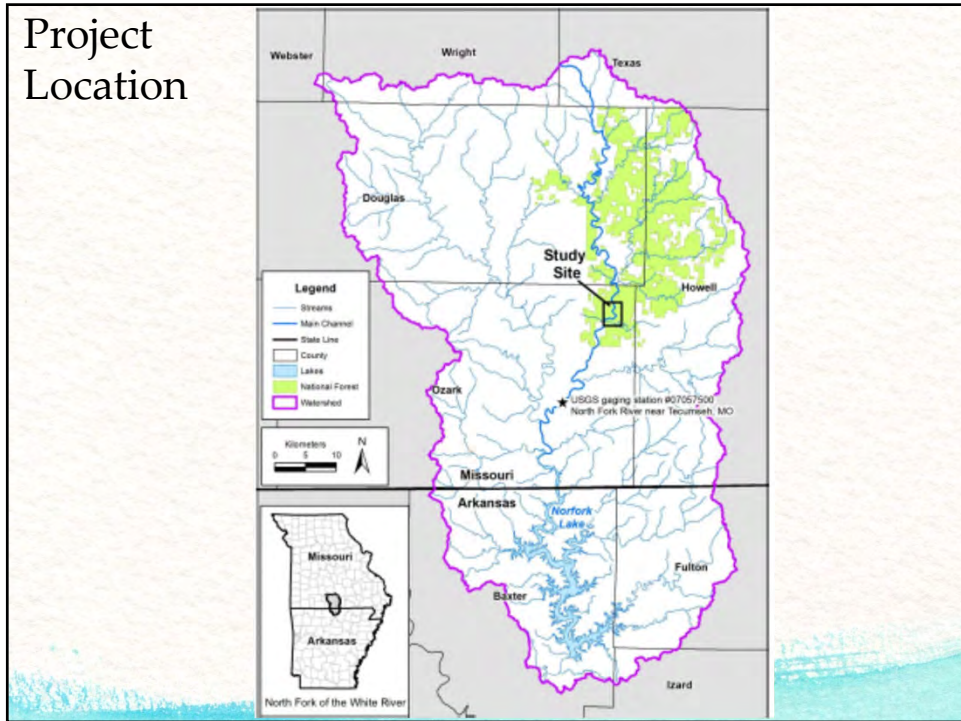


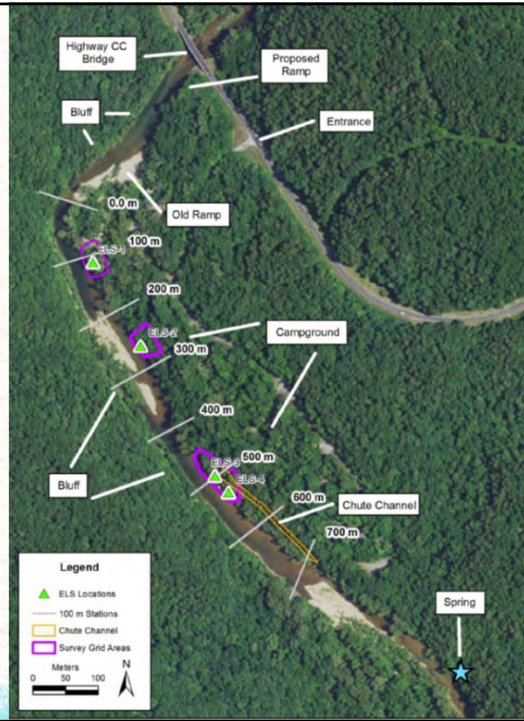
1



2

Large Wood Project Objectives and Layout

- Mitigate / control sediment coming off of recreation area from entering endangered Hellbender habitat immediately downstream
- Mitigate bank toe and slope erosion
- Buffer bank toe from floods
- Demonstrate large wood structures can be effective and remain in Missouri rivers



3

North Fork White River Watershed Site Characteristics

- Basin Area = 403 Square Miles
- Annual Precipitation = 47"
- Bankfull Width =
 - Min. 128.5 Feet
 - Ave. 167 Feet
 - Max. 241 Feet



