

RED RIVER OF THE NORTH BASIN

05061000 BUFFALO RIVER NEAR HAWLEY, MN

LOCATION.--Lat 4651'00", long 9619'45", in NW 1 / 4 SE 1 / 4 sec. 14, T.139 N., R.45 W., Clay County, Hydrologic Unit 09020106, near left downstream end of bridge on farm lane, 2 mi southwest of Hawley.

DRAINAGE AREA.--325 mi² (revised).

PERIOD OF RECORD.--March 1945 to current year, WY 1981 (annual maximum only), March 1982 to September 1985 (no winter records).

REVISED RECORDS.--WSP 1308: 1945-46(M), 1948(M).

GAGE.--Water-stage recorder. Datum of gage is 1,111.91 ft above sea level. Prior to Jan. 29, 1953, nonrecording gage at bridge 1,800 ft upstream at datum 3.17 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, about 11.3 ft, present datum, spring of 1921, from information by local resident.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|-----|-----|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|
| 1 | 43 | 83 | 88 | e57 | e50 | 742 | 297 | 114 | 247 | 1350 | 104 | 54 |
| 2 | 42 | 86 | 88 | e57 | e51 | 692 | 279 | 120 | 239 | 1100 | 95 | 54 |
| 3 | 41 | 64 | 89 | e56 | e51 | 639 | 308 | 116 | 250 | 867 | 89 | 55 |
| 4 | 41 | 50 | e88 | e56 | e51 | 536 | 347 | 108 | 229 | 721 | 84 | 54 |
| 5 | 40 | 51 | e84 | e55 | e51 | 457 | 331 | 105 | 209 | 670 | 79 | 52 |
| | | | | | | | | | | | | |
| 6 | 39 | 76 | e81 | e54 | e51 | 395 | 310 | 104 | 193 | 611 | 74 | 51 |
| 7 | 40 | 94 | e79 | e54 | e51 | 330 | 318 | 99 | 178 | 705 | 70 | 50 |
| 8 | 45 | 99 | e79 | e53 | e51 | 282 | 322 | 114 | 164 | 684 | 67 | 49 |
| 9 | 60 | 110 | e80 | e53 | e51 | e190 | 298 | 136 | 150 | 665 | 65 | 47 |
| 10 | 59 | e100 | e80 | e52 | e51 | e135 | 271 | 140 | 141 | 635 | 62 | 46 |
| | | | | | | | | | | | | |
| 11 | 57 | e90 | e80 | e52 | e51 | e125 | 244 | 133 | 158 | 569 | 61 | 45 |
| 12 | 59 | e96 | e78 | e52 | e51 | e120 | 226 | 221 | 156 | 499 | 58 | 44 |

| | | | | | | | | | | | | |
|-------|------|------|------|------|------|-------|-------|-------|-------|-------|------|------|
| 13 | 111 | e95 | e76 | e51 | e51 | e115 | 235 | 369 | 154 | 435 | 58 | 47 |
| 14 | 196 | e93 | e74 | e51 | e51 | e110 | 245 | 453 | 144 | 388 | 60 | 48 |
| 15 | 217 | e91 | e74 | e51 | e52 | e105 | 222 | 587 | 131 | 373 | 62 | 50 |
| | | | | | | | | | | | | |
| 16 | 189 | e88 | e73 | e50 | e54 | e102 | 207 | 868 | 129 | 361 | 63 | 48 |
| 17 | 169 | e86 | e73 | e50 | e58 | 109 | 194 | 1420 | 127 | 333 | 63 | 46 |
| 18 | 145 | e84 | e72 | e50 | e65 | e115 | 181 | 1220 | 203 | 311 | 68 | 45 |
| 19 | 133 | e83 | e72 | e50 | e75 | e125 | 168 | 947 | 419 | 288 | 72 | 42 |
| 20 | 120 | e81 | e71 | e50 | e85 | e139 | 161 | 744 | 535 | 268 | 72 | 42 |
| | | | | | | | | | | | | |
| 21 | 107 | e80 | e70 | e50 | e100 | 157 | 156 | 669 | 587 | 242 | 69 | 42 |
| 22 | 98 | e79 | e69 | e50 | 145 | 156 | 149 | 571 | 617 | 220 | 76 | 41 |
| 23 | 92 | e78 | e67 | e50 | 245 | 140 | 143 | 444 | 586 | 200 | 78 | 41 |
| 24 | 87 | e78 | e66 | e50 | 379 | 133 | 136 | 349 | 576 | 186 | 70 | 41 |
| 25 | 83 | e77 | e65 | e50 | 543 | 131 | 128 | 293 | 484 | 172 | 64 | 49 |
| | | | | | | | | | | | | |
| 26 | 77 | e77 | e63 | e50 | 658 | 142 | 125 | 251 | 449 | 160 | 63 | 67 |
| 27 | 76 | e81 | e62 | e50 | 750 | 157 | 122 | 217 | 673 | 157 | 60 | 59 |
| 28 | 75 | e84 | e60 | e50 | 841 | 165 | 116 | 204 | 762 | 146 | 58 | 52 |
| 29 | 73 | e88 | e59 | e50 | --- | 178 | 114 | 190 | 1160 | 136 | 57 | 49 |
| 30 | 75 | e89 | e58 | e50 | --- | 251 | 121 | 276 | 1360 | 126 | 55 | 51 |
| 31 | 78 | --- | e58 | e50 | --- | 321 | --- | 296 | --- | 114 | 54 | --- |
| | | | | | | | | | | | | |
| TOTAL | 2767 | 2511 | 2276 | 1604 | 4763 | 7494 | 6474 | 11878 | 11410 | 13692 | 2130 | 1461 |
| MEAN | 89.3 | 83.7 | 73.4 | 51.7 | 170 | 242 | 216 | 383 | 380 | 442 | 68.7 | 48.7 |
| MAX | 217 | 110 | 89 | 57 | 841 | 742 | 347 | 1420 | 1360 | 1350 | 104 | 67 |
| MIN | 39 | 50 | 58 | 50 | 50 | 102 | 114 | 99 | 127 | 114 | 54 | 41 |
| AC-FT | 5490 | 4980 | 4510 | 3180 | 9450 | 14860 | 12840 | 23560 | 22630 | 27160 | 4220 | 2900 |
| CFSM | .28 | .26 | .23 | .16 | .53 | .75 | .67 | 1.19 | 1.18 | 1.37 | .21 | .15 |
| IN. | .32 | .29 | .26 | .19 | .55 | .87 | .75 | 1.37 | 1.32 | 1.58 | .25 | .17 |

