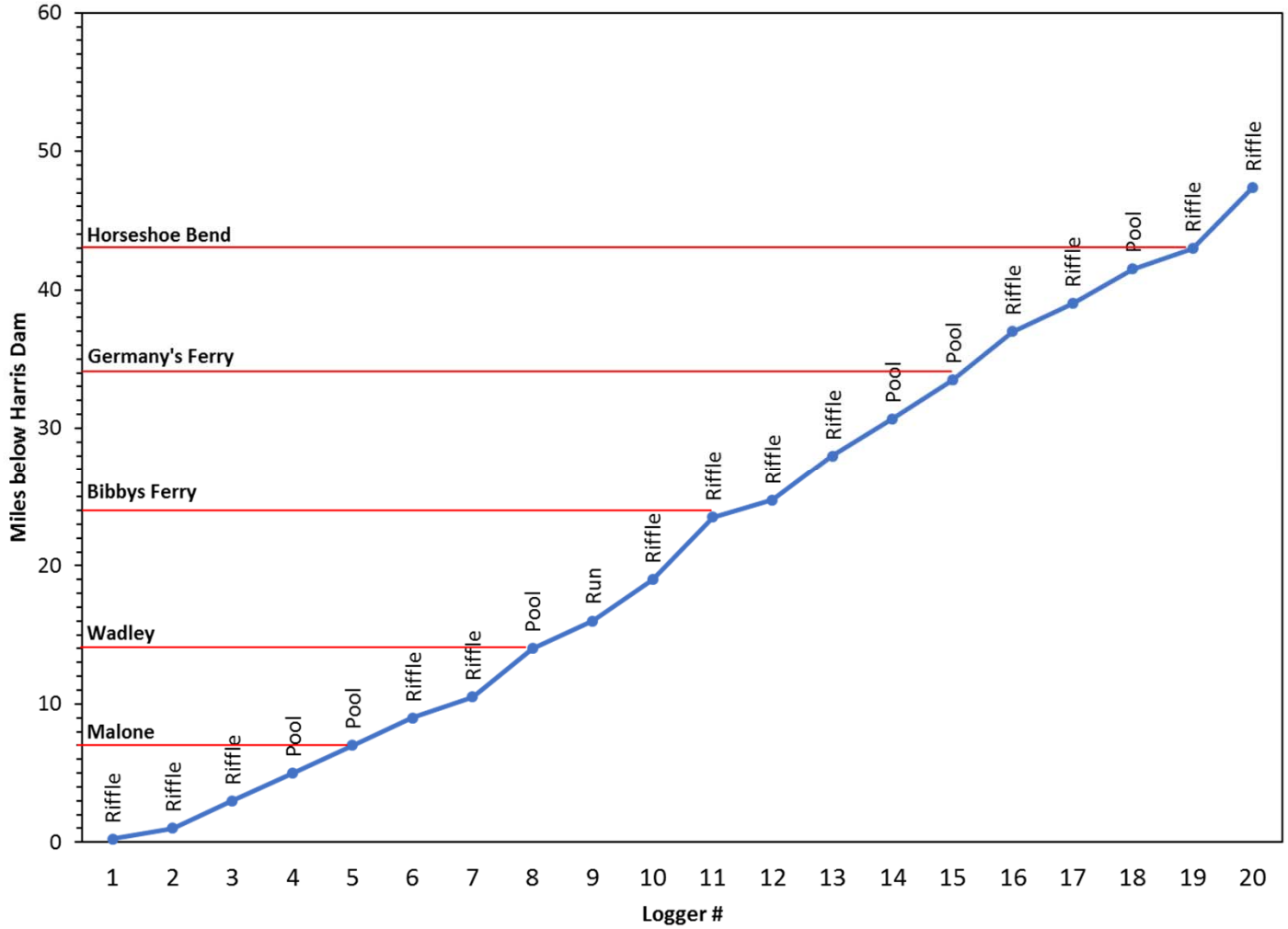
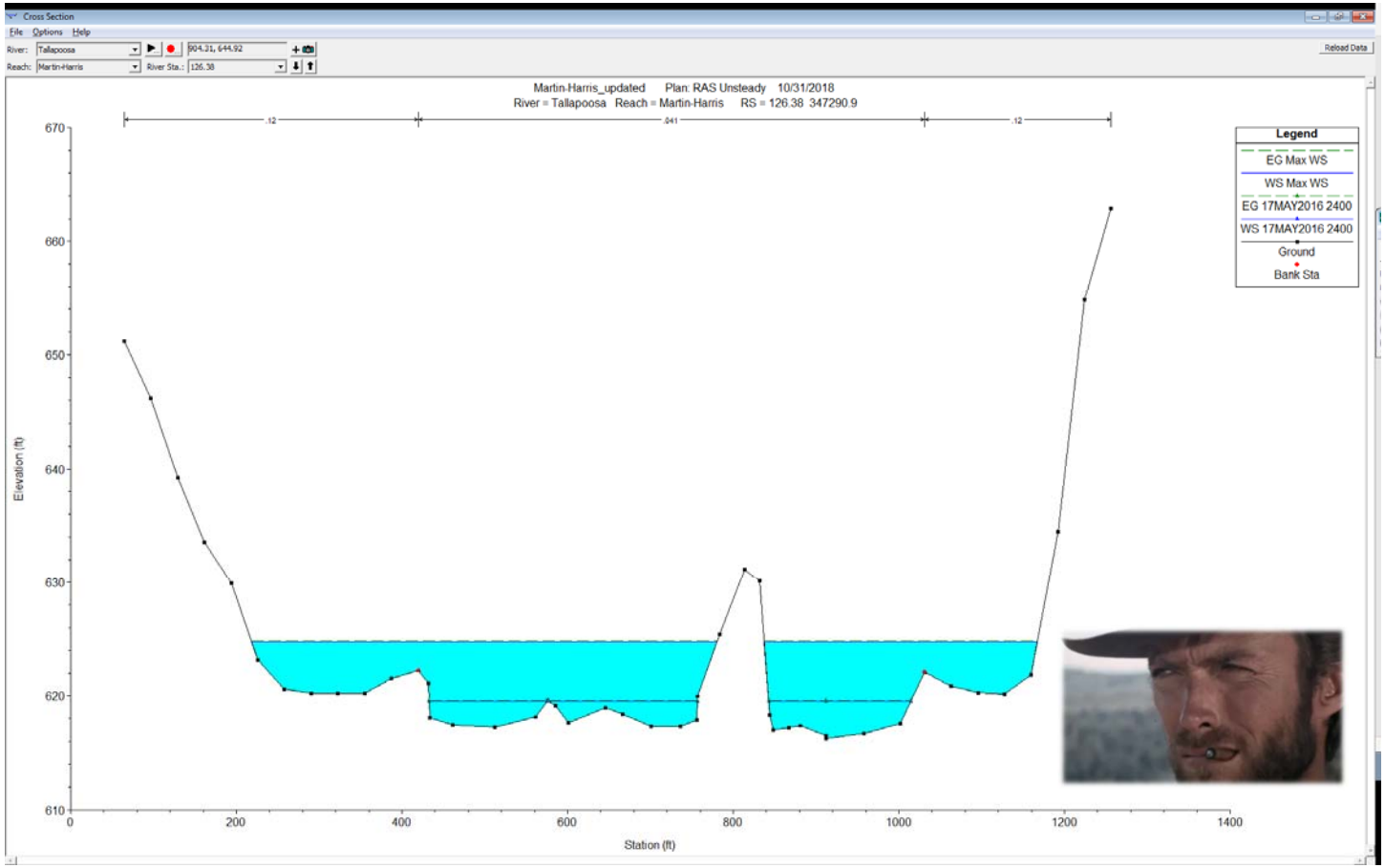


