DIET OVERLAP BETWEEN NATIVE YELLOW PERCH (PERCA FLAVESCENS) AND INVASIVE WHITE PERCH (MORONE AMERICANA) IN TWO MAJOR LAKE CHAMPLAIN TRIBUTARIES.

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Summary
White perch (Morone americana, Fig. 1) are not native to the Lake Champlain Basin, but have become established since their introduction in the 1980s. As efficient opportunist feeders, white perch potentially compete for food with native fishes such as yellow perch (Perca flavescens, Fig. 2). Goals of this study were to determine if significant diet overlap exists between these two fishes and to document seasonal diet shifts in two major Lake Champlain tributaries. Yellow perch (n = 74) and white perch (n = 96) were sampled biweekly from late May through August, and diet overlap was quantified using Schoener’s Index of Proportional Overlap. Diet overlap between species in both rivers was generally not significant. Eggs were common in the diets of both fishes in the late spring; chironomids and other benthic invertebrates constituted the majority of the diets throughout the summer (Fig. 4).

Results

- Eggs were common in diets of both fishes in both rivers in late spring; chironomids and other benthic invertebrates constituted the majority of the diets throughout the summer (Fig. 4).
- Diet overlap was generally not significant in either river; significant overlap (Schoener Index ≥ 0.60) occurred in one of four samples in each river (Tables 1a-b).

Discussion and Conclusions

- Diet overlap was generally not significant between white and yellow perch adults in the Winooski and Missisquoi Rivers (Table 1).
- Significant diet overlap occurred when both species focused on chironomids and juvenile fishes in the Winooski River (2 July, Fig. 4) and unidentified fish eggs and chironomids in the Missisquoi River (29-30 May, Fig. 4).
- Data are consistent with opportunistic feeding, as diets shifted regularly over time (Fig. 4).
- In summary, given white and yellow perch diet overlap data from Missisquoi Bay, the Winooski River and the Missisquoi River:
  - The degree of diet overlap among adults is related to similar temporal shifts in diet by both species.
  - The habitats of the two adult fishes appear well partitioned in both rivers, and thus spatial overlap appears minimal.
  - Future studies might investigate interactions between white perch and juvenile yellow perch, or other species, in the Lake Champlain Basin. The lower Missisquoi River includes rare, suitable walleye spawning habitat (Smith and Yale 2003), and white perch have fed heavily on walleye eggs during spawning periods (Schaeffer and Margraf 1987).

Acknowledgments: This research was made possible by the support of the Lake Champlain Research Consortium and Saint Michael’s College.

Table 1. Summary of Schoener Index values by sample. Red indicates significant (≥ 0.60) diet overlap.

<table>
<thead>
<tr>
<th>Sample Date</th>
<th>Schoener Overlap Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winooski River</td>
<td>Missisquoi River</td>
</tr>
<tr>
<td>5-7 July</td>
<td>2-7 July</td>
</tr>
<tr>
<td>2-7 July</td>
<td>2-7 July</td>
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</tbody>
</table>

A. The Missisquoi River

- We sampled fishes by angling on an approximately biweekly basis, supplemented by overnight sets of three hoop trap nets.
- We measured total and standard lengths (TL and SL, cm) and weight (g).
- Stomachs were weighed (g) and then dissected; food items were identified to the lowest taxonomic group possible.
- We calculated percent composition for each food item in each stomach, and used the Schoener Index of Proportional Overlap (Schoener 1970) to statistically quantify diet overlap; values range from 0 (no overlap) to 1 (perfect overlap) with an accepted significance value of 0.60.  

\[ C_{op} = 1 - 0.5 \left( \frac{P_1 + P_2}{2} \right) \]