Hatchery Creek Stream Restoration–

Design/Monitoring Overview of a Unique Project to Create Trout Habitat

Presented by:
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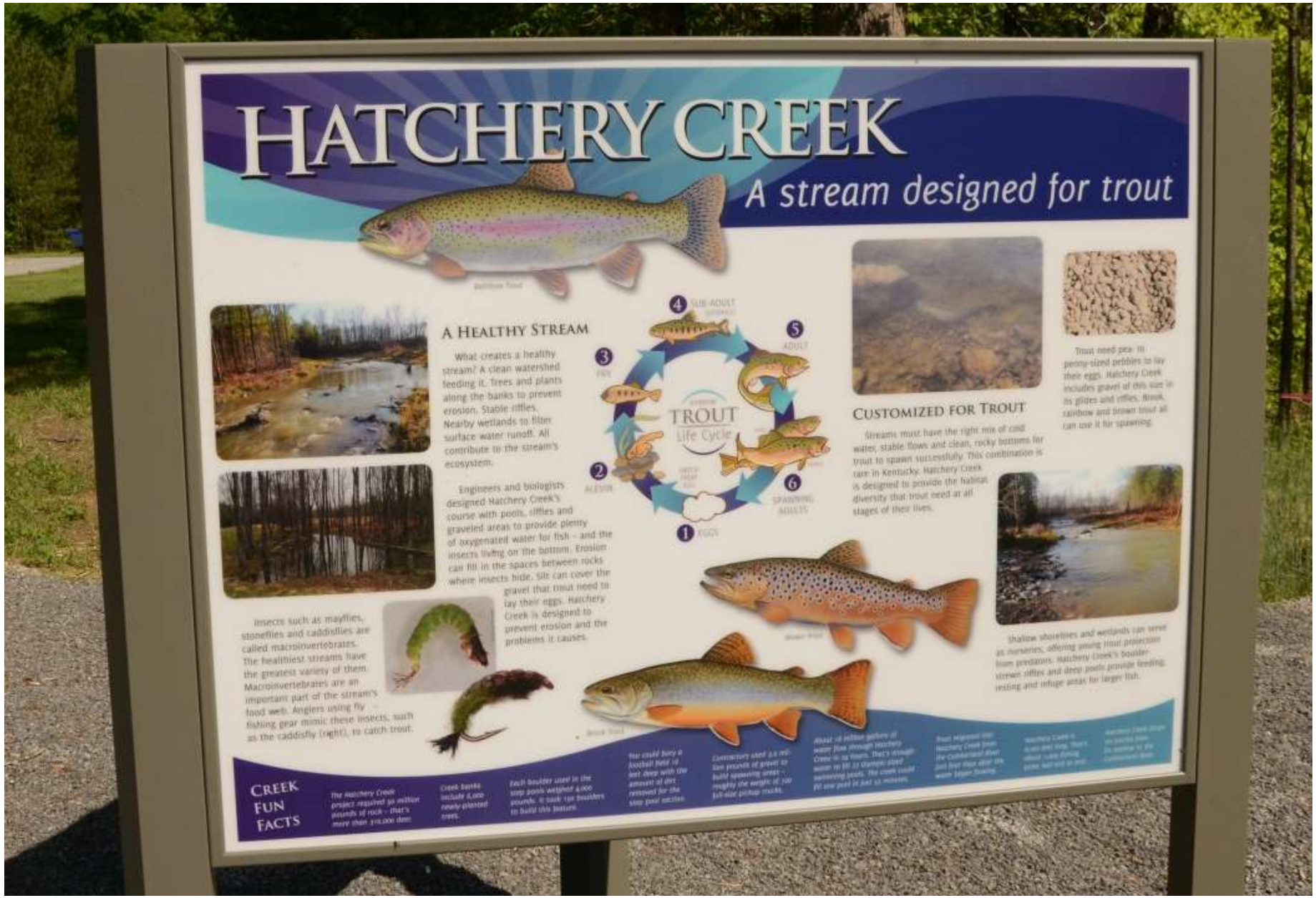
National Stream Restoration Conference 2022
August 2, 2022

