THE HIGH-DEFINITION STREAM SURVEY OF THE CHATTAHOOCHEE RIVER NATIONAL RECREATION AREA, GEORGIA

HIGHLIGHTING A FAST AND FLEXIBLE METHOD TO DOCUMENT STREAM CORRIDOR CONDITIONS LEADING TO RESTORATION ACTIONS

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[1]Trutta Environmental Solutions and [2]National Park Service

High Definition Stream Survey Chattahoochee River, GA
Crayfish Creek Tributary 6/23/2020

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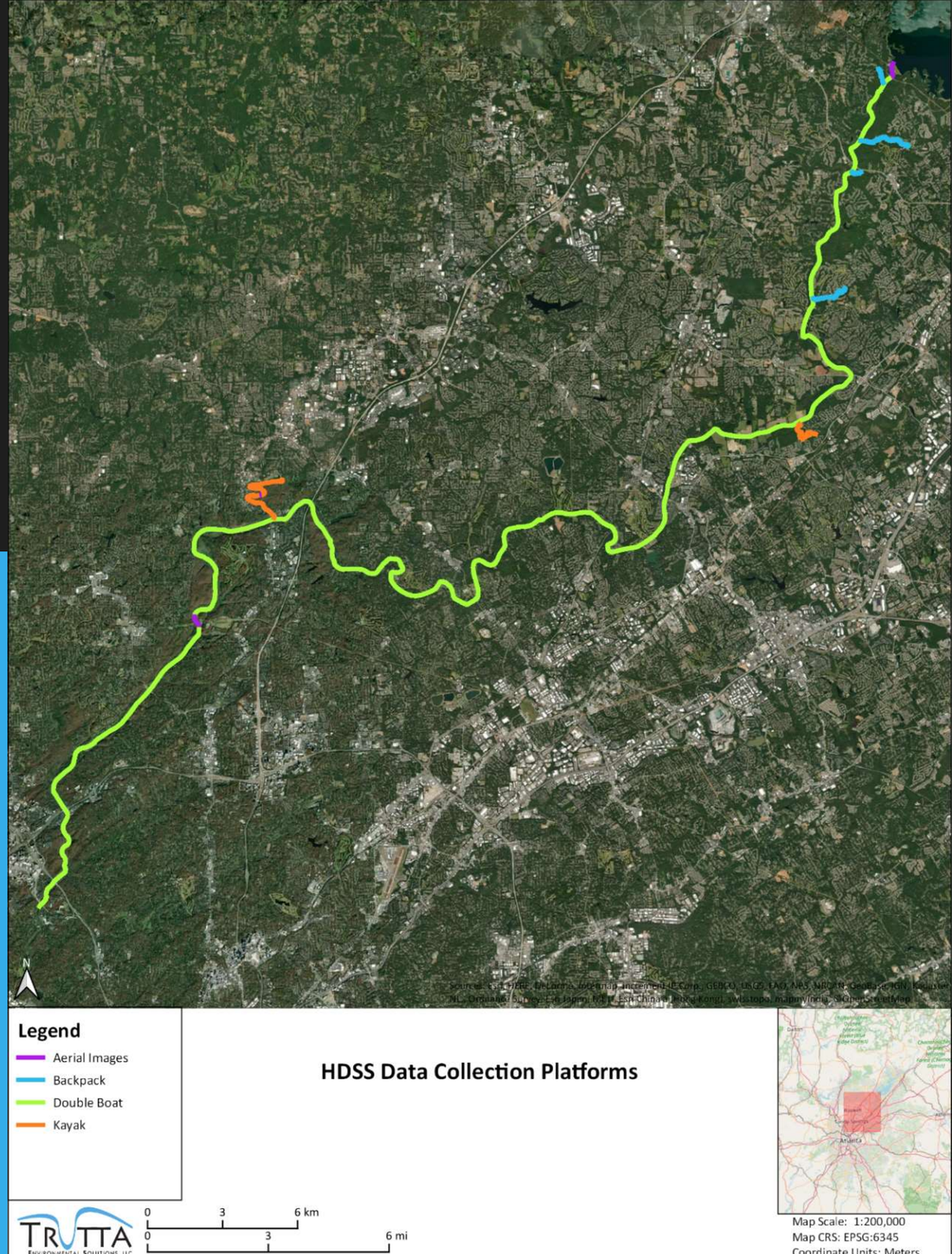
Fast Inventory & Assessment

Chattahoochee River, GA
50 MILES, 2 SURVEYORS, 5.5 DAYS

River Segment	Survey Date	Platform
Haw Creek	June 24, 2020	Backpack
Richland Creek	June 24, 2020	Backpack
Crayfish Creek	June 23, 2020	Backpack
Level Creek	June 24, 2020	Backpack
Suwannee Creek	June 24, 2020	Single Boat
Big Creek	June 25, 2020	Single Boat
Chattahoochee River	Oct. 3-5, 2018	Dual Boat



how do we collect data?

BACKPACK

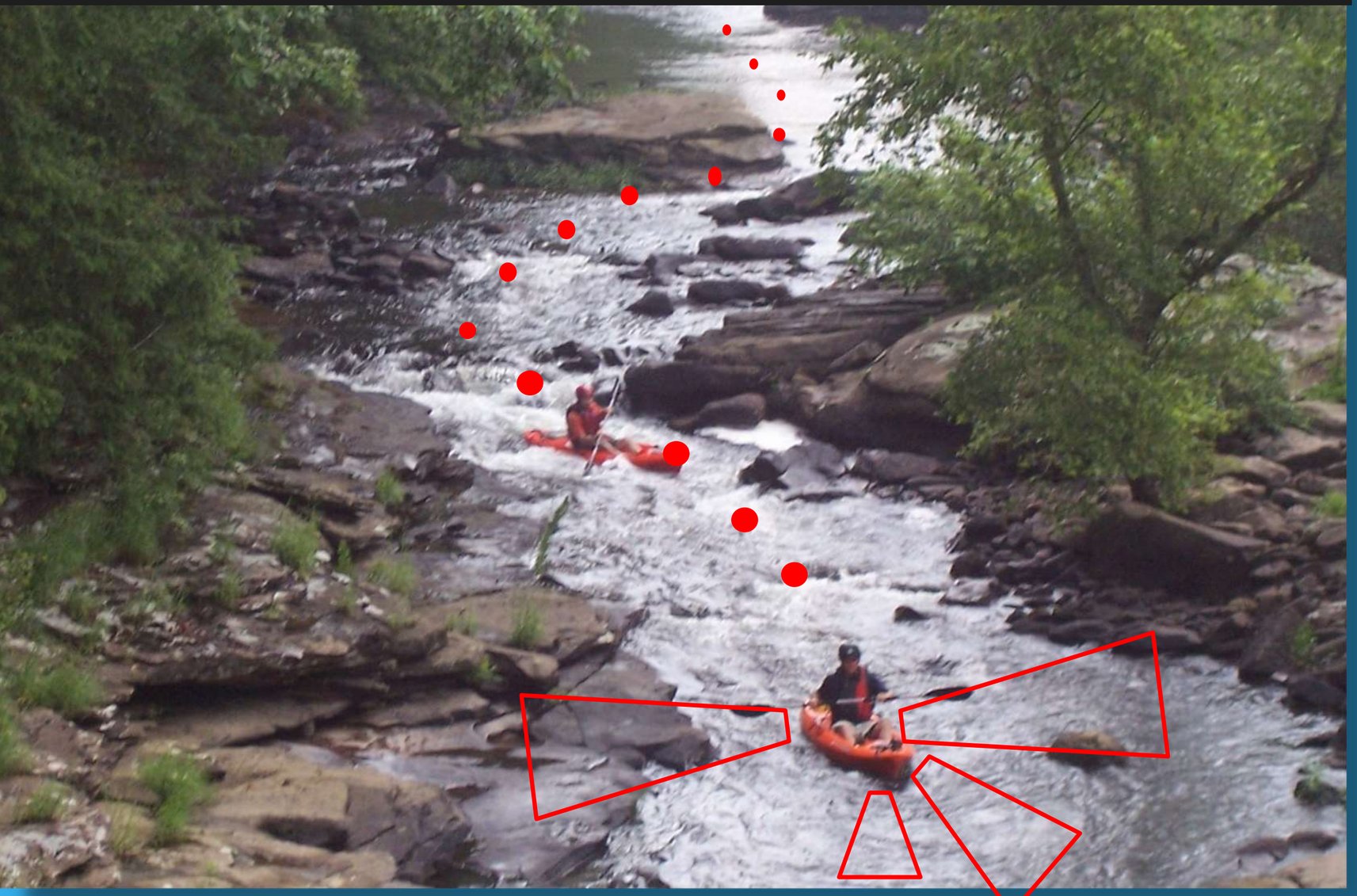
KAYAK

INFLATABLE BOAT

TABLETS

Integrated with DRONES

what data do we collect?



Side Video/LiDAR
- Left & Right Streambank
- Riparian
- Floodplain Access
- Infrastructure

Front Video
- Habitat Type
- Canopy Cover

Down Video & Sonar
- Depth
- Side-scan imagery
- Substrate Type
- Embeddedness

Water Quality Sensor
- DO, pH, Temp, etc.