Water Level Logger Deployments

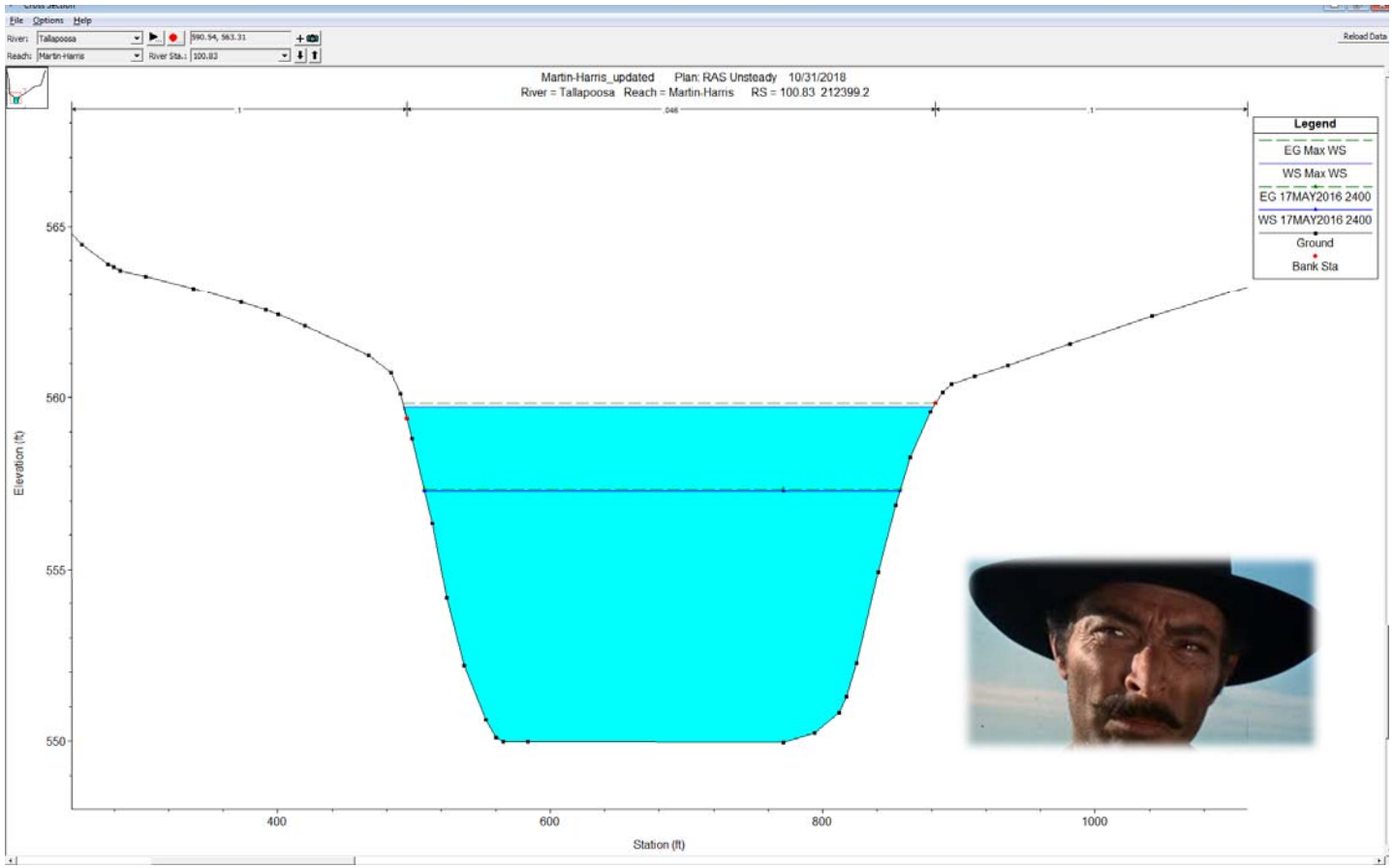

Miles below Harris Dam
60
50
40
30
20
10
0
Horseshoe Bend
Germany's Ferry
Bibbys Ferry
Wadley
Malone
Riffle
Riffle
Riffle
Pool
Pool
Riffle
Riffle
Pool
Run
Riffle
Riffle
Riffle
Pool
Pool
Riffle
Riffle
Pool
Riffle
Riffle
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Logger #

