

# JUNCTION CREEK STREAM HEALTH AT-A-GLANCE 2019

## OVERALL STREAM HEALTH SCORE

**Current Status** Fair **Trend** Improving

## FISH COMMUNITY

**Current Status** Fair **Trend** Improving

### Fish Species Present

#### Pollution Intolerant

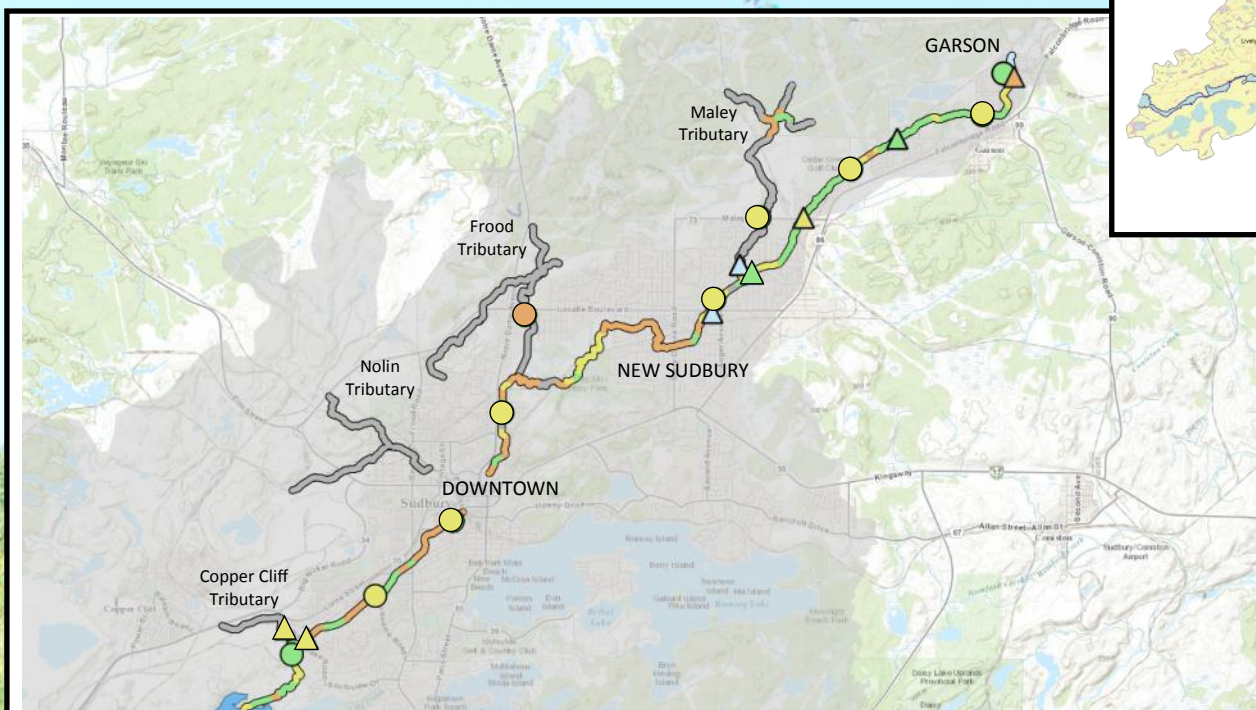
Blacknose shiner  
Brook trout  
Logperch

#### Pollution Sensitive

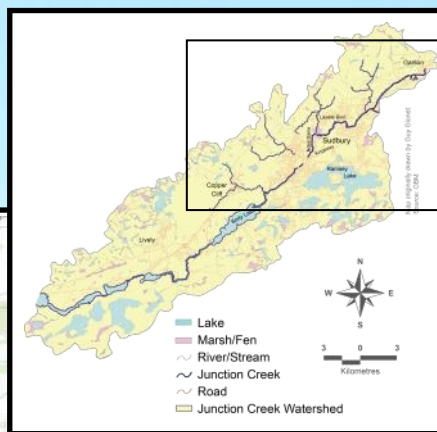
Brassy minnow  
Common shiner  
Finescale dace  
Iowa darter  
Northern redbelly dace  
Pearl dace  
Pumpkinseed  
Yellow perch

#### Pollution Tolerant

Brook stickleback  
Brown bullhead  
Central mudminnow  
Creek chub  
Fathead minnow  
Golden shiner  
White sucker



Map of the upper reaches of Junction Creek depicting results from the 2019 fish community assessment, water sampling and benthic macroinvertebrate sampling studies conducted by the Junction Creek Stewardship Committee.



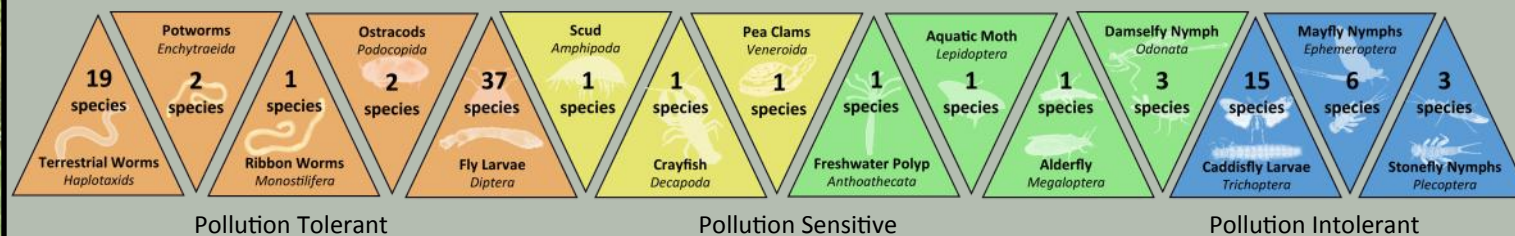
### MAP LEGEND

- Ward Boundary
- Watershed Boundary
- Benthic sampling site
- Water sampling site

### STREAM HEALTH INDEX

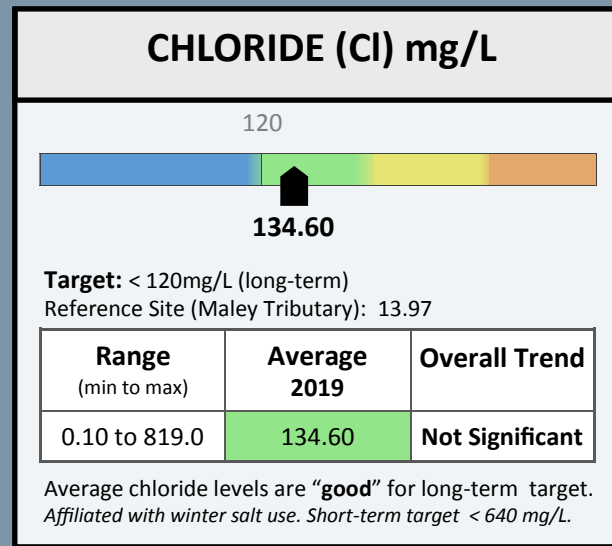
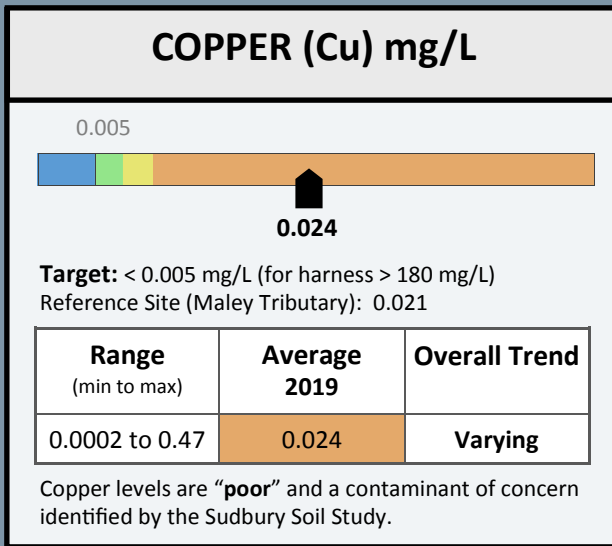
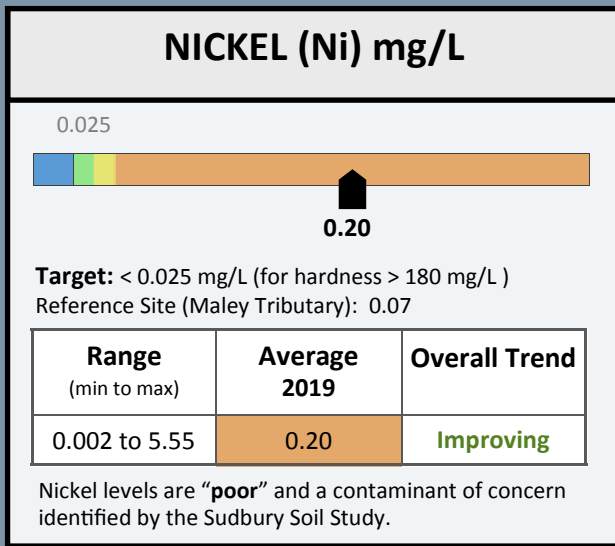
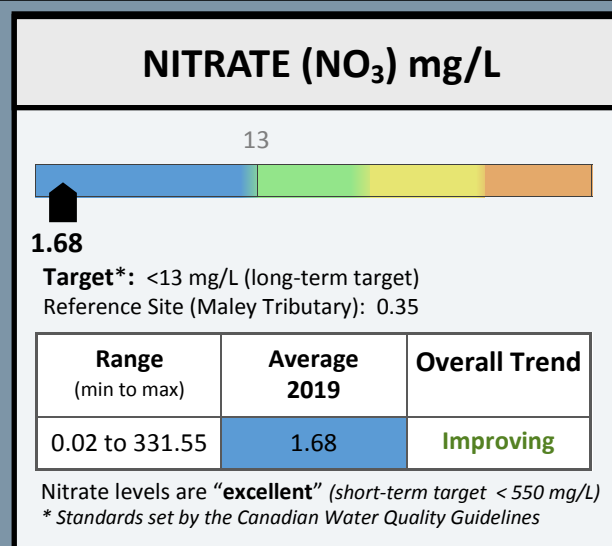
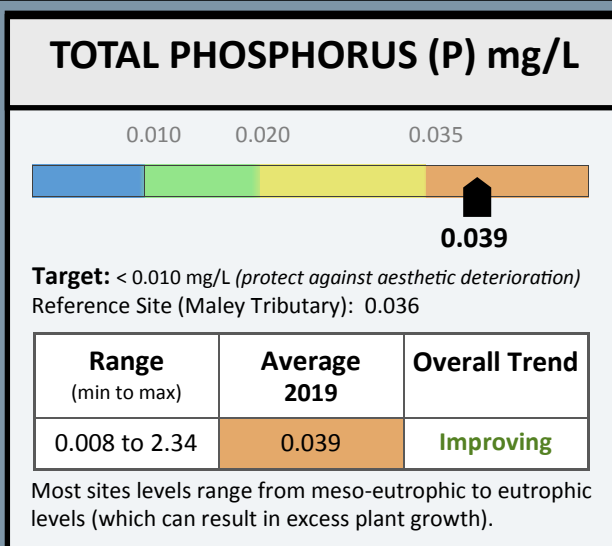
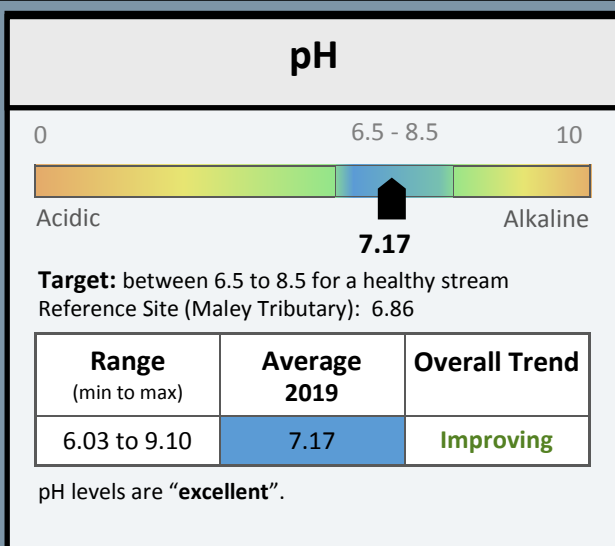
- Excellent
- Good
- Fair
- Poor
- Insufficient Data

