

SELECTED DATA DESCRIBING STREAM SUBBASINS IN THE REDWOOD RIVER BASIN, SOUTHWESTERN MINNESOTA

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ABSTRACT

This report presents selected data describing the characteristics of streams upstream from selected points on streams in the Redwood River basin. The points on the streams include outlets of subbasins of about five square miles, sewage treatment plant outlets, and U.S. Geological Survey gaging stations in the basin.

INTRODUCTION

The Redwood River drains an area of 705 square miles located in southwestern Minnesota and drains areas of Lincoln, Lyon, Murray, Pipestone, Redwood, and Yellow Medicine Counties.

This report is the first of several planned gazeteers providing basin characteristics of streams in Minnesota. It provides selected data for selected points on streams in the Redwood River Basin. The selected points include outlets of subbasins of about five square miles, outlets from sewage treatment plants, and U.S. Geological Survey gaging stations on the streams.

Methods

U.S. Geological Survey 7-1/2 minute-series topographic maps were used as base maps to obtain the data recorded in this report. The drainage area boundaries and stream channels were recorded using a geographic information system (GIS). The data was stored in an Albers Equal-Area projection. Database functions and other capabilities of the GIS were used to aggregate the data, determine drainage area of the subbasins, and determine stream channel lengths. Elevation data for the streams were recorded at the point where topographic contour lines intersected the stream traces. Points on the stream channel 10 percent and 85 percent of the stream channel length from the basin outlet to the drainage divide were located by the GIS and the elevations of these points were interpolated from the data recorded in the GIS. Stream slope was calculated from these data. Lake area and storage area data were calculated using the analytic capabilities of the GIS.

Acknowledgements

The Minnesota State Planning Information Center provided invaluable assistance with much of the digitizing and programing needed to produce this report. The Center's help is gratefully acknowledged.

SIGNIFICANCE OF DRAINAGE AREA BOUNDARIES

The subbasins reported here were delineated on the basis of topographic features and human activities recorded on the topographic maps. Data from field inspection and recent drainage ditch maps were transferred to the topographic maps.

Drainage basins do not have fixed boundaries. Human activities along basin divides and within the basin, such as the installation of storm sewers, the drainage of wetlands, and the diversion of streams may alter the stream's drainage area.

EXPLANATION OF BASIN CHARACTERISTICS

Table 1 is a list of selected basin characteristics for each of the subbasins in the Redwood River basin. The rank of the stream is shown by indentation and indicates the drainage pattern of the stream. The first-ranked river is the Redwood River. Tributary streams are indented two spaces per rank.

The data for drainage area, main-channel length, and main-channel slope are reported using three significant figures or rounded to the nearest hundredth of a unit. The data for lake area and storage area are reported using two significant figures or to the nearest tenth of a percent.

GLOSSARY OF TERMS

Downstream Order Number. -- Distinctive numbers assigned to each gaging station to provide geographical location and identification. The numbers are assigned based on the downstream order for each minor basin. The first digit designates the major river basin. The last six digits designate the downstream order of the location.

Drainage area.--That area measured on a horizontal plane, enclosed by a topographic divide, within which direct surface runoff from precipitation normally flows by gravity into a stream above a specified point. This may include closed basins and other areas which do not contribute directly to surface runoff.

Lake Area.--The percentage of the drainage area covered by open water.

Length.--The total length of the main channel from the basin outlet to the drainage divide. The main channel is that stream which drains the greatest area of all streams in the basin.

Map Number.--This is an arbitrary number used to identify the subbasin. The number is based on the Minnesota Common Stream Number System. The last four digits of the seven-digit number is used. The first three digits are 270 for all basins and were omitted to clarify the map.

Outlet Location.--Quarter-quarter section, quarter section, section, township, and range are given to locate the outlet of the basin.

Slope.--The average slope of the watercourse between points 10 and 85 percent of the distance along the main channel from the basin outlet to the drainage divide.

Storage Area.--The percentage of the drainage area covered by lakes, ponds, and marshes as shown on topographic maps.

