Ecological Monitoring Surrounding Barrier Sites in the Village of Mexico

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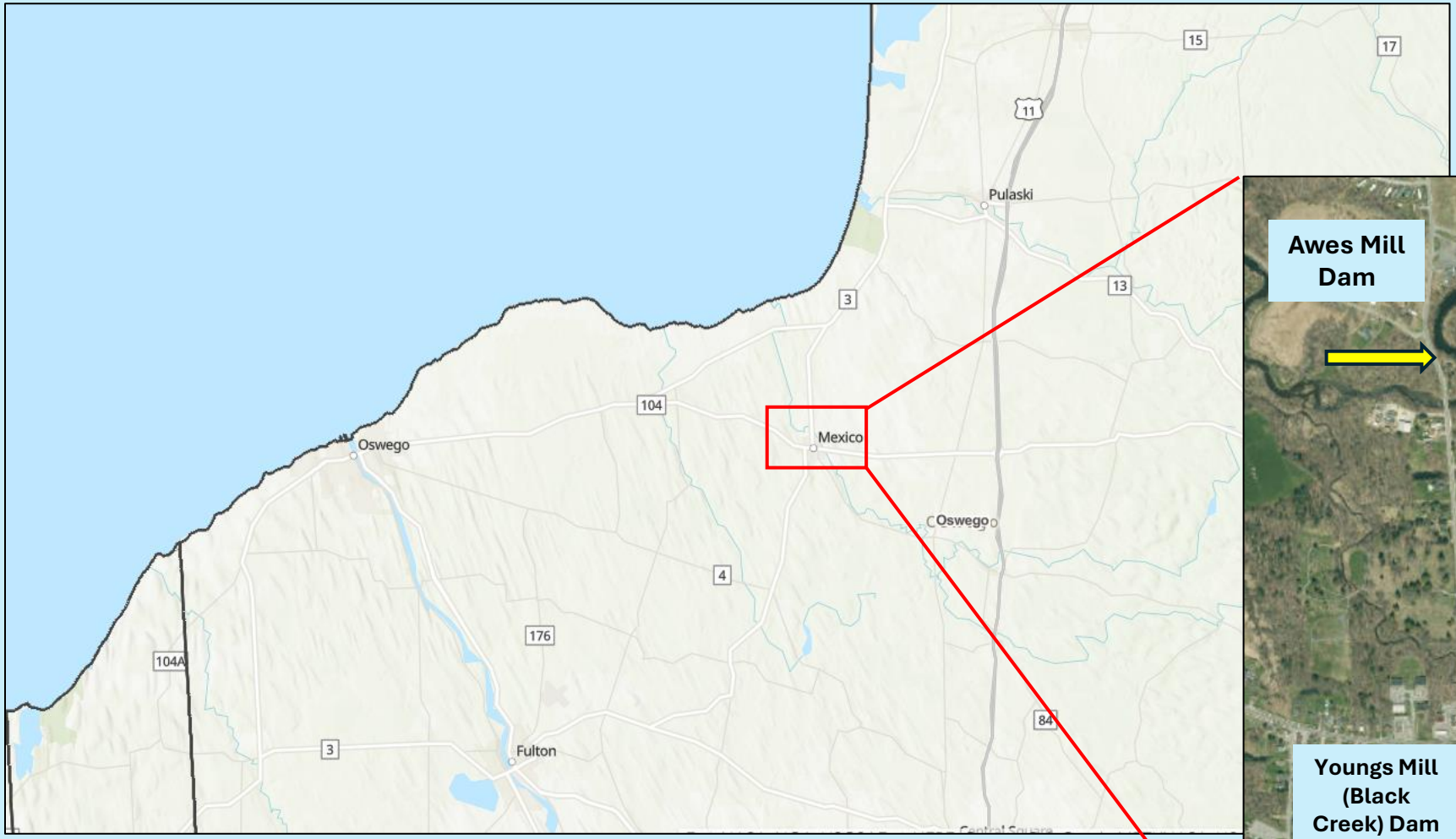
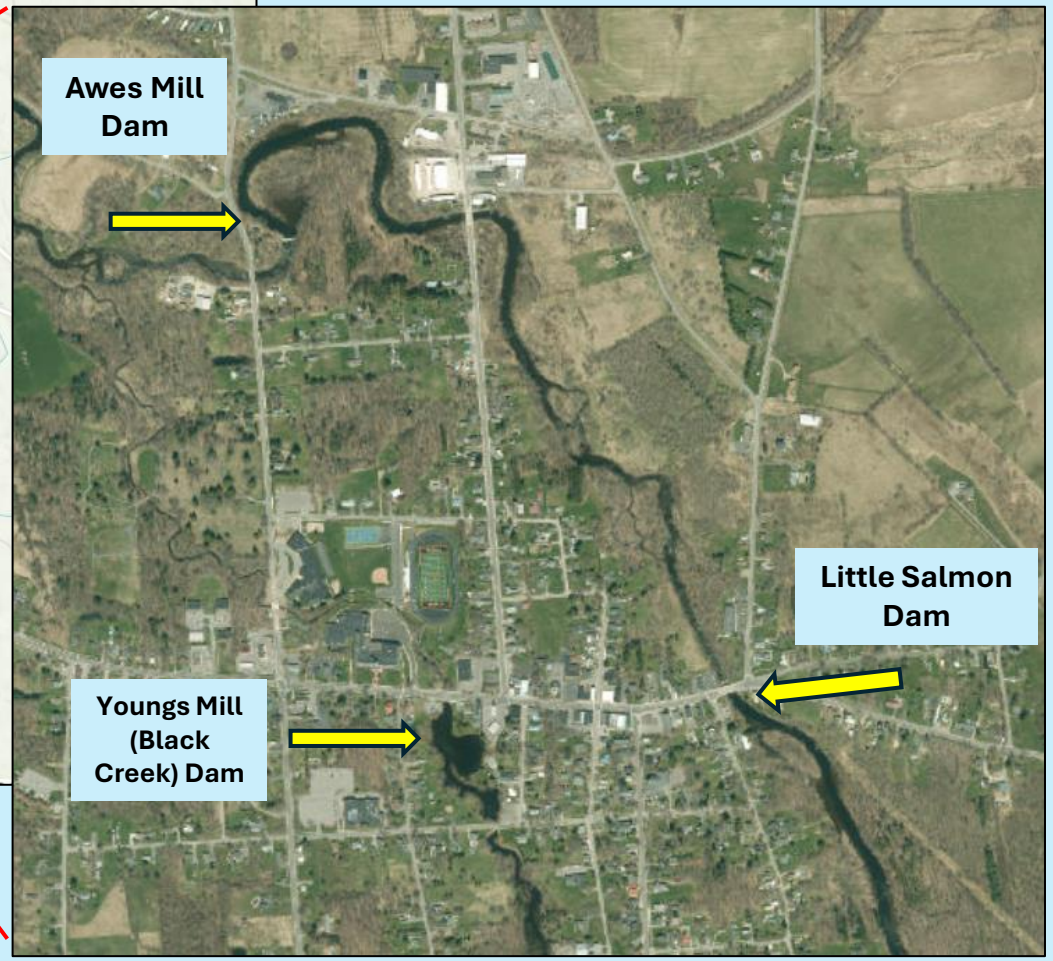
Monitoring Locations

2022 - 2024





YOUNGS MILL DAM
(2022-2023-2024)

LITTLE SALMON DAM
(2022-2023)