Agenda

- Background
- Design Approach
- Implementation
- Post-construction Monitoring



Project Goals

01

Generate Mitigation Credits

02

Stable Stream

- Dimension - Pattern - Profile
- 100-year Flood Event

03

Added Benefit–One of Kentucky's 1st Sustainable Trout Streams

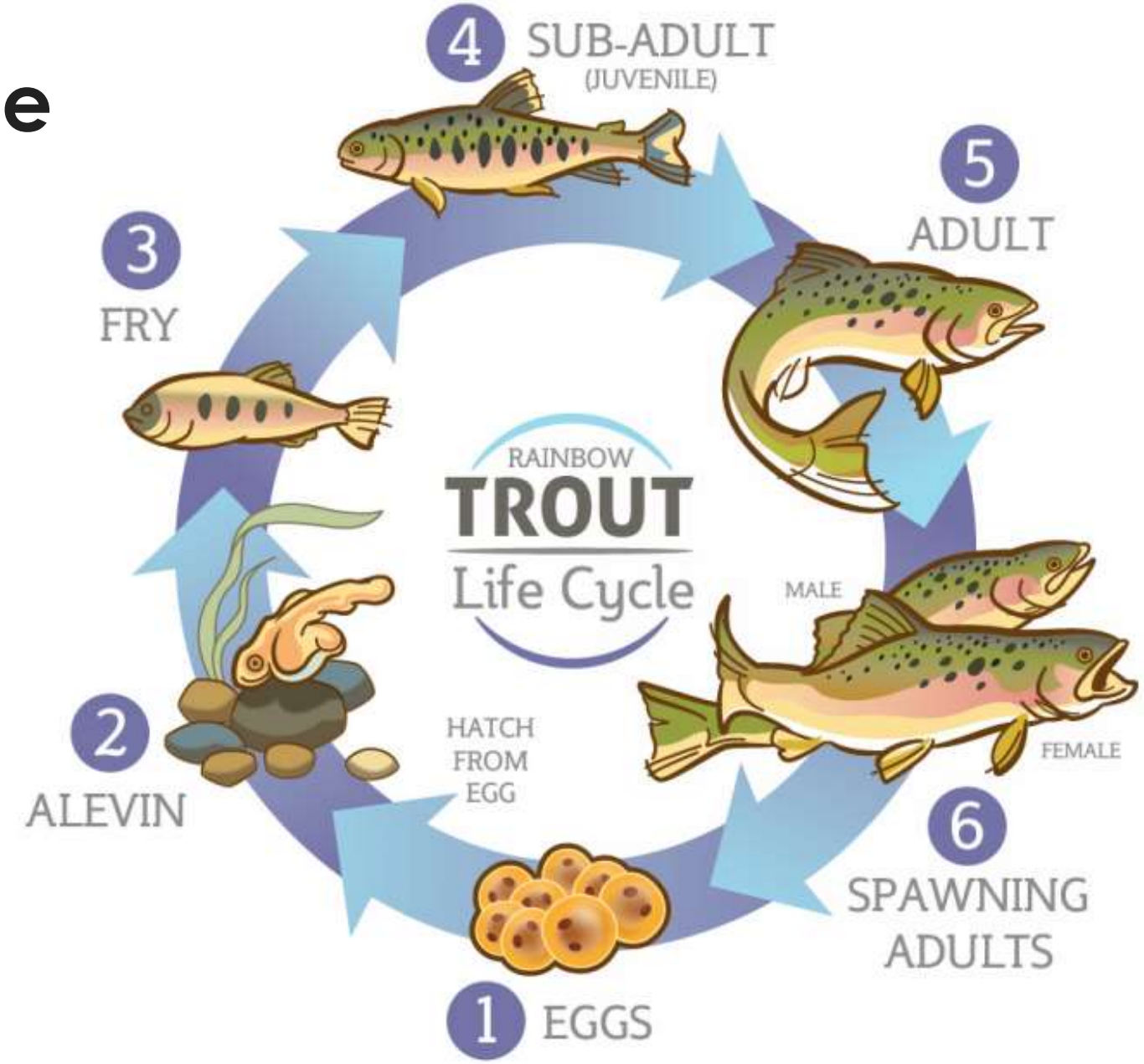
- Spawning
- Rearing
- Fish Passage
- Fishing


Peoria
Bloomington
ILLINOIS
Springfield
Champaign
INDIANA
Indianapolis
Terre Haute
Bloomington
OHIO
Dayton
Columbus
Cincinnati
Canton
Pittsburgh
PENNSYLVANIA
Harrisburg
Lancaster
MARYLAND
Columbia
Washington
Columbia
St Louis
MISSOURI
Louisville
Evansville
Lexington
WEST VIRGINIA
George Washington National Forest
Richmond
ringfield
Mark Twain National Forest
KENTUCKY
Bowling Green
Roanoke
VIRGINIA
Newport News
Norfolk
Project Location
Nashville
Knoxville
Johnson City
Greensboro
Jonesboro
Jackson
TENNESSEE
Asheville
NORTH CAROLINA
Memphis
Gastonia
Greenville
ARKANSAS
Chattanooga
Fayetteville
Greenville
Charlotte
Huntsville
Little Rock
Wilmington
Athens
Atlanta
SOUTH CAROLINA
Birmingham
Augusta
MISSISSIPPI

Unique Aspects of the Project

- Constant Flow Source
- Minimal Sediment Supply
- Water Temperature Effects
- Design for Various Trout Life Stages
- Protection of Spawning Gravels

