BASELINE ASSESSMENT
OF WATER QUALITY
IN STREAMS OF THE
CANNON RIVER WATERSHED

FLOW ASSESSMENT
FLOW RATES FOR CANNON RIVER TRIBUTARIES
### 1996 FLOW RATES FOR TRIBUTARIES IN THE CANNON RIVER BASIN

<table>
<thead>
<tr>
<th>STREAM</th>
<th>MID JUNE FLOW</th>
<th>MID JULY FLOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belle Creek near Welch</td>
<td>61.5 ft³/sec</td>
<td>32.1 ft³/sec</td>
</tr>
<tr>
<td>Pine Creek near Cannon Falls</td>
<td>19.2 ft³/sec</td>
<td>9.1 ft³/sec</td>
</tr>
<tr>
<td>Little Cannon near Oxford Mill</td>
<td>81.8 ft³/sec</td>
<td>44.5 ft³/sec</td>
</tr>
<tr>
<td>Little Cannon near Sogn</td>
<td>24.1 ft³/sec</td>
<td>12.0 ft³/sec</td>
</tr>
<tr>
<td>Little Cannon near Highway 56</td>
<td>7.1 ft³/sec</td>
<td>.4 ft³/sec</td>
</tr>
<tr>
<td>Prairie Creek near Randolph</td>
<td>38.1 ft³/sec</td>
<td>24.3 ft³/sec</td>
</tr>
<tr>
<td>Prairie Creek near Goodhue Ave.</td>
<td>30.0 ft³/sec</td>
<td>13.6 ft³/sec</td>
</tr>
<tr>
<td>Chub Creek near Randolph</td>
<td>45.7 ft³/sec</td>
<td>17.0 ft³/sec</td>
</tr>
<tr>
<td>Heath Creek near Sechler Park</td>
<td>18.5 ft³/sec</td>
<td>6.7 ft³/sec</td>
</tr>
<tr>
<td>Wolf Creek Near Dundas</td>
<td>27.2 ft³/sec</td>
<td>3.5 ft³/sec</td>
</tr>
<tr>
<td>Crane Creek near Owatonna</td>
<td>38.9 ft³/sec</td>
<td>No July values</td>
</tr>
<tr>
<td>Maple Creek near Owatonna</td>
<td>14.6 ft³/sec</td>
<td>flow too slow for</td>
</tr>
<tr>
<td>Turtle Creek near Interstate 35</td>
<td>18.0 ft³/sec</td>
<td>meter to operate</td>
</tr>
<tr>
<td>Straight River at Steele Cty 31</td>
<td>68.9 ft³/sec</td>
<td>31.2 ft³/sec</td>
</tr>
<tr>
<td>Upper Cannon near Morristown</td>
<td>223.8 ft³/sec</td>
<td>63.0 ft³/sec</td>
</tr>
</tbody>
</table>

Locations selected for determining the stream flow were taken as near as possible to the sampling station used for the chemistry and macro-invertebrates. The second criteria for the location was a consistent flow along the transect all the way across the stream. The area of the stream was determined by taking depth measurements at 2 foot intervals along the transect to the nearest half inch. Flow rates were determined using a General Oceanics model 2030 series mechanical flow meter taking flow rates at 4 foot intervals across the stream at a depth midway between the surface and the substrate. Flows were then interpolated for the intermediate points along the transect. The area of each segment was then determined, then multiplied by the flow, and then summed to obtain the total flow at that location.

Flows were pretty consistent throughout the 3 day time period the streams were measured as no rain events had occurred. There were 2 exceptions as noted by the **. June flows for Belle and Pine Creeks were affected by a 2 inch rain which fell in those subwatersheds just prior their measurements. However water levels appeared to be only slightly higher due to those rain events.

Graphs, details, and cross-sections of each stream are found in the pages that follow;
JUNE 1996 CANNON RIVER BASIN FLOW RATES

STREAM
Cannon at Morristown
Straight at 31
Turtle
Maple
Crane
Wolf
Heath
Chub
Prairie Goodhue
Prairie Randolph
L. Cannon at 56
L. Cannon Sogn
L. Cannon Oxford
Pine
Belle

JUNE FLOW RATE (Cubic feet per second)

JULY 1996 CANNON RIVER BASIN FLOW RATES

STREAM
Cannon at Morristown
Straight at 31
Turtle
Maple
Crane
Wolf
Heath
Chub
Prairie Goodhue
Prairie Randolph
L. Cannon at 56
L. Cannon Sogn
L. Cannon Oxford
Pine
Belle

Flow too low for meter to measure at Turtle, Maple, and Crane

JULY FLOW RATE (Cubic Feet per Second)
STREAM--BELLE CREEK NEAR WELCH
June 18, 1996
Cross-section view looking downstream
Total Area = 19.9792 square feet
Total Flow Rate = 61.484 cubic feet/sec
**NOTE - Approximately 2 inches of rain fell in this watershed in the 3 days prior to this data. Water levels were up 2-3 inches from other streams.