Acoustic Doppler Current Profiler
- Bathymetry
- Discharge
- Transects

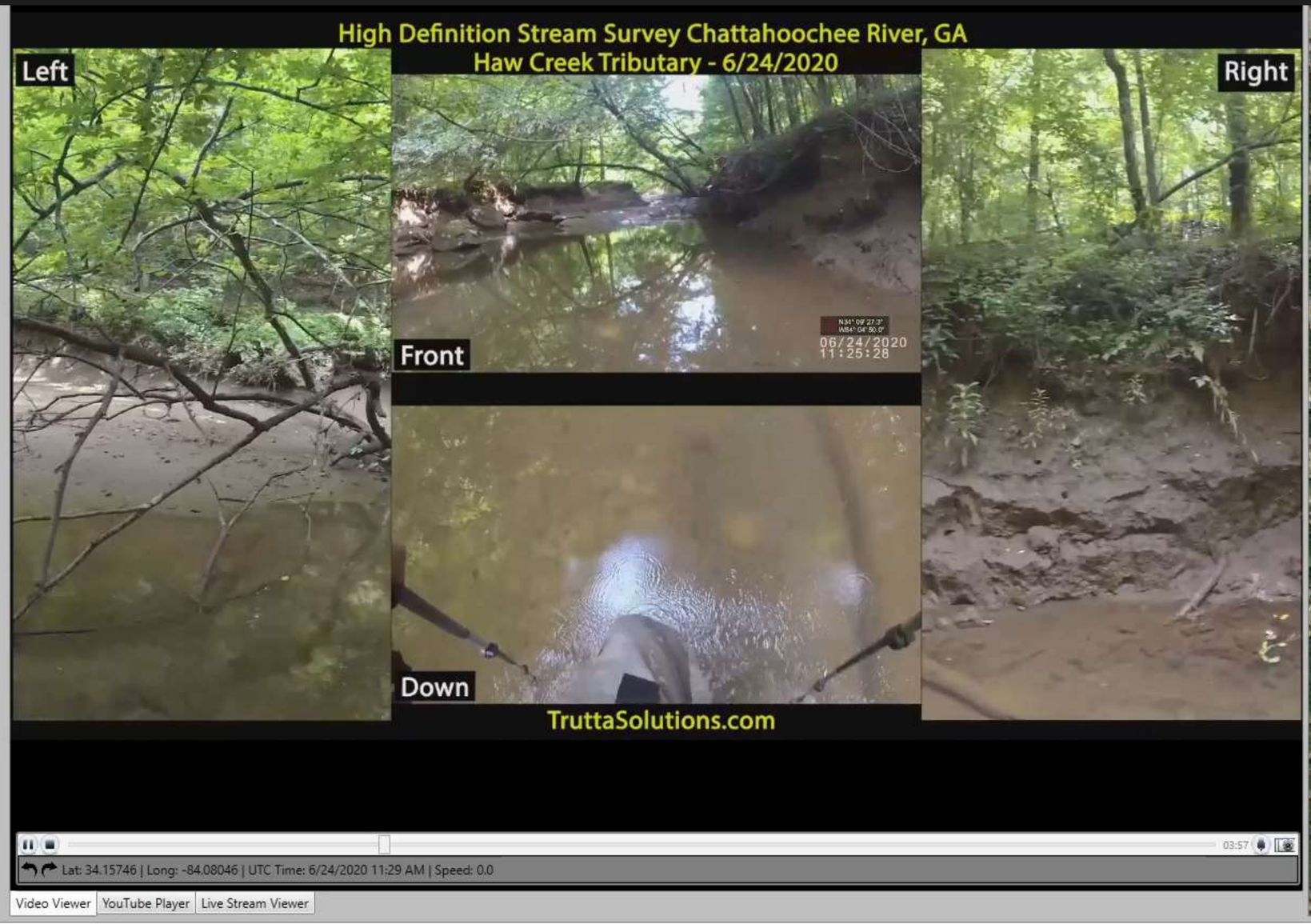
Water Grab Samples
- eDNA

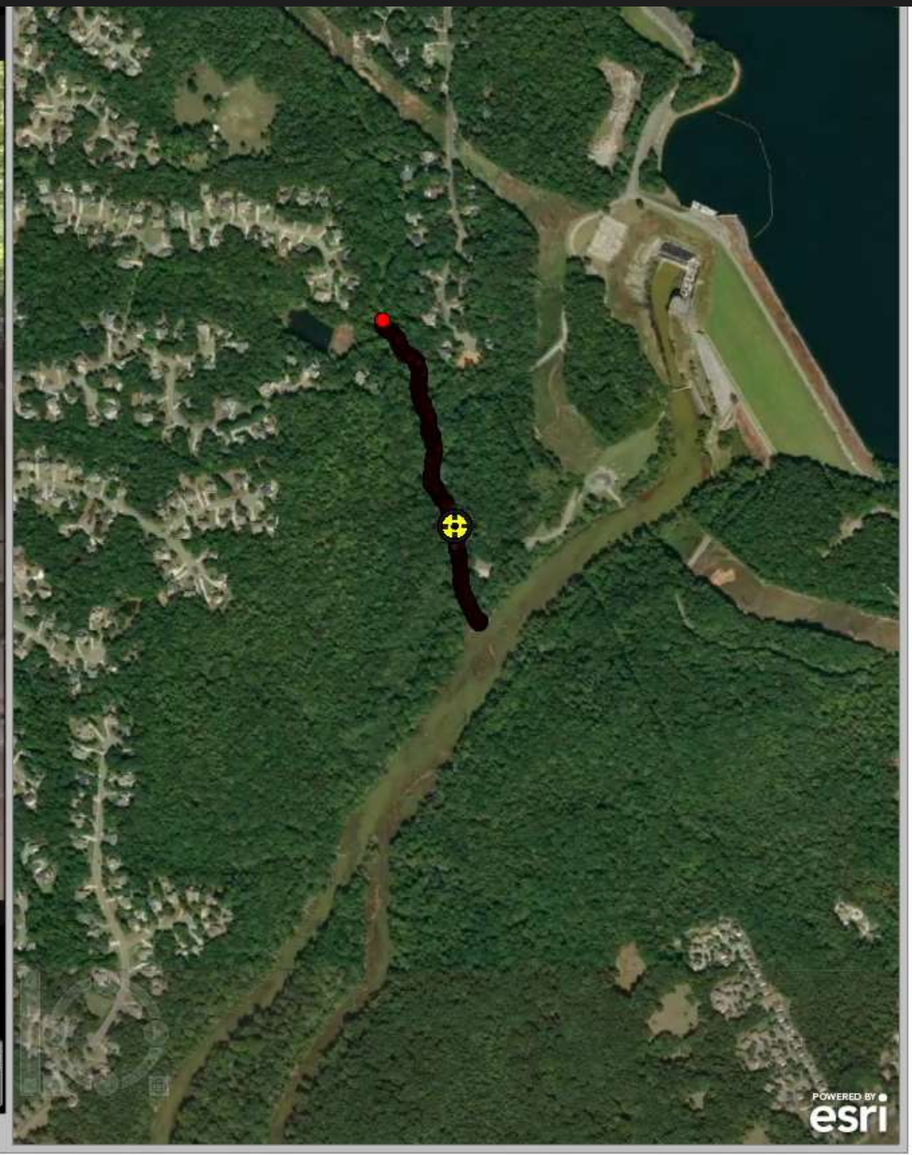
GPS

Time
Location
Elevation

spatial metadata embedded in video:

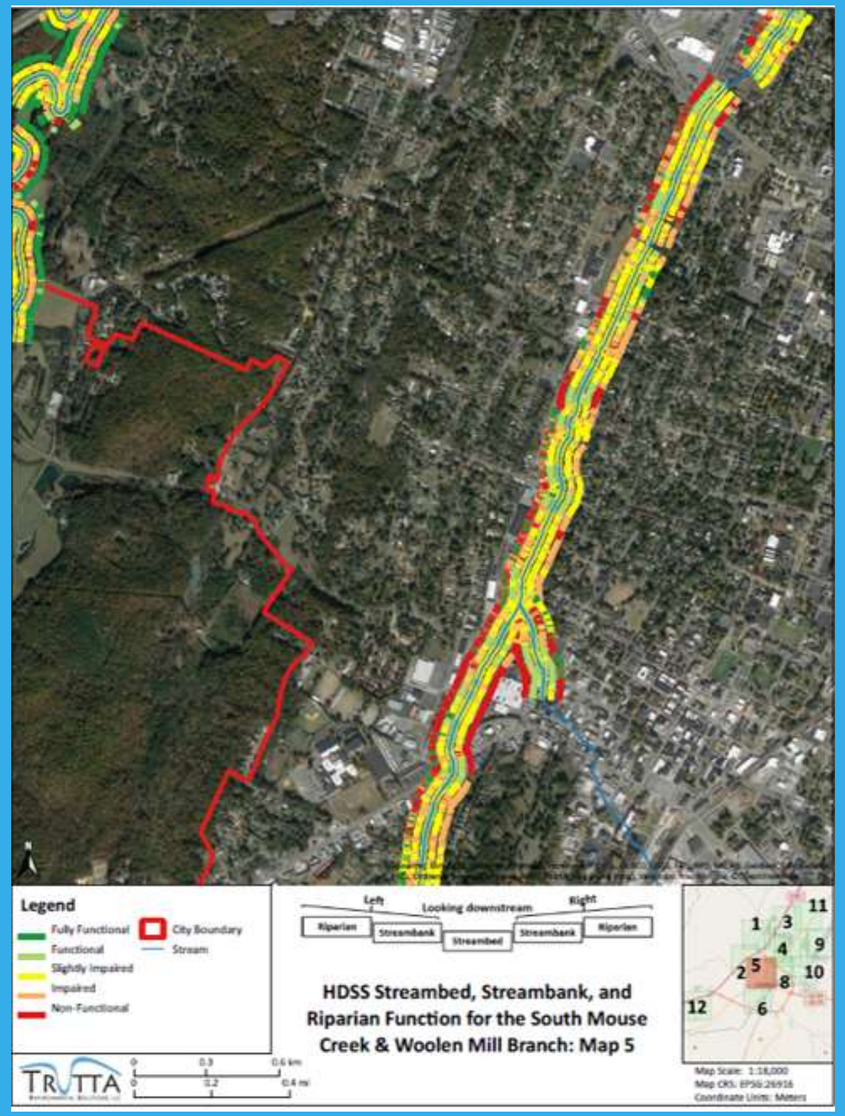
works in arcgis, qgis & remote geosystems geotagger