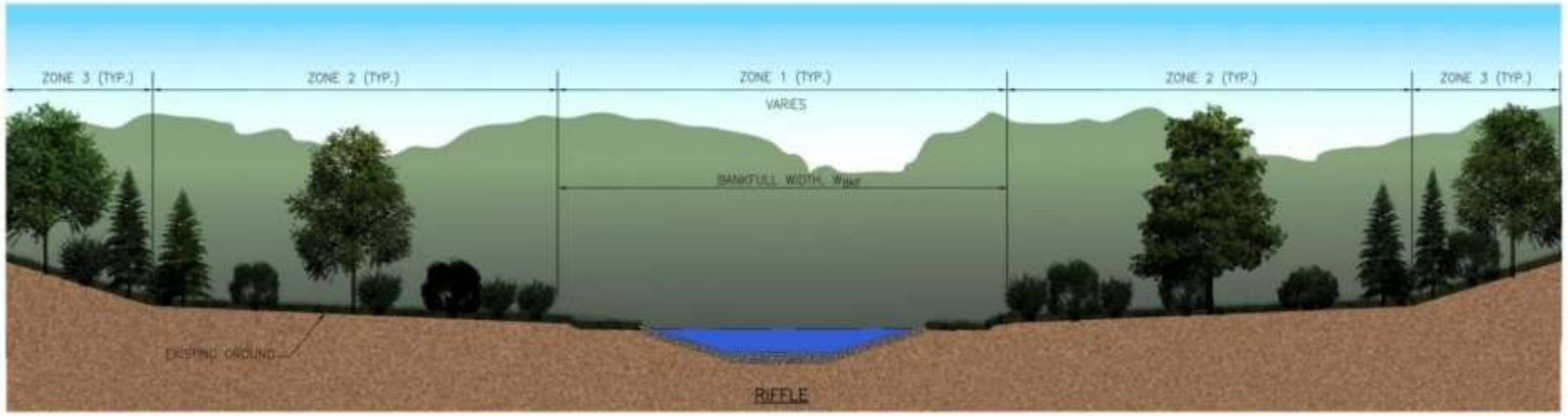
Lifecycle

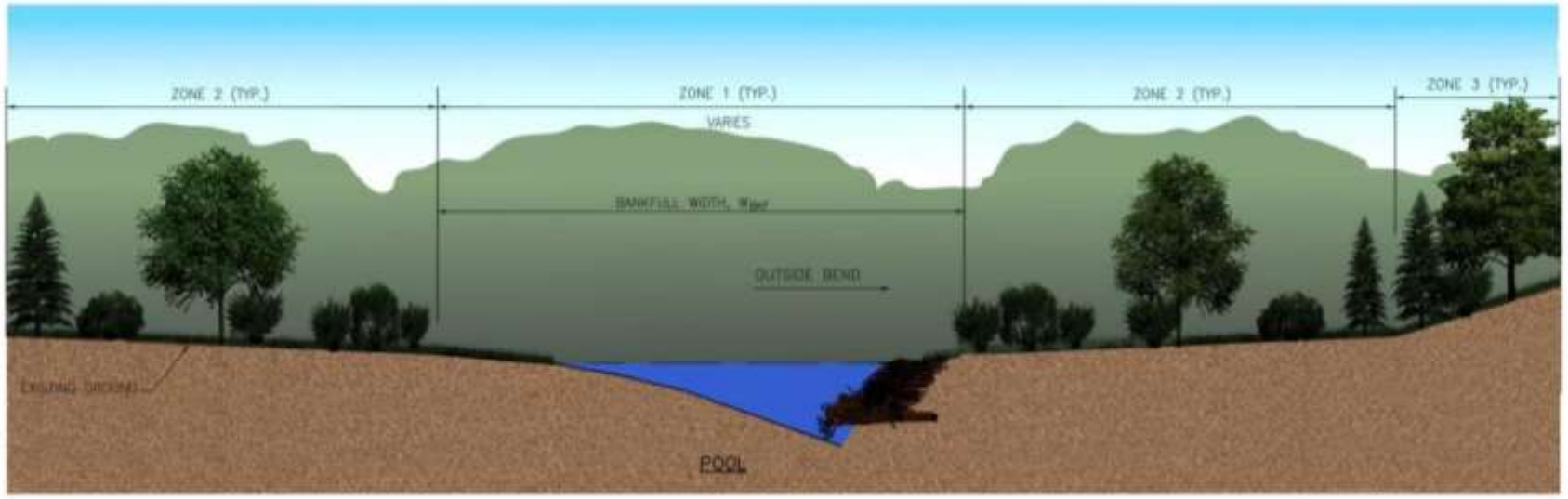

4 SUB-ADULT
(JUVENILE)
5 ADULT
3 FRY
RAINBOW
TROUT
Life Cycle
MALE
FEMALE
2 ALEVIN
HATCH
FROM
EGG
6 SPAWNING
ADULTS
1 EGGS

Design Overview

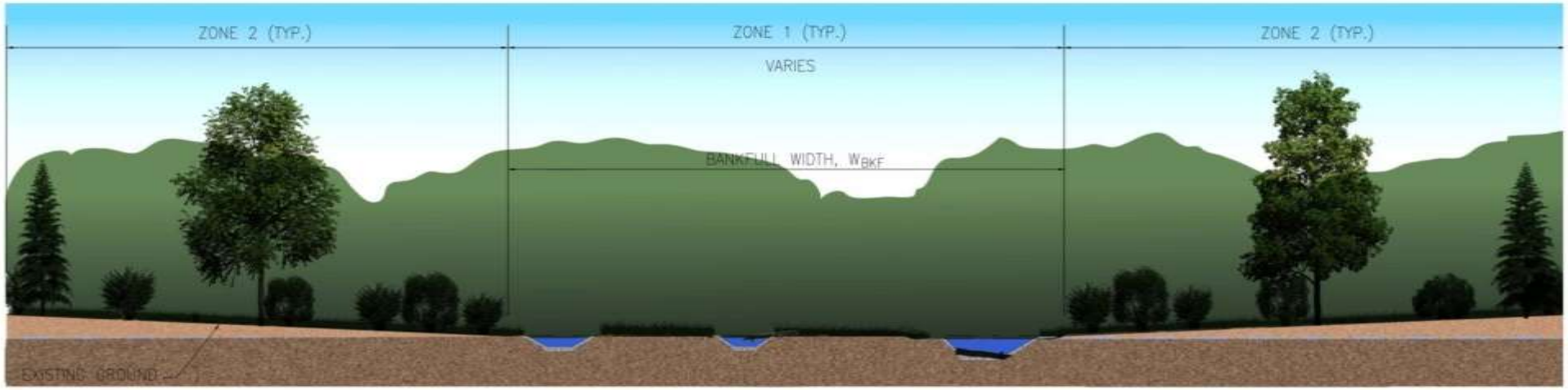
- Threshold Channel
- Reference Reach Parameters
- Combination of Stream Types
  - A
  - High Gradient C
  - Low Gradient C
  - DA