Stream Name.--The name of the stream shown on the map. U.S. Geological Survey gaging stations are given the name of the stream on which they are located. Sewage treatment plants are identified as STP outlets.

Table 1.--Selected data for subbasins in the Redwood River drainage basin

[Outlet location is quarter-quarter section, quarter section, section, township, range]

Map number	Downstream order no.	Stream name	Outlet location	By subbasin			Cumulative to mouth of basin			Main channel length (miles)	Main channel slope (foot per mile)
				Drainage area (square miles)	Lake area (percent of subbasin area)	Storage area (percent of subbasin area)	Drainage area (square miles)	Lake area (percent of total area)	Storage area (percent of total area)		
1801	5314900	Redwood River at Ruthton	NW1/4NW1/4 11 108N 44W	6.43	0.0	0.1	6.43	0.0	0.1	6.59	23.3
1600		Tributary to Redwood River	SE1/4SE1/4 2 108N 44W	8.15	.5	1.2	8.15	.5	1.2	6.61	7.09
1800		Redwood River	NE1/4NW1/4 17 108N 43W	6.43	2.3	5.3	21.0	.9	2.1	12.8	12.0
1900		Tributary to Redwood River	NE1/4NW1/4 17 108N 43W	9.94	.0	.4	9.94	.0	.4	11.1	15.5
2000		Redwood River	NW1/4SW1/4 35 109N 43W	9.85	1.1	2.8	40.8	.7	1.9	22.9	5.71
1700		Tributary to Redwood River	NW1/4SW1/4 35 109N 43W	8.77	14	16	8.77	14	16	6.37	8.92
5200		Redwood River	NE1/4NW1/4 15 109N 43W	7.22	.4	4.0	56.8	2.7	4.3	30.6	4.27
1500		County Ditch #2	SW1/4NE1/4 29 109N 44W	6.91	.3	.6	6.91	.3	.6	6.50	25.0
700		Tributary to County Ditch #2	SW1/4NE1/4 29 109N 44W	12.6	.0	.2	12.6	.0	.2	13.9	8.73
1400		County Ditch #2	NW1/4SW1/4 14 109N 44W	5.83	.0	.2	25.3	.1	.3	15.5	8.00
800		County Ditch #7	NW1/4SW1/4 14 109N 44W	10.9	.6	1.4	10.9	.6	1.4	9.82	9.50
1001		Tyler STP outlet	NE1/4SE1/4 33 110N 44W	1.36	.0	.0	1.36	.0	.0	2.98	20.4
1000		County Ditch #14	SW1/4SE1/4 14 109N 44W	4.28	.0	.1	5.64	.0	.1	6.91	10.2
1300		County Ditch #2	NE1/4NW1/4 15 109N 43W	9.37	.0	.9	51.2	.2	.6	24.8	6.32
1200		Tributary to Redwood River	SE1/4SW1/4 10 109N 43W	9.46	.0	1.1	9.46	.0	1.1	7.86	13.6
1100		Tributary to Redwood River	NW1/4SE1/4 35 110N 43W	6.50	.3	2.4	6.50	.3	2.4	6.59	17.0
5301	5314950	Redwood River near Russel	NW1/4NW1/4 36 110N 43W	5.28	.0	.9	129	1.3	2.4	39.0	5.09
5300		Redwood River	NE1/4SE1/4 24 110N 43W	2.14	.0	.7	131	1.2	2.3	41.8	5.24
500		Coon Creek	NW1/4SE1/4 33 110N 45W	23.2	.6	1.3	23.2	.6	1.3	13.8	7.82
600		Coon Creek	SW1/4NE1/4 26 110N 45W	18.1	25	27	41.3	11	13	17.4	5.66
301	5314960	Coon Creek at Lake Benton Outlet at Lake Benton	NW1/4NE1/4 26 110N 45W	0.11	.0	.0	41.4	11	13	17.9	5.38
400		Judicial Ditch #30	SW1/4NW1/4 13 110N 45W	5.51	.0	.8	5.51	.0	.8	5.14	19.6
900		Tributary to Coon Creek	NW1/4NE1/4 22 110N 44W	8.97	.0	.3	8.97	.0	.3	8.28	14.1
300		Coon Creek	NE1/4NE1/4 11 110N 44W	13.6	.9	2.0	69.5	6.8	8.0	36.2	5.15
201	5314970	Coon Creek near Russel	SE1/4NE1/4 23 110N 43W	23.3	4.5	8.0	92.8	6.2	8.0	54.8	4.59
200		Coon Creek	NE1/4SE1/4 24 110N 43W	3.26	.0	1.6	96.0	6.0	7.8	56.7	4.64
4303		Russel STP outlet	SW1/4NE1/4 19 110N 42W	3.05	3.3	4.1	230	3.2	4.6	43.2	5.40
4302	5315000	Redwood River near Marshall	SE1/4SW1/4 12 111N 42W	28.2	.4	2.0	259	2.9	4.4	60.0	9.40
4301		Marshall STP outlet	SE1/4NE1/4 28 112N 41W	7.95	.0	.4	267	2.8	4.2	70.9	9.76
4300		Redwood River	NE1/4NE1/4 15 112N 41W	3.49	.0	.9	270	2.8	4.2	75.9	9.61