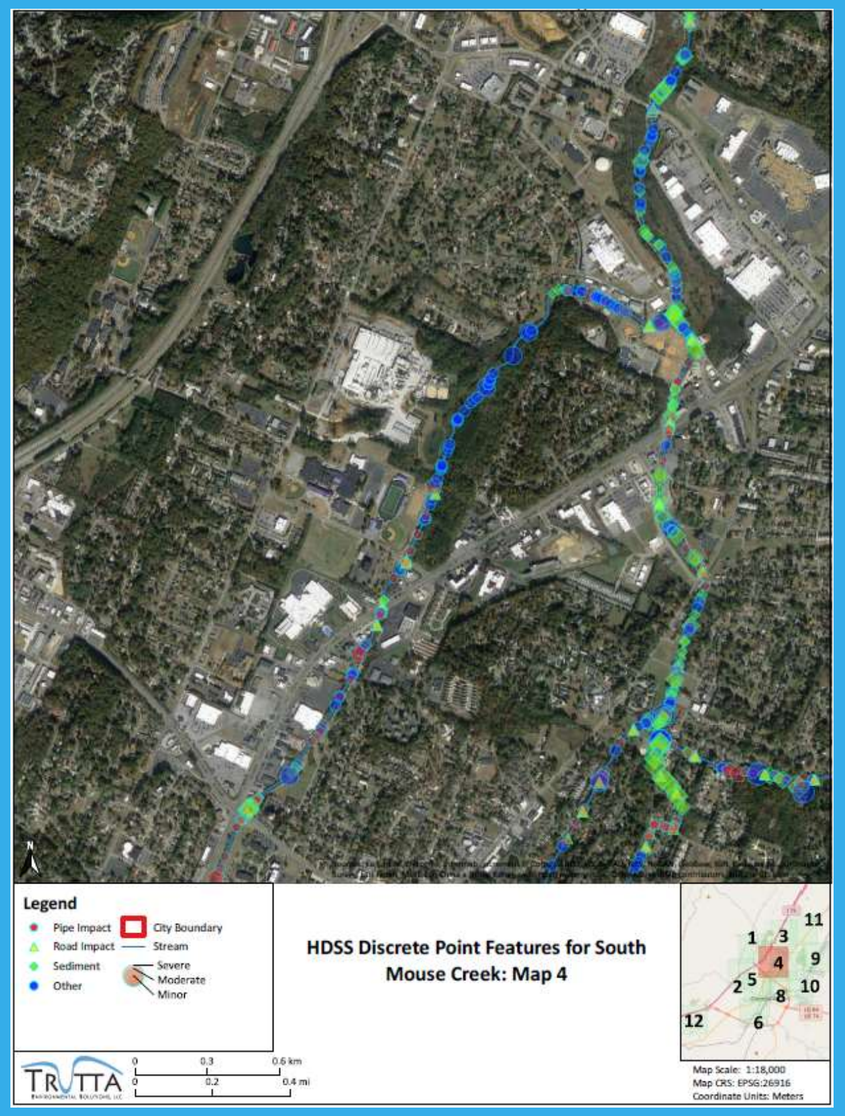


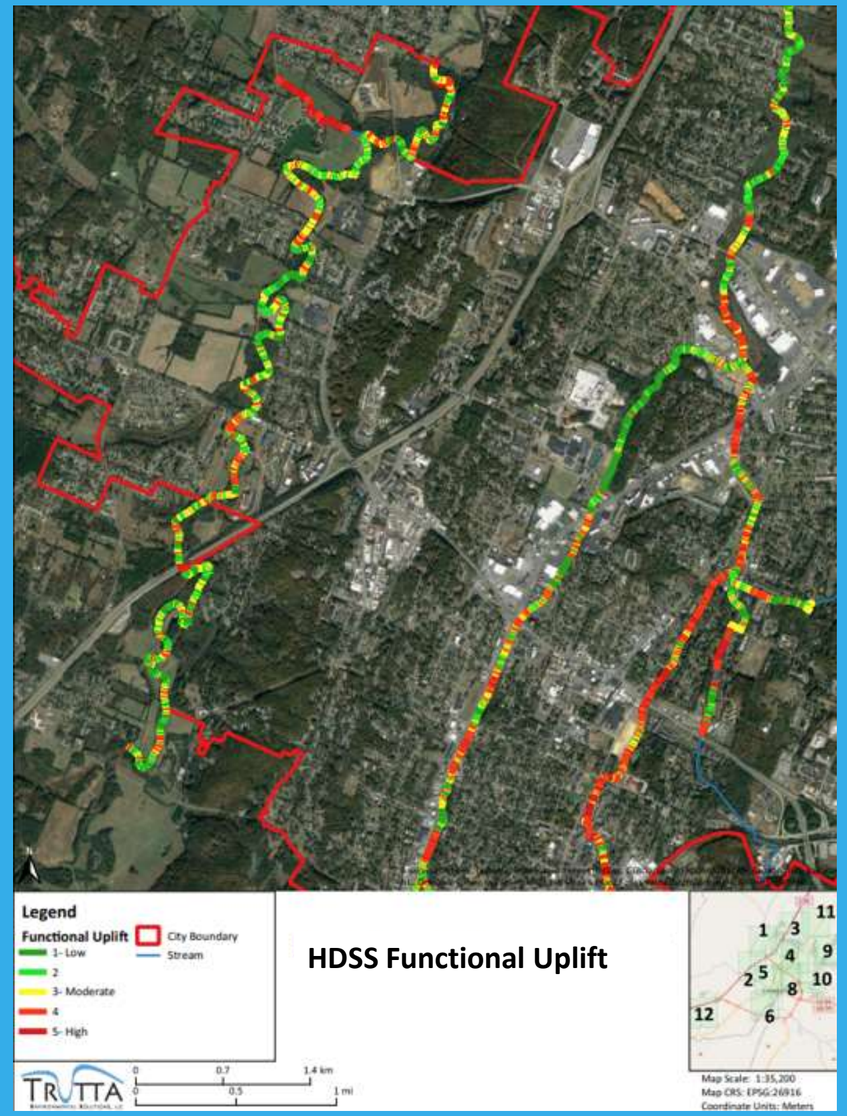


maps showing habitat condition:

Continuous data, point data & combined data

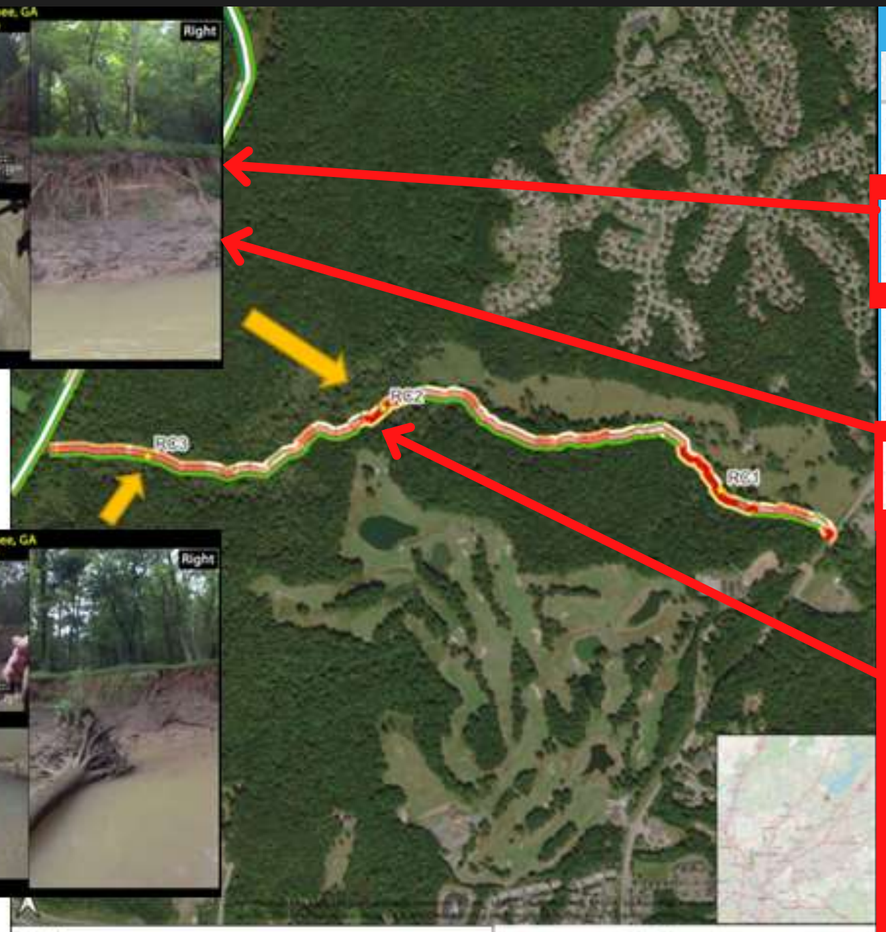




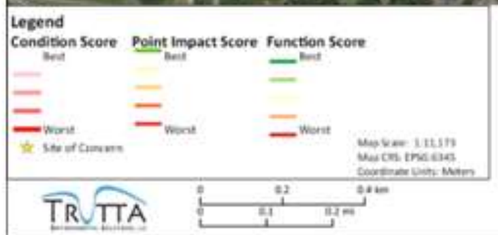


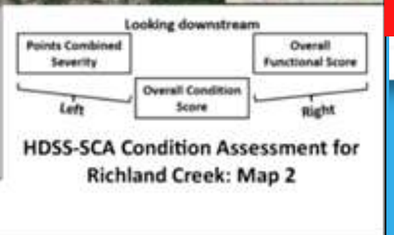
sensor data linked in gis

time, location & condition scores



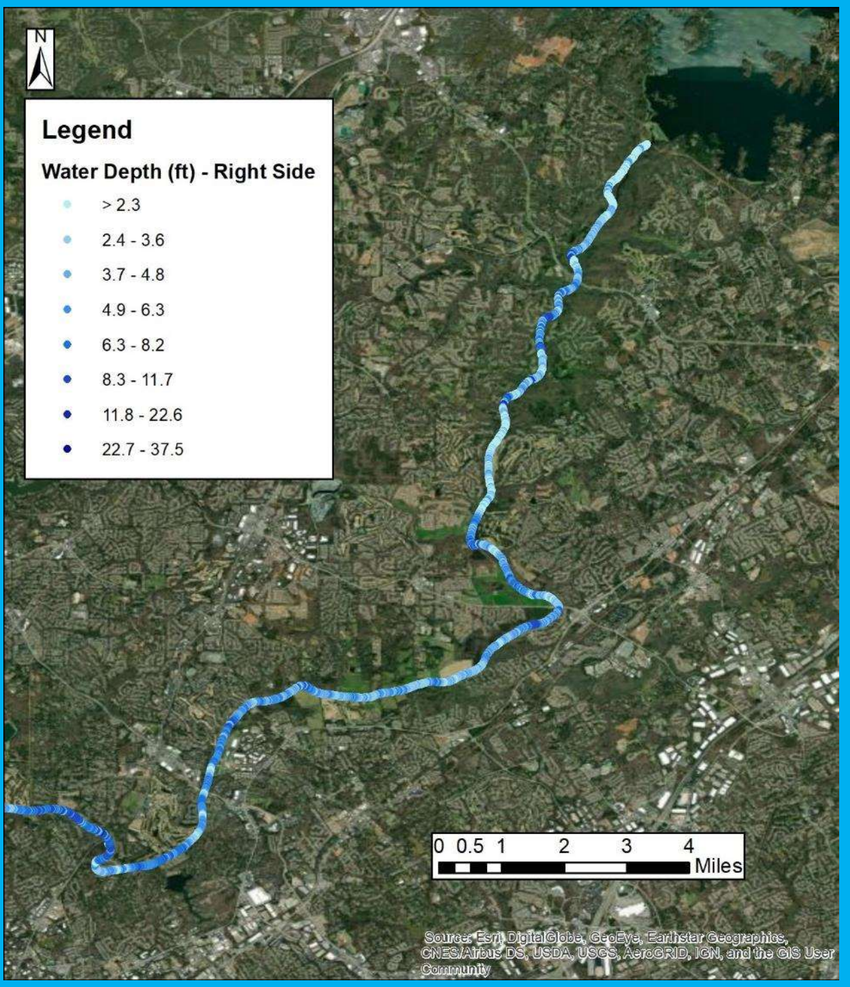
Location:	2,303,052.489 303,402.437 Feet
Field	Value
OBJECTID	1959
	107678
DateTx	5-23-2019
TimeLTx	11:24:34
	404
LocalTimeT	2019-05-23T11:24:34
LocalTimeZ	2019-05-23T11:24:34Z
UTCtime	2019-05-23T15:24:34
	2019-05-23T15:24:34Z
lat	35.16163
lon	-84.880803
LBC_ModType	8
RBC_Severity	3
RBC_ModType	6
LR_Severity	5
LR_ModType	8
RR_Severity	5
RR_ModType	8
SB_Severity	2
SB_ModType	6
Shape	Point
ComboScore	3.2
ComboType	7.2