HEC-RAS Model Development

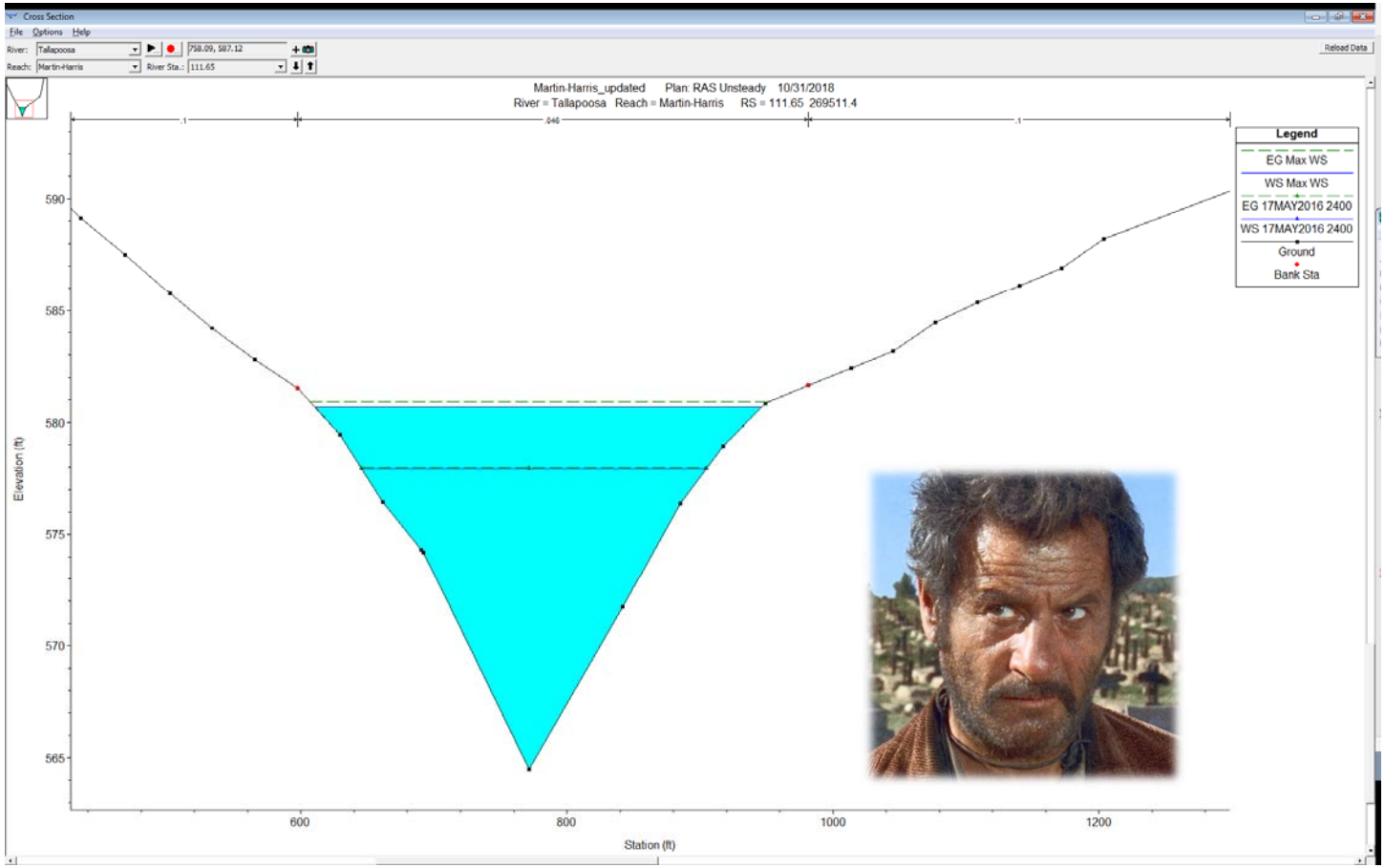
River Cross-Sections – The Good

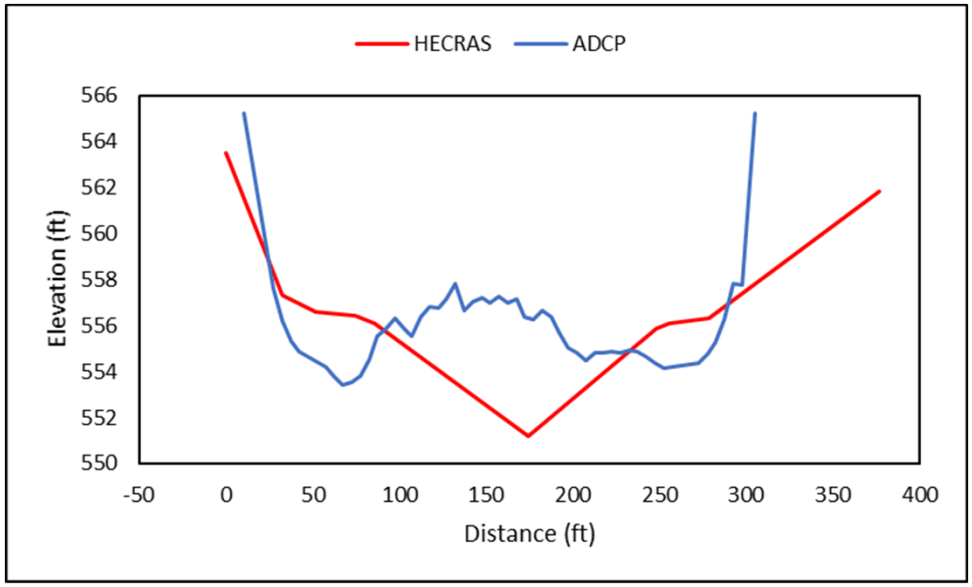


River Cross-Sections – The Bad



River Cross-Sections – and the Ugly

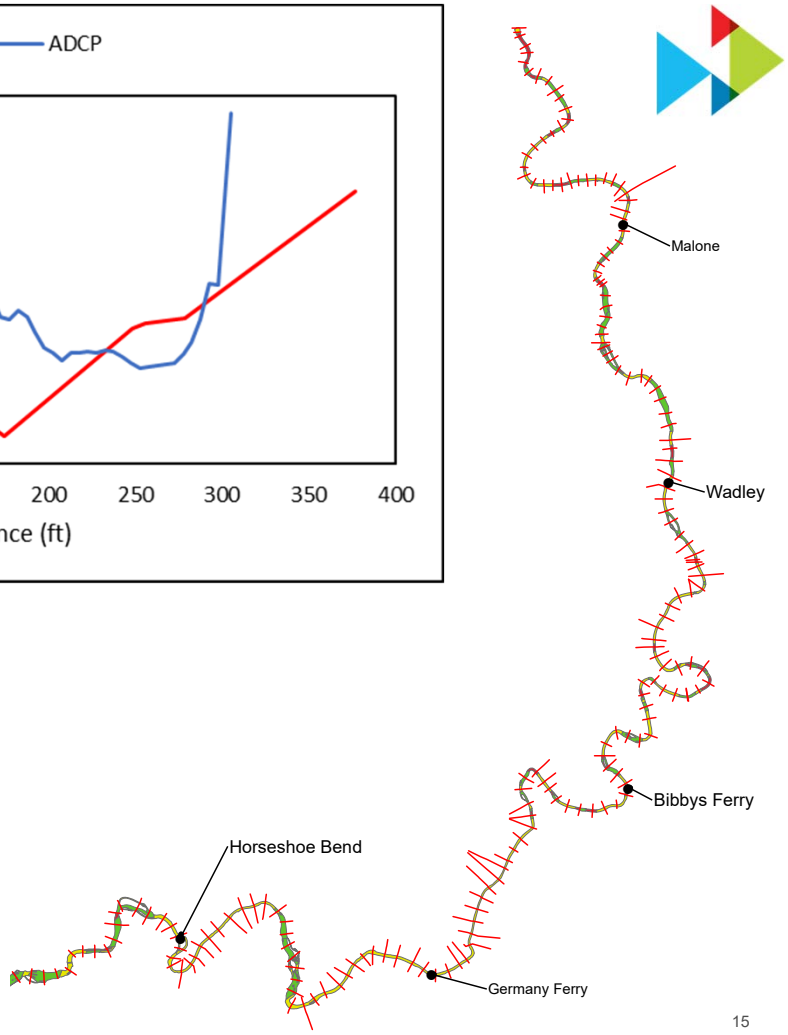


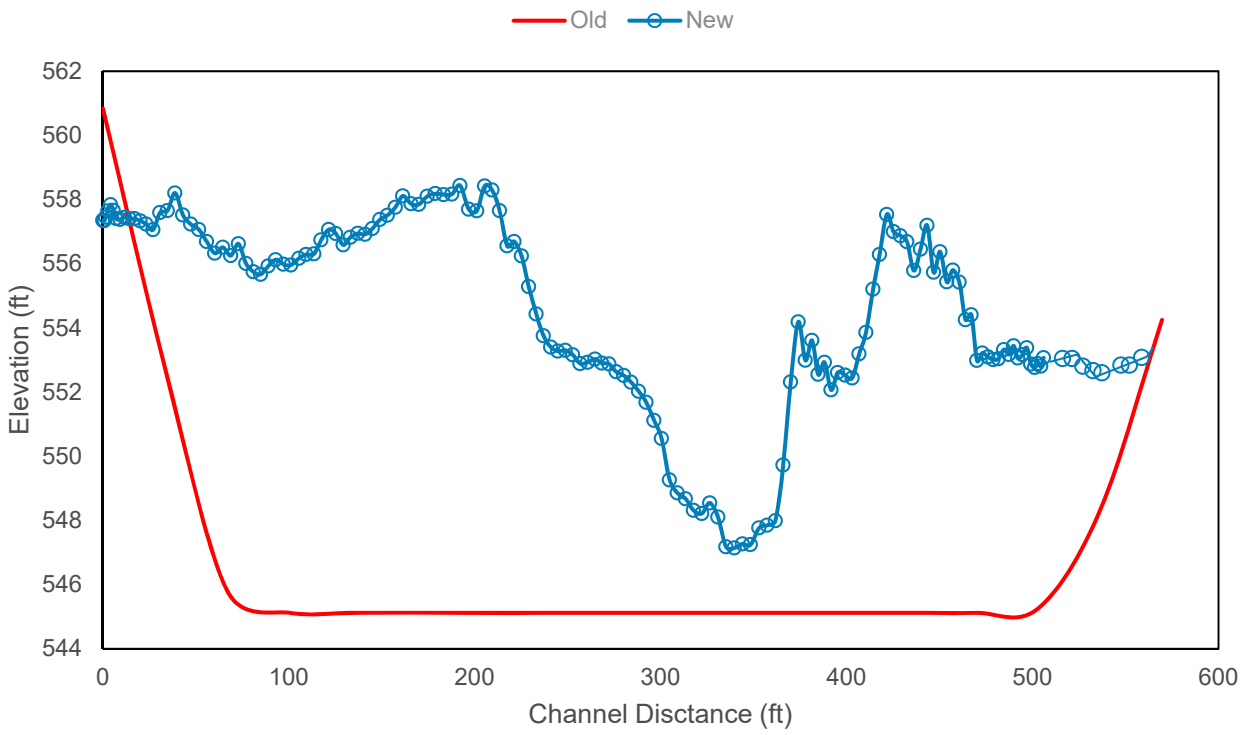


~200 cross-sections