Table 1.--Selected data for subbasins in the Redwood River drainage basin--Continued

Map number	Downstream order no.	Stream name	Outlet location	By subbasin			Cumulative to mouth of basin				Main channel slope (foot per mile)
				Drainage area (square miles)	Lake area (percent of subbasin area)	Storage area (percent of subbasin area)	Drainage area (square miles)	Lake area (percent of total area)	Storage area (percent of total area)	Main channel length (miles)	
4201	5315200	Prairie Ravine near Marshall	SE%ANE% 20 112N 41W	5.56	0.0	0.9	5.56	0.0	0.9	4.71	11.6
4200		Prairie Ravine	NE%AN% 15 112N 41W	5.54	.0	.4	11.1	.0	.6	8.53	9.43
4100		County Ditch #60	SE%SE% 18 112N 40W	18.2	.0	.8	18.2	.0	.8	11.6	5.78
4000		Redwood River	NW%AN% 20 112N 40W	8.78	.3	.6	308	2.5	3.8	81.3	9.39
4600		Tributary to Threemile Creek	NW%AN% 29 111N 43W	5.13	14	17	5.13	14	17	4.54	3.87
100		Threemile Creek	NW%AN% 34 112N 42W	30.7	1.3	3.0	35.8	3.1	5.0	26.2	19.8
5000		Tributary to Threemile Creek	NW%AN% 34 112N 42W	8.31	.0	.7	8.31	.0	.7	10.4	32.7
4500		Tributary to Threemile Creek	NW%SE% 27 112N 42W	17.1	.0	.1	17.1	.0	.1	17.8	25.0
4401	5315300	Threemile Creek near Ghent	SE%AN% 12 112N 42W	11.2	.7	1.9	72.4	1.7	2.9	36.2	14.8
4900		Ghent Creek	SE%SE% 2 112N 42W	17.8	.0	.6	17.8	.0	.6	16.4	17.1
4800		Ghent Creek	NE%AN% 7 112N 41W	10.4	.0	.2	28.2	.0	.5	18.6	15.0
4400		Threemile Creek	NW%AN% 33 113N 41W	2.79	.0	.0	103	1.2	2.1	42.0	12.5
4700		County Ditch #15	NW%AN% 33 113N 41W	9.29	1.9	5.8	9.29	1.9	5.7	4.36	11.8
3901	5315400	Threemile Creek at Green Valley	SE%AN% 2 112N 41W	4.14	.0	.0	117	1.2	2.4	46.3	11.3
3900		Threemile Creek	NW%AN% 20 112N 40W	4.99	.0	.4	122	1.1	2.3	53.6	9.65
3800		Tributary to Redwood River	NE%SW% 15 112N 40W	5.04	.6	2.6	5.04	.6	2.6	4.69	4.26
3700		Tributary to Redwood River	SE%AN% 19 112N 39W	12.9	.0	.3	12.9	.0	.3	8.74	9.58
2500		Redwood River	NE%NE% 19 112N 39W	7.09	.0	.0	455	2.0	3.1	90.0	9.02
2400		Judicial Ditch #3	NE%NE% 19 112N 39W	12.4	4.3	4.6	12.4	4.3	4.6	7.28	5.18
2600		Redwood River	NW%AN% 19 112N 38W	19.7	.0	.4	487	2.0	3.1	100	8.31
2300		Judicial Ditch #37	NW%AN% 19 112N 38W	8.88	.0	.8	8.88	.0	.8	7.88	4.12
3100		County Ditch # 33	SE%NE% 23 112N 38W	8.19	.0	.1	8.19	.0	.1	6.21	8.82
3200		Redwood River	SW%AN% 29 112N 37W	15.5	.0	.3	520	1.8	2.9	111	7.61
2700		Clear Creek	SE%SW% 3 111N 39W	20.2	.0	.7	20.2	.0	.7	11.6	4.63
2800		Tributary to Clear Creek	SE%SW% 3 111N 39W	5.50	.5	1.3	5.50	.5	1.3	5.17	5.62
2900		Judicial Ditch #14 & 15	SE%NE% 10 111N 39W	19.7	.0	.1	19.7	.0	.1	11.6	5.82
3400		County Ditch #90	SW%SW% 32 112N 37W	5.63	.0	.0	5.63	.0	.0	5.49	7.12