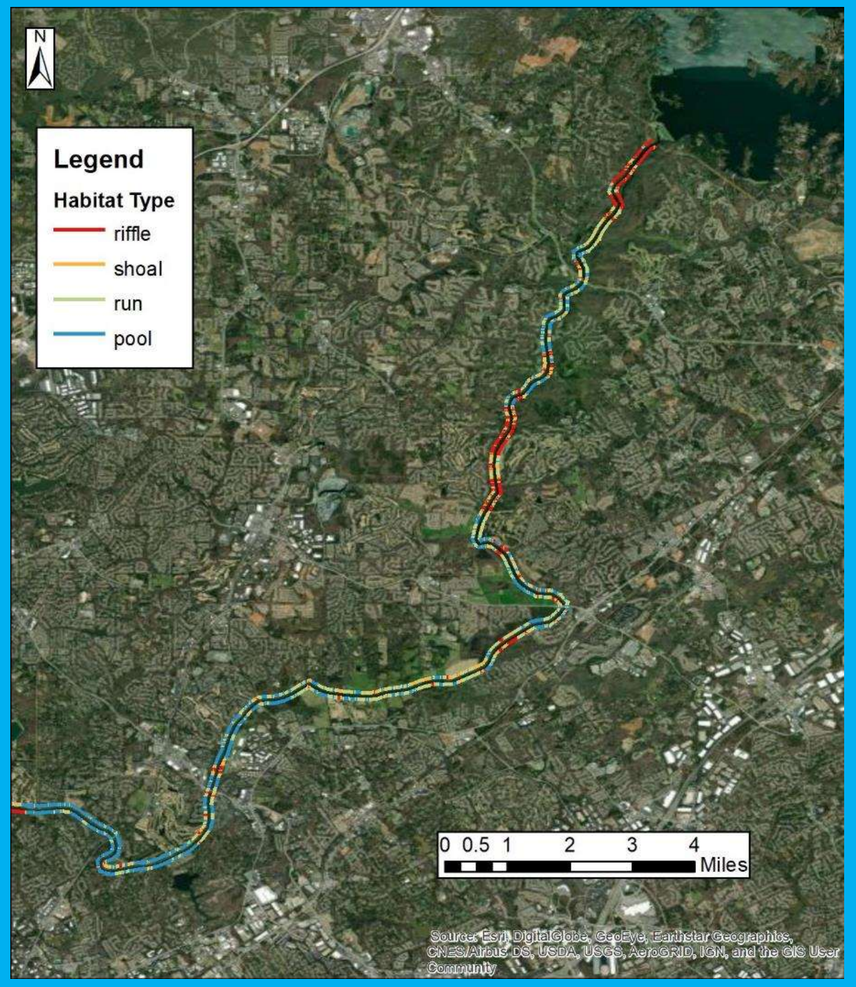


DIGITALLY COLLECTED DATA

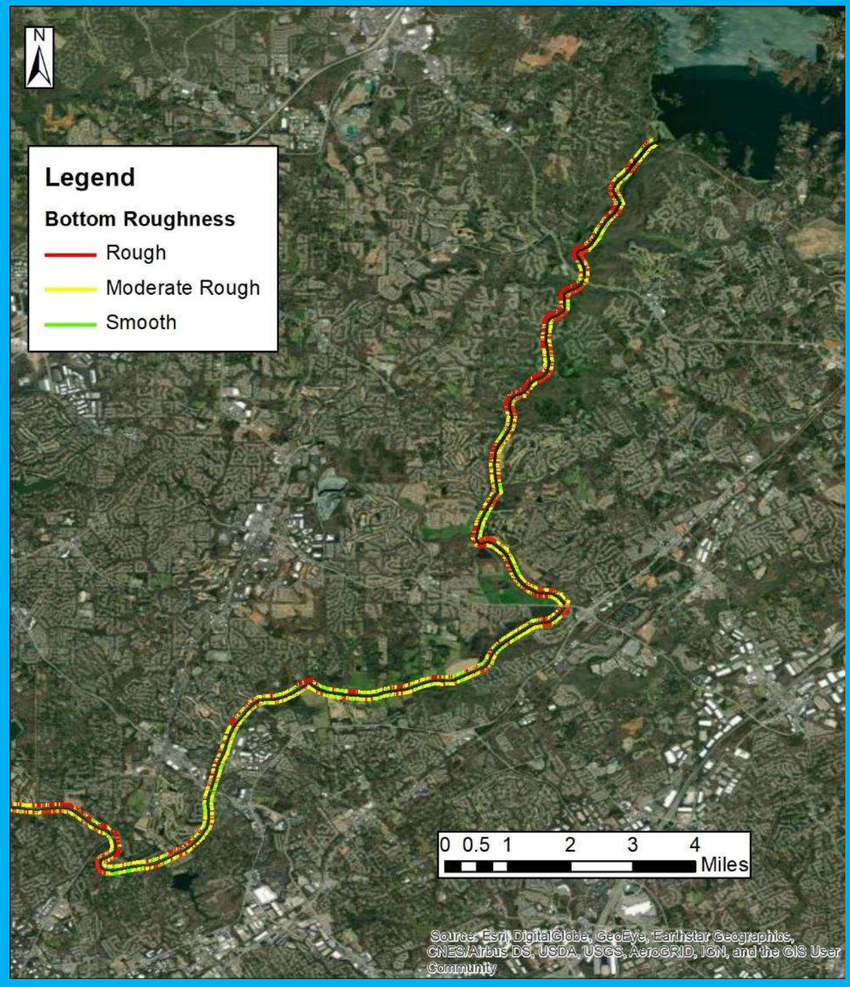
DEPTH, ELEVATION, SLOPE, HABITAT TYPE & ROUGHNESS