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

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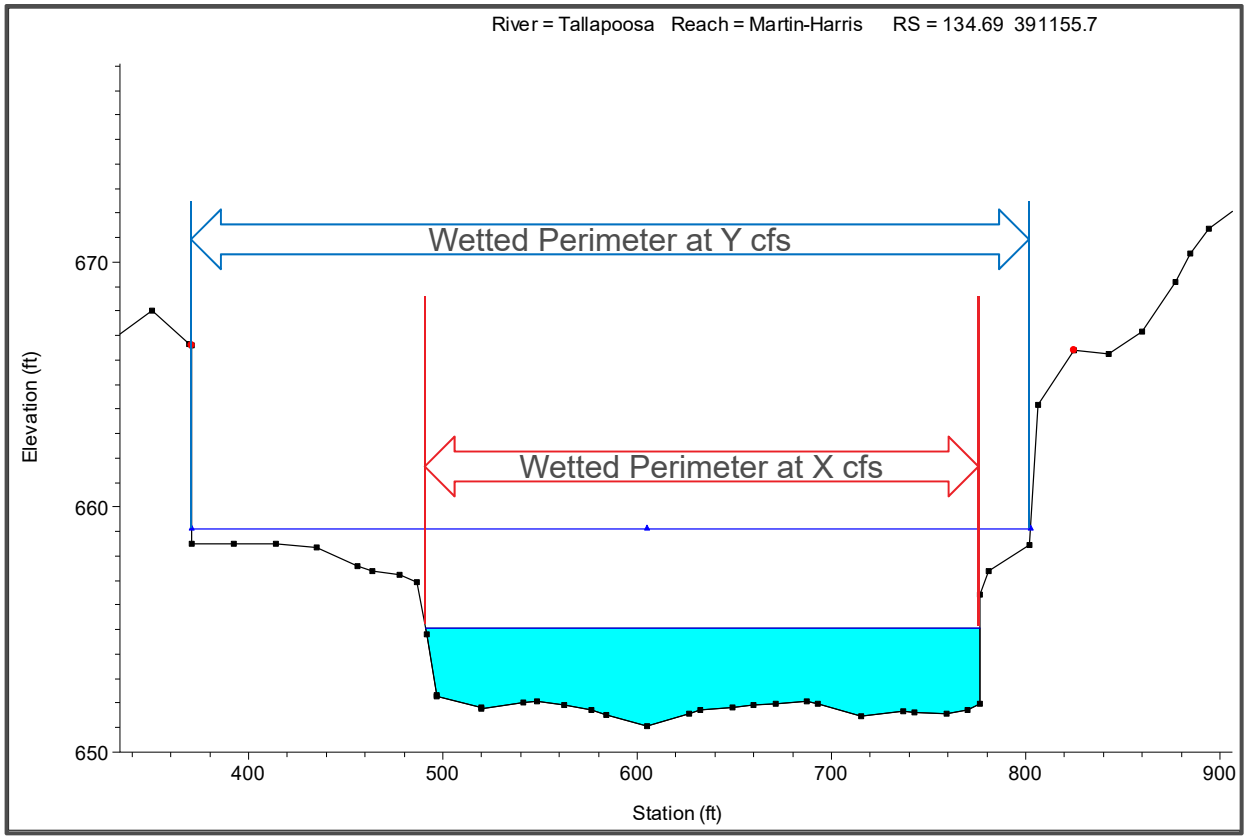
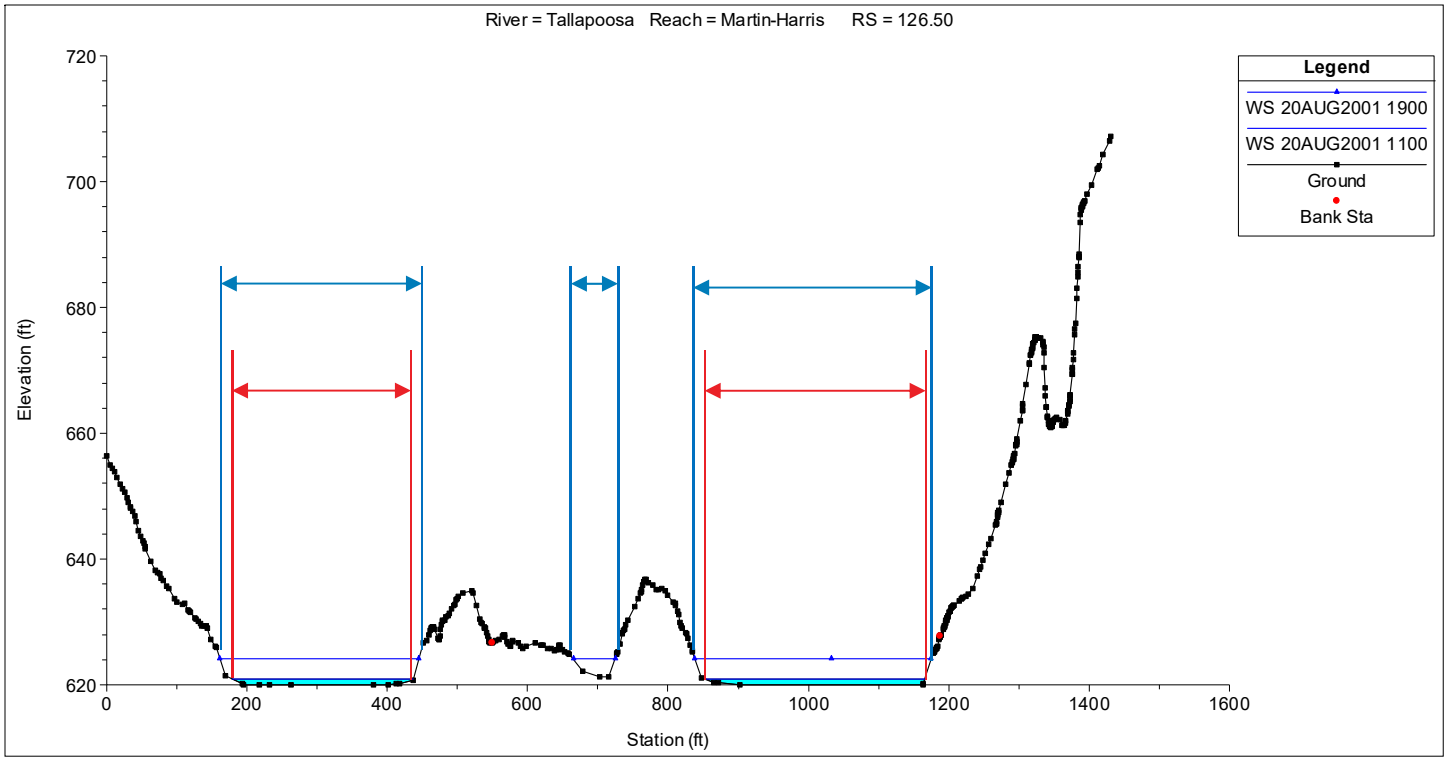


HEC-RAS Results Analysis



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
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134.69	2000	287.71	654.57