## "AQUATIC BUGS" BENTHIC MACROINVERTEBRATES - INDICATOR SPECIES



## WATER QUALITY ANALYSIS 2004-2019 (10 Sampling Sites)

The water quality targets used are the provincial standards set out by the Provincial Water Quality Objectives (PWQO).



## MAJOR IMPAIRMENTS & FOCUS FOR RESTORATION EFFORTS



Litter & Stormwater



Degraded Stream Habitats



Invasive Species



Impaired Riparian Buffer



Altered Stream Corridor

Data collected by Junction Creek Stewardship Committee research projects with the assistance from multiple funding agencies, and collaborative partners, including but not limited to: City of Greater Sudbury, Conservation Sudbury, Vale Canada Ltd., Laurentian University, Cambrian College, Cooperative Freshwater Ecology Unit & Vale Living with Lakes Centre, WWF-Canada, and the STREAM Project.

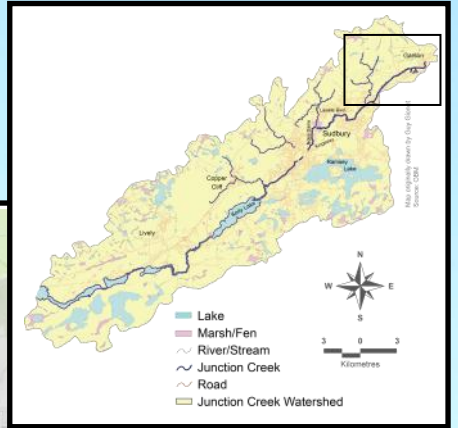


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# WARD 7 JUNCTION CREEK STREAM HEALTH AT-A-GLANCE 2019

## OVERALL STREAM HEALTH SCORE

Current Status **Good** Trend **Improving**

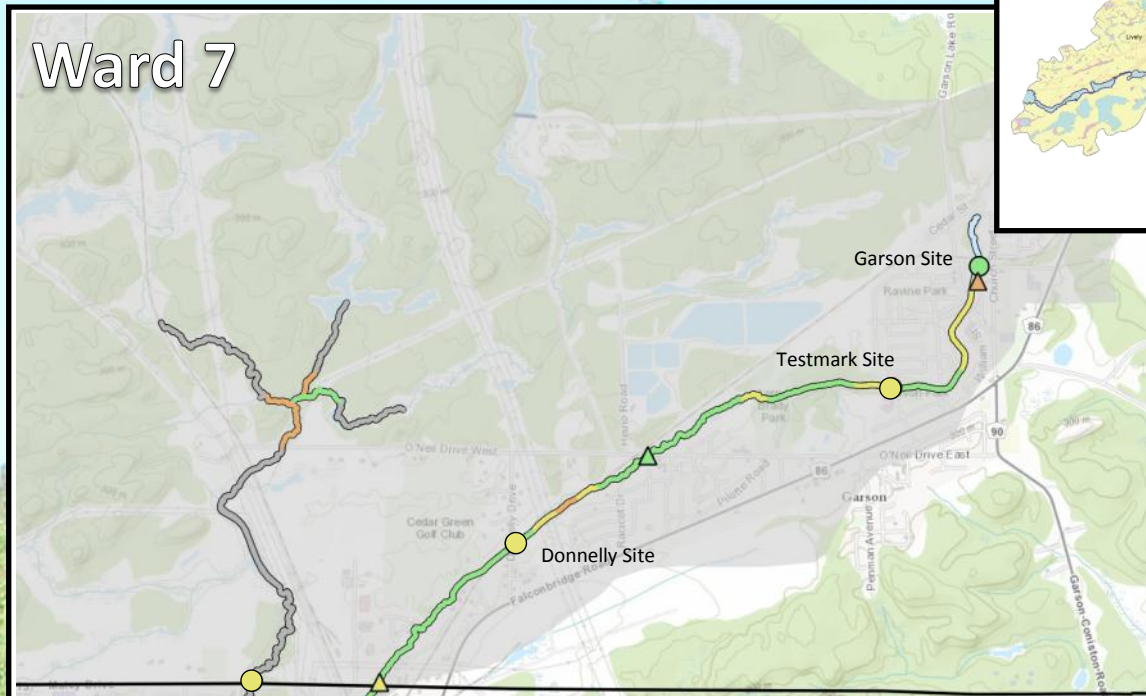


## FISH COMMUNITY

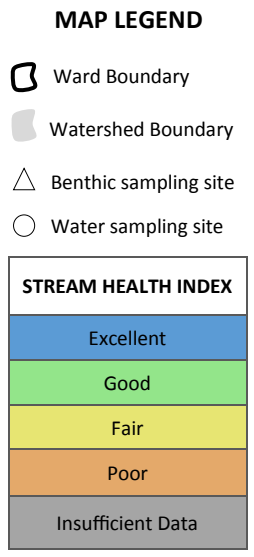
Current Status **Good**

Trend **Improving**

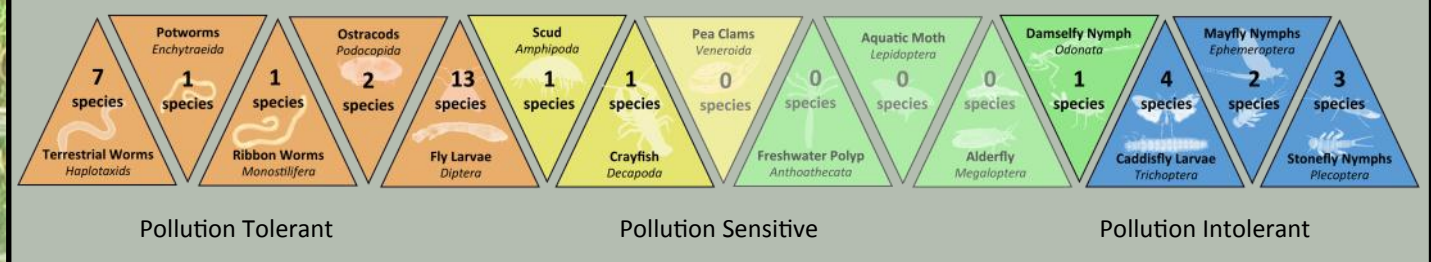
| Fish Species                | Present |
|-----------------------------|---------|
| <b>Pollution Intolerant</b> |         |
| Blacknose shiner            | ✓       |
| Brook trout                 |         |
| Logperch                    |         |
| <b>Pollution Sensitive</b>  |         |
| Brassy minnow               | ✓       |
| Common shiner               | ✓       |
| Finescale dace              | ✓       |
| Iowa darter                 | ✓       |
| Northern redbelly dace      | ✓       |
| Pearl dace                  | ✓       |
| Pumpkinseed                 | ✓       |
| Yellow perch                | ✓       |
| <b>Pollution Tolerant</b>   |         |
| Brook stickleback           | ✓       |
| Brown bullhead              |         |
| Central mudminnow           | ✓       |
| Creek chub                  | ✓       |
| Fathead minnow              | ✓       |
| Golden shiner               | ✓       |
| White sucker                | ✓       |



Map of Junction Creek depicting results from the 2019 fish community assessment, water sampling and benthic macroinvertebrate sampling studies conducted by the Junction Creek Stewardship Committee.