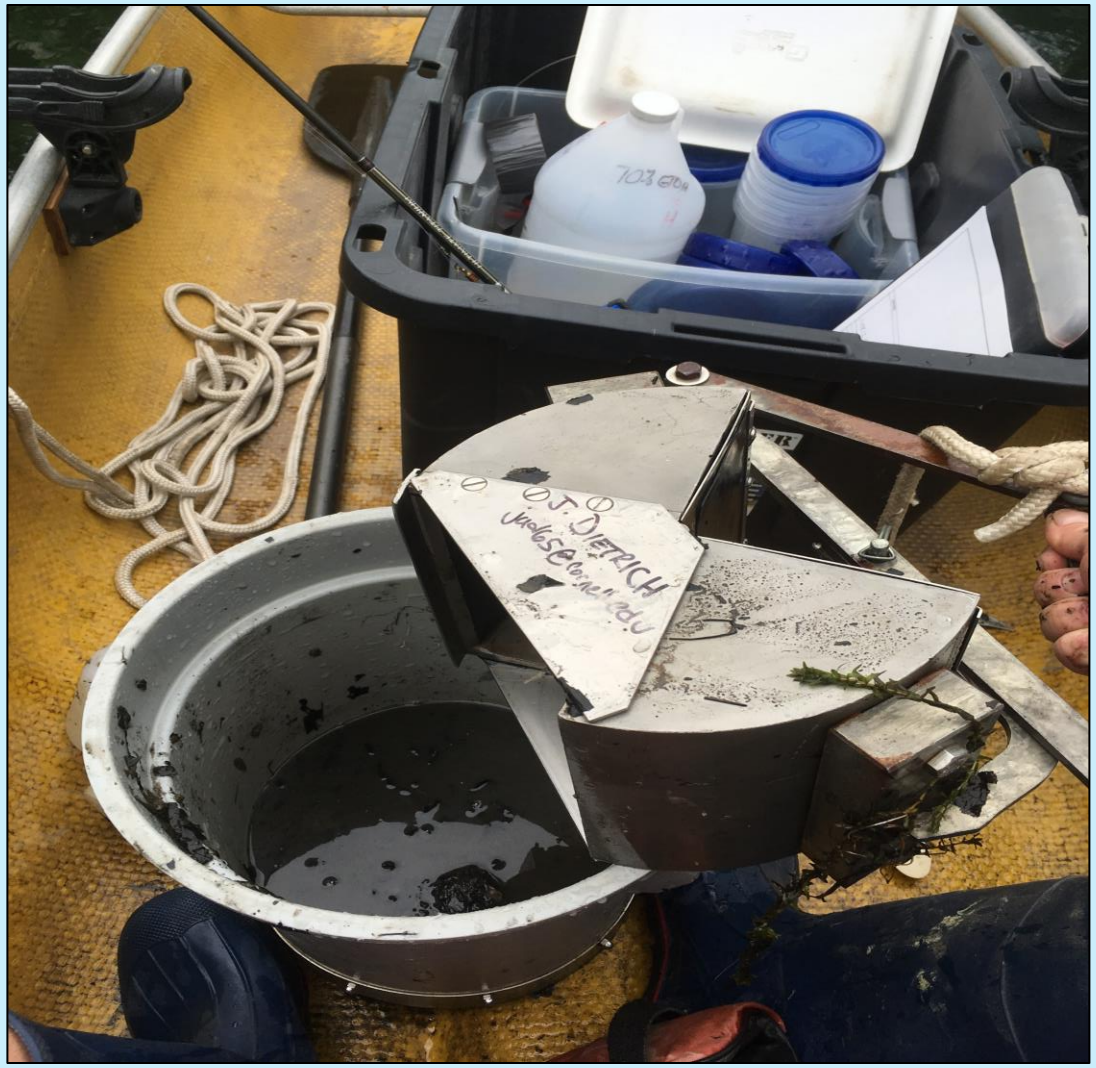
AWES MILL DAM
(2023-2024)

Field Sampling Locations / Transects

Paired upstream-downstream sampling sites.

Field Collections: Upstream Ponar Dredge

Capturing benthic organisms.

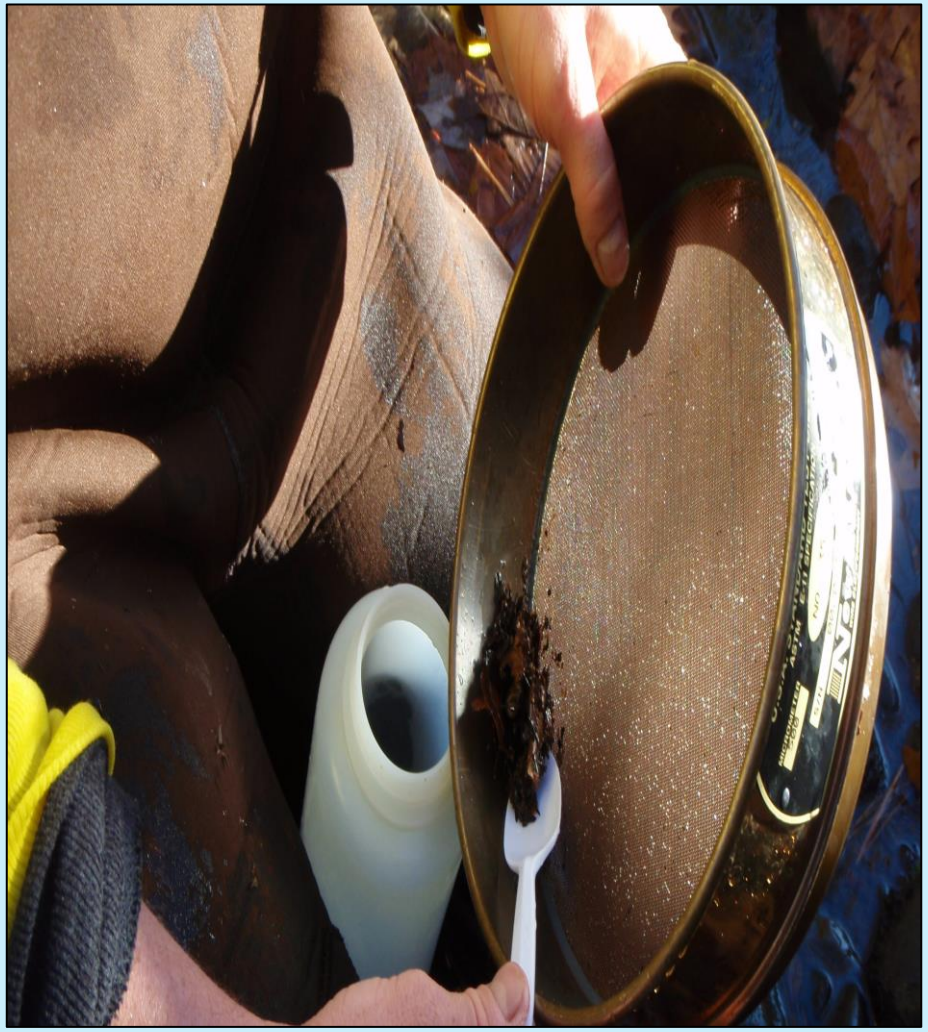


Field Collections Upstream: Multi-Plate Sample

Capturing organisms in drift and within water column.

Field Collections: Downstream Kick-Sample

Captures both benthic and drift organisms.