134.69	2000	287.71	654.57
134.69	2000	287.71	654.57
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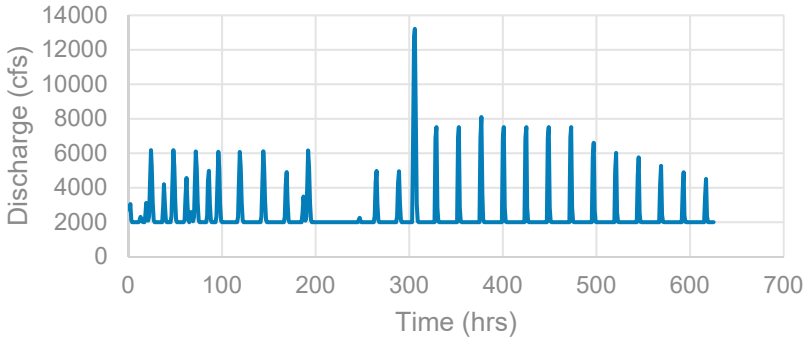
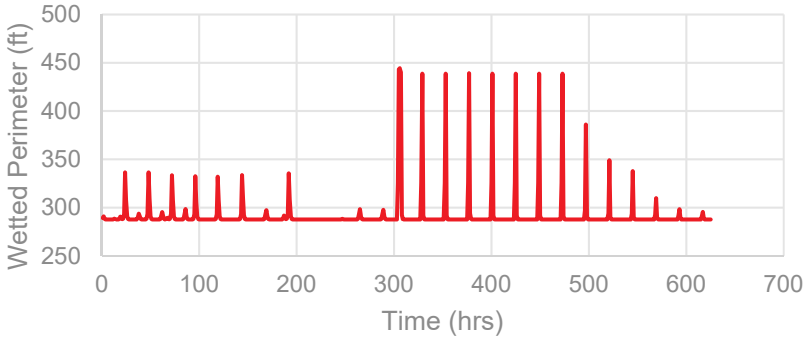
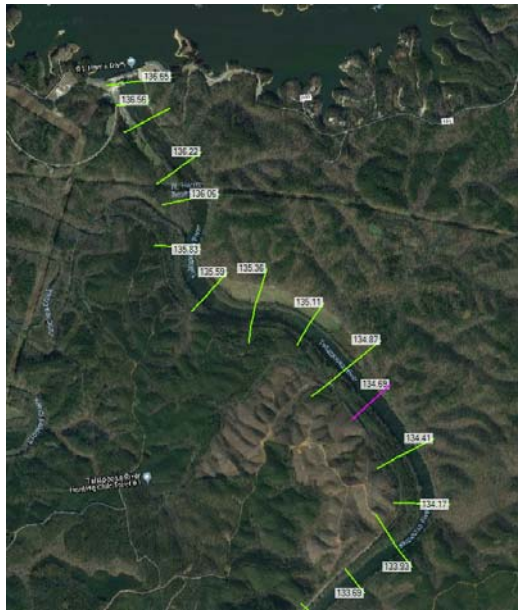
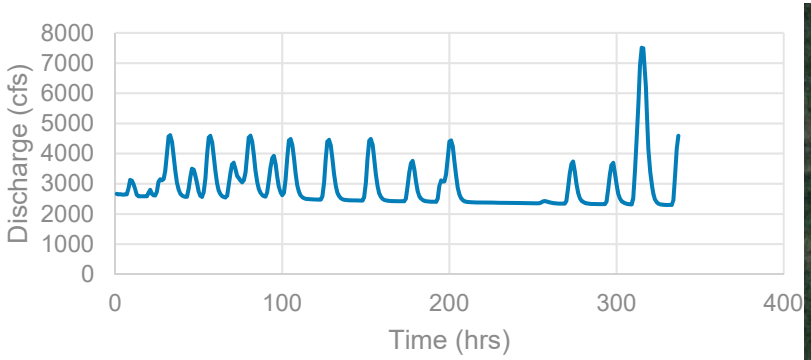
Tailwater Transect