C Stream Type

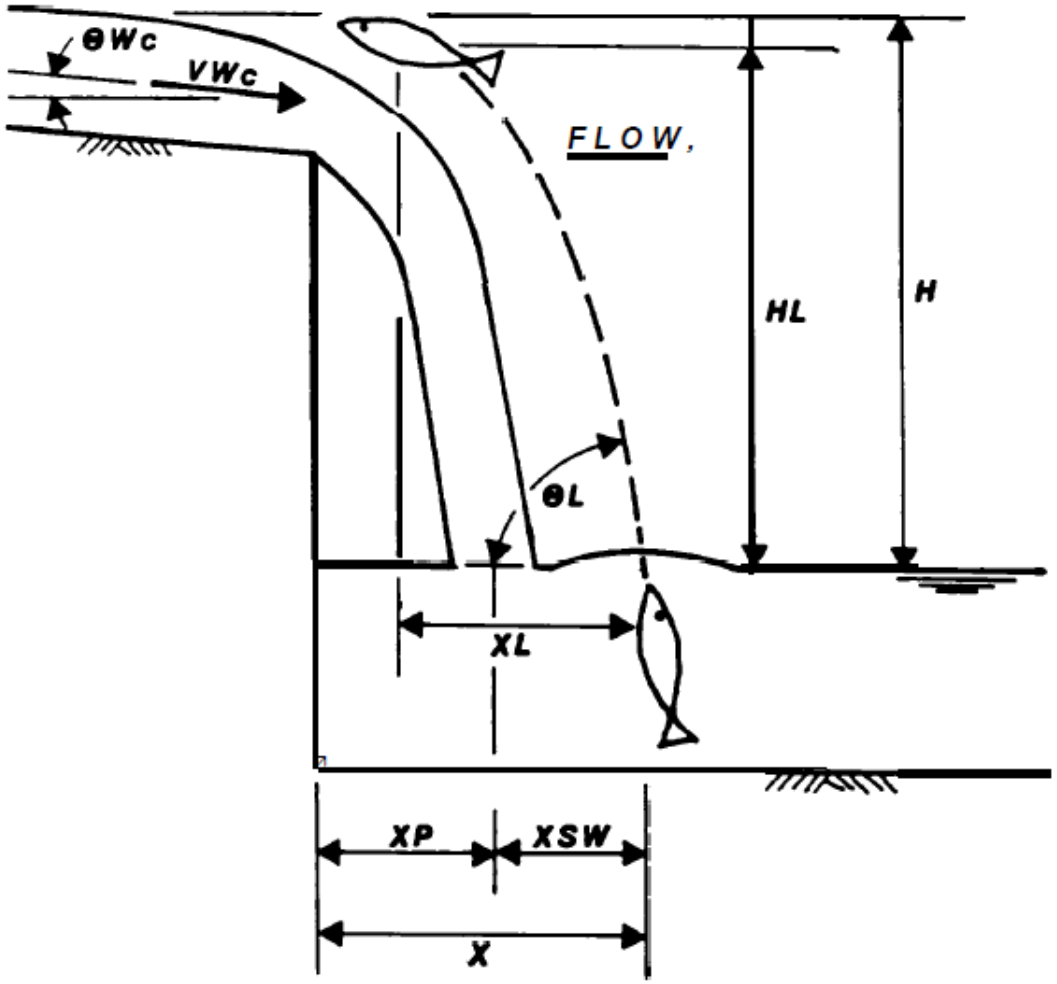




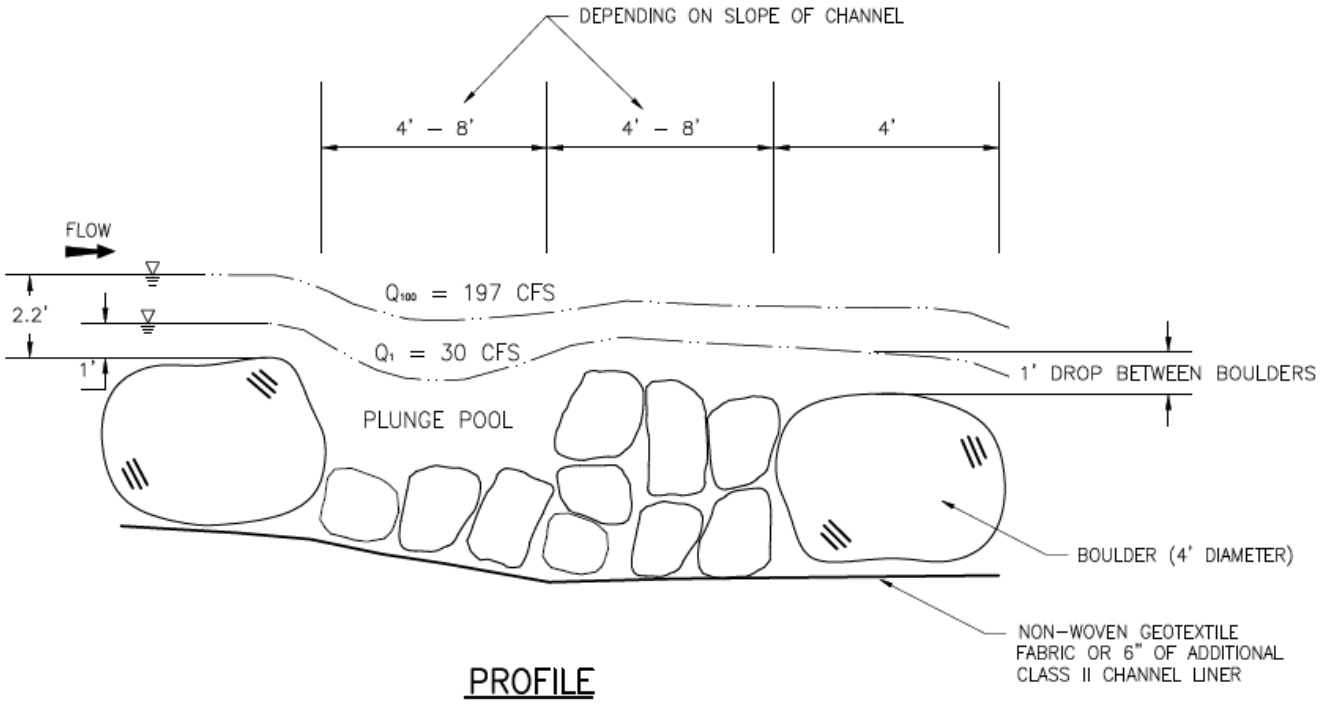
DA/Wetland Enhancement



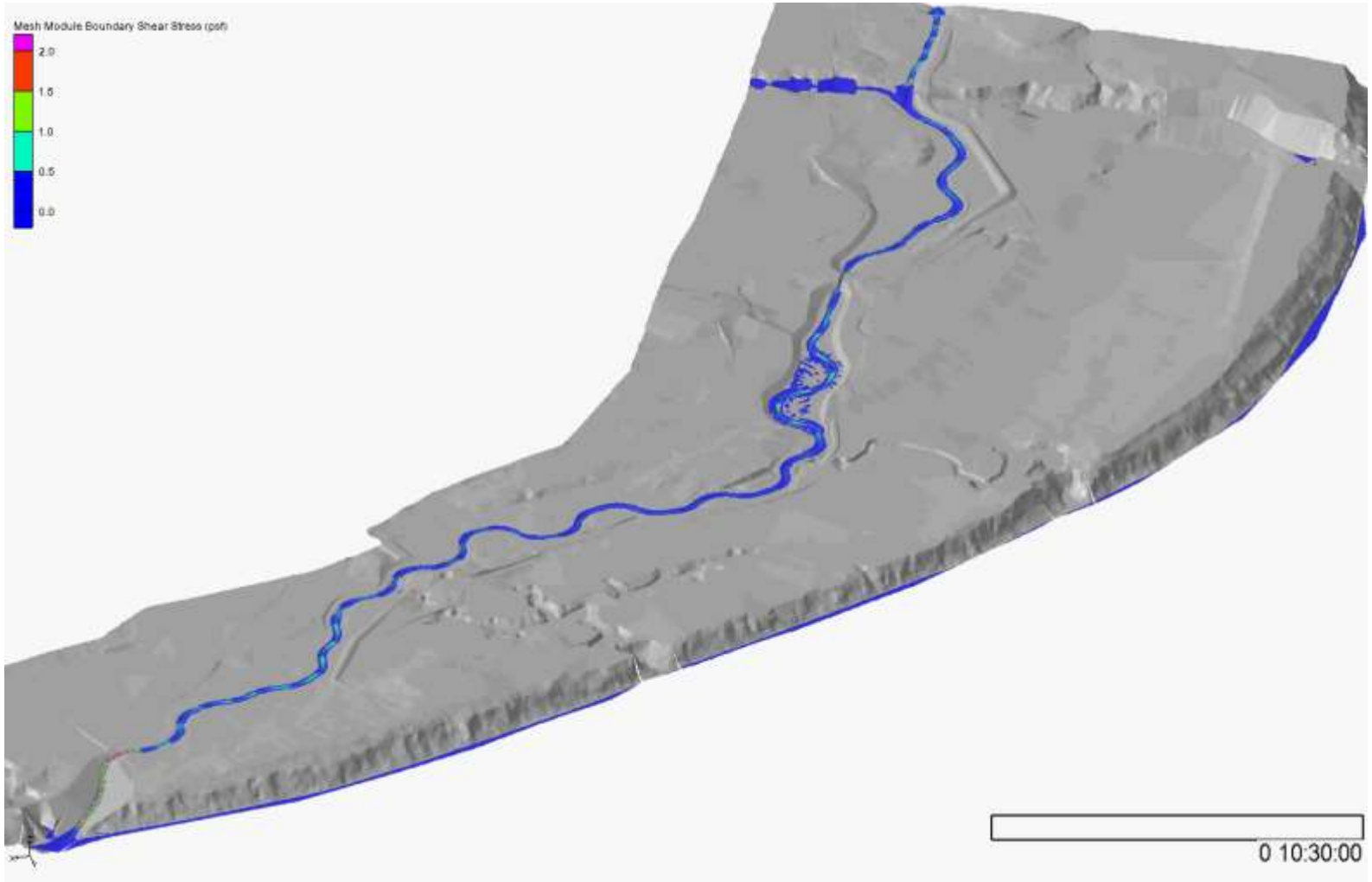