Table 1.--Basin characteristic data for the Redwood River drainage basin--Continued

Map number	Downstream order no.	Stream name	Outlet location	By subbasin			Cumulative to mouth of basin				
				Drainage area (square miles)	Lake area (percent of subbasin area)	Storage area (percent of subbasin area)	Drainage area (square miles)	Lake area (percent of total area)	Storage area (percent of total area)	Main channel length (miles)	Main channel slope (foot per mile)
3001	5316300	Clear Creek at Seaforth	NW¼NE¼ 32 112N 37W	31.9	1.3	3.3	82.9	.5	1.6	24.4	3.31
3000		Clear Creek	SW¼NW¼ 29 112N 37W	0.45	.0	.0	83.4	.5	1.5	25.6	3.34
3504	5316480	Redwood River near Redwood Falls Low-flow site 1	NW¼NW¼ 17 112N 36W	23.4	.0	.6	627	1.6	2.7	121	7.09
3503	5316500	Redwood River near Redwood Falls	SE¼NE¼ 9 112N 36W	2.25	.0	.0	629	1.6	2.7	123	6.98
3502	5316510	Redwood River near Redwood Falls Low-flow site 3	NE¼NW¼ 1 112N 36W	6.56	1.4	1.4	635	1.6	2.6	127	6.84
2100		Judicial Ditch #32	SW¼SW¼ 36 113N 37W	23.4	.0	.6	23.4	.0	.6	13.3	2.15
2200		Ramsey Creek	NW¼NW¼ 5 112N 36W	22.2	.1	1.6	45.6	.1	1.1	17.2	2.30
3300		Tributary to Ramsey Creek	NW¼NW¼ 5 112N 36W	14.3	.0	4.2	14.3	.0	4.2	11.2	3.77
3601	5316540	Ramsey Creek near Redwood Falls	NE¼NW¼ 35 113N 36W	5.43	.0	.0	65.3	.0	1.7	21.2	2.26
3600		Ramsey Creek	SW¼NE¼ 36 113N 36W	1.11	.0	.0	66.4	.0	1.7	23.9	3.34
3501		Redwood River	NW¼NW¼ 31 113N 35W	1.48	.0	.4	704	1.4	2.6	129	6.76
3500		Redwood River	SE¼SW¼ 20 113N 35W	1.43	.0	.0	705	1.4	2.5	132	6.69