



STREAM MANAGEMENT PLAN – Page 1

Stream name Red River		Kittle Number S-001.9	Total Miles in Minn. 4.7	Date of Plan(Mo.-Yr.) 2022
Region 2	Area Fisheries Office F213	Plan Managed Segment (river miles) 0-4.7 (portion within MN)	Length (miles) Plan Managed Segment 4.7	

Major Watershed: St. Louis (3)			Minor Watersheds (significant tributaries) Red River (3171)			
Similar Reach	Similar Reach Name	Stream Miles	Length miles	Rosgen Channel Type	Fisheries Ecological Classification ¹	Species of Management Interest
1	Lower	0-2.3	2.3	unknown	coldwater	Brook Trout
2	Upper	2.3-4.7	2.4	unknown	coldwater	Brook Trout

Long Range Goals

Goal 1: Provide a trout fishery by establishing a naturally reproducing Brook Trout population.

Objectives (Desired Future Conditions) and Operational Plans:

- 1) Reintroduce Brook Trout by stocking 3500 wild strain fingerlings (adipose clipped) annually for three consecutive years beginning in 2023, or as soon as stock are available.
- 2) Conduct population assessments in 2025 and 2028 (or 3rd stocking year and 3 years post stocking) to determine if stocking has resulted in a Brook Trout population that is reproducing.
- 3) Conduct population assessments as needed to monitor the Brook Trout population and impact of management actions.

Goal 2: Increase the connectivity and resiliency of the Red River.

Objectives (Desired Future Conditions) and Operational Plans:

- 1) Work with partners to replace or reconfigure crossings that are barriers to aquatic organism passage.
- 2) Minimize impacts to aquatic resources by providing recommendations during permit review.
- 3) Minimize impacts of climate change by following Operational Order 131.

Area Specific needs
■ 1854 Ceded Territory ■ Designated Trout Stream

Approvals

Plan Authors			
Deserae Hendrickson			
Area Supervisor	Date	Regional Manager	Date

BACKGROUND INFORMATION

Priorities- The Red River is a high management priority because it is a designated trout stream with good angler access, a significant amount of riparian public land, and excellent water temperature profiles.

Description of Stream System- The Red River originates from wetland seepage and runoff and flows for 4.7 miles before entering Wisconsin and ultimately joining the St. Louis River in Superior Wisconsin at a total stream length of 10.5 miles.

Past Surveys and Investigations-

Full Surveys - 1968

Population Assessments - 2008

Temperature Assessments – 2007, 2008, 2009

Past Management-

The Red River was designated as a trout stream in 1952. There is no stocking of this stream on record.

ASSESSMENT OF RESOURCE CONDITION

HYDROLOGY

General Description- The source of the stream is the outlet of a private pond in-channel impoundment, which may reduce flow to headwater reaches through evaporation. There are two tributaries, tributary 5 and 10, identified as having significant perennial flow in the 1968 survey. The extent and duration of flow in other tributaries is unknown (Figure 1).

There is limited rural development in the upper watershed, but the majority is wooded. The land type in the Minnesota section of the Red River watershed (3.3 square miles) consists of deciduous forest (49.1%), coniferous forest (21.9%), grassland (11.4%), mixed wood forest (7.3%), regeneration/young forest (4.6%), cultivated land (3.4%) and wetlands (2.3%). Rainfall runoff rates are not likely to be dramatically impacted by the current level of impervious or non-forested area.

Management Concerns for Hydrology (at each of three spatial scales)

Watershed scale Concerns- Future development has the potential to negatively impact the hydrology of Red River. An increase in the percent of developed land within the watershed could alter the natural hydrology of the stream, resulting in higher intensity and duration of peak flows.

Riparian scale Concerns- None

Instream scale Concerns- None

Management Recommendations for Hydrology: None.

CONNECTIVITY

General Description- The lowest culvert crossing in Minnesota is the Burlington Northern rail line at mile 2.3. This culvert appears to be a total barrier to fish passage, with a significant drop to the

stream bed at the outlet. Highway 23 crosses the main stem at mile 2.7 and is the only main stem road crossing within Minnesota, although there are several road crossings on tributaries to Red River.

Management Concerns for Connectivity (at each of three spatial scales)

Watershed scale Concerns- Cumulative impacts of road and trail crossings may affect longitudinal and lateral connectivity in Red River.

Riparian scale Concerns- None

Instream scale Concerns- Poorly designed road and railroad crossings can be either permanent barriers to fish movement or partial barriers to fish movement and interrupt natural sediment transport processes.

Management Recommendations for Connectivity:

- 1) Evaluate the known road and trail crossings for aquatic organism passage.
- 2) Work with partners to ensure that structures at road and trail crossings are properly sized and placed to allow for aquatic organism passage and stream function.