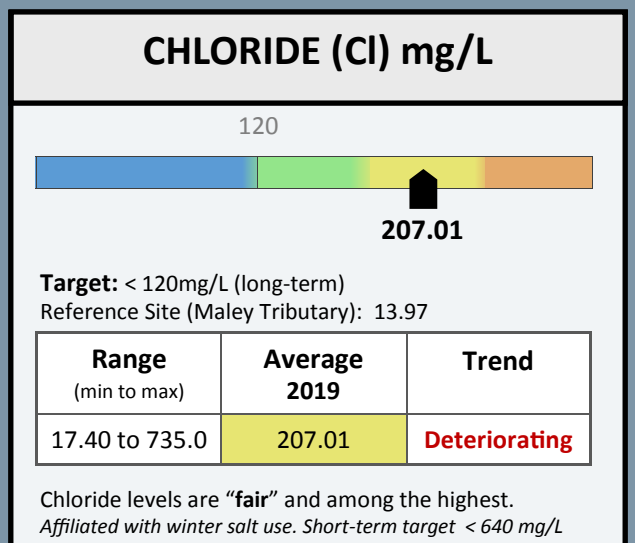
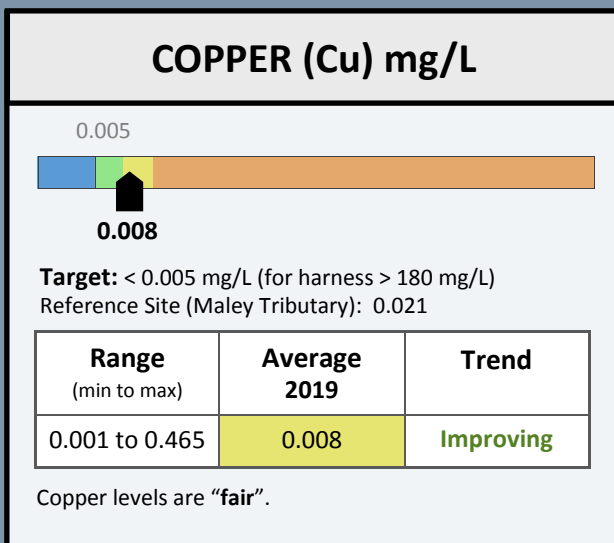
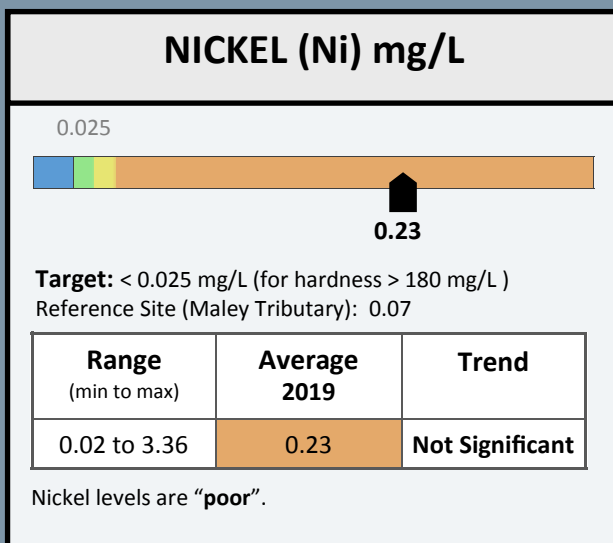
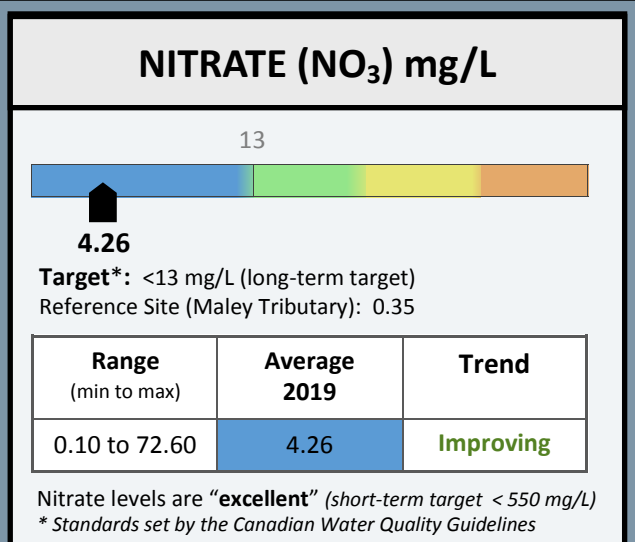
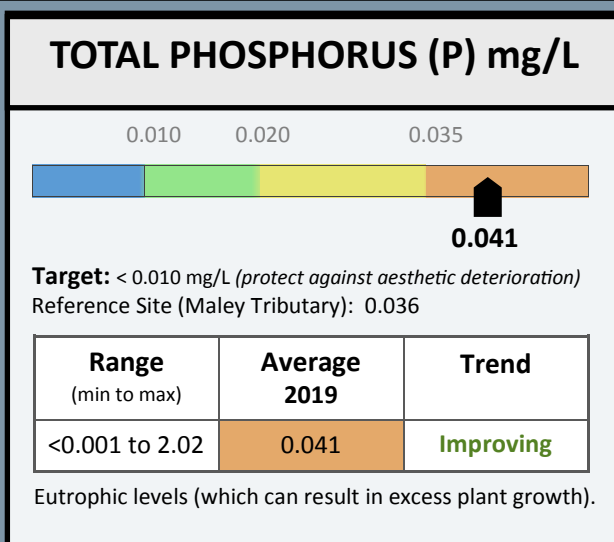
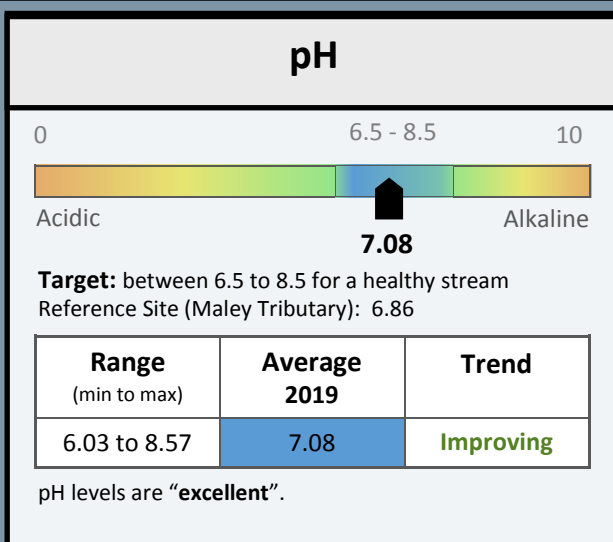


## "AQUATIC BUGS" BENTHIC MACROINVERTEBRATES - INDICATOR SPECIES



## WATER QUALITY ANALYSIS 2004-2019 (Sampling Sites: Garson, Testmark, Donnelly)

Sampling at the Garson and Testmark sites began in 2008. The water quality targets used are the provincial standards set out by the Provincial Water Quality Objectives (PWQO).



## MAJOR IMPAIRMENTS & FOCUS FOR RESTORATION EFFORTS



Contaminants & Stormwater



Aquatic Habitat



Invasive Himalayan Balsam



Impaired Riparian Buffer



Altered Stream Corridor

Data collected by Junction Creek Stewardship Committee research projects with the assistance from multiple funding agencies, and collaborative partners, including but not limited to: City of Greater Sudbury, Conservation Sudbury, Vale Canada Ltd., Laurentian University, Cambrian College, Cooperative Freshwater Ecology Unit & Vale Living with Lakes Centre, WWF-Canada, and the STREAM Project.

