River Watch 2008

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Hanson Riverwatch

Back To The River!

The State Of The Indian Head River 2007 - 2008
The Team

Hanson Middle School
The Indian Head River forms the Northern Border of the Town of Hanson. Other towns that impact the water quality directly in the areas of study include Pembroke to the east and Hanover to the north, northeast.

There are approximately 8 miles between our upstream site near Factory Pond and our downstream site at Ludham’s Ford or as other’s call it, Curtis’ Crossing.

The river covers about eight acres of land in this area and was most likely used as a fishing and travel spot for the Wompatuck Indians.

A guide named James Luddam carried Governor Winthrop across the Indian Head River in 1632 in order to get to Weymouth, Massachusetts.

Though the river is called The Drinkwater River in other towns, we have chosen to refer to it as the Indian Head River in the scope of our study.

There is a small beaver population and the river is annually stocked with trout. Massachusetts Fish and Wildlife has posted the river in it’s entirety from Forge pond in Hanover to route 3 in Norwell and Pembroke including Factory Pond as P6; fishing resources contaminated with mercury. If herring are caught, they must be thrown back into the river. This applies more to the Pembroke side of the river, as there is a fish ladder in Luddams Ford Park.

The likely source of the contamination from the no longer existing Clapps Rubber Factory.

Two new housing developments bracket the river just downstream of our site B location (State St.), one in the town of Hanson and the other in the town of Hanover.
Study Sites

A

B

C
Comparison of Dissolved Oxygen and Temperature Site: “A” Broadway St.
Comparison of Dissolved Oxygen and pH
For Site “A” Broadway St.

- pH
- Dissolved Oxygen

Time HHMMSS
Comparison of Dissolved Oxygen and Temperature Site: “B” State St.
Comparison of Dissolved Oxygen and pH For Site “B” State St.
Site C:
Curtis Crossing, Hanover
Comparison of Dissolved Oxygen and Temperature Site: “C” Curtis Crossing

![Graph showing the comparison of temperature and dissolved oxygen over time. The x-axis represents time in HHMMSS, the y-axis represents temperature in °C, and another y-axis represents dissolved oxygen in mg/L. The graph includes two lines: one for temperature (green) and one for dissolved oxygen (orange).]
Comparison of Dissolved Oxygen and pH
For Site “C” Curtis Crossing

![Graph showing comparison of dissolved oxygen and pH over time. The graph plots dissolved oxygen (DO) and pH values against time. The data points are marked with orange squares for DO and green diamonds for pH. The x-axis represents time in HHMMSS format, ranging from 16:00:00 to 8:00:00, while the y-axis shows pH values ranging from 7.8 to 8.6. The graph illustrates the fluctuation of both DO and pH over the specified time period.]
Comparison Of Dissolved Oxygen (mg/L) At 3 Different Test Sites 10/26/07
Comparison Of pH At 3 Different Test Sites 10/26/07

- Broadway St.
- State St.
- Curtis Crossing
Comparison Of Temperature, °C At 3 Different Test Sites 10/26/07
Average Temperature, pH and Oxygen Saturation For Three Study Sites

<table>
<thead>
<tr>
<th></th>
<th>Temp</th>
<th>pH</th>
<th>DO</th>
<th>DO%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadway St.</td>
<td>15.53294118</td>
<td>7.020588235</td>
<td>7.988235294</td>
<td>80.4</td>
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<tr>
<td>State St.</td>
<td>14.33058824</td>
<td>8.297058824</td>
<td>7.632352941</td>
<td>74.81176471</td>
</tr>
<tr>
<td>Curtis Crossing</td>
<td>15.12411765</td>
<td>7.024705882</td>
<td>8.354117647</td>
<td>83.29411765</td>
</tr>
</tbody>
</table>
Comparison of Nitrogen Load in Kg/Day For Three Study Sites
October 26, 2007

<table>
<thead>
<tr>
<th>Site</th>
<th>Load kg/Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadway</td>
<td>23.29</td>
</tr>
<tr>
<td>State</td>
<td>27.62</td>
</tr>
<tr>
<td>Curtis Crossing</td>
<td>27.82</td>
</tr>
</tbody>
</table>
Comparison of Nitrogen Load At Three Study Sites Over A Six Year Period

![Bar chart showing nitrogen load at three sites over a six-year period.](image)

<table>
<thead>
<tr>
<th>Year</th>
<th>Broadway St.</th>
<th>Curtis Crossing</th>
<th>State St.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>16.95</td>
<td>90.98</td>
<td>27.82</td>
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<tr>
<td>2002</td>
<td>25.72</td>
<td>52.72</td>
<td>20.67</td>
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<tr>
<td>2003</td>
<td>20.67</td>
<td>41.8</td>
<td>36.47</td>
</tr>
<tr>
<td>2004</td>
<td>19.264</td>
<td>36.47</td>
<td>47.88</td>
</tr>
<tr>
<td>2005</td>
<td>114.9</td>
<td>47.88</td>
<td>120.5</td>
</tr>
<tr>
<td>2006</td>
<td>70.6</td>
<td>120.5</td>
<td>62.275</td>
</tr>
<tr>
<td>2007</td>
<td>117.6</td>
<td>109.9</td>
<td>73.3</td>
</tr>
<tr>
<td></td>
<td>79.1</td>
<td>73.3</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>56</td>
<td>27.62</td>
</tr>
</tbody>
</table>
Differences in Discharge: Broadway St. And Curtis Crossing Over A Six Year Period
Mean Discharge (ft³/sec) By USGS Stream Gage Over a 16 Year Period: Site "C" Curtis Crossing

Macroinvertebrates
FBI = 4.538

SITE A

- Elmidae: 31%
- Psphenidae: 16%
- Amphipoda: 12%
- Gastropoda: 8%
- Pelycypoda: 0%
- Hyrudinea: 1%
- Philopotamidae: 1%
- Hydropsychidae: 1%
- Brachycentridae: 1%
- Cordulidae: 1%
- Chironomidae: 12%
- Cordulidae: 27%
- Philopotamidae: 1%
- Hydropsychidae: 0%
FBI = 3.912

SITE B

- Elmidae: 50%
- Gyrinidae: 2%
- Psphenidae: 5%
- Amphipoda: 6%
- Pelycypoda: 1%
- Hyrudinea: 7%
- Philopotamidae: 6%
- Hydropsychidae: 18%
Fecal Coliform

Average < 35 colonies per 100 ml
Lab Geeks Unite!
CONCLUSION