GEOMORPHOLOGY AND FISH HABITAT

General Description- The stream lies in an area of former Glacial Lake Duluth, with primary soil types of clay and clayey silt. It has a gradient of 42 feet/mile and a sinuosity of 1.6 (thalweg length/valley length). Similar reach 2 has a slightly steeper slope (47 feet/mile) than reach 1 (40 feet/mile). The source of the stream is the outlet of a private pond in-channel impoundment.

Land adjacent to the stream consists of deciduous forest (45.2%), coniferous forest (37.4%), mixedwood forest (14%), and grassland (3.4%).

Stream bed substrates were identified as primarily clay (50%), sand (40%) and muck (10%) in the 1968 survey. Stations sampled in the 2008 assessment had primarily sand/gravel substrate. Stream banks were typically low, with height ranging from 0.5 to 2.0 feet.

Management Concerns for Geomorphology and Fish Habitat (at each of three spatial scales)

Watershed scale Concerns- The impoundment at the headwaters may be increasing risk for excessive erosion immediately downstream by interrupting the sediment transport balance within the upper stream reach. This reach of the stream is not considered a protected public water, however, due to the small watershed size and the fact that this section is not designated as trout water.

Riparian scale Concerns- All of the road and railroad crossings in the watershed may impact the stream, causing erosion and altering stream geomorphology if not sized properly.

Instream scale Concerns- None.

Management Recommendations for Geomorphology and Fish Habitat:

- 1) If trout are able to successfully establish, consider extending trout designation to include headwaters.

WATER QUALITY

General Description- Water temperatures monitored from 2007 to 2009 indicate that the thermal regime of Red River is excellent for Brook Trout (Table 1). Water temperatures did not exceed the stressful or lethal threshold for Brook Trout during the monitoring (Figures 2 -4). The high percentage of fully wooded riparian corridor on this stream likely contributes to excellent temperature conditions for trout.

Management Concerns for Water Quality (at each of three spatial scales)

Watershed scale Concerns- None.

Riparian scale Concerns- Maintaining a healthy wooded riparian corridor is important to maintaining ideal temperature conditions for Brook Trout.

Instream scale Concerns- Impoundment of the headwaters is likely raising stream temperatures in the headwaters.

Management Recommendations for Water Quality:

- 1) Work with partners to retain the healthy riparian corridor to provide shade to the stream.
- 2) Encourage removal of in-channel impoundments within the watershed.

BIOLOGY

General Description- A 1968 survey found only White Sucker and Creek Chub present in Red River, despite cold water temperatures.

During the 2008 population assessment, electrofishing occurred at mile 0.4 and 2.7. Four nongame species were sampled, including Brook Stickelback, Mottled Sculpin, Blacknose Dace and Creek Chubs (in order of decreasing abundance, Table 2).

Management Concerns for Biology (at each of three spatial scales)

Watershed scale Concerns- None.

Riparian scale Concerns-None.

Instream scale Concerns- The lack of trout presence is a concern, as this is one of the coldest streams within the Duluth management area.

Management Recommendations for Biology:

- 1) Introduce a wild Brook Trout strain to this trout stream through stockings of 3500 fingerlings in 2023, 2024, and 2025 or as soon as stock are available.
- 2) Monitor the Brook Trout population in 2025 (3rd stocked year) and 2028 (3 years post stocking) to evaluate reintroduction success.

SOCIAL ASPECTS

General Description-

Angling pressure on Red River is unknown. The 1968 survey noted the stream appeared to receive some light fishing pressure near Highway 23. The posted boundary for Red River is located at the Minnesota/Wisconsin state line. This means that anglers must follow the regulations for Lake Superior tributaries above posted boundaries for the entire stream within MN.

State or county owned land adjacent to the stream covers 2.2 miles or 46% of the 4.7 mile section in Minnesota. The portion of the watershed within State and county ownership is 41%. This provides good access to anglers, although not easily accessible by road. The Superior Hiking Trail crosses the stream near the Wisconsin border.

Climate change has the potential to affect fish populations in Red River. A changing climate can alter fish behavior, distribution, development, reproduction and survival. Because the rate and magnitude of climate change may exceed the adaptive capacity of fish species, active (adaptive) management is required to increase resilience and reduce the impacts of climate change. Appendix A of the MNDNR Operational Order 131 was consulted to characterize potential climate effects on aquatic resources in Red River. The primary adaptation strategy for climate change will be to maintain a resilient and healthy watershed for Red River. Protecting important features such as riparian wetlands, floodplains, terraces, sediment transfer areas, water storage areas, nutrient cycling capabilities, natural hydrologic regimes and riparian corridors will help maintain system resiliency to climate change.

A draft of this plan was made available for public review from Feb 15 through March 15. Comments solicited via news release were accepted for consideration. XX comments were received.