Fish Passage



Fish Ladder-Step Pools

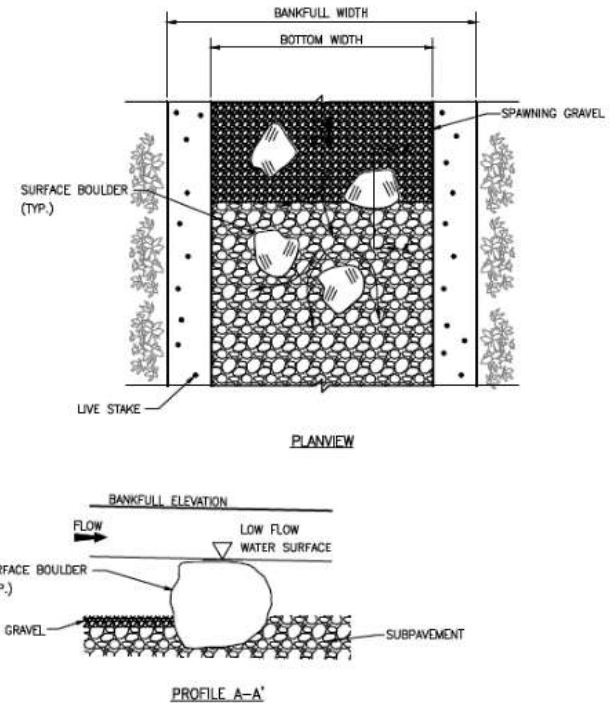


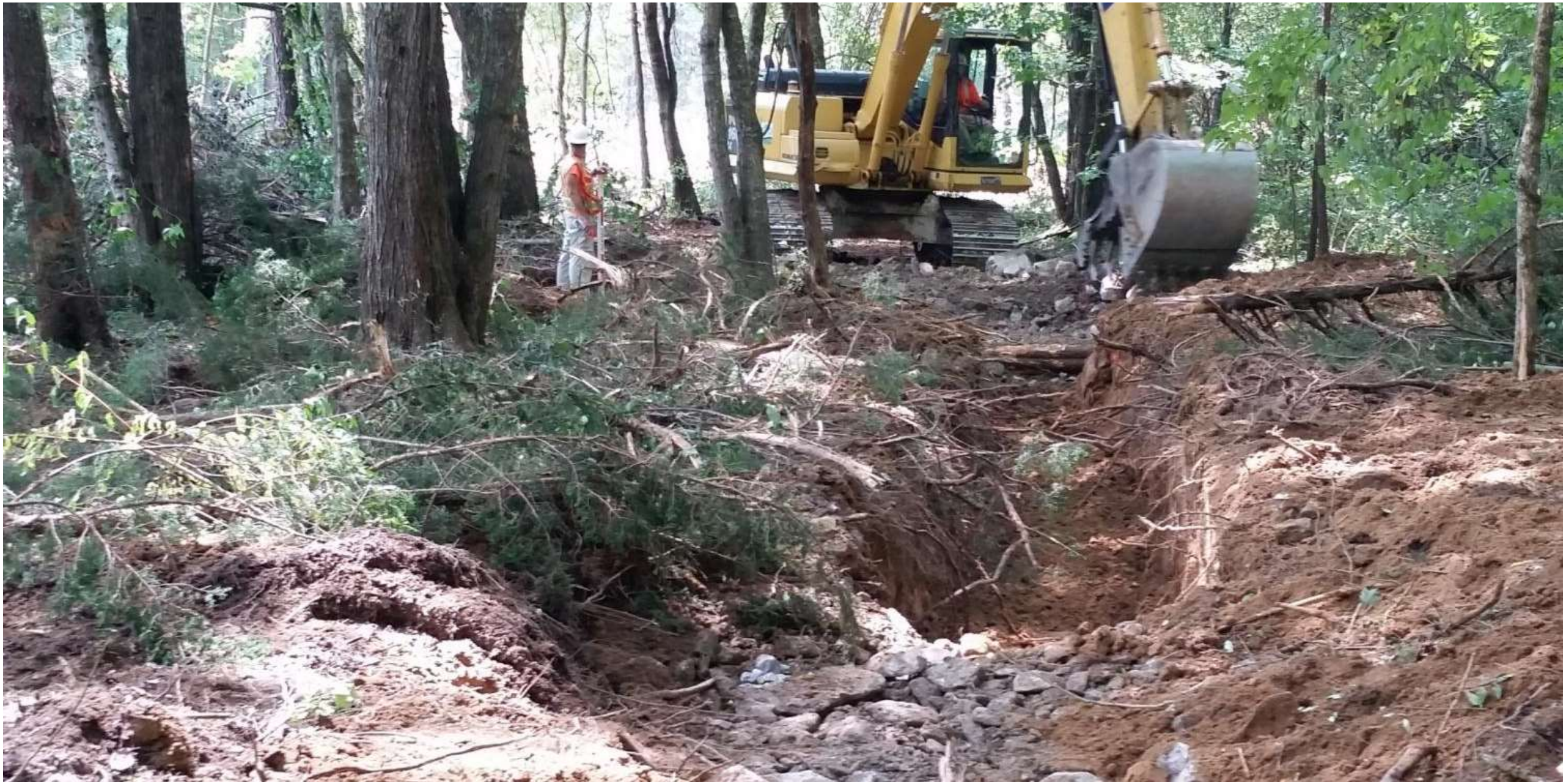
2-D Hydraulic Modeling