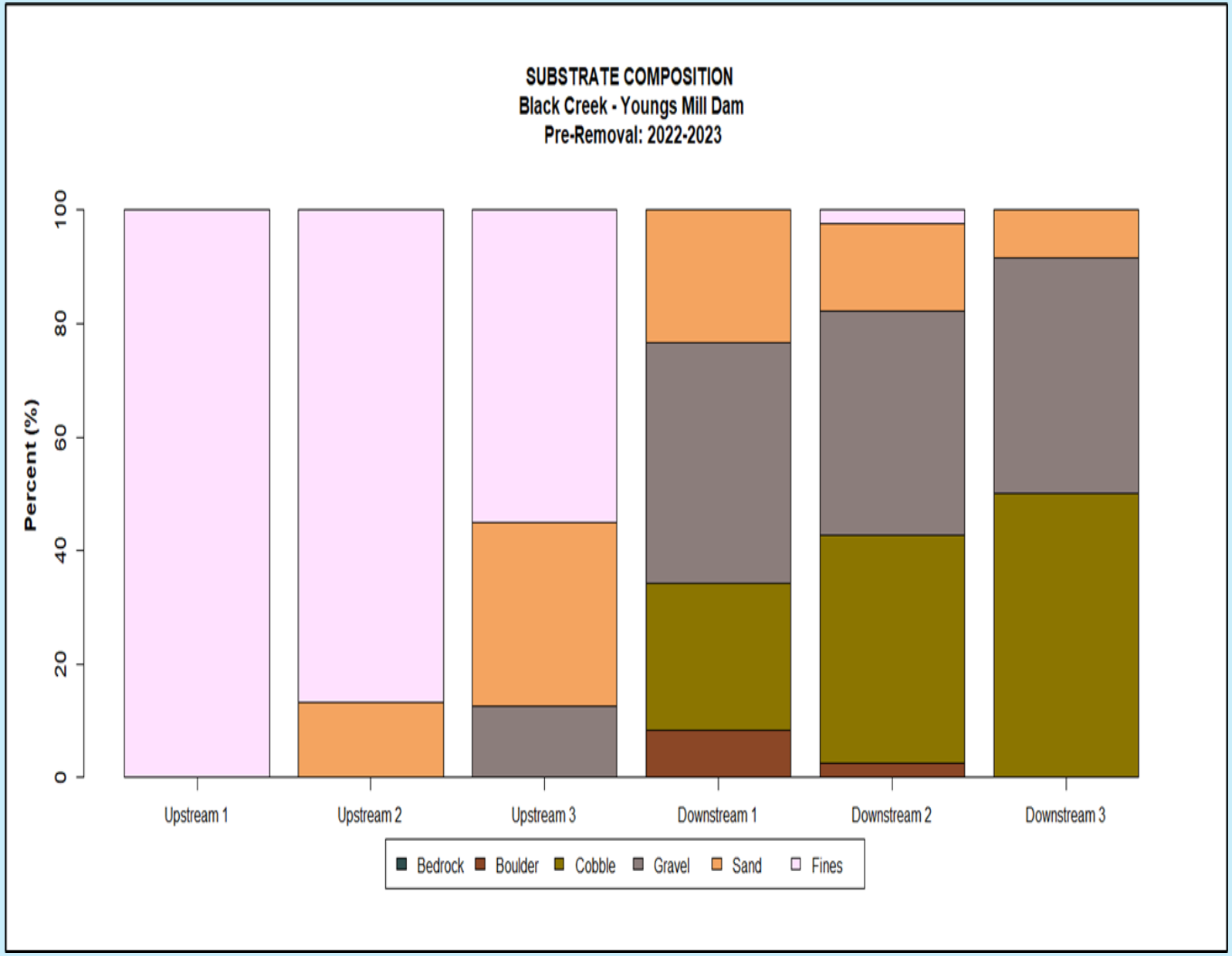


Transect Substrate and Channel Survey

Recording instream substrate type and channel elevation at every 1-ft; each end of transect is fixed with steel spike.

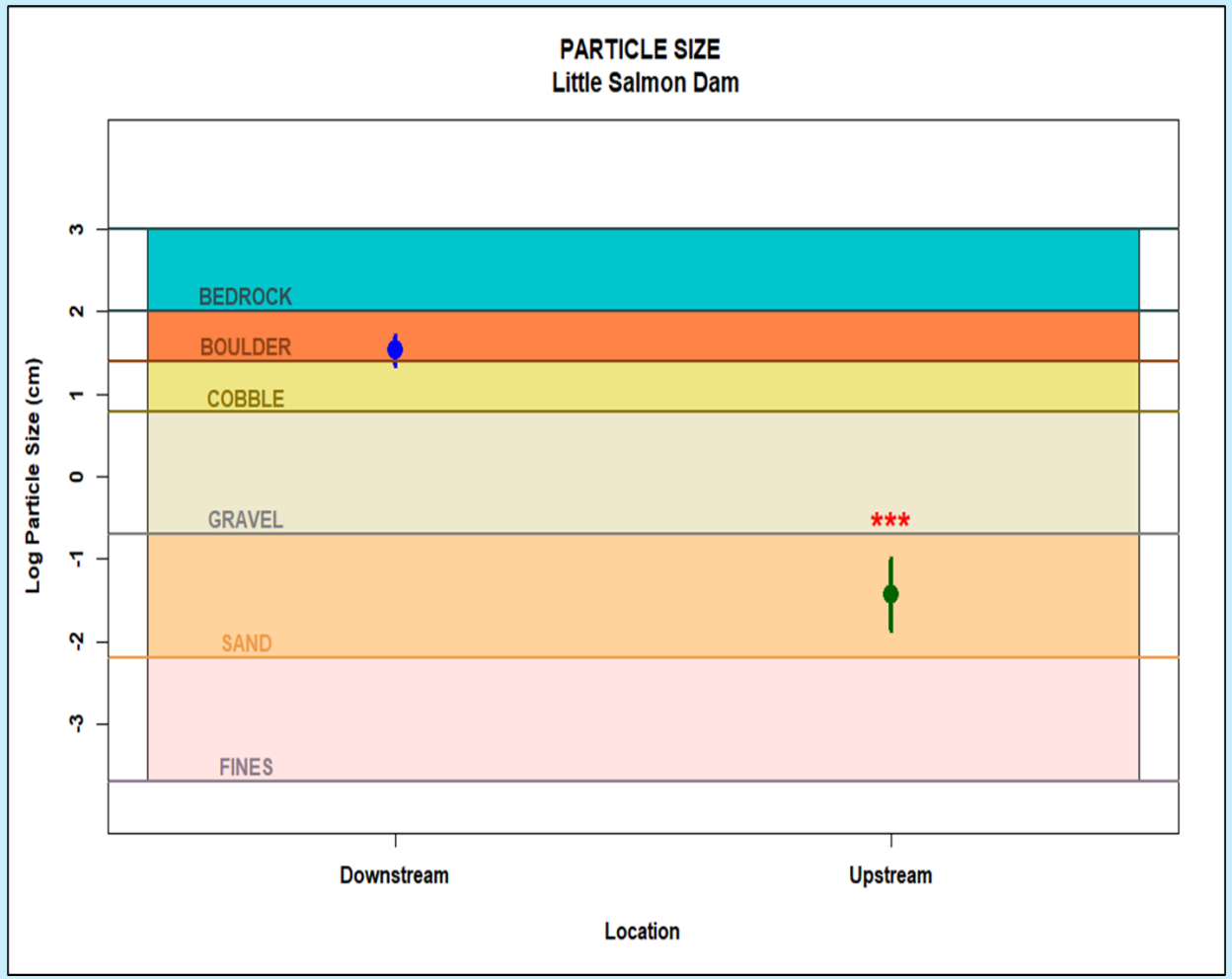
Substrate & Instream Habitat Pre-Removal Conditions

- All locations display benthic habitat disparities between the upstream impoundment and downstream tail reach.
- Upstream sediment composition within the impoundment on Black Creek, averages 78% silt/clay, 17% sand, and 5% gravel.
- Downstream of the Black Creek Dam, the sediment composition is more varied and consists of 4% boulder, 38% cobble, 41% gravel, 16% sand, and 1% silt/clay.
- Habitat variability important for maximizing biological diversity.

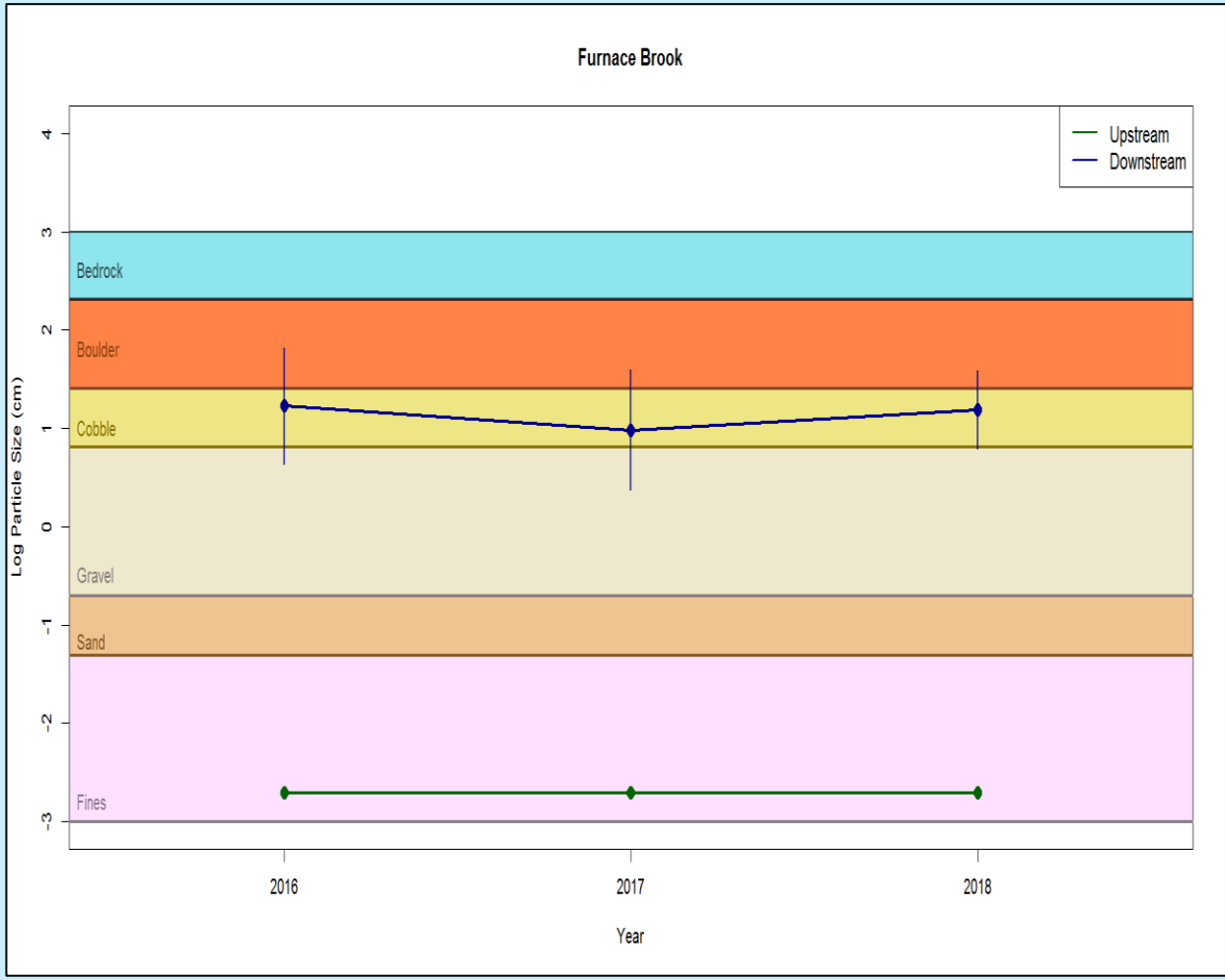


Quantitative Sediment Particle Size Trends

Upstream impoundment areas possess significantly lower particle size (0.07cm) than downstream reaches (37cm).