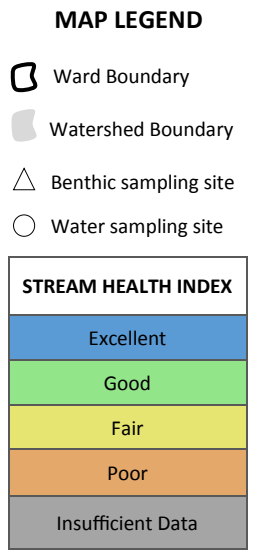
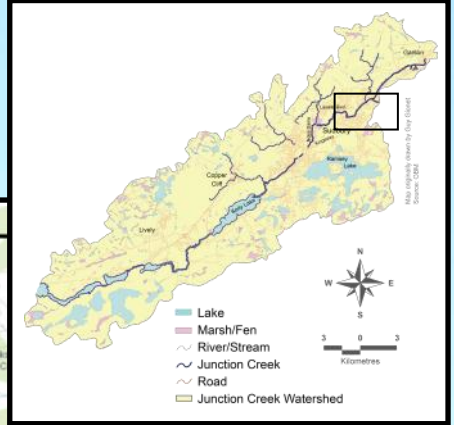


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# WARD 8 JUNCTION CREEK STREAM HEALTH AT-A-GLANCE 2019

## OVERALL STREAM HEALTH SCORE

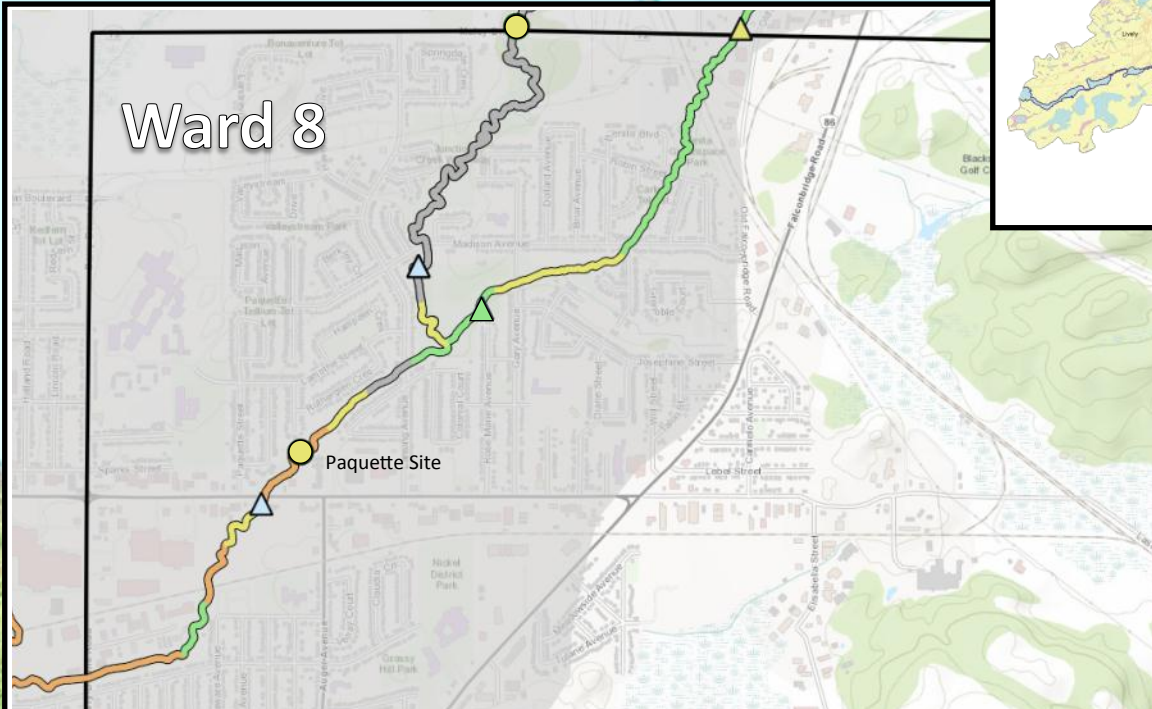
**Current Status** Good **Trend** Improving



## FISH COMMUNITY

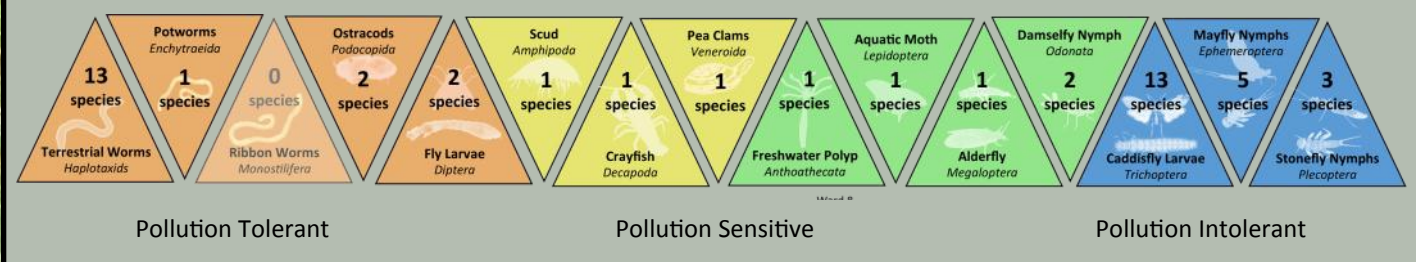
**Current Status** Good  
**Trend** Improving

| Fish Species                | Present |
|-----------------------------|---------|
| <b>Pollution Intolerant</b> |         |
| Blacknose shiner            | ✓       |
| Brook trout                 | ✓       |
| Logperch                    |         |
| <b>Pollution Sensitive</b>  |         |
| Brassy minnow               | ✓       |
| Common shiner               | ✓       |
| Finescale dace              |         |
| Iowa darter                 | ✓       |
| Northern redbelly dace      | ✓       |
| Pearl dace                  | ✓       |
| Pumpkinseed                 | ✓       |
| Yellow perch                | ✓       |
| <b>Pollution Tolerant</b>   |         |
| Brook stickleback           | ✓       |
| Brown bullhead              |         |
| Central mudminnow           | ✓       |
| Creek chub                  | ✓       |
| Fathead minnow              | ✓       |
| Golden shiner               |         |
| White sucker                | ✓       |



Map of Junction Creek depicting results from the 2019 fish community assessment, water sampling and benthic macroinvertebrate sampling studies conducted by the Junction Creek Stewardship Committee.

## "AQUATIC BUGS" BENTHIC MACROINVERTEBRATES - INDICATOR SPECIES



## WATER QUALITY ANALYSIS 2004-2019 (Sampling Sites: Paquette)

The water quality targets used are the provincial standards set out by the Provincial Water Quality Objectives (PWQO).

| <h3>pH</h3> <p>0 6.5 - 8.5 10</p> <p>Acidic <span style="float: right;">Alkaline</span></p> <p><b>7.10</b></p> <p><b>Target:</b> between 6.5 to 8.5 for a healthy stream<br/>Reference Site (Maley Tributary): 6.86</p> <table border="1"> <tr><th>Range (min to max)</th><th>Average 2019</th><th>Trend</th></tr> <tr><td>6.41 to 7.79</td><td>7.10</td><td>Increasing</td></tr> </table> <p>pH levels are "excellent".</p> | Range (min to max) | Average 2019    | Trend | 6.41 to 7.79 | 7.10 | Increasing      | <h3>TOTAL PHOSPHORUS (P) mg/L</h3> <p>0.010 0.020 0.035</p> <p><b>0.042</b></p> <p><b>Target:</b> &lt; 0.010 mg/L (protect against aesthetic deterioration)<br/>Reference Site (Maley Tributary): 0.036</p> <table border="1"> <tr><th>Range (min to max)</th><th>Average 2019</th><th>Trend</th></tr> <tr><td>0.008 to 0.78</td><td>0.042</td><td>Improving</td></tr> </table> <p>Eutrophic levels (which can result in excess plant growth).</p> | Range (min to max) | Average 2019 | Trend | 0.008 to 0.78  | 0.042 | Improving     | <h3>NITRATE (NO<sub>3</sub>) mg/L</h3> <p>13</p> <p><b>0.44</b></p> <p><b>Target*:</b> &lt;13 mg/L (long-term target)<br/>Reference Site (Maley Tributary): 0.35</p> <table border="1"> <tr><th>Range (min to max)</th><th>Average 2019</th><th>Trend</th></tr> <tr><td>0.14 to 15.3</td><td>0.44</td><td>Not Significant</td></tr> </table> <p>Nitrate levels are "excellent" (short-term target &lt; 550 mg/L)<br/>*Standards set by the Canadian Water Quality Guidelines</p> | Range (min to max) | Average 2019 | Trend | 0.14 to 15.3  | 0.44  | Not Significant |
|--|--------------------|-----------------|-------|--------------|------|-----------------|--|--------------------|--------------|-------|----------------|-------|---------------|--|--------------------|--------------|-------|---------------|-------|-----------------|
| Range (min to max)   | Average 2019       | Trend           |       |              |      |                 |  |                    |              |       |                |       |               |  |                    |              |       |               |       |                 |
| 6.41 to 7.79   | 7.10               | Increasing      |       |              |      |                 |  |                    |              |       |                |       |               |  |                    |              |       |               |       |                 |
| Range (min to max)   | Average 2019       | Trend           |       |              |      |                 |  |                    |              |       |                |       |               |  |                    |              |       |               |       |                 |
| 0.008 to 0.78  | 0.042              | Improving       |       |              |      |                 |  |                    |              |       |                |       |               |  |                    |              |       |               |       |                 |
| Range (min to max)   | Average 2019       | Trend           |       |              |      |                 |  |                    |              |       |                |       |               |  |                    |              |       |               |       |                 |
| 0.14 to 15.3   | 0.44               | Not Significant |       |              |      |                 |  |                    |              |       |                |       |               |  |                    |              |       |               |       |                 |
| <h3>NICKEL (Ni) mg/L</h3> <p>0.025</p> <p><b>0.09</b></p> <p><b>Target:</b> &lt; 0.025 mg/L (for hardness &gt; 180 mg/L)<br/>Reference Site (Maley Tributary): 0.07</p> <table border="1"> <tr><th>Range (min to max)</th><th>Average 2019</th><th>Trend</th></tr> <tr><td>0.03 to 0.36</td><td>0.09</td><td>Not Significant</td></tr> </table> <p>Nickel levels are "poor".</p>   | Range (min to max) | Average 2019    | Trend | 0.03 to 0.36 | 0.09 | Not Significant | <h3>COPPER (Cu) mg/L</h3> <p>0.005</p> <p><b>0.013</b></p> <p><b>Target:</b> &lt; 0.005 mg/L (for hardness &gt; 180 mg/L)<br/>Reference Site (Maley Tributary): 0.021</p> <table border="1"> <tr><th>Range (min to max)</th><th>Average 2019</th><th>Trend</th></tr> <tr><td>0.002 to 0.107</td><td>0.013</td><td>Deteriorating</td></tr> </table> <p>Copper levels are "poor".</p>  | Range (min to max) | Average 2019 | Trend | 0.002 to 0.107 | 0.013 | Deteriorating | <h3>CHLORIDE (Cl) mg/L</h3> <p>120</p> <p><b>57.72</b></p> <p><b>Target:</b> &lt; 120mg/L (long-term)<br/>Reference Site (Maley Tributary): 13.97</p> <table border="1"> <tr><th>Range (min to max)</th><th>Average 2019</th><th>Trend</th></tr> <tr><td>9.52 to 608.3</td><td>57.72</td><td>Not Significant</td></tr> </table> <p>Average chloride levels are "excellent".<br/>Affiliated with winter salt use. Short-term target &lt; 640 mg/L</p>                             | Range (min to max) | Average 2019 | Trend | 9.52 to 608.3 | 57.72 | Not Significant |
| Range (min to max)   | Average 2019       | Trend           |       |              |      |                 |  |                    |              |       |                |       |               |  |                    |              |       |               |       |                 |
| 0.03 to 0.36   | 0.09               | Not Significant |       |              |      |                 |  |                    |              |       |                |       |               |  |                    |              |       |               |       |                 |
| Range (min to max)   | Average 2019       | Trend           |       |              |      |                 |  |                    |              |       |                |       |               |  |                    |              |       |               |       |                 |
| 0.002 to 0.107   | 0.013              | Deteriorating   |       |              |      |                 |  |                    |              |       |                |       |               |  |                    |              |       |               |       |                 |
| Range (min to max)   | Average 2019       | Trend           |       |              |      |                 |  |                    |              |       |                |       |               |  |                    |              |       |               |       |                 |
| 9.52 to 608.3  | 57.72              | Not Significant |       |              |      |                 |  |                    |              |       |                |       |               |  |                    |              |       |               |       |                 |