Hydrology

return interval	CFS	exponent for area	gage basin area	ungaged site area	nork for site Q (CFS)
2	11700	0.733	561	402.6	9174
5	23000	0.763	561	402.6	17856
10	33400	0.774	561	402.6	25836
25	50800	0.784	561	402.6	39165
50	67300	0.789	561	402.6	51800
100	87200	0.794	561	402.6	67005
500	150000	0.804	561	402.6	114880

4

Construction

- Work done in the wet
- 2 Excavators used
- Two sites had very high banks (15-20ft)
- Unanticipated shallow bedrock encountered
- Anchor / cable system retrofitted after initial construction

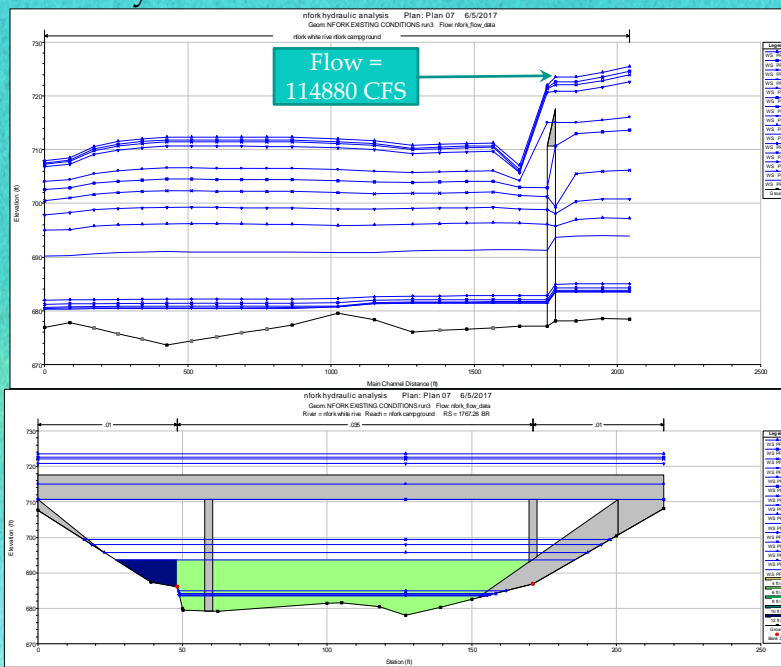


5

Hydraulic Analysis Results

Bridge cross section is truncated.

Elevation of the Q500 approximately coincides with the highest debris line ~46 ft by the Bridge. Flow Return interval will be greater than Q500!



