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

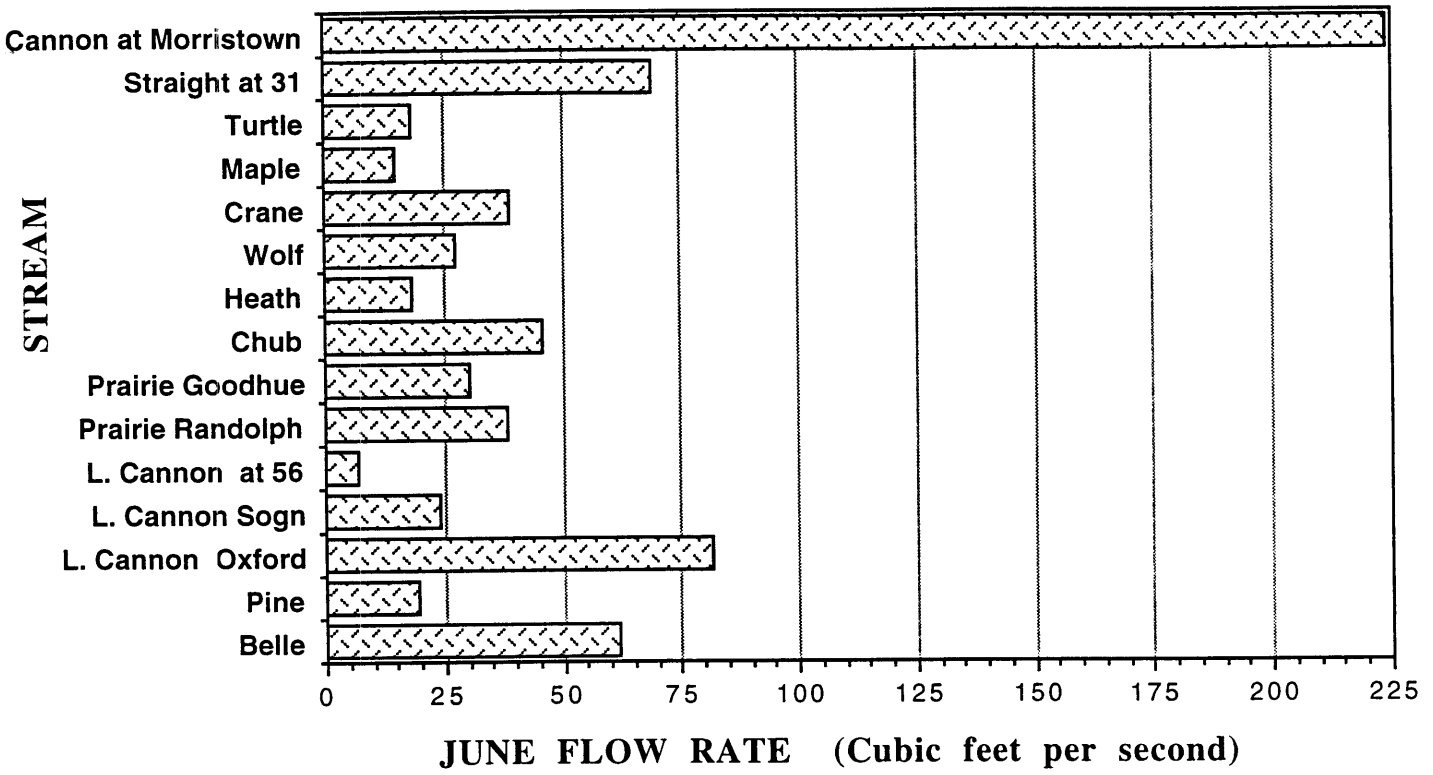
STREAM	MID JUNE FLOW	MID JULY FLOW
Belle Creek near Welch	61.5 ft ^{3}/sec **	32.1 ft ^{3}/sec
Pine Creek near Cannon Falls	19.2 ft ^{3}/sec **	9.1 ft ^{3}/sec
Little Cannon near Oxford Mill	81.8 ft ^{3}/sec	44.5 ft ^{3}/sec
Little Cannon near Sogn	24.1 ft ^{3}/sec	12.0 ft ^{3}/sec
Little Cannon near Highway 56	7.1 ft ^{3}/sec	.4 ft ^{3}/sec
Prairie Creek near Randolph	38.1 ft ^{3}/sec	24.3 ft ^{3}/sec
Prairie Creek near Goodhue Ave.	30.0 ft ^{3}/sec	13.6 ft ^{3}/sec
Chub Creeek near Randolph	45.7 ft ^{3}/sec	17.0 ft ^{3}/sec
Heath Creek near Sechler Park	18.5 ft ^{3}/sec	6.7 ft ^{3}/sec
Wolf Creek Near Dundas	27.2 ft ^{3}/sec	3.5 ft ^{3}/sec
Crane Creek near Owatonna	38.9 ft ^{3}/sec	No July values
Maple Creek near Owatonna	14.6 ft ^{3}/sec	flow too slow for
Turtle Creek near Interstate 35	18.0 ft ^{3}/sec	meter to operate
Straight River at Steele Cty 31	68.9 ft ^{3}/sec	31.2 ft ^{3}/sec
Upper Cannon near Morristown	223.8 ft ^{3}/sec	63.0 ft ^{3}/sec