Management Concerns for Social Aspects (at each of three spatial scales)

Watershed scale Concerns- Future landscape changes in the Red River watershed have the potential to negatively impact all aspects of the health of Red River. Climate change has the potential to alter all aspects of the health of Red River.

Riparian scale Concerns- None.

Instream scale Concerns- None.

Management Recommendations for Social Aspects:

- 1) Minimize impacts to aquatic resources by providing recommendations during permit review.
- 2) Minimize impacts of climate change by following Operational Order 131.

Table 1. The average percentage of hourly water temperatures stressful (68°F-76.9°F) and lethal (>77°F) to Brook Trout¹ in Red River (S-001.9). Hourly temperature readings were obtained in 2007, 2008 and 2009 between June 1st and September 30th of each year.

Location	Years sampled	Miles from river mouth	% of hours stressful to Brook Trout	% of hours lethal to Brook Trout
Off Burlington Northern RR	2008, 2009	0.4	0	0
RR crossing downstream from tributary mouth	2007, 2009	1.6	0	0
Upstream of Highway 23	2007, 2008, 2009	2.7	0	0

¹Brown, H.W. 1974. Handbook of the effects of temperature on some North American fishes. American Electric Power Service Corporation, Canton, Ohio. 524 p and App (12).

Table 2. Species sampled in Red River (S-001.9), 1968-2008.

	1968	2008
Species	Full Survey	Population Assessment
Blacknose Dace		X
Brook Stickleback		X
Creek Chub	X	X
Mottled Sculpin		X
White Sucker	X	

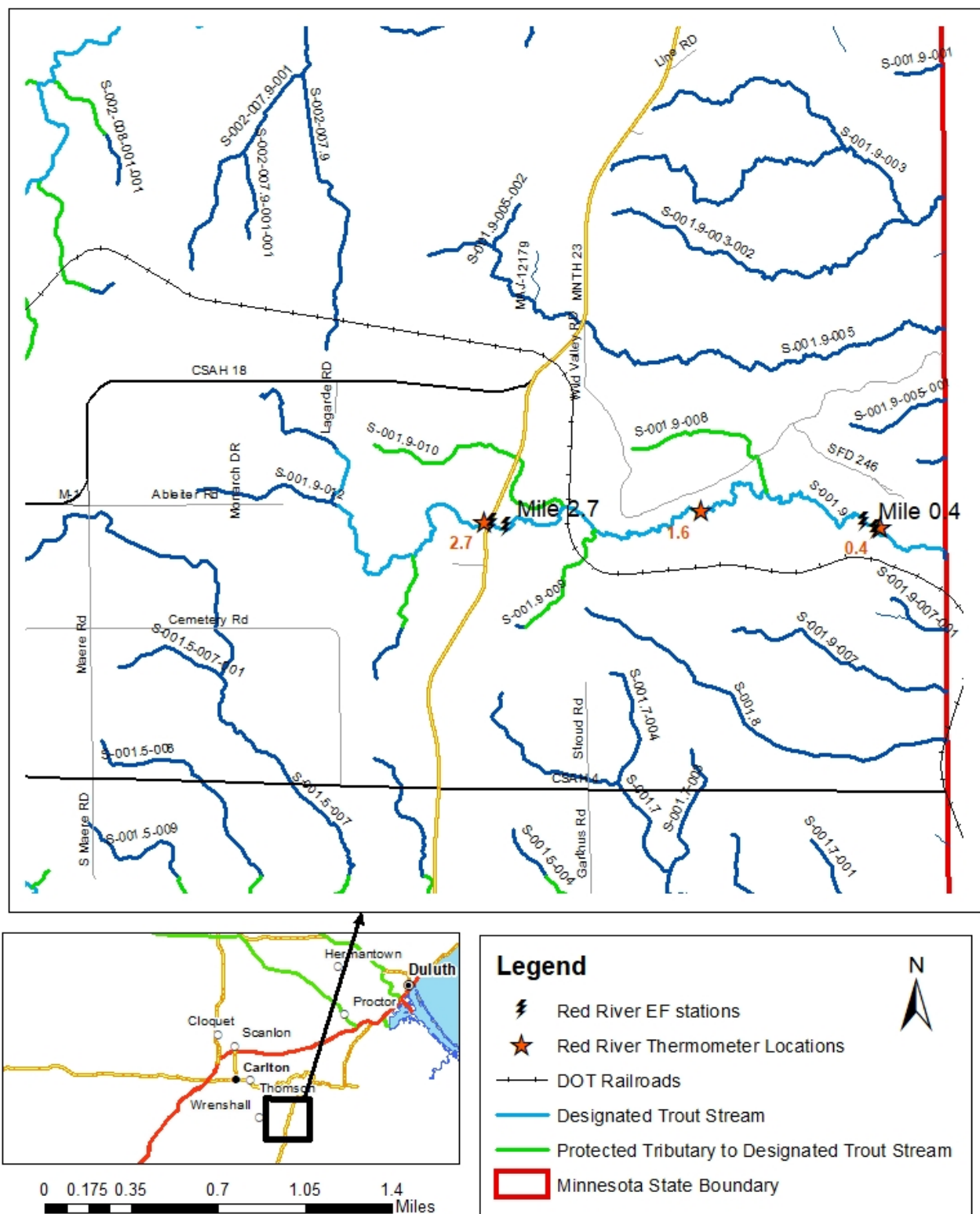


Figure 1. Historic sampling and tributaries in the Red River Watershed (S-001.9).