## MAJOR IMPAIRMENTS & FOCUS FOR RESTORATION EFFORTS

|                     |                     |                  |                        |                    |
|---------------------|---------------------|------------------|------------------------|--------------------|
|                     |                     |                  |                        |                    |
| Litter & Stormwater | Brook Trout Habitat | Invasive species | Natural Infrastructure | Streambank Erosion |

Data collected by Junction Creek Stewardship Committee research projects with the assistance from multiple funding agencies, and collaborative partners, including but not limited to: City of Greater Sudbury, Conservation Sudbury, Vale Canada Ltd., Laurentian University, Cambrian College, Cooperative Freshwater Ecology Unit & Vale Living with Lakes Centre, WWF-Canada, and the STREAM Project.

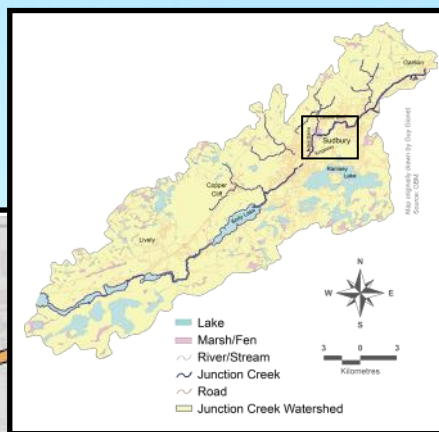
Junction Creek Stewardship Committee  
Comité d'intendance du ruisseau Junction

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# WARDS 5, 11 & 12 JUNCTION CREEK STREAM HEALTH AT-A-GLANCE

## OVERALL STREAM HEALTH SCORE

**Current Status** Fair **Trend** Improving

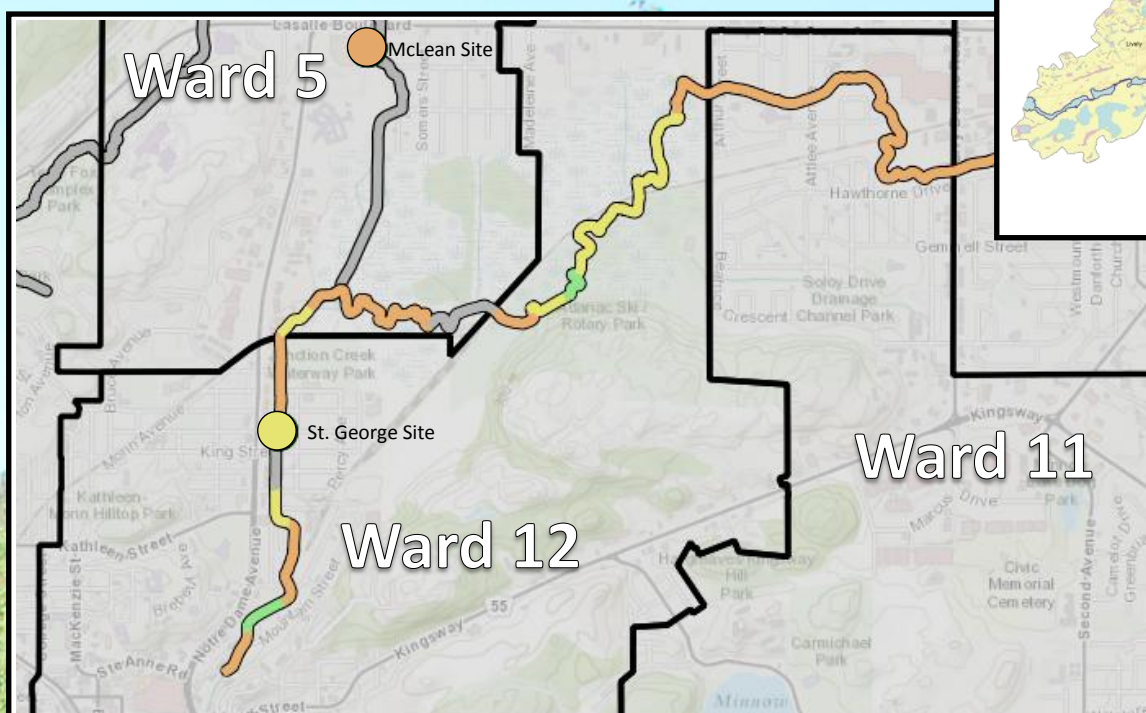


## FISH COMMUNITY

**Current Status** Poor

**Trend** Improving

| Fish Species                | Present |
|-----------------------------|---------|
| <b>Pollution Intolerant</b> |         |
| Blacknose shiner            |         |
| Brook trout                 |         |
| Logperch                    | ✓       |
| <b>Pollution Sensitive</b>  |         |
| Brassy minnow               | ✓       |
| Common shiner               | ✓       |
| Finescale dace              |         |
| Iowa darter                 | ✓       |
| Northern redbelly dace      | ✓       |
| Pearl dace                  | ✓       |
| Pumpkinseed                 |         |
| Yellow perch                | ✓       |
| <b>Pollution Tolerant</b>   |         |
| Brook stickleback           | ✓       |
| Brown bullhead              | ✓       |
| Central mudminnow           | ✓       |
| Creek chub                  | ✓       |
| Fathead minnow              | ✓       |
| Golden shiner               |         |
| White sucker                | ✓       |



Map of Junction Creek depicting results from the 2019 fish community assessment, water sampling and benthic macroinvertebrate sampling studies conducted by the Junction Creek Stewardship Committee.

**MAP LEGEND**

- Ward Boundary
- Watershed Boundary
- Benthic sampling site
- Water sampling site

**STREAM HEALTH INDEX**

- Excellent
- Good
- Fair
- Poor
- Insufficient Data

## "AQUATIC BUGS" BENTHIC MACROINVERTEBRATES - INDICATOR SPECIES

No benthic macroinvertebrate surveys were conducted in this section of Junction Creek in 2019

## WATER QUALITY ANALYSIS 2004-2019 (Sampling Sites: McLean, St. George)

The water quality targets used are the provincial standards set out by the Provincial Water Quality Objectives (PWQO).