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.

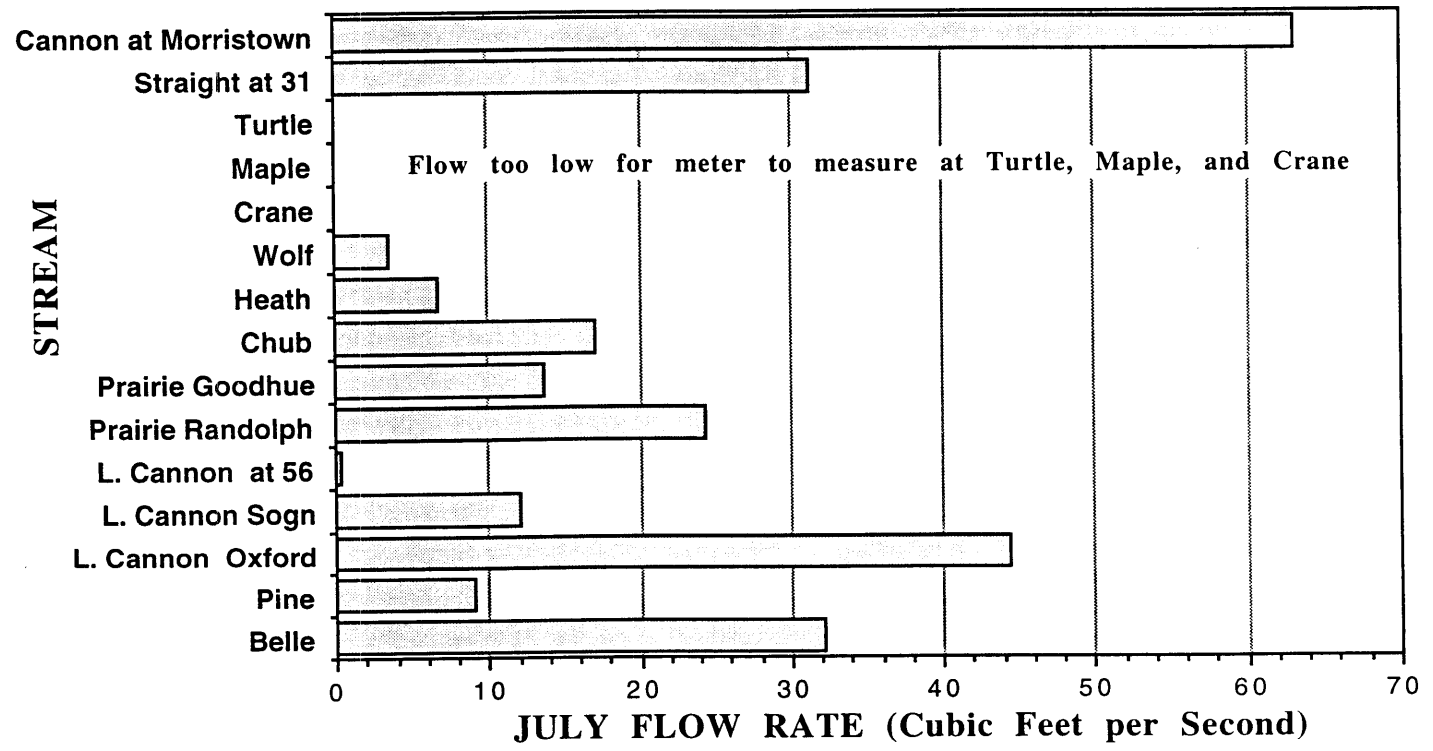
Flows were pretty consistent throughout the 3 day time period the streams were measured as no rain events had occured. There were 2 exceptions as noted by the **. June flows for Belle and Pine Creeks were affected by a 2 inch rain which fell in those subwatersheds just prior their measurements. However 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;