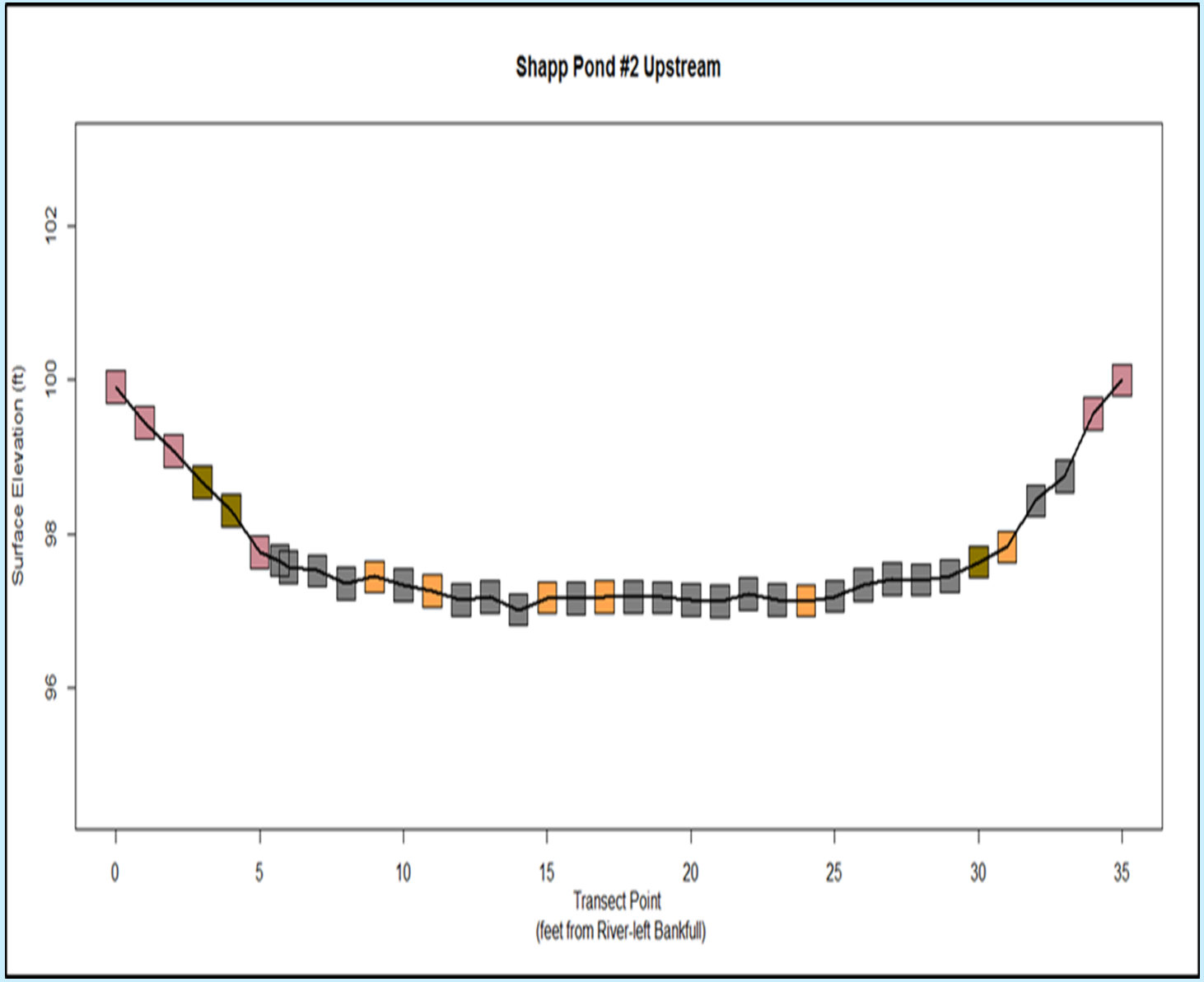


Barriers cause static habitat conditions due to the interruption of hydraulic forces and sediment transport.



Channel Morphology Transect Surveys

- Provide an elevational cross-section of the channel.
- Illustrate the distribution of different sediment types across the channel.
- Can track changes in channel morphology (erosion/deposition) and sediment distribution following dam removal.



In The Lab: Macroinvertebrate Processing

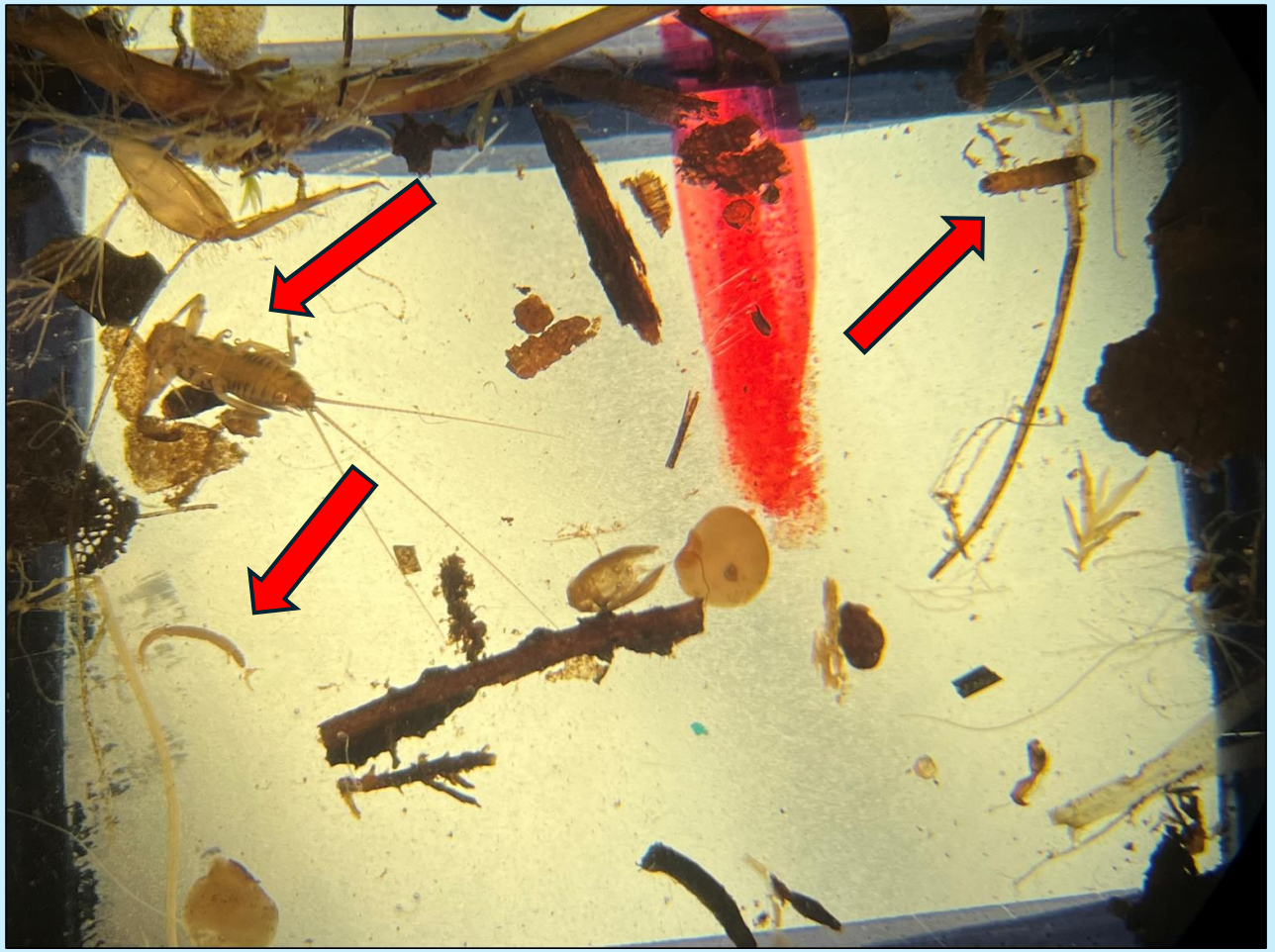
‘Raw’ sample collected from field site.