| <h3>pH</h3> <p>0 6.5 - 8.5 10</p> <p>Acidic Alkaline</p> <p><b>7.11</b></p> <p><b>Target:</b> between 6.5 to 8.5 for a healthy stream<br/>Reference Site (Maley Tributary): 6.86</p> <table border="1"> <thead> <tr> <th>Range (min to max)</th> <th>Average 2019</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>6.33 to 7.84</td> <td>7.11</td> <td>Improving</td> </tr> </tbody> </table> <p>pH levels are "excellent".</p>  | Range (min to max) | Average 2019    | Trend | 6.33 to 7.84 | 7.11 | Improving | <h3>TOTAL PHOSPHORUS (P) mg/L</h3> <p>0.010 0.020 0.035</p> <p><b>0.038</b></p> <p><b>Target:</b> &lt; 0.010 mg/L (protect against aesthetic deterioration)<br/>Reference Site (Maley Tributary): 0.036</p> <table border="1"> <thead> <tr> <th>Range (min to max)</th> <th>Average 2019</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>0.008 to 1.27</td> <td>0.038</td> <td>Improving</td> </tr> </tbody> </table> <p>Eutrophic levels (which can result in excess plant growth).</p> | Range (min to max) | Average 2019 | Trend | 0.008 to 1.27  | 0.038 | Improving       | <h3>NITRATE (NO<sub>3</sub>) mg/L</h3> <p>13</p> <p><b>0.78</b></p> <p><b>Target*:</b> &lt;13 mg/L (long-term target)<br/>Reference Site (Maley Tributary): 0.35</p> <table border="1"> <thead> <tr> <th>Range (min to max)</th> <th>Average 2019</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>0.13 to 9.39</td> <td>0.78</td> <td>Deteriorating</td> </tr> </tbody> </table> <p>Nitrate levels are "excellent" (short-term target &lt; 550 mg/L)<br/>*Standards set by the Canadian Water Quality Guidelines</p> | Range (min to max) | Average 2019 | Trend | 0.13 to 9.39  | 0.78   | Deteriorating   |
|---|--------------------|-----------------|-------|--------------|------|-----------|--|--------------------|--------------|-------|----------------|-------|-----------------|--|--------------------|--------------|-------|---------------|--------|-----------------|
| Range (min to max)  | Average 2019       | Trend           |       |              |      |           |  |                    |              |       |                |       |                 |  |                    |              |       |               |        |                 |
| 6.33 to 7.84  | 7.11               | Improving       |       |              |      |           |  |                    |              |       |                |       |                 |  |                    |              |       |               |        |                 |
| Range (min to max)  | Average 2019       | Trend           |       |              |      |           |  |                    |              |       |                |       |                 |  |                    |              |       |               |        |                 |
| 0.008 to 1.27   | 0.038              | Improving       |       |              |      |           |  |                    |              |       |                |       |                 |  |                    |              |       |               |        |                 |
| Range (min to max)  | Average 2019       | Trend           |       |              |      |           |  |                    |              |       |                |       |                 |  |                    |              |       |               |        |                 |
| 0.13 to 9.39  | 0.78               | Deteriorating   |       |              |      |           |  |                    |              |       |                |       |                 |  |                    |              |       |               |        |                 |
| <h3>NICKEL (Ni) mg/L</h3> <p>0.025</p> <p><b>0.16</b></p> <p><b>Target:</b> &lt; 0.025 mg/L (for hardness &gt; 180 mg/L)<br/>Reference Site (Maley Tributary): 0.07</p> <table border="1"> <thead> <tr> <th>Range (min to max)</th> <th>Average 2019</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>0.02 to 5.55</td> <td>0.16</td> <td>Improving</td> </tr> </tbody> </table> <p>Nickel levels are "poor" with McLean site having some of the highest concentrations.</p> | Range (min to max) | Average 2019    | Trend | 0.02 to 5.55 | 0.16 | Improving | <h3>COPPER (Cu) mg/L</h3> <p>0.005</p> <p><b>0.033</b></p> <p><b>Target:</b> &lt; 0.005 mg/L (for hardness &gt; 180 mg/L)<br/>Reference Site (Maley Tributary): 0.021</p> <table border="1"> <thead> <tr> <th>Range (min to max)</th> <th>Average 2019</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>0.0002 to 0.38</td> <td>0.033</td> <td>Not Significant</td> </tr> </tbody> </table> <p>Copper levels are "poor" with McLean site having some of the highest concentrations.</p>   | Range (min to max) | Average 2019 | Trend | 0.0002 to 0.38 | 0.033 | Not Significant | <h3>CHLORIDE (Cl) mg/L</h3> <p>120</p> <p><b>133.19</b></p> <p><b>Target:</b> &lt; 120mg/L (long-term)<br/>Reference Site (Maley Tributary): 13.97</p> <table border="1"> <thead> <tr> <th>Range (min to max)</th> <th>Average 2019</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>3.39 to 781.8</td> <td>133.19</td> <td>Not Significant</td> </tr> </tbody> </table> <p>Average chloride levels are "good".<br/>Affiliated with winter salt use. Short-term target &lt; 640 mg/L</p>                              | Range (min to max) | Average 2019 | Trend | 3.39 to 781.8 | 133.19 | Not Significant |
| Range (min to max)  | Average 2019       | Trend           |       |              |      |           |  |                    |              |       |                |       |                 |  |                    |              |       |               |        |                 |
| 0.02 to 5.55  | 0.16               | Improving       |       |              |      |           |  |                    |              |       |                |       |                 |  |                    |              |       |               |        |                 |
| Range (min to max)  | Average 2019       | Trend           |       |              |      |           |  |                    |              |       |                |       |                 |  |                    |              |       |               |        |                 |
| 0.0002 to 0.38  | 0.033              | Not Significant |       |              |      |           |  |                    |              |       |                |       |                 |  |                    |              |       |               |        |                 |
| Range (min to max)  | Average 2019       | Trend           |       |              |      |           |  |                    |              |       |                |       |                 |  |                    |              |       |               |        |                 |
| 3.39 to 781.8   | 133.19             | Not Significant |       |              |      |           |  |                    |              |       |                |       |                 |  |                    |              |       |               |        |                 |

## MAJOR IMPAIRMENTS & FOCUS FOR RESTORATION EFFORTS



Litter & Stormwater



Recovering Ecosystems



Invasive Eurasian Watermilfoil



Impaired Riparian Buffer



Altered Stream Corridor

Data collected by Junction Creek Stewardship Committee research projects with the assistance from multiple funding agencies, and collaborative partners, including but not limited to: City of Greater Sudbury, Conservation Sudbury, Vale Canada Ltd., Laurentian University, Cambrian College, Cooperative Freshwater Ecology Unit & Vale Living with Lakes Centre, WWF-Canada, and the STREAM Project.

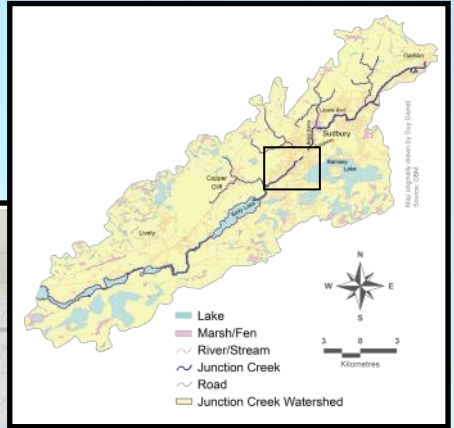


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# WARD 10 JUNCTION CREEK STREAM HEALTH AT-A-GLANCE 2019

## OVERALL STREAM HEALTH SCORE

**Current Status** Fair **Trend** Improving

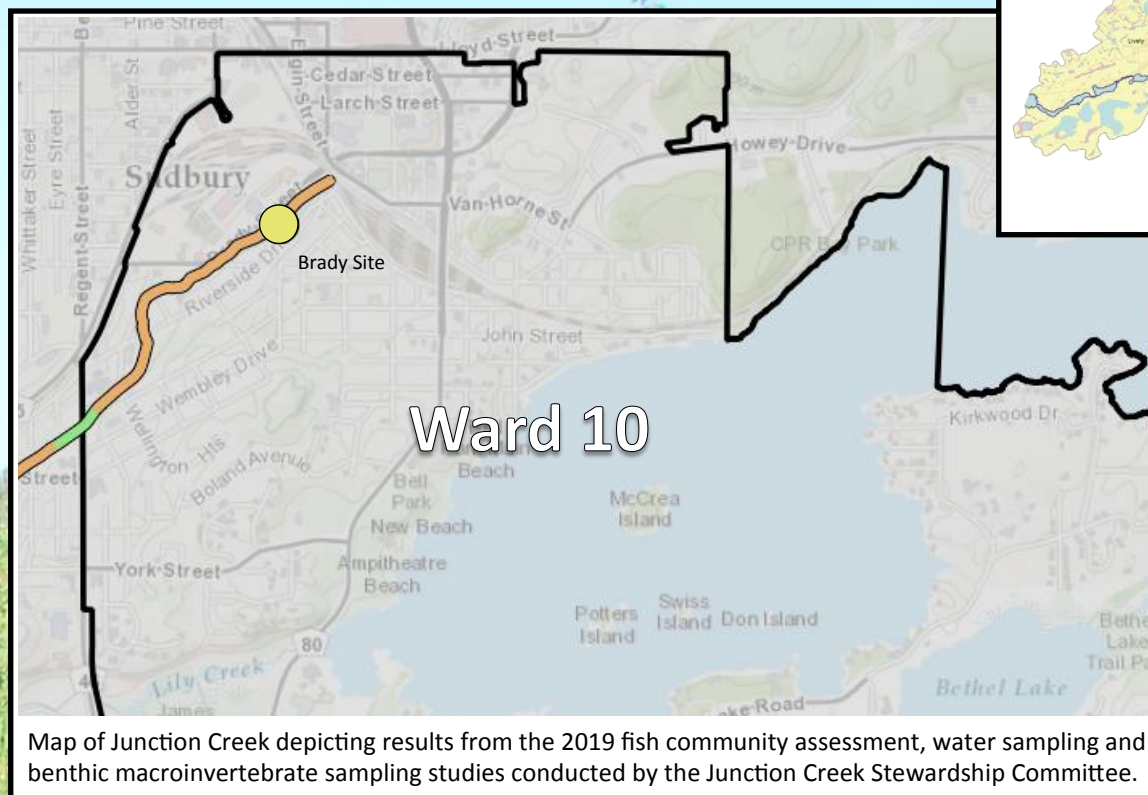


## FISH COMMUNITY

**Current Status** Poor

**Trend** Deteriorating

| Fish Species                | Present |
|-----------------------------|---------|
| <b>Pollution Intolerant</b> |         |
| Blacknose shiner            |         |
| Brook trout                 |         |
| Logperch                    |         |
| <b>Pollution Sensitive</b>  |         |
| Brassy minnow               |         |
| Common shiner               |         |
| Finescale dace              |         |
| Iowa darter                 |         |
| Northern redbelly dace      |         |
| Pearl dace                  |         |
| Pumpkinseed                 |         |
| Yellow perch                | ✓       |
| <b>Pollution Tolerant</b>   |         |
| Brook stickleback           |         |
| Brown bullhead              |         |
| Central mudminnow           |         |
| Creek chub                  | ✓       |
| Fathead minnow              | ✓       |
| Golden shiner               |         |
| White sucker                | ✓       |