6

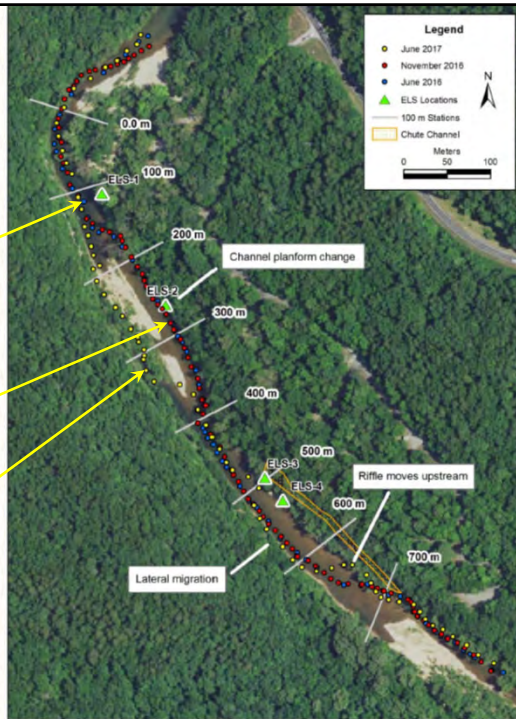
Flood of Epic Proportions



7

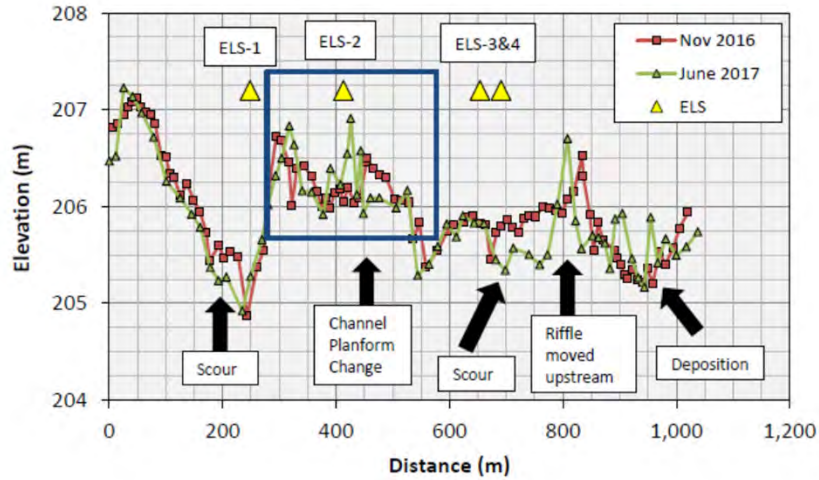
Channel Thalweg Position Changes

- Pre-project
June 2016
Blue Dots
- Thalweg at time of construction
Nov. 2016
Red Dots
- Post flood
June 2017
Yellow Dots



8

Long Profile Comparison



9

Wood Loading in Study Reach

Study Reach Length = 700 meters long
Wood counted had to be 0.1 meter in Diameter

Classification

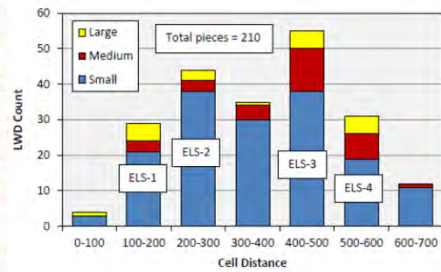
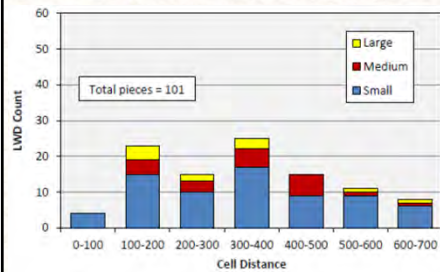
- Small Wood = <0.3 m
- Medium Wood = >0.3 m and <10 m long
- Large Wood = >0.3 m and >10 m long

Pre Flood - August 2016 Wood Survey Results

- 101 LWD pieces – 4 to 25 pieces per 100 meters

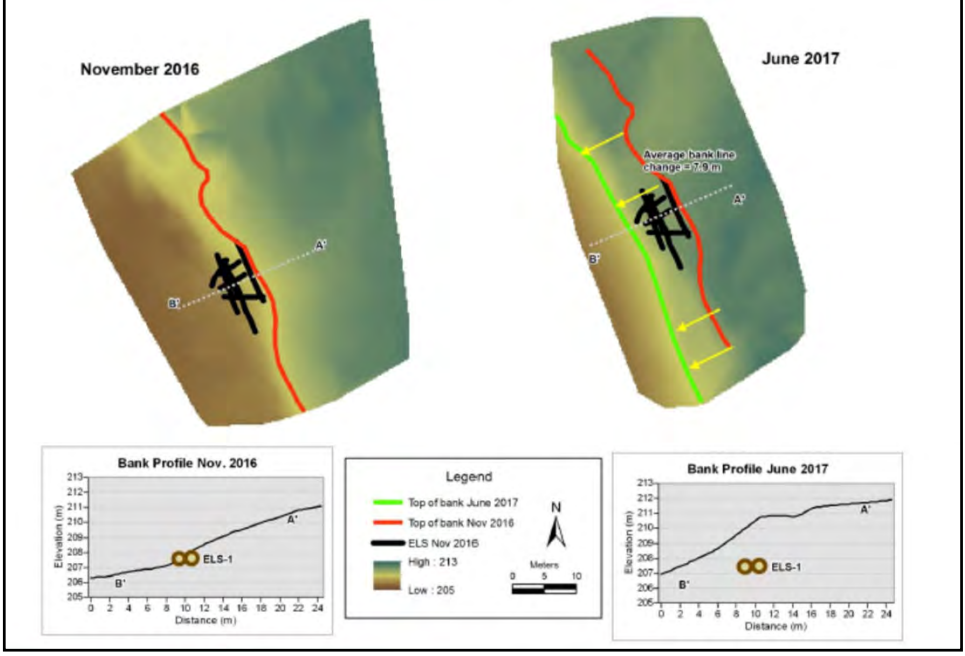
Post Flood – April 2017 Wood Survey Results