Evenly distributed in sorting pan, grids picked randomly to achieve min. 100 sub-sample count.

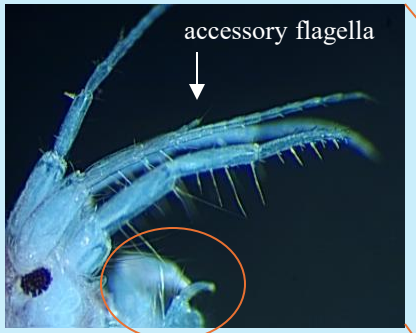
In The Lab: Picking Macroinvertebrate Sub-Sample

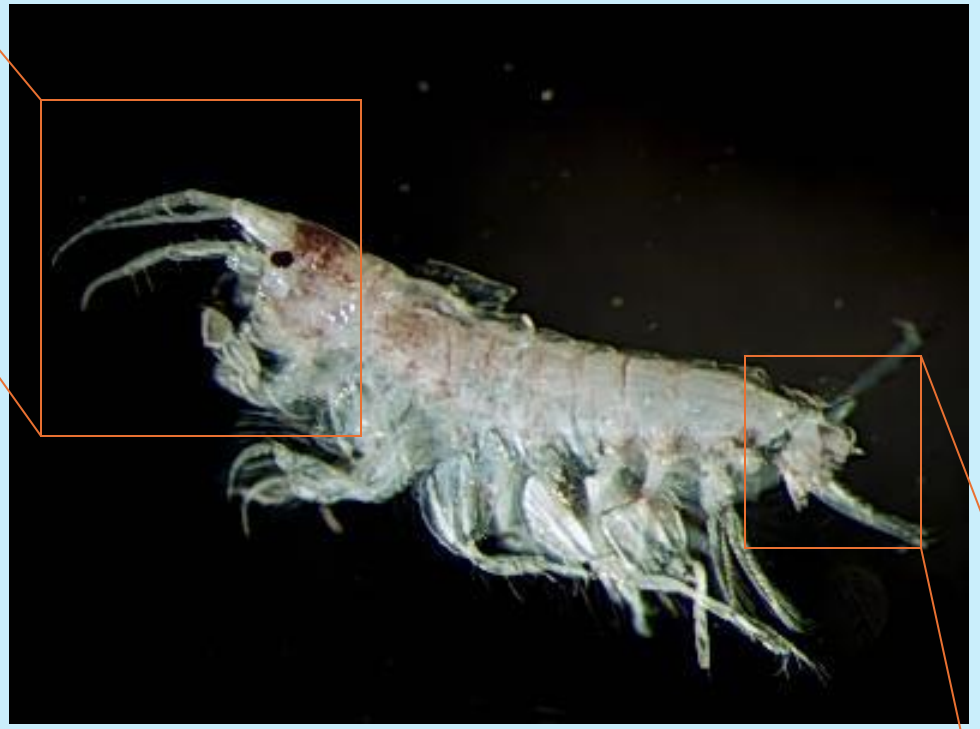
Raw sample grid contents placed into petri dish for inspection.

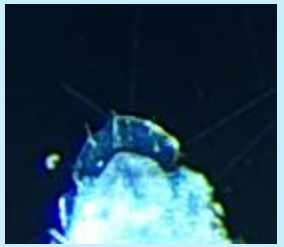
Under microscope (40x), macroinvertebrates are picked out of raw sample for ID and enumeration.



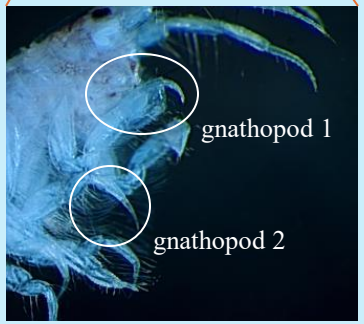
In The Lab: Macroinverterate Identification







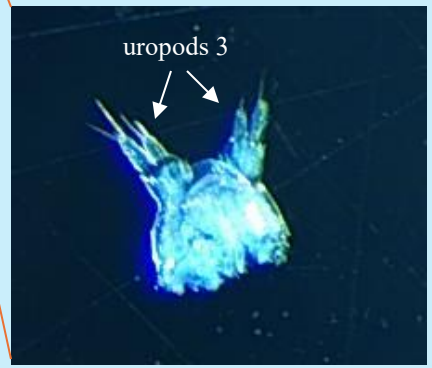
Telson is rounded and entire.



Gnathopods 1 larger than gnathopods 2.

(***Example slide…taxa not represented in all areas***)

Leptocheirus plumulosus is a common burrowing Aorid amphipod found in estuarine areas. Like all Aoridae, *L. plumulosus* has an accessory flagella, biramous uropods 3, and an entire telson.



Uropods 3 are short and biramous.

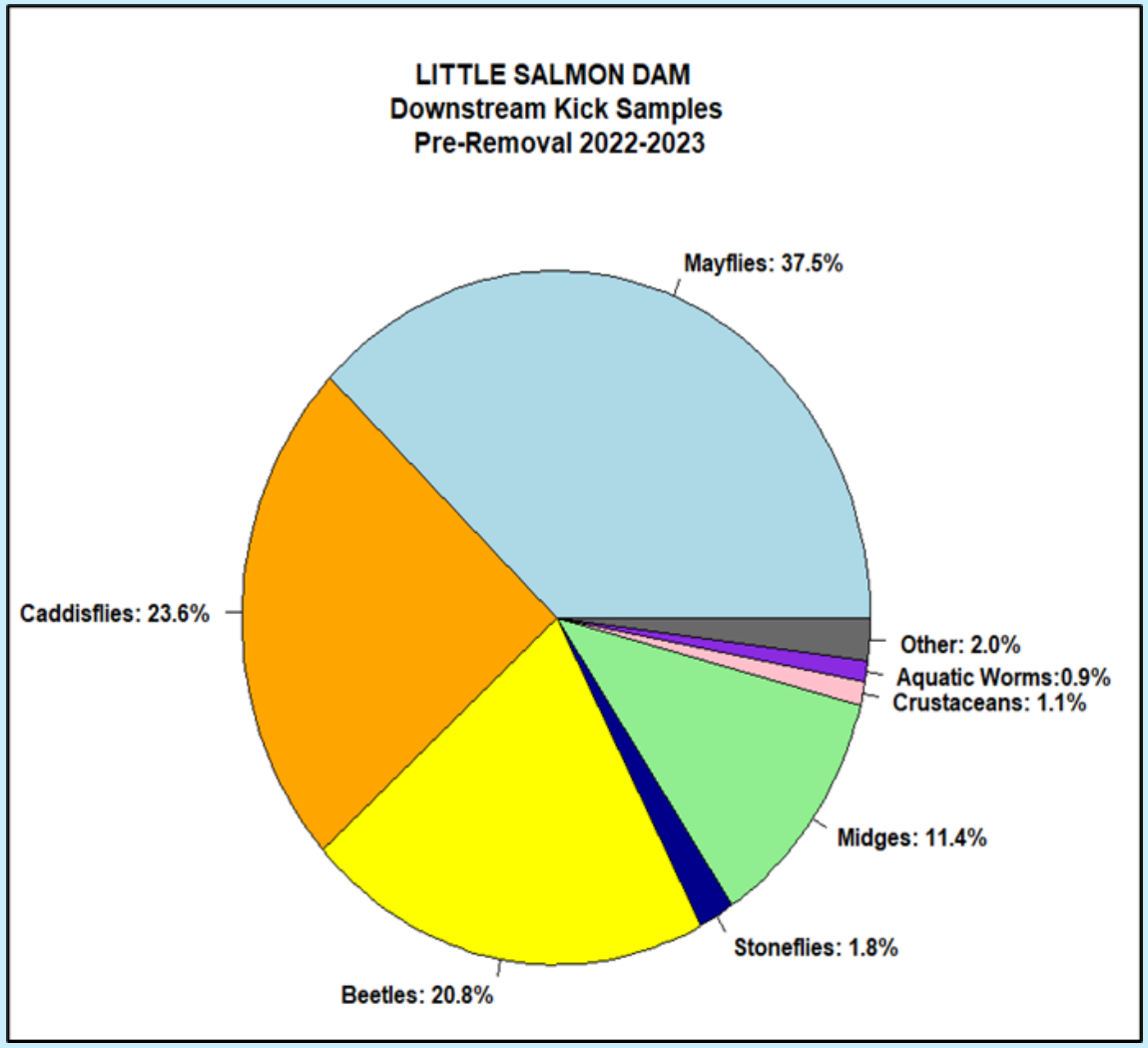
Data Analysis: Recording Taxa Information

Documenting abundance and diversity of existing macroinvertebrate population.