Water Depth

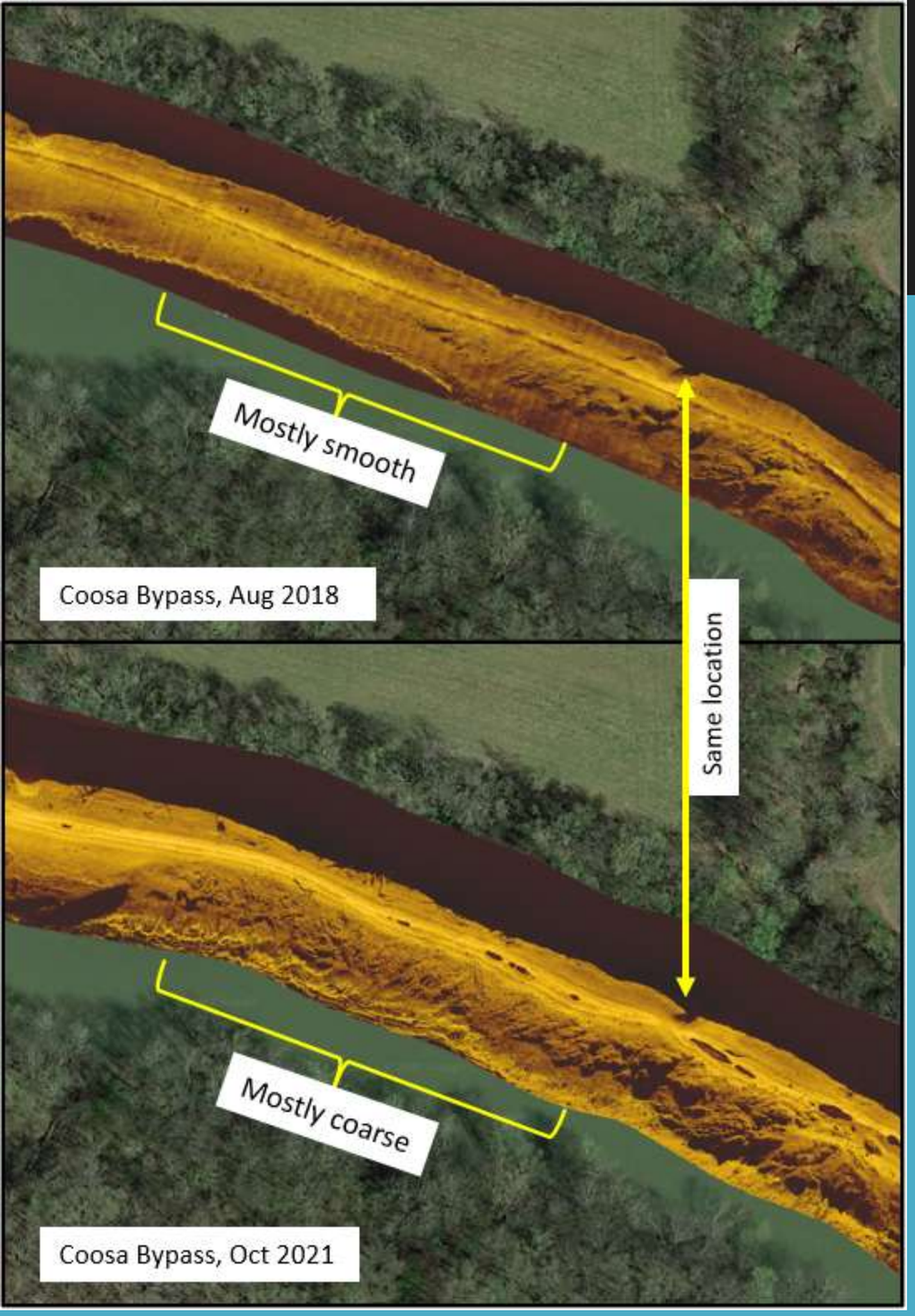


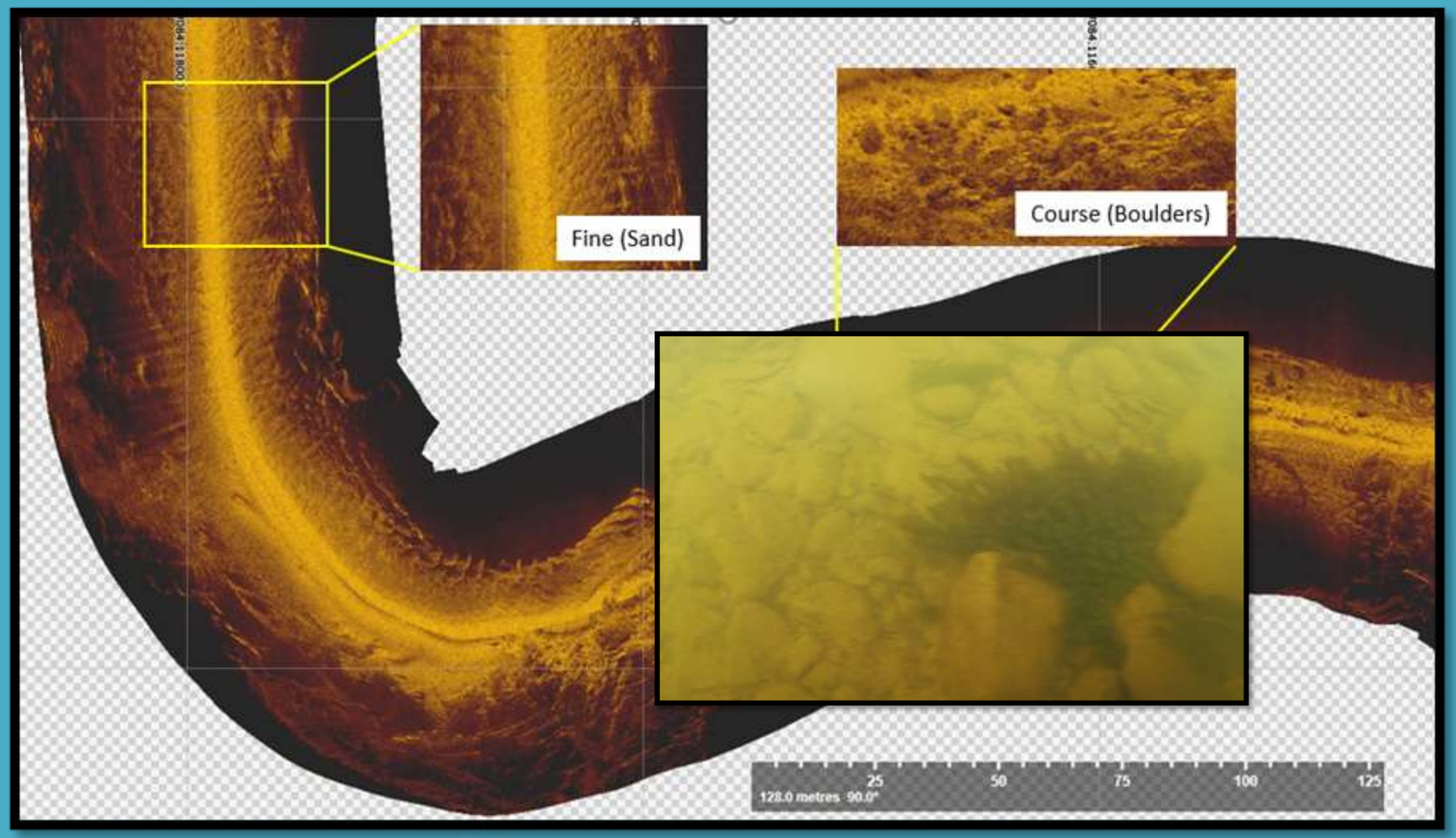
Habitat Type



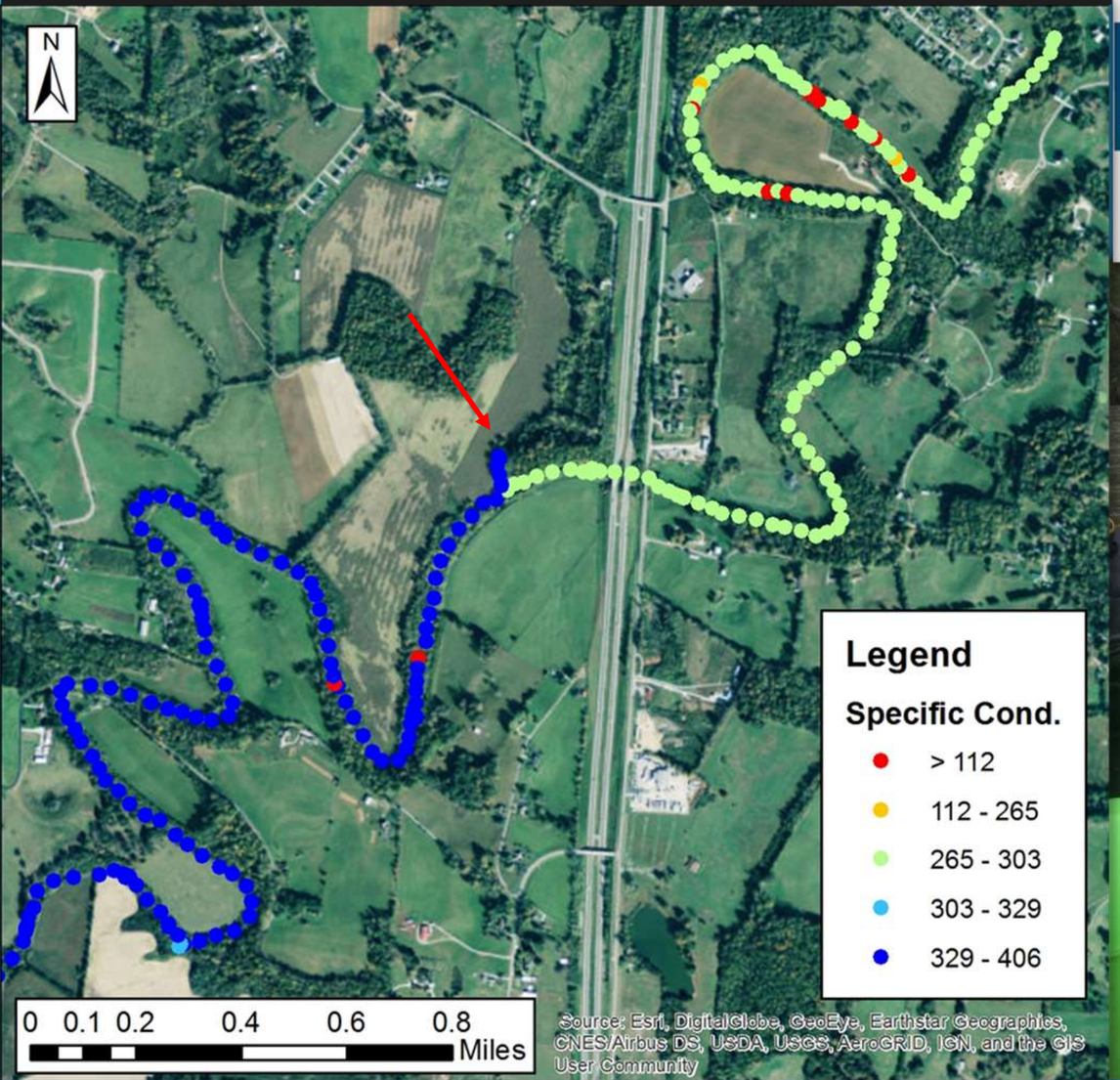
Roughness

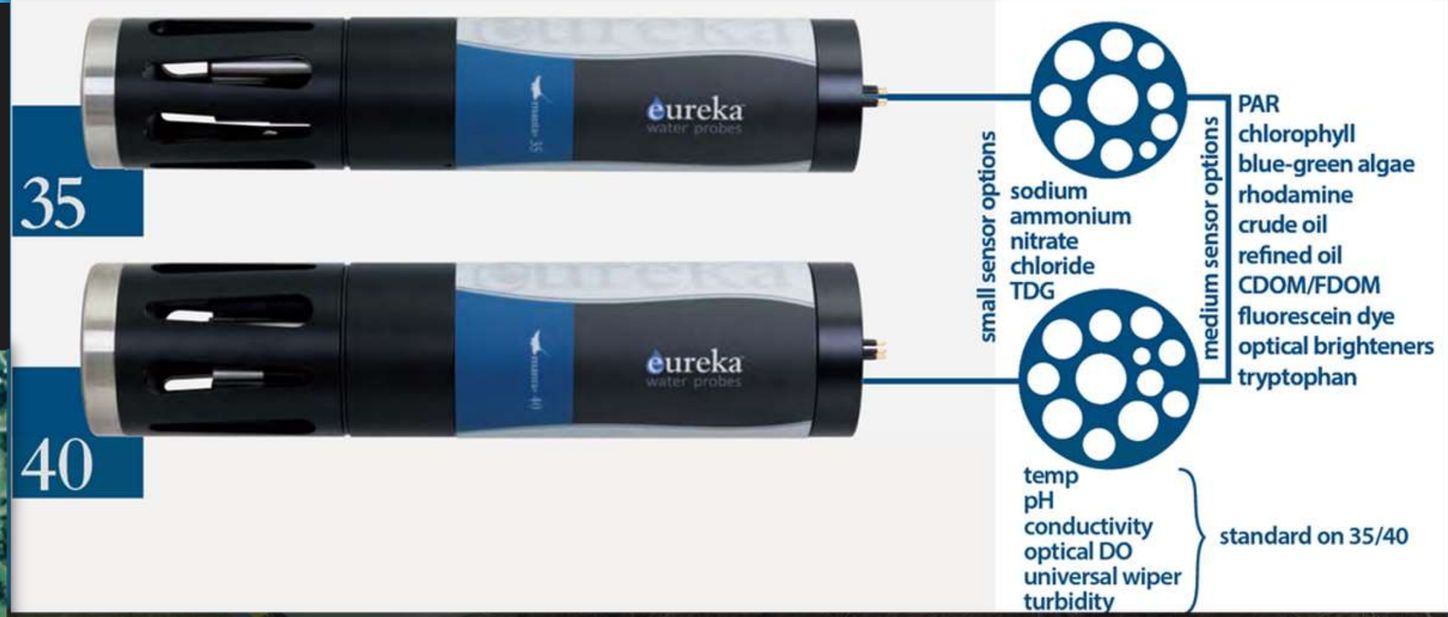
underwater habitat
side-scan sonar & video





WATER QUALITY

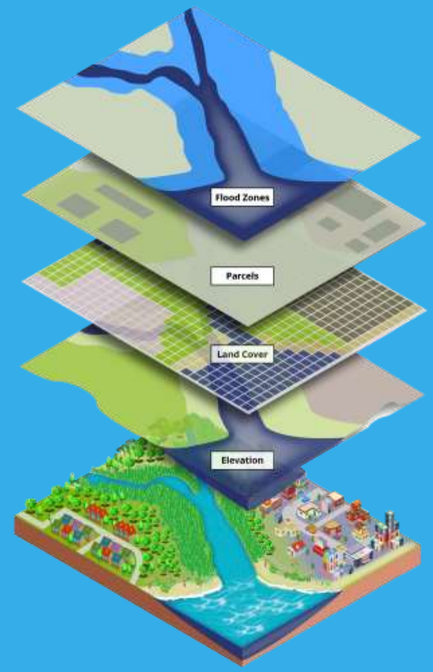




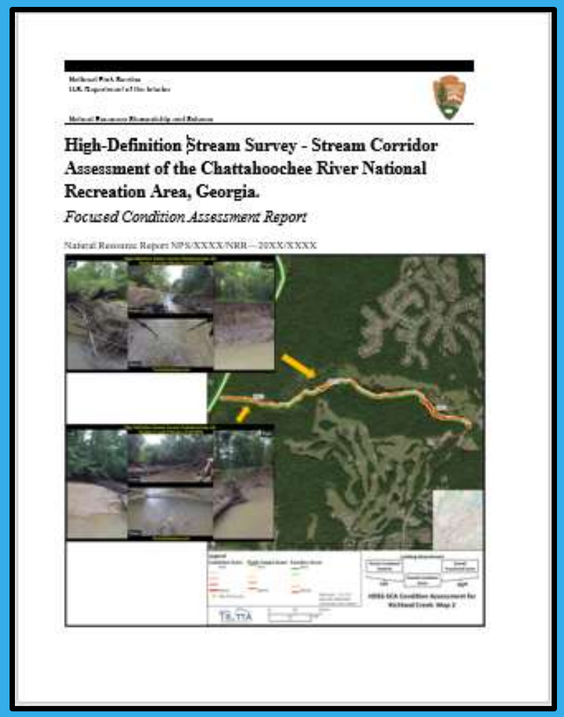
Data Management and Deliverables

StreamView Video
(Video files- .mp4)

GIS Data
(Geopackages- .gpkg)



Report
(pdf)



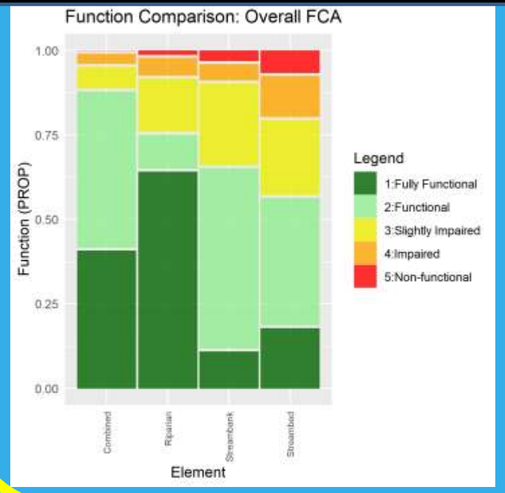
High-Definition Stream Survey - Stream Corridor Assessment of the Chattahoochee River National Recreation Area, Georgia.