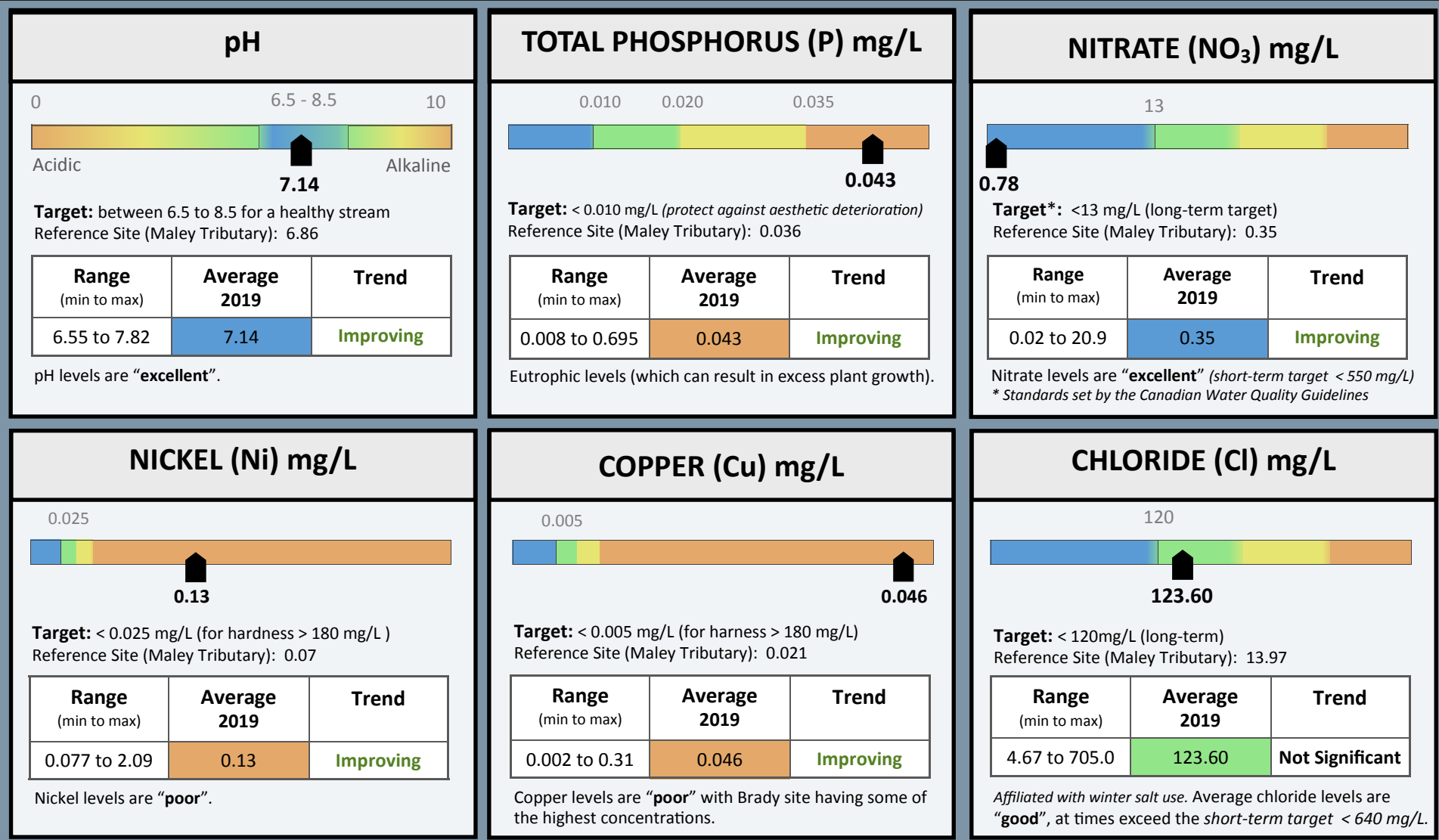


## "AQUATIC BUGS" BENTHIC MACROINVERTEBRATES - INDICATOR SPECIES

No benthic macroinvertebrate surveys were conducted in this section of Junction Creek in 2019

## WATER QUALITY ANALYSIS 2004-2019 (Sampling Sites: Brady)

The water quality targets used are the provincial standards set out by the Provincial Water Quality Objectives (PWQO).



## MAJOR IMPAIRMENTS & FOCUS FOR RESTORATION EFFORTS



Litter & Stormwater



Impaired Aquatic Habitat



Impaired Riparian Buffer



Altered Stream Corridor

Data collected by Junction Creek Stewardship Committee research projects with the assistance from multiple funding agencies, and collaborative partners, including but not limited to: City of Greater Sudbury, Conservation Sudbury, Vale Canada Ltd., Laurentian University, Cambrian College, Cooperative Freshwater Ecology Unit & Vale Living with Lakes Centre, WWF-Canada, and the STREAM Project.

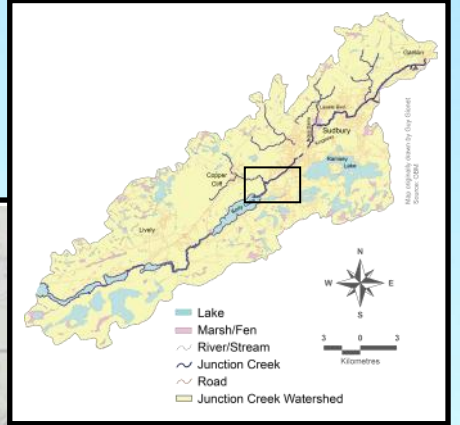


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# WARD 1 JUNCTION CREEK STREAM HEALTH AT-A-GLANCE 2019

## OVERALL STREAM HEALTH SCORE

**Current Status** Fair **Trend** Improving

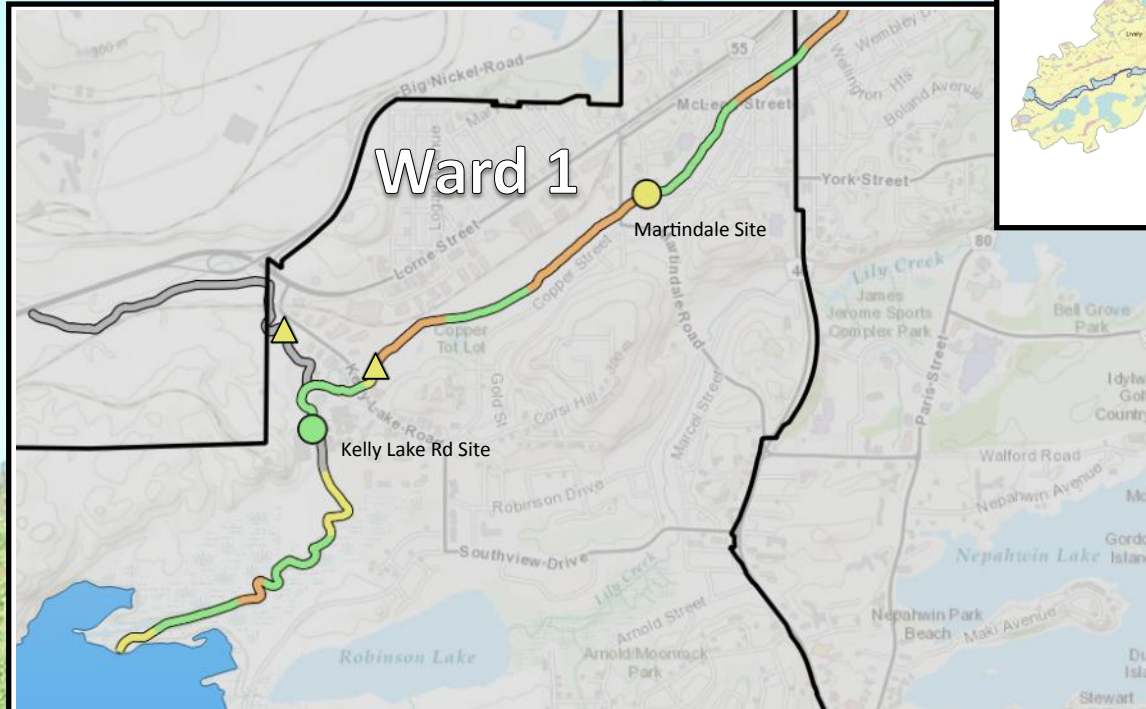


**MAP LEGEND**

- Ward Boundary
- Watershed Boundary
- Benthic sampling site
- Water sampling site