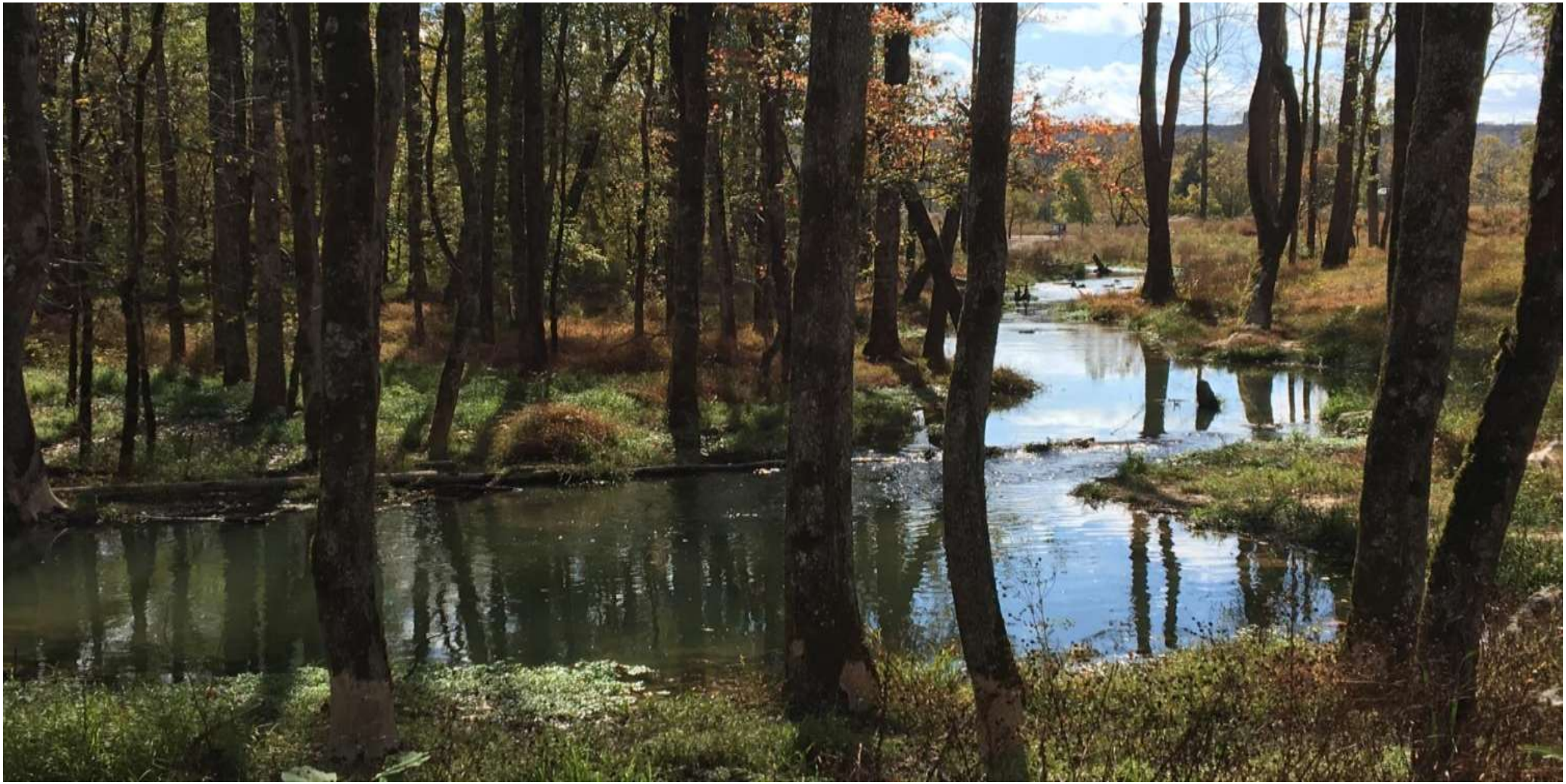


Riffle Design

- Four Different Types of Riffles
- Rock Sizing
  - Low Flow
  - 100-year Storm
- Spawning Gravels Used in Glide and Top of Riffle