e Estimated

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1998, BY WATER YEAR (WY)

| | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| MEAN | 40.1 | 37.8 | 26.2 | 21.7 | 24.9 | 88.8 | 267 | 135 | 105 | 108 | 52.4 | 38.5 |
| MAX | 151 | 176 | 73.4 | 54.7 | 170 | 434 | 1036 | 383 | 530 | 784 | 472 | 182 |
| (WY) | 1974 | 1972 | 1998 | 1981 | 1998 | 1966 | 1997 | 1998 | 1962 | 1993 | 1955 | 1957 |
| MIN | 11.6 | 12.2 | 10.6 | 9.94 | 9.88 | 15.0 | 33.3 | 21.5 | 12.7 | 10.1 | 5.87 | 8.52 |
| (WY) | 1979 | 1977 | 1977 | 1962 | 1949 | 1969 | 1981 | 1977 | 1977 | 1976 | 1976 | 1976 |

| SUMMARY STATISTICS | FOR 1997 CALENDAR YEAR | FOR 1998 WATER YEAR | WATER YEARS 1945 - 1998 | | | | |
|--------------------------|------------------------|---------------------|-------------------------|--------|--------|--------|------|
| ANNUAL TOTAL | 67313 | | 68460 | | | | |
| ANNUAL MEAN | 184 | | 188 | | 79.0 | | |
| HIGHEST ANNUAL MEAN | | | | | 188 | | 1998 |
| LOWEST ANNUAL MEAN | | | | | 16.7 | | 1977 |
| HIGHEST DAILY MEAN | 2360 | Apr 6 | 1420 | May 17 | 2360a | Apr 6 | 1997 |
| LOWEST DAILY MEAN | 14 | Mar 28 | 39 | Oct 6 | 3.2 | Aug 25 | 1976 |
| ANNUAL SEVEN-DAY MINIMUM | 18 | Mar 24 | 41 | Oct 1 | 4.3 | Aug 22 | 1976 |
| INSTANTANEOUS PEAK FLOW | | | 1520 | May 17 | 2360 | Apr 6 | 1997 |
| INSTANTANEOUS PEAK STAGE | | | 9.69 | May 17 | 10.77b | Apr 6 | 1997 |
| INSTANTANEOUS LOW FLOW | | | 38 | Sep 22 | 2.8 | Aug 26 | 1977 |
| ANNUAL RUNOFF (AC-FT) | 133500 | | 135800 | | 57250 | | |
| ANNUAL RUNOFF (CFSM) | .57 | | .58 | | .25 | | |
| ANNUAL RUNOFF (INCHES) | 7.78 | | 7.91 | | 3.33 | | |

| | | | | | | | |
|--------------------|-----|--|-----|--|-----|--|--|
| 10 PERCENT EXCEEDS | 371 | | 513 | | 186 | | |
| 50 PERCENT EXCEEDS | 80 | | 90 | | 33 | | |
| 90 PERCENT EXCEEDS | 30 | | 50 | | 14 | | |

- a Estimated, backwater from ice.
- b Backwater from ice.