**STREAM HEALTH INDEX**

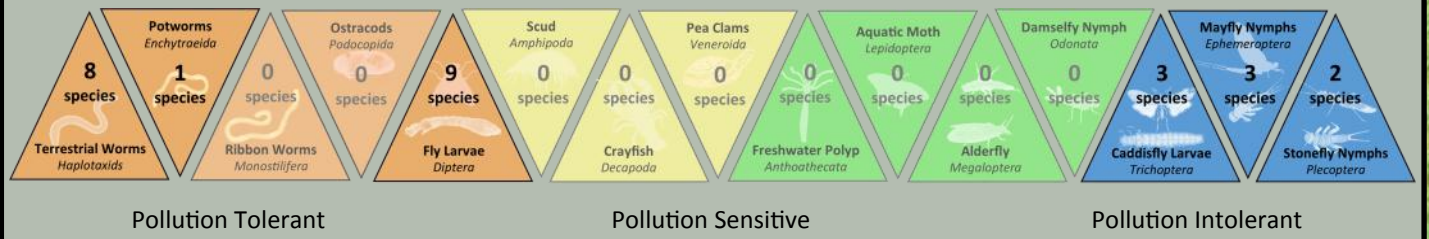
- Excellent
- Good
- Fair
- Poor
- Insufficient Data



Map of Junction Creek depicting results from the 2019 fish community assessment, water sampling and benthic macroinvertebrate sampling studies conducted by the Junction Creek Stewardship Committee.

| FISH COMMUNITY              |           |
|-----------------------------|-----------|
| Current Status              | Fair      |
| Trend                       | Improving |
| Fish Species                | Present   |
| <b>Pollution Intolerant</b> |           |
| Blacknose shiner            | ✓         |
| Brook trout                 |           |
| Logperch                    | ✓         |
| <b>Pollution Sensitive</b>  |           |
| Brassy minnow               | ✓         |
| Common shiner               | ✓         |
| Finescale dace              |           |
| Iowa darter                 | ✓         |
| Northern redbelly dace      |           |
| Pearl dace                  | ✓         |
| Pumpkinseed                 | ✓         |
| Yellow perch                | ✓         |
| <b>Pollution Tolerant</b>   |           |
| Brook stickleback           | ✓         |
| Brown bullhead              |           |
| Central mudminnow           | ✓         |
| Creek chub                  | ✓         |
| Fathead minnow              | ✓         |
| Golden shiner               | ✓         |
| White sucker                | ✓         |

## "AQUATIC BUGS" BENTHIC MACROINVERTEBRATES - INDICATOR SPECIES



## WATER QUALITY ANALYSIS 2004-2019 (Sampling Sites: Martindale, Kelly Lake Rd)

Sampling at the Martindale site began in 2008. The water quality targets used are the provincial standards set out by the Provincial Water Quality Objectives (PWQO).

| <h3>pH</h3> <p>0 6.5 - 8.5 10</p> <p>Acidic 7.59 Alkaline</p> <p><b>Target:</b> between 6.5 to 8.5 for a healthy stream<br/>Reference Site (Maley Tributary): 6.86</p> <table border="1"> <tr><th>Range (min to max)</th><th>Average 2019</th><th>Trend</th></tr> <tr><td>6.71 to 9.10</td><td>7.59</td><td>Increasing</td></tr> </table> <p>pH levels are "excellent". Kelly Lake Rd sampling site shows an increase in pH with great variation.</p> | Range (min to max) | Average 2019    | Trend | 6.71 to 9.10  | 7.59 | Increasing | <h3>TOTAL PHOSPHORUS (P) mg/L</h3> <p>0.010 0.020 0.035</p> <p>0.040</p> <p><b>Target:</b> &lt; 0.010 mg/L (protect against aesthetic deterioration)<br/>Reference Site (Maley Tributary): 0.036</p> <table border="1"> <tr><th>Range (min to max)</th><th>Average 2019</th><th>Trend</th></tr> <tr><td>0.008 to 2.34</td><td>0.040</td><td>Improving</td></tr> </table> <p>Eutrophic levels (which can result in excess plant growth).</p> | Range (min to max) | Average 2019 | Trend | 0.008 to 2.34 | 0.040 | Improving | <h3>NITRATE (NO<sub>3</sub>) mg/L</h3> <p>13</p> <p>0.59</p> <p><b>Target*:</b> &lt;13 mg/L (long-term target)<br/>Reference Site (Maley Tributary): 0.35</p> <table border="1"> <tr><th>Range (min to max)</th><th>Average 2019</th><th>Trend</th></tr> <tr><td>0.04 to 331.55</td><td>0.59</td><td>Improving</td></tr> </table> <p>Nitrate levels are "excellent" (short-term target &lt; 550 mg/L)<br/>*Standards set by the Canadian Water Quality Guidelines</p> | Range (min to max) | Average 2019 | Trend | 0.04 to 331.55 | 0.59   | Improving       |
|---|--------------------|-----------------|-------|---------------|------|------------|---|--------------------|--------------|-------|---------------|-------|-----------|---|--------------------|--------------|-------|----------------|--------|-----------------|
| Range (min to max)  | Average 2019       | Trend           |       |               |      |            |   |                    |              |       |               |       |           |   |                    |              |       |                |        |                 |
| 6.71 to 9.10  | 7.59               | Increasing      |       |               |      |            |   |                    |              |       |               |       |           |   |                    |              |       |                |        |                 |
| Range (min to max)  | Average 2019       | Trend           |       |               |      |            |   |                    |              |       |               |       |           |   |                    |              |       |                |        |                 |
| 0.008 to 2.34   | 0.040              | Improving       |       |               |      |            |   |                    |              |       |               |       |           |   |                    |              |       |                |        |                 |
| Range (min to max)  | Average 2019       | Trend           |       |               |      |            |   |                    |              |       |               |       |           |   |                    |              |       |                |        |                 |
| 0.04 to 331.55  | 0.59               | Improving       |       |               |      |            |   |                    |              |       |               |       |           |   |                    |              |       |                |        |                 |
| <h3>NICKEL (Ni) mg/L</h3> <p>0.025</p> <p>0.32</p> <p><b>Target:</b> &lt; 0.025 mg/L (for hardness &gt; 180 mg/L)<br/>Reference Site (Maley Tributary): 0.07</p> <table border="1"> <tr><th>Range (min to max)</th><th>Average 2019</th><th>Trend</th></tr> <tr><td>0.002 to 5.38</td><td>0.32</td><td>Improving</td></tr> </table> <p>Nickel levels are "poor". Kelly Lake Rd sampling site is has some of the highest concentrations of Nickel.</p> | Range (min to max) | Average 2019    | Trend | 0.002 to 5.38 | 0.32 | Improving  | <h3>COPPER (Cu) mg/L</h3> <p>0.005</p> <p>0.038</p> <p><b>Target:</b> &lt; 0.005 mg/L (for hardness &gt; 180 mg/L)<br/>Reference Site (Maley Tributary): 0.021</p> <table border="1"> <tr><th>Range (min to max)</th><th>Average 2019</th><th>Trend</th></tr> <tr><td>0.002 to 0.32</td><td>0.038</td><td>Improving</td></tr> </table> <p>Copper levels are "poor". Both sites have some of the highest concentrations of Copper.</p>       | Range (min to max) | Average 2019 | Trend | 0.002 to 0.32 | 0.038 | Improving | <h3>CHLORIDE (Cl) mg/L</h3> <p>120</p> <p>129.59</p> <p><b>Target:</b> &lt; 120mg/L (long-term)<br/>Reference Site (Maley Tributary): 13.97</p> <table border="1"> <tr><th>Range (min to max)</th><th>Average 2019</th><th>Trend</th></tr> <tr><td>0.93 to 819.0</td><td>129.59</td><td>Not Significant</td></tr> </table> <p>Average chloride levels are "good". Among the highest at Kelly Lake Rd sampling site. Short-term target &lt; 640 mg/L</p>               | Range (min to max) | Average 2019 | Trend | 0.93 to 819.0  | 129.59 | Not Significant |
| Range (min to max)  | Average 2019       | Trend           |       |               |      |            |   |                    |              |       |               |       |           |   |                    |              |       |                |        |                 |
| 0.002 to 5.38   | 0.32               | Improving       |       |               |      |            |   |                    |              |       |               |       |           |   |                    |              |       |                |        |                 |
| Range (min to max)  | Average 2019       | Trend           |       |               |      |            |   |                    |              |       |               |       |           |   |                    |              |       |                |        |                 |
| 0.002 to 0.32   | 0.038              | Improving       |       |               |      |            |   |                    |              |       |               |       |           |   |                    |              |       |                |        |                 |
| Range (min to max)  | Average 2019       | Trend           |       |               |      |            |   |                    |              |       |               |       |           |   |                    |              |       |                |        |                 |
| 0.93 to 819.0   | 129.59             | Not Significant |       |               |      |            |   |                    |              |       |               |       |           |   |                    |              |       |                |        |                 |

## MAJOR IMPAIRMENTS & FOCUS FOR RESTORATION EFFORTS



In-stream Litter



High Temp. & Runoff Contaminants



Invasive Himalayan Balsam



Semi-barren Riparian Buffer



Streambank Erosion

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