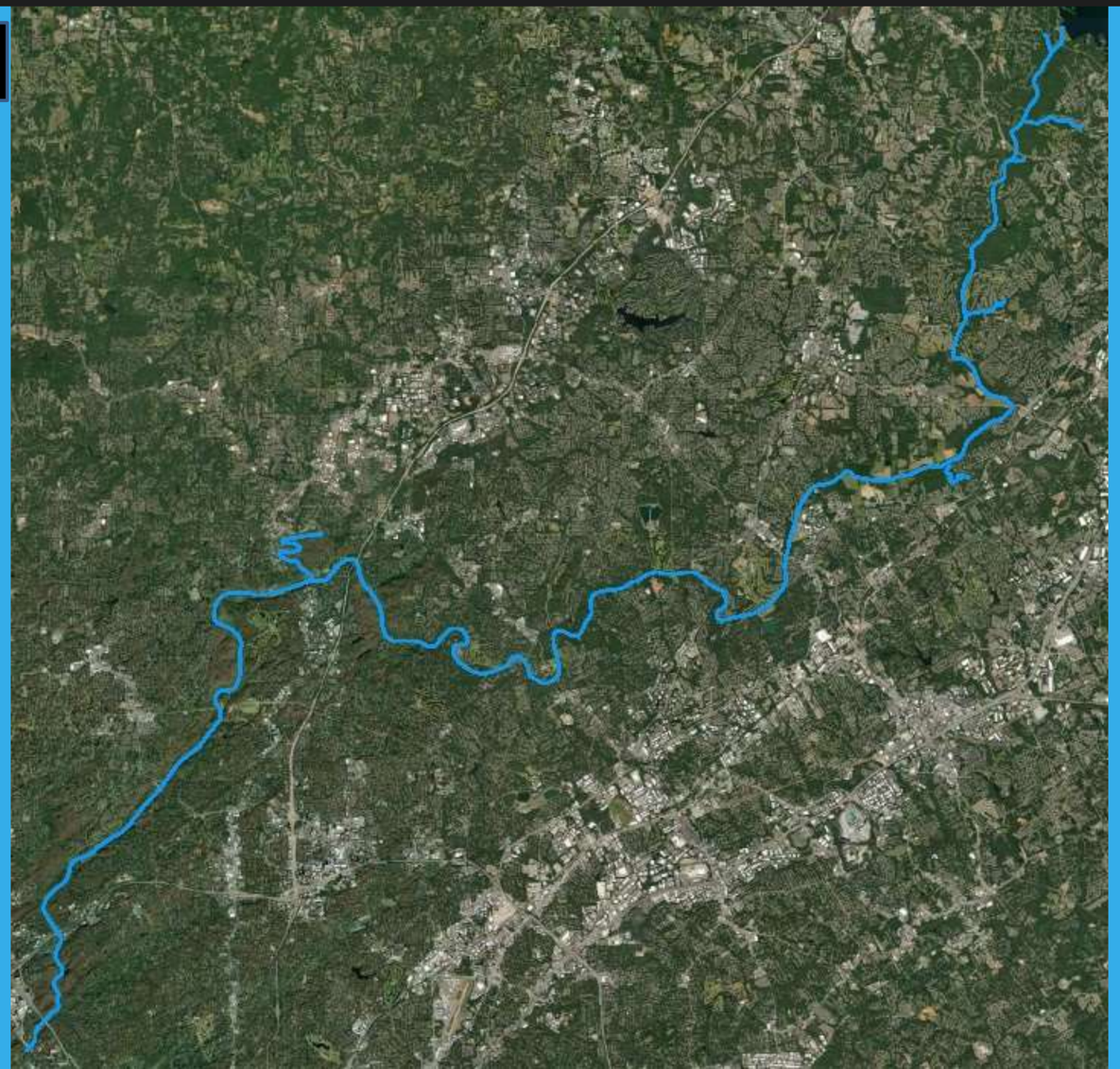
Focused Condition Assessment Report

≈ 500gb to 1tb per day

Multiscale Assessment Framework

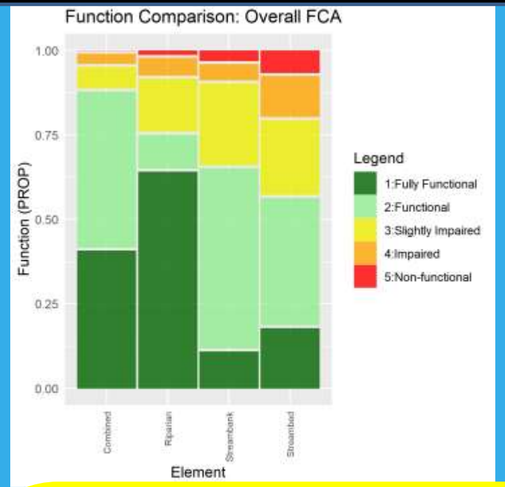
Park



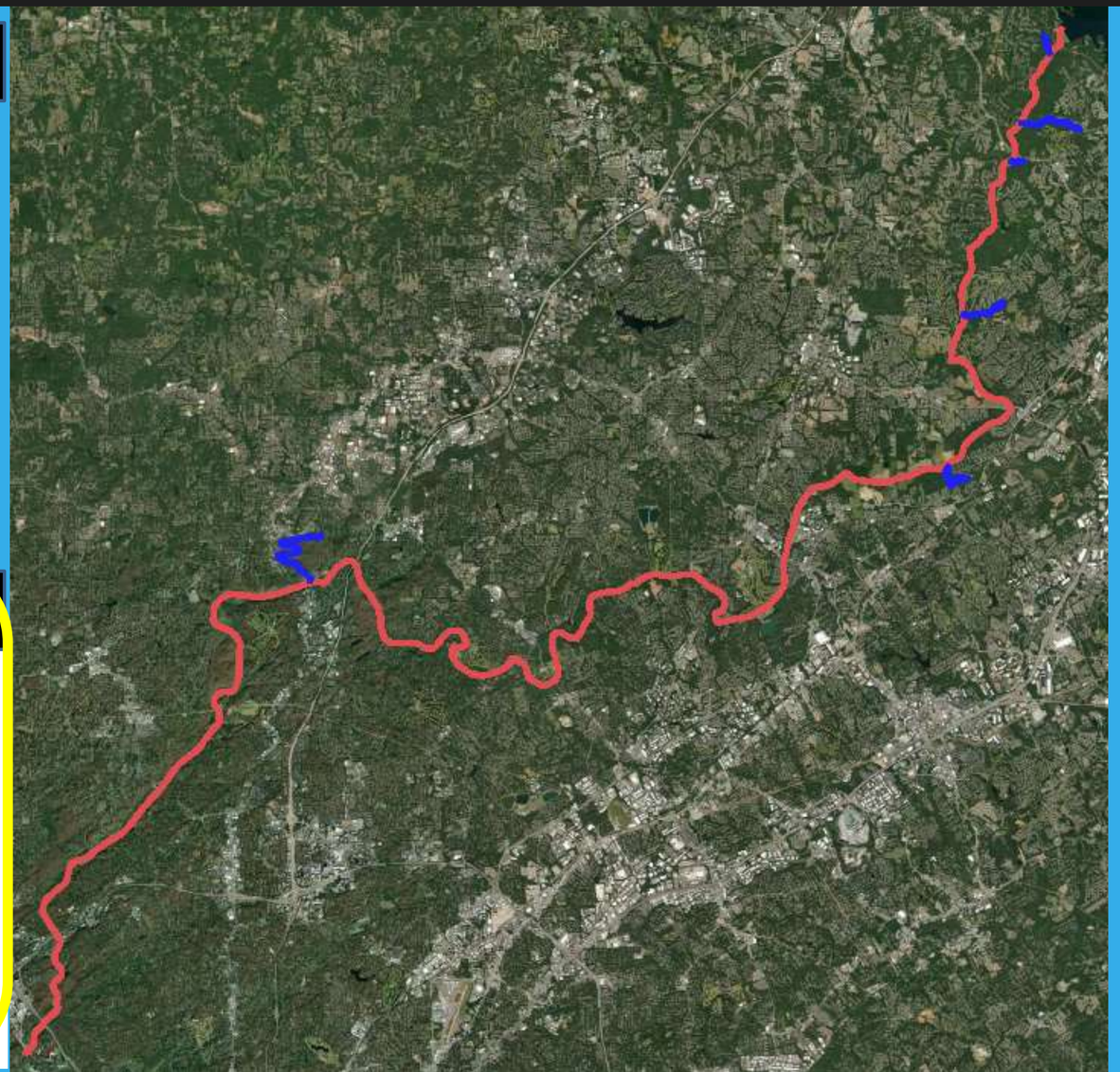


Multiscale Assessment Framework

Park

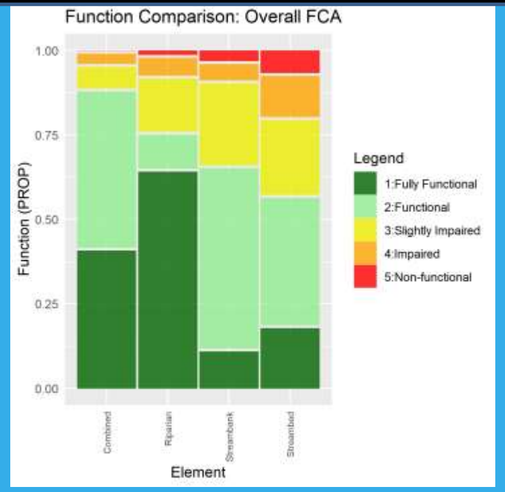


River vs. Tributaries

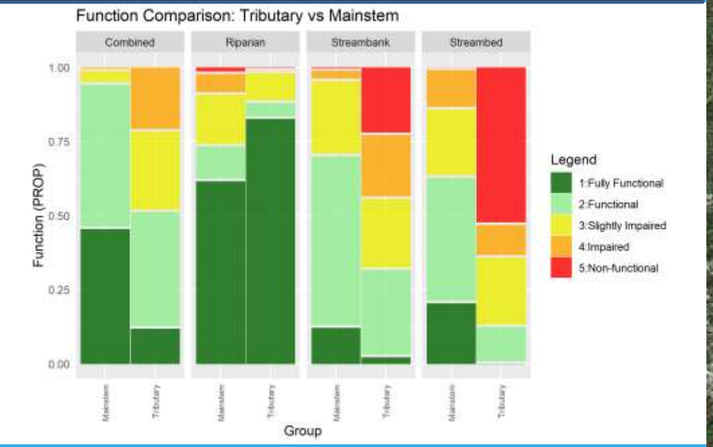


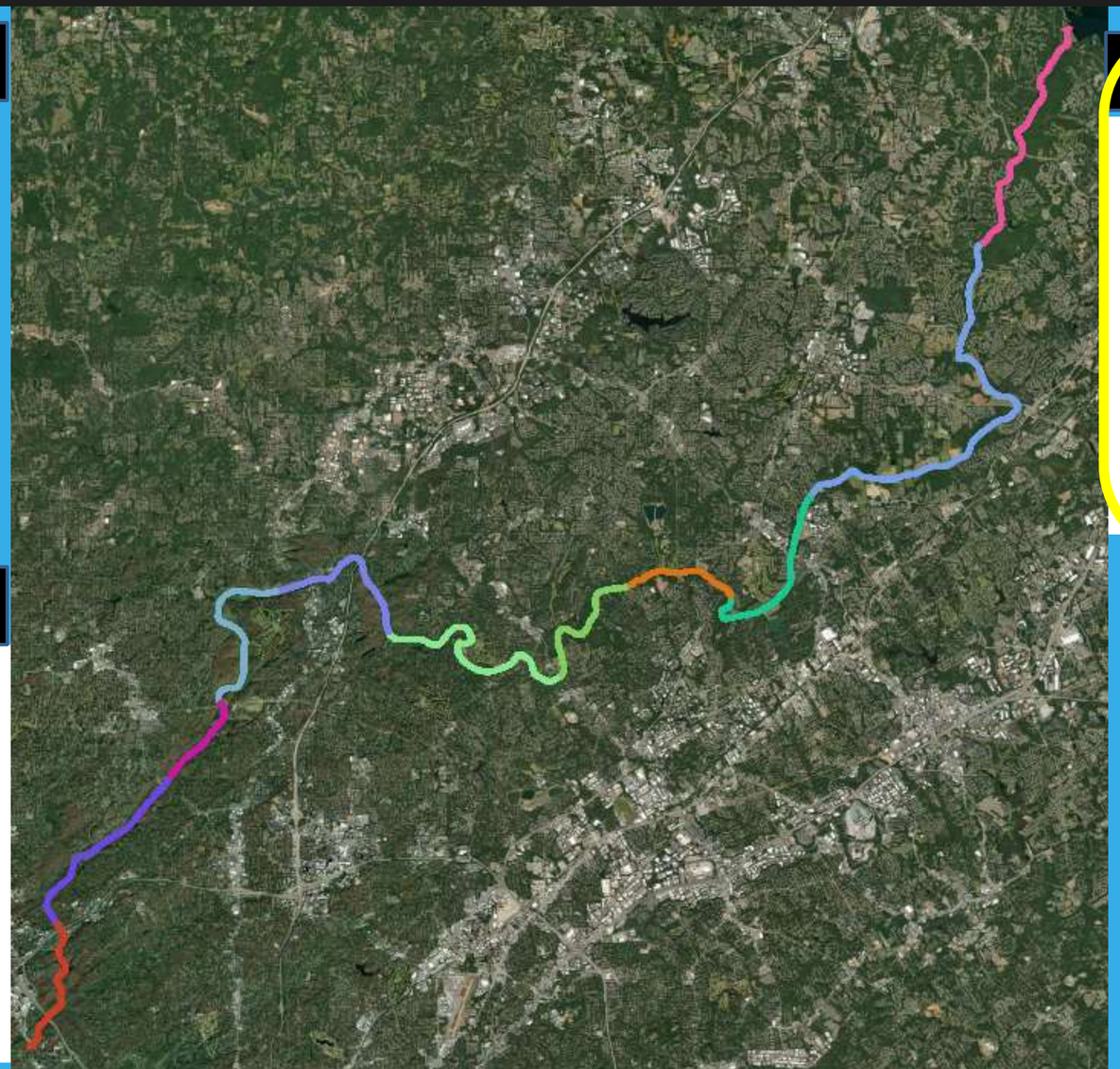
Multiscale Assessment Framework

Park

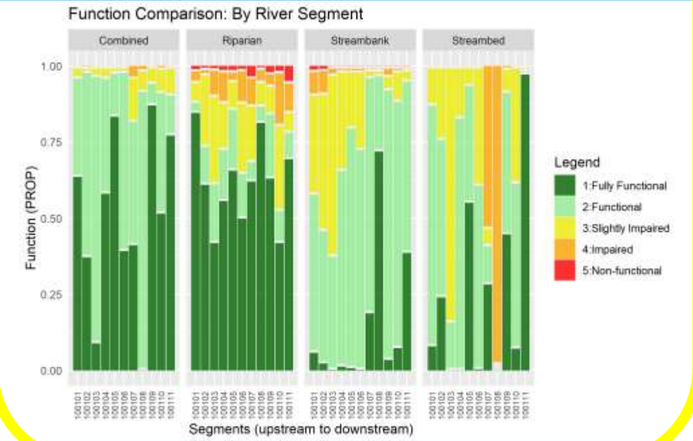


Tributaries vs. River



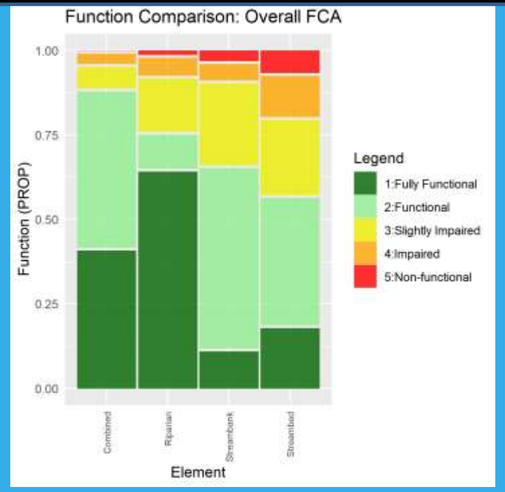


River Segments

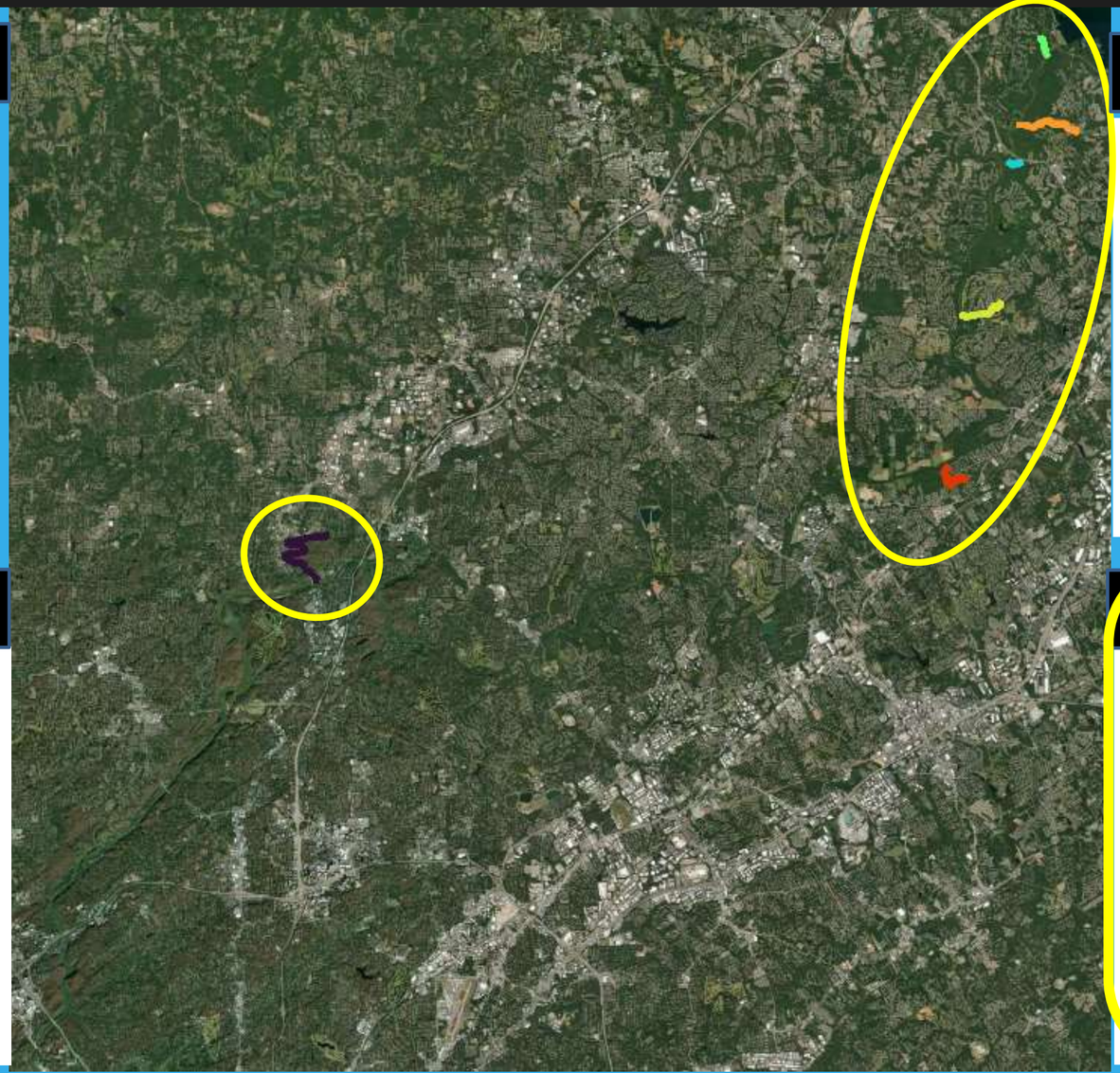


Multiscale Assessment Framework

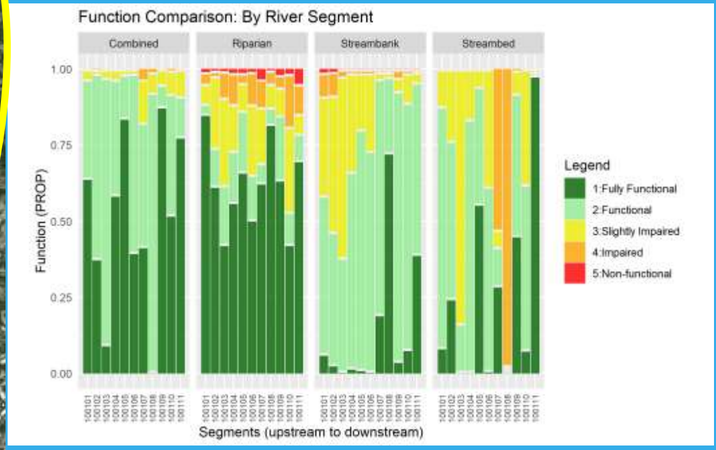
Park



Tributaries vs. River



River Segments

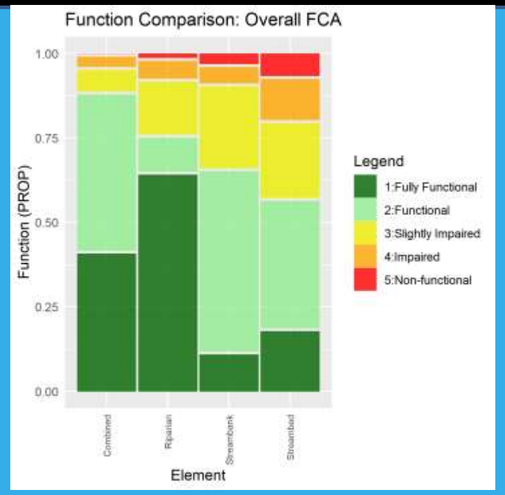


Tributaries