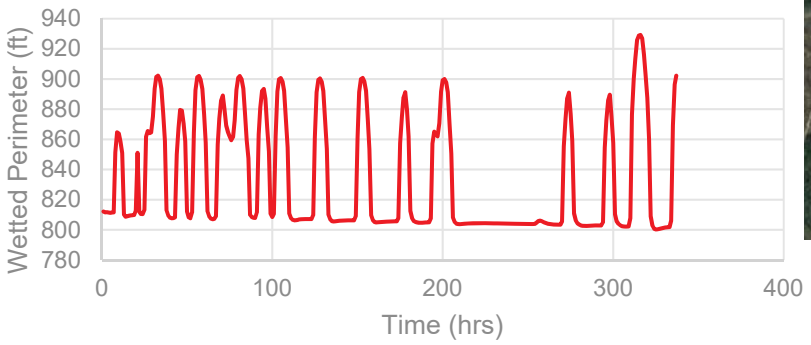


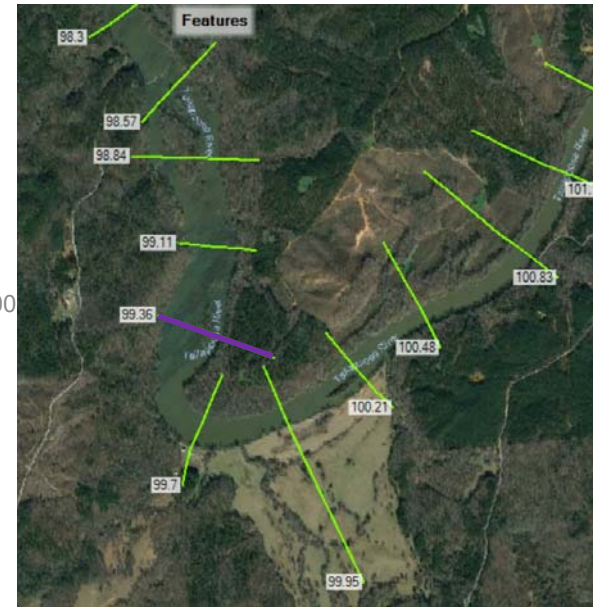




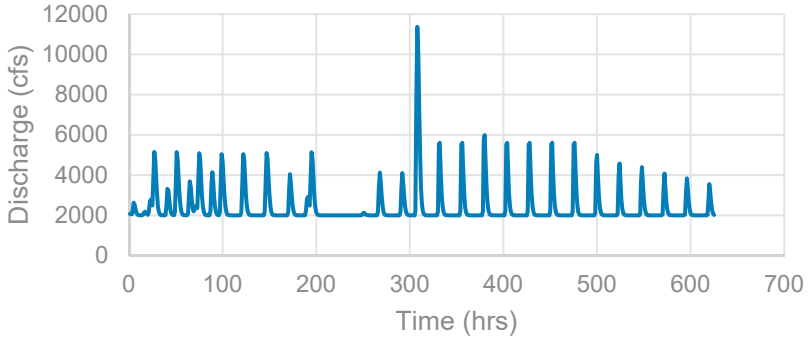
Shoal Transect

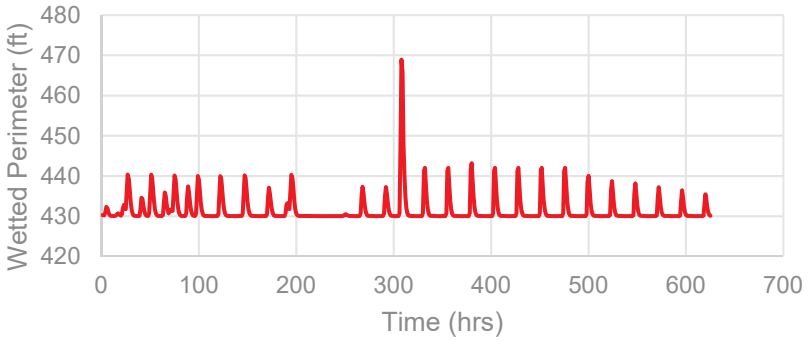






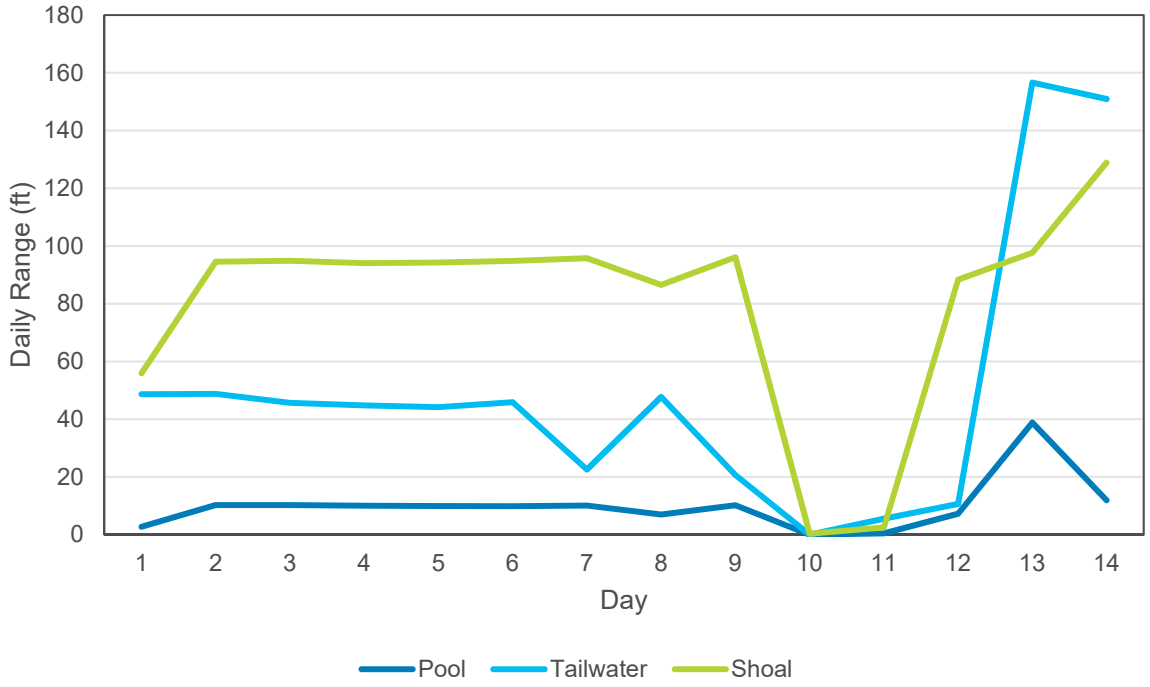
Pool Transect



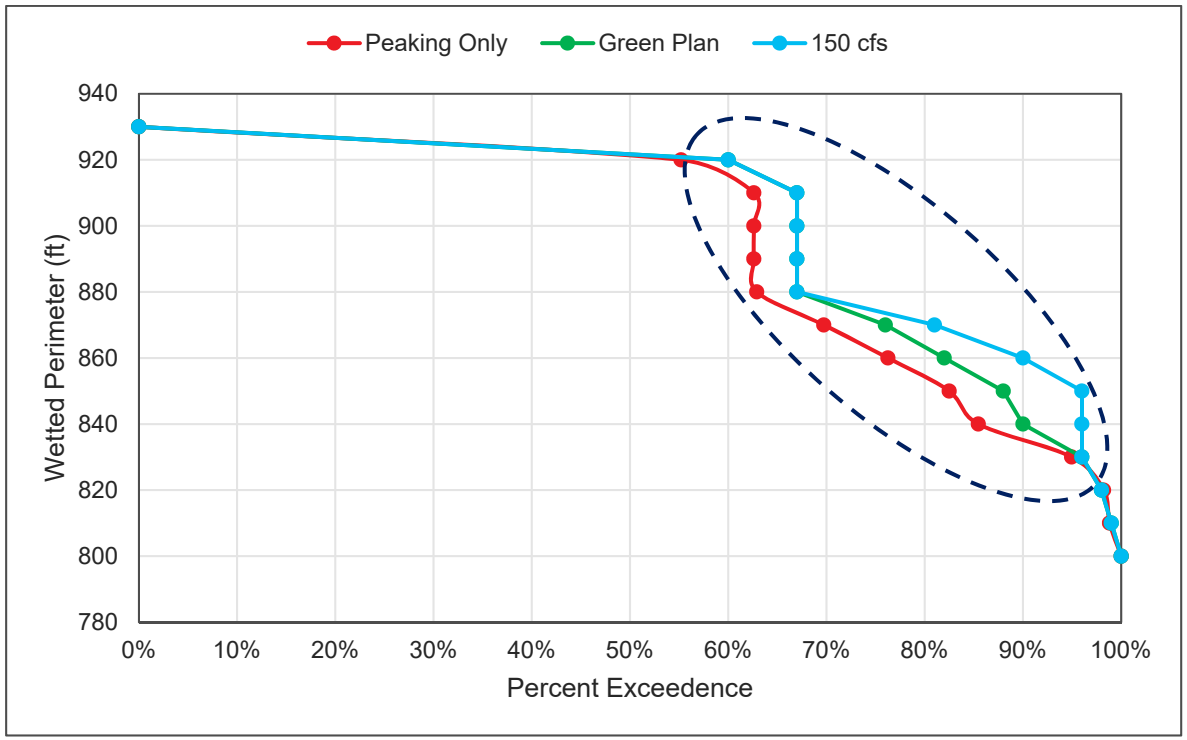


Example Daily Range Comparison

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

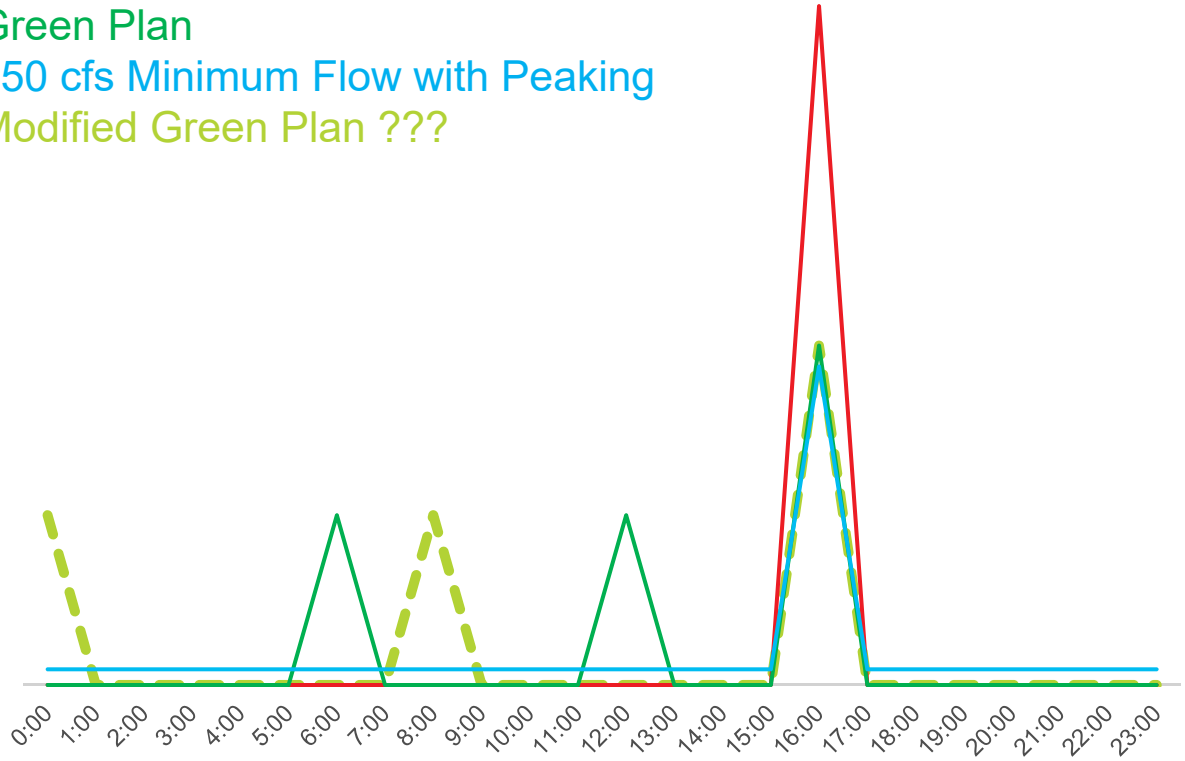