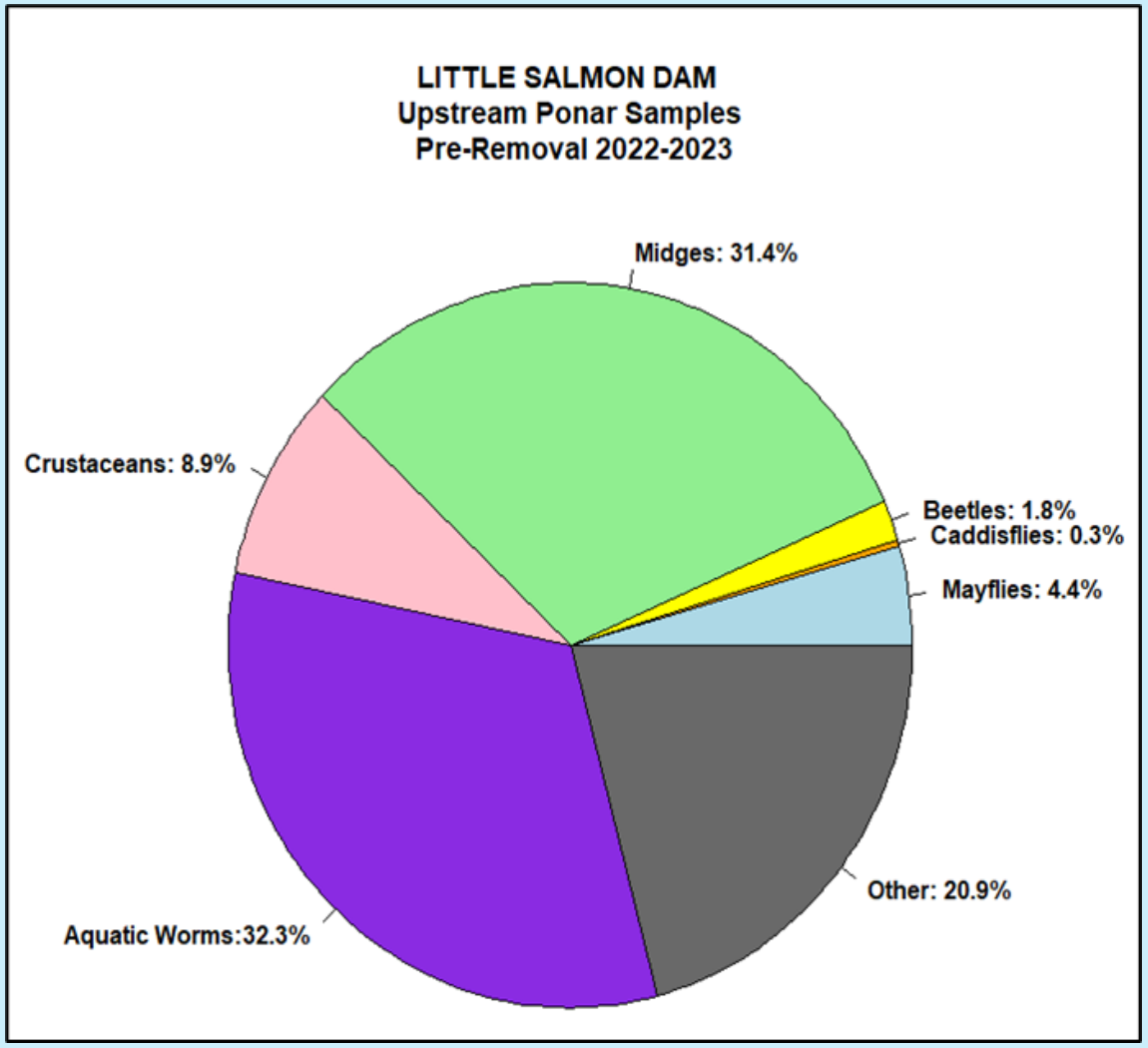
	A	B	C	D	E	F	G	H	I	J	K
1	**Site**	**Location**	**SampleType**	**Rep**	**Phylum**	**Class**	**Order**	**Family**	**Genus**	**n**	**N**
2	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Coleoptera	Elmidae	Optioservus	2	
3	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Coleoptera	Elmidae	Stenelmis	14	
4	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Coleoptera	Psphenidae	Psphenus	1	
5	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Diptera	Chironomidae		14	
6	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Diptera	Simulidae	Simulium	1	
7	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Ephemeroptera	Baetidae	Acentrella	1	
8	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Ephemeroptera	Baetidae	Baetis	8	
9	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Ephemeroptera	Baetidae	Plauditus	2	
10	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Ephemeroptera	Caeniidae	Caenis	1	
11	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Ephemeroptera	Ephemerellidae	Serratella	6	
12	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Ephemeroptera	Heptageniidae	Leucrocuta	5	
13	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Ephemeroptera	Heptageniidae	Macaffertium	8	
14	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Ephemeroptera	Isonychiidae	Isonychia	3	
15	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Plecoptera	Perlidae	Neoperla	1	
16	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Plecoptera	Perlidae	Perlesta	2	
17	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Trichoptera	Brachycentridae	Micrasema	1	
18	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Trichoptera	Helicopsychidae	Helicopsyche	1	
19	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Trichoptera	Hydropsychidae	Cheumatopsyche	7	
20	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Trichoptera	Hydropsychidae	Hydropsyche	19	
21	Awes Mill Dam	Downstream	Kick	1	Arthropoda	Insecta	Trichoptera	Philopotamidae	Chimarra	12	**109**
22	Awes Mill Dam	Downstream	Kick	2	Annelida	Oligochaeta				2	
23	Awes Mill Dam	Downstream	Kick	2	Arthropoda	Insecta	Coleoptera	Elmidae	Promoresia	2	

Data Analysis: Assessing community structure

Downstream populated by common invertebrates found in good quality streams.

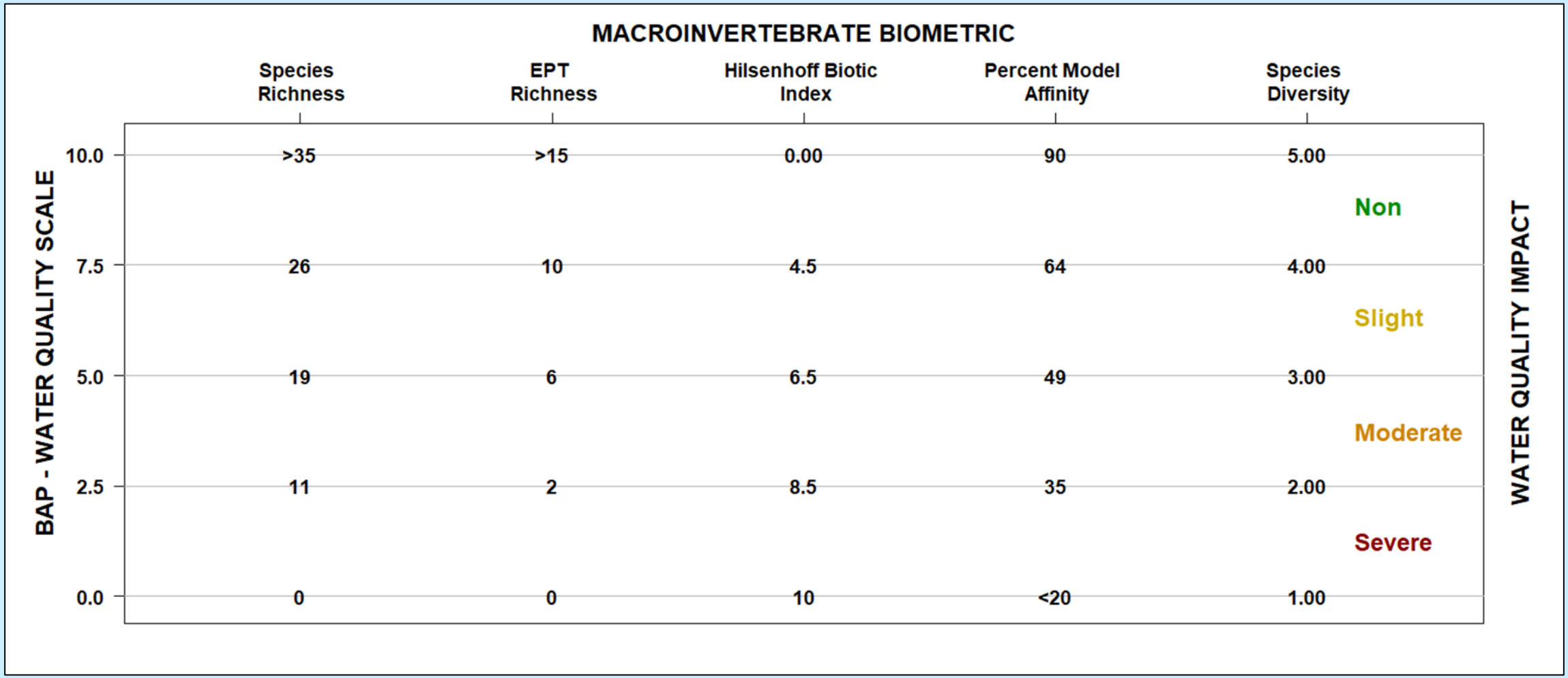


Upstream populated by common pond organisms tolerant of fair to poor water quality.