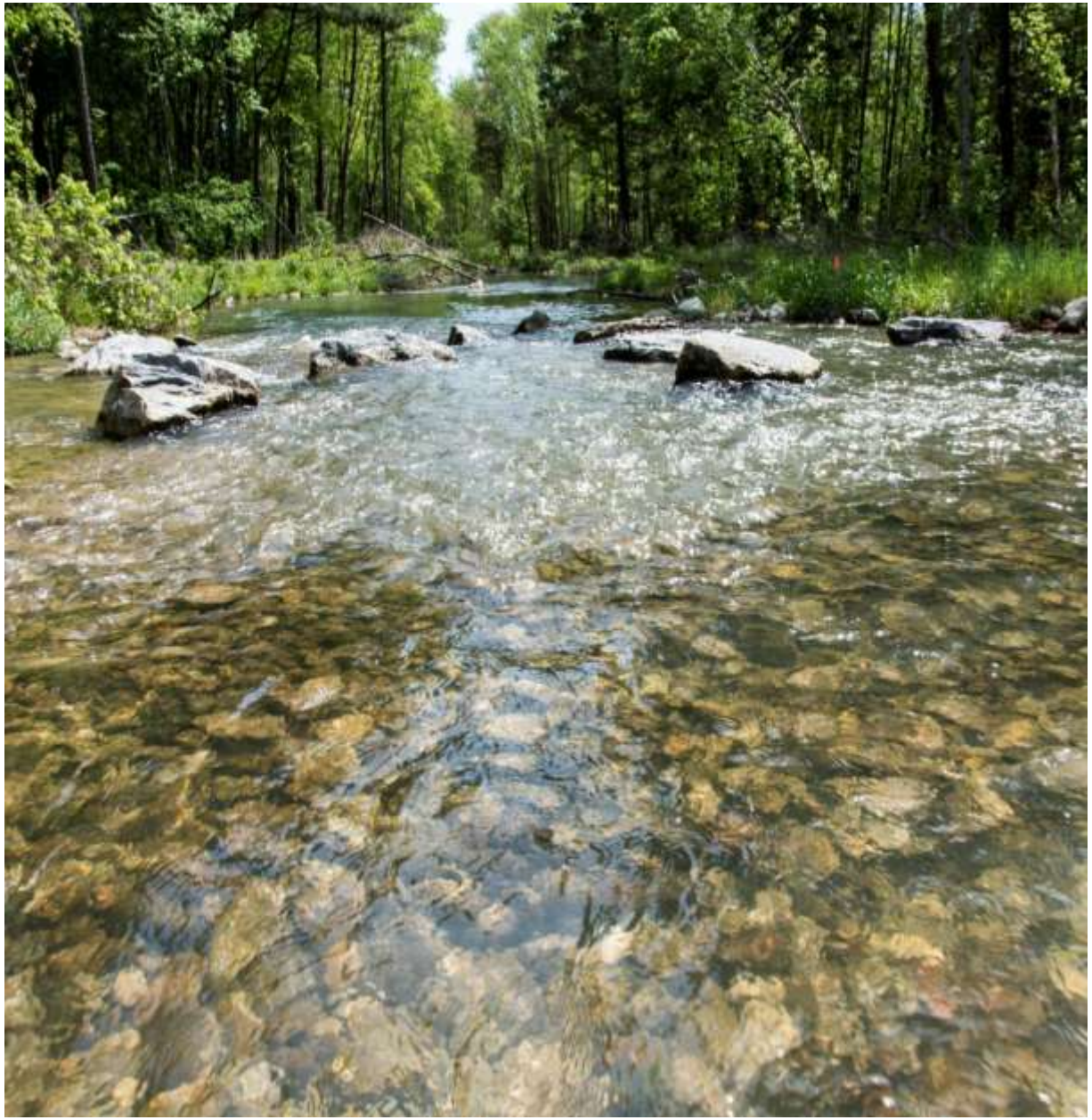






Important Dates

- November 20, 2015
  - Flow Released into New Channel
- April 29, 2016
  - Grand Opening
  - Open for Fishing
- December 31, 2020
  - Released from Monitoring



Monitoring Partnership

Kentucky Department of Fish & Wildlife Resources

- Fish Population Studies
  - Backpack Electroshocking
  - Fin-Clipping
- Temperature Variability

Murray State University

- Macroinvertebrates
- Fish Population Studies

Stantec

- Geomorphic and Vegetation Monitoring
- Wood Loading Survey
- 2-D Modeling
- Snorkel Survey to Document Fish Usage of Wood Structures

Monitoring Photos (2015)

Monitoring Photos (2016)