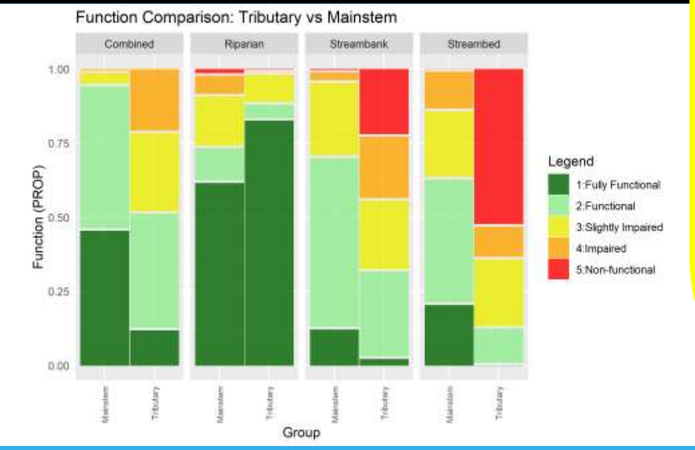
Multiscale Assessment Framework

Sites of Concern

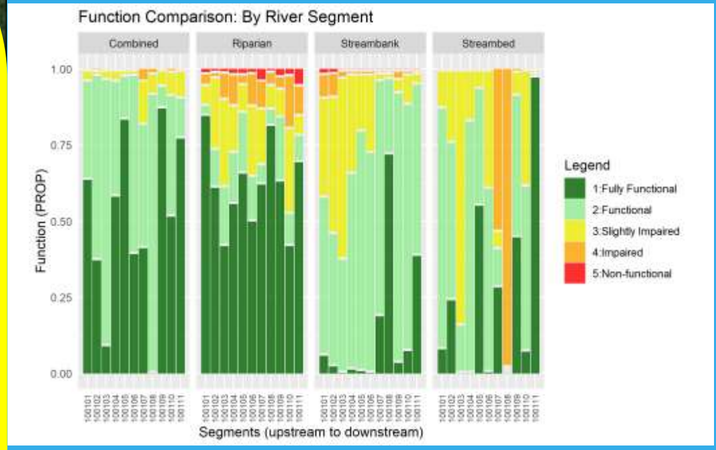
Park



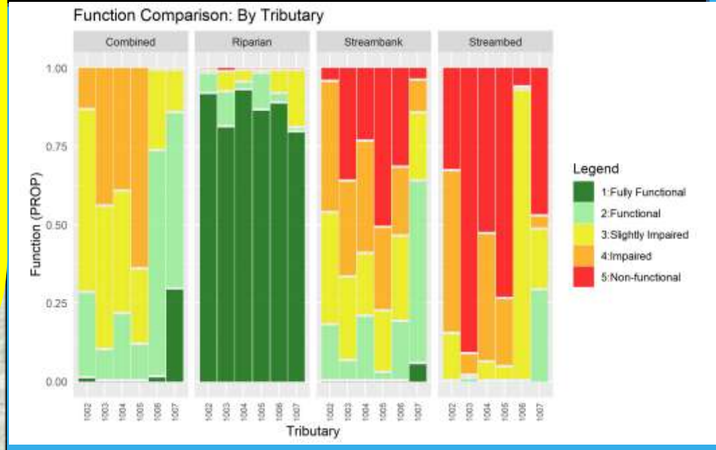
Tributaries vs. River



River Segments



Tributaries



Multiscale Assessment Framework

Sites of Concern

2.4.3 Crayfish Creek

Site Overview

Overall Function in the lower half of Crayfish Creek was affected from excessive stormwater and sediment runoff. Additionally, [illegible] worsened the overall condition of the stream resulting in a *SOC* for this creek (Figure 51). *With* discrete *point features and function*

creek (Figure 51). *With discrete point features and function combined, the overall condition of Crayfish Creek indicates that this stream has one of the top three worst scores of the tributaries sampled.*