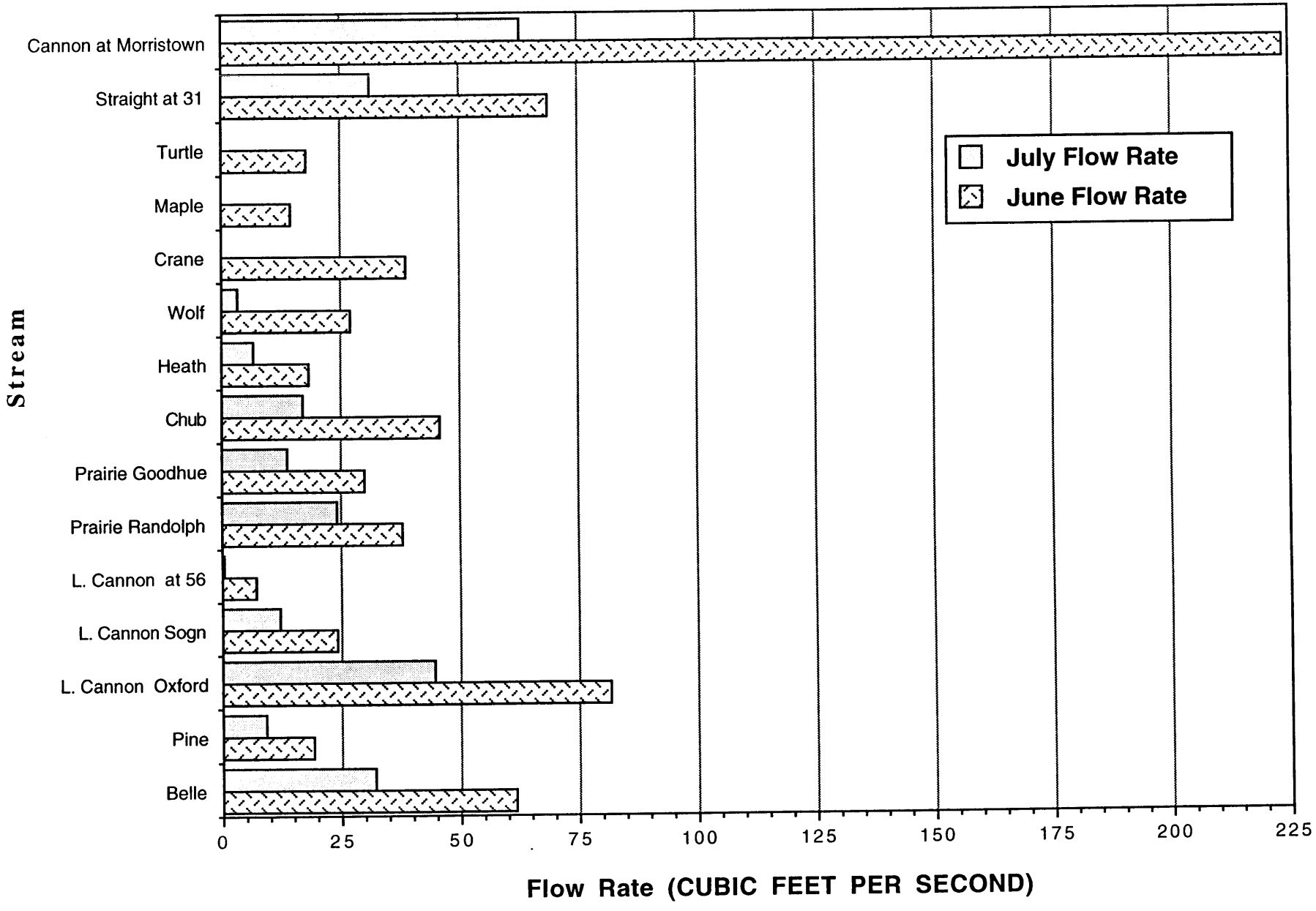
UNE 1996 CANNON RIVER BASIN FLOW RATES



JULY 1996 CANNON RIVER BASIN FLOW RATES



1996 CANNON RIVER FLOW RATES



STREAM--BELLE CREEK NEAR WELCH
J ne 18, 1996
C. oss-section view looking downstream
Total Area = 19.9792 square feet
T tal 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.

S REAM--BELLE CREEK
J LY 22, 1996
Cross-section view looking downstream
T tal Area = 13.5 square feet
Tutal Flow Rate = 32.0636 cubic feet/sec

S REAM--PINE CREEK
June 12, 1996
Cross-section view looking downstream
T tal 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
ULY 22, 1996
ross-section view looking downstream
Total Area = 8.125 square feet
otal 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

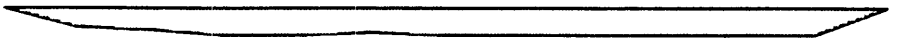
STREAM--HEATH CREEK
JULY 23, 1996
Cross-section view looking downstream
Total Area = 4.79167 square feet
Total Flow Rate = 6.66824 cubic feet/sec

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

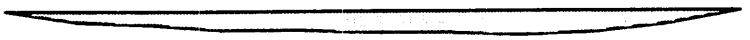
STREAM--WOLF CREEK
July 24, 1996
Cross-section view looking downstream
Total Area = 5.07292 square feet
Total Flow Rate = 3.52588 cubic feet/sec

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

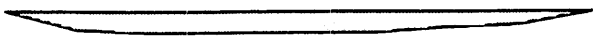
July depths very shallow and flow too slow to be measured



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



STREAM--UPPER CANNON NEAR MORRISTOWN
June 12, 1996
Cross-section view looking downstream
Total Area = 85.375 square feet
Total Flow Rate = 223.775 cubic feet/sec

STREAM--CANNON RIVER ONE MILE DOWNSTREAM OF MORRISTOWN
JULY 23, 1996
Cross-section view looking downstream
Total Area = 50.8958 square feet
Total Flow Rate = 62.9869 cubic feet/sec

STREAM--STRAIGHT RIVER AT STEELE COUNTY 31
June 12, 1996
Cross-section view looking downstream
Total Area = 48.4167 square feet
Total Flow Rate = 68.9094 cubic feet/sec

STREAM--STRAIGHT AT STEELE COUNTY HIGHWAY # 31
JULY 24, 1996
Cross-section view looking downstream
Total Area = 28.8854 square feet
Total Flow Rate = 31.176 cubic feet/sec