STREAM--BELLE CREEK
July 22, 1996
Cross-section view looking downstream
Total Area = 13.5 square feet
Total Flow Rate = 32.0636 cubic feet/sec

STREAM--PINE CREEK
June 12, 1996
Cross-section view looking downstream
Total Area = 11.7917 square feet
Total Flow Rate = 19.1509 cubic feet/sec
***NOTE - Approximately 2 inches of rain fell in this watershed in the 3 days prior to this data. Water levels were up slightly from other streams.

STREAM--PINE CREEK
July 22, 1996
Cross-section view looking downstream
Total Area = 8.125 square feet
Total Flow Rate = 9.06566 cubic feet/sec
STREAM--LITTLE CANNON AT OXFORD MILL
June 13, 1996
Cross-section view looking downstream
Total Area = 21.7917 square feet
Total Flow Rate = 81.7874 cubic feet/sec

STREAM--LITTLE CANNON AT OXFORD MILL
July 23, 1996
Cross-section view looking downstream
Total Area = 15.4792 square feet
Total Flow Rate = 44.5245 cubic feet/sec

STREAM--LITTLE CANNON SOUTH OF SOGN
June 13, 1996
Cross-section view looking downstream
Total Area = 17 square feet
Total Flow Rate = 24.0672 cubic feet/sec

STREAM--LITTLE CANNON ONE MILE UPSTREAM OF SOGN
July 23, 1996
Cross-section view looking downstream
Total Area = 6.9375 square feet
Total Flow Rate = 11.9768 cubic feet/sec

STREAM--LITTLE CANNON AT HIGHWAY 56
June 13, 1996
Cross-section view looking downstream
Total Area = 9.3125 square feet
Total Flow Rate = 7.13423 cubic feet/sec

STREAM--LITTLE CANNON AT MINNESOTA HIGHWAY # 56
July 23, 1996
Cross-section view looking downstream
Total Area = 6.125 square feet
Total Flow Rate = .39768 cubic feet/sec
STREAM--PRAIRIE CREEK NEAR RANDOLPH
June 12, 1996
Cross-section view looking downstream
Total Area = 19.5521 square feet
Total Flow Rate = 38.0808 cubic feet/sec

STREAM--PRAIRIE CREEK
JULY 22, 1996
Cross-section view looking downstream
Total Area = 15.8333 square feet
Total Flow Rate = 24.3261 cubic feet/sec

STREAM--PRAIRIE CREEK AT GOODHUE AVENUE
June 13, 1996
Cross-section view looking downstream
Total Area = 17.4167 square feet
Total Flow Rate = 29.9972 cubic feet/sec

STREAM--PRAIRIE CREEK AT GOODHUE AVENUE
JULY 23, 1996
Cross-section view looking downstream
Total Area = 10.2292 square feet
Total Flow Rate = 13.6454 cubic feet/sec
STREAM--CHUB CREEK AT RANDOLPH
June 13, 1996
Cross-section view looking downstream
Total Area = 24. square feet
Total Flow Rate = 45.7497 cubic feet/sec

STREAM--CHUB CREEK
JULY 22, 1996
Cross-section view looking downstream
Total Area = 18.2708 square feet
Total Flow Rate = 16.9571 cubic feet/sec

STREAM--HEATH CREEK
June 12, 1996
Cross-section view looking downstream
Total Area = 8.4375 square feet
Total Flow Rate = 18.5164 cubic feet/sec

STREAM--HEATH CREEK
JULY 23, 1996
Cross-section view looking downstream
Total Area = 4.79167 square feet
Total Flow Rate = 6.66824 cubic feet/sec

STREAM--WOLF CREEK
June 12, 1996
Cross-section view looking downstream
Total Area = 14.4896 square feet
Total Flow Rate = 27.2386 cubic feet/sec

STREAM--WOLF CREEK
July 24, 1996
Cross-section view looking downstream
Total Area = 5.07292 square feet
Total Flow Rate = 3.52588 cubic feet/sec
STREAM--CRANE CREEK NEAR HIGHWAY 14
June 14, 1996
Cross-section view looking downstream
Total Area = 38.2917 square feet
Total Flow Rate = 38.8542 cubic feet/sec

STREAM--MAPLE CREEK
June 14, 1996
Cross-section view looking downstream
Total Area = 23.0208 square feet
Total Flow Rate = 14.6275 cubic feet/sec

STREAM--TURTLE CREEK
June 14, 1996
Cross-section view looking downstream
Total Area = 18.3333 square feet
Total Flow Rate = 17.9897 cubic feet/sec

July depths very shallow and flow too slow to be measured