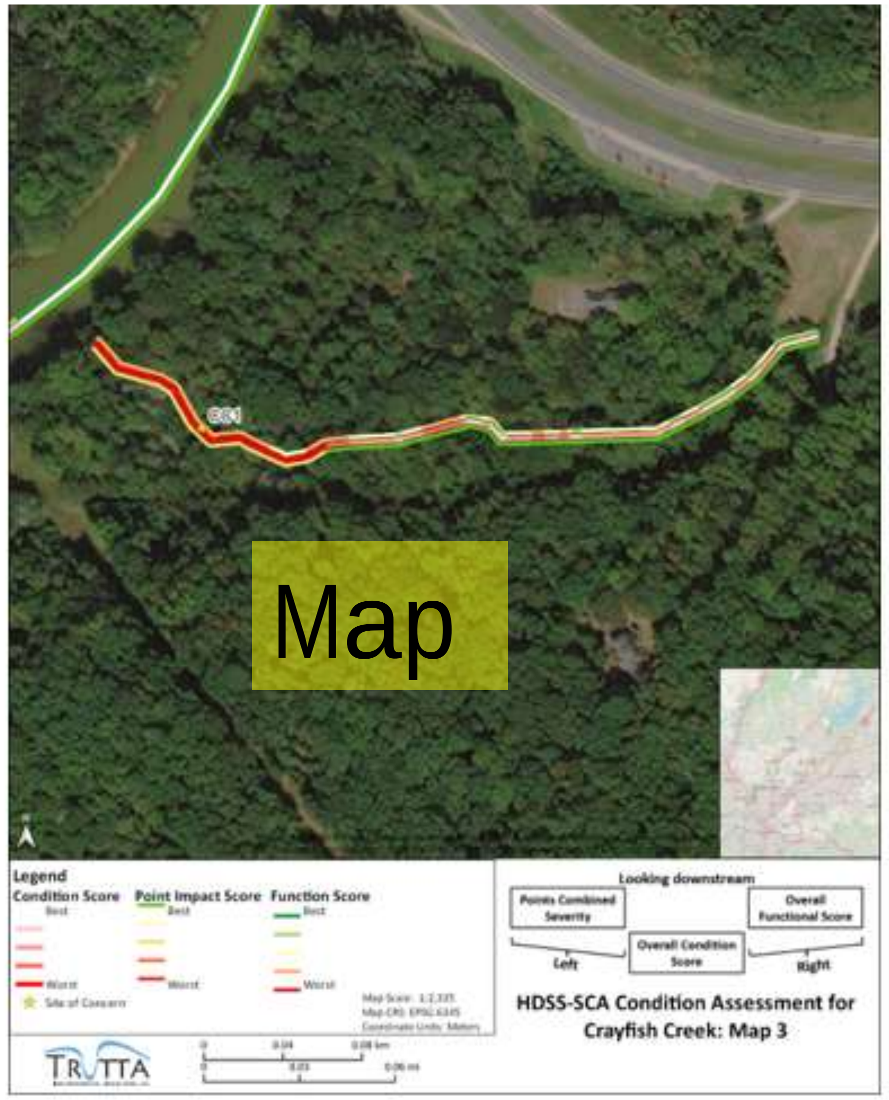


Figure 51: Image of Crayfish Creek identifying one *SOC* (i.e., CC1).

Sites of Concern – CC1

Site Metrics

Site Metrics: Site of Concern CC1 (Figure 52) occurred in Crayfish Creek (1004), on StreamView video track 1 between the time of [illegible]. CC1 had a condition score of 5.0, function score of 3.9, modification score of 1, and a point score of 2.

Figure 52: Image from the CC1 segment of Crayfish Creek observed on 6/23/2020 at 12:16:57.

Problem

Problem: *The CC1 segment of Crayfish Creek is located in the lower downstream portion of the surveyed stream and had both functional and* discrete *point features documented. This segment had streambanks actively eroding and collapsing (Figure 52) into the stream. Also, the streambed was over-widened and filled with* [illegible] and defunct culverts (Figure 53) exacerbated the overall condition of stream by constricting discharge that increased the erosive forces during high flow events. In addition to the active channel failure and the discrete point features listed above an additional 10 unique points features were also documented along this *SOC*, consisting of LWD (n=8) and in channel bars (n=2); however, they have minor or negligible impact directly on the stream channel. A small section streambed (approximately 4 m) was classified as modified due to the presence of the deteriorating culverts.

Cause

Problem Cause: *Crayfish Creek overall appeared to suffer from stormwater and sediment runoff related issues.* Development in the upper portions of the watershed have led to excessive stormwater and sediment in the lower portions of stream. The increased frequency and magnitude in flow volumes during heavy rainfall events exceed the natural capacity of the stream and therefore cause excessive erosion along the streambanks. The debris jams and culverts continue to worsen the condition of the stream by concentrating high flow that continue to degrade the area and prevent the reestablishment of stable streambanks and streambed. It should also be noted that power peaking discharges from Buford Dam also generates backwater jacking and intrusion in the lower reaches of Crayfish Creek leading to downcutting.

Restoration Approach

Restoration Approach: *This area may require two separate restoration approaches. The first restoration activity would be a channel restoration designed to effectively transport water during high flow events and pass sediment through the system.* The specifics of this restoration action are difficult to determine due the fact that the dominate problems influencing the stream are upstream [illegible] mitigation efforts directed to stormwater and sediment detention in the upper watershed are warranted.

The second approach would be the [illegible] *and disposal of the debris dam and defunct culverts.* This would reduce the local constriction created in this area, thus reducing the water force and erosive power. Only accomplishing this second activity in the absence of the first, will likely make natural restoration of this area in the long term unlikely. Final project design would incorporate stormwater flow and sediment detention, channel stabilization as well as grade control measures near its confluence with the Chattahoochee River.

Access

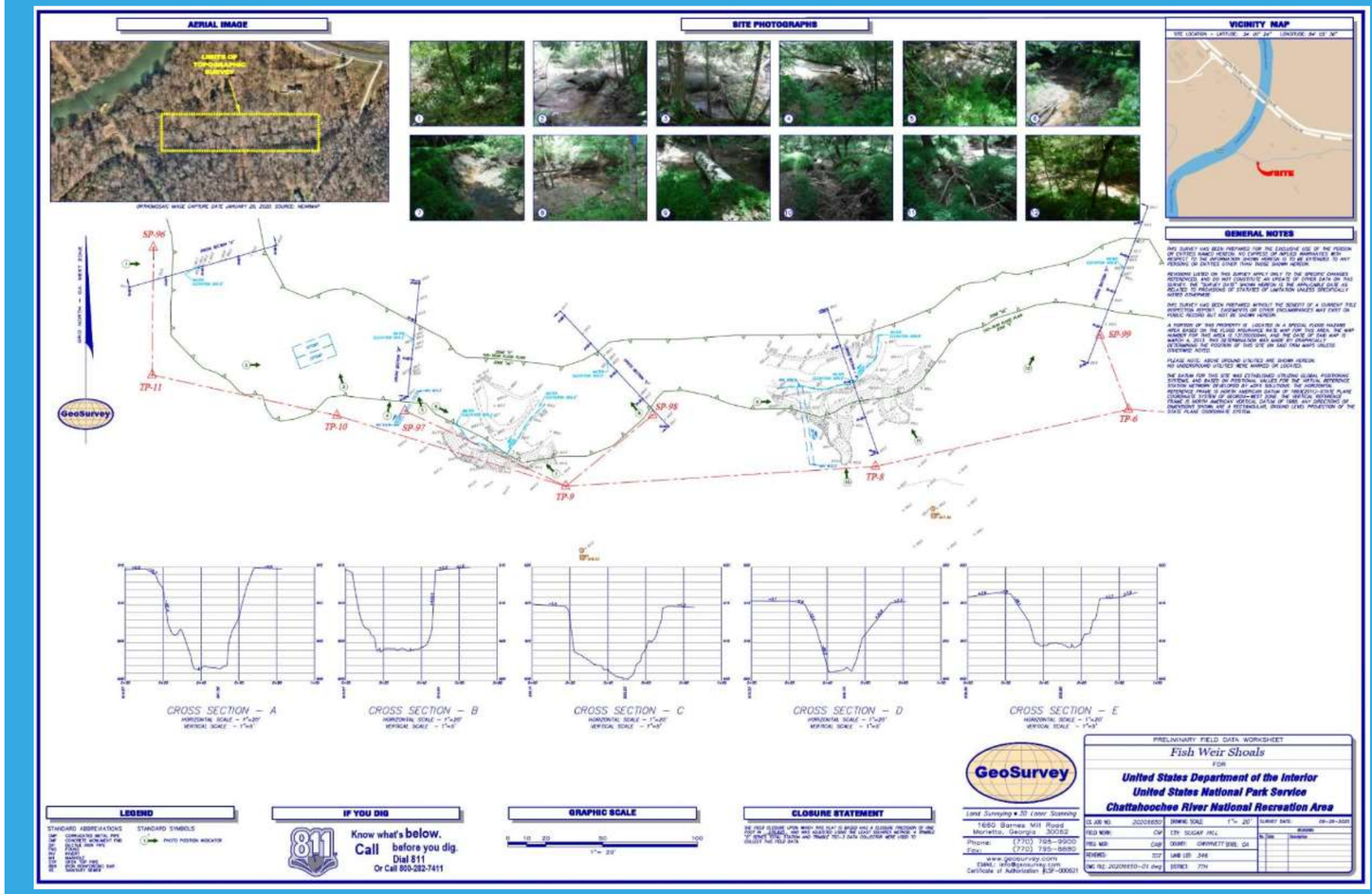
Access: *Moderate to difficult.* This area would be accessed through a heavily wooded area; however, satellite images suggest a potential access road/cutting directly south of the *SOC*. This would allow [illegible] equipment that may be needed in the restoration effort. Access on foot would be easy to moderate since it may require a quarter mile trek.

Correctability

Correctability: *Moderate to difficult.* The mitigation of stormwater runoff problems requires modifications upstream of this location and/or substantial channel restoration efforts at this site. It is [illegible] planning and the use of heavy equipment in the restoration efforts. Solely removing and disposing the defunct culverts will likely require small machinery and/or power tools.

Crayfish Creek Partnership and Planning

Chattahoochee Riverkeeper
Trout Unlimited Upper Chattahoochee Chapter
Warnell School of Forestry & Natural Resources, University of Georgia
GSWCD
Columbia Engineering
Trout Unlimited Embrace A Stream
Crayfish Creek Restoration Project
Oconee River Trout Unlimited
University of Georgia Fly Fishing
Forest Service U.S. Department of Agriculture
NFWF
Restoring the Chattahoochee River One Tributary at a Time
Southern Company
National Park Service
River Through Atlanta
Georgia Department of Natural Resources Wildlife Resources Division
GA Council Trout Unlimited
Chattahoochee National Park Conservancy
Connect. Protect. Your River. Your Park.



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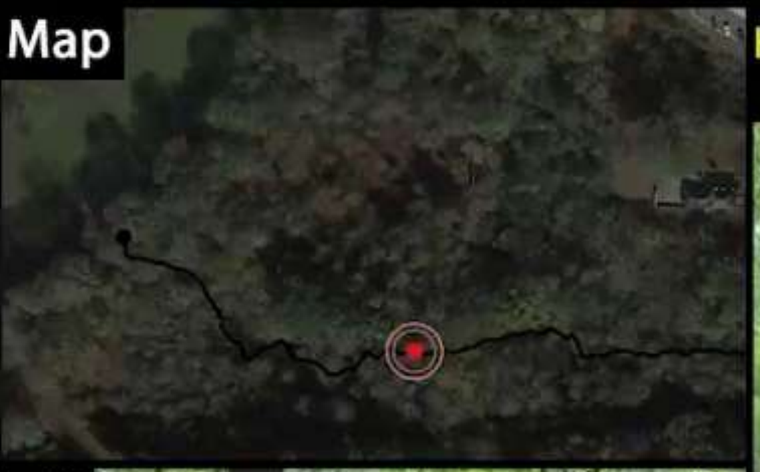

TruttaSolutions.com

Crayfish Creek Restoration

Planting and Completion

Crayfish Creek: Before & After

TRUTTA

ENVIRONMENTAL SOLUTIONS, LLC

BETTER DATA. BETTER DECISIONS.

Jim.Parham@TruttaSolutions.com
TruttaSolutions.com

SBA U.S. Small Business Administration WOSB CERTIFIED

SBA U.S. Small Business Administration 8(a) CERTIFIED

SBA U.S. Small Business Administration EDWOSB CERTIFIED