Macroinvertebrate Communities of the Backwaters, Side Channels, and Rice Lake of the St. Croix River in July 2010.

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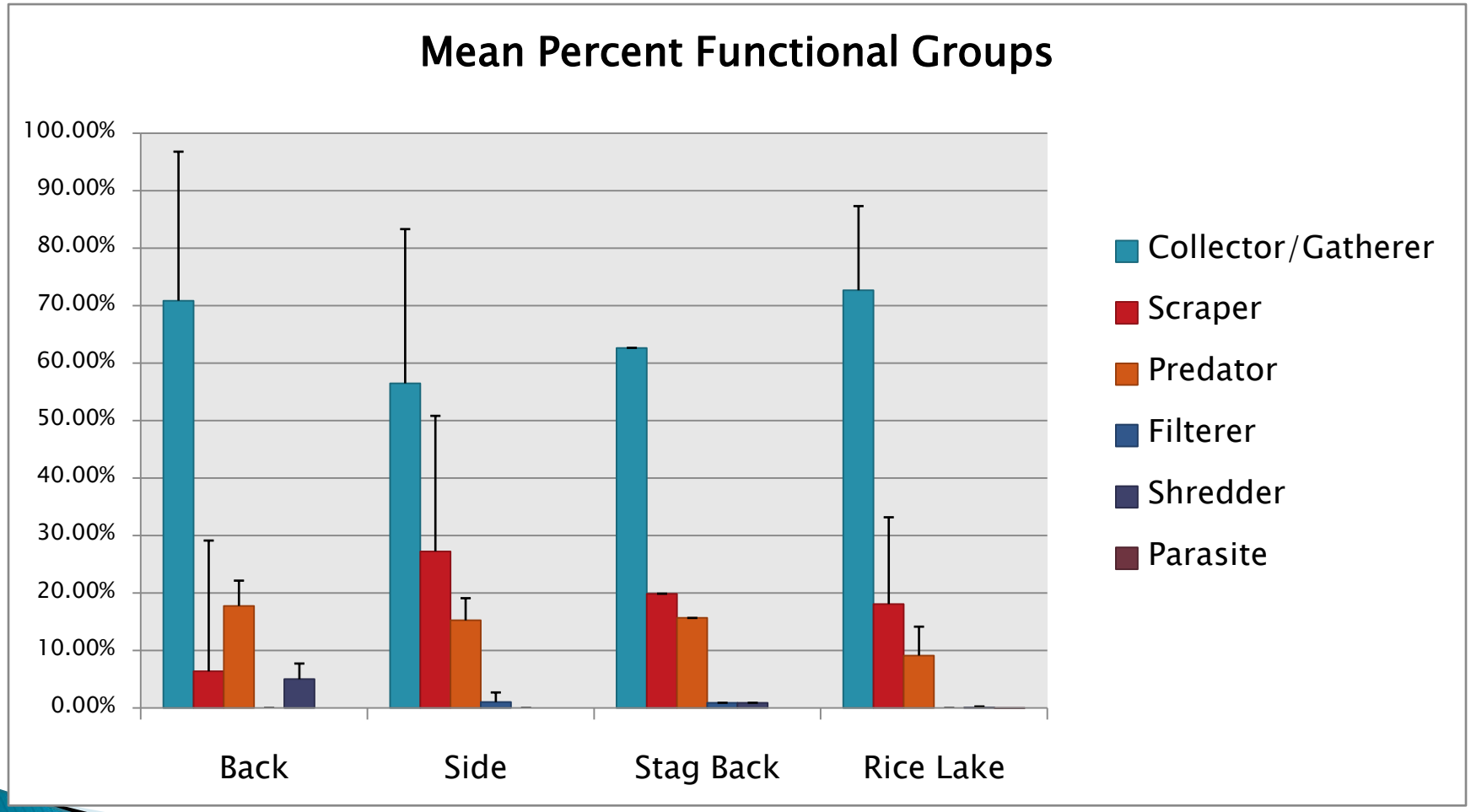
Project Overview

- Macroinvertebrates are the main food source for many fish species and help break down detritus in aquatic ecosystems.
- This project helps assess the existing communities in a backwater, stagnant backwater, side channel, and Rice Lake on the St. Croix River near Marine on St. Croix, MN.
- Results from this project will be used as preliminary work for the National Park Service for more detailed studies.