- 210 LWD Pieces – 4 to 55 pieces per 100 meters



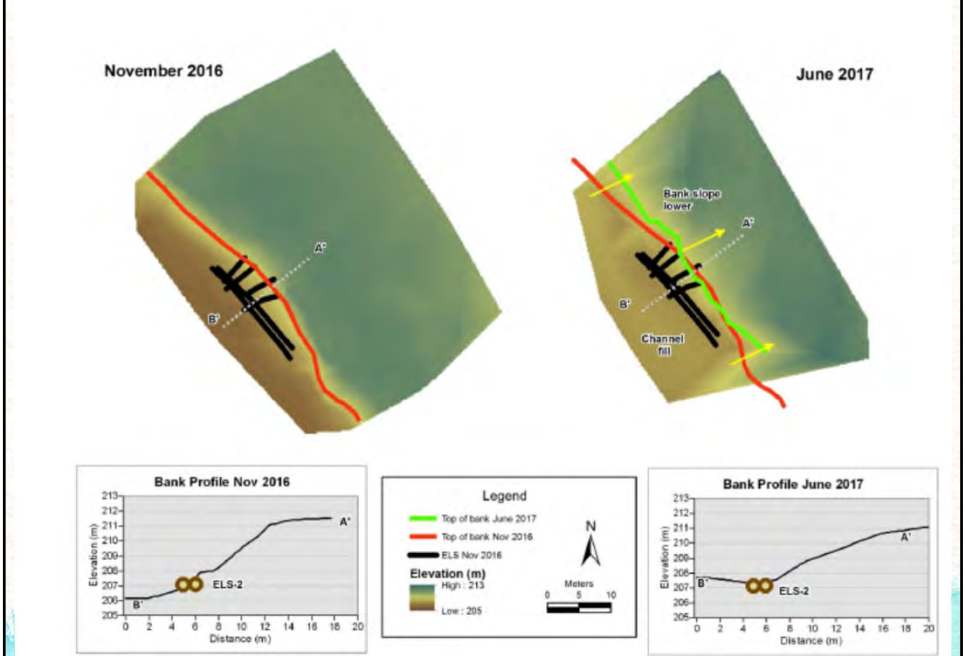
10

Survey results for ELJ #1



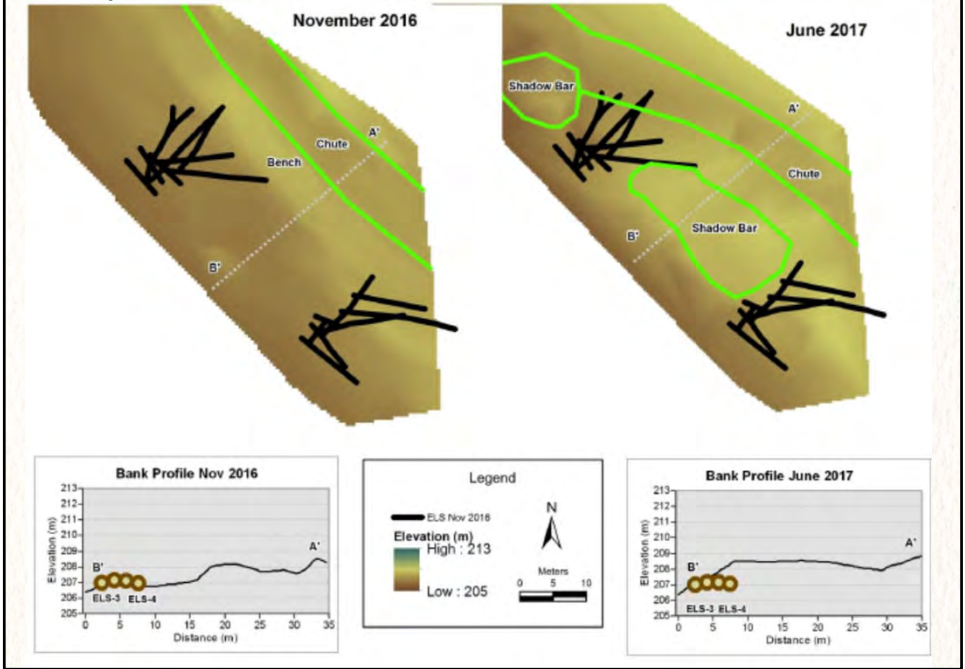
11

Survey results for ELJ #2



12

Survey results for ELJ #3 & #4



13

ELJ #1 Photo Series



14

ELJ #2 Photo Series



Nov. 2016 – As-Built



June 2017 – Post Flood



April 2017 – After 2 Bankfull flows



June 2017 – Post Flood

15

ELJ #3 Photo Series



Nov. 2016 – As-Built



June 2017 – Post Flood