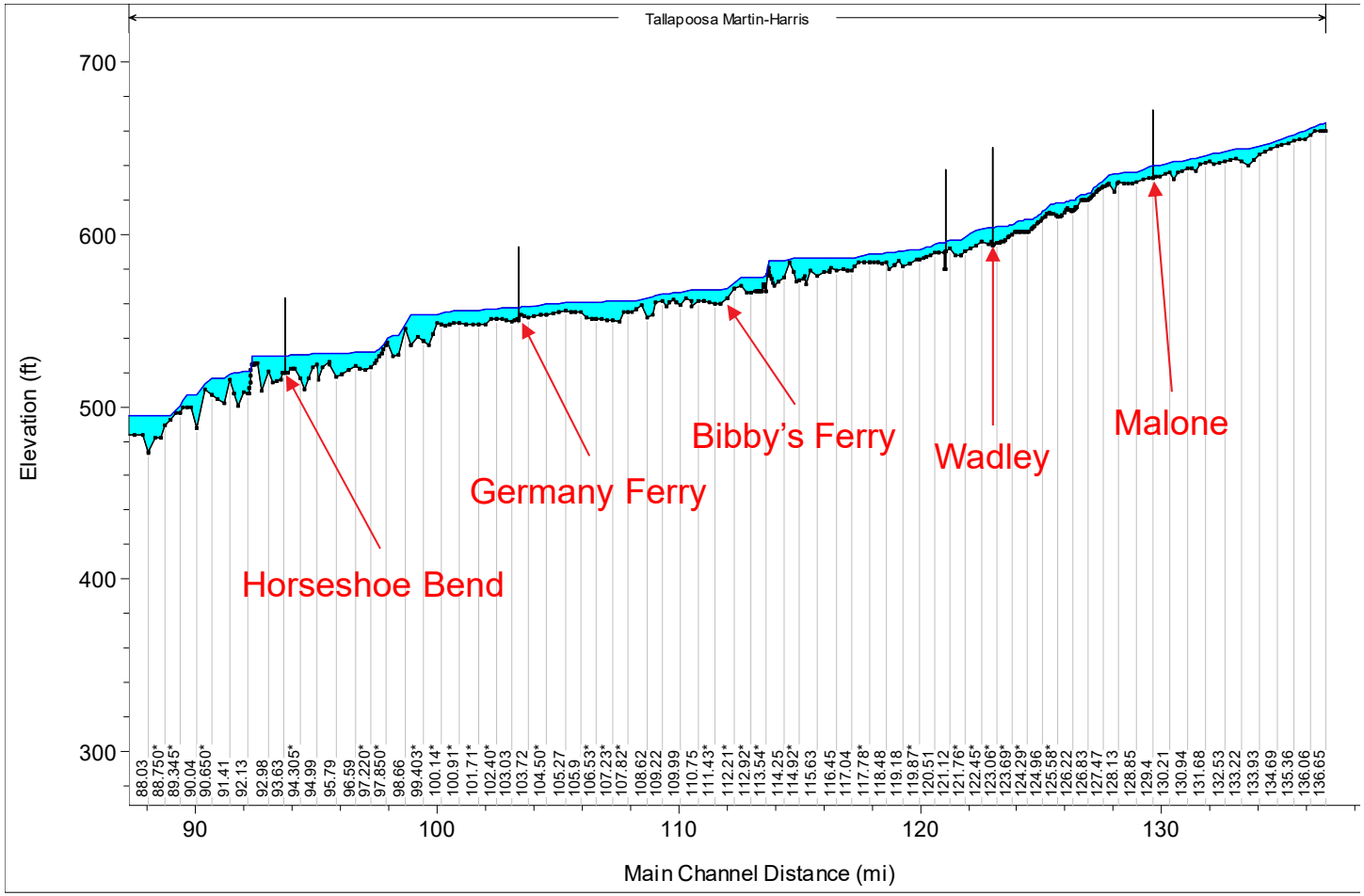
Example Frequency Comparison



Scenarios to Analyze

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




Tallapoosa Martin-Harris
Elevation (ft)
700
600
500
400
300
Horseshoe Bend
Germany Ferry
Bibby's Ferry
Wadley
Malone
88.03
88.750*
89.345*
90.04
90.650*
91.41
92.13
92.98
93.63
94.305*
94.99
95.79
96.59
97.220*
97.850*
98.66
99.403*
100.14*
100.91*
101.71*
102.40*
103.03
103.72
104.50*
105.27
105.9
106.53*
107.23*
107.82*
108.62
109.22
109.99
110.75
111.43*
112.21*
112.92*
113.54*
114.25
114.92*
115.63
116.45
117.04
117.78*
118.48
119.18
119.87*
120.51
121.12
121.76*
122.45*
123.06*
123.69*
124.29*
124.96
125.58*
126.22
126.83
127.47
128.13
128.85
129.4
130.21
130.94
131.68
132.53
133.22
133.93
134.69
135.36
136.06
136.65
90
100
110
120
130
Main Channel Distance (mi)