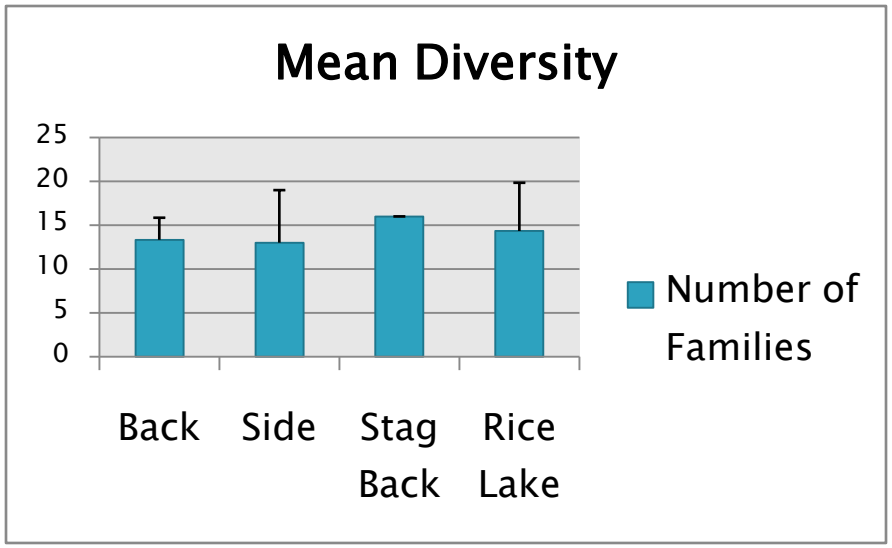
Methods

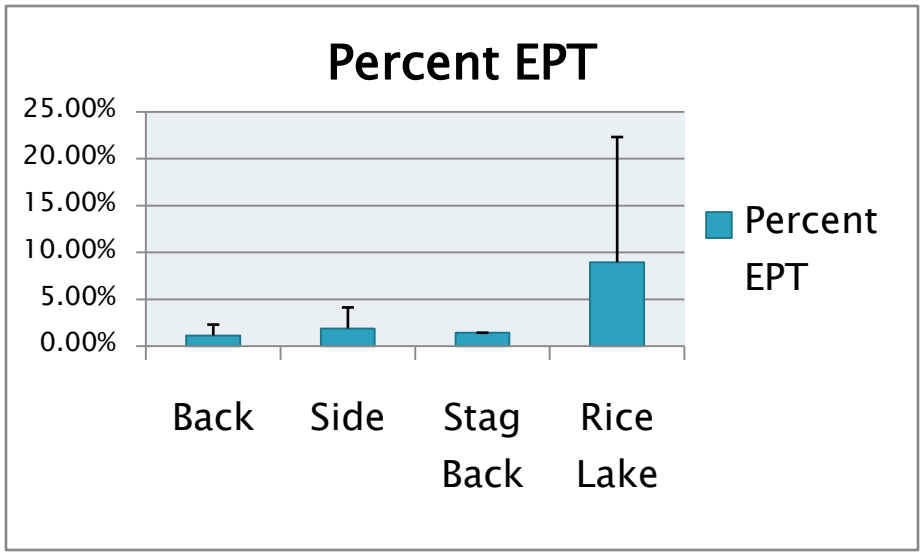
- Each sample area was treated as a habitat (backwater, side channel, etc).
- Each habitat was sampled in 3 areas to give the most comprehensive view of all subhabitats (sand bars, weed beds, etc), excluding the stagnant backwater due to small size.
- Sites were sampled by 2 people using dipnets in a 10 square meter area for 10 minutes.
- Organisms were sorted to taxonomic family in the lab.
- Water quality samples were bottled and taken to the lab for further analysis.
- Water quality readings were taken at each site with a YSI handheld sonde.

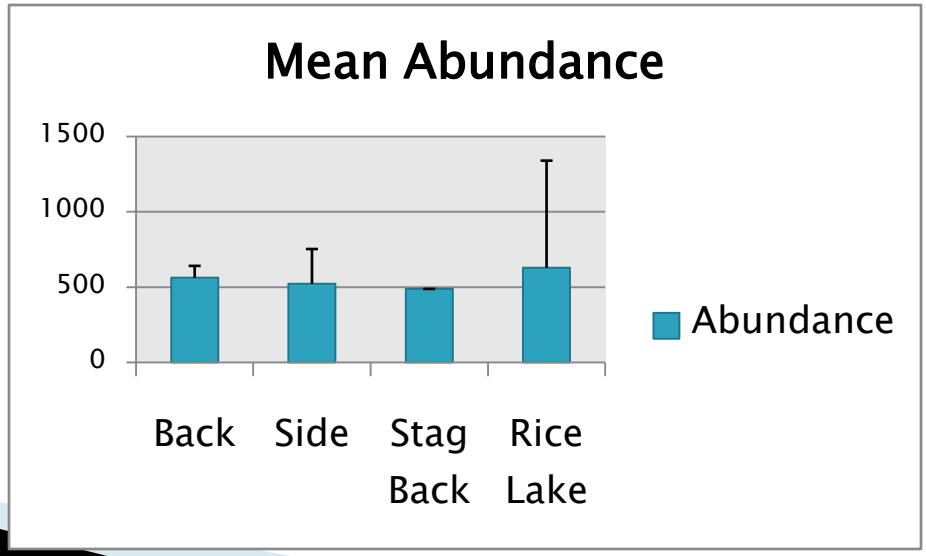
Results


Mean Percent Functional Groups
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
Back
Side
Stag Back
Rice Lake
Collector/Gatherer
Scraper
Predator
Filterer
Shredder
Parasite

Results cont'd







Results cont'd

Water Quality	Temp °C	Spec Con mS/cm	DO mg/L	pH	% DO
Back	23.79	0.242	8.88	8.26	115.57
Side	23.98	0.166	6.07	7.47	73.50
Stag Back	23.26	0.139	3.17	7.24	43.2
Rice Lake	26.08	0.176	4.76	7.39	72.19

Flow Estimate m/s	T1	T2	T3	Mean
Side	0.100	0.077	0.087	0.088
Back	0.000	0.000	0.000	0.000
Stag Back	0.000	0.000	0.000	0.000
Rice Lake	0.050	0.040	0.070	0.053

Conclusions

- Intermediate flow supported organisms that generally require higher quality water. The intermediate flow brings nutrients and food in at a rate where the organisms can use it before it is washed on. It also introduces higher dissolved oxygen and mixing of nutrients not found in backwaters or side channels. A similar result was found in an earlier study on the upper St. Croix near St. Croix State Park (C.A. DeGuire et al. 2009).
- All habitats were dominated by collector/gatherer feeders.
- Taxonomic diversity and abundance were highest in sites that were relatively stable, and not necessarily related to flow.
- Abundance and diversity seem to be related to dissolved oxygen levels, except in the stagnant backwater possibly due to low sample size.
- These conclusions may be used as preliminary work for more detailed studies by the National Park Service and other agencies.