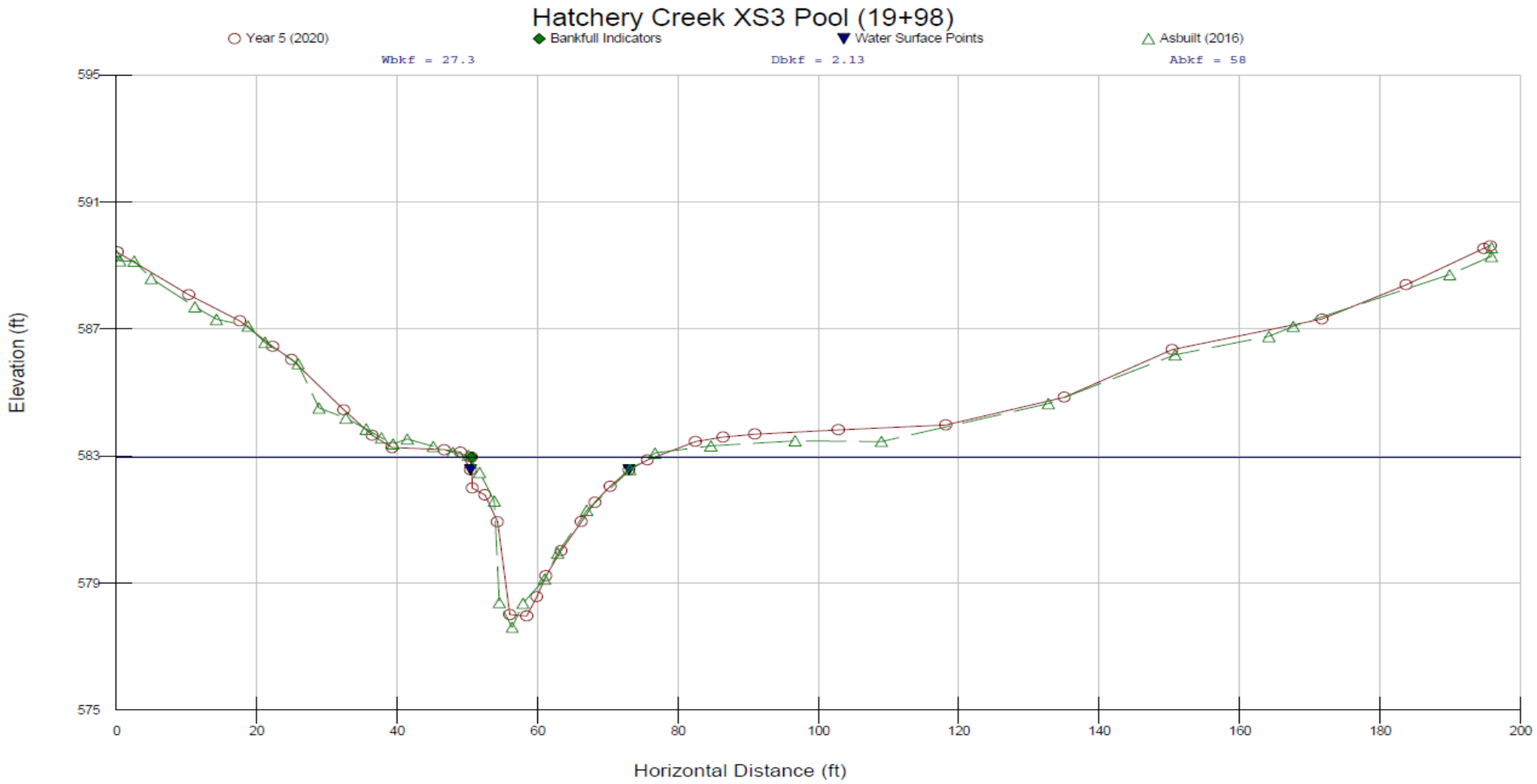
Monitoring Photos (2017)

Monitoring Photos (2018)

Monitoring Photos (2019)

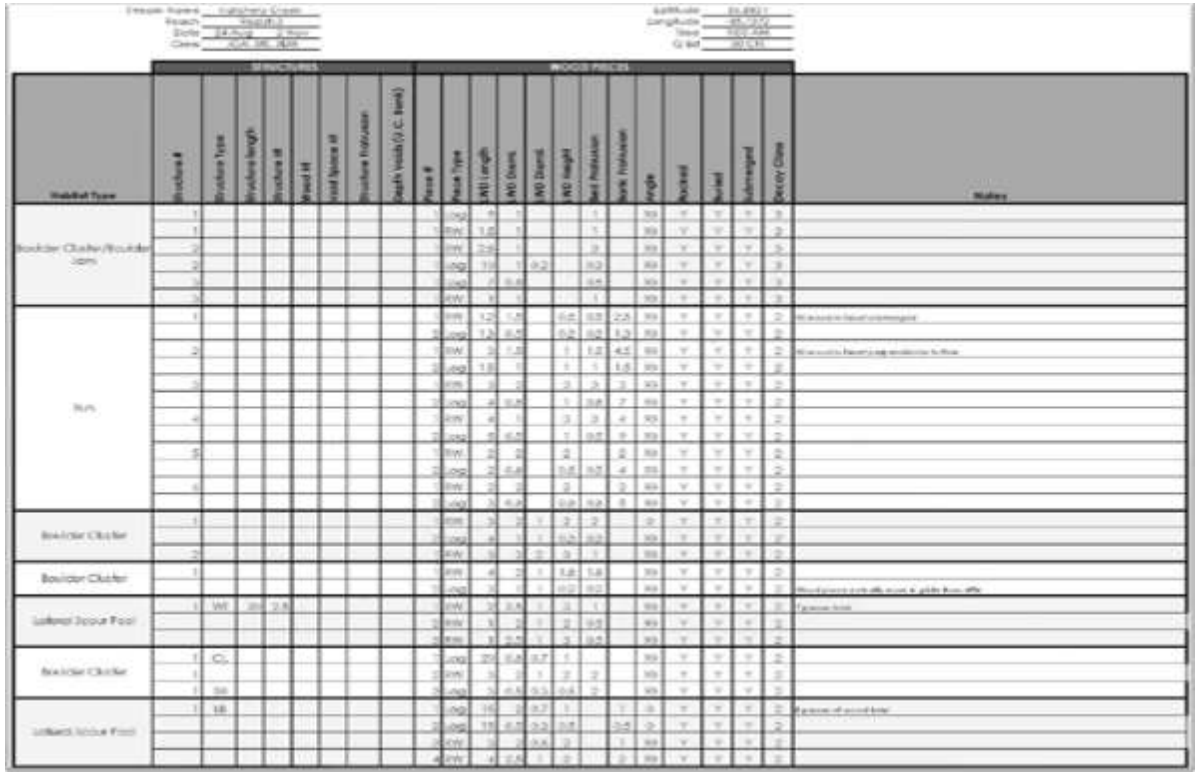
Monitoring Photos (2020)

Geomorphic Monitoring



Wood Loading Survey

- Cover/Habitat Type
- Dimension
- Orientation
- Decay Class
- Degree of Submergence



Fish Snorkel Surveys

- Assess Habitat Utilization
- 2016, 2018, 2019
- Record Fish Observations and Associated Habitat:
  - Depth
  - Velocities
  - Substrate Type
  - Cover Type

Dominant Cover

Questions?

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