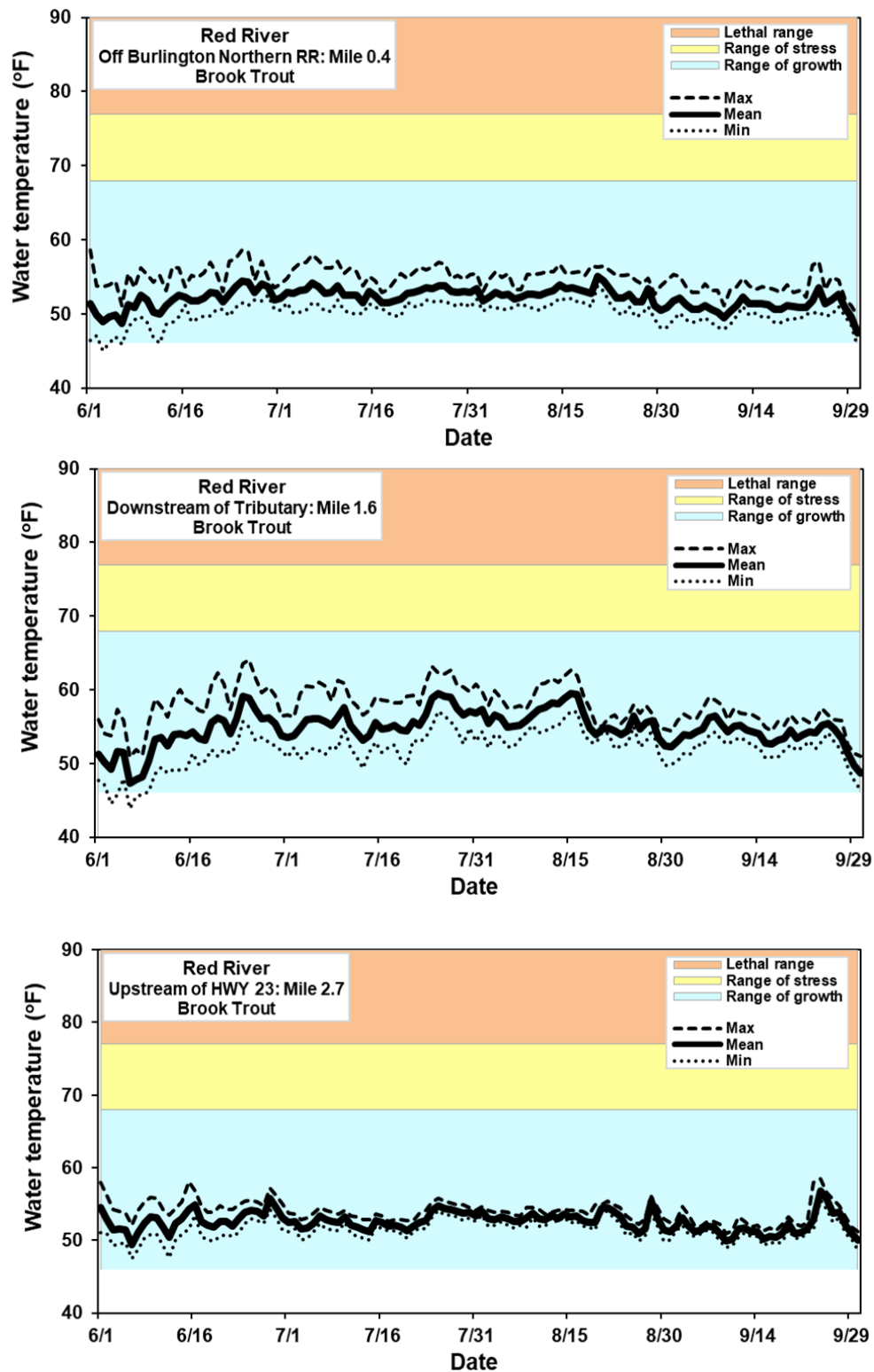


Figure 2. Mean daily water temperatures for each year at each station in Red River (S-001.9). Temperature ranges are for Brook Trout.