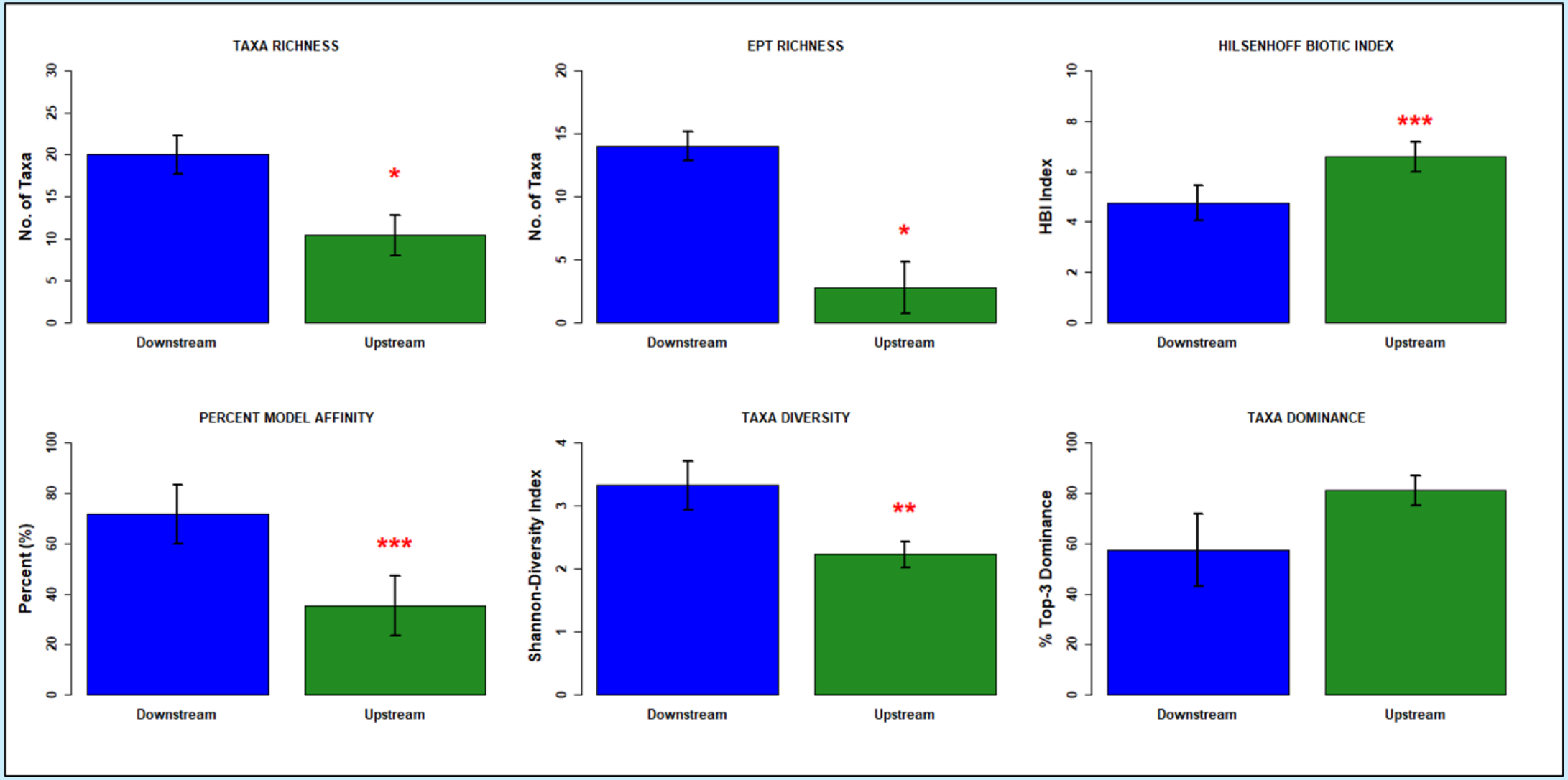
Data Analysis: Biometric Indices

Converting macroinvertebrate community composition information to quantitative water quality data. Each individual metric corresponds to a water quality score and impact designation associated with the NYS DEC Biological Assessment Profile (BAP) Score.



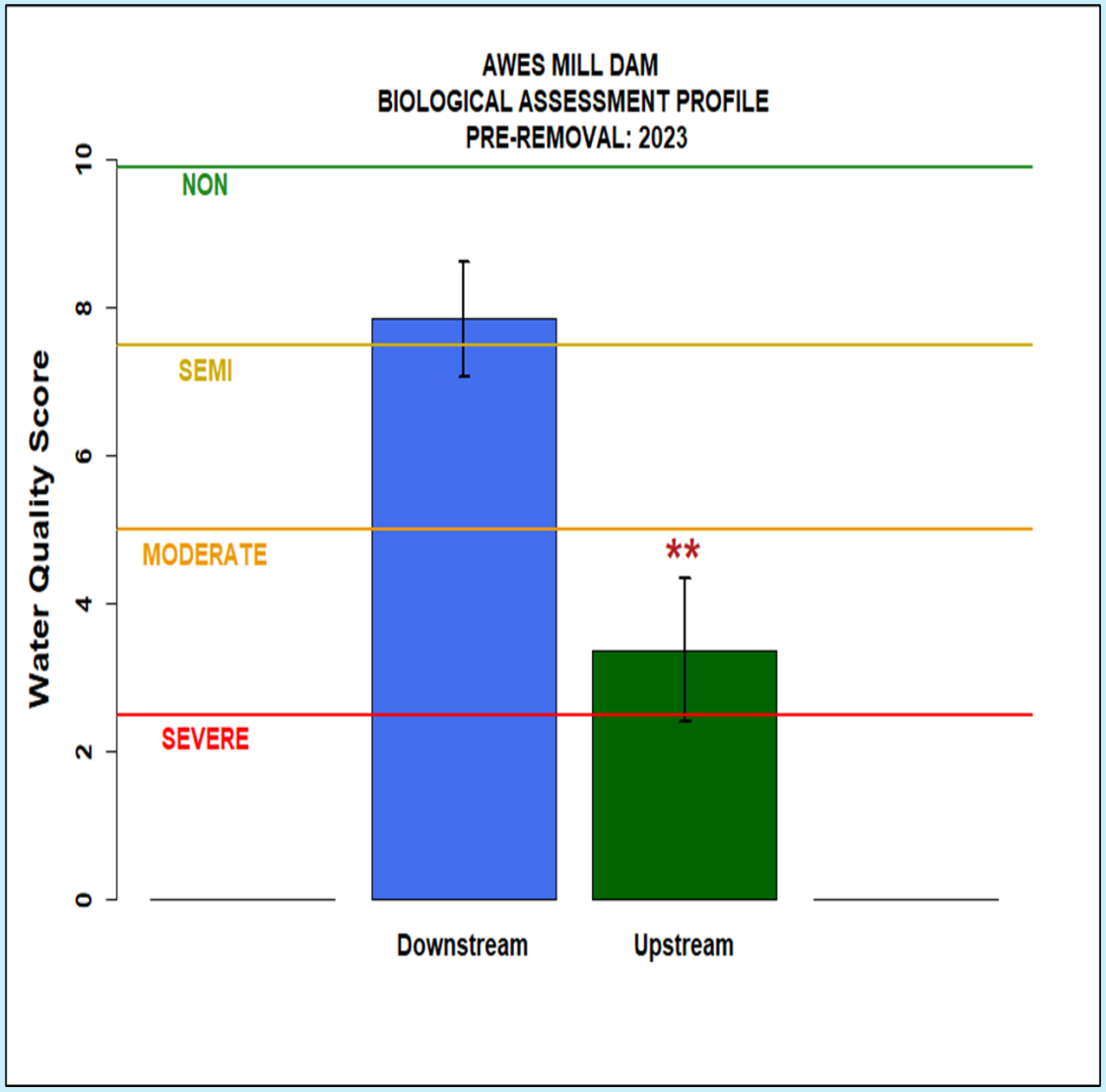
Data Analysis: Comparing Biometrics Across Locations