April 2017 – After 2 Bankfull flows



June 2017 – Post Flood

16

ELJ #4 Photo Series



Nov. 2016 – As-Built



June 2017 – Post Flood



April 2017 – After 2 Bankfull flows



June 2017 – Post Flood

17

ELJ #1,2,3 &4 Panorama Views Post Flood



ELJ #1 & 2



ELJ #4
Downstream



ELJ #3
Upstream

18

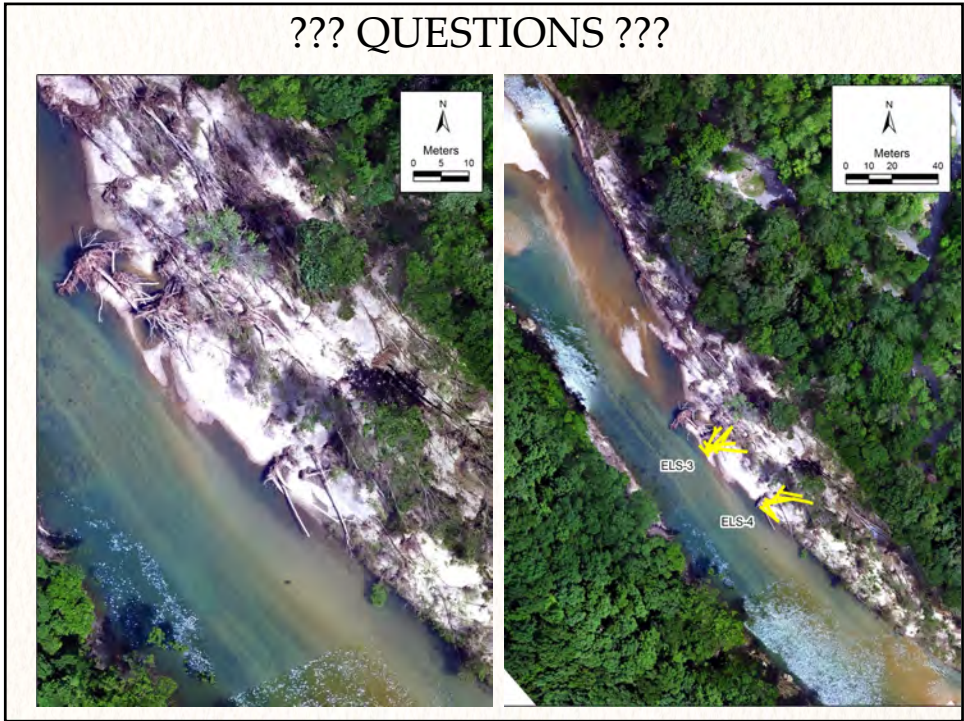


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??? QUESTIONS ???



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