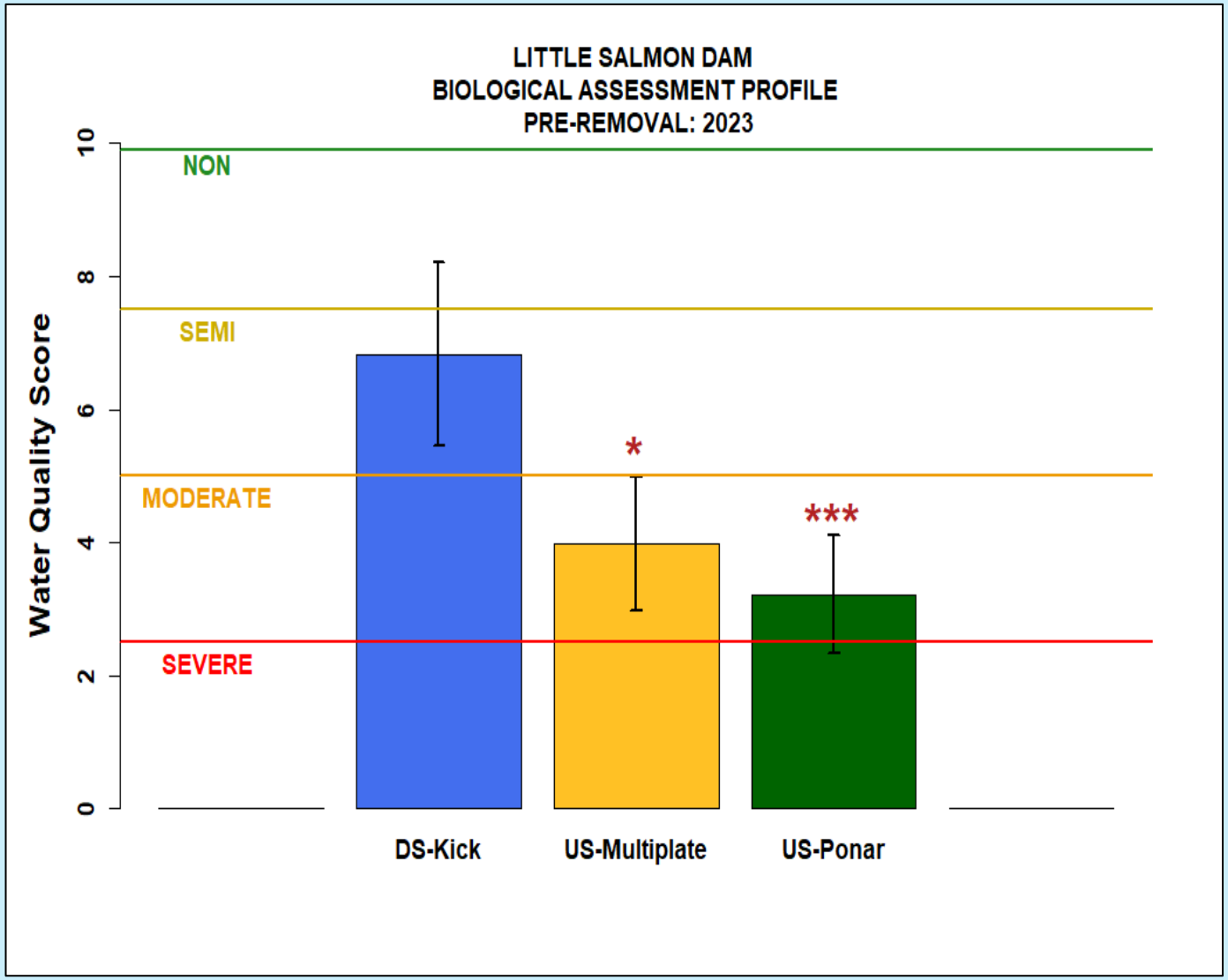
Awes Mill Dam biometric comparison between upstream impoundment and downstream reach in 2023. The upstream location is consistently more impaired than downstream reach.



Data Analysis: BAP Water Quality Results

Upstream locations fall below the 'Impaired Waterbodies' threshold of a 5.0 water quality score.

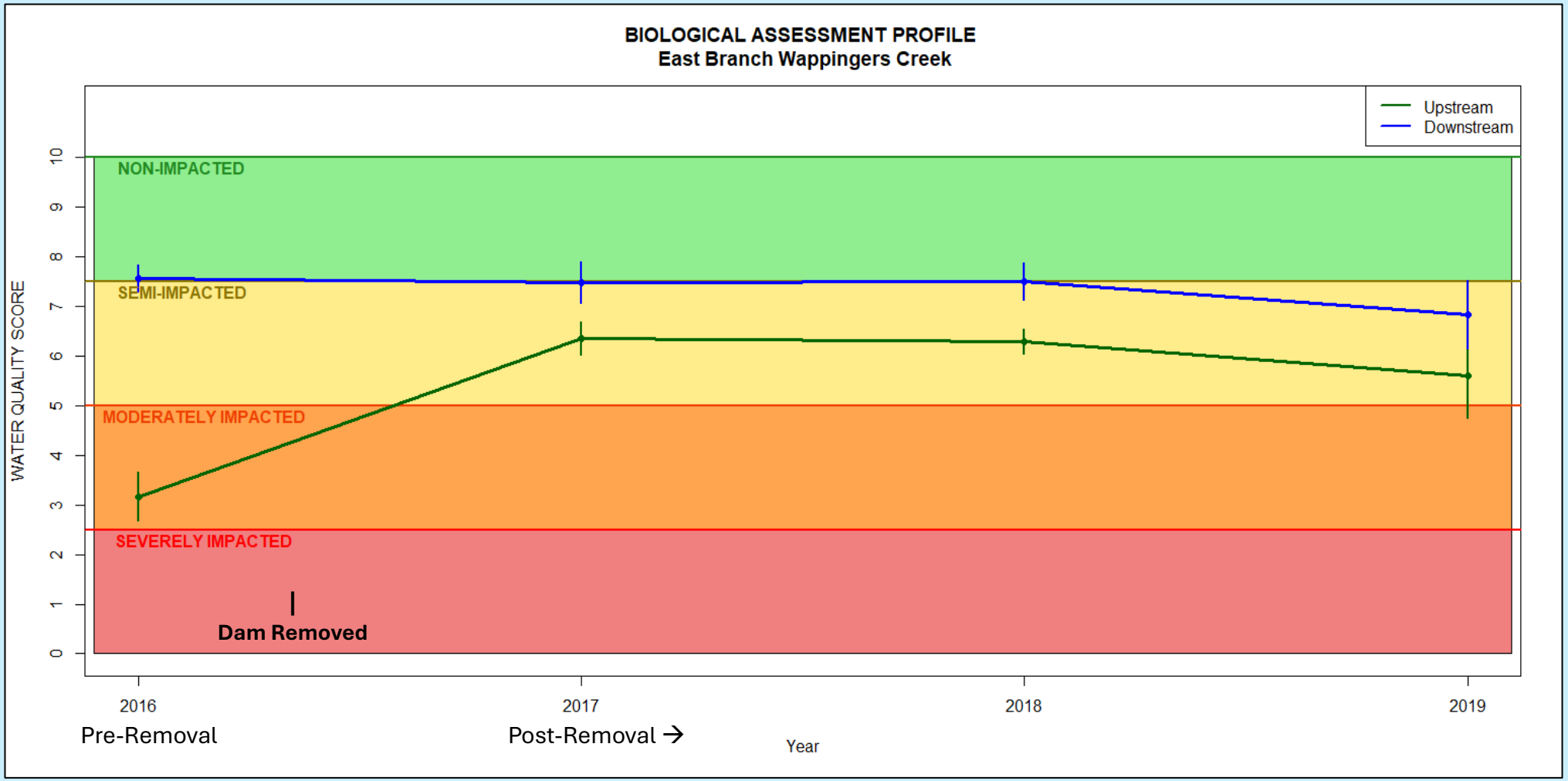




Monitoring Dissemination

Allows for the illustration of water quality trends resulting from management actions and documents successful restoration outcomes.

Example: Shapp Pond Dam, Dutchess County



THANK YOU FOR PARTICIPATING

? QUESTIONS ?